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Ref: 6202

October 2, 2013

Mr. Jon D. Schneider, Chairman
Zoning Board of Appeals
Public Service Administration Building
500 Dedham Avenue
Needham, MA 02492

Re: Response to Traffic Review Comments
Needham Mews Residential Community
692 and 744 Greendale Avenue, Needham, Massachusetts

Dear Mr. Schneider:

Vanasse & Associates, Inc. (VAI) is providing supplemental information and analyses in response to the August 5, 2013 *Peer Review of Traffic Impact and Access Study* comments received from Mr. Kien Ho, P.E., PTOE of BETA Group, Inc., (BETA) concerning his review of the May 2013 *Traffic Impact and Access Study* (the "May 2013 TIAS") prepared by VAI in support of the proposed Needham Mews residential community to be located at 692 and 744 Greendale Avenue in Needham, Massachusetts (hereafter referred to as the "Project"). Listed below are the comments raised in Mr. Ho's August 5, 2013 review letter concerning the May 2013 TIAS followed by our detailed response, with the associated supporting data, calculations, plans, and analysis worksheets attached. Responses to BETA's comments concerning the Site Plans and the Massachusetts Housing Finance Agency Correspondence has been addressed separately. It should be noted that the development program for the Project has been revised downward from 300 units as assessed in the May 2013 TIAS to 268 units as currently proposed, and all results presented herein reflect the modified development program.

1. Study Area

Comment: *The study area includes sporadic intersections along Greendale Avenue including the intersection of Great Plain Avenue at Greendale Avenue, Greendale Avenue at Bird Street, and Kendrick Street at Hunting Road. However, additional intersections should be included in order to fully determine the impact of the project. These intersections include the following:*

a. Highland Avenue at Hunting Road. Traffic to and from the site destined to and from points north on I-95 and the Mass Pike (35% of the site related traffic) will travel through this intersection. Although the Kendrick Street interchange would reduce the impact on this intersection for traffic heading to the site, vehicles traveling north from the site will continue to travel through this intersection (of particular concern during the weekday morning peak hour as residents leave the proposed site and travel to I-95 northbound) as there will not be a northbound I-95 entrance on Kendrick Street.

b. Greendale Avenue at Brookline Street. Brookline Street provides access to the Mitchell Elementary School and points west in Needham. The traffic volume accessing Greendale Avenue from Brookline Street should be collected and included as part of the traffic study due to its close proximity to the north of the proposed site and potential impact and associated need for improvements/mitigation.

c. Greendale Avenue at Bird Street and Rybury Hillway. Although traffic volumes were collected at the intersection of Greendale Avenue at Bird Street, it did not include the volumes associated with Rybury Hillway, which is located adjacent 45 feet to this intersection. The interaction of all three of these roadways is necessary to determine the overall potential impacts.

d. Greendale Avenue at Broad Meadow Road. Broadmeadow Road provides access to the Broadmeadow Elementary School, the Hersey Commuter Rail Station and Needham Center. The traffic volume accessing Greendale Avenue from Broad Meadow Road should be collected due to its close proximity to the south of the site and in order to determine if there is a potential impact and need for improvements/mitigation.

The preceding four intersections should be included as part of the TIAS. The traffic counts for these intersections should not be conducted until school is in session this fall.

Response: Manual turning movement counts (TMCs) and vehicle classification counts were conducted on Thursday, September 12, 2013, as approved by BETA, at the three original study area intersections that were assessed in the May 2013 TIAS (Kendrick Street at Hunting Road; Greendale Avenue at Bird Street; and Great Plain Avenue at Greendale Avenue) in addition to the four intersections added at the request of BETA (Highland Avenue at Gould Street and Hunting Road; Greendale Road at Brookline Street; Greendale Avenue at Rybury Hillway; and Greendale Avenue at Broadmeadow Road). Figures 1 through 13 depict the traffic-volume networks incorporating the peak-hour traffic volumes collected in September 2013 for the entire study area.

2. Traffic Counts

Comment: *Traffic volumes were collected during the month of March. Typically traffic volumes collected in March represent higher than average traffic volume conditions, especially towards the end of the month.*

However, VAI should provide a reasoning why the Turning Movement Counts (TMCs) were collected on March 20, 2013, but the Automatic Traffic Recorder (ATRs) collected volumes on March 27 and 28, 2013. Weather could have impacted the collection of data via ATRs on March 20, which would have also impacted volumes.

The TMC data collected on March 20th should be validated.

Response: The TMCs conducted on March 20th were collected under clear weather conditions. The ATR's could not be conducted on March 19th through 20th due to light snow that occurred on March 19th so they were rescheduled for the following week. As stated previously,

TMCs and vehicle classification counts were conducted at the four additional intersections and at the three original study area intersections that were assessed in the May 2013 TIAS on Thursday, September 12, 2013, as approved by BETA. Figures 1 through 13 depict the traffic-volume networks incorporating the peak-hour traffic volumes collected in September 2013 for the entire study area.

Comment: *The week of the 27th and 28th also did not have typical traffic volumes as March 27th was a limited schedule for the Needham Public Schools, the March 28th was Holy Thursday and both days occurred during Passover.*

The ATR data collected on March 27th and March 28th should be collected again when the traffic counts for the expanded study area intersections are conducted.

Response: Automatic Traffic Recorder (ATR) counts were conducted on Greendale Avenue in the vicinity of the Project site for a continuous 48-hour period on September 12-13, 2013, coinciding with the date that updated TMCs were performed (September 12, 2013). The September 2013 Existing traffic volumes are summarized in Table 1A. The average weekday daily traffic volume along Greendale Avenue was found to be approximately 17 percent higher in September 2013 than measured in March 2013.

Table 1A
2013 EXISTING TRAFFIC VOLUMES

		Weekday Morning Peak Hour			Weekday Evening Peak Hour		
Location	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]	VPH	K Factor	Directional Distribution
Greendale Avenue, south of Bird Street	10,976	1,320	12.0	81.9% NB	1,245	11.3	80.4% SB

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

3. Crash Data

Comment: *The TIAS included crash data obtained from MassDOT. However, crash data from the local Police Department is typically more accurate.*

The Needham Police Department crash data should be reviewed and compared to the MassDOT crash data.

Response: Crash data obtained from MassDOT and the Needham Police Department was reviewed for the study area intersections and is summarized in Table 3A. A review of this data continues to indicate: i) none of the study intersections has a motor vehicle crash rate that exceeds the MassDOT District or Statewide average crash rate for a signalized or unsignalized intersection, as appropriate; and ii) no discernible safety deficiencies are apparent at the study intersections based on the available motor vehicle crash data.

Table 3A
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Traffic Control Type	MassDOT (2008 – 2011)	Needham Police Department (2008 – 2012)
Highland Avenue/Gould Street/Hunting Road	TS		
Total		15	7
Average		3.75	1.40
MassDOT District/Statewide Crash Rate		0.76/0.80	0.76/0.80
Calculated Crash Rate[b]		0.33	0.12
Significant?[c]		No	No
Kendrick Street/Hunting Road	TS		
Total		13	30
Average		3.25	6.00
MassDOT District/Statewide Crash Rate		0.76/0.80	0.76/0.80
Calculated Crash Rate		0.32	0.59
Significant?		No	No
Greendale Avenue/Brookline Street	U		
Total		5	8
Average		1.25	1.60
MassDOT District/Statewide Crash Rate		0.58/0.60	0.58/0.60
Calculated Crash Rate		0.20	0.25
Significant?		No	No
Greendale Avenue/Rybury Hillway	U		
Total		1	0
Average		0.25	0.0
MassDOT District/Statewide Crash Rate		0.58/0.60	0.58/0.60
Calculated Crash Rate		0.05	0.00
Significant?		No	No
Greendale Avenue/Bird Street	U		
Total		3	5
Average		0.75	1.00
MassDOT District/Statewide Crash Rate		0.58/0.60	0.58/0.60
Calculated Crash Rate		0.14	0.18
Significant?		No	No
Greendale Avenue/Broadmeadow Road	U		
Total		2	3
Average		0.50	0.60
MassDOT District/Statewide Crash Rate		0.58/0.60	0.58/0.60
Calculated Crash Rate		0.10	0.12
Significant?		No	No
Great Plain Avenue/Greendale Avenue	TS		
Total		15	21
Average		3.75	4.20
MassDOT District/Statewide Crash Rate		0.76/0.80	0.76/0.80
Calculated Crash Rate		0.48	0.54
Significant?		No	No

[a]Source: MassDOT Safety Management/Traffic Operations Unit and Needham Police Department records.
[b]Crash rate per million vehicles entering the intersection.
[c]The intersection crash rate is significant if it is found to exceed MassDOT District or Statewide crash rate.
Traffic Control Type: U = unsignalized; TS = traffic signal; R = rotary/roundabout.

4. Specific Developments by Others

Comment: *The TIAS included traffic volumes associated with two other approved developments in the area that will impact traffic along Greendale Avenue. These projects include the Greendale Village 40B project (12 single family houses and eight units located four duplex buildings) located south of the proposed project and the Center 128 Commercial development (740,000 square feet of office space and a 128-room hotel) located off of Kendrick Street east of I-95.*

Although the traffic studies for each of these projects are referenced, the Appendix of the TIAS includes traffic volume networks that have been created by VAI. Therefore, it is not possible to verify if the approved trip generation, distribution, and assignments have been properly incorporated.

VAI should include copies of the trip assignment networks from each of the approved developments in order to confirm the specific developments have been properly incorporated.

Response: Copies of the trip assignment networks obtained from the respective traffic studies for each of the identified specific development projects by others are attached.

Comment: *A third development should have been included as well, the Wingate Senior Living residential development.*

The TIAS should include the traffic associated with this development as part of the No Build condition.

Response: Traffic volumes associated with The Residences at Wingate have been included in the revised No-Build and Build condition traffic volumes that are presented as a part of this response to comments. The detailed trip assignment networks for the Residences at Wingate are attached.

5. Background Traffic Growth

Comment: *The study used a one percent growth rate per year for the five year future projections. The use of a one percent growth rate compounded for five years (5.1 percent total growth) is appropriate.*

VAI should provide the appropriate data from the MassDOT permanent count stations in the Appendix of the TIAS.

Response: The MassDOT count data was included in the Appendix of the May 2013 TIAS and is also attached for reference.

6. I-95 Add-A-Lane Project/Kendrick Street Interchange

Comment: *The TIAS reduced the volumes along Greendale Avenue in accordance with the Functional Design Report (FDR) that was completed in association with this construction project.* ***It should be noted that this reduction in traffic is significant. It results in a reduction of approximately 20 percent of the weekday morning peak hour traffic volumes traveling past the site and 40 percent of the weekday evening peak hour traffic volumes passing the site.*** *The proponent should confirm the construction schedule for this project.*

Response: Recent discussions with MassDOT indicate that this project is scheduled to open for bid in January 2014, with the project expected to be substantially complete by the spring of 2018.

Comment: *The TIAS should include an Existing condition based on the collected traffic volumes. A typical No Build condition should be included that accounts for the applied growth rate and the traffic associated with each of the three background developments. The TIAS should then contain a Build condition that determines the impact of the proposed development providing a worst case scenario analysis in the event the Add-A-Lane project is not completed prior to the proposed project. Lastly, the TIAS should contain a future condition that takes into account the reduction of traffic associated with the reconstruction of I-95.*

The four condition method described will provide a true comparison of the impact of the proposed project with current traffic patterns in the study area, provide a worst case scenario should the Add-A-Lane not progress at the same pace as the proposed development and also provide future potential traffic conditions in the area should the final phase of the Add-A-Lane project come to fruition.

Response: Traffic volume networks were prepared and level-of-service and vehicle queue analyses were conducted for: i) 2013 Existing conditions; ii) 2018 No-Build conditions with and without the I-95 Add-A-Lane/Kendrick Street Interchange Project; and iii) 2018 Build conditions with and without the I-95 Add-A-Lane/Kendrick Street Interchange Project; for the intersections within the study area using the peak-hour traffic volumes collected in September 2013. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9A and 10A.

Comment: *In addition, as with the site specific development networks, the TIAS includes regenerated networks instead of the networks from the FDR. The regenerated networks cannot be used to verify the proper traffic volume reductions that should be applied due to the FDR.*

VAI should include copies of the trip reduction networks from the most recent FDR in order to confirm the specific developments have been properly incorporated.

Response: The traffic volume adjustments associated with the completion of the Kendrick Street interchange were developed based on a comparison of the 2017 No-Build and Build condition networks contained in the October 2008 *Functional Design Report* prepared for the I-95/I-93 Transportation Improvement Project (Bridge V) Route 9/ Highland Avenue/Kendrick Street Section prepared by McMahon Associates, Inc. This comparison yielded a proportionate increase or decrease (as a percent) in specific traffic

volumes within the study area, which were then applied to the 2018 No-Build without the I-95 Add-A-Lane/Kendrick Street Interchange Project traffic volumes to establish future condition (2018) traffic volumes with the I-95 Add-A-Lane/Kendrick Street Interchange Project. Copies of the 2017 No-Build and Build condition networks from the October 2008 *Functional Design Report* are attached.

