TRANSPORTATION IMPACT ASSESSMENT

PROPOSED CHICK-FIL-A RESTAURANT
FRAMINGHAM, MASSACHUSETTS

Prepared for:

Atlanta, Georgia

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EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a Chick-fil-A restaurant with a drive-through window facility to be located off Ring Road (a.k.a. Shoppers World West Drive) and situated within the northern portion of the parking area serving the Kohl's Plaza in Framingham, Massachusetts (hereafter referred to as the "Project"). Access to the Project site will be provided by way of the three (3) full-access driveways that serve the Kohl's Plaza and intersect the west side of Ring Road.

This study was prepared in consultation with the Towns of Framingham and Natick, and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*; and was conducted pursuant to the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

Based on a review of the findings of this assessment, it has been concluded that the additional traffic demands that may be associated with the Project can be accommodated within the confines of the existing transportation infrastructure with implementation of the specific recommendations detailed herein.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in December 2012 and updated in September 2014. The field investigation consisted of an inventory of existing parking supply and demand; roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area for the Project was selected to contain the major roadways providing access to the Project site: Cochituate Road (Route 30), Worcester Road (Route 9) and Ring Road; as well as the following major intersections located along these roadways through which Project-related traffic will travel: Route 30 at Ring Road and Shoppers' World Way; Route 9 at Ring Road/retail plaza driveway; Ring Road at Ring Road Connector; Ring Road at the Kohl's Plaza north driveway/retail plaza driveway; Ring Road at the Kohl's Plaza driveway; and Ring Road at the Kohl's Plaza south driveway/retail plaza driveway.

Existing Traffic Volumes

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs) and vehicle classification counts were completed in September 2014 while public schools were in regular session. The ATR counts were conducted on Ring Road in the vicinity of the Project site in order to record weekday and Saturday daily traffic conditions over an extended period, with weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak period manual TMCs performed at the study intersections. These time periods were selected for analysis purposes as they are representative of the peak traffic volume hours for both the Project and the adjacent roadway network. The September traffic volumes were found to be representative of an above average-month condition and were not adjusted downward in order to provide a conservative (above-average) analysis condition. The following summarizes existing traffic volumes along Ring Road:

Ring Road:

Average Weekday Traffic: 7,230 vehicles[1]
Saturday: 8,410 vehicles
Weekday Evening Peak-Hour: (4:00 – 5:00 PM): 489 vph[2]
Saturday Midday Peak-Hour: (12:45 – 1:45 PM): 760 vph

Pedestrian and Bicycle Facilities

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in September 2014. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. Sidewalks are provided along both sides of Route 30 and Route 9, and intermittently along the east side of Ring Road. Marked crosswalks are provided at the signalized study intersections with pedestrian traffic signal equipment and phasing provided. Marked crosswalks are also provided on the north leg of the Ring Road/Ring Road Connector intersection and the east leg of the Ring Road/Kohl's Plaza north driveway/retail driveway intersection.

At present, there are no formal existing bicycle facilities that were identified within the immediate study area; however, Ring Road provides sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration.[3]

Public Transportation

Public transportation services are provided within the study area by the MetroWest Regional Transit Authority (MWRTA). The MWRTA operates fixed-route bus service by way of Route 2, *Framingham Circuit (Clockwise)*; Route 3, *Framingham Circuit (Counter Clockwise)*; and Route 4, *Market Basket/Beaver Park/Natick Mall*. Routes 2 and 3 are clockwise and counter clockwise circuitous routes, respectively, beginning at the Central Hub in Framingham and serving several residential and commercial uses including the MetroWest Medical Center,

[1]Two-way, 24-hour volume.

[2]Vehicles per hour (vph).

[3]A minimum travelled-way (combined travel lane and paved shoulder) of 14-feet is required to support bicycle travel in a shared roadway condition (i.e., motor vehicles and bicycles sharing the roadway).

Nobscot and Pinefield Shopping Centers, Target, Shoppers World, Natick Collection, and MassBay Community College. Route 4 provides service between the Central Hub in Framingham and Market Basket on Route 126 in Ashland. All three bus routes have a scheduled stop on Ring Road in the vicinity of the Kohl's north driveway. Bus service is provided Monday through Friday from approximately 6:00 AM to 8:00 PM, and on Saturday from approximately 9:00 AM to 5:30 PM. Bus Route 2 generally operates with 60-minute headways, with Route 3 generally operating with 75-minute headways and Route 4 operating with 80-minute headways. Roundtrip fares for adults are $1.50, with a $1.00 fare for students and a $0.75 fare for senior citizens and people with disabilities.

Spot Speed Measurements

Vehicle travel speed measurements were performed on Ring Road in the vicinity of the Project site in conjunction with the ATR counts. Based on these measurements, the mean (average) vehicle travel speed along Ring Road in the vicinity of the Project site was found to be approximately 17 miles per hour (mph). The average measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be approximately 22 mph. The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances, and is often used in establishing posted speed limits.

Motor Vehicle Crash Data

Motor vehicle crash information for the study intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2008 through 2012, inclusive) in order to examine motor vehicle crash trends occurring within the study area.

Based on a review of this information, the study intersections were found to have experienced an average of seven (7) or fewer reported motor vehicle crashes over the five-year review period, the majority of which resulted in property damage only; occurred on a weekday; and were reported as rear-end-type collisions. No crashes were reported to have occurred at the Kohl's Plaza driveway intersections with Ring Road, or at the Ring Road/Ring Road Connector intersection. All of the study intersections were found to have a motor vehicle crash rate below both the MassDOT statewide and Highway Division District 3 (the MassDOT Highway Division District in which the intersection is located) average crash rate for a signalized or unsignalized intersection, as appropriate, indicating no inherent safety deficiencies with respect to geometric design or operating conditions. In addition, no fatal motor vehicle crashes were reported at the study intersections over the five-year review period.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2021, which reflects a seven-year planning horizon consistent with State traffic study guidelines. Independent of the Project, traffic volumes on the roadway network in the year 2021 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2021 No-Build traffic volumes reflect 2021 Build traffic volume conditions with the Project.

Specific Development by Others

MassDOT and the Planning Department of the Towns of Framingham and Natick were contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on these discussions, the following projects were identified for inclusion in this assessment:

- ***Avidia Bank, 222 and 236 Cochituate Road, Framingham, Massachusetts.*** This project will entail the construction of a 5,313± square foot (sf) bank with a drive-through teller facility to be located at 222 and 236 Cochituate Road in Framingham, Massachusetts.

- ***TJX Office Expansion, 740-770 Cochituate Road, Framingham, Massachusetts.*** This project will entail the construction of an additional 96,000± sf of office space to be located at 740-770 Cochituate Road in Framingham, Massachusetts.

- ***MathWorks Lakeside Campus Parking Garage, Natick, Massachusetts.*** This project will entail the construction of a 470-space parking garage to be located at 19 Superior Drive within the MathWorks Campus in Natick, Massachusetts.

- ***Proposed Sherwood Plaza South (SPS) Redevelopment, Natick Massachusetts.*** This project will entail the redevelopment of the former BJ's office headquarters to a 216,861± sf mixed-use development consisting of office space, retail space and a fitness facility to be located on the southeast corner of the intersection of Route 9 and Dean Road in Natick, Massachusetts.

Traffic volumes associated with the aforementioned development projects by others were obtained from their respective traffic study[4] or were estimated using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[5] for the appropriate land use, and were assigned onto the study area roadway network based on existing traffic patterns. In addition to the above development projects by others, a portion of the existing Kohl's retail store is planned to be reconfigured to accommodate a Pier 1 Imports store. Traffic volumes associated with this retail conversion project were assumed to be included in the trips generated by the existing Kohl's store as the space that is to be converted currently consists of active retail space. No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general traffic growth trends. Based on a review of this data it was determined that traffic volumes within the Town of Framingham have declined slightly over the past several years. In order to provide a conservative (high) analysis condition, a 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

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[4] *Traffic Impact and Access Study*, Sherwood Plaza South (SPS) – Phased Master Plan Redevelopment, Natick, Massachusetts; VHB; April 2014.

[5] *Trip Generation*, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.

Roadway Improvement Projects

The Town of Framingham and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2021 that would impact traffic volumes or operating conditions within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

No-Build Traffic Volumes

The 2021 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2014 Existing peak-hour traffic volumes and then superimposing the peak-hour traffic volumes associated with the identified specific development projects by others.

Project-Generated Traffic

As proposed, the Project will entail the construction of a 4,779± sf Chick-fil-A restaurant with a two-lane drive-through window facility (two order lanes merging into a single service lane). In order to develop the anticipated traffic characteristics of the Project, trip-generation statistics published by the ITE[6] were used. ITE Land Use Code (LUC) 934, *Fast-Food Restaurant with Drive-Through Window*, was used to develop the traffic characteristics of the Project.

Internal Trips

A portion of the trips expected to be generated by the Project will consist of dual-purpose or internal trips. An internal trip consists of a customer and/or employee that patronizes more than one of the uses planned within the development and is common in mixed-use projects with appropriate accommodations to facilitate trips between uses. By way of example, a person working at the Kohl's retail store may also patronize the proposed Chick-fil-A restaurant. Performing the trip-generation calculations for the Project on an individual land use basis does not account for the interaction between the components of a mixed-use development. In order to account for this interaction, a 10 percent internal capture rate was applied to the ITE trip-generation calculations for the Project.

Pass-By Trips

Not all of the trips expected to be generated by the Project will be new trips on the roadway network. A significant portion of these trips will consist of pass-by trips or vehicles already traveling along Route 30, Route 9 and Ring Road for other purposes that will patronize the Project in conjunction with their trip and then continue on to their original destination. These trips are not new trips on the roadway network as a result of the Project. Statistics published by the ITE[7] indicate that on average, approximately 50 percent of the trips generated by a fast-food restaurant with a drive through window may consist of pass-by trips. As such and consistent with MassDOT guidelines, a 50 percent pass-by trip rate was applied to the trip-generation calculations for the Project.

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[6]Ibid 5.

[7]*Trip Generation Handbook*, 3rd Edition; Institute of Transportation Engineers; Washington, DC; 2014.

Project-Generated Traffic Volume Summary

Using the above methodology, the Project is expected to generate approximately 1,066 new vehicle trips on an average weekday (two-way, 24-hour volume, or approximately 533 vehicles entering and 533 exiting), with approximately 70 new vehicle trips (38 vehicles entering and 32 exiting) expected during the weekday evening peak-hour. On a Saturday, the Project is expected to generate approximately 1,552 new vehicle trips (776 vehicles entering and 776 exiting), with approximately 126 new vehicle trips (66 vehicles entering and 60 exiting) expected during the Saturday midday peak-hour.

Trip Distribution and Assignment

The directional distribution of generated trips to and from the Project site was determined based on a review of existing traffic patterns at the Kohl's Plaza driveways and along both Route 30 and Route 9. In general, 35 percent of Project-related traffic was assigned to/from the west on Route 30, with 20 percent assigned to/from the east on Route 30; 25 percent to/from the west on Route 9; and 20 percent to/from the east on Route 9. It should be noted that vehicles destined to the east on Route 9 were assigned to the Shoppers' World (East) Drive via Ring Road due to the left-turn restriction on the Ring Road southbound approach at the Route 9/Ring Road intersection.

Build Condition Traffic-Volume Networks

The 2021 Build condition traffic volumes consist of the 2021 No-Build traffic volumes with the anticipated Project-generated traffic added to them. The Project was shown to result in traffic-volume increases outside of the immediate study area that is the subject of this assessment ranging from 7 to 44 vehicles during the peak periods.

TRAFFIC OPERATIONS ANALYSIS

In order to assess the impact of the Project on the roadway network, traffic operations and vehicle queue analyses were performed at the study intersections under 2014 Existing, 2021 No-Build and 2021 Build conditions. This analysis has indicated that the Project will not have a significant impact on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build). The study area intersections were shown to operate at a level-of-service (LOS) "C" or better during the peak periods with the addition of Project-related traffic, with the exception of the intersection of Ring Road at the Kohl's Plaza north driveway/retail driveway. The addition of Project-related traffic to this intersection is predicted to result in a change in level-of-service for vehicles exiting the Kohl's Plaza driveway between the No-Build and Build condition from "C" to "E" during the Saturday midday peak-hour (an increase in average motorist delay of approximately 25 seconds was reported); however, all movements along Ring Road were shown to continue to operate at LOS A during the peak periods and the predicted increase in vehicle queuing exiting the Kohl's Plaza driveway was shown to increase by approximately 4 vehicles (from 2 vehicles to 6 vehicles).

PARKING DEMAND ANALYSIS

A detailed parking demand analysis was performed at the existing Kohl's Plaza in order to evaluate the parking demands associated with the Kohl's retail store. An inventory of the existing parking supply within the Kohl's Plaza was conducted in December 2012 during the peak holiday

shopping period. Based on this inventory, it was determined that the Kohl's Plaza currently contains a total of 551 parking spaces, including 12 handicapped parked spaces; with the retail conversion to accommodate the Pier 1 Imports store, the parking supply will be reduced slightly to 546 spaces.

Parking Demand Observations

In order to determine the parking demands for the Kohl's Plaza and parking utilization within the parking lot, parking demand observations were conducted within the Kohl's Plaza during the peak holiday shopping period in December 2012 during the weekday midday (11:00 AM to 1:00 PM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours. The parking observations were completed in 20-minute intervals during each observation period and included both the number of vehicles parked and their location within the parking field.

A review of the data indicates that the peak parking demand within the Kohl's Plaza during the weekday midday peak-hour occurred at 12:40 PM, with an observed peak demand of 250 spaces, or approximately 45 percent of the available spaces (551). The observed peak parking demand during the weekday evening peak-hour was identified to occur at 4:00 PM, with an observed peak demand of 223 spaces, or approximately 40 percent of the available spaces. The observed peak parking demand during the Saturday midday peak-hour was identified to occur at 1:20 PM, with an observed peak demand of 281 spaces, or approximately 51 percent of the available parking supply. In general, the majority of the occupied spaces within the site were observed to be located to the south and east of the Kohl's building, with limited utilization of the parking spaces in the northwest corner of the parking lot, the proposed location of the Project.

Overall Peak Parking Demand

Based on this parking demand analysis, the overall peak parking demand was observed to occur during the Saturday midday peak-hour at 1:20 PM, with an observed peak demand of 281 spaces, or approximately 51 percent of the available parking supply, leaving a balance of 270 unoccupied spaces within the plaza during the peak demand period. With the addition of the Project and consideration of the minor reduction in parking associated with the Pier 1 Imports, the total number of parking spaces provided within the Kohl's Plaza would be reduced by 30 spaces (25 as a result of the Project and 5 spaces in conjunction with Pier 1 Imports), resulting in a net parking supply of 521 spaces, ***which is more than sufficient to accommodate the observed peak parking demand within the Kohl's Plaza during the peak holiday season (281 spaces) and the anticipated parking demands that may be associated with the Project.***

DRIVE-THROUGH WINDOW VEHICLE QUEUE ANALYSIS

An assessment of vehicle queuing related to the drive-through window facility was completed using observations conducted at a similar Chick-fil-A restaurant located in Cherry Hill, New Jersey, on two (2) weekdays and two (2) Saturdays over a continuous 12-hour period (7:00 AM to 7:00 PM). As proposed, the drive-through window facility will consist of two-lanes approaching a dual order board (one board for each lane) that will merge into a single lane between the order boards and the pick-up window.

Based on the observations conducted at the Cherry Hill, New Jersey, Chick-fil-A restaurant, the maximum observed vehicle queue was found to be 13 vehicles on a weekday and 14 vehicles on a Saturday. Given that the proposed drive-through window facility provides sufficient queue storage to accommodate approximately 17 vehicles (10 vehicles (5 vehicles per lane) between the entrance to the drive-through facility and the order board, and 7 vehicles between the order board and the pick-up window assuming 25-feet per vehicle), this analysis has concluded that the drive-through window facility is appropriately designed to accommodate the observed maximum vehicle queue without impeding access to the Project site or on-site circulation.

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the three Kohl's Plaza driveway intersections with Ring Road that will serve the Project site in accordance with American Association of State Highway and Transportation Officials (AASHTO)[8] and MassDOT standards. Based on these measurements, it was determined that the available sight lines exceed the recommended minimum sight distance requirements for the appropriate approach speed along Ring Road (25 mph).

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and to address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and will be completed in conjunction with the Project subject to receipt of all necessary rights, permits and approvals.

Project Access

Access to the Project will be provided by way of the three (3) full access driveways that serve the Kohl's Plaza and intersect the west side of Ring Road (a.k.a. Shoppers World West Drive). The following recommendations are offered with respect to the design and operation of the Project site driveways:

- Within the Project site, circulating roadways should be a minimum of 24-feet in width where two-way traffic is proposed and a minimum of 16-feet in width to support one-way travel.

- Appropriate signs ("One-Way", "Do Not Enter", etc.) and pavement markings should be provided to regulate the one-way traffic flow through the drive-through window facility and around the perimeter of the building.

- Signs and landscaping adjacent to the Kohl's Plaza driveway intersections with Ring Road and within the Project site should be designed and maintained so as not to restrict lines of sight.

[8] *A Policy on Geometric Design of Highway and Streets*, 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2011.

- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD).[9]

Transportation Demand Management Measures

The Project site is accessible via public transportation services provided by the MWRTA, with a scheduled stop at Ring Road in the vicinity of the Project site. In an effort to reduce the overall number of automobile trips in the area and to integrate the Project into the available transportation resources, the following Transportation Demand Management (TDM) measures should be considered for implementation as a part of the Project:

- Information regarding public transportation services, maps, schedules and fare information should be posted in a central location;

- A "commuting alternatives packet" should be provided to employees of the Project detailing available public transportation services, bicycle and walking alternatives, and commuter options available through MassRIDES' and their NuRide program which rewards individuals that choose to walk, bicycle, carpool, vanpool or that use public transportation to travel to and from work;

- Pedestrian and bicycle accommodations should be provided within the Project site including sidewalks and crossings to link the proposed building to the parking area and the Kohl's building;

- Direct deposit for employee paychecks should be offered;

- To the extent feasible, consideration should be given to coordinating employee schedules with public transportation schedules; and

- A bicycle rack should be provided proximate to the building entrance.

With implementation of the above recommendations, safe and efficient access will be provided to the Project site and the Project can be constructed with minimal impact on the roadway system.

[9] *Manual on Uniform Traffic Control Devices* (MUTCD); Federal Highway Administration; Washington, DC; 2009.

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a Chick-fil-A restaurant with a drive-through window facility to be located off Ring Road (a.k.a. Shoppers' World West Drive) and situated within the northern portion of the parking lot serving the Kohl's Plaza in Framingham, Massachusetts (hereafter referred to as the "Project"). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Cochituate Road (Route 30), Worcester Road (Route 9) and Ring Road, as well as at the following major intersections: Route 30 at Ring Road and Shoppers' World Way; Route 9 at Ring Road/retail plaza driveway; Ring Road at Ring Road Connector; Ring Road at the Kohl's Plaza north driveway/retail plaza driveway; Ring Road at the Kohl's Plaza driveway; and Ring Road at the Kohl's Plaza south driveway/retail plaza driveway.

PROJECT DESCRIPTION

As proposed, the Project entails the construction of a 4,779± square foot (sf) Chick-fil-A Restaurant with a two-lane drive-through window facility (two order lanes merging into a single service lane) to be located off of Ring Road and situated within the northern portion of the parking lot serving the Kohl's Plaza in Framingham, Massachusetts. The Project site is bounded by Route 30 to the north; Ring Road to the east; and commercial properties and areas of open and wooded space to the south and west. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of the three (3) full-access driveways that serve the Kohl's Plaza and intersect the west side of Ring Road. On-site parking will be provided for 21 vehicles proximate to the proposed restaurant building, with additional parking available within the Kohl's Plaza immediately adjacent to the Project site.

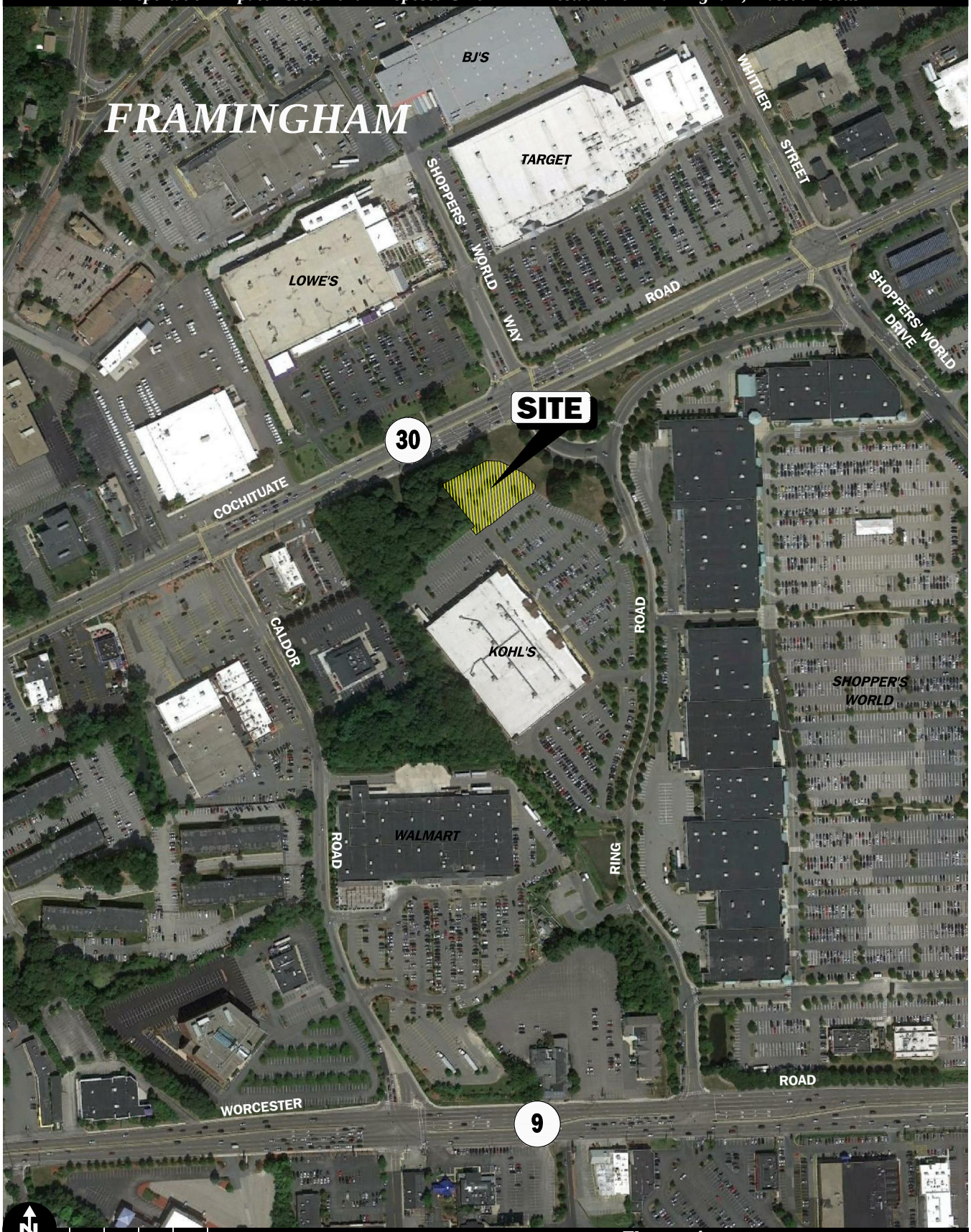

Figure 1

Site Location Map

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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STUDY METHODOLOGY

This study was prepared in consultation with the Towns of Framingham and Natick, and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; public transportation services; observations of traffic flow and parking demand; and collection of daily and peak period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year planning horizon was selected for analysis consistent with MassDOT's TIA guidelines. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in December 2012 and updated in September 2014. The field investigation consisted of an inventory of existing parking demands; roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area for the Project was selected to contain the major roadways providing access to the Project site: Cochituate Road (Route 30), Worcester Road (Route 9) and Ring Road; as well as the following major intersections located along these roadways through which Project-related traffic will travel: Route 30 at Ring Road and Shoppers' World Way; Route 9 at Ring Road/retail plaza driveway; Ring Road at Ring Road Connector; Ring Road at the Kohl's Plaza north driveway/retail plaza driveway; Ring Road at the Kohl's Plaza driveway; and Ring Road at the Kohl's Plaza south driveway/retail plaza driveway.

The following describes the study area roadways and intersections.

Roadways

Cochituate Road (Route 30)

Route 30 is an urban principal arterial roadway under local jurisdiction that traverses the study area in a general east-west direction and provides access to the Massachusetts Turnpike/Interstate 90 (Mass Turnpike/I-90) to the east of the Project site and to Route 126 to the west. Within the study area, Route 30 provides four 12 to 14-foot wide travel lanes separated by a raised median with 1 to 4-foot wide marked shoulders and additional turning lanes provided at major intersections. Sidewalks and illumination (street lights) are provided along Route 30 within the study area. The posted speed limit along Route 30 is 40 miles per hour (mph) within the study area. Land use along Route 30 within the study area consists of the Project site and commercial properties.

Worcester Road (Route 9)

Route 9 is an urban principal arterial roadway under MassDOT jurisdiction that traverses the study area in a general east-west direction and provides access to Interstate 95 (I-95)/Route 128 to the east of the Project site and to the Mass Turnpike/I-90 and Interstate 495 (I-495) to the west. Within the study area, Route 9 provides four to six 11 to 13-foot wide travel lanes separated by a

concrete median barrier with 1 foot wide marked shoulders and additional turning lanes provided at major intersections. Sidewalks and illumination (street lights) are provided along Route 9 within the study area. The posted speed limit along Route 9 is 40 mph within the study area. Land use along Route 9 within the study area consists of Shoppers' World Shopping Center and commercial properties.

Ring Road

Ring Road (a.k.a. Shoppers World West Drive) is a private roadway open to public travel that traverses the study area in a general north-south direction between Route 9 and Route 30, and provides access to the retail stores within the Shoppers' World Shopping Center. Within the study area, Ring Road provides two 13 to 15-foot wide travel lanes separated by a double-yellow centerline with 2-foot wide marked shoulders provided. A sidewalk is intermittently provided along the east side of Ring Road between Route 30 and Route 9. Illumination is provided by way of street lights mounted on steel poles. Land use along Ring Road within the study area consists of the Project site and commercial properties.

<u>Intersections</u>

Route 30 at Ring Road and Shoppers' World Way

- Four-legged intersection under traffic signal control
- Route 30 east and westbound approaches provide a 12.5-foot wide left-turn lane, two 12-to 12.5-foot wide through travel lanes and a 12 to 12.5-foot wide right-turn lane with a 1-foot wide marked shoulder
- Ring Road northbound approach provides two 11 to 12-foot wide left-turn lanes and an 11.5-foot wide general-purpose travel lane with no marked shoulder
- Shoppers' World Way southbound approach provides a 13-foot wide left-turn lane, a 12-foot wide shared left-turn/through travel lane, and a 16-foot wide right-turn lane
- Directions of travel along the intersecting roadways are separated by a raised median
- Sidewalks are provided along both sides of Route 30 and Shoppers' World Way, and along the east side of Ring Road
- Crosswalks are provided across the north, south and the east legs of the intersection
- A bus stop is located in the northwest corner of the intersection
- The traffic signal operates in a four-phase, fully-actuated mode with an exclusive pedestrian phase provided upon pushbutton actuation
- Land use in the vicinity of the intersection consists of the Project site and commercial properties

Route 9 at Ring Road/Retail Plaza Driveway

- Four-legged intersection under traffic signal control
- Route 9 eastbound approach provides two 11-foot wide left-turn lanes, two 11 to 12-foot wide through travel lanes and an 11-foot wide shared through/right-turn lane with a 1-foot wide marked shoulder

- Route 9 westbound approach provides two 11 to 12-foot wide left-turn lanes, three 11.5 to 13.5-foot wide through travel lanes and a 10.5-foot wide right-turn lane with a 1-foot wide marked shoulder
- Directions of travel along Route 9 are separated by a concrete median barrier
- Retail plaza driveway northbound approach provides a 12-foot wide shared left-turn/through travel lane and a 13 -foot wide general-purpose travel lane with no marked shoulder
- Directions of travel along the retail plaza driveway are separated by a raised median
- Ring Road southbound approach provides a 15.5-foot wide right-turn lane with a 1-foot wide marked shoulder
- Directions of travel along Ring Road are separated by a raised median
- Sidewalks are provided along both sides of Route 9 and along the east side of Ring Road
- Crosswalks are provided across the north and south legs of the intersection
- The traffic signal operates in a four-phase, fully-actuated mode
- Land use in the vicinity of the intersection consists of commercial properties

Ring Road at Ring Road Connector

- Three-legged intersection under STOP-sign control
- Ring Road northbound approach consists of a 15-foot wide general-purpose travel lane with a 2-foot wide marked shoulder
- Ring Road Connector southbound approach consists of a 17.5-foot wide general-purpose travel lane with a 2-foot wide marked shoulder
- Directions of travel along Ring Road/Ring Road Connector are separated by a double-yellow centerline
- Ring Road eastbound approach consists of a 20-foot wide general-purpose travel lane with no marked shoulder provided and vehicles approaching Ring Road under STOP-sign control
- Directions of travel along this section of Ring Road are separated by a raised median
- Sidewalks are provided along the north side of Connector Road and the east side of Ring Road
- A crosswalk is provided across the north leg of the intersection
- A bus stop and bus shelter are located south of the intersection
- Land use in the vicinity of the intersection consists of the Project site and commercial properties

Ring Road at Kohl's Plaza North Driveway/Retail Driveway

- Four-legged intersection under STOP-sign control
- Ring Road north and southbound approaches provide a 13 to 14-foot wide general-purpose travel lane with a 2-foot wide marked shoulder

- Directions of travel along Ring Road are separated by a double-yellow centerline
- The Kohl's Plaza north driveway eastbound approach consists of a 17-foot wide general-purpose travel lane with no marked shoulder provided and vehicles approaching Ring Road under STOP-sign control
- Directions of travel along the Kohl's Plaza north driveway are separated by a single-yellow centerline
- The retail driveway westbound approach consists of a 51-foot wide paved drive that accommodates two-way travel with no marked centerline or shoulders provided and vehicles approaching Ring Road under STOP-sign control
- Sidewalks are provided along the east side of Ring Road
- A crosswalk is provided across the east leg of the intersection
- Land use in the vicinity of the intersection consists of the Project site and commercial properties

Ring Road at the Kohl's Plaza Center Driveway

- Three-legged intersection under STOP-sign control
- Ring Road north and southbound approaches provide a 13-foot wide general-purpose travel lane with a 2-foot wide marked shoulder
- Directions of travel along Ring Road are separated by a double-yellow centerline
- The Kohl's Plaza center driveway eastbound approach consists of a 17-foot wide general-purpose travel lane with no marked shoulder provided and vehicles approaching Ring Road under STOP-sign control
- Directions of travel along the Kohl's Plaza center driveway are separated by a single-yellow centerline
- Sidewalks are provided along north side of Connector Road and the east side of Ring Road
- Land use in the vicinity of the intersection consists of the Project site and commercial properties

Ring Road at the Kohl's Plaza South Driveway and a Retail Driveway

- Four-legged intersection under STOP-sign control
- Ring Road north and southbound approaches provide a 13-foot wide general-purpose travel lane with a 2-foot wide marked shoulder
- Directions of travel along Ring Road are separated by a double-yellow centerline
- The Kohl's Plaza south driveway eastbound approach consists of a 15.5-foot wide general-purpose travel lane with no marked shoulder provided and vehicles approaching Ring Road under STOP-sign control
- The retail driveway westbound approach consists of a 15-foot wide general-purpose travel lane with no marked shoulder provided and vehicles approaching Ring Road under STOP-sign control

- Directions of travel along the Kohl's Plaza and retail driveways are separated by a single-yellow centerline
- Land use in the vicinity of the intersection consists of commercial properties

EXISTING TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs) and vehicle classification counts were completed in September 2014 while public schools were in regular session. The ATR counts were conducted on Ring Road in the vicinity of the Project site in order to record weekday and Saturday daily traffic conditions over an extended period, with weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak period TMCs conducted at the study area intersections. These time periods were selected for analysis purposes as they are representative of the peak traffic volume hours for both the Project and the adjacent roadway network.

Traffic Volume Adjustments

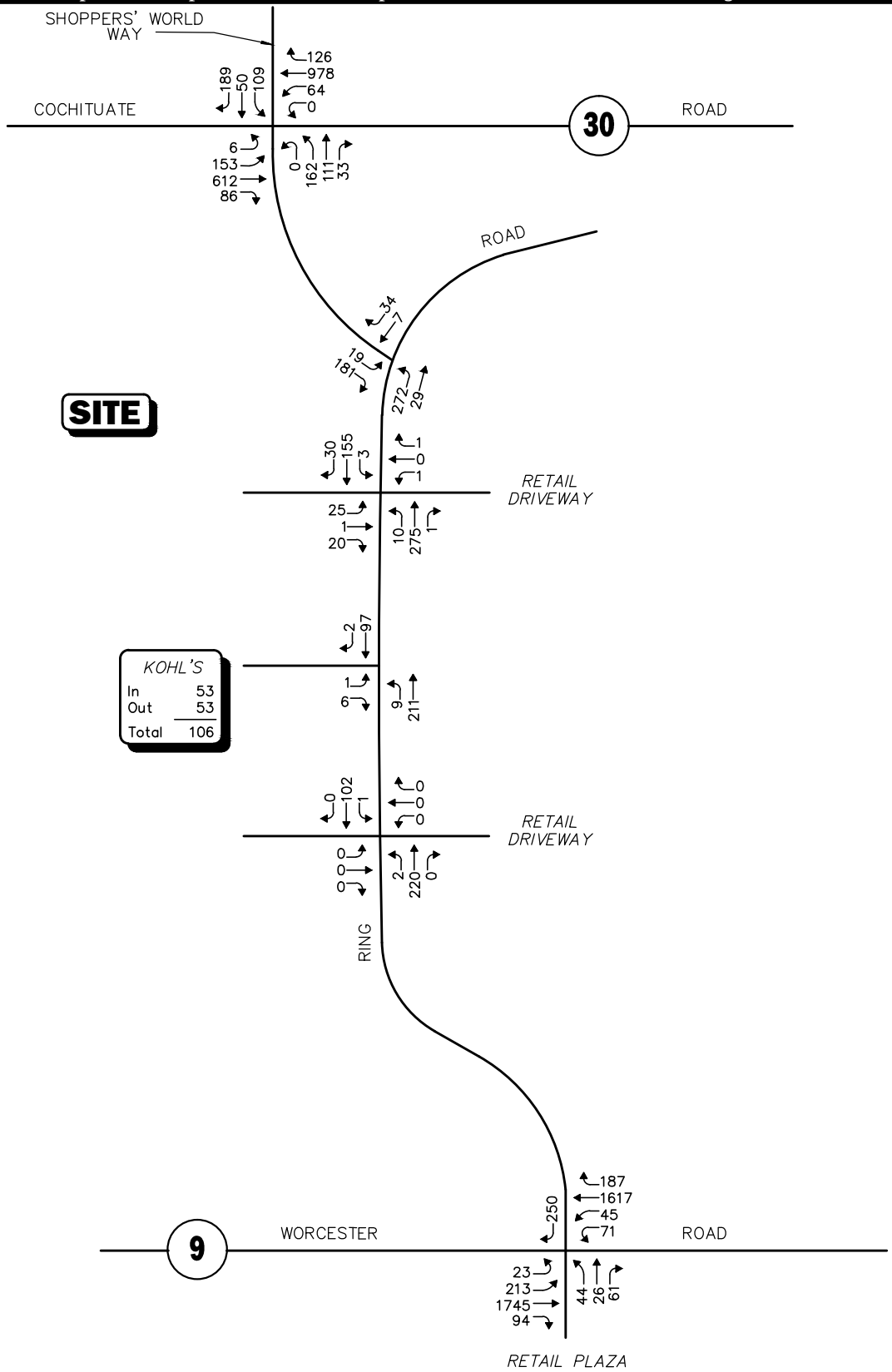
In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, MassDOT weekday seasonal factors for Group 6 roadways (urban arterials, collectors and rural arterials, the MassDOT functional classification for Route 30 and Route 9) were reviewed.[10] Based on a review of this data, it was determined that traffic volumes for the month of September are approximately 8 percent above average-month conditions and, therefore, were not adjusted downward in order to provide a conservative (above-average) analysis condition. The 2014 Existing weekday evening and Saturday midday peak-hour traffic volumes are graphically depicted on Figures 2 and 3, with Table 1 summarizing the daily and peak-hour traffic characteristics of Ring Road as recorded in September 2014.

Table 1
2014 EXISTING TRAFFIC VOLUMES

		Weekday Evening Peak Hour (4:00 – 5:00 PM)			Saturday Midday Peak Hour (12:45 – 1:45 PM)			
Location	AWT[a]	VPH	K Factor	Directional Distribution	Saturday[d]	VPH	K Factor	Directional Distribution
Ring Road, north of the Kohl's Plaza North Driveway	7,230	489	6.8	61.6% NB	8,410	760	9.0	53.3% NB

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak-hour.
[d]Average Saturday traffic in vehicles.
NB = northbound; SB = southbound.

[10]MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2011 Weekday Seasonal Factors, Group 6 – Urban Arterials, Collectors and Rural Arterials.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 2

2014 Existing Weekday Evening Peak Hour Traffic Volumes

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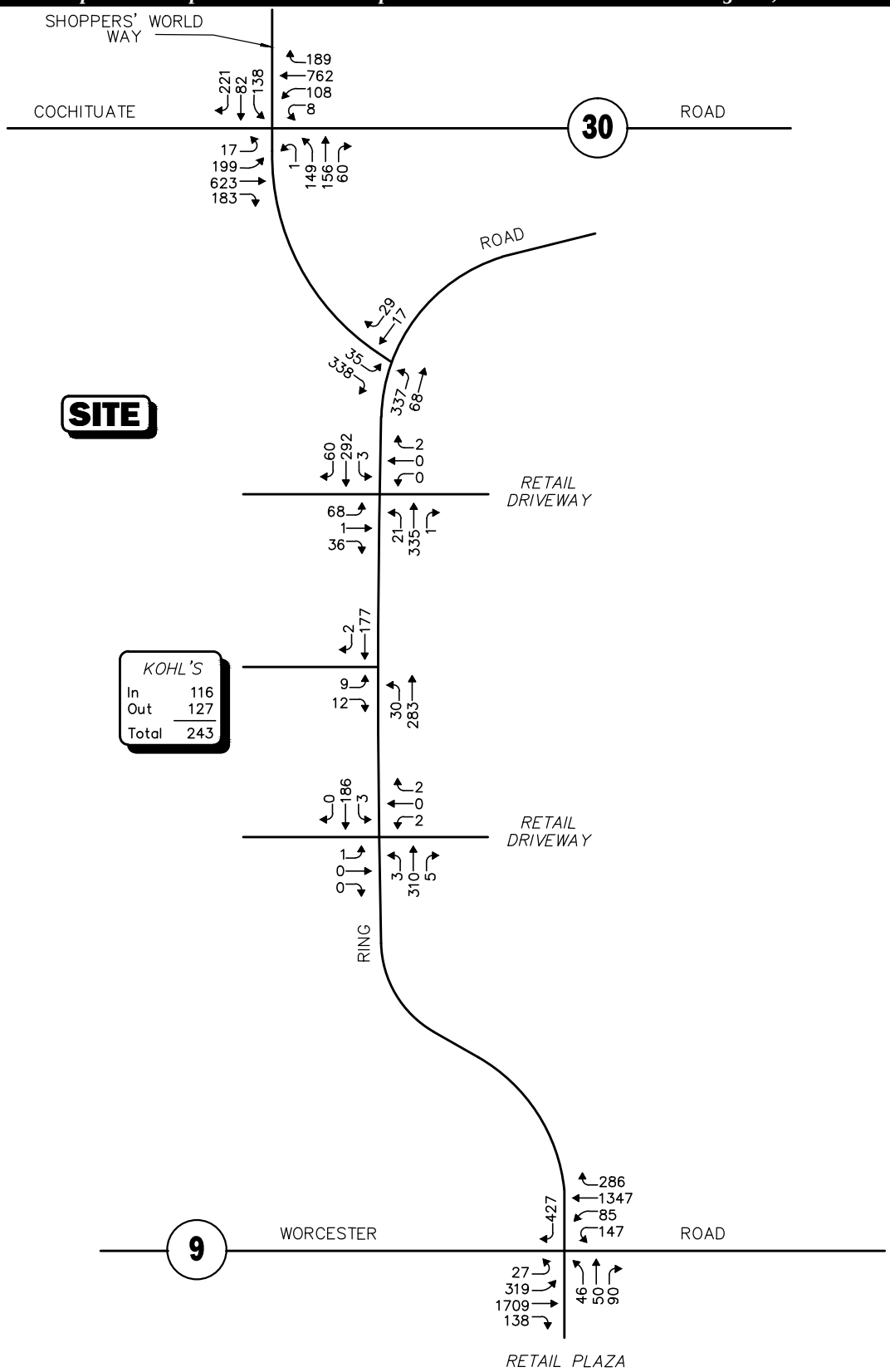

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 3

2014 Existing Saturday Midday Peak Hour Traffic Volumes

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As can be seen in Table 1, Ring Road in the vicinity of the Project site was found to accommodate approximately 7,230 vehicles on an average weekday (two-way, 24-hour volume), with approximately 489 vehicles per hour (vph) during the weekday evening peak-hour. On a Saturday, this section of Ring Road was found to accommodate approximately 8,410 vehicles, with approximately 760 vph during the Saturday midday peak-hour.

PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in September 2014. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. Sidewalks are provided along both sides of Route 30 and Route 9, and intermittently along the east side of Ring Road. Marked crosswalks are provided at the signalized study intersections with pedestrian traffic signal equipment and phasing provided. Marked crosswalks are also provided on the north leg of the Ring Road/Ring Road Connector intersection and the east leg of the Ring Road/Kohl's Plaza north driveway/retail driveway intersection.

At present, there are no formal existing bicycle facilities that were identified within the immediate study area; however, Ring Road provides sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration.[11]

PUBLIC TRANSPORTATION

Public transportation services are provided within the study area by the MetroWest Regional Transit Authority (MWRTA). The MWRTA operates fixed-route bus service by way of Route 2, *Framingham Circuit (Clockwise)*; Route 3, *Framingham Circuit (Counter Clockwise)*; and Route 4, *Market Basket/Beaver Park/Natick Mall*. Routes 2 and 3 are clockwise and counter clockwise circuitous routes, respectively, beginning at the Central Hub in Framingham and serving several residential and commercial uses including the MetroWest Medical Center, Nobscot and Pinefield Shopping Centers, Target, Shoppers World, Natick Collection, and MassBay Community College. Route 4 provides service between the Central Hub in Framingham and Market Basket on Route 126 in Ashland. All three bus routes have a scheduled stop on Ring Road in the vicinity of the Kohl's north driveway. Bus service is provided Monday through Friday from approximately 6:00 AM to 8:00 PM, and on Saturday from approximately 9:00 AM to 5:30 PM. Bus Route 2 generally operates with 60-minute headways, with Route 3 generally operating with 75-minute headways and Route 4 operating with 80-minute headways. Roundtrip fares for adults are $1.50, with a $1.00 fare for students and a $0.75 fare for senior citizens and people with disabilities. The MWRTA system map, bus route service schedules and fare information are provided in the Appendix.

[11] A minimum travelled-way (combined travel lane and paved shoulder) of 14-feet is required to support bicycle travel in a shared roadway condition (i.e., motor vehicles and bicycles sharing the roadway).

SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Ring Road in the vicinity of the Project site in conjunction with the ATR counts. Table 2 summarizes the vehicle travel speed measurements.

Table 2
VEHICLE TRAVEL SPEED MEASUREMENTS

	Ring Road	
	Northbound	Southbound
Mean Travel Speed (mph)	20	13
85th Percentile Speed (mph)	23	19
Posted Speed Limit (mph)	--	--

mph = miles per hour.

As can be seen in Table 2, the mean (average) vehicle travel speed along Ring Road in the vicinity of the Project site was found to be approximately 17 mph. The average measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be approximately 22 mph. The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances, and is often used in establishing posted speed limits. A posted speed limit is not provided along Ring Road.

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2008 through 2012, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, and day of occurrence, and presented in Table 3.

As can be seen in Table 3, the study intersections were found to have experienced an average of seven (7) or fewer reported motor vehicle crashes over the five-year review period, the majority of which resulted in property damage only; occurred on a weekday; and were reported as rear-end-type collisions. No crashes were reported to have occurred at the Kohl's Plaza driveway intersections with Ring Road, or at the Ring Road/Ring Road Connector intersection. All of the study intersections were found to have a motor vehicle crash rate below both the MassDOT statewide and Highway Division District 3 (the MassDOT Highway Division District in which the intersection is located) average crash rate for a signalized or unsignalized intersection, as appropriate, indicating no inherent safety deficiencies with respect to geometric design or operating conditions. In addition, no fatal motor vehicle crashes were reported at the study intersections over the five-year review period. The detailed MassDOT Crash Rate Worksheets are provided in the Appendix.

Table 3
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Route 30/ Ring Road/ Shoppers' World Driveway	Route 9/ Ring Road/ Retail Plaza Driveway	Ring Road/ Ring Road Connector	Ring Road/ Kohl's North Driveway	Ring Road/ Kohl's Center Driveway	Ring Road/ Kohl's South Driveway
Traffic Control Type:	TS	TS	U	U	U	U
Year:						
2008	4	11	0	0	0	0
2009	3	4	0	0	0	0
2010	4	4	0	0	0	0
2011	3	8	0	0	0	0
2012	0	7	0	0	0	0
Total	14	34	0	0	0	0
Average	2.80	6.80	0.00	0.00	0.00	0.00
Rate[b]	0.26	0.38	0.00	0.00	0.00	0.00
MassDOT Crash Rate[c]	0.80/0.89	0.80/0.89	0.60/0.66	0.60/0.66	0.60/0.66	0.60/0.66
Significant?[d]	No	No	No	No	No	No
Severity:						
Property Damage Only	10	25	0	0	0	0
Personal Injury	4	9	0	0	0	0
Fatal	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	14	34	0	0	0	0
Type:						
Angle	4	14	0	0	0	0
Rear-End	9	12	0	0	0	0
Head-On	0	1	0	0	0	0
Other Motor Vehicle	0	0	0	0	0	0
Sideswipe Same Direction	0	5	0	0	0	0
Sideswipe Opposite Direction	0	0	0	0	0	0
Unknown/Other	1	2	0	0	0	0
Total	14	34	0	0	0	0
Weather Conditions:						
Clear	9	25	0	0	0	0
Cloudy	2	3	0	0	0	0
Rain	3	5	0	0	0	0
Snow/Ice	0	1	0	0	0	0
Unknown	0	0	0	0	0	0
Total	14	34	0	0	0	0
Lighting						
Daylight	12	22	0	0	0	0
Dawn/Dusk	0	0	0	0	0	0
Dark (Road Lit)	2	12	0	0	0	0
Dark (Road Unlit)	0	0	0	0	0	0
Dark (No Street Lights)	0	0	0	0	0	0
Other/Unknown	0	0	0	0	0	0
Total	14	34	0	0	0	0
Day of Week:						
Monday through Friday	13	17	0	0	0	0
Saturday	1	8	0	0	0	0
Sunday	0	9	0	0	0	0
Total	14	34	0	0	0	0

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2008 through 2012.
[b]Crash rate per million vehicles entering the intersection.
[b]Statewide/District crash rate.
[d]The intersection crash rate is significant if it is found to exceed 0.66 crashes per million vehicles entering the intersection for unsignalized intersections and 0.89 crashes per million vehicles entering the intersection for signalized intersections as defined by MassDOT for the MassDOT Highway Division District in which the project is located (District 3).
Traffic Control Type: U = unsignalized; TS = traffic signal.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2021, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2021 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2021 No-Build traffic volumes reflect the Build conditions with the Project.

FUTURE TRAFFIC GROWTH

Future 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. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage 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, potential population growth and development external to the study area would not be accounted for in the resulting traffic projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

Specific Development by Others

MassDOT and the Planning Department of the Towns of Framingham and Natick were contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on these discussions, the following projects were identified for inclusion in this assessment:

- ***Avidia Bank, 222 and 236 Cochituate Road, Framingham, Massachusetts.*** This project will entail the construction of a 5,313± sf bank with a drive-through teller facility to be located at 222 and 236 Cochituate Road in Framingham, Massachusetts.

- ***TJX Office Expansion, 740-770 Cochituate Road, Framingham, Massachusetts.*** This project will entail the construction of an additional 96,000± sf of office space to be located at 740-770 Cochituate Road in Framingham, Massachusetts.

- ***MathWorks Lakeside Campus Parking Garage, Natick, Massachusetts.*** This project will entail the construction of a 470 space parking garage to be located at 19 Superior Drive within the MathWorks Campus in Natick, Massachusetts.

- ***Proposed Sherwood Plaza South (SPS) Redevelopment, Natick Massachusetts.*** This project will entail the redevelopment of the former BJ's office headquarters to a 216,861± sf mixed-use development consisting of office space, retail space and a fitness facility to be located on the southeast corner of the intersection of Route 9 and Dean Road in Natick, Massachusetts.

Traffic volumes associated with the aforementioned development projects by others were obtained from their respective traffic study[12] or were estimated using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[13] for the appropriate land use, and were assigned onto the study area roadway network based on existing traffic patterns. In addition to the above development projects by others, a portion of the existing Kohl's retail store is planned to be reconfigured to accommodate a Pier 1 Imports store. Traffic volumes associated with this retail conversion project were assumed to be included in the trips generated by the existing Kohl's store as the space that is to be converted currently consists of active retail space. No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate. The relevant traffic volume networks for the specific development projects by others are included in the Appendix.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general traffic growth trends. Based on a review of this data, it was determined that traffic volumes within the Town of Framingham have declined slightly over the past several years. In order to provide a conservative (high) analysis condition, a 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The Town of Framingham and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2021 that would impact traffic volumes or operating conditions within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

[12] Ibid 4.
[13] Ibid 5.

No-Build Traffic Volumes

The 2021 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2014 Existing peak-hour traffic volumes and then superimposing the peak-hour traffic volumes associated with the identified specific development projects by others. The resulting 2021 No-Build weekday evening and Saturday midday peak-hour traffic volumes are shown on Figures 4 and 5, respectively.

PROJECT-GENERATED TRAFFIC

Design year (2021 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 4,779± sf Chick-fil-A restaurant with a two-lane drive-through window facility (two order lanes merging into a single service lane). In order to develop the anticipated traffic characteristics of the Project, trip-generation statistics published by the ITE[14] were used. ITE Land Use Code (LUC) 934, *Fast-Food Restaurant with Drive-Through Window*, was used to develop the traffic characteristics of the Project.

Internal Trips

A portion of the trips expected to be generated by the Project will consist of dual-purpose or internal trips. An internal trip consists of a customer and/or employee that patronizes more than one of the uses planned within the development and is common in mixed-use projects with appropriate accommodations to facilitate trips between uses. By way of example, a person working at the Kohl's retail store may also patronize the proposed Chick-fil-A restaurant. Performing the trip-generation calculations for the Project on an individual land use basis does not account for the interaction between the components of a mixed-use development. In order to account for this interaction, a 10 percent internal capture rate was applied to the ITE trip-generation calculations for the Project.