7. Trip Generation

Comment: *The report utilized the Institute of Transportation Engineers' (ITE) manual, Trip Generation to determine the trip generation of a fully occupied development. Land Use Code (LUC) 220 was used to calculate the expected trip generation. The proposed 300 units are expected to generate approximately 150 trips during the morning peak hour and approximately 185 trips during the evening peak hour.*

The trip generation methodology is appropriate for this project.

Response: The development program for the Project has been revised downward from 300 units as assessed in the May 2013 TIAS to 268 units as currently proposed. Using LUC 220, *Apartment*, consistent with the methodology used in the May 2013 TIAS, the smaller Project is expected to generate approximately 135 vehicle trips during the weekday morning peak-hour (11 percent reduction) and approximately 165 vehicle trips during the weekday evening peak-hour (10 percent reduction). The revised trip-generation calculations for the Project are summarized in Table 4A and compared to those that were assessed in the May 2013 TIAS. The Build traffic volume networks and analysis presented herein reflect the revised development program for the Project (268 units).

Table 4A
TRIP GENERATION SUMMARY – RESIDENTIAL COMMUNITY

Time Period/Direction	Vehicle Trips (A) Current Proposal (268 units)[a]	(B) Original Proposal (300 units)[a]	(A – B) Net Change
Average Weekday Daily:			
Entering	874	971	
Exiting	874	971	
Total	1,748	1,942	-194
Weekday Morning Peak Hour:			
Entering	27	30	
Exiting	108	121	
Total	135	151	-16
Weekday Evening Peak Hour:			
Entering	107	119	
Exiting	58	64	
Total	165	183	-18

[a]Based on ITE LUC 220, *Apartment.*

8. Trip Distribution

Comment: *The trip distribution used for the trip assignment is based on U.S. Census journey-to-work data. Approximately 80 percent of the traffic will be to and from north of the site and the remaining 20 percent will be to and from the south of the site.*

The vehicle trips associated with the proposed development were added to the traffic volume networks using the appropriate methodology.

Response: No response necessary.

Comment: *However, in any condition that assumes completion of the I-95 reconstruction, the trip distribution should be modified to the north of the site in order to account for the Kendrick Street interchange. Should the Kendrick Street interchange be constructed, the traffic accessing the site from the north will be greatly impacted as there would be an increase in westbound left turns from Kendrick Street to Hunting Road. In addition, there would be a decrease in southbound Hunting Road through movement at Kendrick Street. Traffic departing the site to the north will continue to utilize Hunting Road to Highland Avenue due to the Kendrick Street interchange not providing access to I-95 northbound.*

In the future condition that accounts for the I-95 project, the trip distribution in this portion of the study area should contain separate distribution percentages for vehicles traveling to the site and vehicles traveling from the site.

Response: The Kendrick Street interchange is designed to serve traffic to/from the east of I-95/Route 128 and will not provide access to/from Kendrick Street west of I-95/Route 128 (specific turning movements are prohibited to and from the new ramp system). As such, Project-generated traffic destined to/from I-95/Route 128 will continue to use the Highland Avenue or Great Plain Avenue interchanges with the completion of the Kendrick Street interchange, resulting in the same general trip distribution pattern for the Project with or without the new interchange. A copy of the Kendrick Street interchange plan is attached.

9. Level of Service Analysis

Comment: *The study area intersections were analyzed to determine the capacity and the intersection operations. In Accordance with industry standards, the analysis was conducted using the latest version of Synchro software.*

However, since the study area is in adequate the TIAS needs to be updated to provide a more complete study area.

In addition, analysis must be provided that shows the worst case scenario, the completed project without the reduction in traffic due to the Add-A-Lane project (the requested modified Build condition).

Traffic operations analysis should be provided for the additionally requested intersections ad all of the study area intersections should be analyzed utilizing the four conditions methodology described in this review.

Response: Level-of-service (LOS) and vehicle queue analyses were conducted for the following conditions: i) 2013 Existing; ii) 2018 No-Build conditions with and without the I-95 Add-A-Lane/Kendrick Street Interchange Project; and iii) 2018 Build conditions with and without the I-95 Add-A-Lane/ Kendrick Street Interchange Project; for the intersections within the study area, including the four additional study area intersections and using the peak-hour traffic volume data defined herein. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9A and 10A, with a discussion of Project-related impacts at the study intersections and operating conditions at the Project-site driveways provided below.

Signalized Intersections

The addition of Project-related traffic to the three (3) signalized study area intersections is predicted to result in a change in the overall LOS at only one (1) intersection between the No-Build and Build conditions (Highland Avenue/Hunting Road/Gould Street). Prior to the completion of the Kendrick Street interchange project, overall operating conditions at the intersection of Highland Avenue at Hunting Road and Gould Street are predicted to degrade slightly (3.5 second increase in overall motorist delay) from LOS D under 2018 No-Build conditions to LOS E under 2018 Build conditions during the weekday evening peak-hour as a result of the addition of Project-related traffic (no change in overall LOS was shown to occur during the weekday morning peak-hour). With the implementation of an optimal traffic signal timing and phasing plan, overall motorist delays at the intersection are predicted to be reduced or generally maintained over 2018

No-Build conditions, such that the impacts of the Project are appropriately mitigated. Under 2018 No-Build and 2018 Build conditions with the completion of the Kendrick Street interchange project, this intersection is predicted to operate at an overall LOS E during both the weekday morning and evening peak hours (no change in overall LOS as a result of the addition of Project-related traffic).

Unsignalized Intersections

The addition of Project-related traffic to the four (4) unsignalized study area intersections is predicted to result in a change in the LOS at two (2) intersections between No-Build and Build conditions (Greendale Avenue/Rybury Hillway and Greendale Avenue/ Bird Street). Prior to the completion of the Kendrick Street interchange project, movements from Rybury Hillway are predicted to degrade slightly (increase in projected delay of less than 2 seconds) from LOS B to LOS C during the weekday morning peak-hour with the addition of Project-related traffic, with no change in LOS shown to occur during the weekday evening peak-hour. After the completion of the Kendrick Street interchange project, no change in LOS was shown to occur as a result of the addition of Project-related traffic. No material change in vehicle queuing was shown to occur at the intersection as a result of the addition of Project-related traffic before or after the completion of the Kendrick Street interchange project.

Prior to the completion of the Kendrick Street interchange project, no change in LOS was shown to occur at the Greendale Avenue/Bird Street intersection as a result of the addition of Project-related traffic, with impacts limited to an increase in vehicle queuing of one (1) vehicle on Bird Street. With the completion of the Kendrick Street interchange project, movements from Bird Street are predicted to degrade from LOS D to LOS E during the weekday evening peak-hour with the addition of Project-related traffic, with no change in LOS shown to occur during the weekday morning peak-hour. Vehicle queues on the Bird Street approach were shown to increase by approximately one (1) vehicle as a result of the addition of Project-related traffic.

Project-Site Driveways

Vehicles exiting the north Project site driveway at its intersection with Greendale Avenue were shown to operate at LOS E during the weekday morning peak-hour and at LOS B during the weekday evening peak-hour with or without the Kendrick Street interchange project, with all movements along Greendale Avenue shown to operate at LOS A. Vehicle queuing within the Project site at the north Project site driveway was shown to range from 1 to 3 vehicles and can be accommodated without impeding access to the Project or on-site circulation.

Vehicles exiting the south Project site driveway at its intersection with Greendale Avenue were shown to operate at LOS E during the weekday morning peak-hour and at LOS D during the weekday evening peak-hour without the Kendrick Street interchange project, and at LOS D during the weekday morning peak-hour and at LOS C during the weekday evening peak-hour with the Kendrick Street interchange project. Vehicle queuing within the Project site at the south Project-site driveway was shown to range from 0 to 1 vehicle and can be accommodated without impeding access to the Project or on-site circulation. All movements along Greendale Avenue were shown to operate at LOS A during the peak periods with or without the Kendrick Street interchange project.

10. Sight Distance

Comment: *The minimum sight distance requirements at the proposed site driveway intersections were calculated in accordance with industry standard. The 85th percentile speed (48 and 49 mph) was used to calculate the minimum required distance (425 feet). The 85th percentile speed is almost 10 mph higher than the state determined posted speed limit of 40 mph. Sight distance information was not provided for the unsignalized study area intersection of Greendale Avenue at Bird Street.*

VAI should provide sight distance information for the intersection of Greendale Avenue at Bird Street and Rybury Hillway, as well as the three additionally requested unsignalized intersections (Greendale Avenue at Brookline Street, Greendale Avenue at Broad Meadow Road, Greendale Avenue at Grosvenor Road).

Response: Additional vehicle travel speed measurements were collected in September 2013 in conjunction with the updated traffic counts requested by BETA and recorded an average measured 85th percentile vehicle travel speed of approximately 45 mph, or 5 mph above the posted speed limit (40 mph). Table 2A summarizes the updated vehicle travel speed measurements collected in September 2013.

Table 2A
VEHICLE TRAVEL SPEED MEASUREMENTS

	Greendale Avenue	
	Northbound	Southbound
Mean Travel Speed (mph)	39	42
85th Percentile Speed (mph)	43	46
Posted Speed Limit (mph)	40	40

mph = miles per hour.

Aggregating the speed measurements presented in the May 2013 TIAS and the updated (September 2013) travel speed measurements, which included a larger sample size, indicates that the use of a 45 mph 85th percentile vehicle travel speed is a reasonable design value for Greendale Avenue.

As requested by BETA, sight distance measurements were performed at all of the unsignalized study intersections and are summarized in Table 11A. It should be noted that the Project site driveways have been relocated since the completion of the May 2013 TIAS and, therefore, sight distance measurements were also performed at the relocated Project site driveways.

Table 11A
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum	ISD	Measured
Greendale Avenue at Brookline Street			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	500+
Greendale Avenue approaching from the south	360	--	455
Intersection Sight Distance:			
Looking to the north from Brookline Street	360	430/500[b]	500+
Looking to the south from Brookline Street	360	430/500[b]	415
Greendale Avenue at Rybury Hillway			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	500+
Greendale Avenue approaching from the south	360	--	500+
Intersection Sight Distance:			
Looking to the north from Rybury Hillway	360	430/500[b]	500+
Looking to the south from Rybury Hillway	360	430/500[b]	500+
Greendale Avenue at Bird Street			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	500+
Greendale Avenue approaching from the south	360	--	500+
Intersection Sight Distance:			
Looking to the north from Bird Street	360	430/500[b]	500+
Looking to the south from Bird Street	360	430/500[b]	500+
Greendale Avenue at Broadmeadow Road			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	500+
Greendale Avenue approaching from the south	360	--	500+
Intersection Sight Distance:			
Looking to the north from Broadmeadow Road	360	430/500[b]	465
Looking to the south from Broadmeadow Road	360	430/500[b]	445
Greendale Avenue at Grosvenor Road			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	500+
Greendale Avenue approaching from the south	360	--	420
Intersection Sight Distance:			
Looking to the north from Grosvenor Road	360	430/500[b]	500+
Looking to the south from Grosvenor Road	360	430/500[b]	465

Table 11A (Continued)
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum	ISD	Measured
Greendale Avenue at the North Project Site Driveway			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	650+
Greendale Avenue approaching from the south	360	--	650+
Intersection Sight Distance:			
Looking to the north from the North Project Site Driveway	360	430/500[b]	550
Looking to the south from the North Project Site Driveway	360	430/500[b]	650+
Greendale Avenue at the South Project Site Driveway			
Stopping Sight Distance:			
Greendale Avenue approaching from the north	360	--	650+
Greendale Avenue approaching from the south	360	--	650+
Intersection Sight Distance:			
Looking to the north from the South Project Site Driveway	360	430/500[b]	650+
Looking to the south from the South Project Site Driveway	360	430/500[b]	650+

[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 45 mph approach speed on Greendale Avenue.

[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 11A, available lines of sight at the unsignalized study intersections were found to exceed the recommended minimum sight distance requirements for a 45 mph approach speed along Greendale Avenue, consistent with the measured 85th percentile vehicle travel speed along this roadway (45 mph) and 5 mph above the posted speed limit (40 mph). Lines of sight at the relocated Project site driveway intersections with Greendale Avenue were also found to exceed the recommended minimum sight distance requirements for a 45 mph approach speed along Greendale Avenue, indicating that the driveways continue to be appropriately designed and located to function in a safe manner.