Pass-By Trips

Not all of the trips expected to be generated by the Project will be new trips on the roadway network. A significant portion of these trips will consist of pass-by trips or vehicles already traveling along Route 30, Route 9 and the Ring Road for other purposes that will patronize the Project in conjunction with their trip and then continue on to their original destination. These trips are not new trips on the roadway network as a result of the Project. Statistics published by the ITE[15] indicate that on average, approximately 50 percent of the trips generated by a fast-food restaurant with drive-through window may consist of pass-by trips. As such and consistent with MassDOT guidelines, a 50 percent pass-by trip rate was applied to the trip-generation calculations for the Project.

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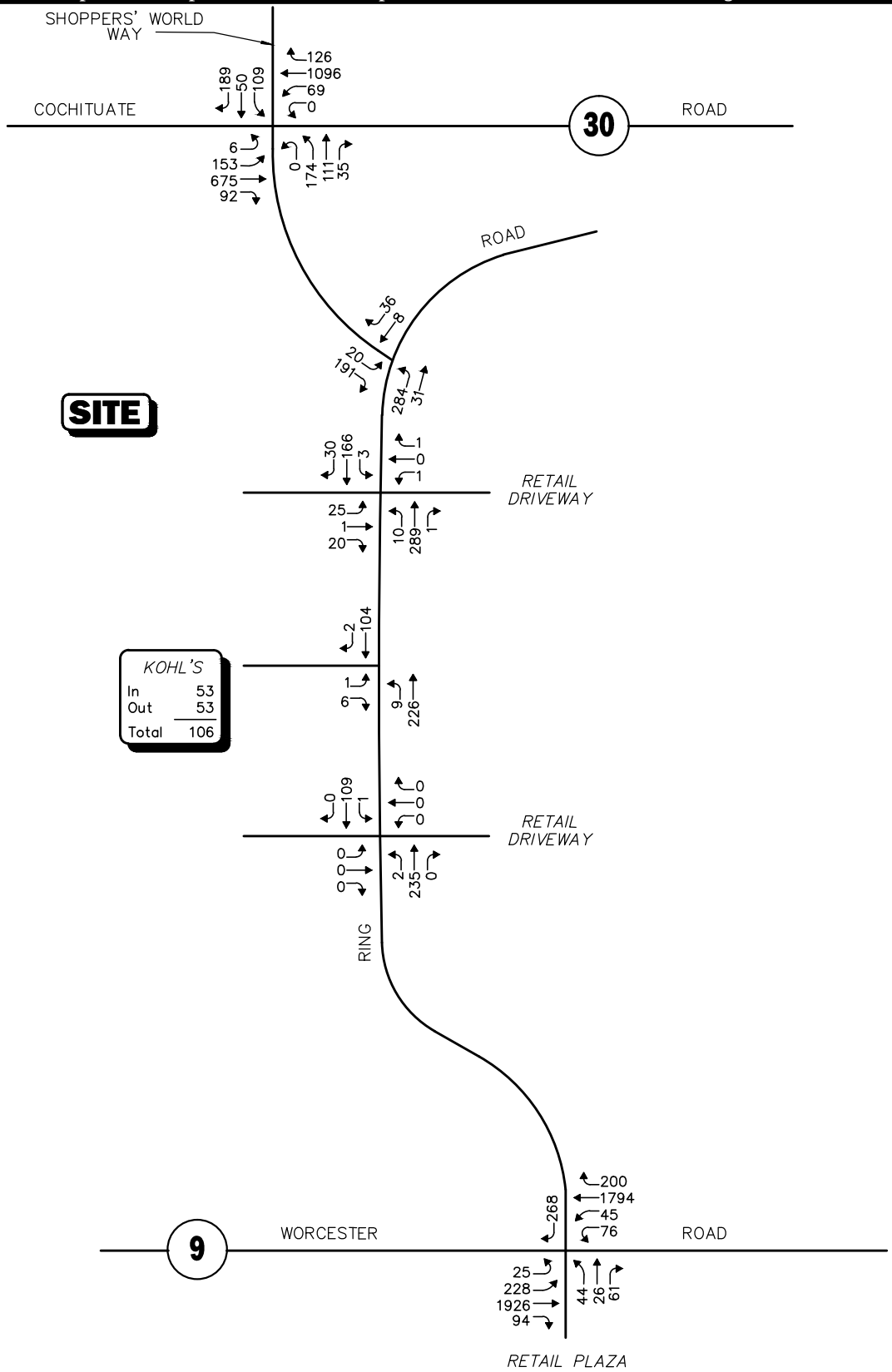
[14]Ibid 5
[15]Ibid 7.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 4

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2021 No-Build
Weekday Evening
Peak Hour Traffic Volumes

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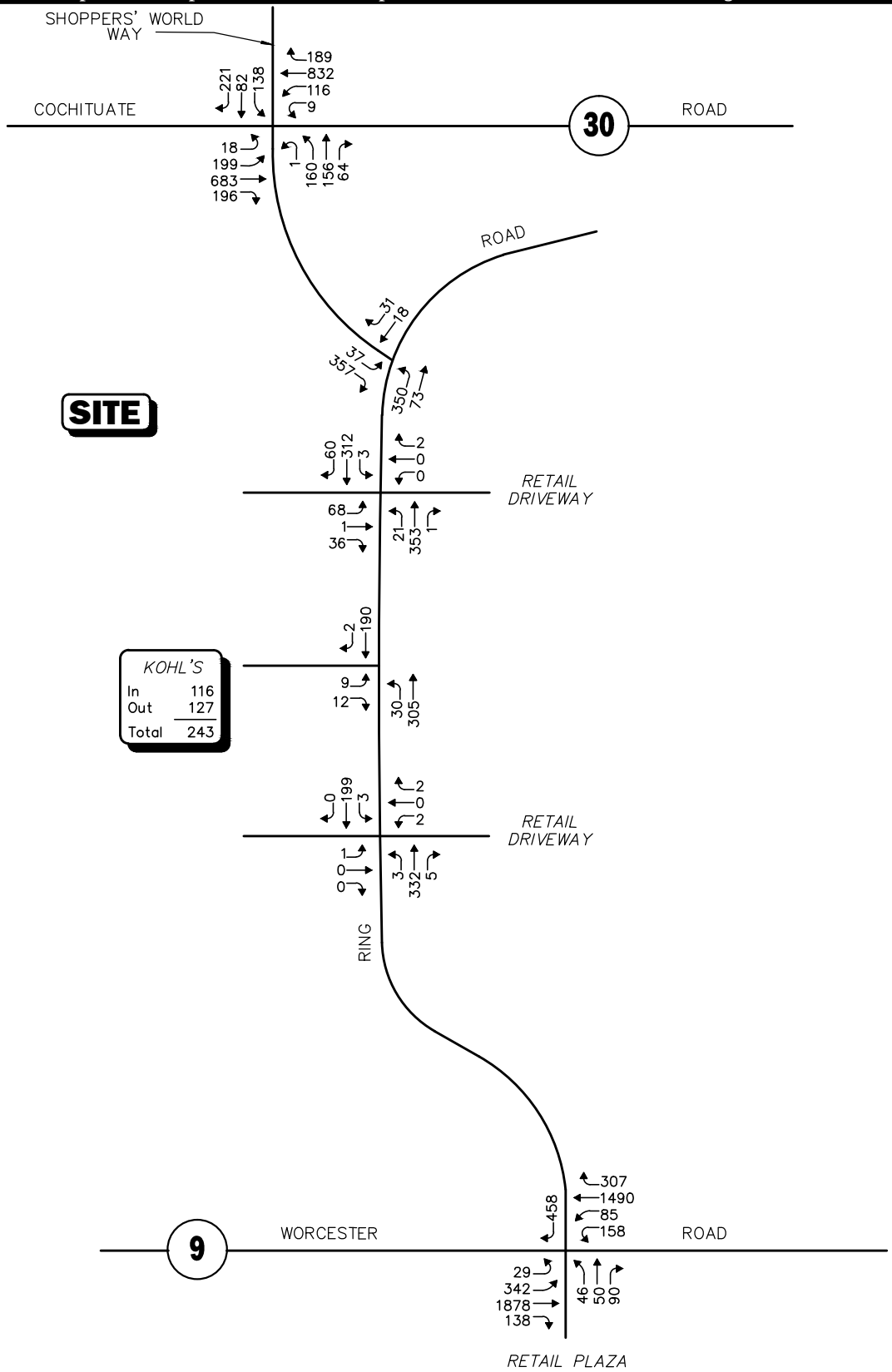

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 5

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2021 No-Build
Saturday Midday
Peak Hour Traffic Volumes

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Table 4 summarizes the anticipated traffic characteristics of the Project using the above methodology.

Table 4
TRIP GENERATION SUMMARY

Time Period/Direction	Vehicle Trips (A) Chick-fil-A Restaurant (4,779 ± sf)[a]	(B = A x 0.10) Internal Trips 10%	(C = A - B) New Trips	(D = C x 0.50) Pass-By Trips (50%)	(E = D - C) Total New Trips
Average Weekday Daily:					
Entering	1,186	119	1,067	534	533
Exiting	1,186	119	1,067	534	533
Total	2,372	238	2,134	1,068	1,066
Weekday Evening Peak-Hour:					
Entering	81	8	73	35	38
Exiting	75	8	67	35	32
Total	156	16	140	70	70
Saturday Daily:					
Entering	1,726	173	1,553	777	776
Exiting	1,726	173	1,553	777	776
Total	3,452	346	3,106	1,554	1,552
Saturday Midday Peak-Hour:					
Entering	144	14	130	64	66
Exiting	138	14	124	64	60
Total	282	28	254	128	126

[a]ITE LUC 934, *Fast-Food Restaurant with Drive-Through Window.*

Project-Generated Traffic Volume Summary

As can be seen in Table 4, using the above methodology, the Project is expected to generate approximately 1,066 new vehicle trips on an average weekday (two-way, 24-hour volume, or 533 vehicles entering and 533 exiting), with approximately 70 new vehicle trips (38 vehicles entering and 32 exiting) expected during the weekday evening peak-hour. On a Saturday, the Project is expected to generate approximately 1,552 new vehicle trips (776 vehicles entering and 776 exiting), with approximately 126 new vehicle trips (66 vehicles entering and 60 exiting) expected during the Saturday midday peak-hour.

Trip Distribution and Assignment

The directional distribution of generated trips to and from the Project site was determined based on a review of existing traffic patterns at the Kohl's Plaza driveways and along both Route 30 and Route 9. The general trip distribution for the Project is summarized in Table 5 and graphically depicted on Figure 6. The additional traffic expected to be generated by the Project was assigned on the study area roadway network as shown on Figures 7 and 8 for the weekday evening and Saturday midday peak hours, respectively. It should be noted that vehicles destined to the east on Route 9 were assigned to the Shoppers' World (East) Drive via Ring Road due to the left-turn restriction on the Ring Road southbound approach at the Route 9/Ring Road intersection.

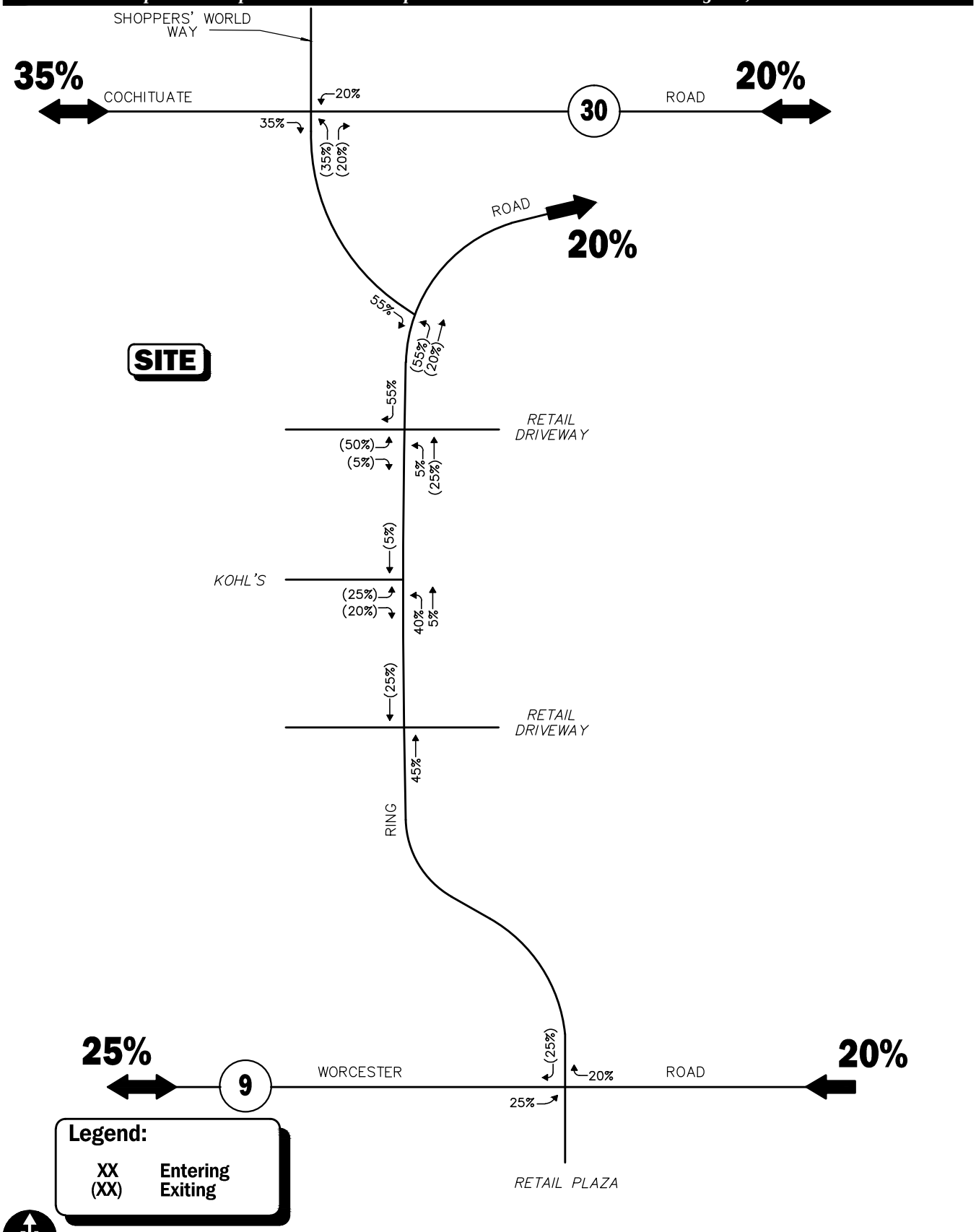

Figure 6

Trip Distribution Map

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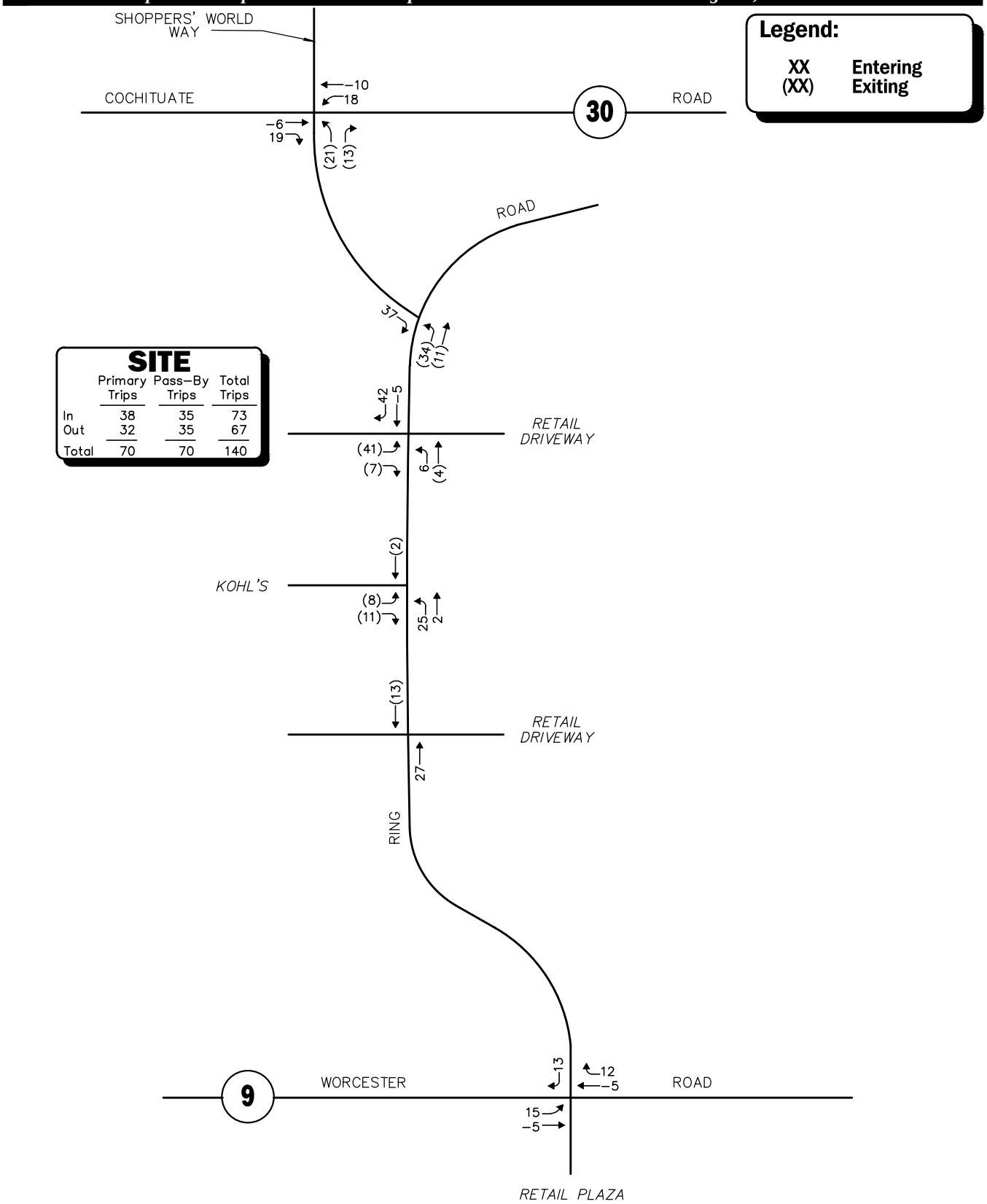

Not To Scale

Figure 7

Project-Generated Weekday Evening Peak Hour Traffic Volumes

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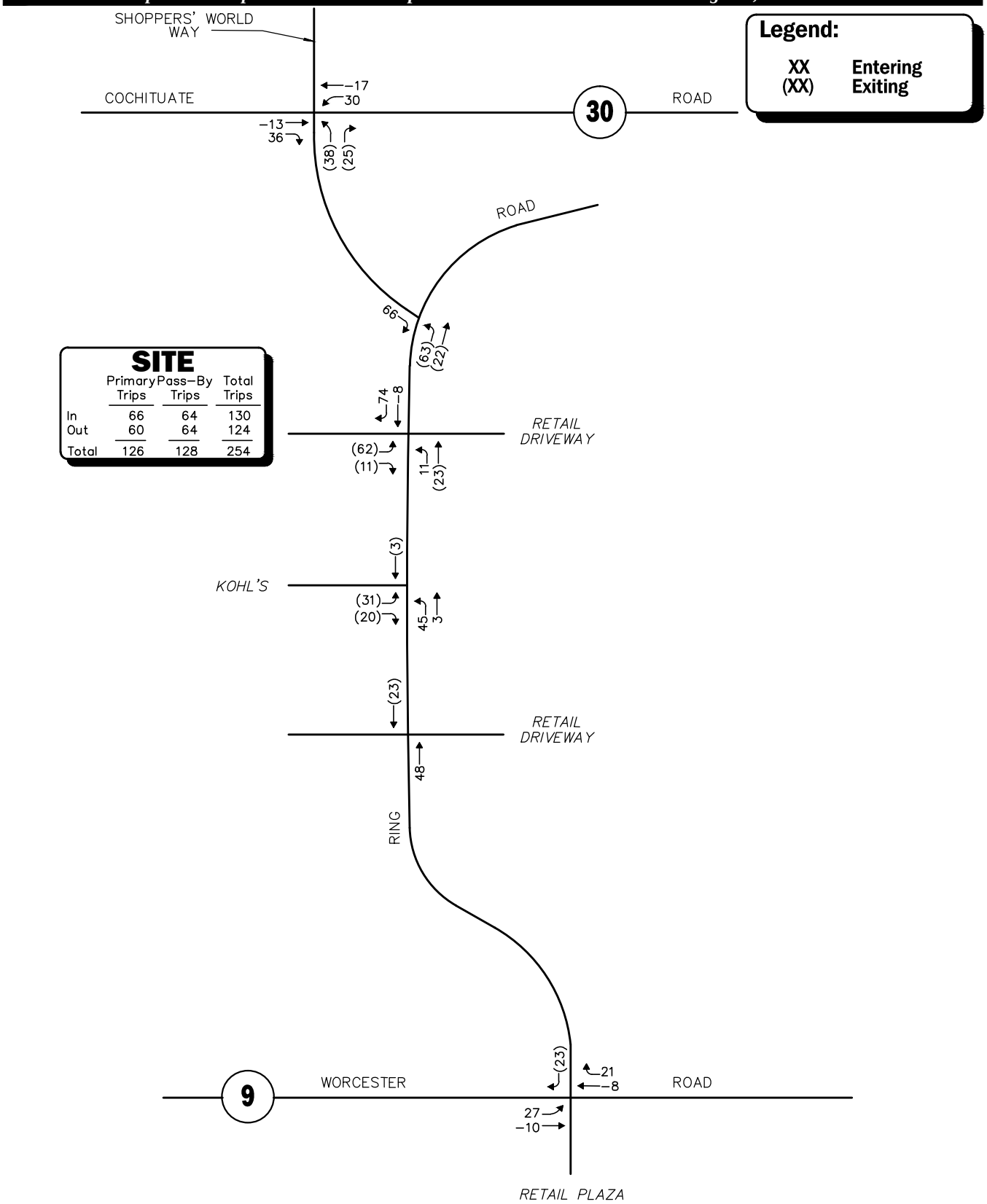

SITE

	Primary Trips	Pass-By Trips	Total Trips
In	66	64	130
Out	60	64	124
Total	126	128	254

Not To Scale

Figure 8

Project-Generated Saturday Midday Peak Hour Traffic Volumes

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Table 5
TRIP-DISTRIBUTION SUMMARY

Roadway	Direction	Percent To/From
Route 30	West	35
Route 30	East	20
Route 9	West	25
Route 9	East	20
TOTAL		100

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

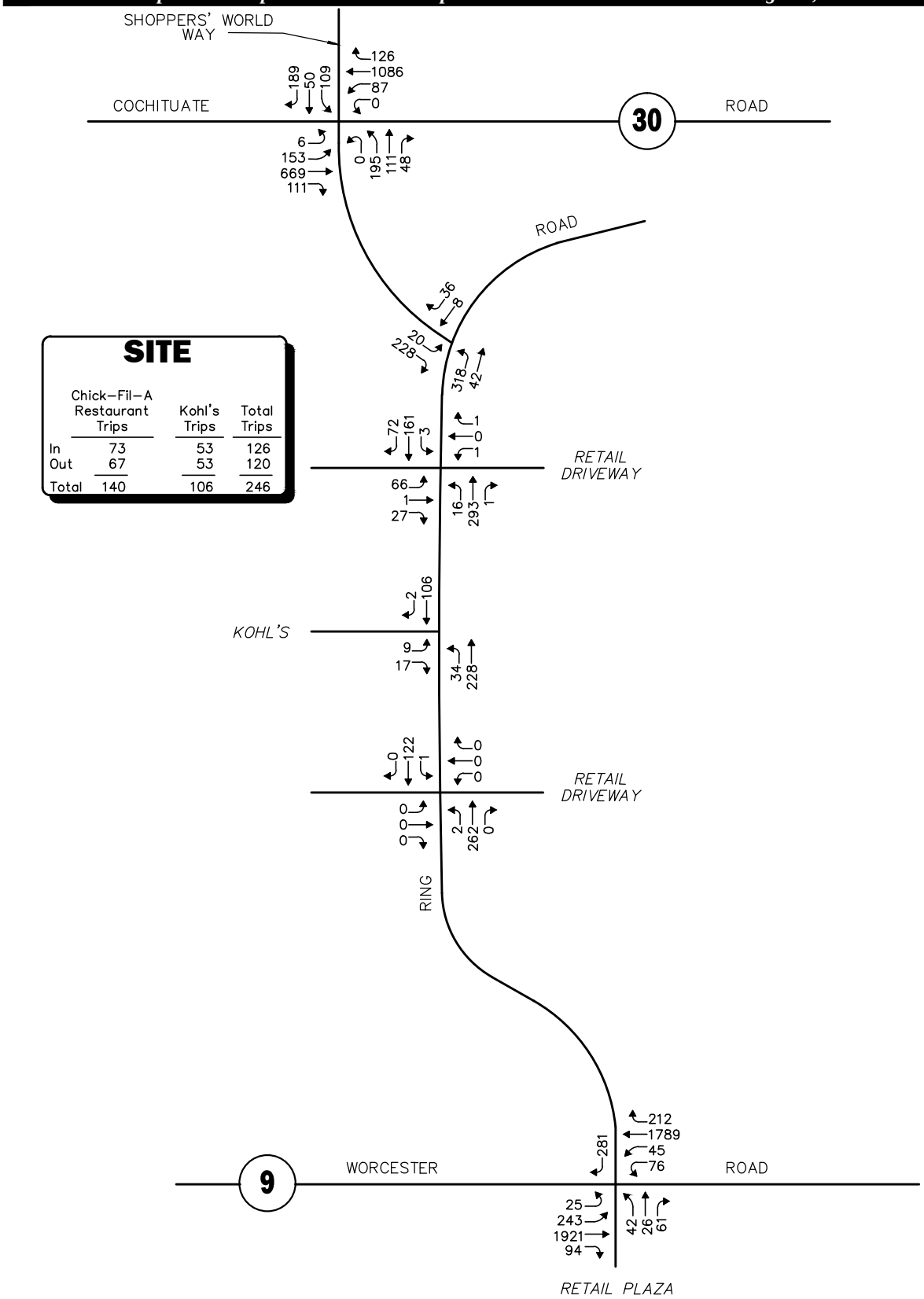
The 2021 Build condition traffic volumes consist of the 2021 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2021 Build weekday evening and Saturday midday peak-hour traffic-volumes are graphically depicted on Figures 9 and 10, respectively.

A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 6. These volumes are based on the expected increases from the Project.

Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak-Hour	2014 Existing	2021 No-Build	2021 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
Route 30, east of Ring Road:					
Weekday Evening	1,922	2,107	2,122	15	0.7
Saturday Midday	1,898	2,040	2,063	23	1.1
Route 30, west of Ring Road:					
Weekday Evening	2,192	2,391	2,415	24	1.0
Saturday Midday	2,171	2,327	2,371	44	1.9
Route 9, east of Ring Road:					
Weekday Evening	3,726	4,178	4,185	7	0.2
Saturday Midday	3,811	4,166	4,179	13	0.3
Route 9, west of Ring Road:					
Weekday Evening	4,009	4,404	4,422	18	0.4
Saturday Midday	4,040	4,410	4,442	32	0.7

As shown in Table 6, Project-related traffic-volume increases external to the study area relative to 2021 No-Build conditions are anticipated to range from 0.2 to 1.9 percent, with vehicle increases ranging from 7 to 44 vehicles during the peak periods.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 9

2021 Build
Weekday Evening
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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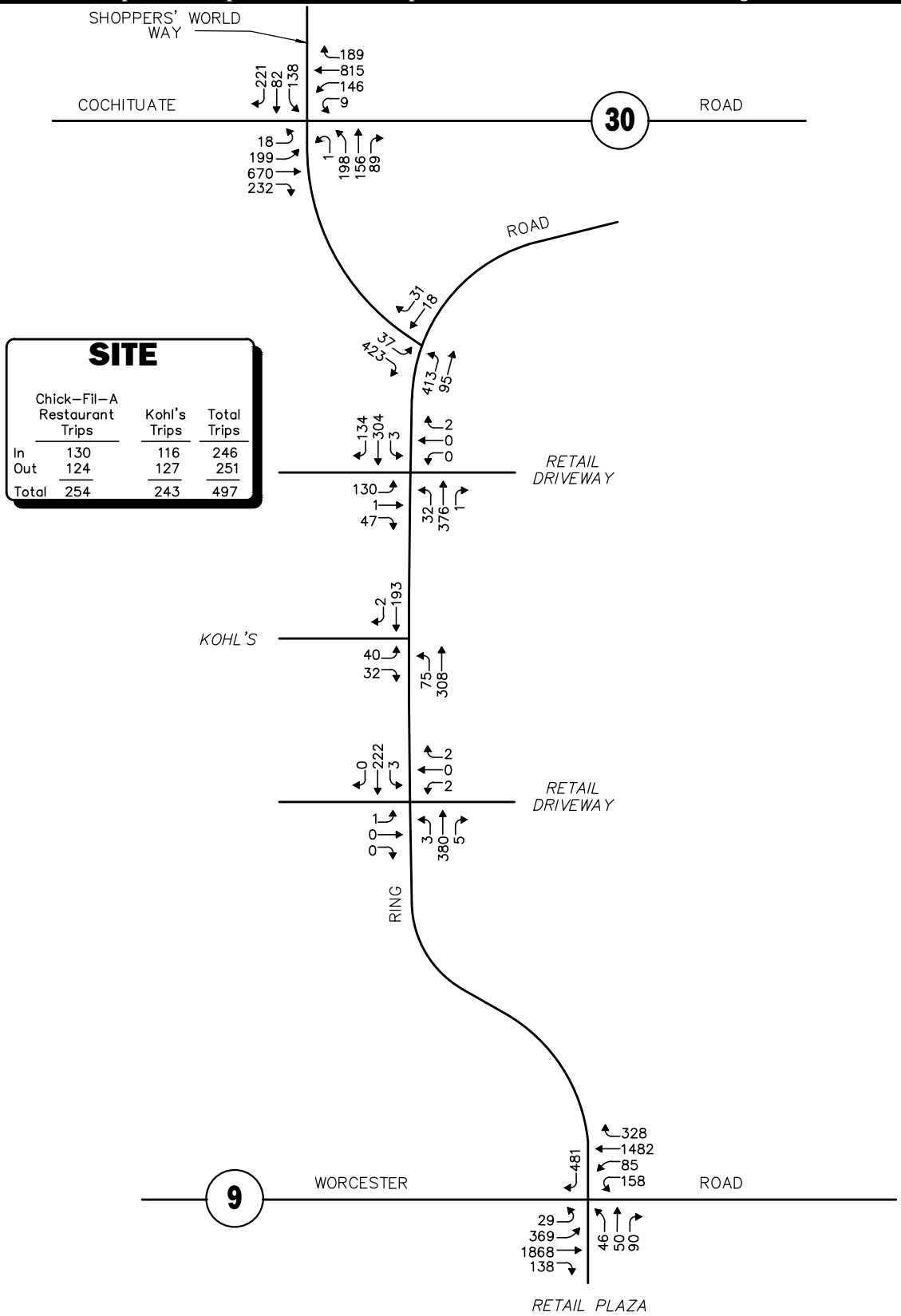

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 10

2021 Build
Saturday Midday
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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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.[16] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

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.

[16]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* 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 extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.[17] 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 affects 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 7 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

Table 7
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
v/c ≤ 1.0	v/c > 1.0	
A	F	≤10.0
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	>50.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

[17]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Signalized Intersections

The six levels of service 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.
- *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.

Levels of service for signalized intersections were calculated using the Percentile Delay Method implemented as a part of the Synchro™ 8 software as suggested by MassDOT in order to compensate for errors found when employing the 2010 *Highway Capacity Manual* methodology as a part of the software. The Percentile Delay Method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on "percentile" delay. Level-of-service designations are based on the criterion of percentile delay per vehicle and is a measure of: i) driver discomfort; ii) motorist frustration; and iii) fuel consumption; and includes a uniform delay based on percentile volumes using a Poisson arrival pattern, an initial queue move-up time, and a queue interaction delay that accounts for delays resulting from queues extending from adjacent intersections. Table 8 summarizes the relationship between level-of-service and percentile delay, and uses the same numerical delay thresholds as the HCM method. The tabulated percentile delay criterion may be applied in assigning level-of-service 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 by Volume-to-Capacity Ratio		Average Control Delay
v/c ≤ 1.0	v/c > 1.0	(Seconds Per Vehicle)
A	F	≤10.0
B	F	10.1 to 20.0
C	F	20.1 to 35.0
D	F	35.1 to 55.0
E	F	55.1 to 80.0
F	F	>80.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 18-6.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro™ intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual.* The Synchro™ vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro™ reports both the average (50th percentile) the 95th percentile vehicle queue. For unsignalized intersections, Synchro™ reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection 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).

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2014 Existing, 2021 No-Build and 2021 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9 and 10, with the detailed analysis results presented in the Appendix.

The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area.

Signalized Intersections

The addition of Project-related traffic to the signalized study area intersections was not shown to result in a change in LOS at either of the two (2) intersections studied. Both of the signalized intersections within the study area were found to be operating at a level-of-service of "C" or better during the peak hours under all analysis conditions, where a level-of-service of "D" or better is generally defined as "acceptable" traffic operations.

Unsignalized Intersections

The addition of Project-related traffic to the unsignalized study area intersections is predicted to result in a change in the overall LOS between the No-Build and Build condition at two (2) of the four (4) intersections studied; the intersection of Ring Road at the Kohl's Plaza north driveway (degradation in LOS from "C" to "E" during the Saturday midday peak-hour) and the intersection of Ring Road at the Kohl's Plaza south driveway (minor degradation in LOS from "B" to "C" during the Saturday midday peak-hour with an increase in overall motorist delay of less than 2 seconds). Three (3) of the four (4) unsignalized intersections within the study area were found to be generally operating at a LOS of "C" or better during the peak hours under all analysis conditions. The following is a summary of the analysis results for the unsignalized intersections that were found to be operating at or over their design capacity (defined as LOS "E" or "F", respectively).

Ring Road at the Kohl's Plaza North Driveway/Retail Plaza Driveway

Under 2014 Existing and 2021 No-Build conditions, the critical movements at this unsignalized intersection (all movements from the Kohl's Plaza north driveway) were shown to operate at LOS B during the weekday evening peak-hour and at LOS C during the Saturday midday peak-hour. Under 2021 Build conditions, with the addition of Project-related traffic, the critical movements were shown to remain at LOS B during the weekday evening peak-hour and to degrade to LOS E during the Saturday midday peak-hour (increase in overall motorist delay of approximately 25 seconds). The addition of Project-related traffic to the intersection was shown to have a predicted increase in vehicle queueing of approximately 0 to 4 vehicles on the Kohl's Plaza north driveway approach. All movements along Ring Road were shown to operate at LOS A under all analysis conditions with negligible vehicle queuing reported.

Table 9
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak-Hour/Movement	2014 Existing V/C[a]	2014 Existing Delay[b]	2014 Existing LOS[c]	2014 Existing Queue[d] Avg/95th	2021 No-Build V/C	2021 No-Build Delay	2021 No-Build LOS	2021 No-Build Queue Avg/95th	2021 Build V/C	2021 Build Delay	2021 Build LOS	2021 Build Queue Avg/95th
Route 30 at Ring Road and Shopper' World Way												
Weekday Evening:												
Route 30 EB UT/LT	0.68	63.7	E	119/195	0.68	63.7	E	119/195	0.68	63.7	E	119/195
Route 30 EB TH	0.32	18.4	B	147/219	0.36	19.0	B	167/246	0.38	20.8	C	174/247
Route 30 EB RT	0.08	1.9	A	0/20	0.09	1.9	A	0/21	0.11	1.9	A	0/23
Route 30 WB UT/LT	0.39	55.9	E	54/97	0.41	56.0	E	57/102	0.47	56.9	E	73/123
Route 30 WB TH	0.62	26.2	C	344/431	0.70	28.2	C	409/504	0.70	28.5	C	412/504
Route 30 WB RT	0.14	1.2	A	0/10	0.14	1.2	A	0/11	0.14	1.2	A	0/11
Ring Road NB LT	0.37	49.6	D	61/95	0.40	50.0	D	66/101	0.43	50.3	D	74/111
Ring Road NB TH/RT	0.61	56.7	E	103/171	0.62	56.5	E	104/173	0.65	56.8	E	110/185
Shoppers World Way SB LT	0.46	55.9	E	72/116	0.46	55.9	E	72/116	0.46	55.9	E	72/116
Shoppers World Way SB LT/TH	0.45	55.3	E	73/118	0.45	55.3	E	73/118	0.45	55.3	E	73/118
Shoppers World Way SB RT	0.54	11.1	B	0/54	0.54	11.1	B	0/54	0.54	11.1	B	0/54
Overall	--	**29.0**	**C**	--	--	**29.7**	**C**	--	--	**30.5**	**C**	--
Saturday Midday:												
Route 30 EB UT/LT	0.82	75.5	E	169/308	0.83	75.5	E	169/308	0.84	76.5	E	169/308
Route 30 EB TH	0.39	24.2	C	181/238	0.43	25.1	C	205/265	0.44	25.8	C	203/259
Route 30 EB RT	0.18	1.7	A	0/28	0.20	1.7	A	0/29	0.23	1.7	A	0/31
Route 30 WB UT/LT	0.56	58.5	E	93/154	0.59	59.9	E	100/165	0.69	64.5	E	125/347
Route 30 WB TH	0.52	27.6	C	256/320	0.57	28.8	C	287/356	0.57	28.9	C	280/201
Route 30 WB RT	0.21	1.4	A	0/17	0.21	1.5	A	0/17	0.21	1.4	A	0/17
Ring Road NB LT	0.28	44.3	D	37/90	0.30	44.5	D	62/96	0.36	45.1	D	77/115
Ring Road NB TH/RT	0.76	60.2	E	166/258	0.76	60.6	E	168/266	0.82	64.6	E	188/320
Shoppers World Way SB LT	0.53	58.4	E	86/149	0.53	58.1	E	86/149	0.53	58.1	E	86/149
Shoppers World Way SB LT/TH	0.53	57.7	E	89/154	0.53	57.7	E	89/154	0.53	57.7	E	89/154
Shoppers World Way SB RT	0.54	14.8	B	0/72	0.54	10.8	B	0/72	0.54	10.8	B	0/72
Overall	--	**32.6**	**C**	--	--	**32.9**	**C**	--	--	**34.1**	**C**	--

See notes at end of table.

Table 9 (Continued)
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak-Hour/Movement	2014 Existing				2021 No-Build				2021 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	V/C	Delay	LOS	Queue Avg/95th	V/C	Delay	LOS	Queue Avg/95th
Route 9 at Ring Road and the Retail Plaza Driveway												
Weekday Evening:												
Route 9 EB UT/LT	0.44	39.9	D	74/113	0.47	40.5	D	80/121	0.50	41.0	D	86/127
Route 9 EB TH/RT	0.60	11.2	B	231/328	0.66	12.3	B	272/336	0.66	12.2	B	272/386
Route 9 WB UT/LT	0.32	43.1	D	37/63	0.33	43.0	D	39/65	0.33	43.0	D	39/65
Route 9 WB TH	0.55	13.4	B	232/289	0.61	14.3	B	260/336	0.61	14.3	B	259/336
Route 9 WB RT	0.19	2.0	A	0/30	0.20	1.9	A	0/31	0.21	1.9	A	0/31
Retail Plaza Driveway NB LT/TH	0.36	45.0	D	46/88	0.36	45.0	D	46/88	0.36	45.0	D	46/88
Retail Plaza Driveway NB RT	0.20	1.4	A	0/0	0.20	1.4	A	0/0	0.20	1.4	A	0/0
Ring Road SB RT	0.44	18.0	B	95/146	0.47	20.2	C	107/161	0.49	21.0	C	116/171
Overall	**--**	**14.9**	**B**	--	**--**	**15.7**	**B**	--	**--**	**15.8**	**B**	--
Saturday Midday:												
Route 9 EB UT/LT	0.63	44.2	D	112/160	0.68	45.7	D	121/172	0.73	47.6	D	131/184
Route 9 EB TH/RT	0.65	14.3	B	268/372	0.71	15.8	B	315/431	0.71	16.0	B	312/431
Route 9 WB UT/LT	0.51	43.3	D	76/113	0.52	43.4	D	79/118	0.52	43.4	D	79/118
Route 9 WB TH	0.48	13.2	B	182/245	0.53	13.9	B	210/279	0.53	14.1	B	209/279
Route 9 WB RT	0.29	2.1	A	0/38	0.31	2.1	A	0/39	0.33	2.1	A	0/40
Retail Plaza Driveway NB LT/TH	0.43	45.1	D	62/109	0.43	44.9	D	62/109	0.42	44.3	D	62/109
Retail Plaza Driveway NB RT	0.28	2.6	A	0/0	0.28	2.6	A	0/6	0.27	2.5	A	0/6
Ring Road SB RT	0.63	25.4	C	182/268	0.68	27.2	C	204/296	0.34	28.3	C	221/319
Overall	**--**	**18.3**	**B**	--	**--**	**19.2**	**B**	--	**--**	**19.7**	**B**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in feet.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; UT = U-turning movements; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 10
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/ Peak-Hour/Movement	2014 Existing				2021 No-Build				2021 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Ring Road at Ring Road Connector												
Weekday Evening:												
Ring Road NB LT/TH	301	7.3	A	18	315	7.3	A	19	360	7.3	A	22
Ring Road Connector SB TH/RT	41	0.0	A	0	44	0.0	A	0	44	0.0	A	0
Ring Road EB LT/TH	200	10.5	B	25	211	10.7	B	27	248	11.2	B	35
Saturday Midday:												
Ring Road NB LT/TH	405	7.2	A	26	423	7.2	A	28	508	7.4	A	35
Ring Road Connector SB TH/RT	46	0.0	A	0	49	0.0	A	0	49	0.0	A	0
Ring Road EB LT/TH	373	14.9	B	79	394	16.2	C	93	460	22.1	C	153
Ring Road at the Kohl's North Driveway and Retail Driveway												
Weekday Evening:												
Kohl's North Driveway EB LT/TH/RT	46	12.1	B	10	46	12.4	B	10	94	14.3	B	20
Retail Driveway WB LT/TH/RT	2	11.8	B	1	2	12.1	B	1	2	12.2	B	1
Ring Road NB LT/TH/RT	286	0.3	A	1	300	0.3	A	1	310	0.5	A	1
Ring Road SB LT/TH/RT	188	0.1	A	0	199	0.1	A	0	236	0.1	A	0
Saturday Midday:												
Kohl's North Driveway EB LT/TH/RT	105	23.0	C	44	105	24.9	C	48	178	49.9	E	132
Retail Driveway WB LT/TH/RT	2	11.2	B	1	2	11.3	B	1	2	11.5	B	1
Ring Road NB LT/TH/RT	367	1.0	A	2	385	0.9	A	2	409	1.0	A	2
Ring Road SB LT/TH/RT	355	0.1	A	0	375	0.1	A	0	441	0.1	A	0

See notes at end of table.

Table 10 (Continued)
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/ Peak-Hour/Movement	2014 Existing				2021 No-Build				2021 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Ring Road at the Kohl's Center Driveway												
Weekday Evening:												
Kohl's Center Driveway EB LT/RT	7	9.2	A	1	7	9.3	A	1	26	9.9	A	3
Ring Road NB LT/TH	220	0.4	A	0	235	0.3	A	0	262	1.2	A	2
Ring Road SB TH/RT	99	0.0	A	0	106	0.0	A	0	108	0.0	A	0
Saturday Midday:												
Kohl's Center Driveway EB LT/RT	21	11.1	B	5	21	11.3	B	5	72	13.6	B	14
Ring Road NB LT/TH	313	0.9	A	2	335	0.9	A	2	383	2.0	A	5
Ring Road SB TH/RT	178	0.0	A	0	192	0.0	A	0	195	0.0	A	0
Ring Road at the Kohl's South Driveway and Retail Driveway												
Weekday Evening:												
Kohl's South Driveway EB LT/TH/RT	0	0.0	A	0	0	0.0	A	0	0	0.0	A	0
Retail Driveway WB LT/TH/RT	0	0.0	A	0	0	0.0	A	0	0	0.0	A	0
Ring Road NB LT/TH/RT	222	0.1	A	0	237	0.1	A	0	264	0.1	A	0
Ring Road SB LT/TH/RT	103	0.1	A	0	110	0.1	A	0	123	0.1	A	0
Saturday Midday:												
Kohl's South Driveway EB LT/TH/RT	1	13.7	B	1	1	14.2	B	1	1	15.5	C	1
Retail Driveway WB LT/TH/RT	4	11.9	B	2	4	12.3	B	2	4	13.1	B	2
Ring Road NB LT/TH/RT	318	0.1	A	0	340	0.1	A	0	388	0.1	A	0
Ring Road SB LT/TH/RT	189	0.2	A	0	202	0.2	A	0	225	0.2	A	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level-of-Service.
[d]Queue length in feet.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

PARKING DEMAND ANALYSIS

A detailed parking demand analysis was performed at the existing Kohl's Plaza in order to evaluate the parking demands associated with the Kohl's retail store. An inventory of the existing parking supply within the Kohl's Plaza was conducted in December 2012 during the peak holiday shopping period. Based on this inventory, it was determined that the Kohl's Plaza currently contains a total of 551 parking spaces, including 12 handicapped parked spaces; with the retail conversion to accommodate the Pier 1 Imports store, the parking supply will be reduced slightly to 546 spaces.

PARKING DEMAND OBSERVATIONS

In order to determine the actual parking demands for the Kohl's Plaza and parking utilization within the parking lot, parking demand observations were conducted within the Kohl's Plaza during the peak holiday shopping period in December 2012 during the weekday midday (11:00 AM to 1:00 PM), weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak hours. The parking observations were completed in 20 minute intervals during each observation period and included both the number of vehicles parked and their location within the parking field. Table 11 summarizes the results of the parking demand observations, with the identified peak parking demand for each observation period shaded for identification.

Table 11
KOHL'S PLAZA PARKING DEMAND OBSERVATIONS
DECEMBER 2012

Time of Day	Number of Occupied Parking Spaces	Percent of Available Spaces Occupied[a]
Weekday Midday:		
11:00 AM	232	42.1%
11:20	243	44.1%
11:40	226	41.0%
12:00 PM	239	43.4%
12:20	248	45.0%
12:40	250	45.4%
1:00	246	44.6%
Weekday Evening:		
4:00 PM	223	40.4%
4:20	208	37.7%
4:40	196	35.6%
5:00	203	36.8%
5:20	193	35.0%
5:40	184	33.4%
6:00	178	32.3%
Saturday Midday:		
11:00 AM	221	40.1%
11:20	220	39.9%
11:40	234	42.5%
12:00 PM	243	44.1%
12:20	254	46.1%
12:40	265	48.1%
1:00	275	49.9%
1:20	281	51.0%
1:40	281	51.0%
2:00	270	49.0%

[a]Calculation is based on the existing parking supply of 551 spaces.

As can be seen in Table 11, the peak parking demand within the Kohl's Plaza during the weekday midday peak-hour was identified to occur at 12:40 PM, with an observed peak demand of 250 spaces, or approximately 45 percent of the available spaces (551). The observed peak parking demand during the

weekday evening peak-hour was identified to occur at 4:00 PM, with an observed peak demand of 223 spaces, or approximately 40 percent of the available spaces. The observed peak parking demand during the Saturday midday peak-hour was identified to occur at 1:20 PM, with an observed peak demand of 281 spaces, or approximately 51 percent of the available parking supply. In general, the majority of the occupied spaces within the site were observed to be located to the south and east of the Kohl's building, with limited utilization of the parking spaces in the northwest corner of the parking lot, the proposed location of the Project.

Overall Peak Parking Demand

Based on this parking demand analysis, the overall peak parking demand was observed to occur during the Saturday midday peak-hour at 1:20 PM, with an observed peak demand of 281 spaces, or approximately 51 percent of the available parking supply, leaving a balance of 270 unoccupied spaces within the plaza during the peak demand period. With the addition of the Project and consideration of the minor reduction in parking associated with the Pier 1 Imports, the total number of parking spaces provided within the Kohl's Plaza would be reduced by 30 spaces (25 as a result of the Project and 5 spaces in conjunction with Pier 1 Imports), resulting in a net parking supply of 521 spaces, ***which is more than sufficient to accommodate the observed peak parking demand within the Kohl's Plaza during the peak holiday season (281 spaces) and the anticipated parking demands that may be associated with the Project.***

DRIVE-THROUGH WINDOW VEHICLE QUEUE ANALYSIS

An assessment of vehicle queuing related to the drive-through window facility was completed using observations conducted at a similar Chick-fil-A restaurant located in Cherry Hill, New Jersey, on two (2) weekdays and two (2) Saturdays over a continuous 12-hour period (7:00 AM to 7:00 PM). As proposed, the drive-through window facility will consist of two-lanes approaching a dual order board (one board for each lane) that will merge into a single lane between the order boards and the pick-up window.

Based on the observations conducted at the Cherry Hill, New Jersey, Chick-fil-A restaurant, the maximum observed vehicle queue was found to be 13 vehicles on a weekday and 14 vehicles on a Saturday. Given that the proposed drive-through window facility provides sufficient queue storage to accommodate approximately 17 vehicles (10 vehicles (5 vehicles per lane) between the entrance to the drive-through facility and the order board, and 7 vehicles between the order board and the pick-up window assuming 25-feet per vehicle), this analysis has concluded that the drive-through window facility is appropriately designed to accommodate the observed maximum vehicle queue without impeding access to the Project site or on-site circulation. The vehicle queue observation worksheets are provided in the Appendix.

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the three (3) existing Kohl's Plaza driveway intersections with Ring Road in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[18] requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 12 presents the measured SSD and ISD at the subject intersections.

[18]Ibid 8.

Table 12
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (Feet)	ISD[b]	Measured (Feet)
Ring Road at the Kohl's Plaza North Driveway			
Stopping Sight Distance:			
Ring Road approaching from the north	155	--	350
Ring Road approaching from the south	155	--	245
Intersection Sight Distance:			
Looking to the north from the Kohl's Plaza north driveway	155	240/280[b]	384
Looking to the south from the Kohl's Plaza north driveway	155	240/280[b]	178
Ring Road at the Kohl's Plaza Center Driveway			
Stopping Sight Distance:			
Ring Road approaching from the north	155	--	333
Ring Road approaching from the south	155	--	217
Intersection Sight Distance:			
Looking to the north from the Kohl's Plaza center driveway	155	240/280[b]	298
Looking to the south from the Kohl's Plaza center driveway	155	240/280[b]	203
Ring Road at the Kohl's Plaza South Driveway			
Stopping Sight Distance:			375
Ring Road approaching from the north	155	--	259
Ring Road approaching from the south	155	--	
Intersection Sight Distance:			
Looking to the north from the Kohl's Plaza south driveway	155	240/280[b]	350
Looking to the south from the Kohl's Plaza south driveway	155	240/280[b]	284

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2011; and based on a 25 mph approach speed on the Ring Road.

[b]Values shown are the intersection sight distance for a vehicle turning right/left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

As can be seen in Table 12, the available lines of sight at the subject intersections were found to exceed the recommended minimum sight distance requirements (SSD) to function in a safe manner based on a 25 mph along the Ring Road, which is generally consistent with the measured 85th percentile vehicle travel speed along this roadway (22 mph).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a Chick-fil-A restaurant with a two-lane drive-through window facility (two order lanes merging into a single service lane) to be located off Ring Road and situated within the northern portion of the parking area serving the Kohl's Plaza in Framingham, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE[19] for the appropriate land use and applying a 10 percent internal trip capture rate and a 50 percent pass-by trip rate, the Project is expected to generate approximately 1,066 new vehicle trips on an average weekday (two-way, 24-hour volume), with approximately 70 new vehicle trips expected during the weekday evening peak-hour. On a Saturday, the Project is expected to generate approximately 1,552 new vehicle trips, with approximately 126 new vehicle trips expected during the Saturday midday peak-hour;

2. In general, the study area intersections were shown to operate at LOS "C" or better during the peak periods with the addition of Project-related traffic, with the exception of the intersection of Ring Road at the Kohl's Plaza north driveway/retail driveway. The addition of Project-related traffic to this intersection is predicted to result in a change in LOS for vehicles exiting the Kohl's Plaza driveway between the No-Build and Build condition from "C" to "E" during the Saturday midday peak-hour; however, all movements along Ring Road were shown to continue to operate at LOS A during the peak periods and the predicted increase in vehicle queuing exiting the Kohl's Plaza driveway was shown to increase by approximately 4 vehicles (from 2 vehicles to 6 vehicles);

3. No discernible safety deficiencies were noted within the study area based on a review of the motor vehicle crash history at the study intersections;

[19] Ibid 5.

4. A review of parking demands within the Kohl's Plaza during the peak holiday shopping period indicates that adequate parking will continue to be provided within the Plaza with the completion of the Project;

5. A review of vehicle queuing as it relates to the proposed drive-through window facility indicates that the drive-through facility is appropriately designed to accommodate the projected maximum vehicle queue without impeding access to the Project site or on-site circulation; and

6. Lines of sight to and from the Kohl's Plaza driveway intersections with Ring Road were found to exceed the required minimum distance for the intersections to function in a safe manner.

Based on the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and to address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and will be completed in conjunction with the Project subject to receipt of all necessary rights, permits and approvals.

Project Access

Access to the Project will be provided by way of the three (3) full access driveways that serve the Kohl's Plaza and intersect the west side of Ring Road (a.k.a. Shoppers World West Drive). The following recommendations are offered with respect to the design and operation of the Project site driveways:

- Within the Project site, circulating roadways should be a minimum of 24-feet in width where two-way traffic is proposed and a minimum of 16-feet in width to support one-way travel.

- Appropriate signs ("One-Way", "Do Not Enter", etc.) and pavement markings should be provided to regulate the one-way traffic flow through the drive-through window facility and around the perimeter of the building.

- Signs and landscaping adjacent to the Kohl's Plaza driveway intersections with Ring Road and within the Project site should be designed and maintained so as not to restrict lines of sight.

- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD).[20]

[20]Ibid 9.

Transportation Demand Management Measures

The Project site is accessible via public transportation services provided by the MWRTA, with a scheduled stop at Ring Road in the vicinity of the Project site. In an effort to reduce the overall number of automobile trips in the area and to integrate the Project into the available transportation resources, the following Transportation Demand Management (TDM) measures should be considered for implementation as a part of the Project:

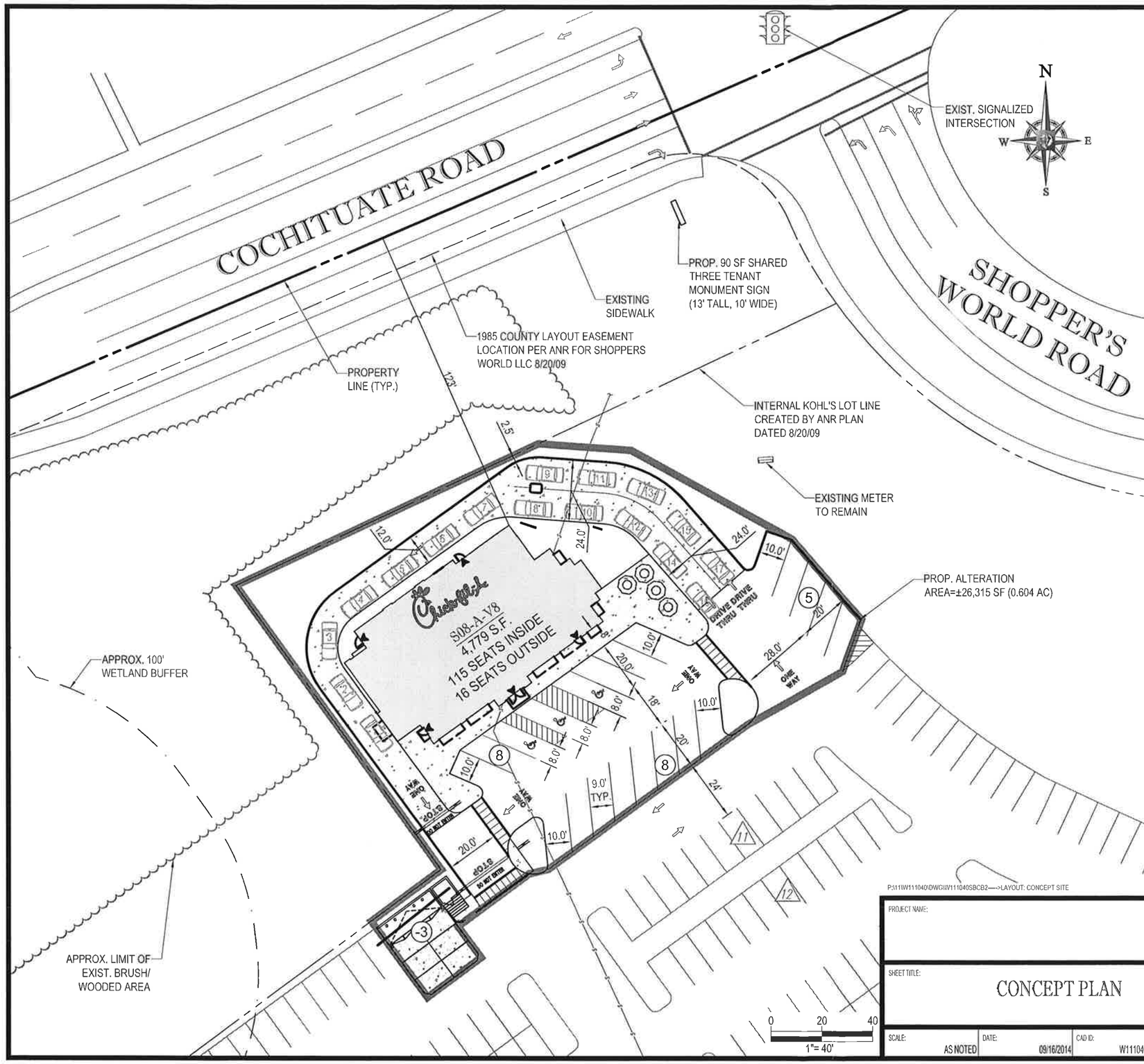
- Information regarding public transportation services, maps, schedules and fare information should be posted in a central location;
- A "commuting alternatives packet" should be provided to employees of the Project detailing available public transportation services, bicycle and walking alternatives, and commuter options available through MassRIDES' and their NuRide program which rewards individuals that choose to walk, bicycle, carpool, vanpool or that use public transportation to travel to and from work;
- Pedestrian and bicycle accommodations should be provided within the Project site including sidewalks and crossings to link the proposed building to the parking area and the Kohl's building;
- Direct deposit for employee paychecks should be offered;
- To the extent feasible, consideration should be given to coordinating employee schedules with public transportation schedules; and
- A bicycle rack should be provided proximate to the building entrance.

With implementation of the above recommendations, safe and efficient access will be provided to the Project site and the Project can be constructed with minimal impact on the roadway system.

APPENDIX

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
MANUAL TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
PUBLIC TRANSPORTATION SCHEDULES
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT NETWORKS
TRIP-GENERATION CALCULATIONS
CAPACITY ANALYSIS WORKSHEETS
DRIVE-THROUGH WINDOW QUEUE OBSERVATIONS

PROJECT SITE PLAN



CONCEPT PLAN GENERAL NOTES

1. THIS PLAN IS BASED ON:
   1) A PLAN ENTITLED "ANR PLAN/KOHL'S PLAN" PREPARED BY MILLMAN SURVEYING, INC., DATED 08/20/09
   2) A PLAN ENTITLED "LAYOUT & MATERIALS PLAN" PREPARED BY VHB, DATED 01/31/02, REVISED THROUGH 6/25/04
   3) A PLAN ENTITLED "ALTA/ACSM LAND TITLE SURVEY" PREPARED BY CONTROL POINT ASSOCIATES, INC., DATED 10/26/12, REVISED THROUGH 04/29/14

BULK REQUIREMENTS:	ALLOWED/REQUIRED	PROVIDED
A. MIN. YARD		
FRONT SETBACK	25'	±123'
SIDE SETBACK (WEST)	15'	>15'
B. MIN. LOT AREA	6,000 SF	±449,512 SF (A)
C. MIN. OPEN SPACE	20%	±19.8% (A)
D. MAX. FAR	0.32	0.23
E. MIN. PARKING REQUIREMENTS		
CHICK-FIL-A PARCEL	1 / 200 SF = 24	21 (B)
PARKING DATA PER KOHL'S LAYOUT & MATERIALS PLAN BY VHB LAST REVISED 6/25/02	KOHL'S = 1/ 200 SF = 513 KOHL'S + CHICK-FIL-A = 1/ 200 = 537	536 (B)
F. MIN. PARKING SPACE DIMENSIONS	9'X18' (C)	9'X18' (C)
G. MAX. BUILDING HEIGHT	80'	±25'-6"
H. MIN. STACKING SPACES BEFORE SERVICE AREA	10	10
I. MIN. STACKING SPACES AFTER SERVICE AREA	5	7

NOTE: BULK INFORMATION TAKEN FROM LAYOUT & MATERIALS PLAN FOR KOHL'S BY VHB DATED 1/ 31/ 02, LAST REVISED 6/ 25/ 02. BULK INFORMATION DOES NOT CONSTITUTE ACTUAL ANALYSIS OF CONFORMANCE AS OVERALL SHOPPERS WORLD DEVELOPMENT WILL NEED TO BE CONSIDERED FOR ZONING PURPOSES PER TOWN PLANNER.

(A) REFERS TO KOHL'S PARCEL.

(B) THE CHICK-FIL-A RESTAURANT IS ANTICIPATED TO RESULT IN A NET DEFICIENCY OF 1 STALL DUE TO THE NET LOSS OF 25 STALLS TO ACCOMMODATE THE PROPOSED BUILDING/DT LAYOUT, AND DEMAND OF AN ADDITIONAL ±24* STALLS FOR THE RESTAURANT USE. FOR PURPOSES OF ZONING AND PARKING COMPLIANCE, KOHL'S IS CONSIDERED PART OF AN OVERALL DEVELOPMENT KNOWN AS SHOPPERS WORLD. BASED ON CORRESPONDENCE IN THE TOWN RECORD GENERATED BY PLANNER JAY GRANDE JULY 22, 2008, IN TERMS OF ZONING COMPLIANCE THE SHOPPERS WORLD DEVELOPMENT HAS A TOTAL OF ONE EXCESS PARKING STALL. THE ADDITION OF CHICK-FIL-A WILL RESULT IN PARKING COMPLIANCE FROM A ZONING STANDPOINT.

(C) 10' STALL WIDTH FOR END STALLS ABUTTING CURB.

P:\11\W111040\DWG\W111040SBCB2—>LAYOUT: CONCEPT SITE

PROJECT NAME:

CHICK-FIL-A - CONCEPT PLAN
1 COCHITUATE ROAD
FRAMINGHAM, MA

SHEET TITLE:

CONCEPT PLAN

SCALE:	DATE:	CAD ID:	PROJECT NUMBER:
AS NOTED	09/16/2014	W111040sbcb2	W111040

BOHLER ENGINEERING
352 TURNPIKE ROAD, SOUTHBOROUGH, MA 01772
PHONE: (508) 480-9900 FAX: (508) 480-9080

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA

Site Code: 63940001
6394VOL1

Start Time	12-Sep-14 Fri	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		2	71			3	96				
12:15		1	65			2	80				
12:30		1	69			5	91				
12:45		1	65	5	270	0	81	10	348	15	618
01:00		1	69			2	94				
01:15		1	75			2	89				
01:30		1	80			0	92				
01:45		2	55	5	279	1	66	5	341	10	620
02:00		0	46			1	86				
02:15		4	65			2	120				
02:30		0	53			1	101				
02:45		0	70	4	234	2	95	6	402	10	636
03:00		2	48			0	77				
03:15		2	59			1	91				
03:30		0	49			0	95				
03:45		0	40	4	196	0	85	1	348	5	544
04:00		1	59			2	93				
04:15		0	48			0	90				
04:30		0	52			2	96				
04:45		2	51	3	210	6	89	10	368	13	578
05:00		2	64			5	96				
05:15		2	59			2	91				
05:30		2	58			3	85				
05:45		7	51	13	232	13	103	23	375	36	607
06:00		4	56			3	80				
06:15		2	50			1	72				
06:30		5	46			16	78				
06:45		15	72	26	224	14	88	34	318	60	542
07:00		12	49			11	62				
07:15		8	61			26	65				
07:30		7	51			23	82				
07:45		16	53	43	214	26	61	86	270	129	484
08:00		23	41			22	59				
08:15		15	25			23	58				
08:30		23	31			21	67				
08:45		17	24	78	121	23	70	89	254	167	375
09:00		34	23			21	63				
09:15		39	20			29	48				
09:30		51	14			45	40				
09:45		54	9	178	66	40	35	135	186	313	252
10:00		56	8			43	29				
10:15		60	12			57	26				
10:30		52	7			64	18				
10:45		64	5	232	32	76	18	240	91	472	123
11:00		62	4			68	12				
11:15		54	4			80	18				
11:30		77	2			65	9				
11:45		62	0	255	10	98	5	311	44	566	54
Total		846	2088			950	3345			1796	5433
Percent		28.8%	71.2%			22.1%	77.9%			24.8%	75.2%

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA

Site Code: 63940001
6394VOL1

Start Time	13-Sep-14 Sat	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	88			8	93				
12:15		2	68			4	93				
12:30		0	83			3	105				
12:45		0	95	7	334	4	91	19	382	26	716
01:00		0	97			1	113				
01:15		0	80			3	114				
01:30		0	71			1	95				
01:45		1	78	1	326	2	124	7	446	8	772
02:00		2	123			0	131				
02:15		0	96			1	108				
02:30		3	114			1	106				
02:45		2	93	7	426	1	132	3	477	10	903
03:00		8	122			0	134				
03:15		5	99			3	114				
03:30		2	72			2	123				
03:45		1	100	16	393	0	124	5	495	21	888
04:00		0	83			1	111				
04:15		0	89			0	121				
04:30		0	67			1	104				
04:45		1	99	1	338	4	118	6	454	7	792
05:00		3	89			2	134				
05:15		0	75			2	136				
05:30		2	58			2	116				
05:45		1	61	6	283	4	104	10	490	16	773
06:00		1	54			1	83				
06:15		0	52			1	78				
06:30		3	62			7	79				
06:45		11	68	15	236	4	70	13	310	28	546
07:00		8	38			9	85				
07:15		3	38			13	60				
07:30		13	38			12	79				
07:45		19	28	43	142	15	42	49	266	92	408
08:00		8	39			20	60				
08:15		13	30			19	53				
08:30		26	30			25	44				
08:45		25	21	72	120	28	43	92	200	164	320
09:00		32	18			24	52				
09:15		31	19			19	54				
09:30		51	11			45	34				
09:45		64	10	178	58	52	43	140	183	318	241
10:00		63	8			53	34				
10:15		61	7			50	15				
10:30		60	5			84	19				
10:45		81	5	265	25	75	10	262	78	527	103
11:00		73	5			71	10				
11:15		69	5			88	17				
11:30		87	3			91	9				
11:45		89	1	318	14	107	4	357	40	675	54
Total		929	2695			963	3821			1892	6516
Percent		25.6%	74.4%			20.1%	79.9%			22.5%	77.5%
Grand Total		1775	4783			1913	7166			3688	11949
Percent		27.1%	72.9%			21.1%	78.9%			23.6%	76.4%
ADT		ADT 7,818		AADT 7,818							

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA

Site Code: 63940001
6394VOL1

Start	08-Sep-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	*	*	*	*	*	*	*	*	5	10	7	19	*	*	6	14
01:00	*	*	*	*	*	*	*	*	5	5	1	7	*	*	3	6
02:00	*	*	*	*	*	*	*	*	4	6	7	3	*	*	6	4
03:00	*	*	*	*	*	*	*	*	4	1	16	5	*	*	10	3
04:00	*	*	*	*	*	*	*	*	3	10	1	6	*	*	2	8
05:00	*	*	*	*	*	*	*	*	13	23	6	10	*	*	10	16
06:00	*	*	*	*	*	*	*	*	26	34	15	13	*	*	20	24
07:00	*	*	*	*	*	*	*	*	43	86	43	49	*	*	43	68
08:00	*	*	*	*	*	*	*	*	78	89	72	92	*	*	75	90
09:00	*	*	*	*	*	*	*	*	178	135	178	140	*	*	178	138
10:00	*	*	*	*	*	*	*	*	232	240	265	262	*	*	248	251
11:00	*	*	*	*	*	*	*	*	**255**	**311**	**318**	**357**	*	*	**286**	**334**
12:00 PM	*	*	*	*	*	*	*	*	270	348	334	382	*	*	302	365
01:00	*	*	*	*	*	*	*	*	**279**	341	326	446	*	*	302	394
02:00	*	*	*	*	*	*	*	*	234	**402**	**426**	477	*	*	**330**	**440**
03:00	*	*	*	*	*	*	*	*	196	348	393	**495**	*	*	294	422
04:00	*	*	*	*	*	*	*	*	210	368	338	454	*	*	274	411
05:00	*	*	*	*	*	*	*	*	232	375	283	490	*	*	258	432
06:00	*	*	*	*	*	*	*	*	224	318	236	310	*	*	230	314
07:00	*	*	*	*	*	*	*	*	214	270	142	266	*	*	178	268
08:00	*	*	*	*	*	*	*	*	121	254	120	200	*	*	120	227
09:00	*	*	*	*	*	*	*	*	66	186	58	183	*	*	62	184
10:00	*	*	*	*	*	*	*	*	32	91	25	78	*	*	28	84
11:00	*	*	*	*	*	*	*	*	10	44	14	40	*	*	12	42
Lane	0	0	0	0	0	0	0	0	2934	4295	3624	4784	0	0	3277	4539
Day	0		0		0		0		7229		8408		0		7816	
AM Peak	-	-	-	-	-	-	-	-	11:00	11:00	11:00	11:00	-	-	11:00	11:00
Vol.	-	-	-	-	-	-	-	-	255	311	318	357	-	-	286	334
PM Peak	-	-	-	-	-	-	-	-	13:00	14:00	14:00	15:00	-	-	14:00	14:00
Vol.	-	-	-	-	-	-	-	-	279	402	426	495	-	-	330	440

Comb. Total	0	0	0	0	7229	8408	0	7816

ADT ADT 7,818 AADT 7,818

MANUAL TURNING MOVEMENT COUNT DATA

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

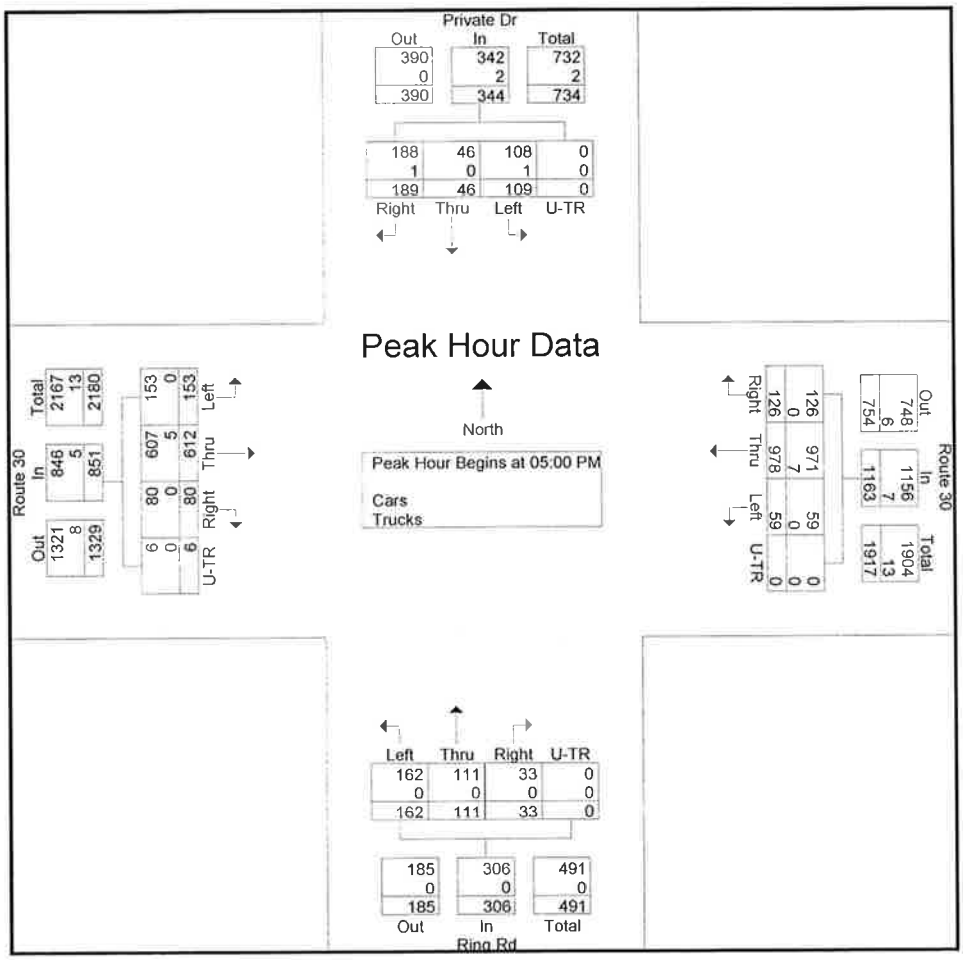
	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	26	20	36	0	13	198	26	0	25	23	15	0	48	146	21	0	597
04:15 PM	21	15	49	0	9	184	29	3	29	32	15	0	36	136	27	0	585
04:30 PM	31	12	48	0	14	189	42	3	29	22	6	0	31	162	16	1	606
04:45 PM	20	11	51	0	3	177	25	0	31	27	17	0	30	164	32	2	590
Total	98	58	184	0	39	748	122	6	114	104	53	0	145	608	96	3	2378
05:00 PM	27	7	46	0	11	216	27	0	44	24	9	0	46	140	21	0	618
05:15 PM	27	12	46	0	21	223	37	0	48	22	8	0	34	165	15	3	661
05:30 PM	23	14	40	0	13	257	29	0	40	32	8	0	31	163	21	2	673
05:45 PM	32	13	57	0	14	282	33	0	30	33	8	0	42	144	23	1	712
Total	109	46	189	0	59	978	126	0	162	111	33	0	153	612	80	6	2664
Grand Total	207	104	373	0	98	1726	248	6	276	215	86	0	298	1220	176	9	5042
Apprch %	30.3	15.2	54.5	0	4.7	83.1	11.9	0.3	47.8	37.3	14.9	0	17.5	71.6	10.3	0.5	
Total %	4.1	2.1	7.4	0	1.9	34.2	4.9	0.1	5.5	4.3	1.7	0	5.9	24.2	3.5	0.2	
Cars	206	104	372	0	98	1708	248	6	276	215	84	0	298	1207	176	9	5007
% Cars	99.5	100	99.7	0	100	99	100	100	100	100	97.7	0	100	98.9	100	100	99.3
Trucks	1	0	1	0	0	18	0	0	0	0	2	0	0	13	0	0	35
% Trucks	0.5	0	0.3	0	0	1	0	0	0	0	2.3	0	0	1.1	0	0	0.7

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 2

	Private Dr From North					Route 30 From East					Ring Rd From South					Route 30 From West					
Start Time	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	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	27	7	46	0	80	11	216	27	0	254	44	24	**9**	0	77	**46**	140	21	0	207	618
05:15 PM	27	12	46	0	85	**21**	223	**37**	0	281	**48**	22	8	0	78	34	**165**	15	**3**	**217**	661
05:30 PM	23	**14**	40	0	77	13	257	29	0	299	40	32	8	0	**80**	31	163	21	2	217	673
05:45 PM	**32**	13	**57**	0	**102**	14	**282**	33	0	**329**	30	**33**	8	0	71	42	144	**23**	1	210	**712**
Total Volume	109	46	189	0	344	59	978	126	0	1163	162	111	33	0	306	153	612	80	6	851	2664
% App. Total	31.7	13.4	54.9	0		5.1	84.1	10.8	0		52.9	36.3	10.8	0		18	71.9	9.4	0.7		
PHF	.852	.821	.829	.000	.843	.702	.867	.851	.000	.884	.844	.841	.917	.000	.956	.832	.927	.870	.500	.980	.935
Cars	108	46	188	0	342	59	971	126	0	1156	162	111	33	0	306	153	607	80	6	846	2650
% Cars	99.1	100	99.5	0	99.4	100	99.3	100	0	99.4	100	100	100	0	100	100	99.2	100	100	99.4	99.5
Trucks	1	0	1	0	2	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	14
% Trucks	0.9	0	0.5	0	0.6	0	0.7	0	0	0.6	0	0	0	0	0	0	0.8	0	0	0.6	0.5



Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	26	20	36	0	13	197	26	0	25	23	13	0	48	144	21	0	592
04:15 PM	21	15	49	0	9	177	29	3	29	32	15	0	36	134	27	0	576
04:30 PM	31	12	48	0	14	188	42	3	29	22	6	0	31	162	16	1	605
04:45 PM	20	11	51	0	3	175	25	0	31	27	17	0	30	160	32	2	584
Total	98	58	184	0	39	737	122	6	114	104	51	0	145	600	96	3	2357
05:00 PM	27	7	46	0	11	212	27	0	44	24	9	0	46	140	21	0	614
05:15 PM	27	12	46	0	21	222	37	0	48	22	8	0	34	163	15	3	658
05:30 PM	22	14	39	0	13	257	29	0	40	32	8	0	31	161	21	2	669
05:45 PM	32	13	57	0	14	280	33	0	30	33	8	0	42	143	23	1	709
Total	108	46	188	0	59	971	126	0	162	111	33	0	153	607	80	6	2650
Grand Total	206	104	372	0	98	1708	248	6	276	215	84	0	298	1207	176	9	5007
Apprch %	30.2	15.2	54.5	0	4.8	82.9	12	0.3	48	37.4	14.6	0	17.6	71.4	10.4	0.5	
Total %	4.1	2.1	7.4	0	2	34.1	5	0.1	5.5	4.3	1.7	0	6	24.1	3.5	0.2	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 1

Groups Printed- Trucks

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	2	0	0	5
04:15 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	2	0	0	9
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
Total	0	0	0	0	0	11	0	0	0	0	2	0	0	8	0	0	21
05:00 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
05:30 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	4
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Total	1	0	1	0	0	7	0	0	0	0	0	0	0	5	0	0	14
Grand Total	1	0	1	0	0	18	0	0	0	0	2	0	0	13	0	0	35
Apprch %	50	0	50	0	0	100	0	0	0	0	100	0	0	100	0	0	
Total %	2.9	0	2.9	0	0	51.4	0	0	0	0	5.7	0	0	37.1	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 1

Groups Printed- Bikes Peds

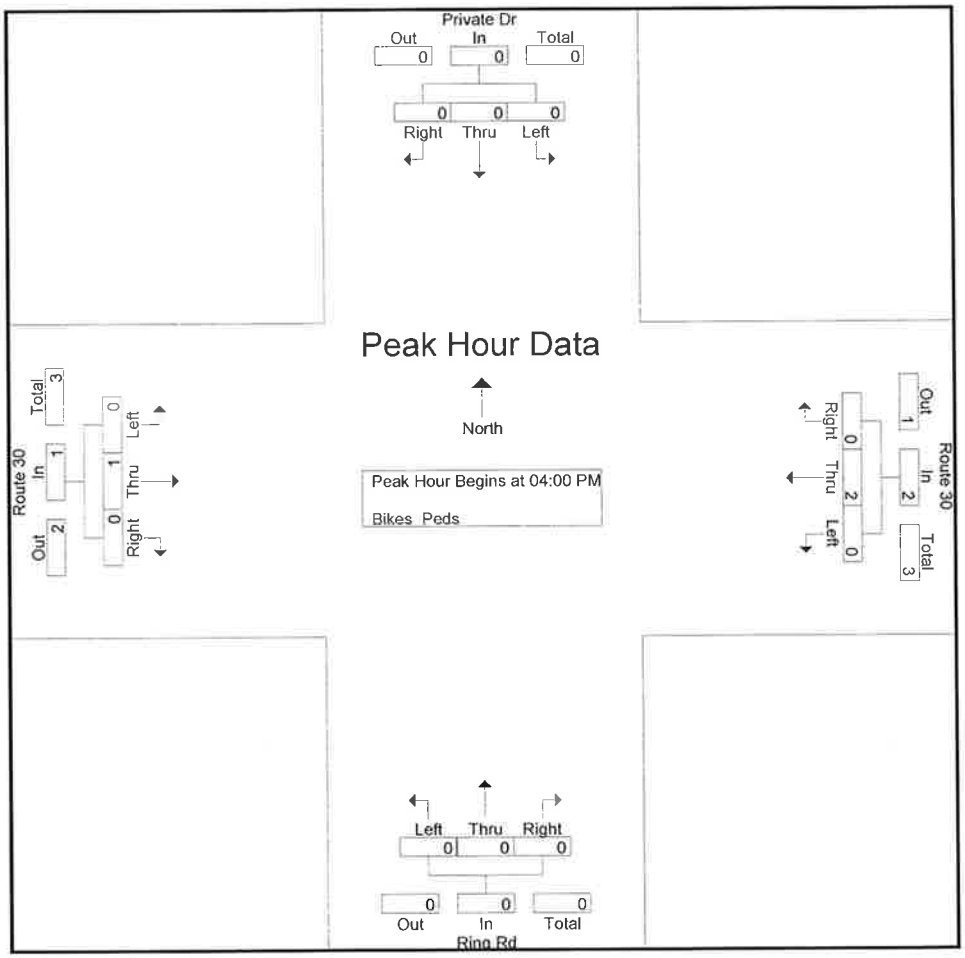
	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	2	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	0	3
04:30 PM	0	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	3	1	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	2	0	0	0	0	0	4	0	1	0	1	7	3	10
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	6	0	6
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	3	0	0	0	3	0	0	0	1	0	0	0	0	7	1	8
Grand Total	0	1	0	5	0	2	0	3	0	0	0	5	0	1	0	1	14	4	18
Apprch %	0	100	0		0	100	0		0	0	0		0	100	0				
Total %	0	25	0		0	50	0		0	0	0		0	25	0		77.8	22.2	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 63940001
Site Code : 63940001
Start Date : 9/3/2014
Page No : 2

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.375



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

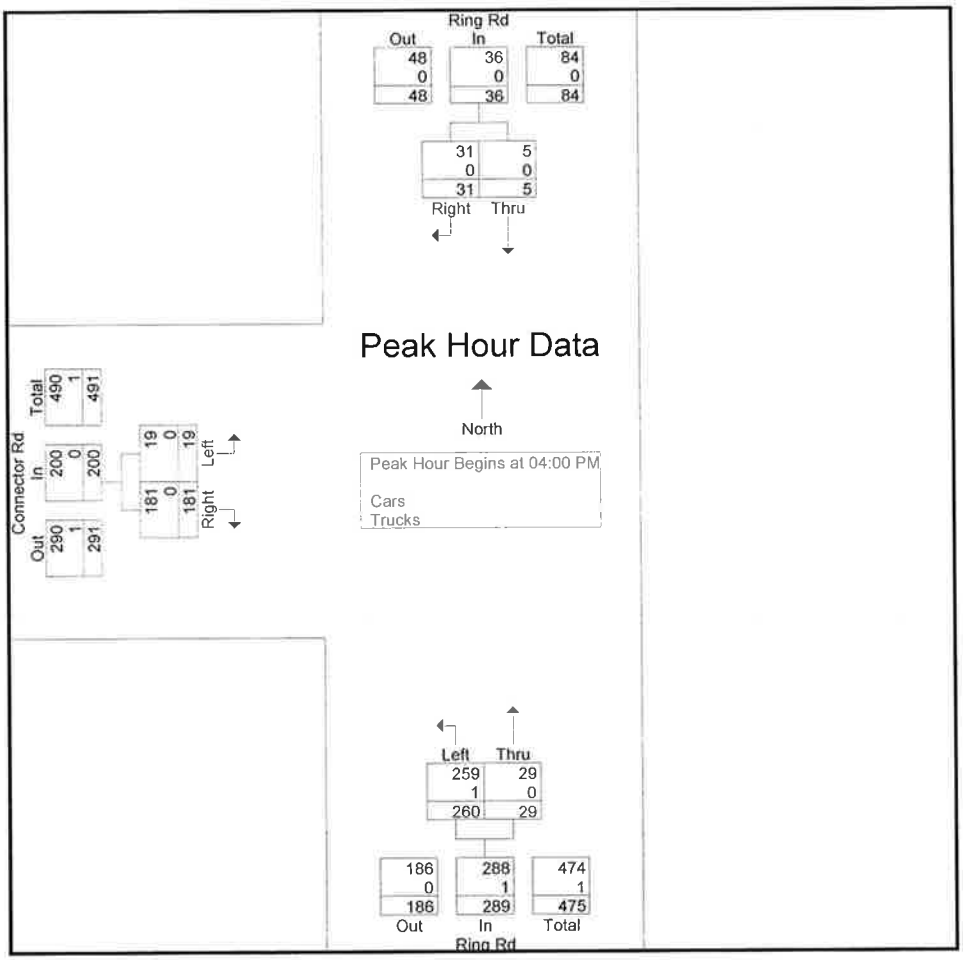
	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	1	6	62	7	7	46	129
04:15 PM	2	7	71	7	4	51	142
04:30 PM	1	7	57	4	3	37	109
04:45 PM	1	11	70	11	5	47	145
Total	5	31	260	29	19	181	525
05:00 PM	0	5	59	6	3	30	103
05:15 PM	4	4	68	5	7	40	128
05:30 PM	3	8	83	5	10	38	147
05:45 PM	1	1	65	7	5	44	123
Total	8	18	275	23	25	152	501
Grand Total	13	49	535	52	44	333	1026
Apprch %	21	79	91.1	8.9	11.7	88.3	
Total %	1.3	4.8	52.1	5.1	4.3	32.5	
Cars	13	49	534	52	44	333	1025
% Cars	100	100	99.8	100	100	100	99.9
Trucks	0	0	1	0	0	0	1
% Trucks	0	0	0.2	0	0	0	0.1

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North			Ring Rd From South			Connector Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	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 04:00 PM										
04:00 PM	1	6	7	62	7	69	7	46	53	129
04:15 PM	**2**	7	9	**71**	7	78	4	**51**	**55**	142
04:30 PM	1	7	**8**	57	4	61	3	37	40	109
04:45 PM	1	**11**	**12**	70	**11**	**81**	5	47	52	**145**
Total Volume	5	31	36	260	29	289	19	181	200	525
% App. Total	13.9	86.1		90	10		9.5	90.5		
PHF	.625	.705	.750	.915	.659	.892	.679	.887	.909	.905
Cars	5	31	36	259	29	288	19	181	200	524
% Cars	100	100	100	99.6	100	99.7	100	100	100	99.8
Trucks	0	0	0	1	0	1	0	0	0	1
% Trucks	0	0	0	0.4	0	0.3	0	0	0	0.2



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	1	6	61	7	7	46	128
04:15 PM	2	7	71	7	4	51	142
04:30 PM	1	7	57	4	3	37	109
04:45 PM	1	11	70	11	5	47	145
Total	5	31	259	29	19	181	524
05:00 PM	0	5	59	6	3	30	103
05:15 PM	4	4	68	5	7	40	128
05:30 PM	3	8	83	5	10	38	147
05:45 PM	1	1	65	7	5	44	123
Total	8	18	275	23	25	152	501
Grand Total	13	49	534	52	44	333	1025
Apprch %	21	79	91.1	8.9	11.7	88.3	
Total %	1.3	4.8	52.1	5.1	4.3	32.5	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	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	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	1	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	0	1	0	0	0	1
Apprch %	0	0	100	0	0	0	
Total %	0	0	100	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 10

Groups Printed- Bikes Peds

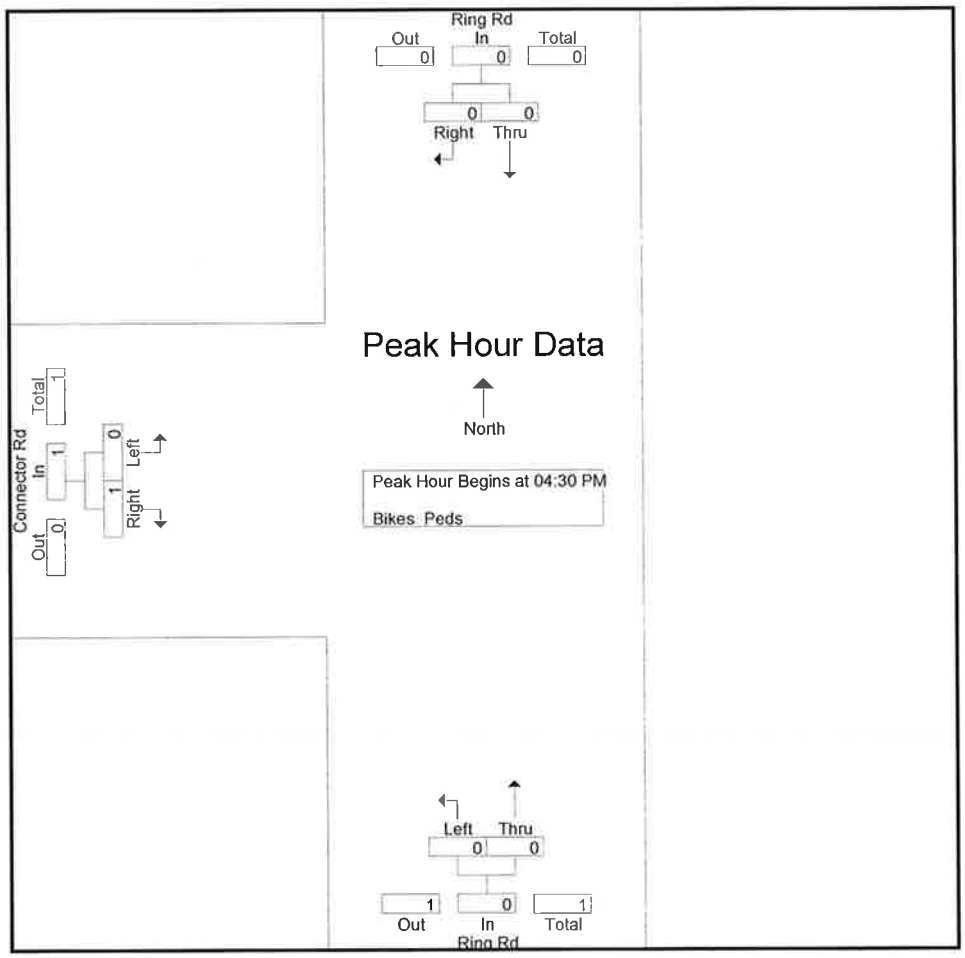
	Ring Rd From North			Ring Rd From South			Connector Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	1	0	0	2	0	0	0	3	0	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	2	0	0	0	3	0	3
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	1	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	1	1	2
Grand Total	0	0	1	0	0	3	0	1	0	4	1	5
Apprch %	0	0		0	0		0	100				
Total %	0	0		0	0		0	100		80	20	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 63940002
Site Code : 63940002
Start Date : 9/3/2014
Page No : 11

	Ring Rd From North			Ring Rd From South			Connector Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	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	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	1	1	1
% App. Total	0	0		0	0		0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

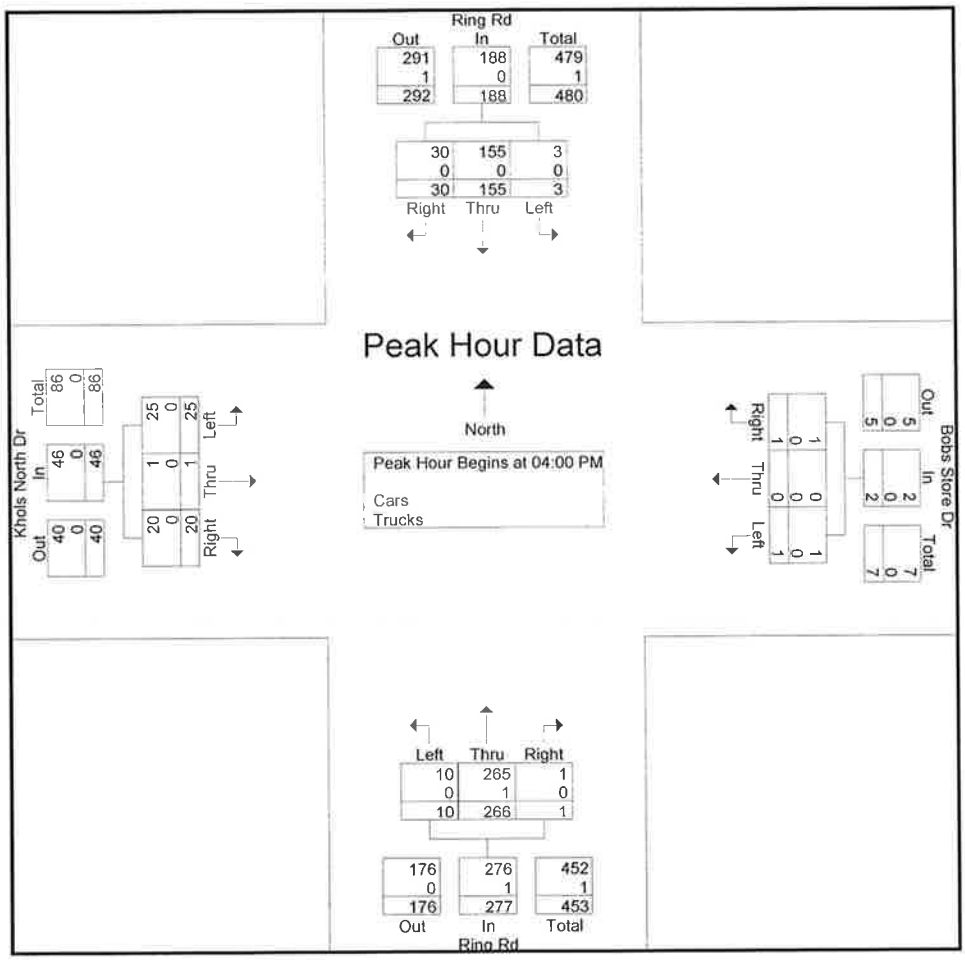
	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	40	11	0	0	0	3	67	1	5	1	4	132
04:15 PM	0	46	2	0	0	0	3	61	0	8	0	5	125
04:30 PM	2	29	11	1	0	1	2	61	0	5	0	1	113
04:45 PM	1	40	6	0	0	0	2	77	0	7	0	10	143
Total	3	155	30	1	0	1	10	266	1	25	1	20	513
05:00 PM	1	28	1	0	0	0	4	56	2	7	0	5	104
05:15 PM	1	38	6	0	0	0	1	76	1	2	0	4	129
05:30 PM	2	36	5	0	0	0	3	78	0	5	0	4	133
05:45 PM	0	33	9	0	0	0	5	59	1	8	0	2	117
Total	4	135	21	0	0	0	13	269	4	22	0	15	483
Grand Total	7	290	51	1	0	1	23	535	5	47	1	35	996
Apprch %	2	83.3	14.7	50	0	50	4.1	95	0.9	56.6	1.2	42.2	
Total %	0.7	29.1	5.1	0.1	0	0.1	2.3	53.7	0.5	4.7	0.1	3.5	
Cars	7	290	51	1	0	1	23	534	5	47	1	35	995
% Cars	100	100	100	100	0	100	100	99.8	100	100	100	100	99.9
Trucks	0	0	0	0	0	0	0	1	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0.2	0	0	0	0	0.1

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	40	**11**	**51**	0	0	0	0	**3**	67	**1**	71	5	**1**	4	10	132
04:15 PM	0	**46**	2	48	0	0	0	0	3	61	0	64	**8**	0	5	13	125
04:30 PM	**2**	29	11	42	**1**	0	**1**	2	2	61	0	63	5	0	1	6	113
04:45 PM	1	40	6	47	0	0	0	0	2	**77**	0	**79**	7	0	**10**	**17**	**143**
Total Volume	3	155	30	188	1	0	1	2	10	266	1	277	25	1	20	46	513
% App. Total	1.6	82.4	16		50	0	50		3.6	96	0.4		54.3	2.2	43.5		
PHF	.375	.842	.682	.922	.250	.000	.250	.250	.833	.864	.250	.877	.781	.250	.500	.676	.897
Cars	3	155	30	188	1	0	1	2	10	265	1	276	25	1	20	46	512
% Cars	100	100	100	100	100	0	100	100	100	99.6	100	99.6	100	100	100	100	99.8
Trucks	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0.2



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	40	11	0	0	0	3	66	1	5	1	4	131
04:15 PM	0	46	2	0	0	0	3	61	0	8	0	5	125
04:30 PM	2	29	11	1	0	1	2	61	0	5	0	1	113
04:45 PM	1	40	6	0	0	0	2	77	0	7	0	10	143
Total	3	155	30	1	0	1	10	265	1	25	1	20	512
05:00 PM	1	28	1	0	0	0	4	56	2	7	0	5	104
05:15 PM	1	38	6	0	0	0	1	76	1	2	0	4	129
05:30 PM	2	36	5	0	0	0	3	78	0	5	0	4	133
05:45 PM	0	33	9	0	0	0	5	59	1	8	0	2	117
Total	4	135	21	0	0	0	13	269	4	22	0	15	483
Grand Total	7	290	51	1	0	1	23	534	5	47	1	35	995
Apprch %	2	83.3	14.7	50	0	50	4.1	95	0.9	56.6	1.2	42.2	
Total %	0.7	29.1	5.1	0.1	0	0.1	2.3	53.7	0.5	4.7	0.1	3.5	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	1
05:00 PM	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
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	0	0	0	0	1
Apprch %	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	100	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 10

Groups Printed- Bikes Peds

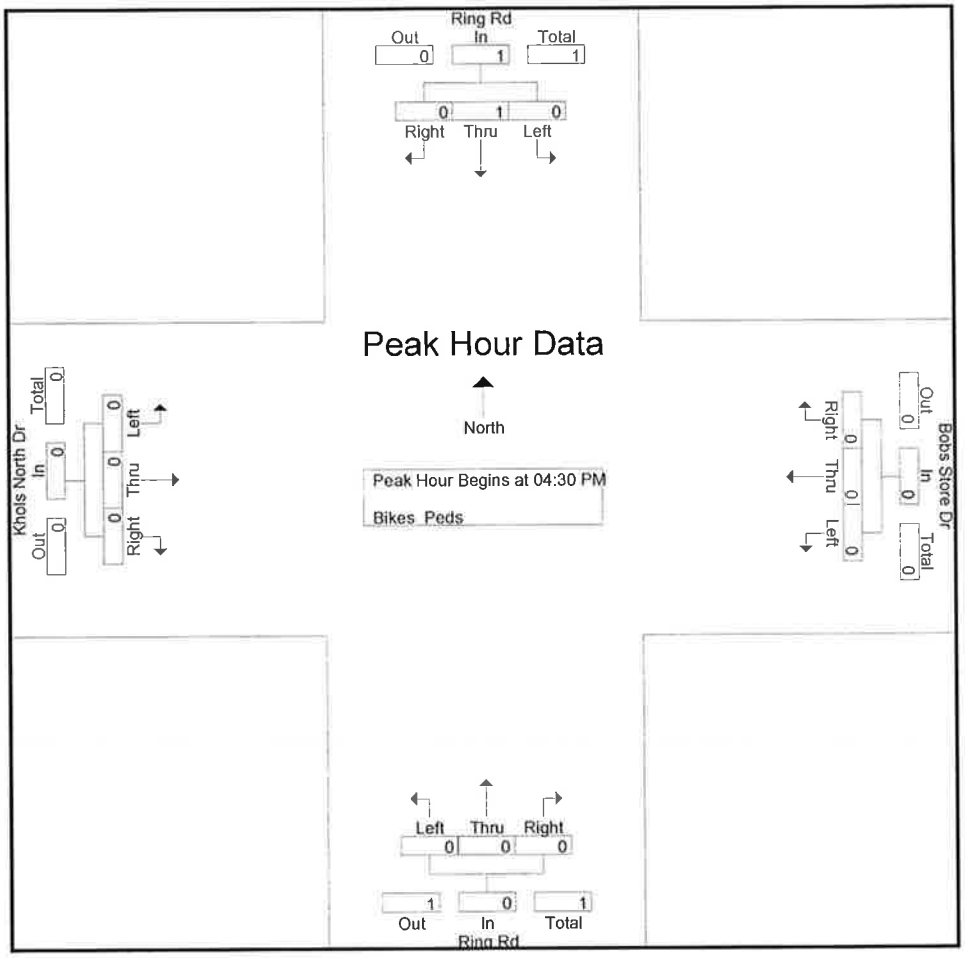
	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	2
Total	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	1	5	0	5
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2
05:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	1	5
Grand Total	0	1	0	0	0	0	0	7	0	0	0	1	0	0	0	1	9	1	10
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0				
Total %	0	100	0		0	0	0		0	0	0		0	0	0		90	10	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940003
Site Code : 63940003
Start Date : 9/3/2014
Page No : 11

	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 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	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

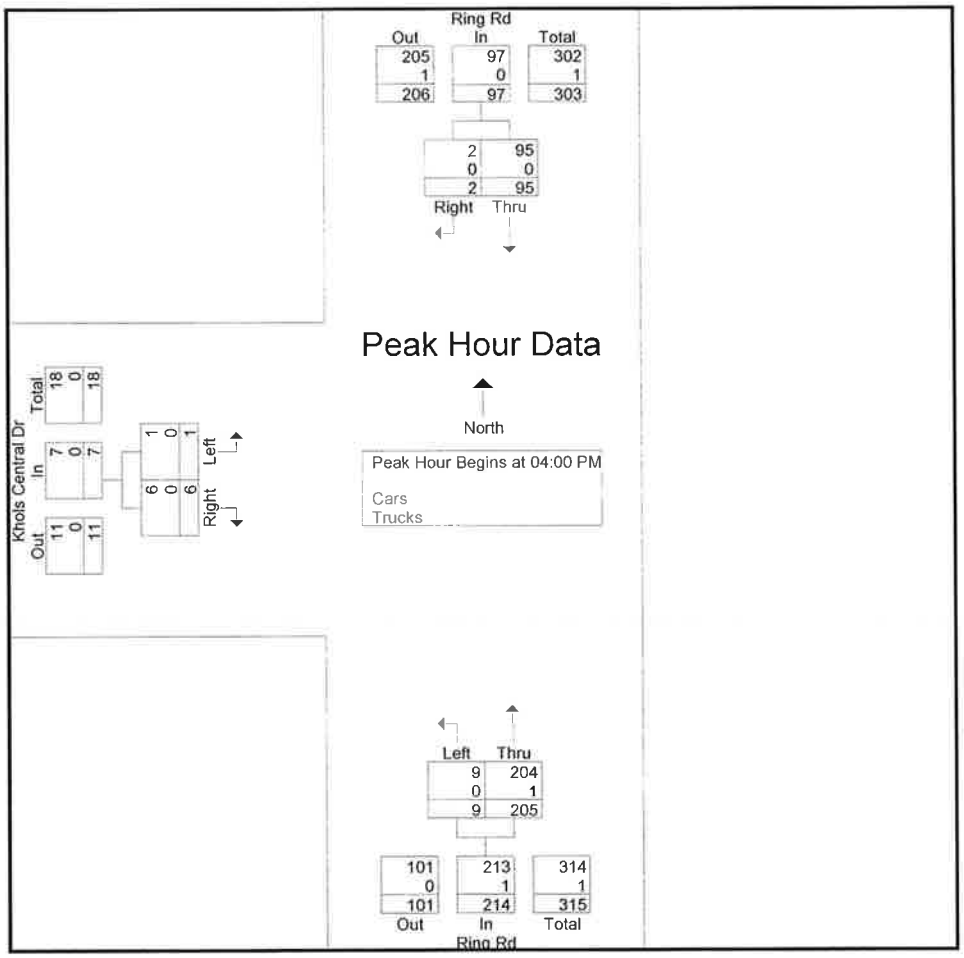
	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	27	1	4	52	1	0	85
04:15 PM	32	1	1	53	0	2	89
04:30 PM	18	0	1	47	0	0	66
04:45 PM	18	0	3	53	0	4	78
Total	95	2	9	205	1	6	318
05:00 PM	18	0	3	47	0	4	72
05:15 PM	17	0	3	45	0	0	65
05:30 PM	25	0	5	69	1	0	100
05:45 PM	22	2	2	41	0	2	69
Total	82	2	13	202	1	6	306
Grand Total	177	4	22	407	2	12	624
Apprch %	97.8	2.2	5.1	94.9	14.3	85.7	
Total %	28.4	0.6	3.5	65.2	0.3	1.9	
Cars	177	4	22	406	2	12	623
% Cars	100	100	100	99.8	100	100	99.8
Trucks	0	0	0	1	0	0	1
% Trucks	0	0	0	0.2	0	0	0.2