11. Mitigation

Comment: *The TIAS did not include any off site mitigation (other than potential signal retiming) in order to offset the transportation impact of the proposed development. Since the traffic study did not adequately address the traffic impacts associated with the proposed development, the potential mitigation measures cannot be determined at this time.*

Mitigation should be proposed at any of the study area intersections that degrades to [or] have approaches operating at unacceptable levels (LOS E or F, v/c ratio greater than 0.99).

Wherever traffic signal timing modifications are proposed as mitigation, the actual signal timing modifications, and associated analysis results should be included in the future submitted traffic data.

Response: In order to off-set the projected impact of the Project at the signalized study area intersections (Highland Avenue/Hunting Road/Gould Street, Kendrick Street/ Hunting Road, and Great Plain Avenue/Greendale Avenue) in advance of the completion of the MassDOT Kendrick Street interchange project, the Project proponent will design and implement an optimal traffic signal timing and phasing plan prior to the issuance of a Certificate of Occupancy for the Project subject to receipt all necessary rights, permits and approvals from third parties and governmental authorities. The mitigated analysis results are summarized in Table 12 with the detailed analysis worksheets inclusive of the recommended traffic signal timing modifications attached.

As can be seen in Table 12, with the implementation of these improvements, overall motorist delays at the signalized study area intersections are predicted to be reduced or generally maintained over 2018 No-Build conditions with or without the completion of the Kendrick Street interchange project, such that the impacts of the Project are appropriately mitigated.

Comment: *Signal Warrant analysis should be conducted at any of the unsignalized intersections where levels of operation degrade to unacceptable levels.*

Response: An analysis of operating conditions at the unsignalized intersections of Greendale Avenue at Brookline Street and Greendale Avenue at Bird Street indicates that motorists exiting Brookline Street and Bird Street experience excessive delay during one or both peak periods under 2013 Existing conditions independent of the Project due to the relatively large volume of conflicting traffic on Greendale Avenue. The addition of Project-related traffic to these intersections resulted in a minimal increase in vehicle queuing over No-Build conditions (0 to 2 vehicles).

Given the reported poor operating conditions at these intersections again, independent of the Project, a Traffic Signal Warrant Analysis (TSWA) will be conducted at both locations in accordance with the methodology and procedures outlined in the Manual on Uniform Traffic Control Devices (MUTCD).[1] In order to complete this analysis, 12-hour manual turning movement and vehicle classification counts will be conducted at the subject intersections on Wednesday, October 2, 2013.

In brief, The MUTCD establishes nine warrants or criteria to evaluate a location for the installation (or retention) of a traffic signal. At least one of the nine warrants must be satisfied in order to justify the installation or retention of a traffic signal; however, satisfaction of a warrant in and of itself does not necessarily indicate that the installation of a traffic signal is the best traffic control solution. An engineering evaluation of the location in question should indicate that the establishment of traffic signal control will

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

improve the overall safety and/or operation of the intersection. Table A lists the nine warrants used to evaluate an intersection for traffic signal control as presented in the MUTCD.

Table A
TRAFFIC SIGNAL WARRANTS

Warrant No.	Description
1	Eight-Hour Vehicular Volume
2	Four-Hour Vehicular Volume
3	Peak-Hour
4	Pedestrian Volume
5	School Crossing
6	Coordinated Signal System
7	Crash Experience
8	Roadway Network
9	Intersection Near a Grade Crossing

Each of the nine traffic signal warrants listed in Table A will be evaluated for the intersections of Greendale Avenue at Brookline Street and Greendale Avenue at Bird Street based on the current intersection geometry and under 2013 Existing, 2018 No-Build and 2018 Build traffic volume conditions, with or without the completion of the Kendrick Street interchange project. The detailed TSWA worksheets and supporting materials will be provided under separate cover.

No discernible safety deficiencies are apparent at the intersection of Greendale Avenue at Brookline Street based on the available motor vehicle crash data, with Project-related impacts at the intersection shown to be confined to an increase in vehicle queuing of between 0 and 2 vehicles during the peak periods. A preliminary review of the peak period traffic volumes indicates that the installation of a traffic control signal may be warranted at the intersection under 2013 Existing traffic volume conditions independent of the Project. This finding will be validated once the formal TSWA is complete.

A preliminary review of peak period traffic volumes at the intersection of Greendale Avenue at Bird Street indicate that the installation of a traffic control signal will not be warranted. However, it is recommended that a STOP-sign be installed on the Bird Street approach to Greendale Avenue independent of the Project in order to formalize the assignment of the vehicular right-of-way at the intersection. As mentioned previously, the detailed TSWA worksheets and supporting materials for the Greendale Avenue/Bird Street will be provided under separate cover.

Comment: *Pedestrian accommodations should be provided along the east side Greendale Avenue with a connection to the existing sidewalk network on the west side of Greendale Avenue. This pedestrian connection will provide access from the site to elementary schools and the residential neighborhood.*

Response: A sidewalk will be constructed along the east side of Greendale Avenue extending to Bird Street and a marked crosswalk will be provided for crossing Greendale Avenue at the intersection (south side) with accompanying pedestrian crossing warning signs installed at and in advance of the crossing on Greendale Avenue. The sidewalk and associated appurtenances (i.e., signs, pavement markings, wheelchair ramps, etc.) will be designed and constructed by the Project proponent subject to receipt all necessary rights, permits and approvals from third parties and governmental authorities.

We trust that this information is responsive to the comments that were raised by Mr. Ho in his August 5, 2013 *Peer Review of Traffic Impact and Access Study* letter concerning BETA's review of the May 2013 TIAS prepared by VAI in support of the Project. If you should have any questions regarding our responses or would like to discuss the information in more detail, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk, P.E., PTOE, FITE
Principal

JSD/las

Attachments

cc: K. Ho, P.E., PTOE – BETA Group, Inc. (via email)
R. Hewitt – Mill Creek Residential Trust, LLC (via email)
LAS, File

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

	2013 Existing				2018 No-Build Without Kendrick Street Interchange				2018 Build Without Kendrick Street Interchange				2018 No-Build With Kendrick Street Interchange				2018 Build With Kendrick Street Interchange			
Signalized Intersection/Peak Hour/Movement	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Highland Avenue at Hunting Road and Gould Street																				
Weekday Morning:																				
Highland Avenue EB LT	0.68	73.1	E	3/7	0.73	79.2	E	3/8	0.73	80.0	F	3/8	0.71	77.0	E	3/6	0.71	77.1	E	3/6
Highland Avenue EB TH/RT	1.03	79.1	E	16/23	1.18	>80.0	F	20/27	1.19	>80.0	F	20/27	1.01	63.5	E	20/25	1.01	64.3	E	20/25
Highland Avenue WB LT	0.86	62.9	E	9/17	0.89	66.9	E	10/18	0.90	68.7	E	10/19	0.30	53.5	D	1/3	0.39	56.3	E	2/4
Highland Avenue WB TH/RT	0.66	28.5	C	10/14	0.71	30.6	C	12/16	0.71	30.6	C	12/16	0.65	31.1	C	10/12	0.65	31.2	C	10/12
Hunting Road NB LT/TH	0.82	67.0	E	7/13	0.87	72.3	E	8/14	0.88	74.7	E	8/15	0.95	73.4	E	12/19	0.96	75.2	E	12/19
Hunting Road NB RT	0.48	13.7	B	4/8	0.51	16.3	B	5/9	0.57	18.4	B	6/11	0.87	44.0	D	13/20	0.95	55.4	E	15/23
Gould Street SB LT	0.69	59.5	E	5/8	0.73	62.0	E	6/9	0.73	62.5	E	6/9	0.81	76.5	E	5/9	0.81	76.5	E	5/9
Gould Street SB LT/TH/RT	0.62	51.9	D	5/8	0.66	53.9	D	5/8	0.66	54.5	D	5/9	0.73	63.5	E	5/8	0.73	64.0	E	5/8
Overall	--	**52.3**	**D**	--	--	**70.1**	**E**	--	--	**71.6**	**E**	--	--	**55.1**	**E**	--	--	**57.4**	**E**	--
Weekday Evening:																				
Highland Avenue EB LT	0.41	58.8	E	2/4	0.44	60.9	E	2/4	0.45	62.1	E	2/4	0.90	>80.0	F	4/9	0.90	>80.0	F	4/9
Highland Avenue EB TH/RT	0.84	50.7	D	10/16	0.92	59.0	E	11/18	0.94	64.0	E	12/18	0.93	67.7	E	18/23	0.93	69.5	E	18/23
Highland Avenue WB LT	0.80	58.8	E	8/12	0.83	61.1	E	9/14	0.89	67.7	E	10/17	0.90	>80.0	F	10/16	1.03	>80.0	F	13/20
Highland Avenue WB TH/RT	0.62	29.5	C	10/14	0.71	32.2	C	12/16	0.69	31.6	C	12/16	0.94	57.5	E	25/28	0.93	55.7	E	25/28
Hunting Road NB LT/TH	0.57	57.3	E	3/6	0.59	58.2	E	4/6	0.61	59.5	E	4/6	1.01	>80.0	F	6/11	1.04	>80.0	F	6/11
Hunting Road NB RT	0.72	30.7	C	9/13	0.75	33.5	C	10/14	0.76	34.1	C	11/15	0.28	7.2	A	0/2	0.32	7.7	A	0/3
Gould Street SB LT	0.80	56.0	E	9/17	0.89	66.5	E	11/19	0.91	71.6	E	11/19	0.56	44.9	D	11/15	0.57	45.4	D	11/15
Gould Street SB LT/TH/RT	0.91	66.6	E	11/21	0.99	>80.0	F	13/23	1.03	>80.0	F	14/23	1.03	>80.0	F	26/36	1.05	>80.0	F	26/36
Overall	--	**45.8**	**D**	--	--	**51.9**	**D**	--	--	**55.4**	**E**	--	--	**70.1**	**E**	--	--	**73.1**	**E**	--
Kendrick Street at Hunting Road																				
Weekday Morning:																				
Kendrick Street EB LT/TH/RT	0.99	73.7	E	14/16	1.13	>80.0	F	17/19	1.13	>80.0	F	17/19	0.95	67.3	E	14/15	0.95	67.3	E	14/15
Kendrick Street WB LT	0.60	55.0	E	3/6	0.72	66.8	E	3/8	0.76	69.8	E	3/9	0.48	48.7	D	2/5	0.51	51.0	D	3/5
Kendrick Street WB TH/RT	0.45	29.4	C	7/13	0.48	30.1	C	8/14	0.48	30.1	C	8/14	0.42	32.5	C	7/13	0.42	32.5	C	7/13
Hunting Road NB LT/TH	1.06	>80.0	F	17/31	1.13	>80.0	F	18/33	1.25	>80.0	F	22/37	0.94	59.1	E	24/43	1.01	73.9	E	27/47
Hunting Road NB RT	0.46	1.0	A	0/0	0.53	1.3	A	0/0	0.55	1.4	A	0/0	0.35	0.6	A	0/0	0.37	0.7	A	0/0
Hunting Road SB LT	0.89	67.8	E	9/20	0.94	75.6	E	10/22	0.94	75.8	E	10/22	0.70	71.7	E	2/6	0.70	71.7	E	2/6
Hunting Road SB TH/RT	0.13	17.6	B	2/4	0.14	17.8	B	2/5	0.15	18.4	B	2/5	0.07	18.5	B	1/3	0.08	18.6	B	2/3
Overall	--	**52.2**	**D**	--	--	**67.6**	**E**	--	--	**75.1**	**E**	--	--	**45.2**	**D**	--	--	**49.2**	**D**	--
Weekday Evening:																				
Kendrick Street EB LT/TH/RT	0.82	68.3	E	4/10	0.90	79.2	E	5/11	0.93	>80.0	F	5/11	0.59	72.1	E	2/4	0.61	75.0	E	2/4
Kendrick Street WB LT	0.88	39.9	D	14/43	1.02	65.3	E	18/45	1.09	>80.0	F	26/48	0.33	35.4	D	5/9	0.41	38.7	D	6/11
Kendrick Street WB TH/RT	0.93	38.0	D	22/53	1.01	54.3	D	26/60	1.03	64.2	E	35/60	0.91	57.9	E	20/37	0.95	68.0	E	20/37
Hunting Road NB LT/TH	0.83	>80.0	F	4/10	0.91	>80.0	F	5/11	1.14	>80.0	F	7/13	0.33	48.6	D	5/7	0.35	45.9	D	6/9
Hunting Road NB RT	0.07	0.1	A	0/0	0.09	0.1	A	0/0	0.10	0.1	A	0/0	0.05	0.1	A	0/0	0.07	0.1	A	0/0
Hunting Road SB LT	0.39	39.1	D	3/6	0.41	39.8	D	4/7	0.40	40.0	D	4/7	0.04	16.7	B	1/2	0.04	16.7	B	1/2
Hunting Road SB TH/RT	0.78	50.2	D	12/18	0.82	53.0	D	13/20	0.87	56.1	E	15/24	0.91	42.4	D	25/41	0.93	44.5	D	28/45
Overall	--	**44.2**	**D**	--	--	**58.6**	**E**	--	--	**73.5**	**E**	--	--	**46.3**	**D**	--	--	**49.6**	**D**	--
Great Plain Avenue at Greendale Avenue																				
Weekday Morning:																				
Great Plain Avenue EB LT/TH/RT	1.84	>80.0	F	20/21	2.16	>80.0	F	17/18	2.17	>80.0	F	17/18	2.09	>80.0	F	23/23	2.10	>80.0	F	23/23
Great Plain Avenue WB LT/TH/RT	1.04	61.4	E	15/21	1.13	>80.0	F	18/23	1.14	>80.0	F	18/24	1.10	>80.0	F	17/22	1.10	>80.0	F	17/22
Greendale Avenue NB LT/TH/RT	0.79	28.3	C	7/11	0.87	34.8	C	8/14	0.88	35.8	D	8/14	0.81	29.5	C	8/12	0.81	30.0	C	8/13
Greendale Avenue SB LT/TH/RT	0.79	33.6	C	5/10	0.93	53.4	D	5/12	1.00	69.4	E	6/13	0.58	20.9	C	3/6	0.66	24.3	C	4/7
Overall	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--
Weekday Evening:																				
Great Plain Avenue EB LT/TH/RT	0.53	15.5	B	4/7	0.55	15.7	B	4/7	0.56	15.9	B	4/7	0.55	15.8	B	4/7	0.56	15.9	B	4/7
Great Plain Avenue WB LT/TH/RT	0.53	14.9	B	4/7	0.55	15.0	B	4/7	0.56	15.1	B	4/7	0.51	14.7	B	4/7	0.52	14.7	B	4/7
Greendale Avenue NB LT/TH/RT	0.52	16.5	B	3/5	0.57	18.3	B	4/6	0.58	18.6	B	4/6	0.54	17.1	B	3/5	0.55	17.6	B	3/5
Greendale Avenue SB LT/TH/RT	1.61	>80.0	F	22/35	1.87	>80.0	F	28/40	1.91	>80.0	F	28/40	1.37	>80.0	F	18/29	1.41	>80.0	F	17/30
Overall	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--

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

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

	2013 Existing				2018 No-Build Without Kendrick Street Interchange				2018 Build Without Kendrick Street Interchange				2018 No-Build With Kendrick Street Interchange				2018 Build With Kendrick Street Interchange			
Unsignalized Intersection/Peak Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Greendale Avenue at Brookline Street																				
Weekday Morning:																				
Brookline Street EB LT/RT	190	>50.0	F	23	199	>50.0	F	27	199	>50.0	F	29	199	>50.0	F	24	199	>50.0	F	26
Greendale Avenue NB LT/TH	1,137	0.1	A	0	1,260	0.1	A	0	1,346	0.1	A	0	1,204	0.1	A	0	1,290	0.1	A	0
Greendale Avenue SB TH/RT	321	0.0	A	0	352	0.0	A	0	374	0.0	A	0	268	0.0	A	0	290	0.0	A	0
Weekday Evening:																				
Brookline Street EB LT/RT	93	>50.0	F	6	97	>50.0	F	8	97	>50.0	F	9	97	>50.0	F	4	97	>50.0	F	6
Greendale Avenue NB LT/TH	267	1.1	A	0	302	1.1	A	1	348	1.1	A	1	246	1.1	A	0	292	1.1	A	0
Greendale Avenue SB TH/RT	1,196	0.0	A	0	1,319	0.0	A	0	1,405	0.0	A	0	1,069	0.0	A	0	1,155	0.0	A	0
Greendale Avenue at Rybury Hillway																				
Weekday Morning:																				
Rybury Hillway EB LT/RT	31	13.2	B	1	32	14.5	B	1	32	15.7	C	1	32	12.9	B	1	32	13.8	B	1
Greendale Avenue NB LT/TH	1,160	0.1	A	0	1,285	0.1	A	0	1,371	0.1	A	0	1,229	0.1	A	0	1,315	0.1	A	0
Greendale Avenue SB TH/RT	264	0.0	A	0	292	0.0	A	0	314	0.0	A	0	208	0.0	A	0	230	0.0	A	0
Weekday Evening:																				
Rybury Hillway EB LT/RT	16	24.4	C	1	17	29.5	D	1	17	34.3	D	1	17	20.3	C	1	17	23.0	C	1
Greendale Avenue NB LT/TH	281	0.7	A	0	317	0.7	A	0	363	0.7	A	0	261	0.7	A	0	307	0.7	A	0
Greendale Avenue SB TH/RT	1,058	0.0	A	0	1,174	0.0	A	0	1,260	0.0	A	0	924	0.0	A	0	1,010	0.0	A	0
Greendale Avenue at Bird Street																				
Weekday Morning:																				
Bird Street EB LT/RT	102	>50.0	F	6	108	>50.0	F	9	108	>50.0	F	10	108	>50.0	F	7	108	>50.0	F	8
Greendale Avenue NB LT/TH	1,081	0.1	A	0	1,202	0.1	A	0	1,288	0.1	A	0	1,146	0.1	A	0	1,232	0.1	A	0
Greendale Avenue SB TH/RT	289	0.0	A	0	318	0.0	A	0	340	0.0	A	0	234	0.0	A	0	256	0.0	A	0
Weekday Evening:																				
Bird Street EB LT/RT	48	46.3	E	2	48	>50.0	F	3	48	>50.0	F	4	48	34.1	D	2	48	45.1	E	2
Greendale Avenue NB LT/TH	244	0.3	A	0	278	0.3	A	0	324	0.3	A	0	222	0.3	A	0	268	0.3	A	0
Greendale Avenue SB TH/RT	1,070	0.0	A	0	1,187	0.0	A	0	1,273	0.0	A	0	937	0.0	A	0	1,023	0.0	A	0
Greendale Avenue at Broadmeadow Road																				
Weekday Morning:																				
Broadmeadow Road EB LT/RT	38	23.3	C	1	40	28.9	D	1	40	30.6	D	2	40	23.4	C	1	40	24.3	C	1
Greendale Avenue NB LT/TH	1,060	0.0	A	0	1,179	0.0	A	0	1,184	0.0	A	0	1,123	0.0	A	0	1,128	0.0	A	0
Greendale Avenue SB TH/RT	243	0.0	A	0	269	0.0	A	0	291	0.0	A	0	185	0.0	A	0	207	0.0	A	0
Weekday Evening:																				
Broadmeadow Road EB LT/RT	22	24.0	C	1	23	29.0	D	1	23	30.0	D	1	23	19.8	C	1	23	20.4	C	1
Greendale Avenue NB LT/TH	239	0.4	A	0	273	0.4	A	0	294	0.4	A	0	217	0.4	A	0	238	0.4	A	0
Greendale Avenue SB TH/RT	996	0.0	A	0	1,108	0.0	A	0	1,120	0.0	A	0	858	0.0	A	0	870	0.0	A	0

See notes at end of table.

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

	2013 Existing				2018 No-Build Without Kendrick Street Interchange				2018 Build Without Kendrick Street Interchange				2018 No-Build With Kendrick Street Interchange				2018 Build With Kendrick Street Interchange			
Unsignalized Intersection/Peak Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Greendale Avenue at the Project North Driveway																				
Weekday Morning:																				
Project North Driveway WB LT/RT	--	--	--	--	--	--	--	--	87	43.2	E	3	--	--	--	--	87	37.3	E	3
Greendale Avenue NB TH/RT	--	--	--	--	--	--	--	--	1,208	0.0	A	0	--	--	--	--	1,152	0.0	A	0
Greendale Avenue SB LT/TH	--	--	--	--	--	--	--	--	288	0.8	A	0	--	--	--	--	204	1.1	A	0
Weekday Evening:																				
Project North Driveway WB LT/RT	--	--	--	--	--	--	--	--	46	13.3	B	1	--	--	--	--	46	11.4	B	1
Greendale Avenue NB TH/RT	--	--	--	--	--	--	--	--	286	0.0	A	0	--	--	--	--	230	0.0	A	0
Greendale Avenue SB LT/TH	--	--	--	--	--	--	--	--	1,200	0.5	A	1	--	--	--	--	950	0.7	A	1
Greendale Avenue at the Project South Driveway																				
Weekday Morning:																				
Project South Driveway WB LT/RT	--	--	--	--	--	--	--	--	21	39.1	E	1	--	--	--	--	21	32.2	D	1
Greendale Avenue NB TH/RT	--	--	--	--	--	--	--	--	1,207	0.0	A	0	--	--	--	--	1,151	0.0	A	0
Greendale Avenue SB LT/TH	--	--	--	--	--	--	--	--	274	0.1	A	1	--	--	--	--	190	0.1	A	0
Weekday Evening:																				
Project South Driveway WB LT/RT	--	--	--	--	--	--	--	--	12	29.7	D	1	--	--	--	--	12	20.3	C	0
Greendale Avenue NB TH/RT	--	--	--	--	--	--	--	--	299	0.0	A	0	--	--	--	--	243	0.0	A	0
Greendale Avenue SB LT/TH	--	--	--	--	--	--	--	--	1,123	0.0	A	0	--	--	--	--	873	0.1	A	0