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North			Ring Rd From South			Khols Central Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	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 04:00 PM										
04:00 PM	27	**1**	28	**4**	52	**56**	**1**	0	1	85
04:15 PM	**32**	1	**33**	1	**53**	54	0	2	2	**89**
04:30 PM	18	0	18	1	47	48	0	0	0	66
04:45 PM	18	0	18	3	53	56	0	**4**	**4**	78
Total Volume	95	2	97	9	205	214	1	6	7	318
% App. Total	97.9	2.1		4.2	95.8		14.3	85.7		
PHF	.742	.500	.735	.563	.967	.955	.250	.375	.438	.893
Cars	95	2	97	9	204	213	1	6	7	317
% Cars	100	100	100	100	99.5	99.5	100	100	100	99.7
Trucks	0	0	0	0	1	1	0	0	0	1
% Trucks	0	0	0	0	0.5	0.5	0	0	0	0.3



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	27	1	4	51	1	0	84
04:15 PM	32	1	1	53	0	2	89
04:30 PM	18	0	1	47	0	0	66
04:45 PM	18	0	3	53	0	4	78
Total	95	2	9	204	1	6	317
05:00 PM	18	0	3	47	0	4	72
05:15 PM	17	0	3	45	0	0	65
05:30 PM	25	0	5	69	1	0	100
05:45 PM	22	2	2	41	0	2	69
Total	82	2	13	202	1	6	306
Grand Total	177	4	22	406	2	12	623
Apprch %	97.8	2.2	5.1	94.9	14.3	85.7	
Total %	28.4	0.6	3.5	65.2	0.3	1.9	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	0	0	0	1	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	0	0	1	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	0	0	1	0	0	1
Apprch %	0	0	0	100	0	0	
Total %	0	0	0	100	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 10

Groups Printed- Bikes Peds

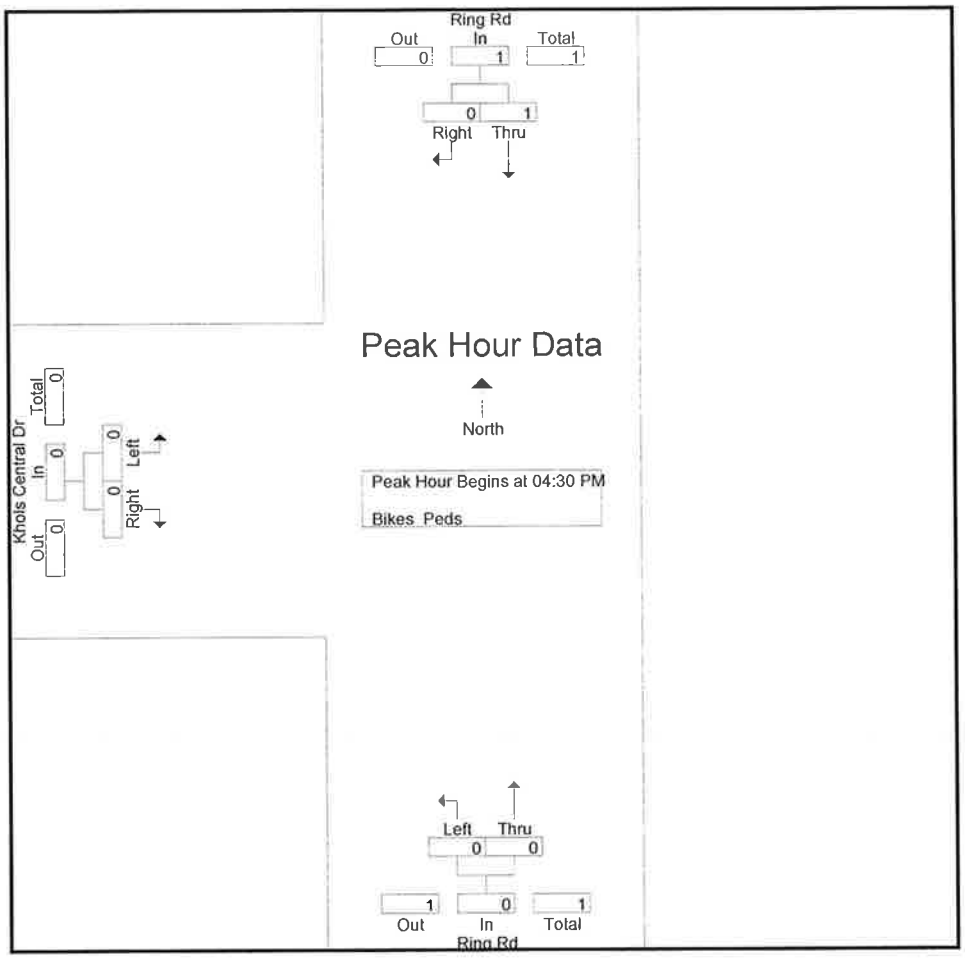
	Ring Rd From North			Ring Rd From South			Khols Central Dr From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	1	0	0	0	0	0	0	1	0	1
Total	0	0	1	0	0	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	0	1	1
Grand Total	1	0	1	0	0	0	0	0	0	1	1	2
Apprch %	100	0		0	0		0	0				
Total %	100	0		0	0		0	0		50	50	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 63940004
Site Code : 63940004
Start Date : 9/3/2014
Page No : 11

	Ring Rd From North			Ring Rd From South			Khols Central Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	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	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	1	0	0	0	0	0	0	1
Total Volume	1	0	1	0	0	0	0	0	0	1
% App. Total	100	0		0	0		0	0		
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

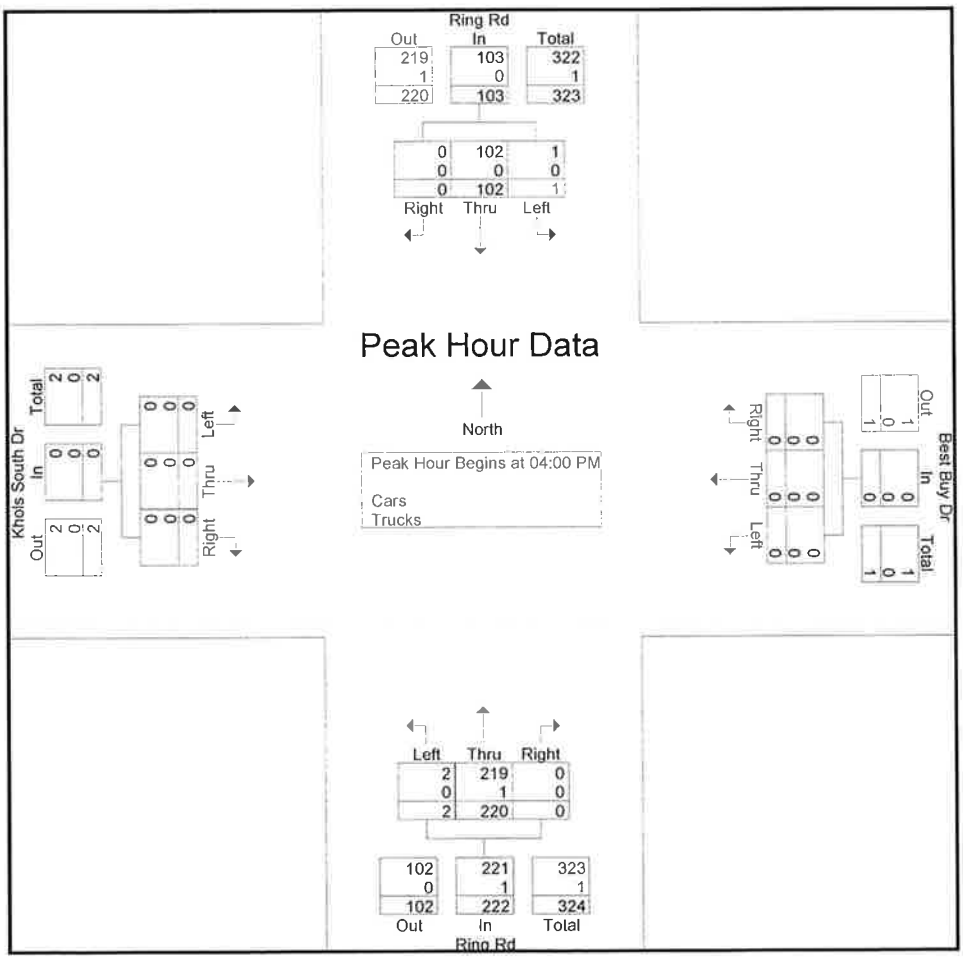
	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	27	0	0	0	0	1	55	0	0	0	0	84
04:15 PM	0	32	0	0	0	0	0	60	0	0	0	0	92
04:30 PM	0	21	0	0	0	0	0	49	0	0	0	0	70
04:45 PM	0	22	0	0	0	0	1	56	0	0	0	0	79
Total	1	102	0	0	0	0	2	220	0	0	0	0	325
05:00 PM	1	22	0	0	0	1	0	47	0	0	0	0	71
05:15 PM	0	17	0	0	0	0	1	51	0	0	0	0	69
05:30 PM	0	26	0	0	0	0	0	73	0	0	0	0	99
05:45 PM	0	26	0	1	0	0	0	45	0	0	0	0	72
Total	1	91	0	1	0	1	1	216	0	0	0	0	311
Grand Total	2	193	0	1	0	1	3	436	0	0	0	0	636
Apprch %	1	99	0	50	0	50	0.7	99.3	0	0	0	0	
Total %	0.3	30.3	0	0.2	0	0.2	0.5	68.6	0	0	0	0	
Cars	2	193	0	1	0	1	3	435	0	0	0	0	635
% Cars	100	100	0	100	0	100	100	99.8	0	0	0	0	99.8
Trucks	0	0	0	0	0	0	0	1	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0.2	0	0	0	0	0.2

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	27	0	28	0	0	0	0	**1**	55	0	56	0	0	0	0	84
04:15 PM	0	**32**	0	**32**	0	0	0	0	0	**60**	0	**60**	0	0	0	0	**92**
04:30 PM	0	21	0	21	0	0	0	0	0	49	0	49	0	0	0	0	70
04:45 PM	0	22	0	22	0	0	0	0	1	56	0	57	0	0	0	0	79
Total Volume	1	102	0	103	0	0	0	0	2	220	0	222	0	0	0	0	325
% App. Total	1	99	0		0	0	0		0.9	99.1	0		0	0	0		
PHF	.250	.797	.000	.805	.000	.000	.000	.000	.500	.917	.000	.925	.000	.000	.000	.000	.883
Cars	1	102	0	103	0	0	0	0	2	219	0	221	0	0	0	0	324
% Cars	100	100	0	100	0	0	0	0	100	99.5	0	99.5	0	0	0	0	99.7
Trucks	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0.3



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	27	0	0	0	0	1	54	0	0	0	0	83
04:15 PM	0	32	0	0	0	0	0	60	0	0	0	0	92
04:30 PM	0	21	0	0	0	0	0	49	0	0	0	0	70
04:45 PM	0	22	0	0	0	0	1	56	0	0	0	0	79
Total	1	102	0	0	0	0	2	219	0	0	0	0	324
05:00 PM	1	22	0	0	0	1	0	47	0	0	0	0	71
05:15 PM	0	17	0	0	0	0	1	51	0	0	0	0	69
05:30 PM	0	26	0	0	0	0	0	73	0	0	0	0	99
05:45 PM	0	26	0	1	0	0	0	45	0	0	0	0	72
Total	1	91	0	1	0	1	1	216	0	0	0	0	311
Grand Total	2	193	0	1	0	1	3	435	0	0	0	0	635
Apprch %	1	99	0	50	0	50	0.7	99.3	0	0	0	0	
Total %	0.3	30.4	0	0.2	0	0.2	0.5	68.5	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	0	1
05:00 PM	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
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	0	0	0	0	1
Apprch %	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	100	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 10

Groups Printed- Bikes Peds

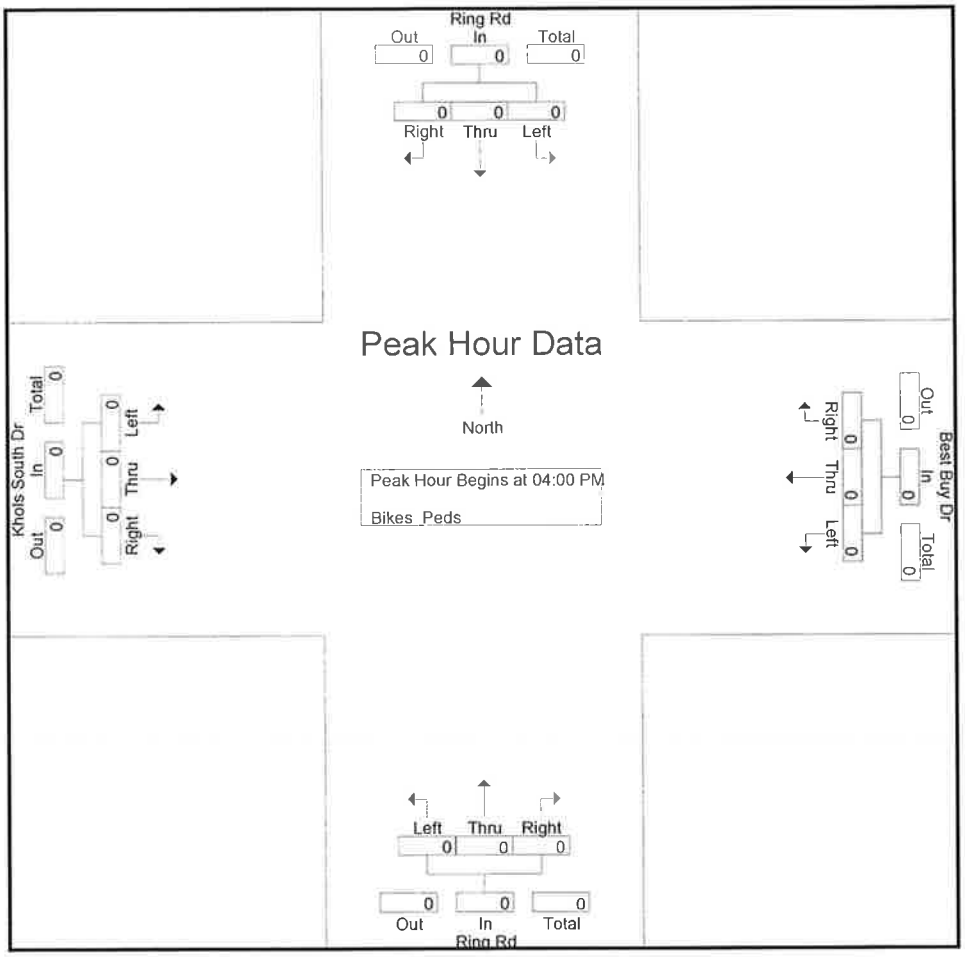
	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	5	0	5
05:00 PM	0	0	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	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	3	6	0	6
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 63940005
Site Code : 63940005
Start Date : 9/3/2014
Page No : 11

	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West				
Start Time	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Int Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars - Trucks

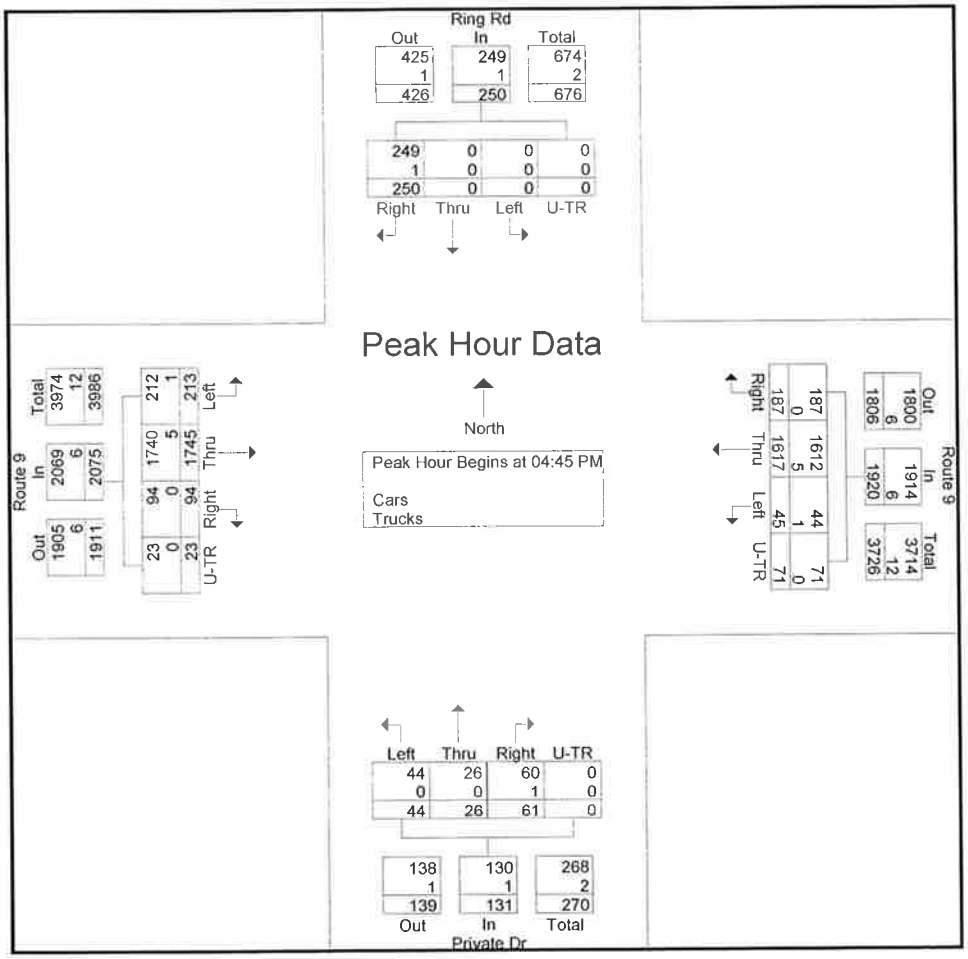
	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	66	0	13	395	37	24	11	11	20	0	41	382	21	6	1027
04:15 PM	0	0	72	0	14	443	47	20	14	7	15	0	45	398	10	4	1089
04:30 PM	0	0	58	0	12	405	55	25	17	6	12	0	45	394	24	2	1055
04:45 PM	0	0	48	0	11	375	34	22	8	8	19	0	59	431	24	6	1045
Total	0	0	244	0	50	1618	173	91	50	32	66	0	190	1605	79	18	4216
05:00 PM	0	0	62	0	14	405	42	18	13	2	15	0	48	426	22	5	1072
05:15 PM	0	0	74	0	8	441	50	9	17	7	12	0	50	472	24	4	1168
05:30 PM	0	0	66	0	12	396	61	22	6	9	15	0	56	416	24	8	1091
05:45 PM	0	0	53	0	17	396	38	16	11	7	14	0	50	347	14	10	973
Total	0	0	255	0	51	1638	191	65	47	25	56	0	204	1661	84	27	4304
Grand Total	0	0	499	0	101	3256	364	156	97	57	122	0	394	3266	163	45	8520
Apprch %	0	0	100	0	2.6	84	9.4	4	35.1	20.7	44.2	0	10.2	84.4	4.2	1.2	
Total %	0	0	5.9	0	1.2	38.2	4.3	1.8	1.1	0.7	1.4	0	4.6	38.3	1.9	0.5	
Cars	0	0	498	0	100	3243	364	156	97	57	121	0	393	3251	163	45	8488
% Cars	0	0	99.8	0	99	99.6	100	100	100	100	99.2	0	99.7	99.5	100	100	99.6
Trucks	0	0	1	0	1	13	0	0	0	0	1	0	1	15	0	0	32
% Trucks	0	0	0.2	0	1	0.4	0	0	0	0	0.8	0	0.3	0.5	0	0	0.4

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North					Route 9 From East					Private Dr From South					Route 9 From West					
Start Time	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	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	0	0	48	0	48	11	375	34	**22**	442	8	8	**19**	0	35	**59**	431	**24**	6	520	1045
05:00 PM	0	0	62	0	62	**14**	405	42	18	479	13	2	15	0	30	48	426	22	5	501	1072
05:15 PM	0	0	**74**	0	**74**	8	**441**	50	9	**508**	**17**	7	12	0	**36**	50	**472**	24	4	**550**	**1168**
05:30 PM	0	0	66	0	66	12	396	**61**	22	491	6	**9**	15	0	30	56	416	24	**8**	504	1091
Total Volume	0	0	250	0	250	45	1617	187	71	1920	44	26	61	0	131	213	1745	94	23	2075	4376
% App. Total	0	0	100	0		2.3	84.2	9.7	3.7		33.6	19.8	46.6	0		10.3	84.1	4.5	1.1		
PHF	.000	.000	.845	.000	.845	.804	.917	.766	.807	.945	.647	.722	.803	.000	.910	.903	.924	.979	.719	.943	.937
Cars	0	0	249	0	249	44	1612	187	71	1914	44	26	60	0	130	212	1740	94	23	2069	4362
% Cars	0	0	99.6	0	99.6	97.8	99.7	100	100	99.7	100	100	98.4	0	99.2	99.5	99.7	100	100	99.7	99.7
Trucks	0	0	1	0	1	1	5	0	0	6	0	0	1	0	1	1	5	0	0	6	14
% Trucks	0	0	0.4	0	0.4	2.2	0.3	0	0	0.3	0	0	1.6	0	0.8	0.5	0.3	0	0	0.3	0.3



Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 1

Groups Printed- Cars

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	66	0	13	390	37	24	11	11	20	0	41	379	21	6	1019
04:15 PM	0	0	72	0	14	440	47	20	14	7	15	0	45	394	10	4	1082
04:30 PM	0	0	58	0	12	405	55	25	17	6	12	0	45	392	24	2	1053
04:45 PM	0	0	47	0	10	374	34	22	8	8	18	0	58	428	24	6	1037
Total	0	0	243	0	49	1609	173	91	50	32	65	0	189	1593	79	18	4191
05:00 PM	0	0	62	0	14	405	42	18	13	2	15	0	48	425	22	5	1071
05:15 PM	0	0	74	0	8	439	50	9	17	7	12	0	50	471	24	4	1165
05:30 PM	0	0	66	0	12	394	61	22	6	9	15	0	56	416	24	8	1089
05:45 PM	0	0	53	0	17	396	38	16	11	7	14	0	50	346	14	10	972
Total	0	0	255	0	51	1634	191	65	47	25	56	0	204	1658	84	27	4297
Grand Total	0	0	498	0	100	3243	364	156	97	57	121	0	393	3251	163	45	8488
Apprch %	0	0	100	0	2.6	84	9.4	4	35.3	20.7	44	0	10.2	84.4	4.2	1.2	
Total %	0	0	5.9	0	1.2	38.2	4.3	1.8	1.1	0.7	1.4	0	4.6	38.3	1.9	0.5	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 1

Groups Printed- Trucks

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	8
04:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	7
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	0	0	1	0	1	1	0	0	0	0	1	0	1	3	0	0	8
Total	0	0	1	0	1	9	0	0	0	0	1	0	1	12	0	0	25
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
05:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	7
Grand Total	0	0	1	0	1	13	0	0	0	0	1	0	1	15	0	0	32
Apprch %	0	0	100	0	7.1	92.9	0	0	0	0	100	0	6.2	93.8	0	0	
Total %	0	0	3.1	0	3.1	40.6	0	0	0	0	3.1	0	3.1	46.9	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 1

Groups Printed- Bikes Peds

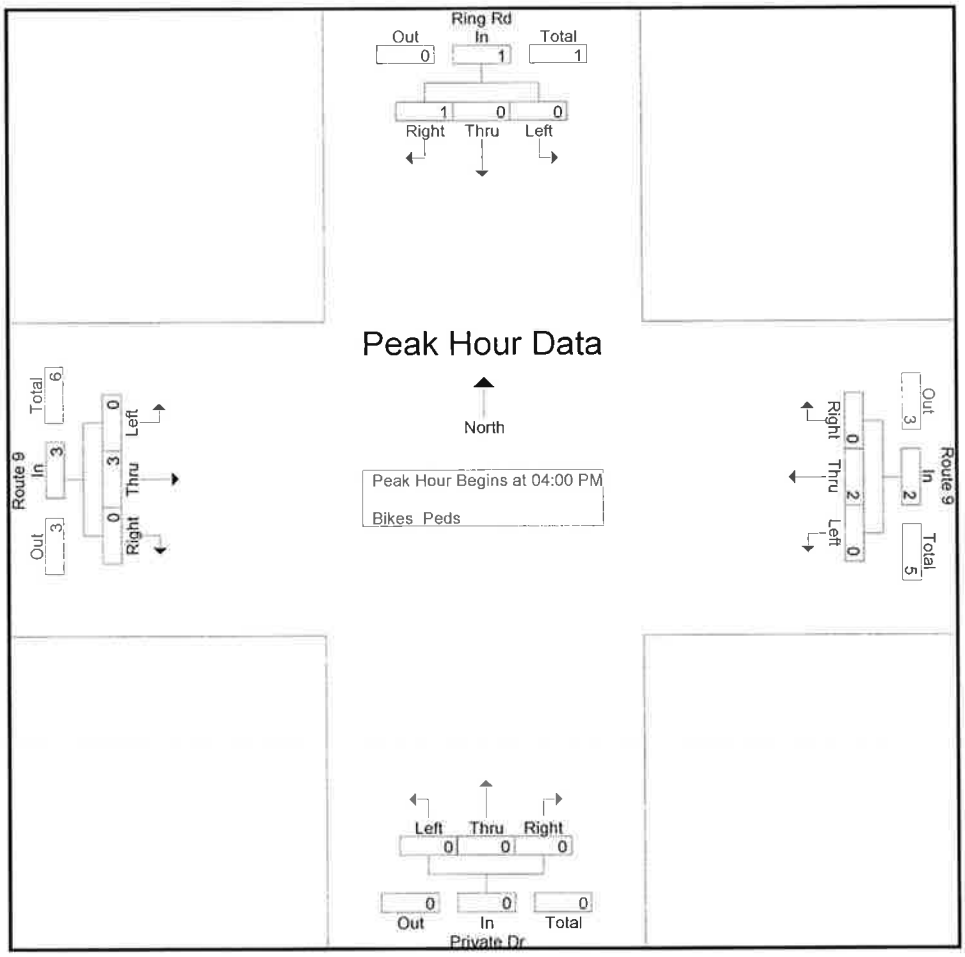
	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	3	0	1	0	0	3	2	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
04:45 PM	0	0	1	4	0	1	0	0	0	0	0	1	0	1	0	0	5	3	8
Total	0	0	1	5	0	2	0	0	0	0	0	4	0	3	0	0	9	6	15
05:00 PM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
Grand Total	0	0	1	14	0	2	0	0	0	0	0	4	0	3	0	0	18	6	24
Apprch %	0	0	100		0	100	0		0	0	0		0	100	0				
Total %	0	0	16.7		0	33.3	0		0	0	0		0	50	0		75	25	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 63940006
Site Code : 63940006
Start Date : 9/3/2014
Page No : 2

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	3
Total Volume	0	0	1	1	0	2	0	2	0	0	0	0	0	3	0	3	6
% App. Total	0	0	100		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.750	.000	.750	.500



Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

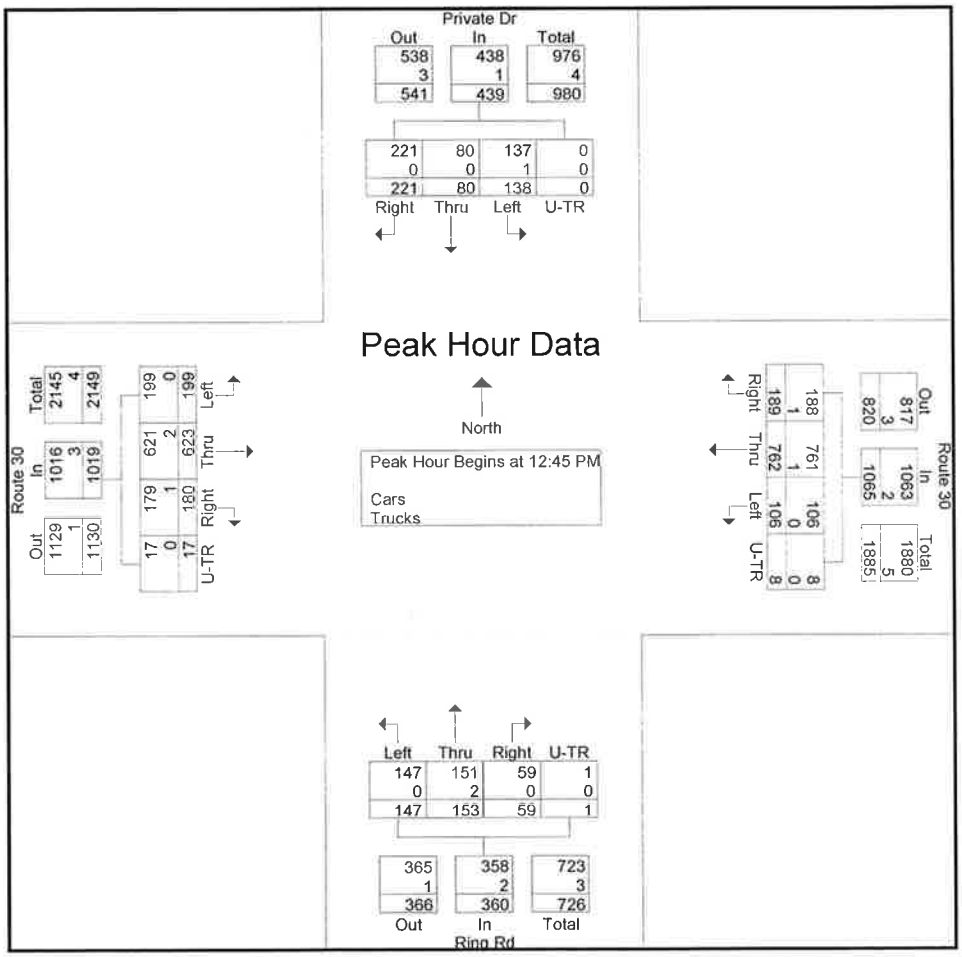
	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	31	19	48	0	23	151	45	0	15	36	6	0	50	148	28	3	603
11:15 AM	28	20	51	0	22	163	48	2	24	45	14	0	56	147	32	1	653
11:30 AM	41	19	64	0	30	181	47	1	31	29	11	0	54	170	29	1	708
11:45 AM	30	17	54	0	34	190	39	2	30	44	9	0	52	158	36	0	695
Total	130	75	217	0	109	685	179	5	100	154	40	0	212	623	125	5	2659
12:00 PM	29	28	63	0	17	217	39	1	35	47	14	0	41	154	26	3	714
12:15 PM	30	24	61	0	18	222	37	1	31	43	5	0	47	173	44	2	738
12:30 PM	35	20	42	0	23	176	48	2	39	39	13	0	48	163	41	1	690
12:45 PM	34	13	53	0	27	217	44	1	43	40	11	1	41	153	53	3	734
Total	128	85	219	0	85	832	168	5	148	169	43	1	177	643	164	9	2876
01:00 PM	35	23	56	0	25	170	42	1	28	38	18	0	48	157	50	4	695
01:15 PM	33	16	61	0	25	187	44	0	33	36	12	0	56	160	37	6	706
01:30 PM	36	28	51	0	29	188	59	6	43	39	18	0	54	153	40	4	748
01:45 PM	44	24	42	0	21	166	41	2	36	45	18	0	59	154	47	3	702
Total	148	91	210	0	100	711	186	9	140	158	66	0	217	624	174	17	2851
Grand Total	406	251	646	0	294	2228	533	19	388	481	149	1	606	1890	463	31	8386
Apprch %	31.2	19.3	49.6	0	9.6	72.5	17.3	0.6	38.1	47.2	14.6	0.1	20.3	63.2	15.5	1	
Total %	4.8	3	7.7	0	3.5	26.6	6.4	0.2	4.6	5.7	1.8	0	7.2	22.5	5.5	0.4	
Cars	404	251	645	0	294	2217	532	19	388	479	145	1	606	1884	461	31	8357
% Cars	99.5	100	99.8	0	100	99.5	99.8	100	100	99.6	97.3	100	100	99.7	99.6	100	99.7
Trucks	2	0	1	0	0	11	1	0	0	2	4	0	0	6	2	0	29
% Trucks	0.5	0	0.2	0	0	0.5	0.2	0	0	0.4	2.7	0	0	0.3	0.4	0	0.3

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 2

	Private Dr From North					Route 30 From East					Ring Rd From South					Route 30 From West					
Start Time	Left	Thru	Right	U-TR	App Total	Left	Thru	Right	U-TR	App Total	Left	Thru	Right	U-TR	App Total	Left	Thru	Right	U-TR	App Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:45 PM																					
12:45 PM	34	13	53	0	100	27	**217**	44	1	**289**	**43**	**40**	11	**1**	95	41	153	**53**	3	250	734
01:00 PM	35	23	56	0	114	25	170	42	1	238	28	38	**18**	0	84	48	157	50	4	**259**	695
01:15 PM	33	16	**61**	0	110	25	187	44	0	256	33	36	12	0	81	**56**	**160**	37	**6**	259	706
01:30 PM	**36**	**28**	51	0	**115**	**29**	188	**59**	**6**	282	43	39	18	0	**100**	54	153	40	4	251	**748**
Total Volume	138	80	221	0	439	106	762	189	8	1065	147	153	59	1	360	199	623	180	17	1019	2883
% App. Total	31.4	18.2	50.3	0		10	71.5	17.7	0.8		40.8	42.5	16.4	0.3		19.5	61.1	17.7	1.7		
PHF	.958	.714	.906	.000	.954	.914	.878	.801	.333	.921	.855	.956	.819	.250	.900	.888	.973	.849	.708	.984	.964
Cars	137	80	221	0	438	106	761	188	8	1063	147	151	59	1	358	199	621	179	17	1016	2875
% Cars	99.3	100	100	0	99.8	100	99.9	99.5	100	99.8	100	98.7	100	100	99.4	100	99.7	99.4	100	99.7	99.7
Trucks	1	0	0	0	1	0	1	1	0	2	0	2	0	0	2	0	2	1	0	3	8
% Trucks	0.7	0	0	0	0.2	0	0.1	0.5	0	0.2	0	1.3	0	0	0.6	0	0.3	0.6	0	0.3	0.3



Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	31	19	48	0	23	150	45	0	15	36	6	0	50	148	28	3	602
11:15 AM	28	20	51	0	22	161	48	2	24	45	13	0	56	147	32	1	650
11:30 AM	41	19	63	0	30	180	47	1	31	29	10	0	54	169	29	1	704
11:45 AM	30	17	54	0	34	190	39	2	30	44	9	0	52	157	36	0	694
Total	130	75	216	0	109	681	179	5	100	154	38	0	212	621	125	5	2650
12:00 PM	29	28	63	0	17	216	39	1	35	47	13	0	41	153	25	3	710
12:15 PM	30	24	61	0	18	221	37	1	31	43	5	0	47	173	44	2	737
12:30 PM	35	20	42	0	23	175	48	2	39	39	13	0	48	162	41	1	688
12:45 PM	34	13	53	0	27	217	44	1	43	40	11	1	41	153	53	3	734
Total	128	85	219	0	85	829	168	5	148	169	42	1	177	641	163	9	2869
01:00 PM	35	23	56	0	25	169	42	1	28	37	18	0	48	156	50	4	692
01:15 PM	32	16	61	0	25	187	44	0	33	36	12	0	56	159	36	6	703
01:30 PM	36	28	51	0	29	188	58	6	43	38	18	0	54	153	40	4	746
01:45 PM	43	24	42	0	21	163	41	2	36	45	17	0	59	154	47	3	697
Total	146	91	210	0	100	707	185	9	140	156	65	0	217	622	173	17	2838
Grand Total	404	251	645	0	294	2217	532	19	388	479	145	1	606	1884	461	31	8357
Apprch %	31.1	19.3	49.6	0	9.6	72.4	17.4	0.6	38.3	47.3	14.3	0.1	20.3	63.2	15.5	1	
Total %	4.8	3	7.7	0	3.5	26.5	6.4	0.2	4.6	5.7	1.7	0	7.3	22.5	5.5	0.4	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 1

Groups Printed- Trucks

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	3
11:30 AM	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	4
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	1	0	0	4	0	0	0	0	2	0	0	2	0	0	9
12:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0	4
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	0	0	0	0	1	0	0	2	1	0	7
01:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
01:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
01:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
01:45 PM	1	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	5
Total	2	0	0	0	0	4	1	0	0	2	1	0	0	2	1	0	13
Grand Total	2	0	1	0	0	11	1	0	0	2	4	0	0	6	2	0	29
Apprch %	66.7	0	33.3	0	0	91.7	8.3	0	0	33.3	66.7	0	0	75	25	0	
Total %	6.9	0	3.4	0	0	37.9	3.4	0	0	6.9	13.8	0	0	20.7	6.9	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 1

Groups Printed- Bikes Peds

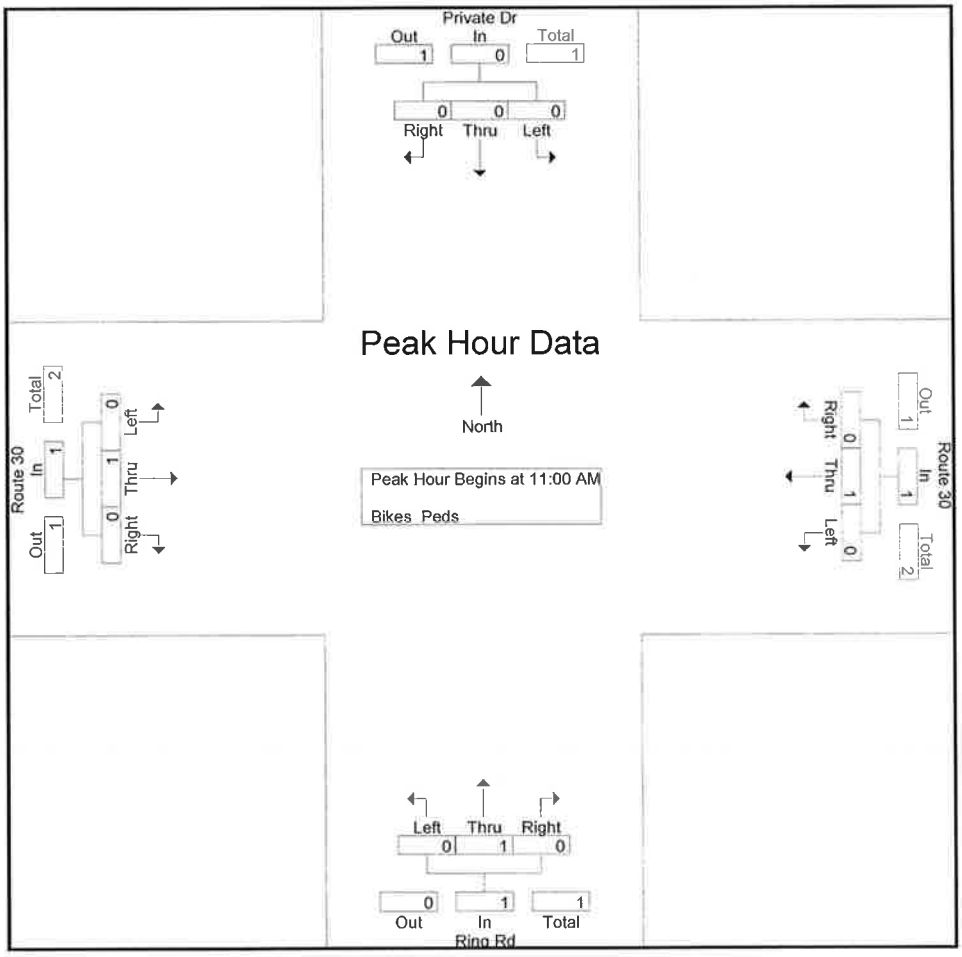
	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
11:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
11:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	3	0	1	0	0	0	1	0	0	0	1	0	0	3	3	6
12:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	2	1	3
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
12:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	2
Total	0	0	0	0	0	0	0	3	0	1	0	0	0	2	0	0	3	3	6
01:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
01:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	2	3
Total	0	1	0	2	0	1	0	0	0	0	0	0	0	1	0	1	3	3	6
Grand Total	0	1	0	5	0	2	0	3	0	2	0	0	0	4	0	1	9	9	18
Apprch %	0	100	0		0	100	0		0	100	0		0	100	0				
Total %	0	11.1	0		0	22.2	0		0	22.2	0		0	44.4	0		50	50	

Accurate Counts
978-664-2565

N/S Street : Ring Road Private Drive
E/W Street : Route 30
City/State : Framingham, MA
Weather : Clear

File Name : 639400S1
Site Code : 63940001
Start Date : 9/6/2014
Page No : 2

	Private Dr From North				Route 30 From East				Ring Rd From South				Route 30 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	1	3
% App. Total	0	0	0		0	100	0		0	100	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.000	.250	.375



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

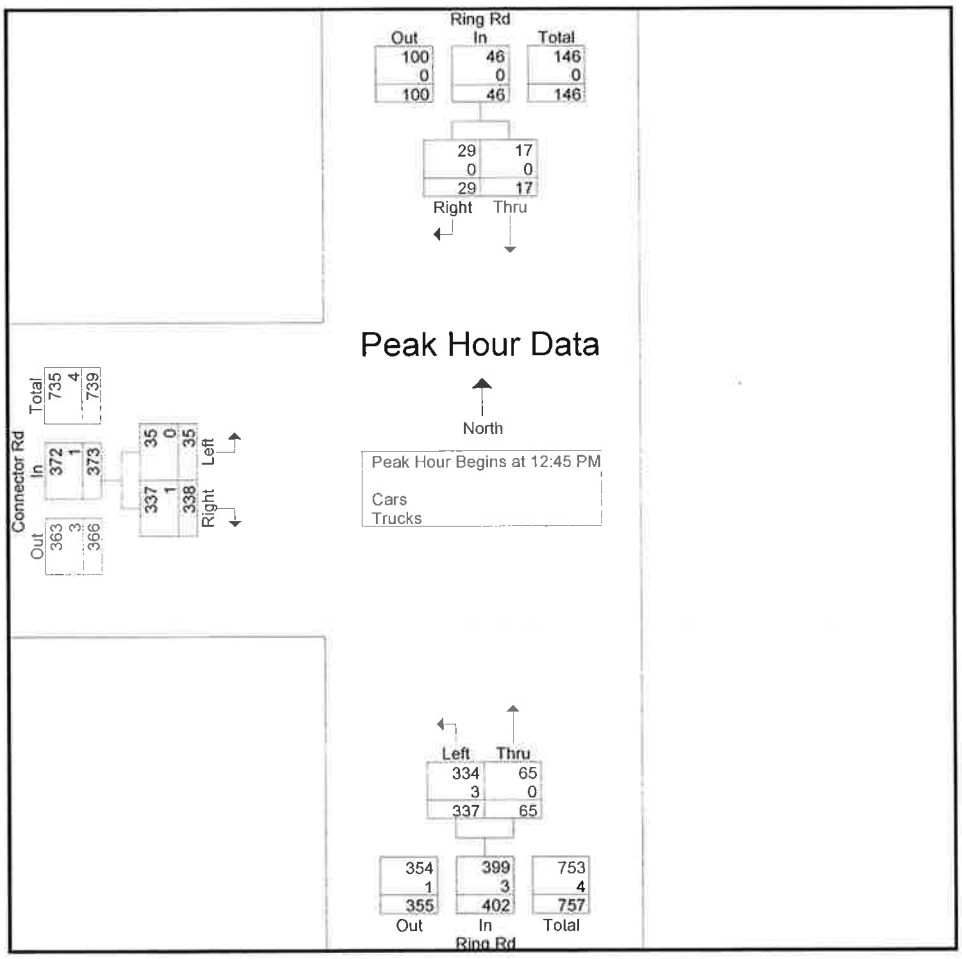
	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	2	3	56	12	11	58	142
11:15 AM	7	6	77	14	10	65	179
11:30 AM	4	4	65	13	9	65	160
11:45 AM	0	6	81	12	14	74	187
Total	13	19	279	51	44	262	668
12:00 PM	7	8	92	14	12	59	192
12:15 PM	2	4	81	16	9	83	195
12:30 PM	3	6	78	9	11	66	173
12:45 PM	6	12	82	12	13	85	210
Total	18	30	333	51	45	293	770
01:00 PM	2	7	73	16	8	93	199
01:15 PM	3	3	82	17	6	72	183
01:30 PM	6	7	100	20	8	88	229
01:45 PM	5	11	81	17	11	75	200
Total	16	28	336	70	33	328	811
Grand Total	47	77	948	172	122	883	2249
Apprch %	37.9	62.1	84.6	15.4	12.1	87.9	
Total %	2.1	3.4	42.2	7.6	5.4	39.3	
Cars	46	76	942	170	122	881	2237
% Cars	97.9	98.7	99.4	98.8	100	99.8	99.5
Trucks	1	1	6	2	0	2	12
% Trucks	2.1	1.3	0.6	1.2	0	0.2	0.5

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 2

	Ring Rd From North			Ring Rd From South			Connector Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:45 PM										
12:45 PM	**6**	**12**	**18**	82	12	94	**13**	85	98	210
01:00 PM	2	7	9	73	16	89	8	**93**	**101**	199
01:15 PM	3	3	6	82	17	99	6	72	78	183
01:30 PM	6	7	13	**100**	**20**	**120**	8	88	96	**229**
Total Volume	17	29	46	337	65	402	35	338	373	821
% App. Total	37	63		83.8	16.2		9.4	90.6		
PHF	.708	.604	.639	.843	.813	.838	.673	.909	.923	.896
Cars	17	29	46	334	65	399	35	337	372	817
% Cars	100	100	100	99.1	100	99.3	100	99.7	99.7	99.5
Trucks	0	0	0	3	0	3	0	1	1	4
% Trucks	0	0	0	0.9	0	0.7	0	0.3	0.3	0.5



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	1	3	55	11	11	58	139
11:15 AM	7	6	77	14	10	65	179
11:30 AM	4	4	64	13	9	65	159
11:45 AM	0	6	81	11	14	74	186
Total	12	19	277	49	44	262	663
12:00 PM	7	8	91	14	12	58	190
12:15 PM	2	4	81	16	9	83	195
12:30 PM	3	6	78	9	11	66	173
12:45 PM	6	12	82	12	13	85	210
Total	18	30	332	51	45	292	768
01:00 PM	2	7	72	16	8	93	198
01:15 PM	3	3	82	17	6	71	182
01:30 PM	6	7	98	20	8	88	227
01:45 PM	5	10	81	17	11	75	199
Total	16	27	333	70	33	327	806
Grand Total	46	76	942	170	122	881	2237
Apprch %	37.7	62.3	84.7	15.3	12.2	87.8	
Total %	2.1	3.4	42.1	7.6	5.5	39.4	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North		Ring Rd From South		Connector Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	1	0	1	1	0	0	3
11:15 AM	0	0	0	0	0	0	0
11:30 AM	0	0	1	0	0	0	1
11:45 AM	0	0	0	1	0	0	1
Total	1	0	2	2	0	0	5
12:00 PM	0	0	1	0	0	1	2
12:15 PM	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0
Total	0	0	1	0	0	1	2
01:00 PM	0	0	1	0	0	0	1
01:15 PM	0	0	0	0	0	1	1
01:30 PM	0	0	2	0	0	0	2
01:45 PM	0	1	0	0	0	0	1
Total	0	1	3	0	0	1	5
Grand Total	1	1	6	2	0	2	12
Apprch %	50	50	75	25	0	100	
Total %	8.3	8.3	50	16.7	0	16.7	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 10

Groups Printed- Bikes Peds

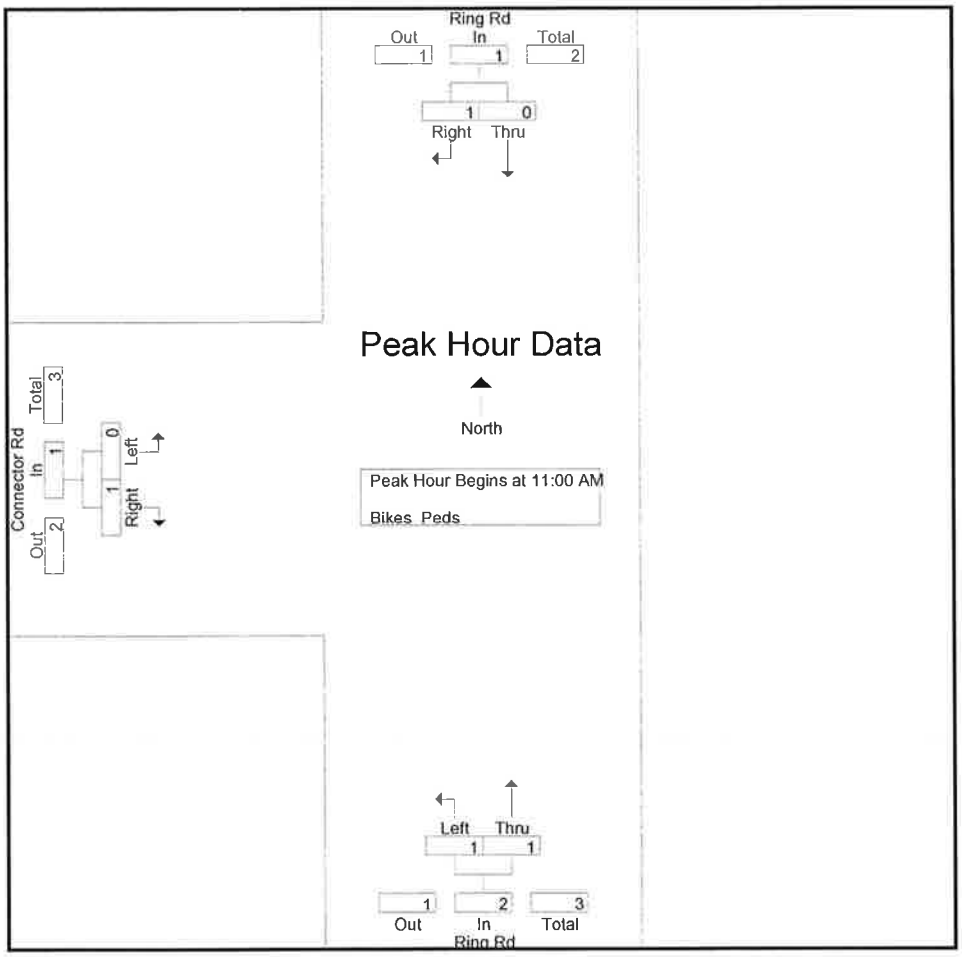
	Ring Rd From North			Ring Rd From South			Connector Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	1	0	0	0	0	0	0	1	1
11:15 AM	0	0	0	0	0	0	0	1	0	0	1	1
11:30 AM	0	1	0	0	1	0	0	0	0	0	2	2
11:45 AM	0	0	0	0	0	2	0	0	0	2	0	2
Total	0	1	0	1	1	2	0	1	0	2	4	6
12:00 PM	0	0	0	0	0	2	0	0	1	3	0	3
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	1	0	0	0	0	0	0	1	1
12:45 PM	0	0	1	0	0	0	0	0	0	1	0	1
Total	0	0	1	1	0	2	0	0	1	4	1	5
01:00 PM	0	0	0	0	0	1	0	0	0	1	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	1	0	1	0	0	0	0	0	0	1	1	2
Total	1	0	1	0	0	1	0	0	0	2	1	3
Grand Total	1	1	2	2	1	5	0	1	1	8	6	14
Apprch %	50	50		66.7	33.3		0	100				
Total %	16.7	16.7		33.3	16.7		0	16.7		57.1	42.9	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Connector Road
City/State : Framingham, MA
Weather : Clear