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

Table 12
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY WITH MITIGATION

Signalized Intersection/Peak Hour/Movement	2018 No-Build Without Kendrick Street Interchange				2018 Build Without Kendrick Street Interchange				2018 Build with Mitigation Without Kendrick Street Interchange				2018 No-Build With Kendrick Street Interchange				2018 Build With Kendrick Street Interchange				2018 Build with Mitigation With Kendrick Street Interchange			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Highland Avenue at Hunting Road and Gould Street																								
Weekday Morning:																								
Highland Avenue EB LT	0.73	79.2	E	3/8	0.73	80.0	F	3/8	0.72	78.0	E	4/7	0.71	77.0	E	3/6	0.71	77.1	E	3/6	--	--	--	--
Highland Avenue EB TH/RT	1.18	>80.0	F	20/27	1.19	>80.0	F	20/27	1.08	>80.0	F	20/25	1.01	63.5	E	20/25	1.01	64.3	E	20/25	--	--	--	--
Highland Avenue WB LT	0.89	66.9	E	10/18	0.90	68.7	E	10/19	0.93	75.7	E	11/19	0.30	53.5	D	1/3	0.39	56.3	E	2/4	--	--	--	--
Highland Avenue WB TH/RT	0.71	30.6	C	12/16	0.71	30.6	C	12/16	0.68	29.4	C	12/15	0.65	31.1	C	10/12	0.65	31.2	C	10/12	--	--	--	--
Hunting Road NB LT/TH	0.87	72.3	E	8/14	0.88	74.7	E	8/15	0.88	76.7	E	9/14	0.95	73.4	E	12/19	0.96	75.2	E	12/19	--	--	--	--
Hunting Road NB RT	0.51	16.3	B	5/9	0.57	18.4	B	6/11	0.60	23.5	C	8/12	0.87	44.0	D	13/20	0.95	55.4	E	15/23	--	--	--	--
Gould Street SB LT	0.73	62.0	E	6/9	0.73	62.5	E	6/9	0.79	72.0	E	6/10	0.81	76.5	E	5/9	0.81	76.5	E	5/9	--	--	--	--
Gould Street SB LT/TH/RT	0.66	53.9	D	5/8	0.66	54.5	D	5/9	0.72	61.9	E	6/9	0.73	63.5	E	5/8	0.73	64.0	E	5/8	--	--	--	--
Overall	--	**70.1**	**E**	--	--	**71.6**	**E**	--	--	**61.4**	**E**	--	--	**55.1**	**E**	--	--	**57.4**	**E**	--	--	--	--	--
Weekday Evening:																								
Highland Avenue EB LT	0.44	60.9	E	2/4	0.45	62.1	E	2/4	0.47	64.3	E	2/4	0.90	>80.0	F	4/9	0.90	>80.0	F	4/9	--	--	--	--
Highland Avenue EB TH/RT	0.92	59.0	E	11/18	0.94	64.0	E	12/18	0.94	64.6	E	12/18	0.93	67.7	E	18/23	0.93	69.5	E	18/23	--	--	--	--
Highland Avenue WB LT	0.83	61.1	E	9/14	0.89	67.7	E	10/17	0.93	77.4	E	11/18	0.90	>80.0	F	10/16	1.03	>80.0	F	13/20	--	--	--	--
Highland Avenue WB TH/RT	0.71	32.2	C	12/16	0.69	31.6	C	12/16	0.70	33.6	C	13/17	0.94	57.5	E	25/28	0.93	55.7	E	25/28	--	--	--	--
Hunting Road NB LT/TH	0.59	58.2	E	4/6	0.61	59.5	E	4/6	0.64	64.4	E	4/6	1.01	>80.0	F	6/11	1.04	>80.0	F	6/11	--	--	--	--
Hunting Road NB RT	0.75	33.5	C	10/14	0.76	34.1	C	11/15	0.78	35.8	D	11/16	0.28	7.2	A	0/2	0.32	7.7	A	0/3	--	--	--	--
Gould Street SB LT	0.89	66.5	E	11/19	0.91	71.6	E	11/19	0.84	59.6	E	11/18	0.56	44.9	D	11/15	0.57	45.4	D	11/15	--	--	--	--
Gould Street SB LT/TH/RT	0.99	>80.0	F	13/23	1.03	>80.0	F	14/23	0.94	72.2	E	13/22	1.03	>80.0	F	26/36	1.05	>80.0	F	26/36	--	--	--	--
Overall	--	**51.9**	**D**	--	--	**55.4**	**E**	--	--	**53.8**	**D**	--	--	**70.1**	**E**	--	--	**73.1**	**E**	--	--	--	--	--
Kendrick Street at Hunting Road																								
Weekday Morning:																								
Kendrick Street EB LT/TH/RT	1.13	>80.0	F	17/19	1.13	>80.0	F	17/19	0.99	75.3	E	17/18	0.95	67.3	E	14/15	0.95	67.3	E	14/15	--	--	--	--
Kendrick Street WB LT	0.72	66.8	E	3/8	0.76	69.8	E	3/9	0.90	77.4	E	4/11	0.48	48.7	D	2/5	0.51	51.0	D	3/5	--	--	--	--
Kendrick Street WB TH/RT	0.48	30.1	C	8/14	0.48	30.1	C	8/14	0.50	34.3	C	5/16	0.42	32.5	C	7/13	0.42	32.5	C	7/13	--	--	--	--
Hunting Road NB LT/TH	1.13	>80.0	F	18/33	1.25	>80.0	F	22/37	0.98	78.9	E	19/35	0.94	59.1	E	24/43	1.01	73.9	E	27/47	--	--	--	--
Hunting Road NB RT	0.53	1.3	A	0/0	0.55	1.4	A	0/0	0.55	1.4	A	0/0	0.35	0.6	A	0/0	0.37	0.7	A	0/0	--	--	--	--
Hunting Road SB LT	0.94	75.6	E	10/22	0.94	75.8	E	10/22	1.14	>80.0	F	13/26	0.70	71.7	E	2/6	0.70	71.7	E	2/6	--	--	--	--
Hunting Road SB TH/RT	0.14	17.8	B	2/5	0.15	18.4	B	2/5	0.14	18.2	B	3/5	0.07	18.5	B	1/3	0.08	18.6	B	2/3	--	--	--	--
Overall	--	**67.6**	**E**	--	--	**75.1**	**E**	--	--	**56.6**	**E**	--	--	**45.2**	**D**	--	--	**49.2**	**D**	--	--	--	--	--
Weekday Evening:																								
Kendrick Street EB LT/TH/RT	0.90	79.2	E	5/11	0.93	>80.0	F	5/11	0.73	61.6	E	5/9	0.59	72.1	E	2/4	0.61	75.0	E	2/4	--	--	--	--
Kendrick Street WB LT	1.02	65.3	E	18/45	1.09	>80.0	F	26/48	1.08	78.8	E	27/47	0.33	35.4	D	5/9	0.41	38.7	D	6/11	--	--	--	--
Kendrick Street WB TH/RT	1.01	54.3	D	26/60	1.03	64.2	E	35/60	0.98	46.7	D	29/56	0.91	57.9	E	20/37	0.95	68.0	E	20/37	--	--	--	--
Hunting Road NB LT/TH	0.91	>80.0	F	5/11	1.14	>80.0	F	7/13	0.73	67.5	E	6/10	0.33	48.6	D	5/7	0.35	45.9	D	6/9	--	--	--	--
Hunting Road NB RT	0.09	0.1	A	0/0	0.10	0.1	A	0/0	0.10	0.1	A	0/0	0.05	0.1	A	0/0	0.07	0.1	A	0/0	--	--	--	--
Hunting Road SB LT	0.41	39.8	D	4/7	0.40	40.0	D	4/7	0.58	47.8	D	4/7	0.04	16.7	B	1/2	0.04	16.7	B	1/2	--	--	--	--
Hunting Road SB TH/RT	0.82	53.0	D	13/20	0.87	56.1	E	15/24	0.96	76.1	E	17/28	0.91	42.4	D	25/41	0.93	44.5	D	28/45	--	--	--	--
Overall	--	**58.6**	**E**	--	--	**73.5**	**E**	--	--	**60.4**	**E**	--	--	**46.3**	**D**	--	--	**49.6**	**D**	--	--	--	--	--

See notes at end of table.

Table 12 (Continued)
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY WITH MITIGATION

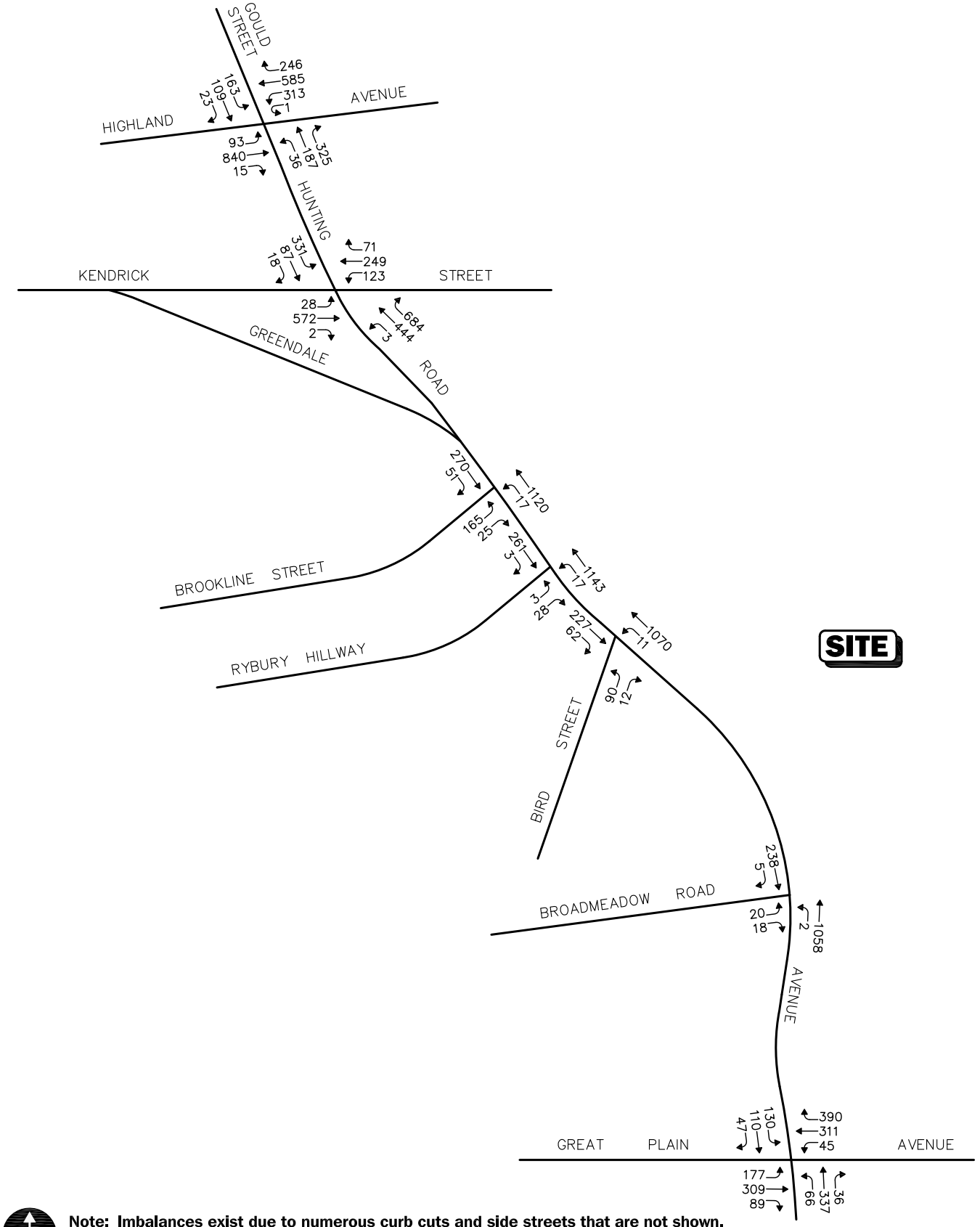
Signalized Intersection/Peak Hour/Movement	2018 No-Build Without Kendrick Street Interchange				2018 Build Without Kendrick Street Interchange				2018 Build with Mitigation Without Kendrick Street Interchange				2018 No-Build With Kendrick Street Interchange				2018 Build With Kendrick Street Interchange				2018 Build with Mitigation With Kendrick Street Interchange			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Great Plain Avenue at Greendale Avenue																								
Weekday Morning:																								
Great Plain Avenue EB LT/TH/RT	2.16	>80.0	F	17/18	2.17	>80.0	F	17/18	2.15	>80.0	F	19/19	2.09	>80.0	F	23/23	2.10	>80.0	F	23/23	1.71	>80.0	F	24/24
Great Plain Avenue WB LT/TH/RT	1.13	>80.0	F	18/23	1.14	>80.0	F	18/24	1.12	>80.0	F	21/26	1.10	>80.0	F	17/22	1.10	>80.0	F	17/22	0.97	41.3	D	15/23
Greendale Avenue NB LT/TH/RT	0.87	34.8	C	8/14	0.88	35.8	D	8/14	0.86	35.9	D	10/15	0.81	29.5	C	8/12	0.81	30.0	C	8/13	0.94	50.6	D	10/16
Greendale Avenue SB LT/TH/RT	0.93	53.4	D	5/12	1.00	69.4	E	6/13	0.99	69.6	E	7/14	0.58	20.9	C	3/6	0.66	24.3	C	4/7	0.85	47.6	D	5/10
Overall	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--
Weekday Evening:																								
Great Plain Avenue EB LT/TH/RT	0.55	15.7	B	4/7	0.56	15.9	B	4/7	0.91	51.9	D	7/14	0.55	15.8	B	4/7	0.56	15.9	B	4/7	0.88	47.1	D	7/14
Great Plain Avenue WB LT/TH/RT	0.55	15.0	B	4/7	0.56	15.1	B	4/7	0.81	37.5	D	7/13	0.51	14.7	B	4/7	0.52	14.7	B	4/7	0.76	33.9	C	7/12
Greendale Avenue NB LT/TH/RT	0.57	18.3	B	4/6	0.58	18.6	B	4/6	0.48	11.0	B	4/6	0.54	17.1	B	3/5	0.55	17.6	B	3/5	0.42	9.7	A	3/4
Greendale Avenue SB LT/TH/RT	1.87	>80.0	F	28/40	1.91	>80.0	F	28/40	1.39	>80.0	F	30/39	1.37	>80.0	F	18/29	1.41	>80.0	F	17/30	1.04	60.3	E	18/27
Overall	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--	--	**44.8**	**D**	--

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

ATTACHMENTS

UPDATED TRAFFIC-VOLUME NETWORKS
TRAFFIC COUNT DATA
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS
SITE-SPECIFIC DEVELOPMENT TRAFFIC-VOLUME NETWORKS
GENERAL BACKGROUND TRAFFIC GROWTH
I-95/ROUTE 128 ADD-A-LANE TRAFFIC VOLUME REDISTRIBUTION
TRIP-GENERATION CALCULATIONS
CAPACITY ANALYSIS WORKSHEETS
PRELIMINARY TRAFFIC SIGNAL WARRANTS ANALYSIS