File Name : 639400S2
Site Code : 63940002
Start Date : 9/6/2014
Page No : 11

	Ring Rd From North			Ring Rd From South			Connector Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:00 AM										
11:00 AM	0	0	0	1	0	1	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	1	1	1
11:30 AM	0	1	1	0	1	1	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	1	1	2	0	1	1	4
% App. Total	0	100		50	50		0	100		
PHF	.000	.250	.250	.250	.250	.500	.000	.250	.250	.500



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	0	43	17	0	0	0	5	59	0	5	0	11	140
11:15 AM	1	60	9	0	0	0	5	72	0	13	0	2	162
11:30 AM	1	57	14	0	0	0	5	74	0	10	0	10	171
11:45 AM	0	58	14	0	0	1	1	87	1	8	0	16	186
Total	2	218	54	0	0	1	16	292	1	36	0	39	659
12:00 PM	2	53	14	0	0	0	7	88	0	18	1	6	189
12:15 PM	1	65	16	0	0	1	7	79	0	14	0	9	192
12:30 PM	0	55	16	1	0	0	4	80	0	14	0	10	180
12:45 PM	1	69	12	0	0	0	7	75	0	15	0	9	188
Total	4	242	58	1	0	1	25	322	0	61	1	34	749
01:00 PM	1	78	19	0	0	0	6	82	0	13	0	7	206
01:15 PM	0	63	11	0	0	2	4	84	0	21	1	9	195
01:30 PM	1	74	18	0	0	0	4	94	1	19	0	11	222
01:45 PM	1	63	15	0	0	1	7	80	0	12	0	8	187
Total	3	278	63	0	0	3	21	340	1	65	1	35	810
Grand Total	9	738	175	1	0	5	62	954	2	162	2	108	2218
Apprch %	1	80	19	16.7	0	83.3	6.1	93.7	0.2	59.6	0.7	39.7	
Total %	0.4	33.3	7.9	0	0	0.2	2.8	43	0.1	7.3	0.1	4.9	
Cars	9	735	175	0	0	5	62	946	2	162	2	108	2206
% Cars	100	99.6	100	0	0	100	100	99.2	100	100	100	100	99.5
Trucks	0	3	0	1	0	0	0	8	0	0	0	0	12
% Trucks	0	0.4	0	100	0	0	0	0.8	0	0	0	0	0.5

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
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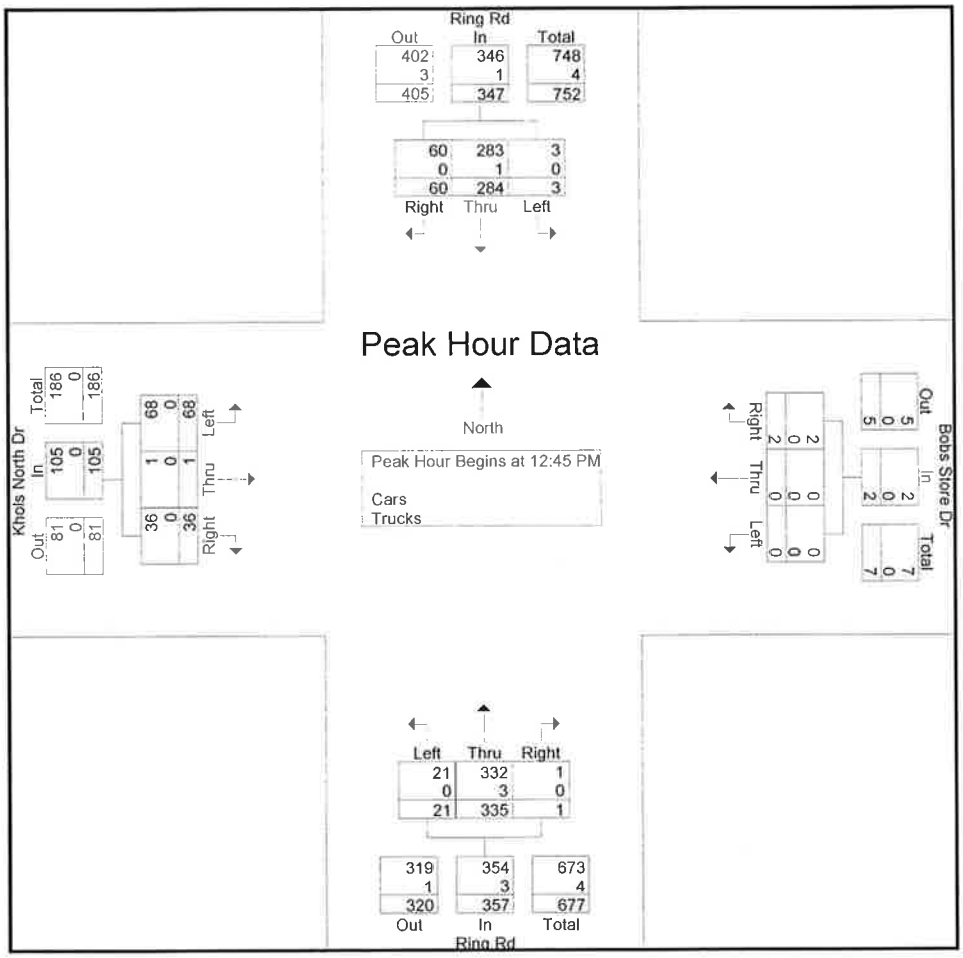
	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	**1**	69	12	82	0	0	0	0	**7**	75	0	82	15	0	9	24	188
01:00 PM	1	**78**	**19**	**98**	0	0	0	0	6	82	0	88	13	0	7	20	206
01:15 PM	0	63	11	74	0	0	**2**	**2**	4	84	0	88	**21**	**1**	9	**31**	195
01:30 PM	1	74	18	93	0	0	0	0	4	**94**	**1**	**99**	19	0	**11**	30	**222**
Total Volume	3	284	60	347	0	0	2	2	21	335	1	357	68	1	36	105	811
% App. Total	0.9	81.8	17.3		0	0	100		5.9	93.8	0.3		64.8	1	34.3		
PHF	.750	.910	.789	.885	.000	.000	.250	.250	.750	.891	.250	.902	.810	.250	.818	.847	.913
Cars	3	283	60	346	0	0	2	2	21	332	1	354	68	1	36	105	807
% Cars	100	99.6	100	99.7	0	0	100	100	100	99.1	100	99.2	100	100	100	100	99.5
Trucks	0	1	0	1	0	0	0	0	0	3	0	3	0	0	0	0	4
% Trucks	0	0.4	0	0.3	0	0	0	0	0	0.9	0	0.8	0	0	0	0	0.5



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	0	42	17	0	0	0	5	57	0	5	0	11	137
11:15 AM	1	60	9	0	0	0	5	72	0	13	0	2	162
11:30 AM	1	57	14	0	0	0	5	73	0	10	0	10	170
11:45 AM	0	58	14	0	0	1	1	86	1	8	0	16	185
Total	2	217	54	0	0	1	16	288	1	36	0	39	654
12:00 PM	2	52	14	0	0	0	7	87	0	18	1	6	187
12:15 PM	1	65	16	0	0	1	7	79	0	14	0	9	192
12:30 PM	0	55	16	0	0	0	4	80	0	14	0	10	179
12:45 PM	1	69	12	0	0	0	7	75	0	15	0	9	188
Total	4	241	58	0	0	1	25	321	0	61	1	34	746
01:00 PM	1	78	19	0	0	0	6	81	0	13	0	7	205
01:15 PM	0	62	11	0	0	2	4	84	0	21	1	9	194
01:30 PM	1	74	18	0	0	0	4	92	1	19	0	11	220
01:45 PM	1	63	15	0	0	1	7	80	0	12	0	8	187
Total	3	277	63	0	0	3	21	337	1	65	1	35	806
Grand Total	9	735	175	0	0	5	62	946	2	162	2	108	2206
Apprch %	1	80	19	0	0	100	6.1	93.7	0.2	59.6	0.7	39.7	
Total %	0.4	33.3	7.9	0	0	0.2	2.8	42.9	0.1	7.3	0.1	4.9	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North			Bobs Store Dr From East			Ring Rd From South			Khols North Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	0	4	0	0	0	0	5
12:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	1	0	0	0	0	3
01:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
01:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
01:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	3	0	0	0	0	4
Grand Total	0	3	0	1	0	0	0	8	0	0	0	0	12
Apprch %	0	100	0	100	0	0	0	100	0	0	0	0	
Total %	0	25	0	8.3	0	0	0	66.7	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
Page No : 10

Groups Printed- Bikes Peds

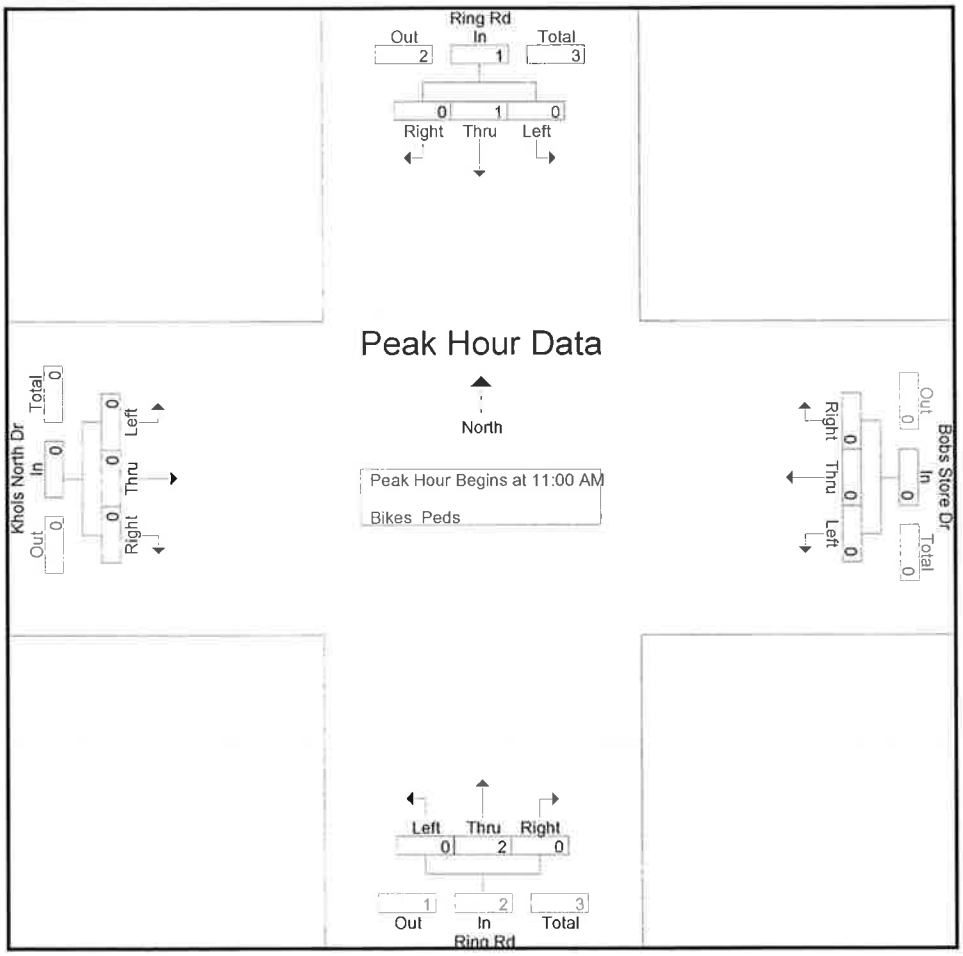
	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
11:15 AM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
11:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
Total	0	1	0	0	0	0	0	3	0	2	0	1	0	0	0	0	4	3	7
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
12:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	1	4	1	5
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	3
Grand Total	0	1	0	0	0	0	0	7	0	3	0	3	0	0	0	1	11	4	15
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	25	0		0	0	0		0	75	0		0	0	0		73.3	26.7	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Bobs Store / Khols North Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S3
Site Code : 63940003
Start Date : 9/6/2014
Page No : 11

	Ring Rd From North				Bobs Store Dr From East				Ring Rd From South				Khols North Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.750



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

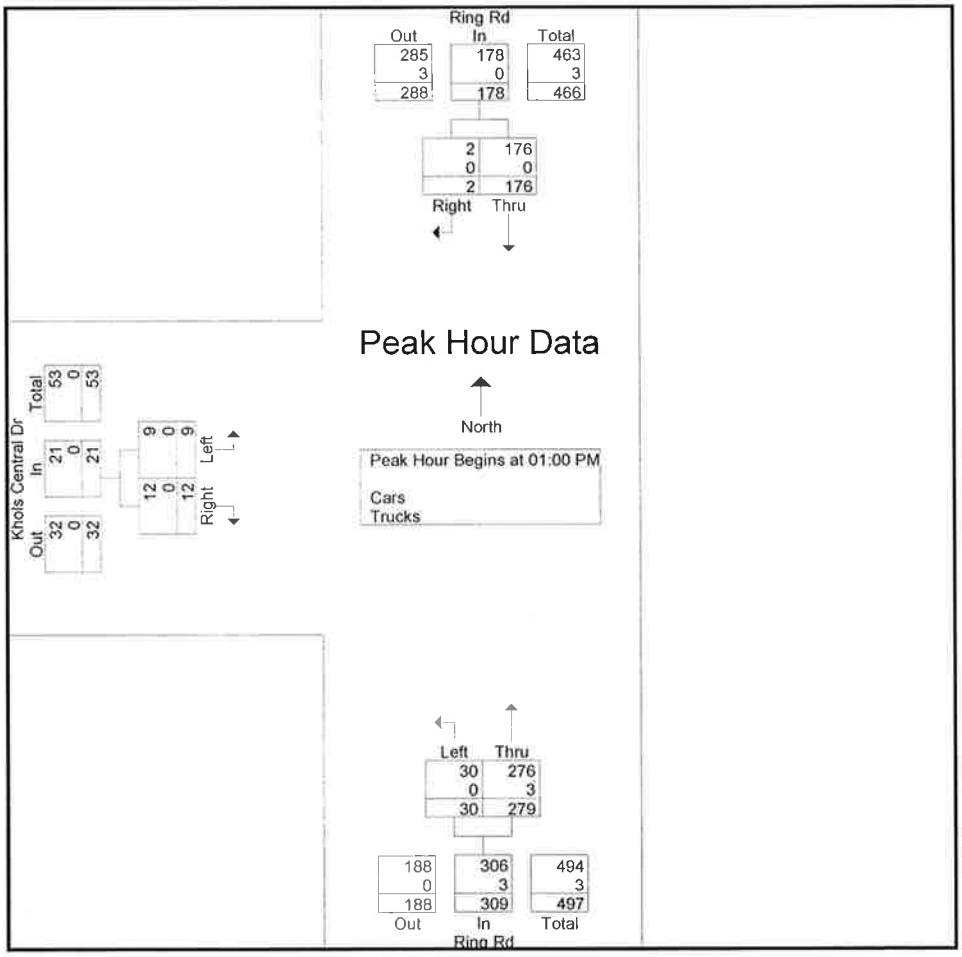
	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	28	1	8	42	2	3	84
11:15 AM	29	0	7	62	0	1	99
11:30 AM	37	0	6	59	1	1	104
11:45 AM	46	1	4	60	0	1	112
Total	140	2	25	223	3	6	399
12:00 PM	39	2	7	79	2	4	133
12:15 PM	40	0	3	58	2	1	104
12:30 PM	35	2	5	75	3	3	123
12:45 PM	37	3	5	58	0	6	109
Total	151	7	20	270	7	14	469
01:00 PM	50	1	8	63	2	7	131
01:15 PM	30	0	10	65	3	2	110
01:30 PM	48	0	3	76	2	2	131
01:45 PM	48	1	9	75	2	1	136
Total	176	2	30	279	9	12	508
Grand Total	467	11	75	772	19	32	1376
Apprch %	97.7	2.3	8.9	91.1	37.3	62.7	
Total %	33.9	0.8	5.5	56.1	1.4	2.3	
Cars	465	11	75	765	18	32	1366
% Cars	99.6	100	100	99.1	94.7	100	99.3
Trucks	2	0	0	7	1	0	10
% Trucks	0.4	0	0	0.9	5.3	0	0.7

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 2

	Ring Rd From North			Ring Rd From South			Khols Central Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:00 PM										
01:00 PM	**50**	**1**	**51**	8	63	71	2	**7**	**9**	131
01:15 PM	30	0	30	**10**	65	75	**3**	2	5	110
01:30 PM	48	0	48	3	**76**	79	2	2	4	131
01:45 PM	48	1	49	9	75	**84**	2	1	3	**136**
Total Volume	176	2	178	30	279	309	9	12	21	508
% App. Total	98.9	1.1		9.7	90.3		42.9	57.1		
PHF	.880	.500	.873	.750	.918	.920	.750	.429	.583	.934
Cars	176	2	178	30	276	306	9	12	21	505
% Cars	100	100	100	100	98.9	99.0	100	100	100	99.4
Trucks	0	0	0	0	3	3	0	0	0	3
% Trucks	0	0	0	0	1.1	1.0	0	0	0	0.6



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	27	1	8	41	1	3	81
11:15 AM	29	0	7	62	0	1	99
11:30 AM	37	0	6	58	1	1	103
11:45 AM	46	1	4	59	0	1	111
Total	139	2	25	220	2	6	394
12:00 PM	39	2	7	78	2	4	132
12:15 PM	40	0	3	58	2	1	104
12:30 PM	34	2	5	75	3	3	122
12:45 PM	37	3	5	58	0	6	109
Total	150	7	20	269	7	14	467
01:00 PM	50	1	8	62	2	7	130
01:15 PM	30	0	10	65	3	2	110
01:30 PM	48	0	3	74	2	2	129
01:45 PM	48	1	9	75	2	1	136
Total	176	2	30	276	9	12	505
Grand Total	465	11	75	765	18	32	1366
Apprch %	97.7	2.3	8.9	91.1	36	64	
Total %	34	0.8	5.5	56	1.3	2.3	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North		Ring Rd From South		Khols Central Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00 AM	1	0	0	1	1	0	3
11:15 AM	0	0	0	0	0	0	0
11:30 AM	0	0	0	1	0	0	1
11:45 AM	0	0	0	1	0	0	1
Total	1	0	0	3	1	0	5
12:00 PM	0	0	0	1	0	0	1
12:15 PM	0	0	0	0	0	0	0
12:30 PM	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	2
01:00 PM	0	0	0	1	0	0	1
01:15 PM	0	0	0	0	0	0	0
01:30 PM	0	0	0	2	0	0	2
01:45 PM	0	0	0	0	0	0	0
Total	0	0	0	3	0	0	3
Grand Total	2	0	0	7	1	0	10
Apprch %	100	0	0	100	100	0	
Total %	20	0	0	70	10	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 10

Groups Printed- Bikes Peds

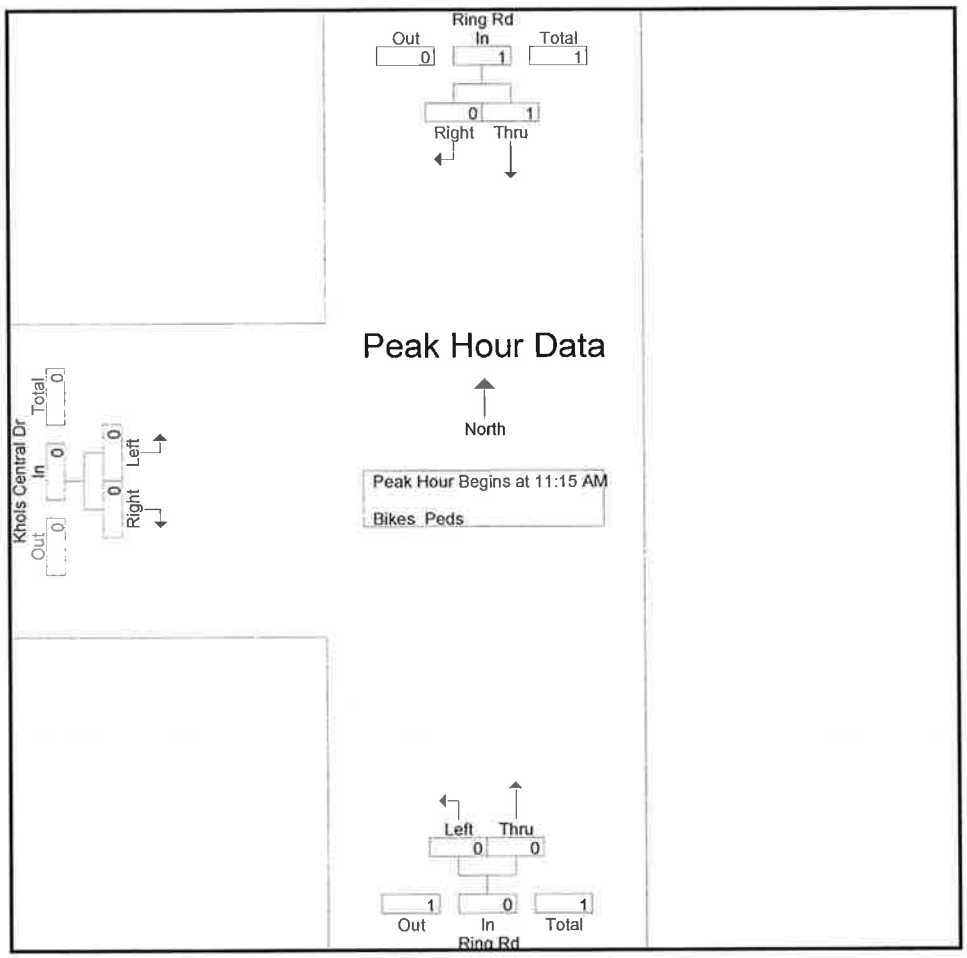
	Ring Rd From North			Ring Rd From South			Khols Central Dr From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	4	0	0	0	4	0	4
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	4	0	0	0	4	0	4
12:00 PM	1	0	0	0	0	0	0	0	1	1	1	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	1	1	1	2
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	0	4	0	0	1	5	1	6
Apprch %	100	0		0	0		0	0				
Total %	100	0		0	0		0	0		83.3	16.7	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Khols Central Drive
City/State : Framingham, MA
Weather : Clear

File Name : 639400S4
Site Code : 63940004
Start Date : 9/6/2014
Page No : 11

	Ring Rd From North			Ring Rd From South			Khols Central Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:15 AM										
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0
12:00 PM	1	0	1	0	0	0	0	0	0	1
Total Volume	1	0	1	0	0	0	0	0	0	1
% App. Total	100	0		0	0		0	0		
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

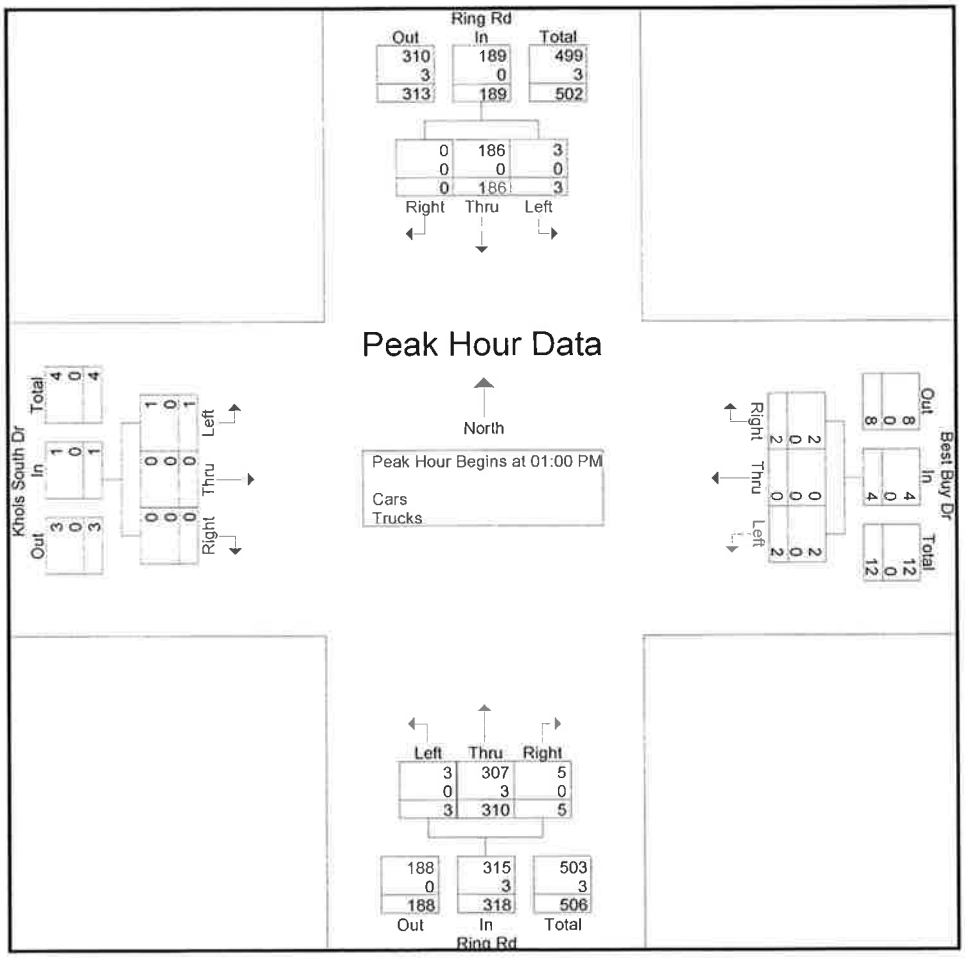
	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	2	30	0	0	0	0	1	52	1	0	0	0	86
11:15 AM	0	32	0	0	0	0	1	66	0	0	0	1	100
11:30 AM	3	33	0	1	0	0	0	65	0	0	0	0	102
11:45 AM	0	48	0	0	0	0	0	66	0	0	0	0	114
Total	5	143	0	1	0	0	2	249	1	0	0	1	402
12:00 PM	0	42	0	0	0	2	1	83	1	0	0	1	130
12:15 PM	1	45	0	0	0	0	2	66	0	0	0	0	114
12:30 PM	0	37	0	0	0	1	1	79	0	0	0	1	119
12:45 PM	0	43	0	1	0	0	1	64	0	0	0	0	109
Total	1	167	0	1	0	3	5	292	1	0	0	2	472
01:00 PM	2	56	0	0	0	0	1	72	2	1	0	0	134
01:15 PM	0	30	0	0	0	1	0	73	1	0	0	0	105
01:30 PM	0	52	0	0	0	0	1	80	2	0	0	0	135
01:45 PM	1	48	0	2	0	1	1	85	0	0	0	0	138
Total	3	186	0	2	0	2	3	310	5	1	0	0	512
Grand Total	9	496	0	4	0	5	10	851	7	1	0	3	1386
Apprch %	1.8	98.2	0	44.4	0	55.6	1.2	98	0.8	25	0	75	
Total %	0.6	35.8	0	0.3	0	0.4	0.7	61.4	0.5	0.1	0	0.2	
Cars	9	494	0	4	0	5	9	844	7	1	0	3	1376
% Cars	100	99.6	0	100	0	100	90	99.2	100	100	0	100	99.3
Trucks	0	2	0	0	0	0	1	7	0	0	0	0	10
% Trucks	0	0.4	0	0	0	0	10	0.8	0	0	0	0	0.7

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 2

	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West				
Start Time	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	2	56	0	58	0	0	0	0	1	72	2	75	1	0	0	1	134
01:15 PM	0	30	0	30	0	0	1	1	0	73	1	74	0	0	0	0	105
01:30 PM	0	52	0	52	0	0	0	0	1	80	2	83	0	0	0	0	135
01:45 PM	1	48	0	49	2	0	1	3	1	85	0	86	0	0	0	0	138
Total Volume	3	186	0	189	2	0	2	4	3	310	5	318	1	0	0	1	512
% App. Total	1.6	98.4	0		50	0	50		0.9	97.5	1.6		100	0	0		
PHF	.375	.830	.000	.815	.250	.000	.500	.333	.750	.912	.625	.924	.250	.000	.000	.250	.928
Cars	3	186	0	189	2	0	2	4	3	307	5	315	1	0	0	1	509
% Cars	100	100	0	100	100	0	100	100	100	99.0	100	99.1	100	0	0	100	99.4
Trucks	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
% Trucks	0	0	0	0	0	0	0	0	0	1.0	0	0.9	0	0	0	0	0.6



Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 4

Groups Printed- Cars

	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	2	29	0	0	0	0	0	51	1	0	0	0	83
11:15 AM	0	32	0	0	0	0	1	66	0	0	0	1	100
11:30 AM	3	33	0	1	0	0	0	64	0	0	0	0	101
11:45 AM	0	48	0	0	0	0	0	65	0	0	0	0	113
Total	5	142	0	1	0	0	1	246	1	0	0	1	397
12:00 PM	0	42	0	0	0	2	1	82	1	0	0	1	129
12:15 PM	1	45	0	0	0	0	2	66	0	0	0	0	114
12:30 PM	0	36	0	0	0	1	1	79	0	0	0	1	118
12:45 PM	0	43	0	1	0	0	1	64	0	0	0	0	109
Total	1	166	0	1	0	3	5	291	1	0	0	2	470
01:00 PM	2	56	0	0	0	0	1	71	2	1	0	0	133
01:15 PM	0	30	0	0	0	1	0	73	1	0	0	0	105
01:30 PM	0	52	0	0	0	0	1	78	2	0	0	0	133
01:45 PM	1	48	0	2	0	1	1	85	0	0	0	0	138
Total	3	186	0	2	0	2	3	307	5	1	0	0	509
Grand Total	9	494	0	4	0	5	9	844	7	1	0	3	1376
Apprch %	1.8	98.2	0	44.4	0	55.6	1	98.1	0.8	25	0	75	
Total %	0.7	35.9	0	0.3	0	0.4	0.7	61.3	0.5	0.1	0	0.2	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 7

Groups Printed- Trucks

	Ring Rd From North			Best Buy Dr From East			Ring Rd From South			Khols South Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	0	1	0	0	0	0	1	1	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	1	3	0	0	0	0	5
12:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	1	0	0	0	0	2
01:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	3	0	0	0	0	3
Grand Total	0	2	0	0	0	0	1	7	0	0	0	0	10
Apprch %	0	100	0	0	0	0	12.5	87.5	0	0	0	0	
Total %	0	20	0	0	0	0	10	70	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 10

Groups Printed- Bikes Peds

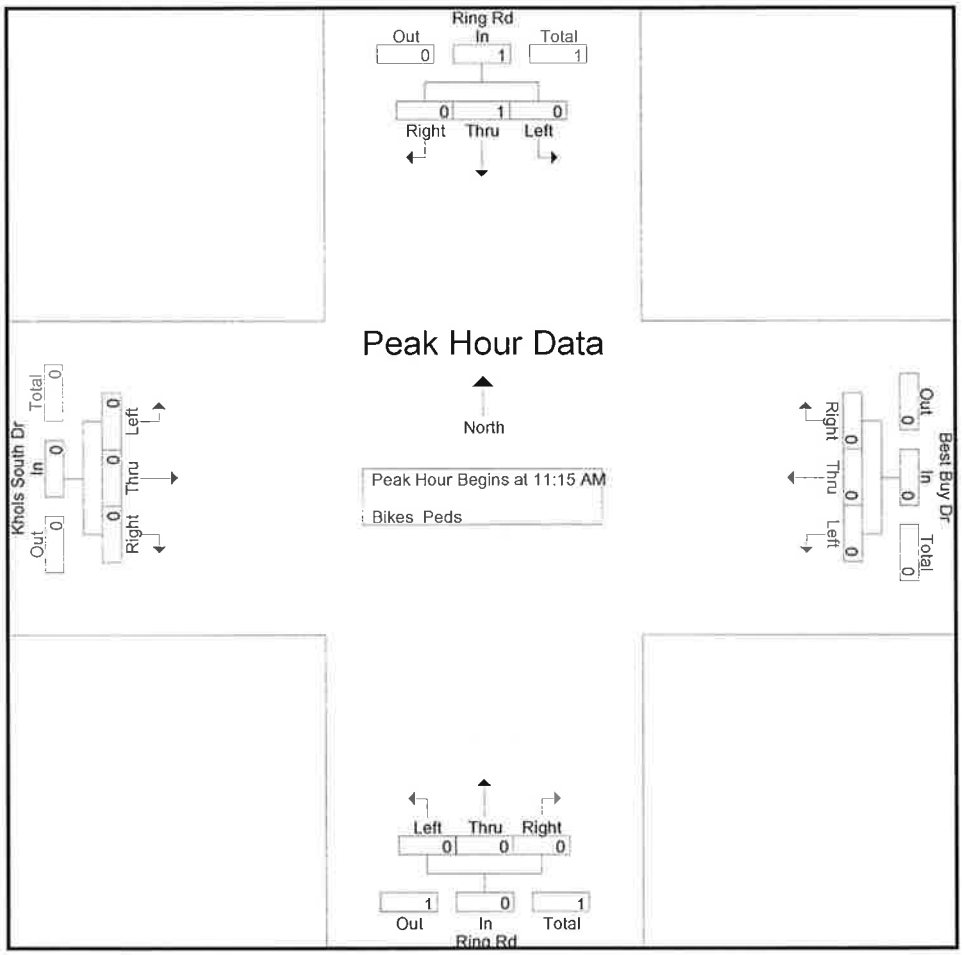
	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	4
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	4
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	1	3
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	3
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	3
Grand Total	0	1	0	1	0	0	0	4	0	0	0	4	0	0	0	0	9	1	10
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0				
Total %	0	100	0		0	0	0		0	0	0		0	0	0		90	10	

Accurate Counts
978-664-2565

N/S Street : Ring Road
E/W Street : Best Buy Dr/ Khols South Dr
City/State : Framingham, MA
Weather : Clear

File Name : 639400S5
Site Code : 63940005
Start Date : 9/6/2014
Page No : 11

	Ring Rd From North				Best Buy Dr From East				Ring Rd From South				Khols South Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:15 AM																	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	**1**	0	**1**	0	0	0	**0**	0	0	0	0	0	0	0	0	**1**
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars - Trucks

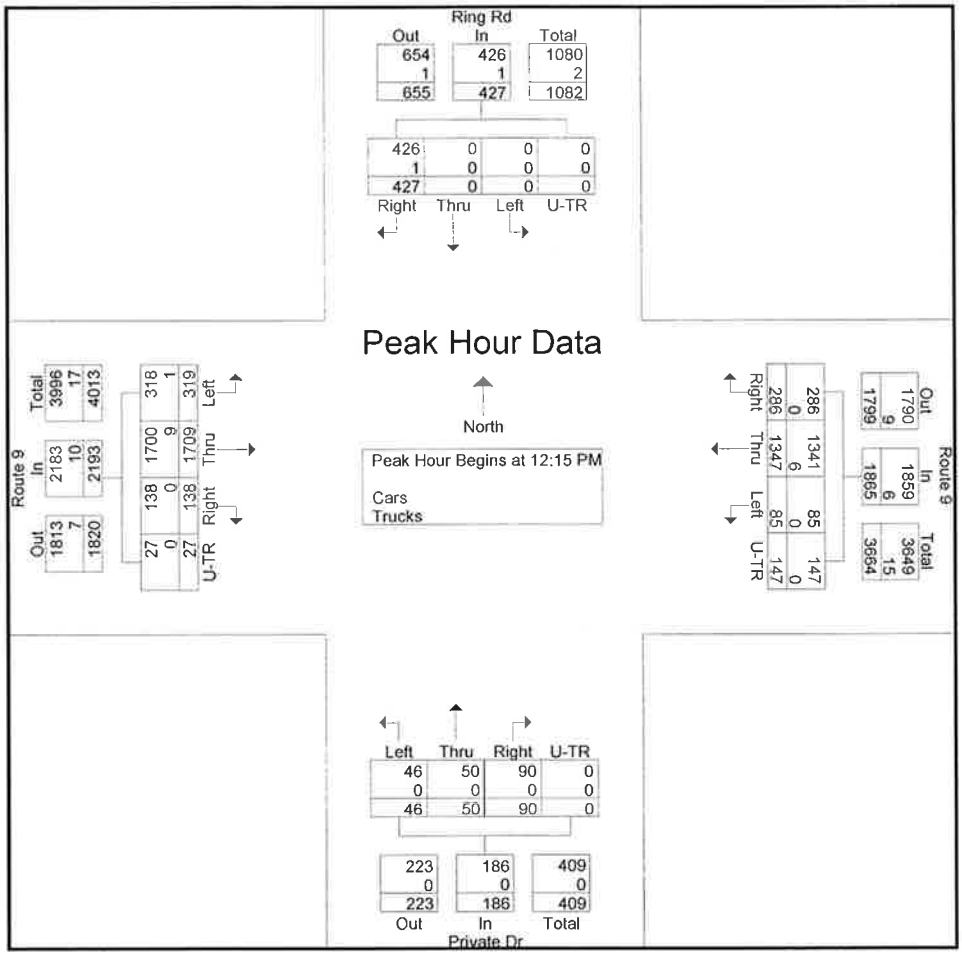
	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	0	0	66	0	18	296	52	25	10	10	28	0	72	408	20	4	1009
11:15 AM	0	0	89	0	18	272	50	24	17	6	17	0	83	406	33	6	1021
11:30 AM	0	0	84	0	31	297	61	26	9	6	19	0	87	412	27	8	1067
11:45 AM	0	0	98	0	25	359	70	28	10	8	21	0	84	397	30	3	1133
Total	0	0	337	0	92	1224	233	103	46	30	85	0	326	1623	110	21	4230
12:00 PM	0	0	103	0	21	322	55	25	11	12	32	0	87	391	33	9	1101
12:15 PM	0	0	109	0	28	324	70	38	10	12	20	0	66	415	33	5	1130
12:30 PM	0	0	110	0	17	327	60	42	12	15	21	0	94	404	42	6	1150
12:45 PM	0	0	107	0	18	332	82	26	11	9	26	0	73	446	27	7	1164
Total	0	0	429	0	84	1305	267	131	44	48	99	0	320	1656	135	27	4545
01:00 PM	0	0	101	0	22	364	74	41	13	14	23	0	86	444	36	9	1227
01:15 PM	0	1	106	0	25	305	81	25	18	15	12	0	61	384	24	6	1063
01:30 PM	0	3	103	0	41	294	70	30	14	14	22	0	65	397	45	9	1107
01:45 PM	0	0	91	0	25	341	76	25	33	21	30	0	100	407	32	9	1190
Total	0	4	401	0	113	1304	301	121	78	64	87	0	312	1632	137	33	4587
Grand Total	0	4	1167	0	289	3833	801	355	168	142	271	0	958	4911	382	81	13362
Apprch %	0	0.3	99.7	0	5.5	72.6	15.2	6.7	28.9	24.4	46.6	0	15.1	77.6	6	1.3	
Total %	0	0	8.7	0	2.2	28.7	6	2.7	1.3	1.1	2	0	7.2	36.8	2.9	0.6	
Cars	0	4	1164	0	288	3813	800	355	168	142	270	0	957	4891	382	81	13315
% Cars	0	100	99.7	0	99.7	99.5	99.9	100	100	100	99.6	0	99.9	99.6	100	100	99.6
Trucks	0	0	3	0	1	20	1	0	0	0	1	0	1	20	0	0	47
% Trucks	0	0	0.3	0	0.3	0.5	0.1	0	0	0	0.4	0	0.1	0.4	0	0	0.4

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 2

	Ring Rd From North					Route 9 From East					Private Dr From South					Route 9 From West					
Start Time	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	0	109	0	109	**28**	324	70	38	460	10	12	20	0	42	66	415	33	5	519	1130
12:30 PM	0	0	**110**	0	**110**	17	327	60	**42**	446	12	**15**	21	0	48	**94**	404	**42**	6	546	1150
12:45 PM	0	0	107	0	107	18	332	**82**	26	458	11	9	**26**	0	46	73	**446**	27	7	553	1164
01:00 PM	0	0	101	0	101	22	**364**	74	41	**501**	**13**	14	23	0	**50**	86	444	36	**9**	**575**	**1227**
Total Volume	0	0	427	0	427	85	1347	286	147	1865	46	50	90	0	186	319	1709	138	27	2193	4671
% App. Total	0	0	100	0		4.6	72.2	15.3	7.9		24.7	26.9	48.4	0		14.5	77.9	6.3	1.2		
PHF	.000	.000	.970	.000	.970	.759	.925	.872	.875	.931	.885	.833	.865	.000	.930	.848	.958	.821	.750	.953	.952
Cars	0	0	426	0	426	85	1341	286	147	1859	46	50	90	0	186	318	1700	138	27	2183	4654
% Cars	0	0	99.8	0	99.8	100	99.6	100	100	99.7	100	100	100	0	100	99.7	99.5	100	100	99.5	99.6
Trucks	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	1	9	0	0	10	17
% Trucks	0	0	0.2	0	0.2	0	0.4	0	0	0.3	0	0	0	0	0	0.3	0.5	0	0	0.5	0.4



Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 1

Groups Printed- Cars

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	0	0	64	0	17	292	51	25	10	10	27	0	72	405	20	4	997
11:15 AM	0	0	89	0	18	269	50	24	17	6	17	0	83	406	33	6	1018
11:30 AM	0	0	84	0	31	296	61	26	9	6	19	0	87	409	27	8	1063
11:45 AM	0	0	98	0	25	357	70	28	10	8	21	0	84	394	30	3	1128
Total	0	0	335	0	91	1214	232	103	46	30	84	0	326	1614	110	21	4206
12:00 PM	0	0	103	0	21	321	55	25	11	12	32	0	87	389	33	9	1098
12:15 PM	0	0	109	0	28	322	70	38	10	12	20	0	66	410	33	5	1123
12:30 PM	0	0	109	0	17	327	60	42	12	15	21	0	94	401	42	6	1146
12:45 PM	0	0	107	0	18	329	82	26	11	9	26	0	73	446	27	7	1161
Total	0	0	428	0	84	1299	267	131	44	48	99	0	320	1646	135	27	4528
01:00 PM	0	0	101	0	22	363	74	41	13	14	23	0	85	443	36	9	1224
01:15 PM	0	1	106	0	25	304	81	25	18	15	12	0	61	384	24	6	1062
01:30 PM	0	3	103	0	41	293	70	30	14	14	22	0	65	397	45	9	1106
01:45 PM	0	0	91	0	25	340	76	25	33	21	30	0	100	407	32	9	1189
Total	0	4	401	0	113	1300	301	121	78	64	87	0	311	1631	137	33	4581
Grand Total	0	4	1164	0	288	3813	800	355	168	142	270	0	957	4891	382	81	13315
Apprch %	0	0.3	99.7	0	5.5	72.5	15.2	6.8	29	24.5	46.6	0	15.2	77.5	6.1	1.3	
Total %	0	0	8.7	0	2.2	28.6	6	2.7	1.3	1.1	2	0	7.2	36.7	2.9	0.6	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 1

Groups Printed- Trucks

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
11:00 AM	0	0	2	0	1	4	1	0	0	0	1	0	0	3	0	0	12
11:15 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
11:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
11:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	5
Total	0	0	2	0	1	10	1	0	0	0	1	0	0	9	0	0	24
12:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
12:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	5	0	0	7
12:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	4
12:45 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	1	0	0	6	0	0	0	0	0	0	0	10	0	0	17
01:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	3
01:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
01:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	4	0	0	0	0	0	0	1	1	0	0	6
Grand Total	0	0	3	0	1	20	1	0	0	0	1	0	1	20	0	0	47
Apprch %	0	0	100	0	4.5	90.9	4.5	0	0	0	100	0	4.8	95.2	0	0	
Total %	0	0	6.4	0	2.1	42.6	2.1	0	0	0	2.1	0	2.1	42.6	0	0	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 1

Groups Printed- Bikes Peds

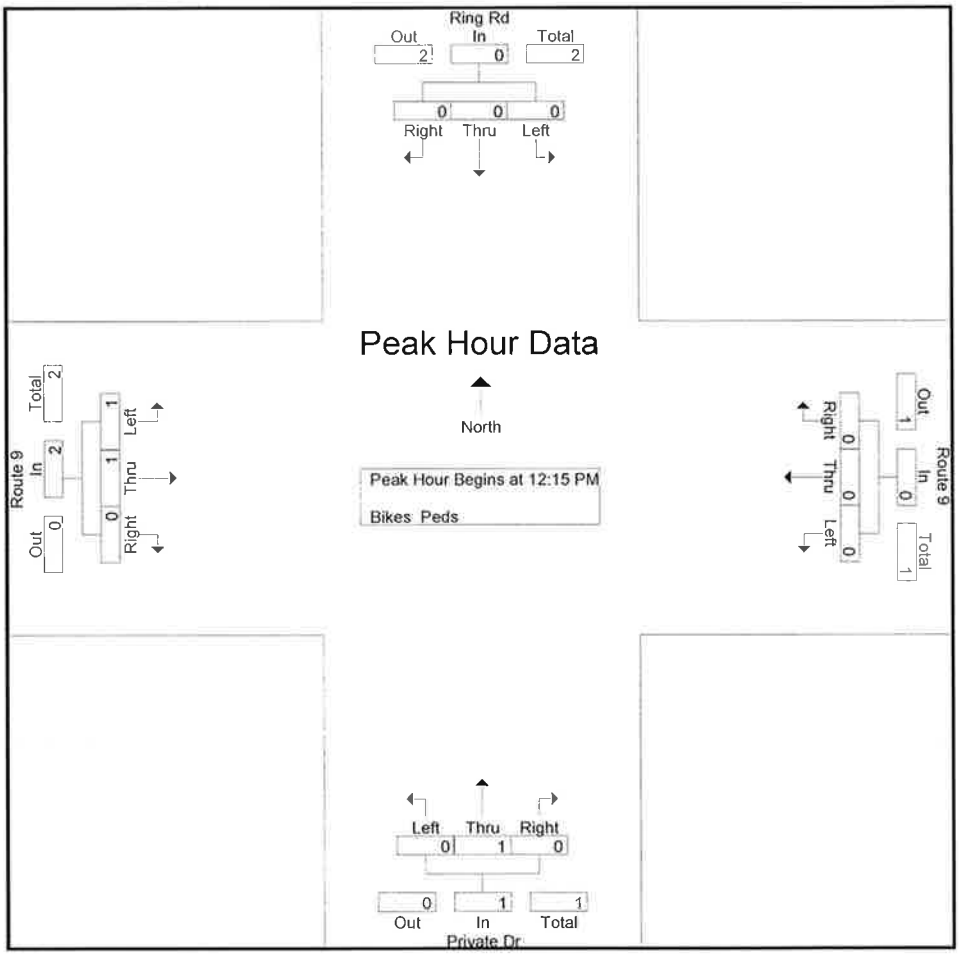
	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
11:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3
11:30 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2	6	0	6
11:45 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3	0	3
Total	0	0	0	7	0	0	0	0	0	0	0	2	0	2	0	2	11	2	13
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	2
12:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3	0	3
12:45 PM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
Total	0	0	0	9	0	0	0	0	0	1	0	3	0	0	0	1	13	1	14
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3
01:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	1	1	2	0	0	3	3	6
Grand Total	0	0	0	17	0	0	0	1	0	1	0	6	1	4	0	3	27	6	33
Apprch %	0	0	0		0	0	0		0	100	0		20	80	0				
Total %	0	0	0		0	0	0		0	16.7	0		16.7	66.7	0		81.8	18.2	

Accurate Counts
978-664-2565

N/S Street : Ring Road / Private Dr
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 639400S6
Site Code : 63940006
Start Date : 9/6/2014
Page No : 2

	Ring Rd From North				Route 9 From East				Private Dr From South				Route 9 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15 PM																	
12:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	2	3
% App. Total	0	0	0		0	0	0		0	100	0		50	50	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250	.250	.000	.250	.375



SEASONAL ADJUSTMENT DATA

MASSACHUSETTS HIGHWAY DEPARTMENT - STATEWIDE TRAFFIC DATA COLLECTION

2011 WEEKDAY SEASONAL FACTORS *

* Note: These are weekday factors. The average of the factors for the year will not equal 1, as weekend data are not considered.

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GROUP 1 - WEST INTERSTATE	0.98	0.93	0.90	0.89	0.90	0.88	0.91	0.90	0.89	0.89	0.93	0.95
Use group 2 for R5, R6, & R0 GROUP 2 - RURAL MAJOR COLLECTOR (R-5)	1.12	1.12	1.07	0.99	0.91	0.90	0.86	0.86	0.92	0.93	1.01	1.05
GROUP 3A - RECREATIONAL **(1-4) See below	1.26	1.25	1.20	1.06	0.96	0.89	0.76	0.76	0.92	0.99	1.08	1.14
GROUP 3B - RECREATIONAL ***(5) See below	1.22	1.26	1.22	1.06	0.96	0.90	0.72	0.74	0.97	1.02	1.14	1.15
GROUP 4 - I-495 INTERSTATE	1.02	1.00	1.00	0.96	0.92	0.89	0.85	0.83	0.93	0.96	1.01	1.03
GROUP 5 - EAST INTERSTATE	1.04	1.00	0.96	0.93	0.92	0.91	0.91	0.89	0.93	0.93	0.96	1.01
Use group 6 for U2, U3, U5, U6, U0, R2, & R3 GROUP 6 - URBAN ARTERIALS, COLLECTORS & RURAL ARTERIALS (R-2, R-3)	1.03	1.01	0.96	0.92	0.91	0.90	0.92	0.92	0.93	0.92	0.97	0.97
GROUP 7 - I-84 PROXIMITY (STAS. 17,3921)	1.24	1.24	1.15	1.04	0.99	1.00	0.93	0.89	1.05	1.05	1.05	1.12
GROUP 8 - I-295 PROXIMITY (STA. 6590)	1.00	0.99	0.95	0.92	0.94	0.91	0.93	0.92	0.95	0.94	0.97	0.95
GROUP 9 - I-195 PROXIMITY (STA. 7)	1.13	1.05	1.03	0.95	0.89	0.87	0.86	0.79	0.88	0.91	0.99	1.03

RECREATIONAL: (ALL YEARS)

**GROUP 3A:
1. CAPE COD (ALL TOWNS)
2.PLYMOUTH(SOUTH OF RTE.3A)

7014, 7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108,7178
3.MARTHA'S VINEYARD
4.NANTUCKET

***GROUP 3B:
5.PERMANENTS 2 & 189
1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,
1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,
1105,1106,1107,1108,1113,1114,1116,2195,2197,2198

2011 AXLE CORRECTION FACTORS

ROAD INVENTORY FUNCTIONAL CLASSIFICATION	AXLE CORRECTION FACTOR
RURAL	
1	0.95
2	0.97
3	0.98
0,5,6	0.98
URBAN	
1	0.96
2	0.98
3	0.98
5	0.98
0,6	0.99
I-84	0.90

Apply I-84 factor to stations: 3290,3929

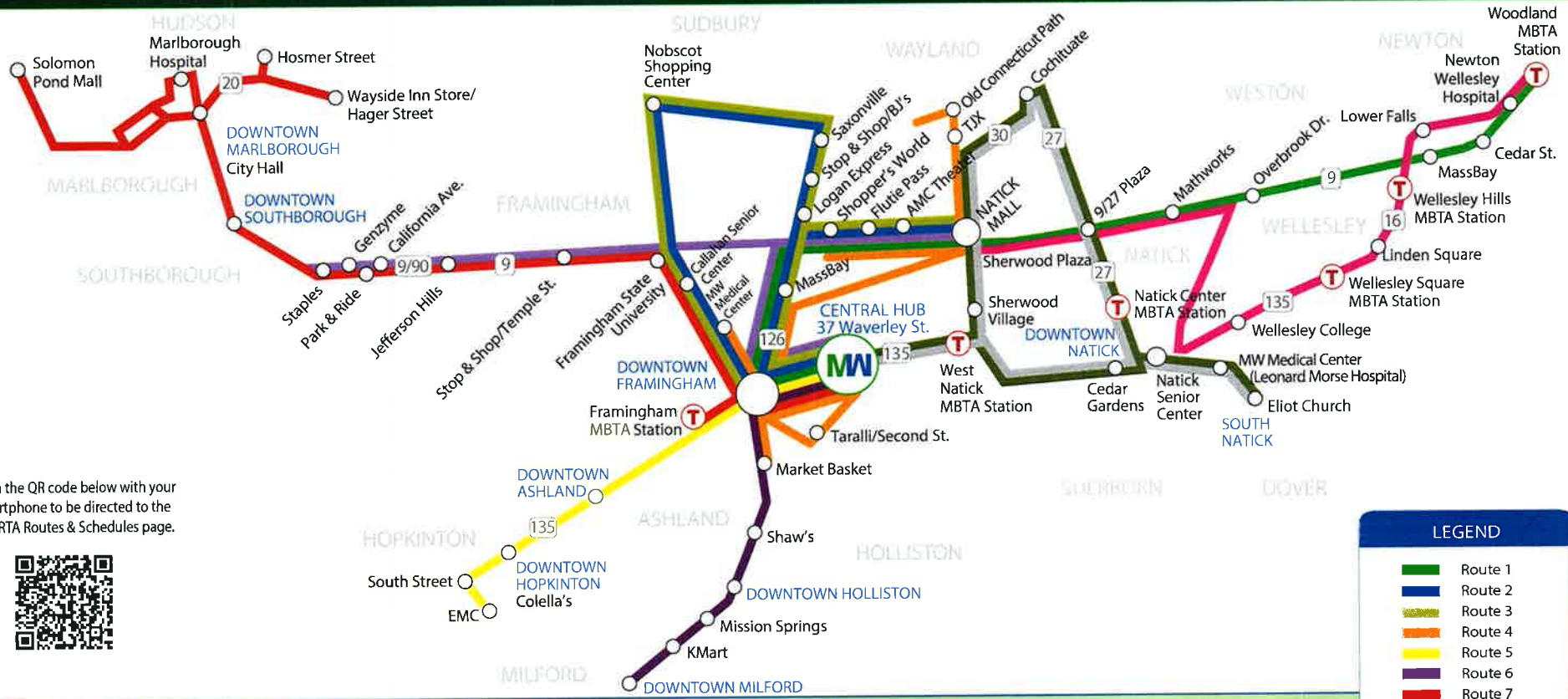
ROUND OFF

0 - 999.....10
> 1,000.....100

PUBLIC TRANSPORTATION SCHEDULES

METROWEST REGIONAL TRANSIT AUTHORITY

Public Transportation System



Scan the QR code below with your smartphone to be directed to the MWRTA Routes & Schedules page.

LEGEND

- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 10
- Route 11
- Bus Stop
- The MWRTA uses the "flag down" system.

MetroWest Regional Transit Authority

From Solomon Pond Mall in Marlborough to Woodland Station in Newton—We've got you covered.

MetroWest Regional Transit Authority (MWTRA) provides public transportation along twelve different bus routes connecting the entire MetroWest community.

We provide access to all major area employers, medical facilities, and shopping locations. MWRTA also connects commuters with the Massachusetts Bay Transportation Authority (MBTA) system. The commuter rail connection can take you eastbound or westbound to Boston or Worcester.

Go Green. Be friendly to our environment and be mindful of your carbon footprint.

Customer Service & Travel Information
Please call 508.935.2222 or visit us online at mwrta.com.

@mwrta

www.mwrta.com 508.935.2222

2

ROUTE 2 (Monday-Friday Service)

ROUTE 2: Framingham Circuit (Clockwise)

MetroWest Regional Transit Authority

Fare Information

Adult fare: $1.50 cash / $1.10 with a Charlie Card
Student fare: $1.00 cash with valid Student ID.
Children under 6 ride free when accompanied by an adult.
Children under 12 may not ride unaccompanied.
Elderly (65 years of age or older)- $0.75 cash with photo ID indicating date of birth or a MWRTA senior TAP Pass or $0.70 with a Charlie Card
Individuals with disabilities- Valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass are accepted as proof of eligibility for the MWRTA reduced-fare program.
Charlie Cards are available free of charge at the Central Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

No service provided on the following Holidays:
New Year's Day
Patriot's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Transfer/Connections

Transfer coupons are available on all buses and are good for transfers going in the same direction within the MWRTA system only. Transfers are not compatible within the MBTA system. One transfer per paid fare is issued upon request and must be presented to the next driver within 90 minutes.

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

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

Route 2 (Monday-Friday Service)

Effective Winter 2013

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

Follow Us: @mwrta

2 ROUTE 2 Weekday (Monday-Friday Service) 2

	AM						PM					
Central Hub (37 Waverly St.) [1 2]	6:30	7:30	8:30	9:30	10:30	11:30	12:40	1:55	3:10	4:25	5:40	6:55
Concord/Howard Sts.	6:35	7:35	8:35	9:35	10:35	11:35	12:49	2:04	3:19	4:34	5:49	7:00
MetroWest Medical Center			8:36	9:36	10:36	11:36	12:50	2:05	3:20	4:35	5:50	7:01
Callahan Center	R	R	R	R	R	R	R	R	R	R	R	R
Framingham Center [1]	6:39	7:39	8:39	9:39	10:39	11:44	12:58	2:13	3:28	4:43	5:58	7:04
Vernon/Pleasant Sts.	R	R	R	R	R	R	R	R	R	R	R	R
Nobscot Shopping Center	6:46	7:46	8:46	9:46	10:46	11:51	1:05	2:20	3:35	4:50	6:05	7:11
Pinefield Shopping Center	6:50	7:50	8:50	9:50	10:50	11:55	1:09	2:24	3:39	4:54	6:09	7:15
Framingham High School	6:52	7:52	8:52	9:52	10:52	11:57	1:11	2:26	3:41	4:56	6:11	7:17
Super Stop & Shop	6:55	7:55	8:55	9:55	10:55	12:05 P	1:14	2:29	3:44	4:59	6:14	7:20
Target/Whittier Sts. [3]	6:58	7:58	8:58	9:58	10:58	12:06 P	1:17	2:32	3:47	5:02	6:17	7:23
Shoppers World East	6:59	7:59	8:59	9:59	10:59	12:07 P	1:18	2:33	3:48	5:03	6:18	7:24
Natick Mall (Macy's) [1 2]	7:06	8:06	9:06	10:06	11:06	12:11 P	1:25	2:40	3:55	5:10	6:25	7:31
Shoppers World Shelter	7:09	8:09	9:09	10:09	11:09	12:14 P	1:28	2:43	3:58	5:13	6:28	7:34
Kohl's	7:10	8:10	9:10	10:10	11:10	12:15 P	1:29	2:44	3:59	5:14	6:29	7:35
Rt. 30/Rt. 126, Concord Street	7:12	8:12	9:12	10:12	11:12	12:17 P	1:31	2:46	4:01	5:16	6:31	7:37
Arsenal Road Bus Stop	7:14	8:14	9:14	10:14	11:14	12:22 P	1:35	2:50	4:05	5:20	6:35	7:39
MassBay Community College			9:15	10:15	11:15	12:23 P	1:36	2:51	4:06			
Rose Kennedy Lane*			9:16	10:16	11:16	12:24 P	1:37	2:52	4:07			
Lincoln/Pearl Sts.	7:19	8:19	9:19	10:19	11:19	12:29 P	1:44	2:59	4:14	5:29	6:44	7:44
Central Hub (37 Waverly St.) [1 2]	7:30	8:30	9:30	10:30	11:30	12:40 P	1:55	3:10	4:25	5:40	6:55	7:55

Scheduled Times

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

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

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

MetroWest Regional Transit Authority
Public Transportation System

Transfers

[1] Route 2 passengers can make the following transfers: Routes 4, 5, 6, 7, 10, 11 and Shuttle Services at the Central Hub, 37 Waverly St.; 1, 4, 8, 9, 10, and 11 at Natick Mall (Macy's).

[2] On Saturday Route 2 passengers can transfer to Route 7 and 10 at the Central Hub or Route 10 at Macy's at the Natick Mall (Macy's)

[3] Route 2 passengers may get picked up or dropped off via Shoppers World for Logan Express.

R- Request only- riders must call ahead to customer service at 508-935-2222 or notify the bus driver if onboard to request that the bus stop at the location.

*Stop may NOT be serviced due to snow/ice.

MWRTA will deviate (D) from its Route 2 fixed route service for ADA Certified riders. Please call 508-935-2222 for more information.

3

ROUTE 3 (Monday-Friday Service)

ROUTE 3: Framingham Circuit
(Counter Clockwise)

MetroWest Regional Transportation Authority

Cash Fare Information

Adult fare: $1.50 / $1.10 with a Charlie Card
Student fare:$1.00 with valid Student ID.
Children under 6 ride free when accompanied by an adult.
Children under 12 may not ride unaccompanied.
Elderly (65 years of age or older)- $0.75 with photo ID indicating date of birth or a MWRTA senior TAP Pass or $0.70 with a Charlie Card
Individuals with disabilities- Valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass are accepted as proof of eligibility for the MWRTA half-fare program.
Charlie Cards are available free of charge at the Central Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

No service provided on the following Holidays:
New Year's Day
Patriot's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Transfer/Connections

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

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

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

Follow Us: @mwrta

Route 3 (Monday-Friday Service)

Effective Winter 2013

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

3

3 ROUTE 3 Weekday Counter Clockwise (Monday-Friday Service) 3

	AM						PM					
Central Hub (37 Waverly St.) [1]	6:15	7:30	8:30	9:30	10:30	11:30	12:45	2:00	3:15	4:30	5:45	7:00
Concord/Howard Sts.	6:25	7:35	8:35	9:35	10:35	11:35	12:54	2:09	3:24	4:39	5:54	7:05
MassBay Community College				9:41	10:41	11:41	1:04	2:19	3:34	4:49		
Rose Kennedy Lane*				9:42	10:42	11:42	1:05	2:20	3:35	4:50		
Rt. 30/Rt. 126 Concord Street	6:35	7:46	8:46	9:46	10:46	11:46	1:11	2:26	3:41	4:56	6:11	7:16
Walmart	6:37	7:48	8:48	9:48	10:48	11:48	1:14	2:29	3:44	4:59	6:14	7:18
Sherwood Plaza	6:39	7:51	8:51	9:51	10:51	11:51	1:17	2:32	3:47	5:02	6:17	7:21
Natick Mall (Macy's)[1]	6:41	7:56	8:56	9:56	10:56	11:56	1:22	2:37	3:52	5:07	6:22	7:26
Shoppers World East	6:43	7:57	8:57	9:57	10:57	11:57	1:23	2:38	3:53	5:08	6:23	7:27
Target/Whittier Sts. [2]	6:44	7:58	8:58	9:58	10:58	11:58	1:24	2:39	3:54	5:09	6:24	7:28
Super Stop & Shop	6:45	8:03	9:03	10:03	11:03	12:03 P	1:29	2:44	3:59	5:14	6:29	7:33
Framingham High School/A St.	6:47	8:05	9:05	10:05	11:05	12:05 P	1:31	2:46	4:01	5:16	6:31	7:35
Pinefield/Water Sts.	6:50	8:07	9:07	10:07	11:07	12:07 P	1:33	2:48	4:03	5:18	6:33	7:37
Nobscot Fire Station	6:55	8:12	9:12	10:12	11:12	12:12 P	1:38	2:53	4:08	5:23	6:38	7:42
Framingham Center [1]	7:00	8:16	9:16	10:16	11:16	12:16 P	1:42	2:57	4:12	5:27	6:42	7:46
Callahan Center	R	R	R	R	R	R	R	R	R	R	R	R
MetroWest Medical Center		8:21	9:21	10:21	11:21	12:21 P	1:46	3:01	4:16	5:31	6:46	7:51
Lincoln/Pearl Sts.	7:04	8:22	9:22	10:22	11:22	12:22 P	1:47	3:02	4:17	5:32	6:47	7:52
Danforth Museum	7:05	8:23	9:23	10:23	11:23	12:23 P	1:48	3:03	4:18	5:33	6:48	7:53
Central Hub (37 Waverly St.) [1]	7:10	8:30	9:30	10:30	11:30	12:45 P	2:00	3:15	4:30	5:45	7:00	8:00

Scheduled Times

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

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

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

MetroWest Regional Transit Authority
Public Transportation System

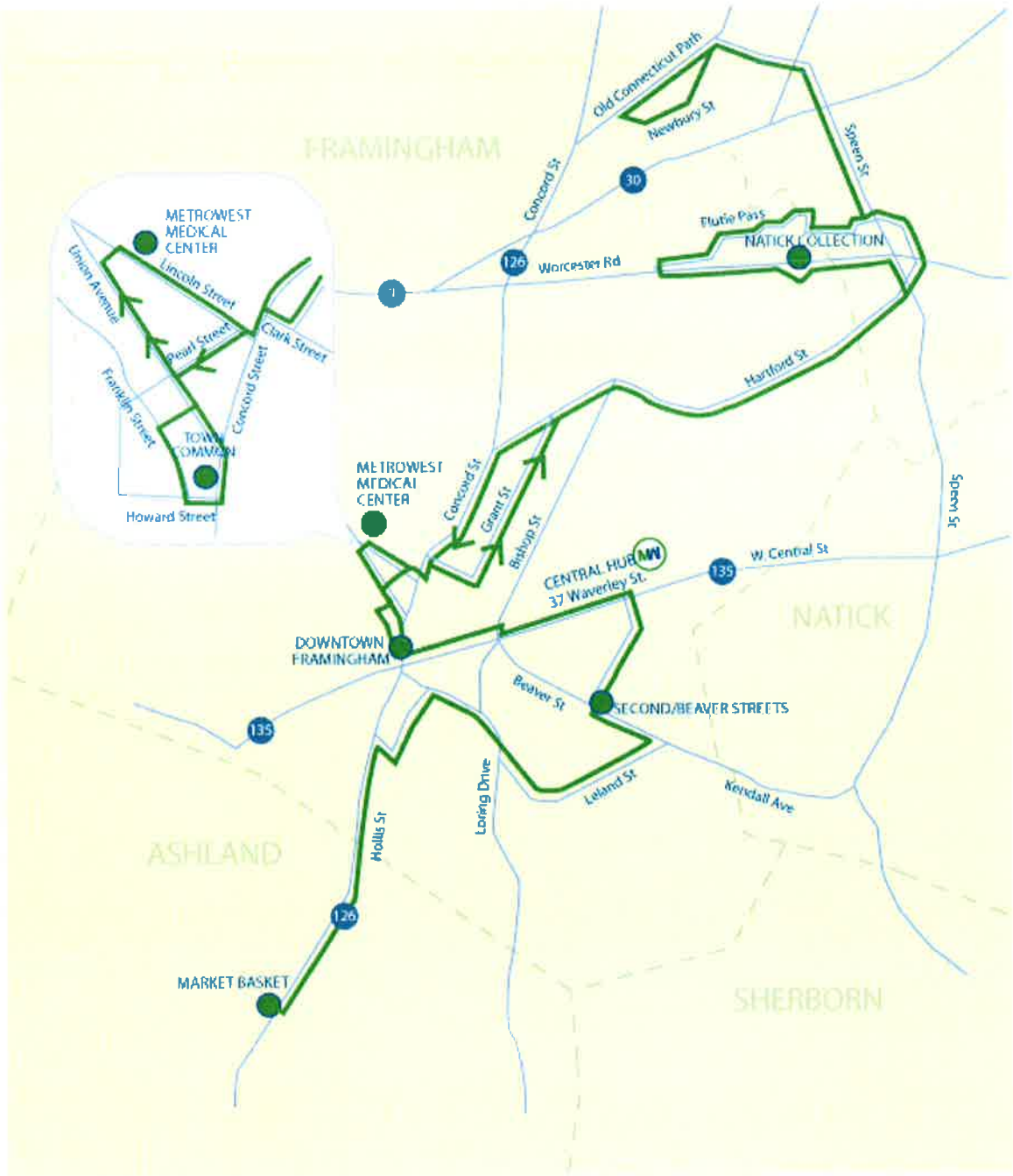
[1] Route 3 passengers can make the following transfers:
Routes 4, 5, 6, 7, 10, 11 and the Shuttle Services at the Central Hub, 37 Waverly St.; 1, 4, 8, 9, 10, and 11 at the Natick Mall (Macy's).

[2] Route 3 passengers may get picked up or dropped off alongside Logan Express at Shoppers World East.

*Stop may NOT be serviced due to snow/ice.

R - Request Only

***MWRTA will deviate (D) from its Route 3 fixed route service for ADA Certified riders. Please call 508-935-2222 for more information.*


FRAMINGHAM
Old Connecticut Path
Newbury St
Concord St
30
Speen St
Flutie Pass
NATICK COLLECTION
126
Worcester Rd
1
Hartford St
METROWEST MEDICAL CENTER
Union Avenue
Lincoln Street
Pearl Street
Clark Street
Concord Street
Franklin Street
TOWN COMMON
Howard Street
METROWEST MEDICAL CENTER
Concord St
Grant St
Bishop St
Speen St
W. Central St
135
CENTRAL HUB
37 Waverley St.
NATICK
DOWNTOWN FRAMINGHAM
Beaver St
SECOND/BEAVER STREETS
135
Leland St
Kendall Ave
Loring Drive
Hollis St
ASHLAND
126
MARKET BASKET
SHERBORN

Route 4 - Market Basket Beaver Park Natick Mall - Morning (AM) Stops

Framingham					
Central Hub (37 Waverly St.)	6:10				
MCI / Adesa	6:18				
Central Hub (37 Waverly St.)	6:25				
MBTA Station (Framingham)	6:31				
Central Hub (37 Waverly St.)	6:36	8:00	9:25	10:45	
Second St. / Beaver Park Rd.	6:37	8:01	9:26	10:46	
Beaver Park Rd. / Tarelli Ter.	6:38	8:02	9:27	10:47	
Beaver St. / Leland St.	6:40	8:04	9:29	10:49	
Leland St. / Irving St.	6:41	8:05	9:30	10:50	
Irving St. / Loring Dr.	6:42	8:06	9:31	10:51	
MCI / Adesa	6:44	8:08	9:33	10:53	
Irving St. / Hollis St.	6:47	8:11	9:36	10:56	
Memorial House	D	D	D	D	
Hollis St. / Market Basket (Big Lots)	6:53	8:17	9:42	11:02	
Memorial House	D	D	D	D	
Hollis St. / Irving St.	6:58	8:22	9:47	11:07	
Second St. / Beaver Park Rd.	7:01	8:25	9:50	11:10	
Tarelli Ter. / Waverly St.	7:02	8:26	9:51	11:11	
(Arrive) Central Hub (37 Waverly St.)	7:04	8:28	9:53	11:13	
(Depart) Central Hub (37 Waverly St.)	7:05	8:30	9:55	11:15	
Howard St. / Concord St.	7:10	8:35	10:00	11:20	
Union Ave. / Lincoln St.	7:12	8:37	10:02	11:22	
Lincoln St. / Beech St.	7:13	8:38	10:03	11:23	
Concord St. / Clark St.	7:14	8:39	10:04	11:24	
Concord St. / Hartford St.	7:18	8:43	10:08	11:28	
Hartford St. / Speen St.	7:23	8:48	10:13	11:33	
Speen St. / Mall Rd. / Macy's	7:29	8:54	10:19	11:39	
Mall Rd. / Flutie Pass	7:31	8:56	10:21	11:41	
Shopper's World Bus Shelter	7:33	8:58	10:23	11:43	
Kohl's Bus Shelter	7:34	8:59	10:24	11:44	
Target	7:36	9:01	10:26	11:46	
BJ's Wholesale Club	7:37	9:02	10:27	11:47	
Rte 30 / Caldor Rd.	7:40	9:05	10:30	11:50	
Walmart	7:42	9:07	10:32	11:52	
Rte 9 / Sherwood Plaza	7:45	9:10	10:35	11:55	
Rte 9 / Speen St.	7:47	9:12	10:37	11:57	

Speen St. / Hartford St.	7:49	9:14	10:39	11:59
Kendall Plaza (Rte 135-Next to West Natick MBTA)	7:52	9:17	10:42	
Central Hub (37 Waverly St.)	7:54	9:19	10:44	

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Route 4 - Market Basket Beaver Park Natick Mall - Evening (PM) Stops

Framingham						
Central Hub (37 Waverly St.)						
MCI / Adesa						
Central Hub (37 Waverly St.)						
MBTA Station (Framingham)						
Central Hub (37 Waverly St.)		12:10	1:30	2:50	4:10	5:30
Second St. / Beaver Park Rd.		12:11	1:31	2:51	4:11	5:31
Beaver Park Rd. / Tarelli Ter.		12:12	1:32	2:52	4:12	5:32
Beaver St. / Leland St.		12:14	1:34	2:54	4:14	5:34
Leland St. / Irving St.		12:15	1:35	2:55	4:15	5:35
Irving St. / Loring Dr.		12:16	1:36	2:56	4:16	5:36
MCI / Adesa		12:18	1:38	2:58	4:18	5:38
Irving St. / Hollis St.		12:21	1:41	3:01	4:21	5:41
Memorial House		D	D	D	D	D
Hollis St. / Market Basket (Big Lots)		12:27	1:47	3:07	4:27	5:47
Memorial House		D	D	D	D	D
Hollis St. / Irving St.		12:32	1:52	3:12	4:32	5:52
Second St. / Beaver Park Rd.		12:35	1:55	3:15	4:35	5:55
Tarelli Ter. / Waverly St.		12:36	1:56	3:16	4:36	5:56
Central Hub (37 Waverly St.)		12:38	1:58	3:18	4:38	5:58
Central Hub (37 Waverly St.)		12:40	2:00	3:20	4:40	6:00
Howard St. / Concord St.		12:45	2:05	3:25	4:45	6:05
Union Ave. / Lincoln St.		12:47	2:07	3:27	4:47	6:07
Lincoln St. / Beech St.		12:48	2:08	3:28	4:48	6:08
Concord St. / Clark St.		12:49	2:09	3:29	4:49	6:09
Concord St. / Hartford St.		12:53	2:13	3:33	4:53	6:13
Hartford St. / Speen St.		12:58	2:18	3:38	4:58	6:18
Speen St. / Mall Rd. / Macy's		1:04	2:24	3:44	5:04	6:24
Mall Rd. / Flutie Pass		1:06	2:26	3:46	5:06	6:26
Shopper's World Bus Shelter		1:08	2:28	3:48	5:08	6:28
Kohl's Bus Shelter		1:09	2:29	3:49	5:09	6:29
Target		1:11	2:31	3:51	5:11	6:31
BJ's Wholesale Club		1:12	2:32	3:52	5:12	6:32
Rte 30 / Caldor Rd.		1:15	2:35	3:55	5:15	6:35
Walmart		1:17	2:37	3:57	5:17	6:37
Natick						
Rte 9 / Sherwood Plaza		1:20	2:40	4:00	5:20	6:40

Rte 9 / Speen St.		1:22	2:42	4:02	5:22	6:42
Speen St. / Hartford St.		1:24	2:44	4:04	5:24	6:44
Kendall Plaza (Rte 135-Next to West Natick MBTA)	12:02	1:27	2:47	4:07	5:27	6:47
Framingham						
Central Hub (37 Waverly St.)	12:04	1:29	2:49	4:09	5:29	6:49

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Route 4 - Market Basket Beaver Park Natick Mall - Evening (PM) Stops

Framingham						
Central Hub (37 Waverly St.) (Outbound)		12:40	2:15	3:52		
Second St. / Beaver Park Rd.		12:42	2:17	3:54		
Beaver St. / Leland St.		12:44	2:19	3:56		
Irving St. / Hollis St.		12:48	2:23	4:00		
Ashland						
Market Basket (Big Lots)		12:54	2:29	4:06		
Shaw's Ashland		12:58	2:33	4:10		
Framingham						
Hollis St. / Irving St.		1:05	2:40	4:17		
Leland St. / Beaver St.		1:09	2:44	4:21		
Second St. / Beaver Park Rd.		1:11	2:46	4:23		
Central Hub (37 Waverly St.) (Inbound)		1:14	2:49	4:26		
Central Hub (37 Waverly St.) (Outbound)		1:16	2:52	4:30		
Howard St. / Concord St.		1:21	2:57	4:35		
Rose Kennedy Lane		1:27	3:03	4:39		
Arsenal Road		1:29	3:05	4:41		
Hartford St. / Speen St.		1:34	3:10	4:46		
Speen St. / Mall Rd.	12:02	1:38	3:14	4:50		
Macy's	12:06	1:42	3:18	4:54		
Shopper's World Bus Shelter	12:10	1:46	3:22	4:58		
Kohl's Bus Shelter	12:12	1:48	3:24	5:00		
Target / BJ's Wholesale Club	12:14	1:50	3:26	5:02		
Lowe's Bus Shelter	12:16	1:52	3:28	5:04		
Walmart	12:20	1:56	3:32	5:06		
Sherwood Plaza	12:24	2:00	3:36	5:10		
Mill St. (Sherwood Village)	12:28	2:04	3:40	5:14		
Central Hub (37 Waverly St.) (Inbound)	12:34	2:10	3:46	5:20		

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Route 4 - Market Basket Beaver Park Natick Mall - Morning (AM) Stops

Framingham					
Central Hub (37 Waverly St.) (Outbound)		9:26	11:00		
Second St. / Beaver Park Rd.		9:28	11:02		
Beaver St. / Leland St.		9:30	11:06		
Irving St. / Hollis St.		9:34	11:12		
Ashland					
Market Basket (Big Lots)		9:40	11:18		
Shaw's Ashland		9:44	11:22		
Framingham					
Hollis St. / Irving St.		9:51	11:29		
Leland St. / Beaver St.		9:55	11:33		
Second St. / Beaver Park Rd.		9:57	11:35		
Central Hub (37 Waverly St.) (Inbound)		10:00	11:38		
Central Hub (37 Waverly St.) (Outbound)	8:30	10:02	11:40		
Howard St. / Concord St.	8:35	10:07	11:45		
Rose Kennedy Lane	8:41	10:13	11:51		
Arsenal Road	8:43	10:15	11:53		
Hartford St. / Speen St.	8:48	10:20	11:58		
Speen St. / Mall Rd.	8:52	10:24			
Macy's	8:56	10:28			
Shopper's World Bus Shelter	9:00	10:32			
Kohl's Bus Shelter	9:02	10:34			
Target / BJ's Wholesale Club	9:04	10:36			
Lowe's Bus Shelter	9:06	10:38			
Walmart	9:10	10:42			
Sherwood Plaza	9:14	10:46			
Mill St. (Sherwood Village)	9:18	10:50			
Central Hub (37 Waverly St.) (Inbound)	9:24	10:56			

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Routes & Schedules
Rates & Passes
Senior and Disabled Transportation
News Announcements and Solicitations
Feedback
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MetroWest Regional Transit Authority

Service Announcements (3)

Date: 10/06/2014

Columbus Day

The MWRTA will be running full service on Columbus Day Monday, October 13th 2014. If you have any questions, please contact MWRTA Customer Service at (508) 935-2222.

Date: 06/30/2014

Logan Express Location Change

Due to the relocation of the Logan Express, riders interested in getting to the new location must now take the Route 11. Route 2 and 3 do not service this new location.

Date: 04/29/2014

SERVICE ANNOUNCEMENT

Attention all Rte. 8 passengers. Please be advised that due to construction on Linden St. the Wellesley Rte. 8 may be detoured. The Wellesley Square MBTA will still be serviced, however expect delays. Also, due to construction on Oak St. / Rte. 9 Natick, the bus will be temporarily seeking an alternative route down Bacon St. to Rte 27.

Rates & Passes

The following are the latest fare rates for our services.

MWRTA uses the "flag down" system. This allows you to wave down a bus in transit anywhere along the route, as well as at noted stops. The bus will stop to pick you up, as long as it is safe to do so. Due to various unexpected conditions, traffic, weather, we recommend to arrive ten minutes before the scheduled stop time, and to wait at least ten minutes after the scheduled departure time.

See below for Fare Information, Pass Information, Transfers, Commuter Checks, Weather Emergencies, and Holidays. If you have further questions, please call us at 1-888-996-9782 or 508-935-2222.

***MWRTA Bus Rates & Pass Information**

You may pay with exact fare on the buses, or obtain a Charlie Card to load value on, from either the bus driver, or at the office of the MWRTA, 37 Waverly Street, (Route 135), Framingham, MA 01702, You may also obtain Charlie Cards from the Treasurer's office at Framingham Town Hall, and the Town Clerk's office at Natick Town Hall. Value can be added to Charlie Cards on all MWRTA fixed route buses. Please note: When using a Charlie Card, your fare cost is reduced! See the fare charts below.

Cash Fares	Cash Rate	Charlie Card Rate

Adults	$1.50	$1.10
Students under the age of 18, or with current school ID	$1.00	N/A
Children under the age of six when accompanied by an adult	Free	N/A
Senior (65 years or older), with photo ID indicating date of birth / MWRTA Senior Pass	$0.75	$0.70
Individuals with disabilities with valid MWRTA Transportation Access Pass, MBTA Transportation Access Pass, or a Medicare Card.	$0.75	$0.70

***Blind persons ride free with a Massachusetts Commission for the Blind ID Card.*

***Children under 12 must be accompanied by an adult.*

MWRTA now accepts the MBTA Charlie Card on all of its fixed route buses. Patrons are encouraged to obtain a Charlie Card, either online at the MBTA Website or at the MWRTA Central Hub, located at 37 Waverly St, Framingham MA, during our normal business hours. Charlie Cards can be loaded directly on any MWRTA bus. Drivers will have available Charlie Cards and will assist patrons in loading value.

Please Note:

Students- The MBTA Student Charlie Card is not honored on the MWRTA system. Students may use an Adult Charlie Card and be charged the $1.10 fare or continue to pay $1.00 in cash.

Senior/Disabled- Senior/Disabled patrons must obtain a Transportation Access Pass (TAP) Card from the MWRTA Central Hub or the MBTA Access Pass Office in order to receive the Senior/Disabled Charlie Card fare. Information for obtaining a TAP card can be found below or via the MBTA Website.

CharlieTickets- MBTA Charlie Tickets are not honored on the MWRTA system. MWRTA buses only accept the plastic CharlieCards.

MBTA Monthly Passes- The only fare medium on the Charlie Card honored on the MWRTA system is stored value. Any MBTA pass product (i.e. monthly pass) is not honored on the MWRTA system.

10 Ride Passes- MWRTA no longer accepts the older 10 ride pass for fare payment. These have been out of circulation for quite some time.

Reduced Fare Identification Cards

Senior ID (Charlie Card) Transportation Pass
Anyone over 65 with photo identification as proof of age.

Transportation (Charlie Card) Access Pass
Disabled under 65 with approved application, available at MWRTA Offices.

The passes can be used to receive reduced fare on all fixed route busses and trains statewide. All passes have Charlie Card capability.

These Identification Cards may be obtained by visiting the MWRTA administrative offices at 37 Waverly St, Framingham.
Monday - Friday - between the hours of 8:00am - 4:00pm

Replacement Card Policy:
Card 1&2 - free of charge
Card 3 - $5.00 fee
Card 4 - $10.00 fee
The MWRTA will not issue more than 4 cards to any one individual.

MWRTA Payment and Service Information

Transfer coupons are available on all buses and are good for transfers between all route buses. Riders wishing to transfer from one bus to another, free of charge, must ask the driver for a transfer coupon and then present the coupon to the driver of the next bus. The transfer must be used within 30 minutes.

Commuter Checks

Commuter Checks are vouchers that are redeemed for prepaid Charlie Cards. They are provided tax-free by employers in amounts up to $100 per month. Commuter Checks are an employee benefit. Contact your Human Resources Department to find out if your company offers this service

For more information see www.commutercheck.com or call 800-727-9436.

Weather Emergencies

The service schedule is subject to change during a weather emergency. Any interruption of service will be posted under Service Announcements, located on the Home page, or you can call 508-935-2222 or 888-996-9782 to confirm the schedule.

Holidays:

There is also ***no*** fixed route bus service provided on the following holidays:

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

VEHICLE TRAVEL SPEED DATA

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA
Northbound

Site Code: 63940001
6394SPD1

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	76 999	Total	85th Percent	95th Percent
09/12/14	0	4	6	0	0	0	0	0	0	0	0	0	0	0	10	23	24
01:00	0	1	2	2	0	0	0	0	0	0	0	0	0	0	5	28	29
02:00	1	4	1	0	0	0	0	0	0	0	0	0	0	0	6	20	23
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	19	19
04:00	0	6	3	1	0	0	0	0	0	0	0	0	0	0	10	24	27
05:00	2	10	8	3	0	0	0	0	0	0	0	0	0	0	23	24	28
06:00	0	6	20	6	**2**	0	0	0	0	0	0	0	0	0	34	27	30
07:00	4	26	30	24	2	0	0	0	0	0	0	0	0	0	86	27	29
08:00	12	26	36	14	1	0	0	0	0	0	0	0	0	0	89	25	28
09:00	10	51	57	17	0	0	0	0	0	0	0	0	0	0	135	24	28
10:00	7	120	92	21	0	0	0	0	0	0	0	0	0	0	240	24	27
11:00	**14**	**126**	**138**	**31**	2	0	0	0	0	0	0	0	0	0	**311**	24	27
12 PM	**36**	146	141	24	1	0	0	0	0	0	0	0	0	0	348	24	26
13:00	23	166	129	18	2	**3**	0	0	0	0	0	0	0	0	341	23	26
14:00	34	**216**	132	19	1	0	0	0	0	0	0	0	0	0	**402**	23	24
15:00	8	152	150	**37**	1	0	0	0	0	0	0	0	0	0	348	24	27
16:00	13	154	169	29	**3**	0	0	0	0	0	0	0	0	0	368	24	27
17:00	14	155	**173**	30	2	1	0	0	0	0	0	0	0	0	375	24	27
18:00	9	137	140	31	1	0	0	0	0	0	0	0	0	0	318	24	27
19:00	22	146	87	15	0	0	0	0	0	0	0	0	0	0	270	23	25
20:00	20	134	86	13	1	0	0	0	0	0	0	0	0	0	254	23	25
21:00	14	107	57	8	0	0	0	0	0	0	0	0	0	0	186	23	24
22:00	3	43	33	11	1	0	0	0	0	0	0	0	0	0	91	24	28
23:00	3	19	16	5	1	0	0	0	0	0	0	0	0	0	44	24	28
Total	249	1956	1706	359	21	4	0	0	0	0	0	0	0	0	4295		
Percent	5.8%	45.5%	39.7%	8.4%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	06:00										11:00		
Vol.	14	126	138	31	2										311		
PM Peak	12:00	14:00	17:00	15:00	16:00	13:00									14:00		
Vol.	36	216	173	37	3	3									402		

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA
Northbound

Site Code: 63940001
6394SPD1

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	76 999	Total	85th Percent	95th Percent
09/13/14	0	9	8	2	0	0	0	0	0	0	0	0	0	0	19	24	27
01:00	1	1	4	1	0	0	0	0	0	0	0	0	0	0	7	24	28
02:00	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	23	24
03:00	2	1	0	2	0	0	0	0	0	0	0	0	0	0	5	28	29
04:00	1	3	0	2	0	0	0	0	0	0	0	0	0	0	6	27	29
05:00	0	7	1	2	0	0	0	0	0	0	0	0	0	0	10	26	28
06:00	0	3	5	5	0	0	0	0	0	0	0	0	0	0	13	28	29
07:00	4	14	24	5	2	0	0	0	0	0	0	0	0	0	49	24	29
08:00	1	26	50	14	1	0	0	0	0	0	0	0	0	0	92	25	28
09:00	5	67	59	9	0	0	0	0	0	0	0	0	0	0	140	23	26
10:00	8	124	103	26	1	0	0	0	0	0	0	0	0	0	262	24	27
11:00	26	188	126	16	1	0	0	0	0	0	0	0	0	0	357	23	24
12 PM	18	192	153	19	0	0	0	0	0	0	0	0	0	0	382	23	24
13:00	60	218	146	21	1	0	0	0	0	0	0	0	0	0	446	23	24
14:00	35	279	146	16	1	0	0	0	0	0	0	0	0	0	477	23	24
15:00	67	250	164	13	1	0	0	0	0	0	0	0	0	0	495	23	24
16:00	30	248	149	27	0	0	0	0	0	0	0	0	0	0	454	23	25
17:00	50	285	142	12	1	0	0	0	0	0	0	0	0	0	490	22	24
18:00	32	171	91	15	1	0	0	0	0	0	0	0	0	0	310	23	25
19:00	46	148	67	5	0	0	0	0	0	0	0	0	0	0	266	22	24
20:00	23	123	49	4	1	0	0	0	0	0	0	0	0	0	200	22	24
21:00	21	112	46	4	0	0	0	0	0	0	0	0	0	0	183	22	24
22:00	4	41	25	8	0	0	0	0	0	0	0	0	0	0	78	24	27
23:00	4	17	18	1	0	0	0	0	0	0	0	0	0	0	40	23	24
Total	439	2527	1578	229	11	0	0	0	0	0	0	0	0	0	4784		
Percent	9.2%	52.8%	33.0%	4.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	10:00	07:00										11:00		
Vol.	26	188	126	26	2										357		
PM Peak	15:00	17:00	15:00	16:00	13:00										15:00		
Vol.	67	285	164	27	1										495		
Grand Total	688	4483	3284	588	32	4	0	0	0	0	0	0	0	0	9079		
Percent	7.6%	49.4%	36.2%	6.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	15 MPH
50th Percentile :	19 MPH
85th Percentile :	23 MPH
95th Percentile :	26 MPH

Statistics

10 MPH Pace Speed :	16-25 MPH
Number in Pace :	7767
Percent in Pace :	85.5%
Number of Vehicles > 20 MPH :	3908
Percent of Vehicles > 20 MPH :	43.0%
Mean Speed(Average) :	20 MPH

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA

Site Code: 63940001
6394SPD1

Southbound

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	76 999	Total	85th Percent	95th Percent
09/12/14	4	1	0	0	0	0	0	0	0	0	0	0	0	0	5	16	18
01:00	3	1	1	0	0	0	0	0	0	0	0	0	0	0	5	21	23
02:00	3	1	0	0	0	0	0	0	0	0	0	0	0	0	4	17	19
03:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4	18	19
04:00	1	1	0	1	0	0	0	0	0	0	0	0	0	0	3	27	29
05:00	5	5	3	0	0	0	0	0	0	0	0	0	0	0	13	21	23
06:00	18	7	1	0	0	0	0	0	0	0	0	0	0	0	26	17	19
07:00	31	7	5	0	0	0	0	0	0	0	0	0	0	0	43	18	22
08:00	51	19	6	1	1	0	0	0	0	0	0	0	0	0	78	19	23
09:00	119	45	11	3	0	0	0	0	0	0	0	0	0	0	178	18	22
10:00	143	64	20	5	0	0	0	0	0	0	0	0	0	0	232	19	23
11:00	**157**	**70**	**25**	3	0	0	0	0	0	0	0	0	0	0	**255**	19	23
12 PM	163	**81**	25	1	0	0	0	0	0	0	0	0	0	0	270	19	22
13:00	**174**	71	34	0	0	0	0	0	0	0	0	0	0	0	**279**	19	22
14:00	136	73	25	0	0	0	0	0	0	0	0	0	0	0	234	19	22
15:00	110	63	23	0	0	0	0	0	0	0	0	0	0	0	196	19	22
16:00	118	53	39	0	0	0	0	0	0	0	0	0	0	0	210	20	23
17:00	126	74	26	5	1	0	0	0	0	0	0	0	0	0	232	19	23
18:00	147	51	23	3	0	0	0	0	0	0	0	0	0	0	224	19	23
19:00	135	55	20	4	0	0	0	0	0	0	0	0	0	0	214	19	23
20:00	86	26	7	1	1	0	0	0	0	0	0	0	0	0	121	18	22
21:00	44	16	6	0	0	0	0	0	0	0	0	0	0	0	66	18	22
22:00	26	6	0	0	0	0	0	0	0	0	0	0	0	0	32	16	18
23:00	6	4	0	0	0	0	0	0	0	0	0	0	0	0	10	18	19
Total	1808	796	300	27	3	0	0	0	0	0	0	0	0	0	2934		
Percent	61.6%	27.1%	10.2%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	10:00	08:00										11:00		
Vol.	157	70	25	5	1										255		
PM Peak	13:00	12:00	16:00	17:00	17:00										13:00		
Vol.	174	81	39	5	1										279		

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA

Site Code: 63940001
6394SPD1

Southbound

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	76 999	Total	85th Percent	95th Percent
09/13/14	2	4	1	0	0	0	0	0	0	0	0	0	0	0	7	19	23
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	19	19
02:00	5	2	0	0	0	0	0	0	0	0	0	0	0	0	7	17	19
03:00	4	8	4	0	0	0	0	0	0	0	0	0	0	0	16	22	24
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	19	19
05:00	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6	12	14
06:00	12	3	0	0	0	0	0	0	0	0	0	0	0	0	15	16	18
07:00	28	12	2	1	0	0	0	0	0	0	0	0	0	0	43	18	22
08:00	55	11	4	**2**	0	0	0	0	0	0	0	0	0	0	72	17	23
09:00	118	48	10	2	0	0	0	0	0	0	0	0	0	0	178	18	21
10:00	165	80	18	2	0	0	0	0	0	0	0	0	0	0	265	18	21
11:00	**191**	**100**	**27**	0	0	0	0	0	0	0	0	0	0	0	**318**	18	22
12 PM	193	110	28	3	0	0	0	0	0	0	0	0	0	0	334	19	22
13:00	165	134	26	1	0	0	0	0	0	0	0	0	0	0	326	19	22
14:00	**251**	137	34	3	**1**	0	0	0	0	0	0	0	0	0	**426**	19	22
15:00	212	**144**	37	0	0	0	0	0	0	0	0	0	0	0	393	19	22
16:00	188	110	36	**4**	0	0	0	0	0	0	0	0	0	0	338	19	23
17:00	106	123	52	2	0	0	0	0	0	0	0	0	0	0	283	21	23
18:00	56	120	**60**	0	0	0	0	0	0	0	0	0	0	0	236	22	24
19:00	25	89	28	0	0	0	0	0	0	0	0	0	0	0	142	21	23
20:00	34	61	21	4	0	0	0	0	0	0	0	0	0	0	120	21	24
21:00	23	23	12	0	0	0	0	0	0	0	0	0	0	0	58	21	23
22:00	13	8	3	1	0	0	0	0	0	0	0	0	0	0	25	20	24
23:00	8	1	5	0	0	0	0	0	0	0	0	0	0	0	14	22	24
Total	1860	1330	408	25	1	0	0	0	0	0	0	0	0	0	3624		
Percent	51.3%	36.7%	11.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	08:00											11:00		
Vol.	191	100	27	2											318		
PM Peak	14:00	15:00	18:00	16:00	14:00										14:00		
Vol.	251	144	60	4	1										426		
Grand Total	3668	2126	708	52	4	0	0	0	0	0	0	0	0	0	6558		
Percent	55.9%	32.4%	10.8%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	4 MPH
50th Percentile :	13 MPH
85th Percentile :	19 MPH
95th Percentile :	23 MPH

Statistics

10 MPH Pace Speed :	11-20 MPH
Number in Pace :	3349
Percent in Pace :	51.1%
Number of Vehicles > 20 MPH :	764
Percent of Vehicles > 20 MPH :	11.6%
Mean Speed(Average) :	13 MPH

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA
Southbound, Northbound

Site Code: 63940001
6394SPD1

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	76 999	Total	85th Percent	95th Percent
09/12/14	4	5	6	0	0	0	0	0	0	0	0	0	0	0	15	23	24
01:00	3	2	3	2	0	0	0	0	0	0	0	0	0	0	10	26	28
02:00	4	5	1	0	0	0	0	0	0	0	0	0	0	0	10	19	22
03:00	2	3	0	0	0	0	0	0	0	0	0	0	0	0	5	18	19
04:00	1	7	3	2	0	0	0	0	0	0	0	0	0	0	13	25	28
05:00	7	15	11	3	0	0	0	0	0	0	0	0	0	0	36	23	26
06:00	18	13	21	6	**2**	0	0	0	0	0	0	0	0	0	60	24	29
07:00	35	33	35	24	2	0	0	0	0	0	0	0	0	0	129	26	29
08:00	63	45	42	15	2	0	0	0	0	0	0	0	0	0	167	24	27
09:00	129	96	68	20	0	0	0	0	0	0	0	0	0	0	313	23	26
10:00	150	184	112	26	0	0	0	0	0	0	0	0	0	0	472	23	25
11:00	**171**	**196**	**163**	**34**	2	0	0	0	0	0	0	0	0	0	**566**	23	26
12 PM	**199**	227	166	25	1	0	0	0	0	0	0	0	0	0	618	22	24
13:00	197	237	163	18	2	**3**	0	0	0	0	0	0	0	0	620	22	24
14:00	170	**289**	157	19	1	0	0	0	0	0	0	0	0	0	**636**	22	24
15:00	118	215	173	**37**	1	0	0	0	0	0	0	0	0	0	544	23	26
16:00	131	207	**208**	29	**3**	0	0	0	0	0	0	0	0	0	578	23	25
17:00	140	229	199	35	3	1	0	0	0	0	0	0	0	0	607	23	26
18:00	156	188	163	34	1	0	0	0	0	0	0	0	0	0	542	23	26
19:00	157	201	107	19	0	0	0	0	0	0	0	0	0	0	484	22	24
20:00	106	160	93	14	2	0	0	0	0	0	0	0	0	0	375	22	24
21:00	58	123	63	8	0	0	0	0	0	0	0	0	0	0	252	22	24
22:00	29	49	33	11	1	0	0	0	0	0	0	0	0	0	123	24	27
23:00	9	23	16	5	1	0	0	0	0	0	0	0	0	0	54	24	28
Total	2057	2752	2006	386	24	4	0	0	0	0	0	0	0	0	7229		
Percent	28.5%	38.1%	27.7%	5.3%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	06:00										11:00		
Vol.	171	196	163	34	2										566		
PM Peak	12:00	14:00	16:00	15:00	16:00	13:00									14:00		
Vol.	199	289	208	37	3	3									636		

Accurate Counts
978-664-2565

Location : Ring Road
Location : North of Kohl's Driveway
City/State: Framingham, MA
Southbound, Northbound

Site Code: 63940001
6394SPD1

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	76 999	Total	85th Percent	95th Percent
09/13/14	2	13	9	2	0	0	0	0	0	0	0	0	0	0	26	23	26
01:00	1	2	4	1	0	0	0	0	0	0	0	0	0	0	8	24	27
02:00	6	2	2	0	0	0	0	0	0	0	0	0	0	0	10	21	23
03:00	6	9	4	2	0	0	0	0	0	0	0	0	0	0	21	23	27
04:00	1	4	0	2	0	0	0	0	0	0	0	0	0	0	7	27	29
05:00	6	7	1	2	0	0	0	0	0	0	0	0	0	0	16	22	27
06:00	12	6	5	5	0	0	0	0	0	0	0	0	0	0	28	25	28
07:00	32	26	26	6	**2**	0	0	0	0	0	0	0	0	0	92	23	27
08:00	56	37	54	16	1	0	0	0	0	0	0	0	0	0	164	24	27
09:00	123	115	69	11	0	0	0	0	0	0	0	0	0	0	318	22	24
10:00	173	204	121	**28**	1	0	0	0	0	0	0	0	0	0	527	22	25
11:00	**217**	**288**	**153**	16	1	0	0	0	0	0	0	0	0	0	**675**	22	24
12 PM	211	302	181	22	0	0	0	0	0	0	0	0	0	0	716	22	24
13:00	225	352	172	22	1	0	0	0	0	0	0	0	0	0	772	22	24
14:00	**286**	**416**	180	19	**2**	0	0	0	0	0	0	0	0	0	**903**	21	24
15:00	279	394	**201**	13	1	0	0	0	0	0	0	0	0	0	888	22	24
16:00	218	358	185	**31**	0	0	0	0	0	0	0	0	0	0	792	22	24
17:00	156	408	194	14	1	0	0	0	0	0	0	0	0	0	773	22	24
18:00	88	291	151	15	1	0	0	0	0	0	0	0	0	0	546	22	24
19:00	71	237	95	5	0	0	0	0	0	0	0	0	0	0	408	22	24
20:00	57	184	70	8	1	0	0	0	0	0	0	0	0	0	320	22	24
21:00	44	135	58	4	0	0	0	0	0	0	0	0	0	0	241	22	24
22:00	17	49	28	9	0	0	0	0	0	0	0	0	0	0	103	23	27
23:00	12	18	23	1	0	0	0	0	0	0	0	0	0	0	54	23	24
Total	2299	3857	1986	254	12	0	0	0	0	0	0	0	0	0	8408		
Percent	27.3%	45.9%	23.6%	3.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	10:00	07:00										11:00		
Vol.	217	288	153	28	2										675		
PM Peak	14:00	14:00	15:00	16:00	14:00										14:00		
Vol.	286	416	201	31	2										903		
Grand Total	4356	6609	3992	640	36	4	0	0	0	0	0	0	0	0	15637		
Percent	27.9%	42.3%	25.5%	4.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	8 MPH
50th Percentile :	17 MPH
85th Percentile :	22 MPH
95th Percentile :	24 MPH

Statistics

10 MPH Pace Speed :	16-25 MPH
Number in Pace :	10601
Percent in Pace :	67.8%
Number of Vehicles > 20 MPH :	4672
Percent of Vehicles > 20 MPH :	29.9%
Mean Speed(Average) :	17 MPH

MASSDOT CRASH RATE WORKSHEETS

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Framingham COUNT DATE : Sep-14

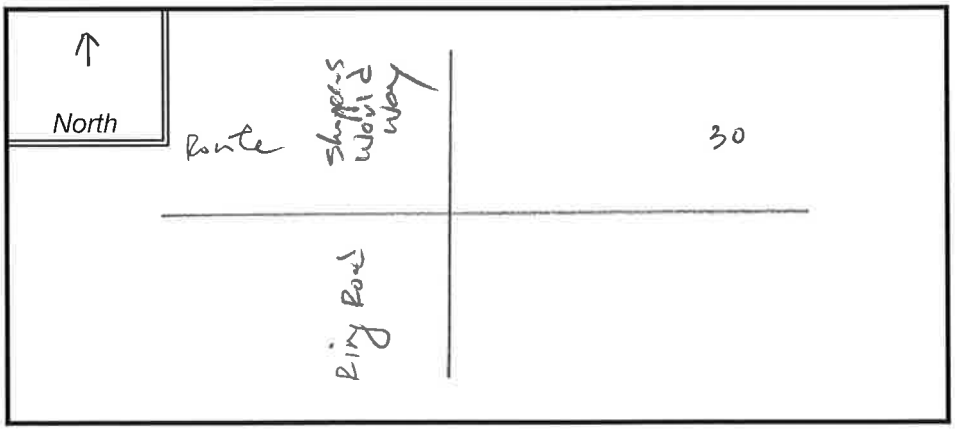
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 30