UPDATED TRAFFIC-VOLUME NETWORKS



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

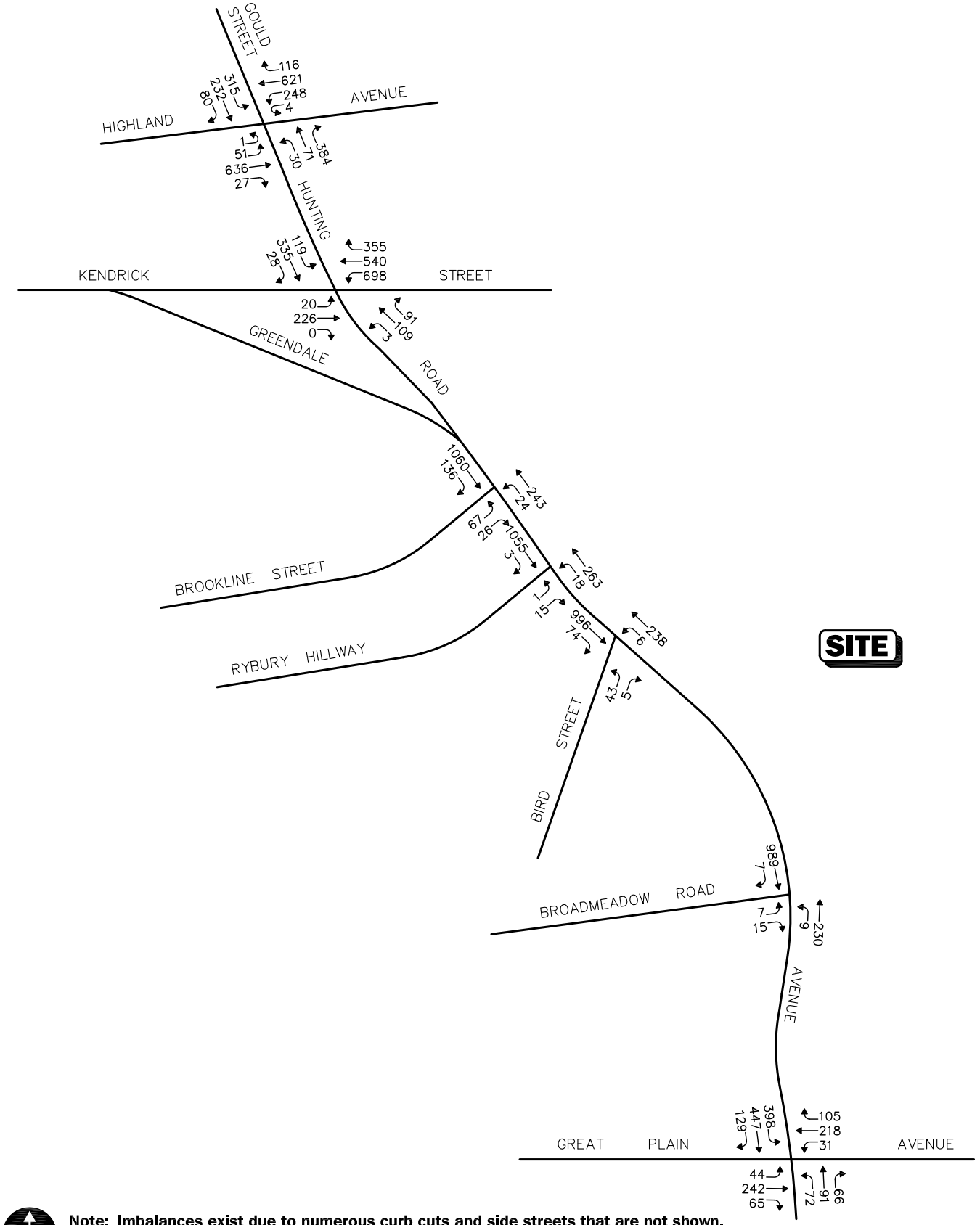
Not To Scale

Figure 1

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2013 Existing
Weekday Morning
Peak Hour Traffic Volumes

R:\6202\RTC\6202nt1.dwg 9/24/2013 9:12:12 AM EDT



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

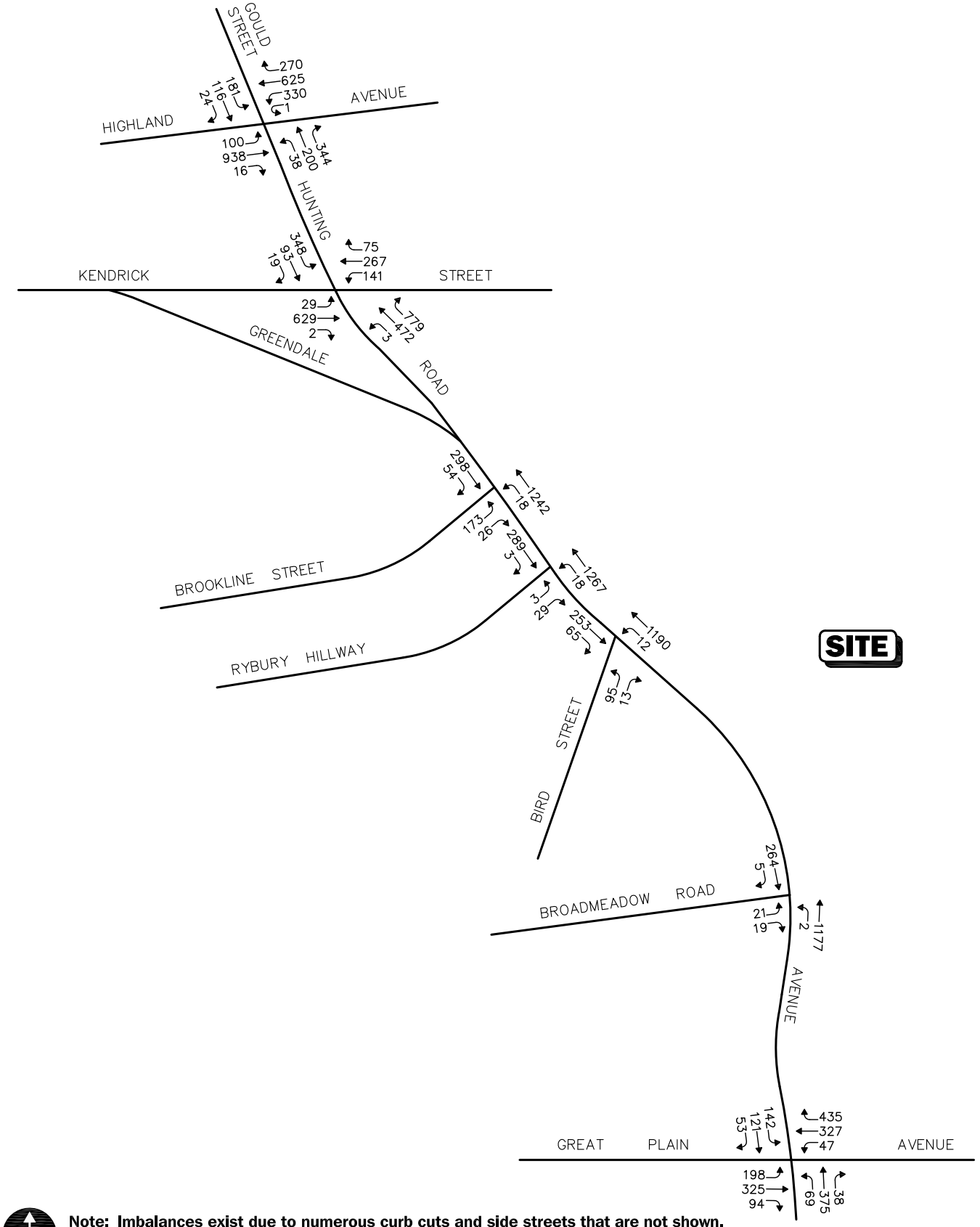
Not To Scale

Figure 2

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2013 Existing Weekday Evening Peak Hour Traffic Volumes

R:\6202\RTC\6202nt2.dwg 9/18/2013 1:34:22 PM EDT



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

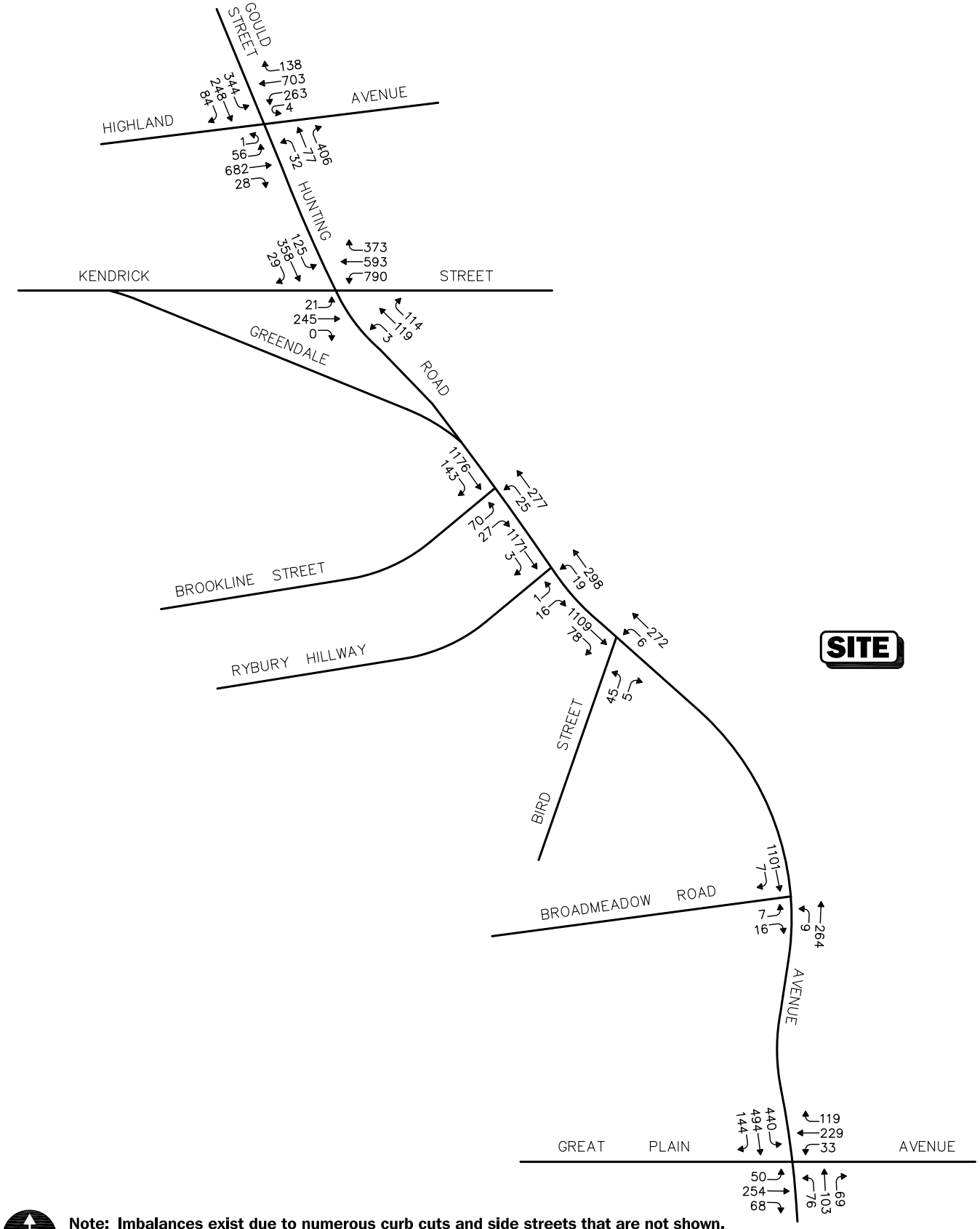
Not To Scale

Figure 3

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 No-Build
Weekday Morning
Peak Hour Traffic Volumes
Without Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt3.dwg 9/18/2013 1:44:22 PM EDT



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

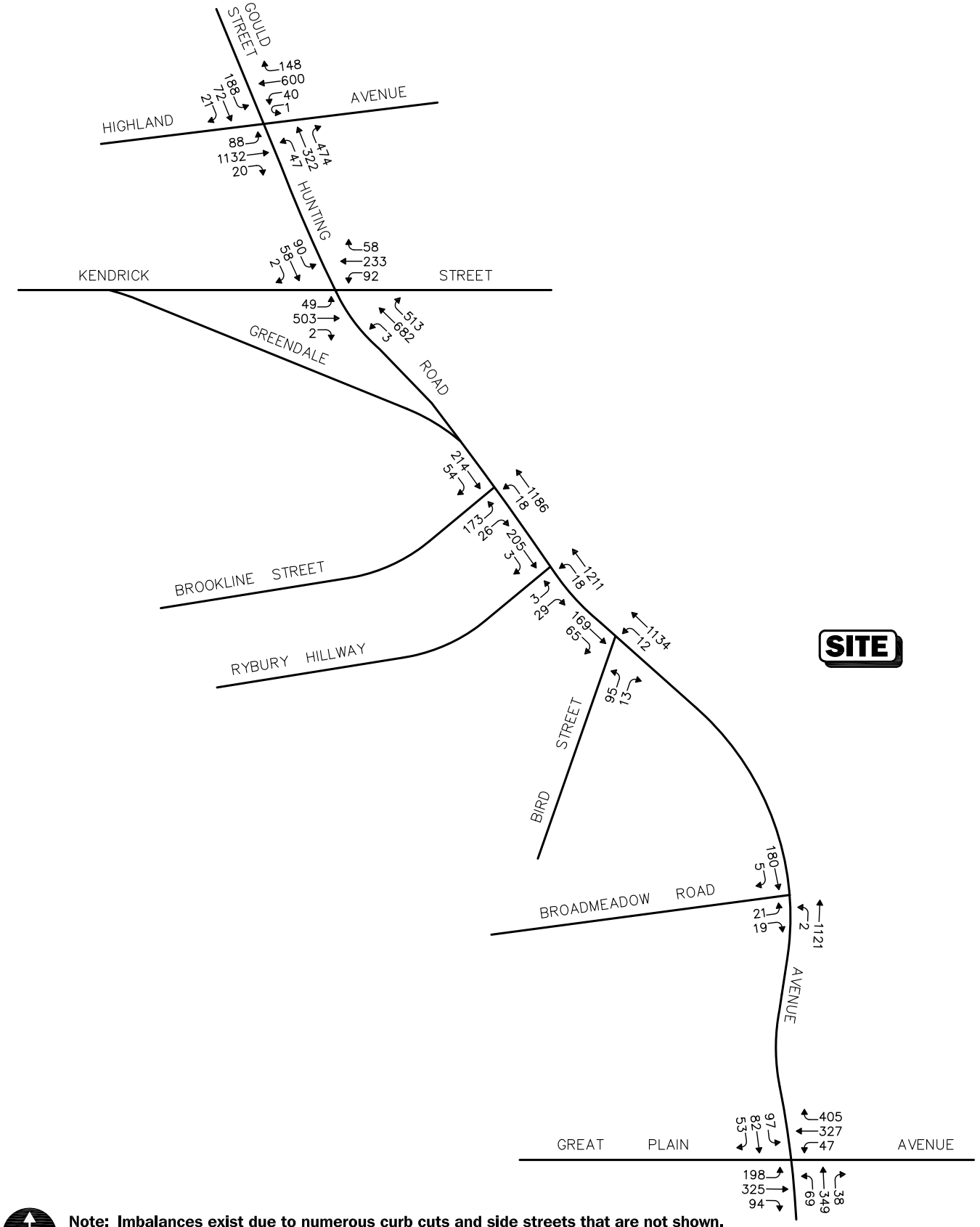
Not To Scale

Figure 4

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 No-Build
Weekday Evening
Peak Hour Traffic Volumes
Without Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt4.dwg 9/18/2013 1:53:57 PM EDT