MINOR STREET(S) : Ring Road/Shoppers World Way

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	851	1,163	306	344		2,664

" K " FACTOR : 0.090 INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : 29,600

TOTAL # OF CRASHES : 14 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : 2.80

CRASH RATE CALCULATION : 0.26 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below District 3 crash rate of 0.89 for signalized intersection

Project Title & Date: Proposed Chick-Fil-A Restaurant 9/15/14

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Framingham COUNT DATE : Sep-14

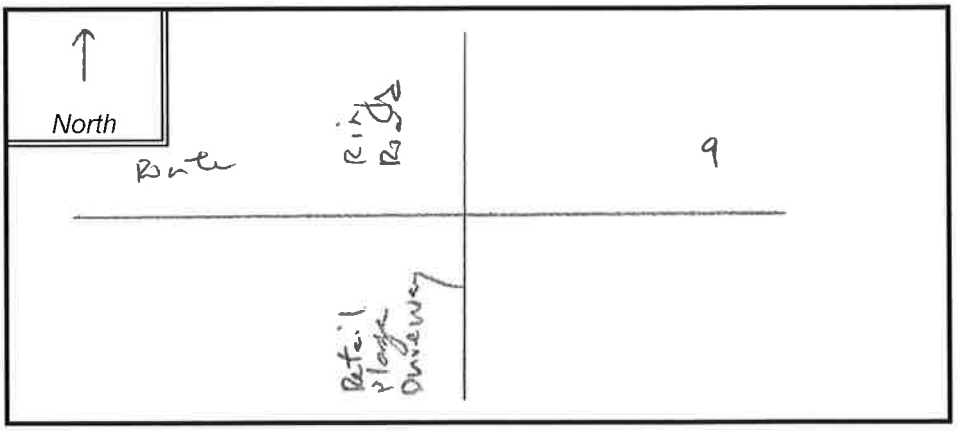
DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : Ring Road/Retail Plaza Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	2,075	1,920	131	250		4,376

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **48,622**

TOTAL # OF CRASHES : 34 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **6.80**

CRASH RATE CALCULATION : 0.38 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below District 3 crash rate of 0.89 for signalized intersection

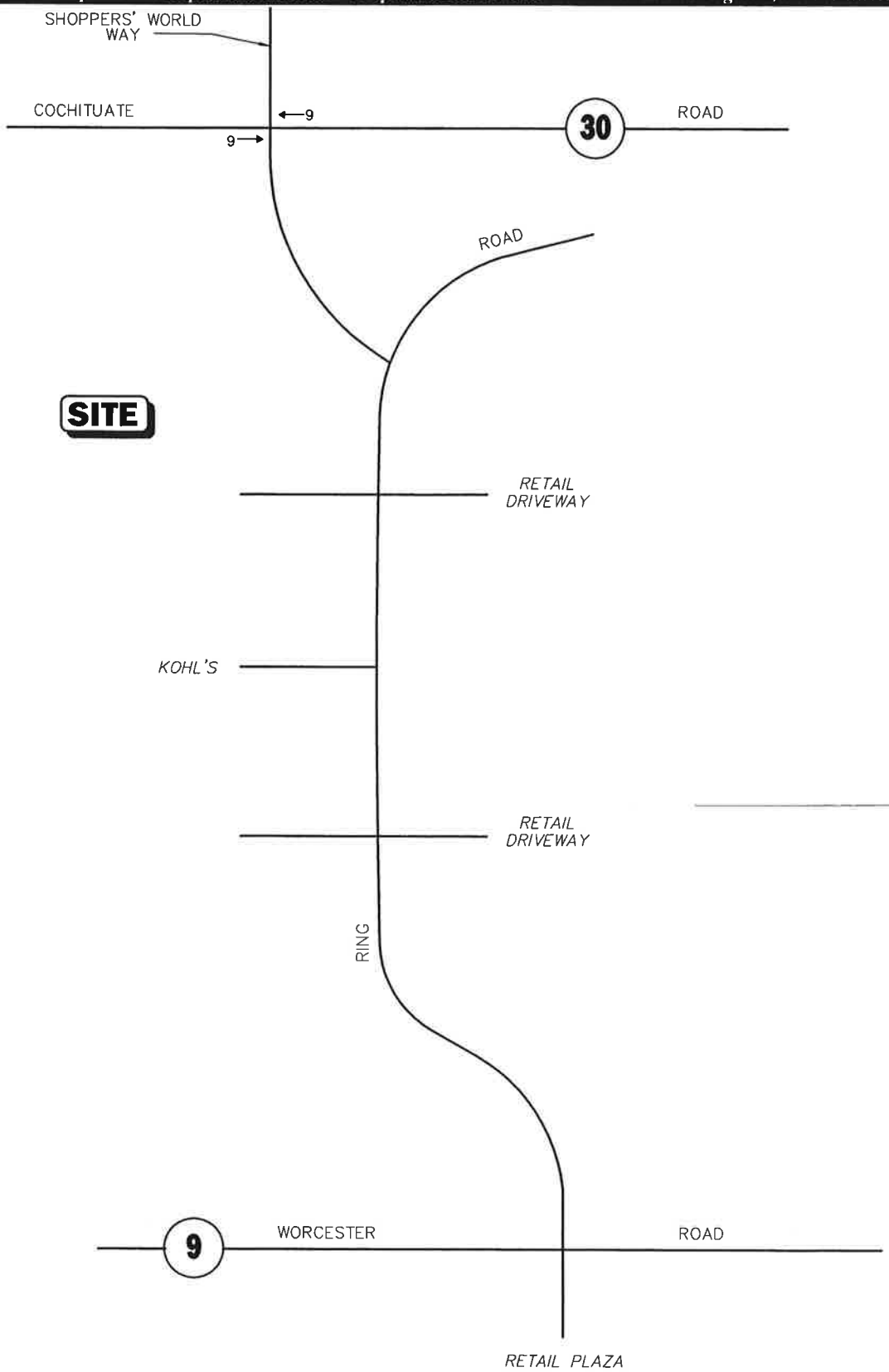
Project Title & Date: Proposed Chick-Fil-A Restaurant 9/15/14

GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth

STA.	CITY/TOWN	ROUTE/STREET	LOCATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Annual Growth Rate
4157	FRAMINGHAM	BEACON ST.	NORTH OF RTE.9			7600			7000			6600		-2.32%
4018	FRAMINGHAM	FOUNTAIN ST.	EAST OF WINTER ST.		11700			11800			11200			-0.72%
4017	FRAMINGHAM	GROVE ST.	NORTH OF MASSACHUSETTS TURNPIKE			3600			3600			3000		-2.96%
4924	FRAMINGHAM	RTE.135	EAST OF RTE.126		15400			17100			15700			0.36%
4019	FRAMINGHAM	UNION AVE.	SOUTH OF WAYTE AVE.					25400			18100			-10.68%
4016	FRAMINGHAM	WATER ST.	WEST OF NICKOLAS RD.			11900			12500					1.65%
4156	FRAMINGHAM	WINCH ST.	WEST OF GROVE ST.			1300			1600			1300		0.16%
														-2.07%

BACKGROUND DEVELOPMENT NETWORKS



Not To Scale

Figure A-1

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Avidia Bank
222 and 236 Cochituate Road
Weekday Evening
Peak Hour Traffic Volumes

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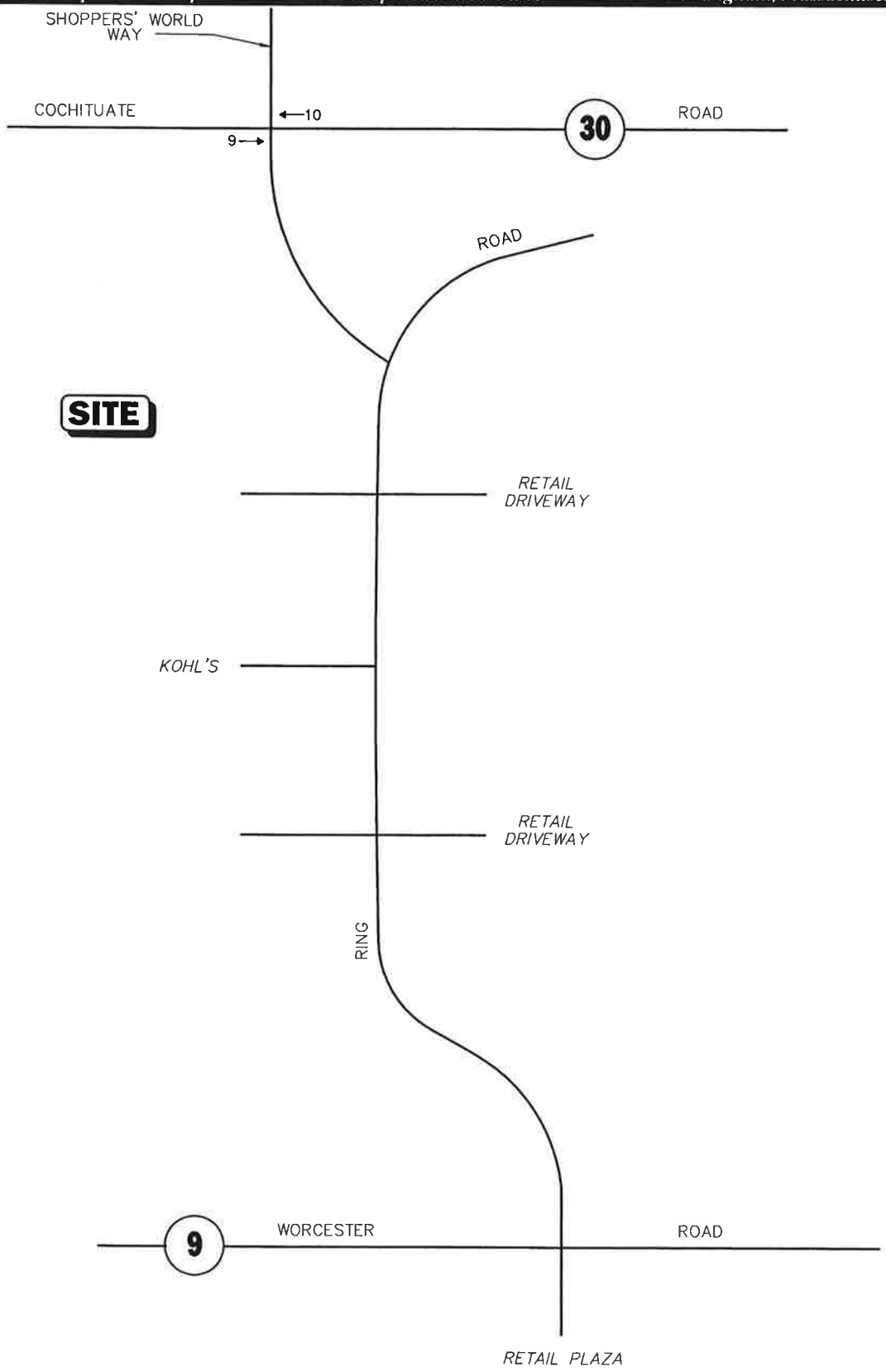

Not To Scale

Figure A-2

Avidia Bank
222 and 236 Cochituate Road
Saturday Midday
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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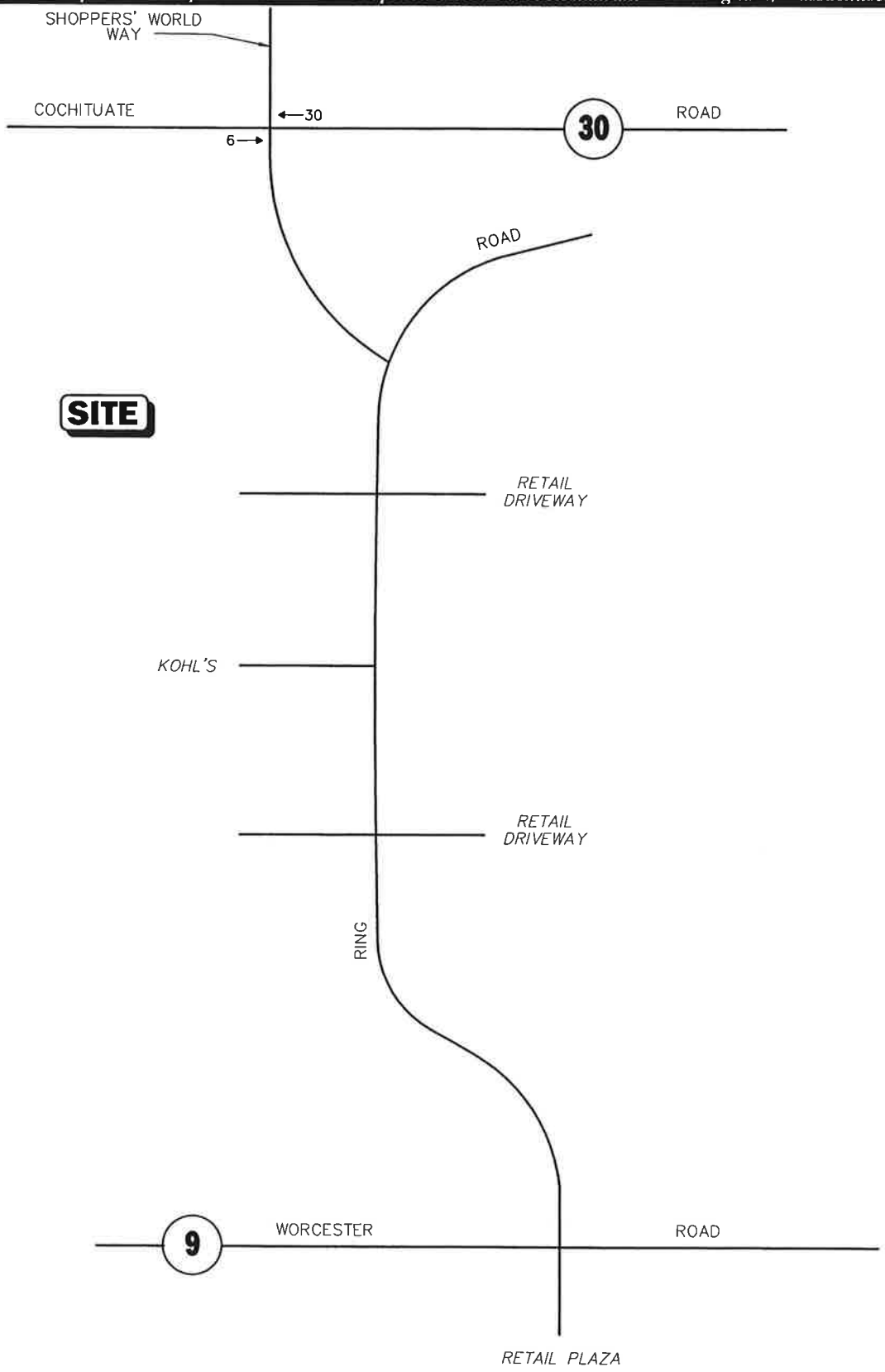

Not To Scale

Figure A-3

Vanasse & Associates, Inc.
Transportation Engineers & Planners

TJX Office Expansion
740-770 Cochituate Road
Weekday Evening
Peak Hour Traffic Volumes

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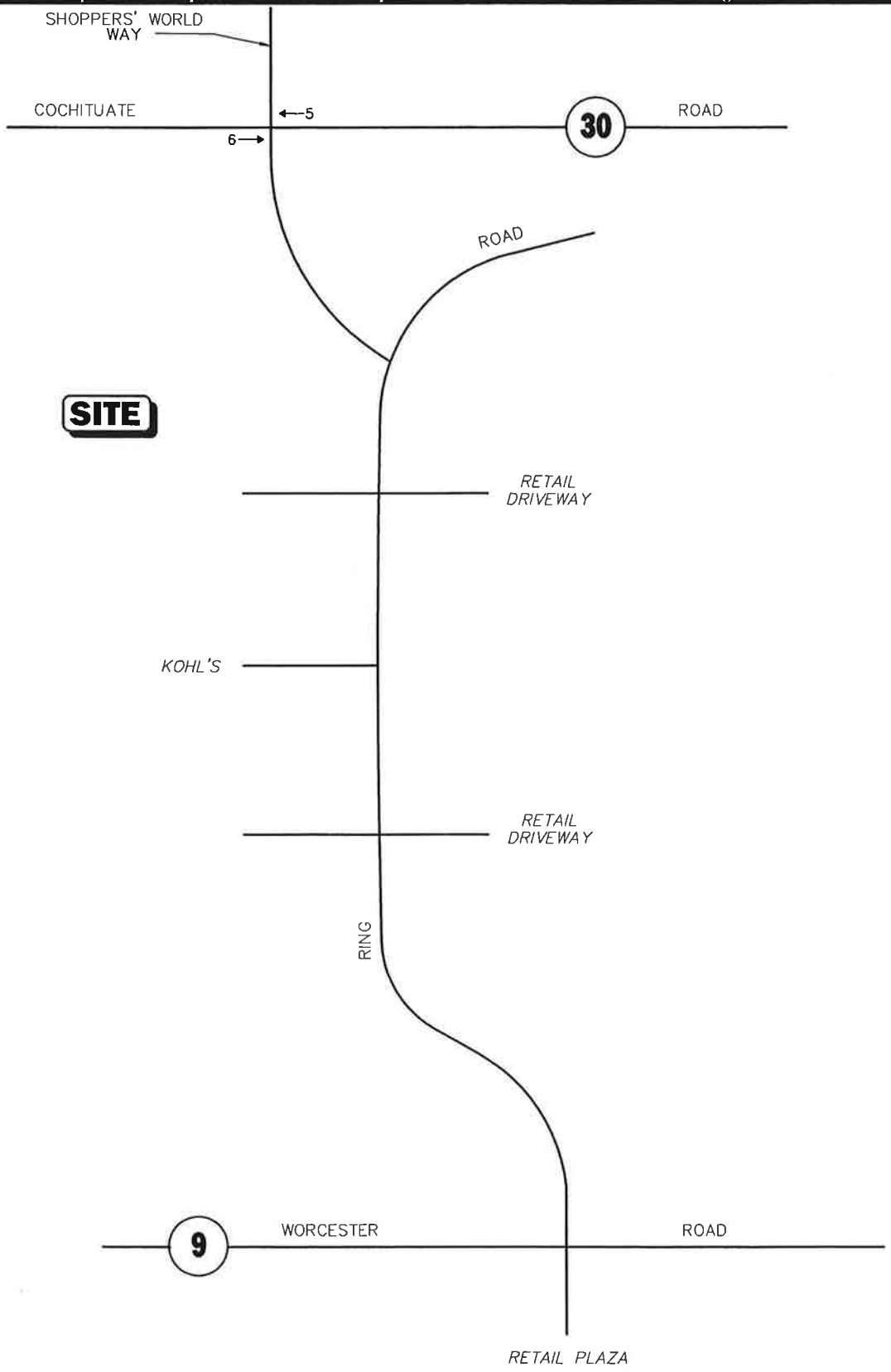

Not To Scale

Figure A-4

Vanasse & Associates, Inc.
Transportation Engineers & Planners

TJX Office Expansion
740-770 Cochituate Road
Saturday Midday
Peak Hour Traffic Volumes

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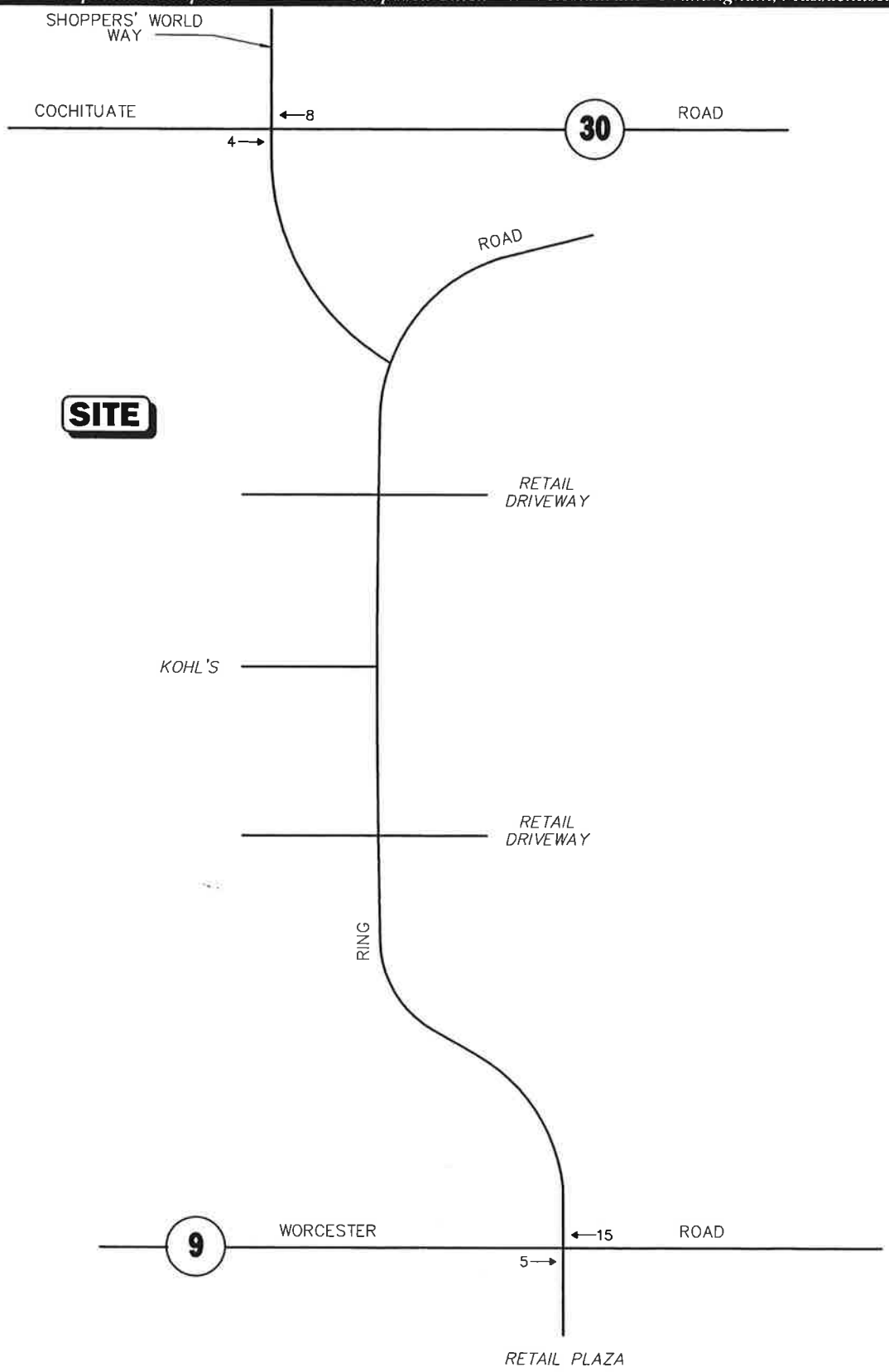

Not To Scale

Figure A-5

Vanasse & Associates, Inc.
Transportation Engineers & Planners

MathWorks
Garage Development
19 Superior Drive
Weekday Evening
Peak Hour Traffic Volumes

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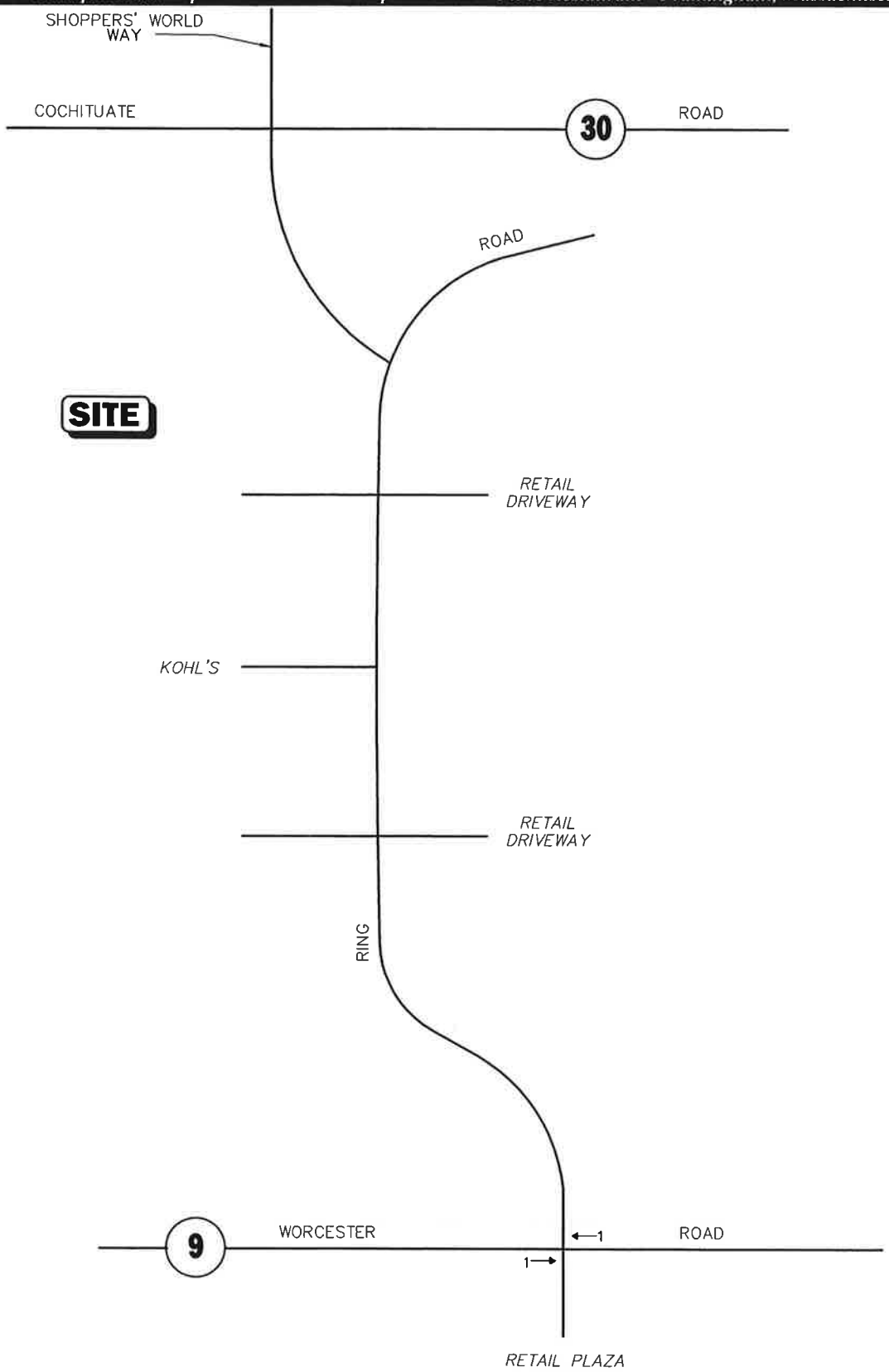

Not To Scale

Figure A-6

Vanasse & Associates, Inc.
Transportation Engineers & Planners

MathWorks
Garage Development
19 Superior Drive
Saturday Midday
Peak Hour Traffic Volumes

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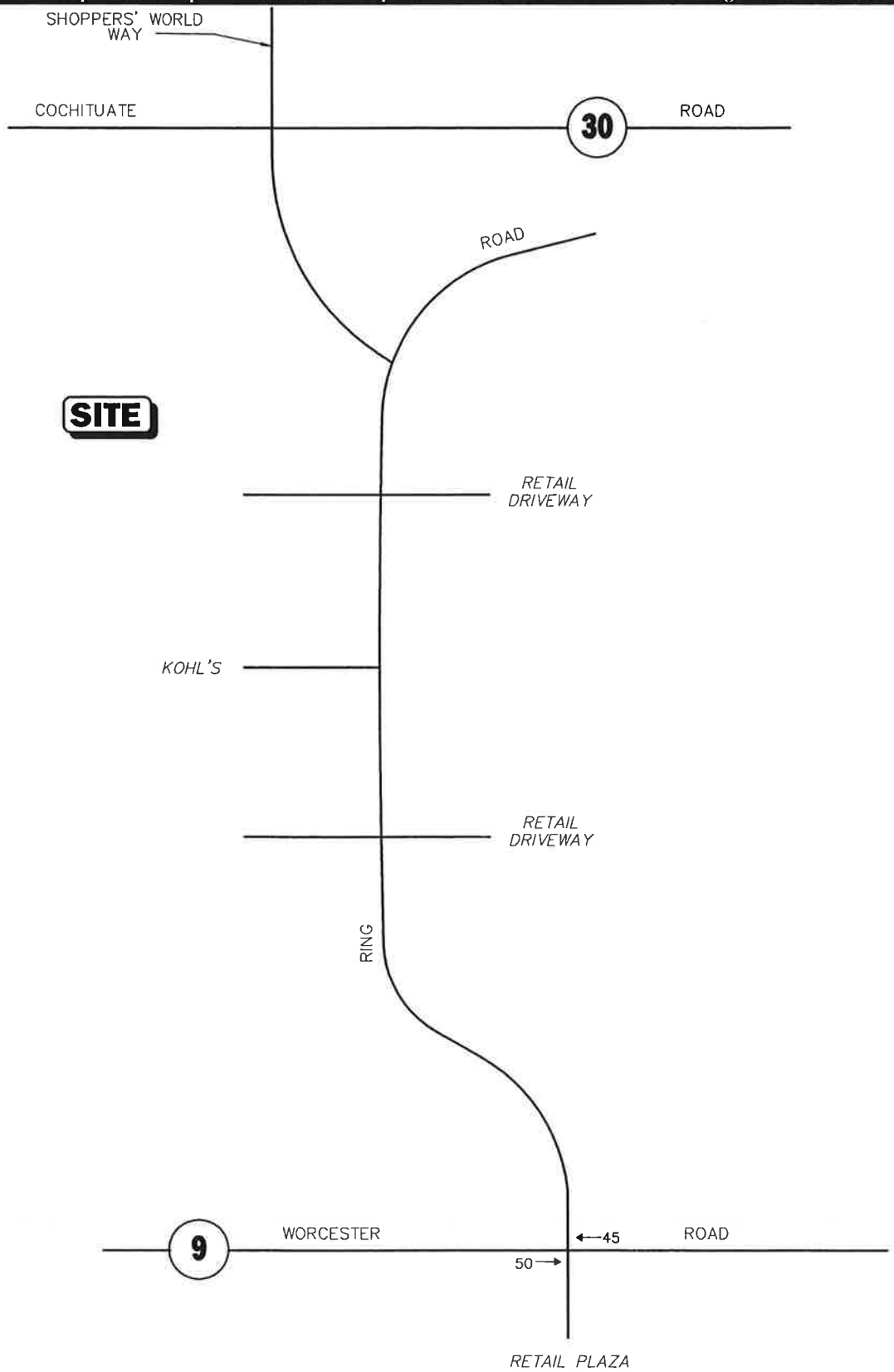

Not To Scale

Figure A-7

Sherwood Plaza South Tract Redevelopment Weekday Evening Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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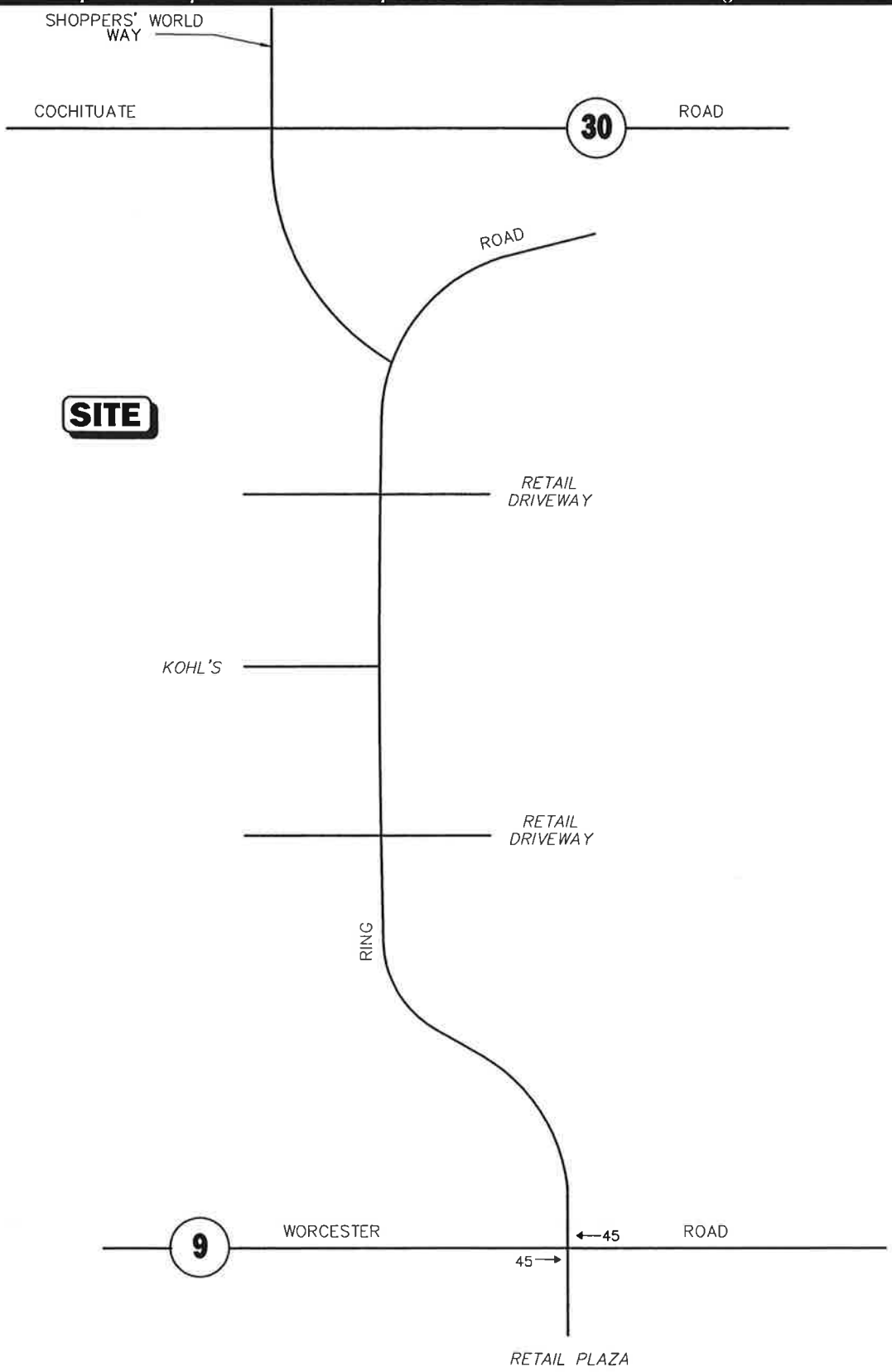

Not To Scale

Figure A-8

Sherwood Plaza South Tract Redevelopment Saturday Midday Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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TRIP-GENERATION CALCULATIONS

Institute of Transportation Engineers (ITE)
Trip Generation, 9th Edition
Land Use Code (LUC) 934 - Fast-Food Restaurant with Drive-Through Window

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Floor Area
Independent Variable (X): 4.779

AVERAGE WEEKDAY DAILY

T = 496.12 * (X)
T = 496.12 * 4.779
T = 2,370.96
T = 2,372 vehicle trips
with 50% (1,186 vpd) entering and 50% (1,186 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 32.65 * (X)
T = 32.65 * 4.779
T = 156.03
T = 156 vehicle trips
with 52% (81 vph) entering and 48% (75 vph) exiting.

SATURDAY DAILY

T = 722.03 * (X)
T = 722.03 * 4.779
T = 3,450.58
T = 3,452 vehicle trips
with 50% (1,726 vpd) entering and 50% (1,726 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 59.00 * (X)
T = 59.00 * 4.779
T = 281.96
T = 282 vehicle trips
with 51% (144 vph) entering and 49% (138 vph) exiting.

CAPACITY ANALYSIS WORKSHEETS

Route 30 (Cochituate Road) at Ring Road and Shoppers' World Way
Route 9 (Worcester Road) at Ring Road and the Retail Plaza Driveway
Ring Road at Ring Road Connector
Ring Road at the Kohl's North Driveway and a Retail Driveway
Ring Road at the Kohl's Center Driveway
Ring Road at the Kohl's South Driveway and a Retail Driveway

Route 30 (Cochituate Road) at Ring Road and Shoppers' World Way

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	153	612	86	64	978	126	162	111	33	109	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	13	13	12	12	12	12	12	12
Storage Length (ft)		225		0	180		0	0		0	0	
Storage Lanes		1		1	1		1	2		0	1	
Taper Length (ft)		25			25			25			25	
Satd. Flow (prot)	0	1805	3574	1615	1865	3693	1599	3502	1835	0	1698	1766
Flt Permitted		0.950			0.950			0.950			0.950	0.982
Satd. Flow (perm)	0	1805	3574	1615	1865	3693	1599	3502	1835	0	1698	1766
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)				96			143		10			
Link Speed (mph)			30			30			30			30
Link Distance (ft)			732			858			133			100
Travel Time (s)			16.6			19.5			3.0			2.3
Peak Hour Factor	0.98	0.98	0.98	0.90	0.88	0.88	0.88	0.96	0.96	0.96	0.84	0.84
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)											28%	
Lane Group Flow (vph)	0	162	624	96	73	1111	143	169	150	0	94	96
Turn Type	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA
Protected Phases	7	7	4	2	3	8	6	2	2		6	6
Permitted Phases				4			8					
Detector Phase	7	7	4	2	3	8	6	2	2		6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0		22.0	22.0
Total Split (s)	21.0	21.0	55.0	22.0	21.0	55.0	22.0	22.0	22.0		22.0	22.0
Total Split (%)	17.5%	17.5%	45.8%	18.3%	17.5%	45.8%	18.3%	18.3%	18.3%		18.3%	18.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
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	Lead	Lag		Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	None	None	C-Max	None	None	None		None	None
Act Effct Green (s)		16.0	64.6	84.1	12.0	58.1	72.5	15.5	15.5		14.4	14.4
Actuated g/C Ratio		0.13	0.54	0.70	0.10	0.48	0.60	0.13	0.13		0.12	0.12
v/c Ratio		0.68	0.32	0.08	0.39	0.62	0.14	0.37	0.61		0.46	0.45
Control Delay		63.7	18.4	1.9	55.9	26.2	1.2	49.6	56.7		55.9	55.3
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	18.4	1.9	55.9	26.2	1.2	49.6	56.7		55.9	55.3
LOS		E	B	A	E	C	A	D	E		E	E
Approach Delay			24.9			25.1			52.9			31.5
Approach LOS			C			C			D			C
Queue Length 50th (ft)		119	147	0	54	344	0	61	103		72	73
Queue Length 95th (ft)		195	219	20	97	431	11	95	171		116	118
Internal Link Dist (ft)			652			778			53			20
Turn Bay Length (ft)		225			180							
Base Capacity (vph)		259	1922	1191	264	1788	1066	525	283		254	264

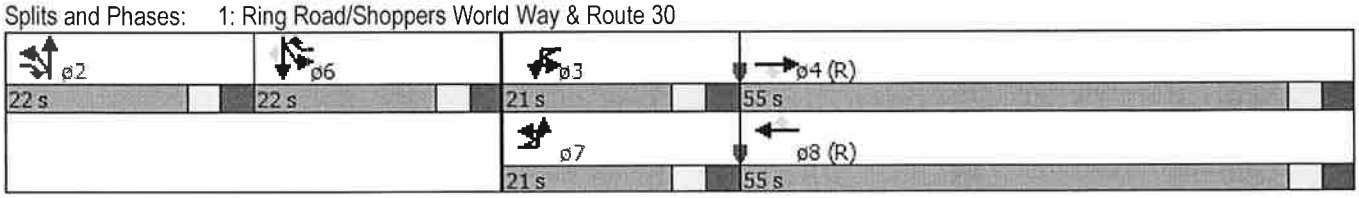
Lane Group	SBR
Lane Configurations	↱
Volume (vph)	189
Ideal Flow (vphpl)	1900
Lane Width (ft)	16
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1812
Flt Permitted	
Satd. Flow (perm)	1812
Right Turn on Red	Yes
Satd. Flow (RTOR)	225
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.84
Heavy Vehicles (%)	1%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	225
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18.3%
Yellow Time (s)	3.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	4.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	14.4
Actuated g/C Ratio	0.12
v/c Ratio	0.54
Control Delay	11.1
Queue Delay	0.0
Total Delay	11.1
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	54
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	463

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
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		0.63	0.32	0.08	0.28	0.62	0.13	0.32	0.53		0.37	0.36

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 29.0 Intersection LOS: C
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBR
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.49

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	17	199	623	183	8	108	762	189	150	156	60	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	12	13	13	12	12	12	12	12
Storage Length (ft)		225		0		180		0	0		0	0
Storage Lanes		1		1		1		1	2		0	1
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	1805	3610	1599	0	1865	3730	1599	3502	1807	0	1698
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	1805	3610	1599	0	1865	3730	1599	3502	1807	0	1698
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				203				205		14		
Link Speed (mph)			30				30			30		
Link Distance (ft)			732				858			133		
Travel Time (s)			16.6				19.5			3.0		
Peak Hour Factor	0.98	0.98	0.98	0.90	0.92	0.92	0.92	0.92	0.90	0.90	0.90	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%
Shared Lane Traffic (%)												22%
Lane Group Flow (vph)	0	220	636	203	0	126	828	205	167	240	0	113
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Split	NA		Split
Protected Phases	7	7	4	2	3	3	8	6	2	2		6
Permitted Phases				4				8				
Detector Phase	7	7	4	2	3	3	8	6	2	2		6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	10.0	22.0	21.0	22.0	22.0		21.0
Total Split (s)	21.0	21.0	52.0	26.0	21.0	21.0	52.0	21.0	26.0	26.0		21.0
Total Split (%)	17.5%	17.5%	43.3%	21.7%	17.5%	17.5%	43.3%	17.5%	21.7%	21.7%		17.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
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	Lead	Lag		Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes					
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None
Act Effct Green (s)		17.7	54.0	78.3		14.6	51.0	66.0	20.3	20.3		15.1
Actuated g/C Ratio		0.15	0.45	0.65		0.12	0.42	0.55	0.17	0.17		0.13
v/c Ratio		0.83	0.39	0.18		0.56	0.52	0.21	0.28	0.76		0.53
Control Delay		75.5	24.2	1.7		58.7	27.8	1.4	44.3	60.2		58.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		75.5	24.2	1.7		58.7	27.8	1.4	44.3	60.2		58.1
LOS		E	C	A		E	C	A	D	E		E
Approach Delay			30.6				26.5			53.7		
Approach LOS			C				C			D		
Queue Length 50th (ft)		169	181	0		93	256	0	57	166		86
Queue Length 95th (ft)		#308	238	28		154	320	17	90	258		149
Internal Link Dist (ft)			652				778			53		
Turn Bay Length (ft)		225				180						
Base Capacity (vph)		266	1624	1133		264	1585	994	642	342		240

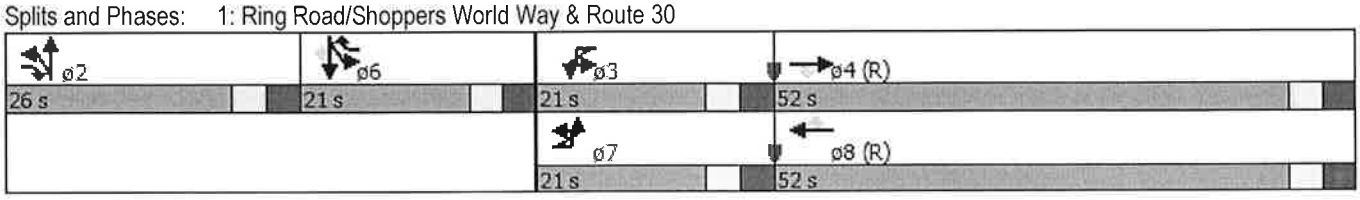
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	82	221
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	16
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1777	1830
Flt Permitted	0.987	
Satd. Flow (perm)	1777	1830
Right Turn on Red		Yes
Satd. Flow (RTOR)		233
Link Speed (mph)	30	
Link Distance (ft)	100	
Travel Time (s)	2.3	
Peak Hour Factor	0.95	0.95
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	118	233
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	21.0	21.0
Total Split (s)	21.0	21.0
Total Split (%)	17.5%	17.5%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.0	3.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	4.0	4.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)	15.1	15.1
Actuated g/C Ratio	0.13	0.13
v/c Ratio	0.53	0.54
Control Delay	57.7	10.8
Queue Delay	0.0	0.0
Total Delay	57.7	10.8
LOS	E	B
Approach Delay	34.2	
Approach LOS	C	
Queue Length 50th (ft)	89	0
Queue Length 95th (ft)	154	72
Internal Link Dist (ft)	20	
Turn Bay Length (ft)		
Base Capacity (vph)	251	459

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
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	0.39	0.18		0.48	0.52	0.21	0.26	0.70		0.47

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 32.6 Intersection LOS: C
Intersection Capacity Utilization 71.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBT	SBR
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.51

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	153	675	92	69	1096	126	174	111	35	109	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	13	13	12	12	12	12	12	12
Storage Length (ft)		225		0	180		0	0		0	0	
Storage Lanes		1		1	1		1	2		0	1	
Taper Length (ft)		25			25			25			25	
Satd. Flow (prot)	0	1805	3574	1615	1865	3693	1599	3502	1832	0	1698	1766
Flt Permitted		0.950			0.950			0.950			0.950	0.982
Satd. Flow (perm)	0	1805	3574	1615	1865	3693	1599	3502	1832	0	1698	1766
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)				102			143		11			
Link Speed (mph)			30			30			30			30
Link Distance (ft)			732			858			133			100
Travel Time (s)			16.6			19.5			3.0			2.3
Peak Hour Factor	0.98	0.98	0.98	0.90	0.88	0.88	0.88	0.96	0.96	0.96	0.84	0.84
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)											28%	
Lane Group Flow (vph)	0	162	689	102	78	1245	143	181	152	0	94	96
Turn Type	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA
Protected Phases	7	7	4	2	3	8	6	2	2		6	6
Permitted Phases				4			8					
Detector Phase	7	7	4	2	3	8	6	2	2		6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0		22.0	22.0
Total Split (s)	21.0	21.0	55.0	22.0	21.0	55.0	22.0	22.0	22.0		22.0	22.0
Total Split (%)	17.5%	17.5%	45.8%	18.3%	17.5%	45.8%	18.3%	18.3%	18.3%		18.3%	18.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
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	Lead	Lag		Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	None	None	C-Max	None	None	None		None	None
Act Effct Green (s)		16.0	64.2	83.8	12.4	58.1	72.4	15.5	15.5		14.4	14.4
Actuated g/C Ratio		0.13	0.54	0.70	0.10	0.48	0.60	0.13	0.13		0.12	0.12
v/c Ratio		0.68	0.36	0.09	0.41	0.70	0.14	0.40	0.62		0.46	0.45
Control Delay		63.7	19.0	1.9	56.0	28.2	1.2	50.0	56.5		55.9	55.3
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	19.0	1.9	56.0	28.2	1.2	50.0	56.5		55.9	55.3
LOS		E	B	A	E	C	A	D	E		E	E
Approach Delay			24.8			27.1			53.0			31.5
Approach LOS			C			C			D			C
Queue Length 50th (ft)		119	167	0	57	407	0	66	104		72	73
Queue Length 95th (ft)		195	246	21	102	504	11	101	173		116	118
Internal Link Dist (ft)			652			778			53			20
Turn Bay Length (ft)		225			180							
Base Capacity (vph)		259	1913	1189	264	1787	1066	525	284		254	264

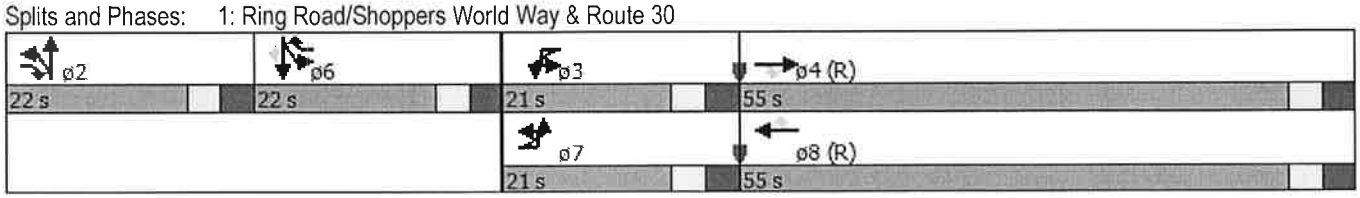
Lane Group	SBR
Lane Configurations	↱
Volume (vph)	189
Ideal Flow (vphpl)	1900
Lane Width (ft)	16
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1812
Flt Permitted	
Satd. Flow (perm)	1812
Right Turn on Red	Yes
Satd. Flow (RTOR)	225
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.84
Heavy Vehicles (%)	1%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	225
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18.3%
Yellow Time (s)	3.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	4.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	14.4
Actuated g/C Ratio	0.12
v/c Ratio	0.54
Control Delay	11.1
Queue Delay	0.0
Total Delay	11.1
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	54
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	463

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
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		0.63	0.36	0.09	0.30	0.70	0.13	0.34	0.54		0.37	0.36

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 72.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBR
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.49

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	17	199	683	196	9	116	832	189	161	156	64	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	12	13	13	12	12	12	12	12
Storage Length (ft)		225		0		180		0	0		0	0
Storage Lanes		1		1		1		1	2		0	1
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	1805	3610	1599	0	1865	3730	1599	3502	1804	0	1698
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	1805	3610	1599	0	1865	3730	1599	3502	1804	0	1698
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				218				205		15		
Link Speed (mph)			30				30			30		
Link Distance (ft)			732				858			133		
Travel Time (s)			16.6				19.5			3.0		
Peak Hour Factor	0.98	0.98	0.98	0.90	0.92	0.92	0.92	0.92	0.90	0.90	0.90	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%
Shared Lane Traffic (%)												22%
Lane Group Flow (vph)	0	220	697	218	0	136	904	205	179	244	0	113
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Split	NA		Split
Protected Phases	7	7	4	2	3	3	8	6	2	2		6
Permitted Phases				4				8				
Detector Phase	7	7	4	2	3	3	8	6	2	2		6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	10.0	22.0	21.0	22.0	22.0		21.0
Total Split (s)	21.0	21.0	52.0	26.0	21.0	21.0	52.0	21.0	26.0	26.0		21.0
Total Split (%)	17.5%	17.5%	43.3%	21.7%	17.5%	17.5%	43.3%	17.5%	21.7%	21.7%		17.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
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	Lead	Lag		Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes					
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None
Act Effct Green (s)		17.7	53.6	78.0		14.9	50.9	65.9	20.4	20.4		15.1
Actuated g/C Ratio		0.15	0.45	0.65		0.12	0.42	0.55	0.17	0.17		0.13
v/c Ratio		0.83	0.43	0.20		0.59	0.57	0.21	0.30	0.76		0.53
Control Delay		75.5	25.1	1.7		59.9	28.8	1.4	44.5	60.6		58.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		75.5	25.1	1.7		59.9	28.8	1.4	44.5	60.6		58.1
LOS		E	C	A		E	C	A	D	E		E
Approach Delay			30.3				27.7			53.8		
Approach LOS			C				C			D		
Queue Length 50th (ft)		169	205	0		100	287	0	62	168		86
Queue Length 95th (ft)		#308	265	29		165	356	17	96	#266		149
Internal Link Dist (ft)			652				778			53		
Turn Bay Length (ft)		225				180						
Base Capacity (vph)		266	1612	1133		264	1581	993	642	342		240