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

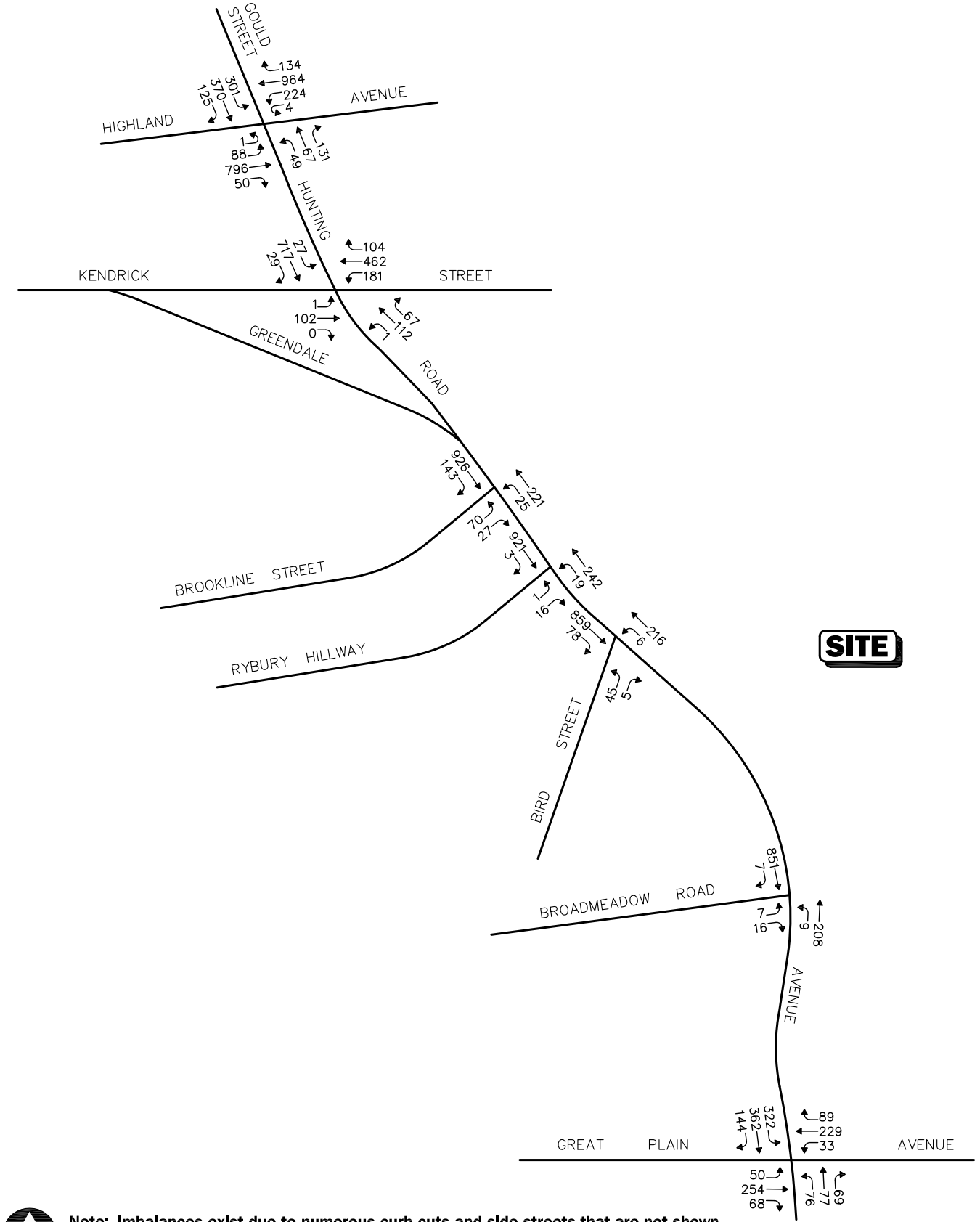
Not To Scale

Figure 5

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 No-Build
Weekday Morning
Peak Hour Traffic Volumes
With Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt5.dwg 9/24/2013 9:13:37 AM EDT



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

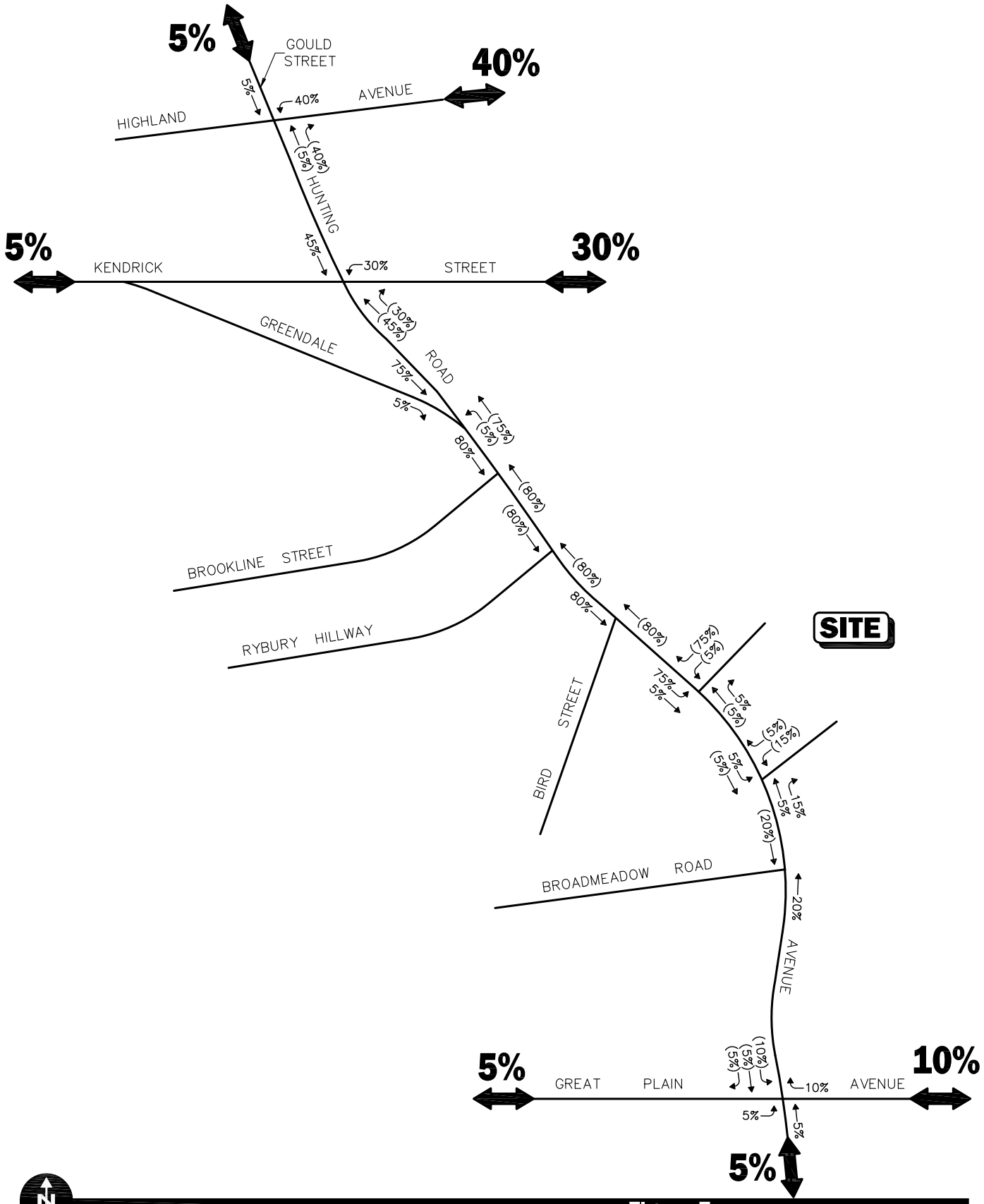
Not To Scale

Figure 6

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 No-Build
Weekday Evening
Peak Hour Traffic Volumes
With Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt6.dwg 9/18/2013 2:25:57 PM EDT



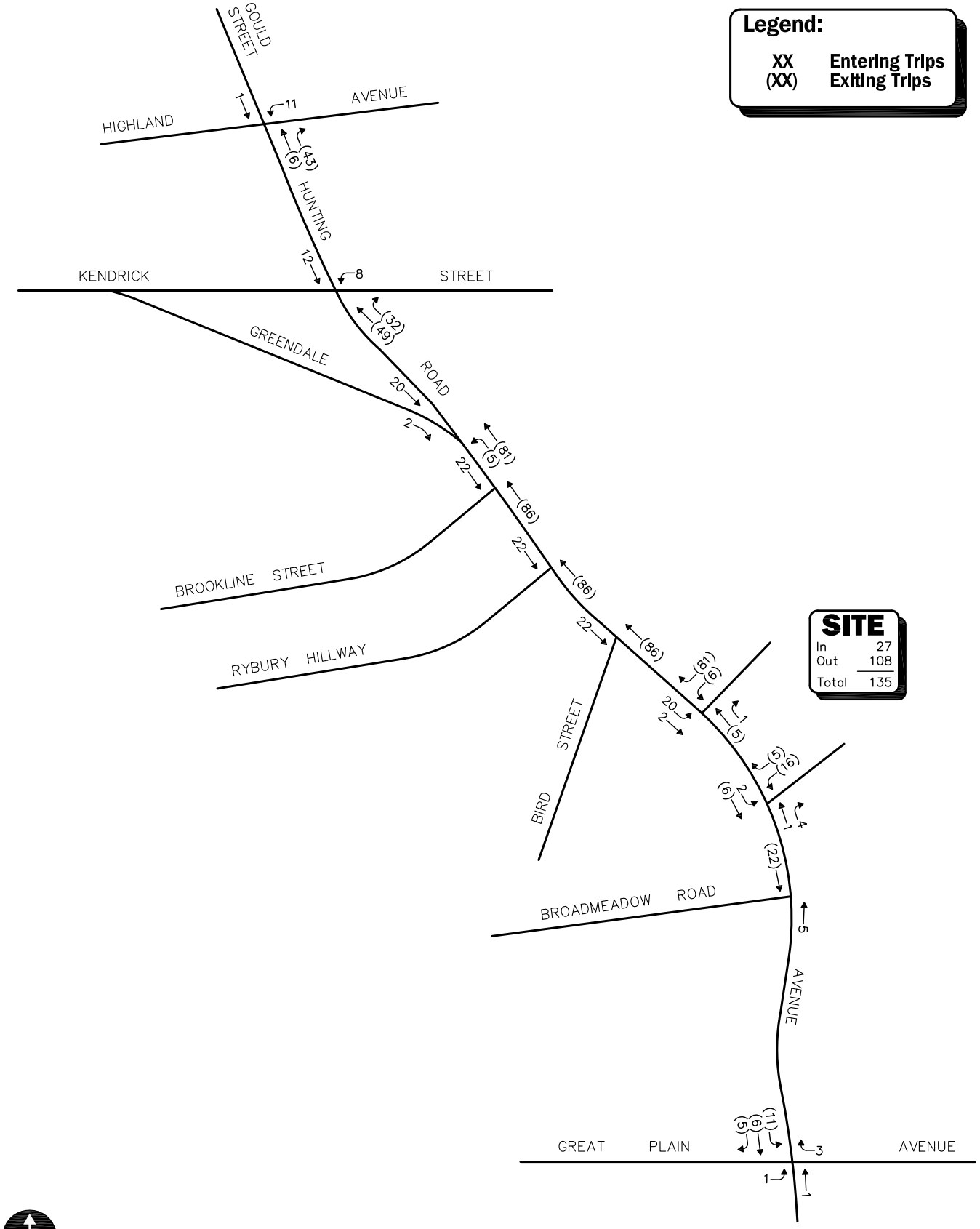
Not To Scale

Figure 7

Trip Distribution Map

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\6202\RTC\6202trip.dwg 9/24/2013 9:14:45 AM EDT