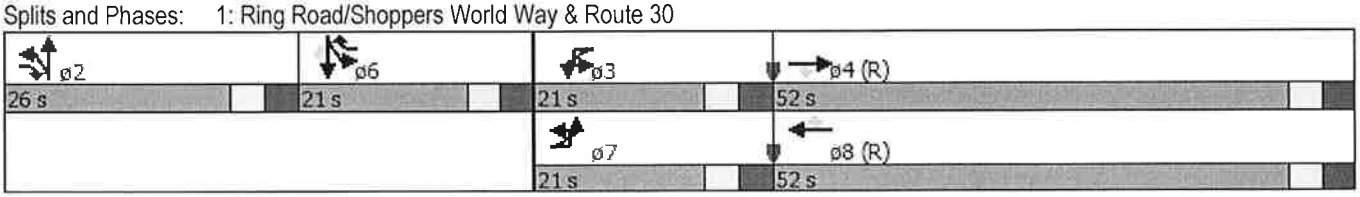
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	82	221
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	16
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1777	1830
Flt Permitted	0.987	
Satd. Flow (perm)	1777	1830
Right Turn on Red		Yes
Satd. Flow (RTOR)		233
Link Speed (mph)	30	
Link Distance (ft)	100	
Travel Time (s)	2.3	
Peak Hour Factor	0.95	0.95
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	118	233
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	21.0	21.0
Total Split (s)	21.0	21.0
Total Split (%)	17.5%	17.5%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.0	3.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	4.0	4.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)	15.1	15.1
Actuated g/C Ratio	0.13	0.13
v/c Ratio	0.53	0.54
Control Delay	57.7	10.8
Queue Delay	0.0	0.0
Total Delay	57.7	10.8
LOS	E	B
Approach Delay	34.2	
Approach LOS	C	
Queue Length 50th (ft)	89	0
Queue Length 95th (ft)	154	72
Internal Link Dist (ft)	20	
Turn Bay Length (ft)		
Base Capacity (vph)	251	459

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
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	0.43	0.19		0.52	0.57	0.21	0.28	0.71		0.47

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 32.9 Intersection LOS: C
Intersection Capacity Utilization 74.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBT	SBR
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.51

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	153	669	111	87	1086	126	195	111	48	109	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	13	13	12	12	12	12	12	12
Storage Length (ft)		225		0	180		0	0		0	0	
Storage Lanes		1		1	1		1	2		0	1	
Taper Length (ft)		25			25			25			25	
Satd. Flow (prot)	0	1805	3574	1615	1865	3693	1599	3502	1814	0	1698	1766
Flt Permitted		0.950			0.950			0.950			0.950	0.982
Satd. Flow (perm)	0	1805	3574	1615	1865	3693	1599	3502	1814	0	1698	1766
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)				123			143		15			
Link Speed (mph)			30			30			30			30
Link Distance (ft)			732			858			133			100
Travel Time (s)			16.6			19.5			3.0			2.3
Peak Hour Factor	0.98	0.98	0.98	0.90	0.88	0.88	0.88	0.96	0.96	0.96	0.84	0.84
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)											28%	
Lane Group Flow (vph)	0	162	683	123	99	1234	143	203	166	0	94	96
Turn Type	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA		Split	NA
Protected Phases	7	7	4	2	3	8	6	2	2		6	6
Permitted Phases				4			8					
Detector Phase	7	7	4	2	3	8	6	2	2		6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	22.0	22.0	22.0	22.0		22.0	22.0
Total Split (s)	21.0	21.0	55.0	22.0	21.0	55.0	22.0	22.0	22.0		22.0	22.0
Total Split (%)	17.5%	17.5%	45.8%	18.3%	17.5%	45.8%	18.3%	18.3%	18.3%		18.3%	18.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
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	Lead	Lag		Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Recall Mode	None	None	C-Max	None	None	C-Max	None	None	None		None	None
Act Effct Green (s)		16.0	60.1	80.2	13.5	57.6	71.9	16.1	16.1		14.4	14.4
Actuated g/C Ratio		0.13	0.50	0.67	0.11	0.48	0.60	0.13	0.13		0.12	0.12
v/c Ratio		0.68	0.38	0.11	0.47	0.70	0.14	0.43	0.65		0.46	0.45
Control Delay		63.7	20.8	1.9	56.9	28.5	1.2	50.3	56.8		55.9	55.3
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	20.8	1.9	56.9	28.5	1.2	50.3	56.8		55.9	55.3
LOS		E	C	A	E	C	A	D	E		E	E
Approach Delay			25.6			27.8			53.2			31.5
Approach LOS			C			C			D			C
Queue Length 50th (ft)		119	174	0	73	412	0	74	110		72	73
Queue Length 95th (ft)		195	247	23	123	498	11	111	185		116	118
Internal Link Dist (ft)			652			778			53			20
Turn Bay Length (ft)		225			180							
Base Capacity (vph)		259	1789	1143	264	1771	1059	525	284		254	264

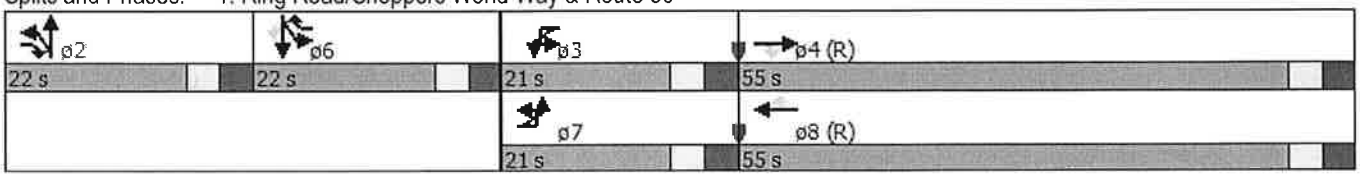
Lane Group	SBR
Lane Configurations	↱
Volume (vph)	189
Ideal Flow (vphpl)	1900
Lane Width (ft)	16
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1812
Flt Permitted	
Satd. Flow (perm)	1812
Right Turn on Red	Yes
Satd. Flow (RTOR)	225
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.84
Heavy Vehicles (%)	1%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	225
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18.3%
Yellow Time (s)	3.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	4.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	14.4
Actuated g/C Ratio	0.12
v/c Ratio	0.54
Control Delay	11.1
Queue Delay	0.0
Total Delay	11.1
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	54
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	463

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
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		0.63	0.38	0.11	0.38	0.70	0.14	0.39	0.58		0.37	0.36

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBR
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.49

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	17	199	670	232	9	146	815	189	199	156	89	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	12	12	12	12	13	13	12	12	12	12	12
Storage Length (ft)		225		0		180		0	0		0	0
Storage Lanes		1		1		1		1	2		0	1
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	1805	3610	1599	0	1865	3730	1599	3502	1784	0	1698
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	1805	3610	1599	0	1865	3730	1599	3502	1784	0	1698
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				258				205		21		
Link Speed (mph)			30				30			30		
Link Distance (ft)			732				858			133		
Travel Time (s)			16.6				19.5			3.0		
Peak Hour Factor	0.98	0.98	0.98	0.90	0.92	0.92	0.92	0.92	0.90	0.90	0.90	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	1%
Shared Lane Traffic (%)												22%
Lane Group Flow (vph)	0	220	684	258	0	169	886	205	221	272	0	113
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Split	NA		Split
Protected Phases	7	7	4	2	3	3	8	6	2	2		6
Permitted Phases				4				8				
Detector Phase	7	7	4	2	3	3	8	6	2	2		6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Minimum Split (s)	10.0	10.0	22.0	22.0	10.0	10.0	22.0	21.0	22.0	22.0		21.0
Total Split (s)	21.0	21.0	52.0	26.0	21.0	21.0	52.0	21.0	26.0	26.0		21.0
Total Split (%)	17.5%	17.5%	43.3%	21.7%	17.5%	17.5%	43.3%	17.5%	21.7%	21.7%		17.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
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	Lead	Lag		Lead	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes					
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None
Act Effct Green (s)		17.5	52.1	77.1		15.8	50.4	65.4	21.0	21.0		15.1
Actuated g/C Ratio		0.15	0.43	0.64		0.13	0.42	0.54	0.18	0.18		0.13
v/c Ratio		0.84	0.44	0.23		0.69	0.57	0.21	0.36	0.82		0.53
Control Delay		76.5	25.8	1.7		64.5	28.9	1.4	45.1	64.6		58.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		76.5	25.8	1.7		64.5	28.9	1.4	45.1	64.6		58.1
LOS		E	C	A		E	C	A	D	E		E
Approach Delay			30.0				29.2			55.9		
Approach LOS			C				C			E		
Queue Length 50th (ft)		169	203	0		125	280	0	77	188		86
Queue Length 95th (ft)		#308	259	31		201	347	17	115	#320		149
Internal Link Dist (ft)			652				778			53		
Turn Bay Length (ft)		225				180						
Base Capacity (vph)		264	1567	1130		264	1566	988	642	344		240

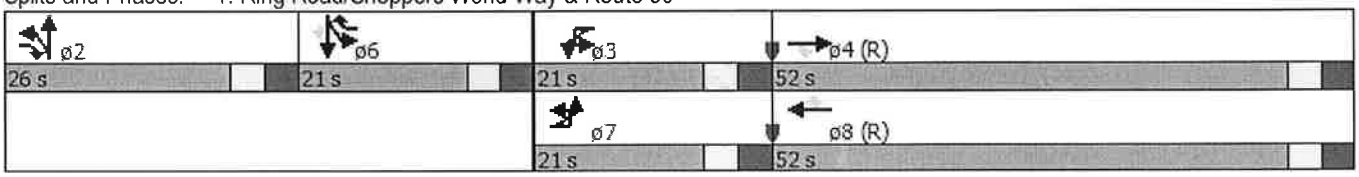
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	82	221
Ideal Flow (vphpl)	1900	1900
Lane Width (ft)	12	16
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1777	1830
Flt Permitted	0.987	
Satd. Flow (perm)	1777	1830
Right Turn on Red		Yes
Satd. Flow (RTOR)		233
Link Speed (mph)	30	
Link Distance (ft)	100	
Travel Time (s)	2.3	
Peak Hour Factor	0.95	0.95
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	118	233
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	21.0	21.0
Total Split (s)	21.0	21.0
Total Split (%)	17.5%	17.5%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	3.0	3.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	4.0	4.0
Lead/Lag		
Lead-Lag Optimize?		
Recall Mode	None	None
Act Effct Green (s)	15.1	15.1
Actuated g/C Ratio	0.13	0.13
v/c Ratio	0.53	0.54
Control Delay	57.7	10.8
Queue Delay	0.0	0.0
Total Delay	57.7	10.8
LOS	E	B
Approach Delay	34.2	
Approach LOS	C	
Queue Length 50th (ft)	89	0
Queue Length 95th (ft)	154	72
Internal Link Dist (ft)	20	
Turn Bay Length (ft)		
Base Capacity (vph)	251	459

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
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	0.44	0.23		0.64	0.57	0.21	0.34	0.79		0.47

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 34.1 Intersection LOS: C
Intersection Capacity Utilization 75.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ring Road/Shoppers World Way & Route 30



Lane Group	SBT	SBR
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.51

Intersection Summary

Route 9 (Worcester Road) at Ring Road and the Retail Plaza Driveway

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	23	213	1745	94	71	45	1617	187	44	26	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	3385	4974	0	0	3475	5187	1615	0	1843	1615	0
Flt Permitted		0.950				0.950				0.970		
Satd. Flow (perm)	0	3385	4974	0	0	3475	5187	1615	0	1843	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			13					197			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.91	0.91	0.91	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	251	1956	0	0	122	1702	197	0	77	67	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?			Yes		Yes	Yes						
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	65.6			10.9	59.5	59.5		11.5	11.5	
Actuated g/C Ratio		0.17	0.66			0.11	0.60	0.60		0.12	0.12	
v/c Ratio		0.44	0.60			0.32	0.55	0.19		0.36	0.20	
Control Delay		39.9	11.2			43.1	13.4	2.0		45.0	1.4	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		39.9	11.2			43.1	13.4	2.0		45.0	1.4	
LOS		D	B			D	B	A		D	A	
Approach Delay			14.4				14.1			24.7		
Approach LOS			B				B			C		
Queue Length 50th (ft)		74	231			37	222	0		46	0	
Queue Length 95th (ft)		113	328			63	289	30		88	0	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)												
Base Capacity (vph)		575	3269			556	3086	1040		313	410	
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	

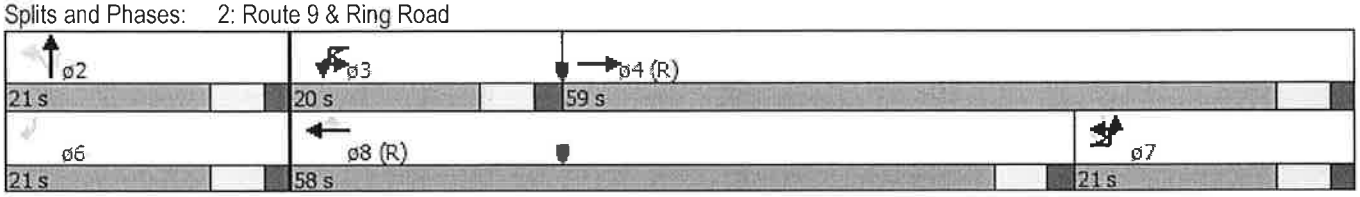
Lane Group	SBT	SBR	ø6
Lane Configurations			
Volume (vph)	0	250	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.85	0.85	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	294	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		32.5	
Actuated g/C Ratio		0.32	
v/c Ratio		0.44	
Control Delay		19.0	
Queue Delay		0.0	
Total Delay		19.0	
LOS		B	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		95	
Queue Length 95th (ft)		146	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Reduced v/c Ratio		0.44	0.60			0.22	0.55	0.19		0.25	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	27	319	1709	138	147	85	1347	286	46	50	90	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)		200		0		200		200	0		75	0
Storage Lanes		2		0		2		1	0		1	0
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	3385	4913	0	0	3502	5187	1615	0	1856	1615	0
Flt Permitted		0.950				0.950				0.977		
Satd. Flow (perm)	0	3385	4913	0	0	3502	5187	1615	0	1856	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			20					308			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	364	1944	0	0	249	1448	308	0	103	97	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?			Yes		Yes	Yes						
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	61.1			14.0	58.1	58.1		12.9	12.9	
Actuated g/C Ratio		0.17	0.61			0.14	0.58	0.58		0.13	0.13	
v/c Ratio		0.63	0.65			0.51	0.48	0.29		0.43	0.28	
Control Delay		44.2	14.3			43.3	13.2	2.1		45.1	2.6	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		44.2	14.3			43.3	13.2	2.1		45.1	2.6	
LOS		D	B			D	B	A		D	A	
Approach Delay			19.1				15.2			24.5		
Approach LOS			B				B			C		
Queue Length 50th (ft)		112	268			76	182	0		62	0	
Queue Length 95th (ft)		160	372			113	245	38		109	6	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)		200				200		200			75	
Base Capacity (vph)		575	3010			560	3015	1067		315	410	

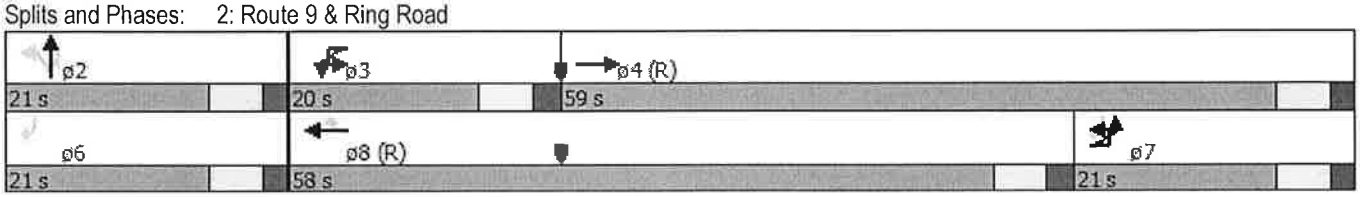
Lane Group	SBT	SBR	ø6
Lane Configurations			
Volume (vph)	0	427	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Storage Length (ft)		0	
Storage Lanes		1	
Taper Length (ft)			
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.97	0.97	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	440	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		33.9	
Actuated g/C Ratio		0.34	
v/c Ratio		0.63	
Control Delay		25.4	
Queue Delay		0.0	
Total Delay		25.4	
LOS		C	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		182	
Queue Length 95th (ft)		268	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
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	0.65			0.44	0.48	0.29		0.33	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 18.3 — Intersection LOS: B
Intersection Capacity Utilization 80.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	SBT	SBR	ø6
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	
Reduced v/c Ratio		0.57	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	25	228	1926	94	76	45	1794	200	44	26	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	3385	4979	0	0	3476	5187	1615	0	1843	1615	0
Flt Permitted		0.950				0.950				0.970		
Satd. Flow (perm)	0	3385	4979	0	0	3476	5187	1615	0	1843	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			12					211			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.91	0.91	0.91	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	2149	0	0	127	1888	211	0	77	67	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?			Yes		Yes	Yes						
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	65.5			11.0	59.5	59.5		11.5	11.5	
Actuated g/C Ratio		0.17	0.66			0.11	0.60	0.60		0.12	0.12	
v/c Ratio		0.47	0.66			0.33	0.61	0.20		0.36	0.20	
Control Delay		40.5	12.3			43.0	14.3	1.9		45.0	1.4	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		40.5	12.3			43.0	14.3	1.9		45.0	1.4	
LOS		D	B			D	B	A		D	A	
Approach Delay			15.4				14.8			24.7		
Approach LOS			B				B			C		
Queue Length 50th (ft)		80	272			39	260	0		46	0	
Queue Length 95th (ft)		121	386			65	336	31		88	0	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)												
Base Capacity (vph)		575	3265			556	3086	1046		313	410	
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	

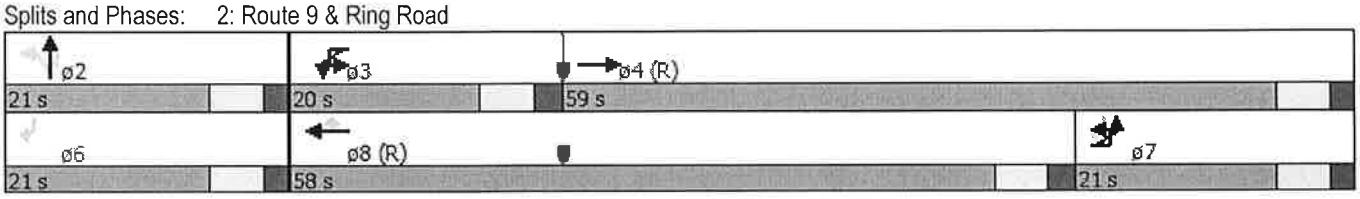
Lane Group	SBT	SBR	ø6
Lane Configurations		↱	
Volume (vph)	0	268	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.85	0.85	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	315	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		32.5	
Actuated g/C Ratio		0.32	
v/c Ratio		0.47	
Control Delay		20.2	
Queue Delay		0.0	
Total Delay		20.2	
LOS		C	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		107	
Queue Length 95th (ft)		161	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Reduced v/c Ratio		0.47	0.66			0.23	0.61	0.20		0.25	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 15.7 Intersection LOS: B
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	SBT	SBR	ø6
Reduced v/c Ratio		0.41	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	29	342	1878	138	158	85	1490	307	46	50	90	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)		200		0		200		200	0		75	0
Storage Lanes		2		0		2		1	0		1	0
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	3385	4918	0	0	3502	5187	1615	0	1856	1615	0
Flt Permitted		0.950				0.950				0.977		
Satd. Flow (perm)	0	3385	4918	0	0	3502	5187	1615	0	1856	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			18					330			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	391	2122	0	0	261	1602	330	0	103	97	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes				
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	60.8			14.3	58.1	58.1		12.9	12.9	
Actuated g/C Ratio		0.17	0.61			0.14	0.58	0.58		0.13	0.13	
v/c Ratio		0.68	0.71			0.52	0.53	0.31		0.43	0.28	
Control Delay		45.7	15.8			43.4	13.9	2.1		44.9	2.6	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		45.7	15.8			43.4	13.9	2.1		44.9	2.6	
LOS		D	B			D	B	A		D	A	
Approach Delay			20.5				15.7			24.4		
Approach LOS			C				B			C		
Queue Length 50th (ft)		121	315			79	210	0		62	0	
Queue Length 95th (ft)		172	431			118	279	39		109	6	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)		200				200		200			75	
Base Capacity (vph)		575	2996			561	3011	1075		315	410	

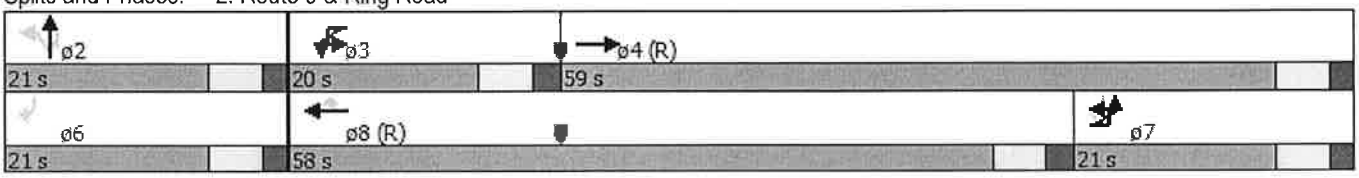
Lane Group	SBT	SBR	ø6
Lane Configurations		↱	
Volume (vph)	0	458	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Storage Length (ft)		0	
Storage Lanes		1	
Taper Length (ft)			
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.97	0.97	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	472	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		33.9	
Actuated g/C Ratio		0.34	
v/c Ratio		0.68	
Control Delay		27.2	
Queue Delay		0.0	
Total Delay		27.2	
LOS		C	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		204	
Queue Length 95th (ft)		296	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
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	0.71			0.47	0.53	0.31		0.33	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 19.2 Intersection LOS: B
Intersection Capacity Utilization 86.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	SBT	SBR	ø6
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	
Reduced v/c Ratio		0.61	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	25	243	1921	94	76	45	1789	212	44	26	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	3385	4979	0	0	3476	5187	1615	0	1843	1615	0
Flt Permitted		0.950				0.950				0.970		
Satd. Flow (perm)	0	3385	4979	0	0	3476	5187	1615	0	1843	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			12					223			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.91	0.91	0.91	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	286	2144	0	0	127	1883	223	0	77	67	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?			Yes		Yes	Yes						
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	65.5			11.0	59.5	59.5		11.5	11.5	
Actuated g/C Ratio		0.17	0.66			0.11	0.60	0.60		0.12	0.12	
v/c Ratio		0.50	0.66			0.33	0.61	0.21		0.36	0.20	
Control Delay		41.0	12.2			43.0	14.3	1.9		45.0	1.4	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		41.0	12.2			43.0	14.3	1.9		45.0	1.4	
LOS		D	B			D	B	A		D	A	
Approach Delay			15.6				14.7			24.7		
Approach LOS			B				B			C		
Queue Length 50th (ft)		86	271			39	259	0		46	0	
Queue Length 95th (ft)		127	384			65	335	31		88	0	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)												
Base Capacity (vph)		575	3265			556	3086	1051		313	410	
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	

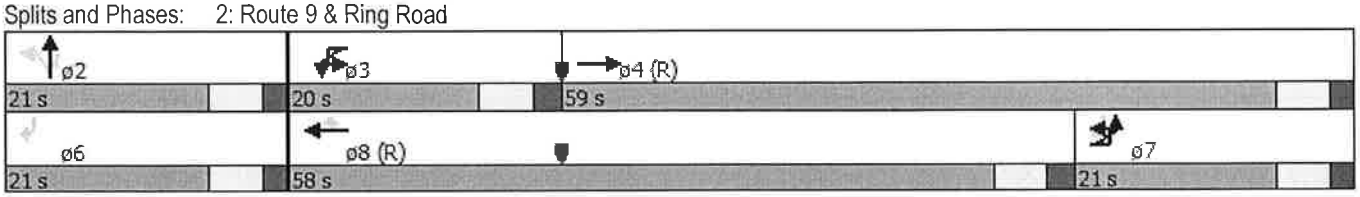
Lane Group	SBT	SBR	ø6
Lane Configurations			
Volume (vph)	0	281	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.85	0.85	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	331	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		32.5	
Actuated g/C Ratio		0.32	
v/c Ratio		0.49	
Control Delay		21.0	
Queue Delay		0.0	
Total Delay		21.0	
LOS		C	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		116	
Queue Length 95th (ft)		171	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Reduced v/c Ratio		0.50	0.66			0.23	0.61	0.21		0.25	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 15.8 Intersection LOS: B
Intersection Capacity Utilization 76.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	SBT	SBR	ø6
Reduced v/c Ratio		0.43	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	29	369	1868	138	158	85	1482	328	46	50	90	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	12	12	12	12	12	12	12	12	12
Storage Length (ft)		200		0		200		200	0		75	0
Storage Lanes		2		0		2		1	0		1	0
Taper Length (ft)		25				25			25			25
Satd. Flow (prot)	0	3385	4918	0	0	3502	5187	1615	0	1856	1615	0
Flt Permitted		0.950				0.950				0.977		
Satd. Flow (perm)	0	3385	4918	0	0	3502	5187	1615	0	1856	1615	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)			18					353			164	
Link Speed (mph)			30				30			30		
Link Distance (ft)			702				953			141		
Travel Time (s)			16.0				21.7			3.2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	2111	0	0	261	1594	353	0	103	97	0
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Perm	NA	Perm	
Protected Phases	7	7	4		3	3	8			2		
Permitted Phases								8	2		2	
Detector Phase	7	7	4		3	3	8	8	2	2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	22.0		10.0	10.0	22.0	22.0	21.0	21.0	21.0	
Total Split (s)	21.0	21.0	59.0		20.0	20.0	58.0	58.0	21.0	21.0	21.0	
Total Split (%)	21.0%	21.0%	59.0%		20.0%	20.0%	58.0%	58.0%	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	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	
Total Lost Time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes				
Recall Mode	None	None	C-Max		None	None	C-Max	C-Max	None	None	None	
Act Effct Green (s)		17.0	60.5			14.3	57.8	57.8		13.2	13.2	
Actuated g/C Ratio		0.17	0.60			0.14	0.58	0.58		0.13	0.13	
v/c Ratio		0.73	0.71			0.52	0.53	0.33		0.42	0.27	
Control Delay		47.6	16.0			43.4	14.1	2.1		44.3	2.5	
Queue Delay		0.0	0.0			0.0	0.0	0.0		0.0	0.0	
Total Delay		47.6	16.0			43.4	14.1	2.1		44.3	2.5	
LOS		D	B			D	B	A		D	A	
Approach Delay			21.3				15.6			24.0		
Approach LOS			C				B			C		
Queue Length 50th (ft)		131	312			79	209	0		62	0	
Queue Length 95th (ft)		184	427			118	278	40		109	6	
Internal Link Dist (ft)			622				873			61		
Turn Bay Length (ft)		200				200		200			75	
Base Capacity (vph)		575	2982			561	2996	1082		315	410	

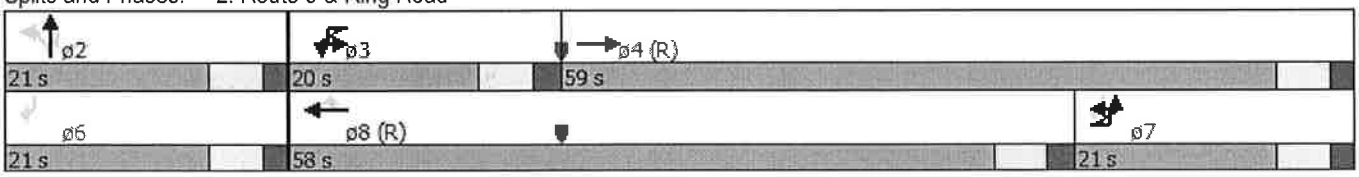
Lane Group	SBT	SBR	ø6
Lane Configurations			
Volume (vph)	0	481	
Ideal Flow (vphpl)	1900	1900	
Lane Width (ft)	12	16	
Storage Length (ft)		0	
Storage Lanes		1	
Taper Length (ft)			
Satd. Flow (prot)	0	1863	
Flt Permitted			
Satd. Flow (perm)	0	1863	
Right Turn on Red		Yes	
Satd. Flow (RTOR)		98	
Link Speed (mph)	30		
Link Distance (ft)	531		
Travel Time (s)	12.1		
Peak Hour Factor	0.97	0.97	
Heavy Vehicles (%)	0%	0%	
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	496	
Turn Type		custom	
Protected Phases			6
Permitted Phases		6 7	
Detector Phase		6 7	
Switch Phase			
Minimum Initial (s)			4.0
Minimum Split (s)			21.0
Total Split (s)			21.0
Total Split (%)			21%
Yellow Time (s)			4.0
All-Red Time (s)			2.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Recall Mode			None
Act Effct Green (s)		34.2	
Actuated g/C Ratio		0.34	
v/c Ratio		0.71	
Control Delay		28.3	
Queue Delay		0.0	
Total Delay		28.3	
LOS		C	
Approach Delay			
Approach LOS			
Queue Length 50th (ft)		221	
Queue Length 95th (ft)		319	
Internal Link Dist (ft)	451		
Turn Bay Length (ft)			
Base Capacity (vph)		768	

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Starvation Cap Reductn		0	0			0	0	0		0	0	
Spillback Cap Reductn		0	0			0	0	0		0	0	
Storage Cap Reductn		0	0			0	0	0		0	0	
Reduced v/c Ratio		0.73	0.71			0.47	0.53	0.33		0.33	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Route 9 & Ring Road



Lane Group	SBT	SBR	ø6
Starvation Cap Reductn		0	
Spillback Cap Reductn		0	
Storage Cap Reductn		0	
Reduced v/c Ratio		0.65	

Intersection Summary

Ring Road at Ring Road Connector

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	272	29	19	181	7	34
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.75	0.75
Hourly flow rate (vph)	306	33	21	199	9	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	55		676	32		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55		676	32		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	80		94	81		
cM capacity (veh/h)	1563		340	1048		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	338	220	55
Volume Left	306	21	0
Volume Right	0	199	45
cSH	1563	874	1700
Volume to Capacity	0.20	0.25	0.03
Queue Length 95th (ft)	18	25	0
Control Delay (s)	7.3	10.5	0.0
Lane LOS	A	B	
Approach Delay (s)	7.3	10.5	0.0
Approach LOS		B	

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	337	68	35	338	17	29
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.64	0.64
Hourly flow rate (vph)	401	81	38	367	27	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	72		933	49		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	72		933	49		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	74		83	64		
cM capacity (veh/h)	1541		220	1025		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	482	405	72
Volume Left	401	38	0
Volume Right	0	367	45
cSH	1541	764	1700
Volume to Capacity	0.26	0.53	0.04
Queue Length 95th (ft)	26	79	0
Control Delay (s)	7.2	14.9	0.0
Lane LOS	A	B	
Approach Delay (s)	7.2	14.9	0.0
Approach LOS		B	

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	284	31	20	191	8	36
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.75	0.75
Hourly flow rate (vph)	319	35	22	210	11	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	59		708	35		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	59		708	35		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	80		93	80		
cM capacity (veh/h)	1558		322	1044		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	354	232	59
Volume Left	319	22	0
Volume Right	0	210	48
cSH	1558	861	1700
Volume to Capacity	0.20	0.27	0.03
Queue Length 95th (ft)	19	27	0
Control Delay (s)	7.3	10.7	0.0
Lane LOS	A	B	
Approach Delay (s)	7.3	10.7	0.0
Approach LOS		B	

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	350	73	37	357	18	31
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.64	0.64
Hourly flow rate (vph)	417	87	40	388	28	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	77		973	52		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77		973	52		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	73		80	62		
cM capacity (veh/h)	1535		206	1021		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	504	428	77
Volume Left	417	40	0
Volume Right	0	388	48
cSH	1535	744	1700
Volume to Capacity	0.27	0.58	0.05
Queue Length 95th (ft)	28	93	0
Control Delay (s)	7.2	16.2	0.0
Lane LOS	A	C	
Approach Delay (s)	7.2	16.2	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	318	42	20	228	8	36
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.75	0.75
Hourly flow rate (vph)	357	47	22	251	11	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	59		796	35		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	59		796	35		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	77		92	76		
cM capacity (veh/h)	1558		276	1044		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	404	273	59
Volume Left	357	22	0
Volume Right	0	251	48
cSH	1558	853	1700
Volume to Capacity	0.23	0.32	0.03
Queue Length 95th (ft)	22	35	0
Control Delay (s)	7.3	11.2	0.0
Lane LOS	A	B	
Approach Delay (s)	7.3	11.2	0.0
Approach LOS		B	

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Volume (veh/h)	413	95	37	423	18	31
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.84	0.84	0.92	0.92	0.64	0.64
Hourly flow rate (vph)	492	113	40	460	28	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (ft)	1226					
pX, platoon unblocked						
vC, conflicting volume	77		1149	52		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77		1149	52		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	68		73	55		
cM capacity (veh/h)	1535		151	1021		

Direction, Lane #	NB 1	SE 1	SW 1
Volume Total	605	500	77
Volume Left	492	40	0
Volume Right	0	460	48
cSH	1535	697	1700
Volume to Capacity	0.32	0.72	0.05
Queue Length 95th (ft)	35	153	0
Control Delay (s)	7.4	22.1	0.0
Lane LOS	A	C	
Approach Delay (s)	7.4	22.1	0.0
Approach LOS		C	

Intersection Summary			
Average Delay	13.2		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

Ring Road at the Kohl's North Driveway and a Retail Driveway

2014 Existing Weekday evening peak hour
4: Kohl's North Driveway & Ring Road

10/14/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1	20	1	0	1	10	275	1	3	155	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.25	0.25	0.25	0.88	0.88	0.88	0.91	0.91	0.91
Hourly flow rate (vph)	37	1	29	4	0	4	11	312	1	3	170	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	533	530	187	559	546	313	203			314		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	533	530	187	559	546	313	203			314		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	97	99	100	99	99			100		
cM capacity (veh/h)	454	453	860	423	443	732	1380			1258		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	8	325	207
Volume Left	37	4	11	3
Volume Right	29	4	1	33
cSH	571	536	1380	1258
Volume to Capacity	0.12	0.01	0.01	0.00
Queue Length 95th (ft)	10	1	1	0
Control Delay (s)	12.1	11.8	0.3	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.1	11.8	0.3	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	68	1	36	0	0	2	31	335	1	3	292	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.25	0.25	0.25	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	80	1	42	0	0	8	34	372	1	3	317	65
Pedestrians											60	
Lane Width (ft)											14.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											6	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	866	799	350	841	831	433	383			373		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	866	799	350	841	831	433	383			373		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	100	94	100	100	99	97			100		
cM capacity (veh/h)	250	311	698	262	298	591	1187			1196		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	124	8	408	386
Volume Left	80	0	34	3
Volume Right	42	8	1	65
cSH	321	591	1187	1196
Volume to Capacity	0.38	0.01	0.03	0.00
Queue Length 95th (ft)	44	1	2	0
Control Delay (s)	23.0	11.2	1.0	0.1
Lane LOS	C	B	A	A
Approach Delay (s)	23.0	11.2	1.0	0.1
Approach LOS	C	B		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1	20	1	0	1	10	289	1	3	166	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.68	0.68	0.25	0.25	0.25	0.88	0.88	0.88	0.91	0.91	0.91
Hourly flow rate (vph)	37	1	29	4	0	4	11	328	1	3	182	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	561	558	199	587	574	329	215			330		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	561	558	199	587	574	329	215			330		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	97	99	100	99	99			100		
cM capacity (veh/h)	435	436	847	405	427	717	1367			1241		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	8	341	219
Volume Left	37	4	11	3
Volume Right	29	4	1	33
cSH	552	517	1367	1241
Volume to Capacity	0.12	0.02	0.01	0.00
Queue Length 95th (ft)	10	1	1	0
Control Delay (s)	12.4	12.1	0.3	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.4	12.1	0.3	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	68	1	36	0	0	2	31	353	1	3	312	60
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.25	0.25	0.25	0.90	0.90	0.90	0.92	0.92	0.92
Hourly flow rate (vph)	80	1	42	0	0	8	34	392	1	3	339	65
Pedestrians											60	
Lane Width (ft)											14.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											6	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	908	840	372	883	873	453	404			393		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	908	840	372	883	873	453	404			393		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	100	94	100	100	99	97			100		
cM capacity (veh/h)	234	294	679	245	281	575	1165			1176		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	124	8	428	408
Volume Left	80	0	34	3
Volume Right	42	8	1	65
cSH	303	575	1165	1176
Volume to Capacity	0.41	0.01	0.03	0.00
Queue Length 95th (ft)	48	1	2	0
Control Delay (s)	24.9	11.3	0.9	0.1
Lane LOS	C	B	A	A
Approach Delay (s)	24.9	11.3	0.9	0.1
Approach LOS	C	B		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	66	1	27	1	0	1	16	293	1	3	161	72
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	1	29	4	0	4	17	318	1	3	175	78
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	578	575	214	604	614	319	253			320		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	578	575	214	604	614	319	253			320		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	100	96	99	100	99	99			100		
cM capacity (veh/h)	419	422	826	393	403	726	1312			1252		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	102	8	337	257
Volume Left	72	4	17	3
Volume Right	29	4	1	78
cSH	488	510	1312	1252
Volume to Capacity	0.21	0.02	0.01	0.00
Queue Length 95th (ft)	20	1	1	0
Control Delay (s)	14.3	12.2	0.5	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	12.2	0.5	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	130	1	47	0	0	2	32	376	1	3	304	134
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	1	51	0	0	8	35	409	1	3	330	146
Pedestrians											60	
Lane Width (ft)											14.0	
Walking Speed (ft/s)											4.0	
Percent Blockage											6	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1101				
pX, platoon unblocked												
vC, conflicting volume	957	889	403	940	961	469	476			410		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	957	889	403	940	961	469	476			410		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	34	100	92	100	100	99	97			100		
cM capacity (veh/h)	215	275	647	220	249	563	1097			1160		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	193	8	445	479
Volume Left	141	0	35	3
Volume Right	51	8	1	146
cSH	261	563	1097	1160
Volume to Capacity	0.74	0.01	0.03	0.00
Queue Length 95th (ft)	132	1	2	0
Control Delay (s)	49.9	11.5	1.0	0.1
Lane LOS	E	B	A	A
Approach Delay (s)	49.9	11.5	1.0	0.1
Approach LOS	E	B		

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Ring Road at the Kohl's Center Driveway

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	6	9	211	97	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.44	0.44	0.96	0.96	0.74	0.74
Hourly flow rate (vph)	2	14	9	220	131	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	371	132	134			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	371	132	134			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	629	922	1463			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	229	134
Volume Left	2	9	0
Volume Right	14	0	3
cSH	865	1463	1700
Volume to Capacity	0.02	0.01	0.08
Queue Length 95th (ft)	1	0	0
Control Delay (s)	9.2	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	12	30	283	176	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.92	0.92	0.87	0.87
Hourly flow rate (vph)	16	21	33	308	202	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	576	203	205			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	576	203	205			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	98			
cM capacity (veh/h)	471	842	1379			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	340	205
Volume Left	16	33	0
Volume Right	21	0	2
cSH	630	1379	1700
Volume to Capacity	0.06	0.02	0.12
Queue Length 95th (ft)	5	2	0
Control Delay (s)	11.1	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	6	9	226	104	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.44	0.44	0.96	0.96	0.74	0.74
Hourly flow rate (vph)	2	14	9	235	141	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	396	142	143			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	142	143			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	99			
cM capacity (veh/h)	609	911	1452			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	245	143
Volume Left	2	9	0
Volume Right	14	0	3
cSH	851	1452	1700
Volume to Capacity	0.02	0.01	0.08
Queue Length 95th (ft)	1	0	0
Control Delay (s)	9.3	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	12	30	305	190	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.92	0.92	0.87	0.87
Hourly flow rate (vph)	16	21	33	332	218	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	616	220	221			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	616	220	221			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	98			
cM capacity (veh/h)	446	825	1360			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	36	364	221
Volume Left	16	33	0
Volume Right	21	0	2
cSH	605	1360	1700
Volume to Capacity	0.06	0.02	0.13
Queue Length 95th (ft)	5	2	0
Control Delay (s)	11.3	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	11.3	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	17	34	228	106	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.96	0.96	0.92	0.92
Hourly flow rate (vph)	10	18	35	238	115	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	425	116	117			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	425	116	117			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	98			
cM capacity (veh/h)	572	936	1471			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	28	273	117
Volume Left	10	35	0
Volume Right	18	0	2
cSH	767	1471	1700
Volume to Capacity	0.04	0.02	0.07
Queue Length 95th (ft)	3	2	0
Control Delay (s)	9.9	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	1.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	40	32	75	308	193	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	35	82	335	210	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				825		
pX, platoon unblocked						
vC, conflicting volume	709	211	212			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	709	211	212			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	96	94			
cM capacity (veh/h)	377	829	1358			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	78	416	212
Volume Left	43	82	0
Volume Right	35	0	2
cSH	497	1358	1700
Volume to Capacity	0.16	0.06	0.12
Queue Length 95th (ft)	14	5	0
Control Delay (s)	13.6	2.0	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	2.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Ring Road at the Kohl's South Driveway and a Retail Driveway

2014 Existing Weekday evening peak hour
6: Kohl's South Driveway & Ring Road

10/14/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	0	2	220	0	1	102	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	0	0	0	2	237	0	1	126	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	369	369	126	369	369	237	126			237		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	369	369	126	369	369	237	126			237		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	590	562	930	590	562	807	1473			1342		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	0	239	127
Volume Left	0	0	2	1
Volume Right	0	0	0	0
cSH	1700	1700	1473	1342
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.1	0.1
Lane LOS	A	A	A	A
Approach Delay (s)	0.0	0.0	0.1	0.1
Approach LOS	A	A		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	0	2	0	2	3	310	5	3	186	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.33	0.33	0.33	0.92	0.92	0.92	0.82	0.82	0.82
Hourly flow rate (vph)	4	0	0	6	0	6	3	337	5	4	227	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	586	583	227	580	580	340	227			342		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	586	583	227	580	580	340	227			342		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	99	100			100		
cM capacity (veh/h)	419	424	818	427	426	707	1353			1228		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	12	346	230
Volume Left	4	6	3	4
Volume Right	0	6	5	0
cSH	419	532	1353	1228
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	13.7	11.9	0.1	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	13.7	11.9	0.1	0.2
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	0	2	235	0	1	109	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	0	0	0	2	253	0	1	135	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	394	394	135	394	394	253	135			253		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	394	394	135	394	394	253	135			253		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	568	544	920	568	544	791	1462			1324		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	0	255	136
Volume Left	0	0	2	1
Volume Right	0	0	0	0
cSH	1700	1700	1462	1324
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.1	0.1
Lane LOS	A	A	A	A
Approach Delay (s)	0.0	0.0	0.1	0.1
Approach LOS	A	A		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	17.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	0	2	0	2	3	332	5	3	199	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.33	0.33	0.33	0.92	0.92	0.92	0.82	0.82	0.82
Hourly flow rate (vph)	4	0	0	6	0	6	3	361	5	4	243	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	626	623	243	620	620	364	243			366		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	626	623	243	620	620	364	243			366		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	98	100	99	100			100		
cM capacity (veh/h)	394	403	801	401	404	686	1336			1203		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	12	370	246
Volume Left	4	6	3	4
Volume Right	0	6	5	0
cSH	394	506	1336	1203
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	14.2	12.3	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	14.2	12.3	0.1	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	0	2	262	0	1	122	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	0	0	0	2	282	0	1	151	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	439	439	151	439	439	282	151			282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	439	439	151	439	439	282	151			282		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	531	513	901	531	513	762	1443			1292		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	0	284	152
Volume Left	0	0	2	1
Volume Right	0	0	0	0
cSH	1700	1700	1443	1292
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.1	0.1
Lane LOS	A	A	A	A
Approach Delay (s)	0.0	0.0	0.1	0.1
Approach LOS	A	A		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	0	2	0	2	3	380	5	3	222	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.33	0.33	0.33	0.92	0.92	0.92	0.82	0.82	0.82
Hourly flow rate (vph)	4	0	0	6	0	6	3	413	5	4	271	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								531				
pX, platoon unblocked												
vC, conflicting volume	706	703	271	700	700	416	271			418		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	706	703	271	700	700	416	271			418		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	98	100	99	100			100		
cM capacity (veh/h)	348	362	773	355	364	641	1304			1151		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	12	422	274
Volume Left	4	6	3	4
Volume Right	0	6	5	0
cSH	348	457	1304	1151
Volume to Capacity	0.01	0.03	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	15.5	13.1	0.1	0.1
Lane LOS	C	B	A	A
Approach Delay (s)	15.5	13.1	0.1	0.1
Approach LOS	C	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

DRIVE-THROUGH WINDOW QUEUE OBSERVATIONS

DYNAMIC TRAFFIC

Location: Haddonfield Road

Date: Thursday, July 26, 2012

Municipality: Cherry Hill

Enumerator: DP

State: New Jersey

Job #: 0742-12-004TE

	Parking Count	Maximum Queue
7:00 AM	5	0
7:15 AM	6	1
7:30 AM	6	2
7:45 AM	6	5
8:00 AM	9	6
8:15 AM	12	3
8:30 AM	9	8
8:45 AM	8	8
9:00 AM	10	7
9:15 AM	13	3
9:30 AM	10	2
9:45 AM	10	4
10:00 AM	11	4
10:15 AM	13	2
10:30 AM	12	2
10:45 AM	14	3
11:00 AM	12	3
11:15 AM	19	2
11:30 AM	17	6
11:45 AM	19	7
12:00 PM	17	12
12:15 PM	26	10
12:30 PM	34	13
12:45 PM	35	12

	Parking Count	Maximum Queue
1:00 PM	33	12
1:15 PM	33	9
1:30 PM	35	9
1:45 PM	36	11
2:00 PM	38	11
2:15 PM	28	10
2:30 PM	23	8
2:45 PM	24	11
3:00 PM	28	6
3:15 PM	17	5
3:30 PM	17	4
3:45 PM	21	6
4:00 PM	29	4
4:15 PM	18	8
4:30 PM	20	7
4:45 PM	22	4
5:00 PM	18	7
5:15 PM	11	6
5:30 PM	13	4
5:45 PM	15	3
6:00 PM	15	3
6:15 PM	16	4
6:30 PM	24	3
6:45 PM	23	3

Maximum Parking Demand	38
Maximum Drive-Thru Queue	13

DYNAMIC TRAFFIC

Location: Haddonfield Road

Date: Monday, January 21, 2013

Municipality: Cherry Hill

Enumerator: AA

State: New Jersey

Job #: 0742-12-004TE

	Parking Count	Maximum Queue
7:00 AM	2	0
7:15 AM	1	0
7:30 AM	1	3
7:45 AM	1	0
8:00 AM	2	1
8:15 AM	2	3
8:30 AM	1	3
8:45 AM	3	4
9:00 AM	3	3
9:15 AM	5	6
9:30 AM	7	5
9:45 AM	5	2
10:00 AM	7	6
10:15 AM	7	3
10:30 AM	6	5
10:45 AM	9	5
11:00 AM	11	5
11:15 AM	11	6
11:30 AM	16	5
11:45 AM	18	4
12:00 PM	18	7
12:15 PM	26	8
12:30 PM	25	10
12:45 PM	33	13

	Parking Count	Maximum Queue
1:00 PM	25	13
1:15 PM	25	3
1:30 PM	23	4
1:45 PM	13	4
2:00 PM	21	2
2:15 PM	14	3
2:30 PM	17	3
2:45 PM	11	3
3:00 PM	12	3
3:15 PM	7	1
3:30 PM	13	2
3:45 PM	13	4
4:00 PM	13	1
4:15 PM	13	2
4:30 PM	15	3
4:45 PM	15	1
5:00 PM	16	2
5:15 PM	12	3
5:30 PM	14	1
5:45 PM	21	2
6:00 PM	26	2
6:15 PM	27	4
6:30 PM	28	3
6:45 PM	27	5

Maximum Parking Demand	33
Maximum Drive-Thru Queue	13

DYNAMIC TRAFFIC

Location: Haddonfield Road

Date: Saturday, January 19, 2013

Municipality: Cherry Hill

Enumerator: AA

State: New Jersey

Job #: 0742-12-004TE

	Parking Count	Maximum Queue
7:00 AM	1	0
7:15 AM	1	1
7:30 AM	1	0
7:45 AM	2	3
8:00 AM	2	2
8:15 AM	3	2
8:30 AM	3	1
8:45 AM	2	2
9:00 AM	2	3
9:15 AM	3	4
9:30 AM	4	1
9:45 AM	3	1
10:00 AM	1	2
10:15 AM	2	4
10:30 AM	3	5
10:45 AM	3	2
11:00 AM	5	3
11:15 AM	9	4
11:30 AM	13	3
11:45 AM	14	6
12:00 PM	19	6
12:15 PM	23	9
12:30 PM	19	10
12:45 PM	27	9

	Parking Count	Maximum Queue
1:00 PM	37	10
1:15 PM	29	11
1:30 PM	32	14
1:45 PM	26	11
2:00 PM	38	11
2:15 PM	42	9
2:30 PM	48	8
2:45 PM	45	11
3:00 PM	30	12
3:15 PM	33	10
3:30 PM	32	8
3:45 PM	23	7
4:00 PM	21	4
4:15 PM	29	10
4:30 PM	37	13
4:45 PM	34	10
5:00 PM	31	6
5:15 PM	30	8
5:30 PM	33	6
5:45 PM	28	5
6:00 PM	24	5
6:15 PM	22	2
6:30 PM	20	6
6:45 PM	23	8

Maximum Parking Demand	48
Maximum Drive-Thru Queue	14

DYNAMIC TRAFFIC

Location: Haddonfield Road

Date: Saturday, July 21, 2012

Municipality: Cherry Hill

Enumerator: Traffic Databank

State: New Jersey

Job #: 0742-12-004TE

	Parking Count	Maximum Queue
7:00 AM	2	0
7:15 AM	2	2
7:30 AM	3	1
7:45 AM	3	0
8:00 AM	5	1
8:15 AM	6	3
8:30 AM	7	3
8:45 AM	5	1
9:00 AM	8	3
9:15 AM	6	2
9:30 AM	5	1
9:45 AM	7	1
10:00 AM	8	1
10:15 AM	7	1
10:30 AM	7	1
10:45 AM	8	1
11:00 AM	7	1
11:15 AM	10	2
11:30 AM	12	1
11:45 AM	14	4
12:00 PM	18	8
12:15 PM	23	9
12:30 PM	26	7
12:45 PM	25	10

	Parking Count	Maximum Queue
1:00 PM	36	6
1:15 PM	35	7
1:30 PM	33	7
1:45 PM	31	6
2:00 PM	30	11
2:15 PM	33	13
2:30 PM	33	9
2:45 PM	30	13
3:00 PM	29	8
3:15 PM	27	7
3:30 PM	25	7
3:45 PM	29	8
4:00 PM	23	10
4:15 PM	23	8
4:30 PM	21	8
4:45 PM	20	7
5:00 PM	21	6
5:15 PM	18	6
5:30 PM	19	8
5:45 PM	21	8
6:00 PM	22	4
6:15 PM	22	7
6:30 PM	26	4
6:45 PM	24	7

Maximum Parking Demand	36
Maximum Drive-Thru Queue	13