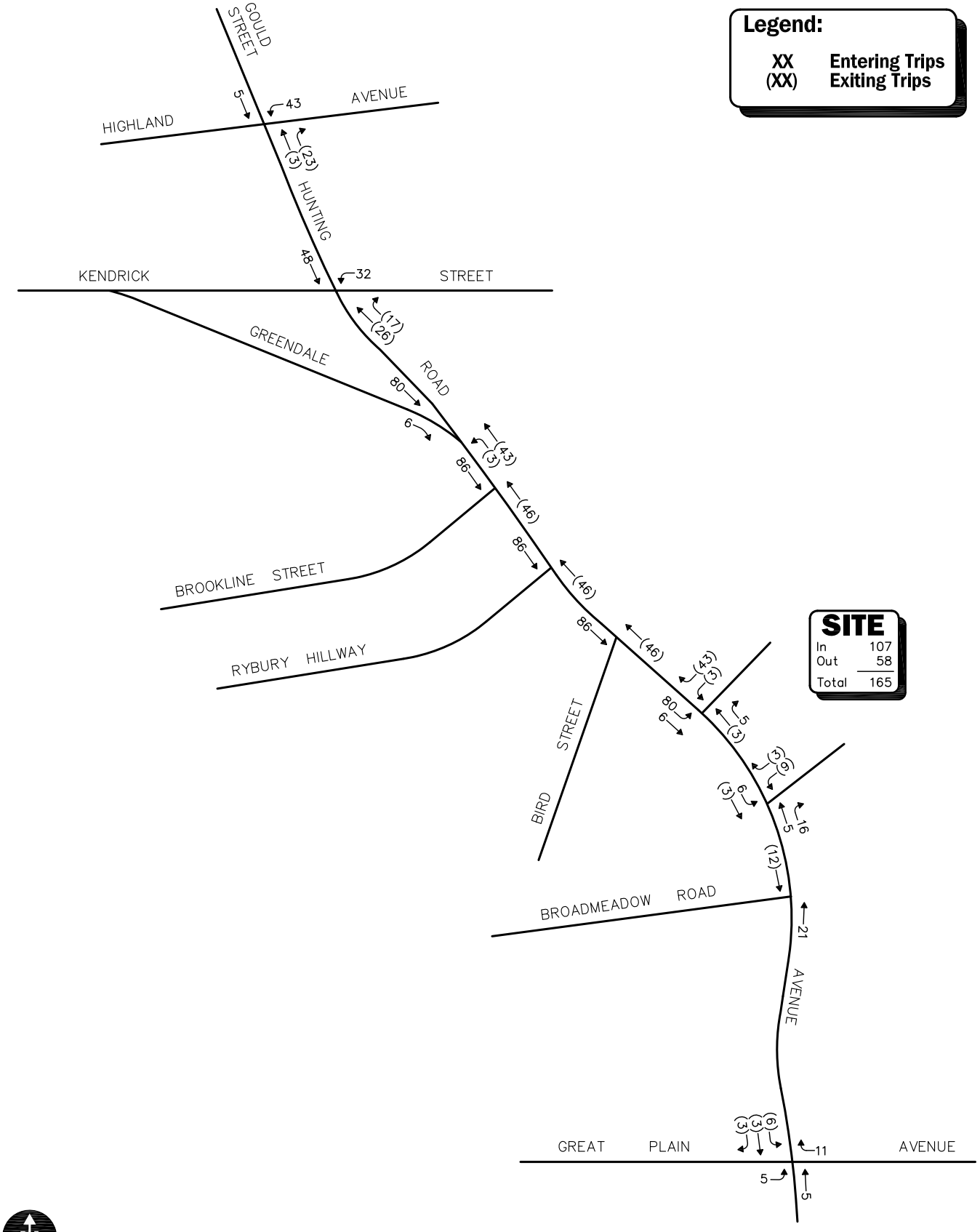
Not To Scale

Figure 8

Project-Generated Weekday Morning Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\6202\RTC\6202nt7.dwg 9/24/2013 9:15:51 AM EDT



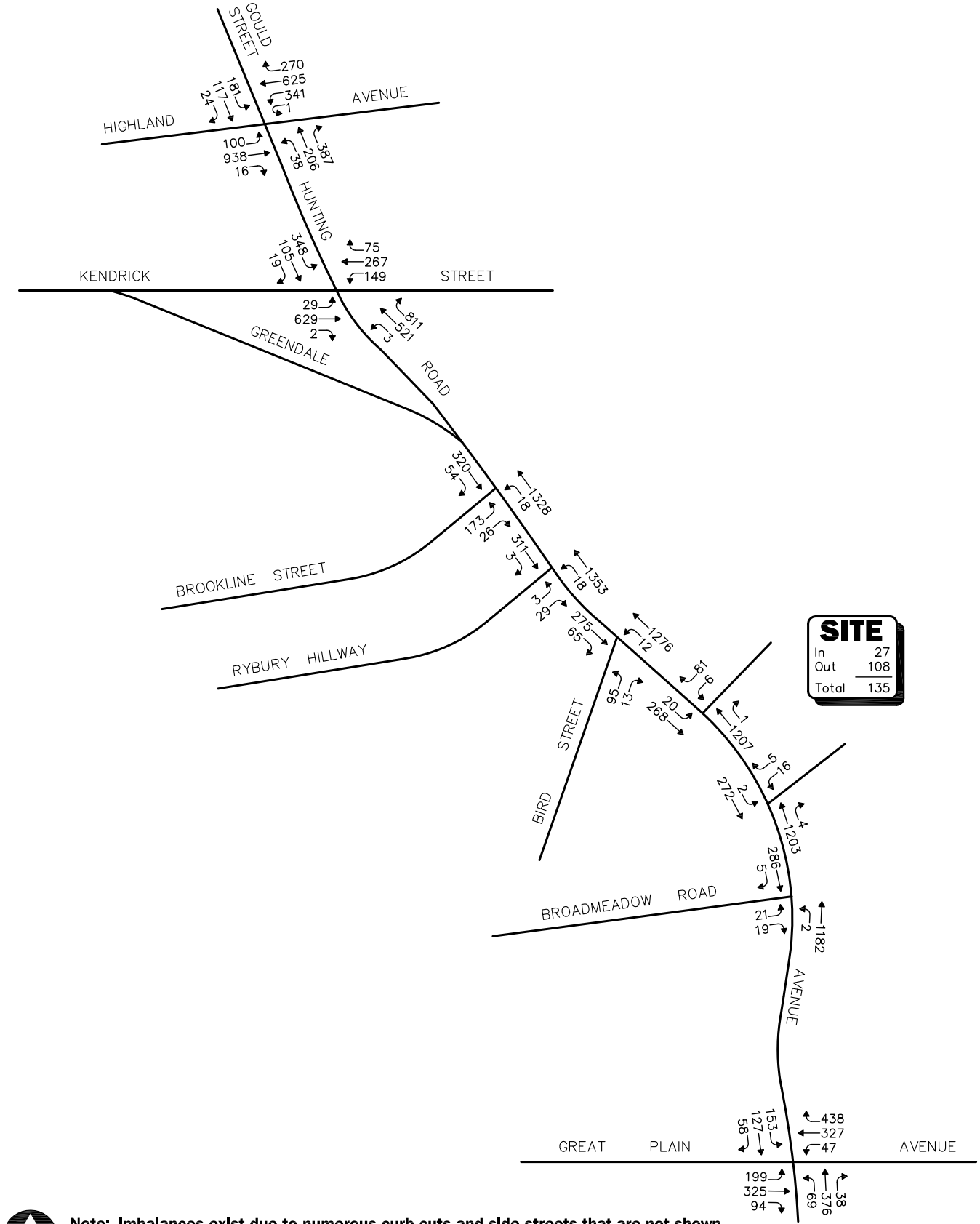
Not To Scale

Figure 9

Project-Generated Weekday Evening Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\6202\RTC\6202nt8.dwg 9/24/2013 9:16:32 AM EDT



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

Not To Scale

Figure 10

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 Build
Weekday Morning
Peak Hour Traffic Volumes
Without Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt9.dwg 9/18/2013 3:52:46 PM EDT

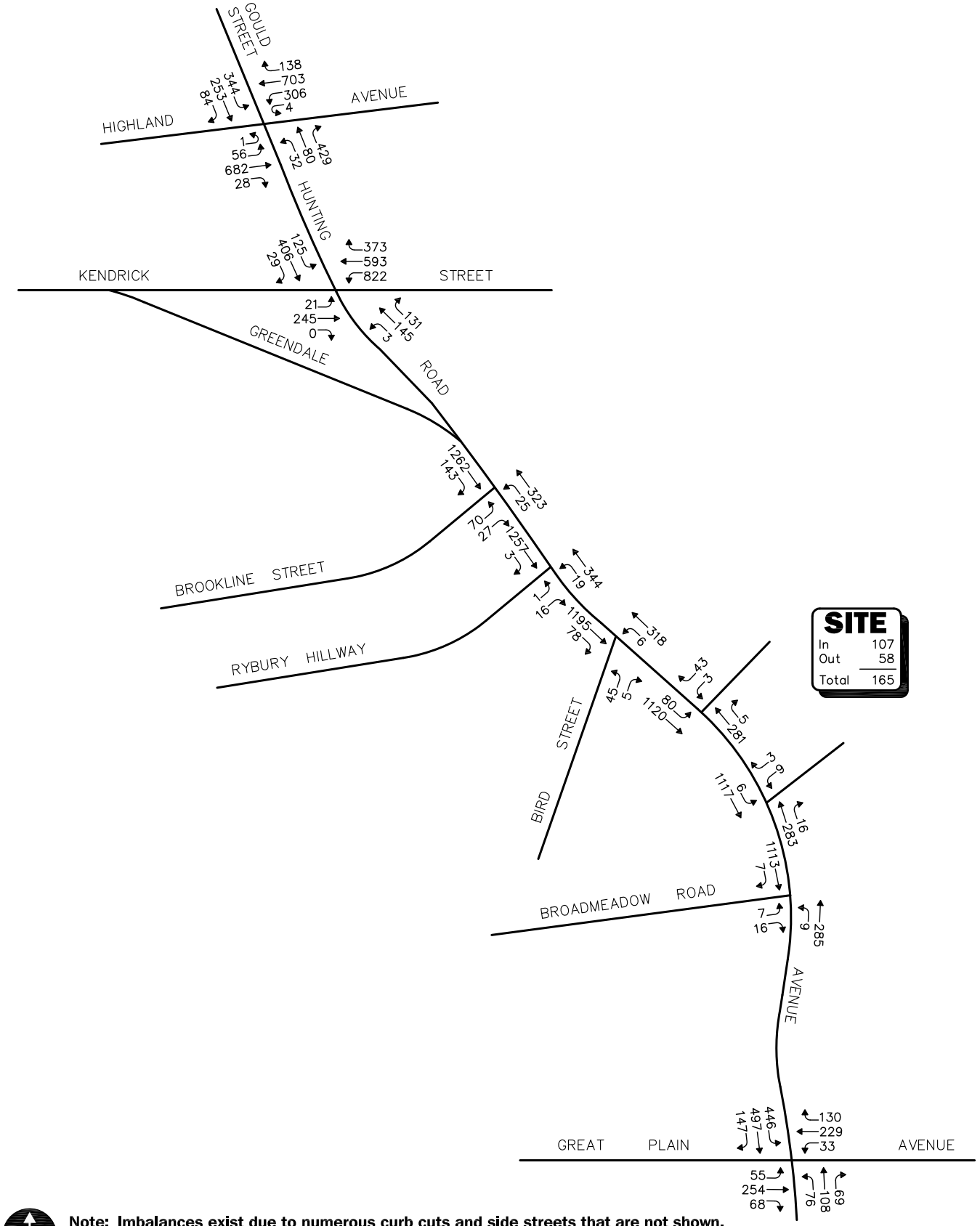
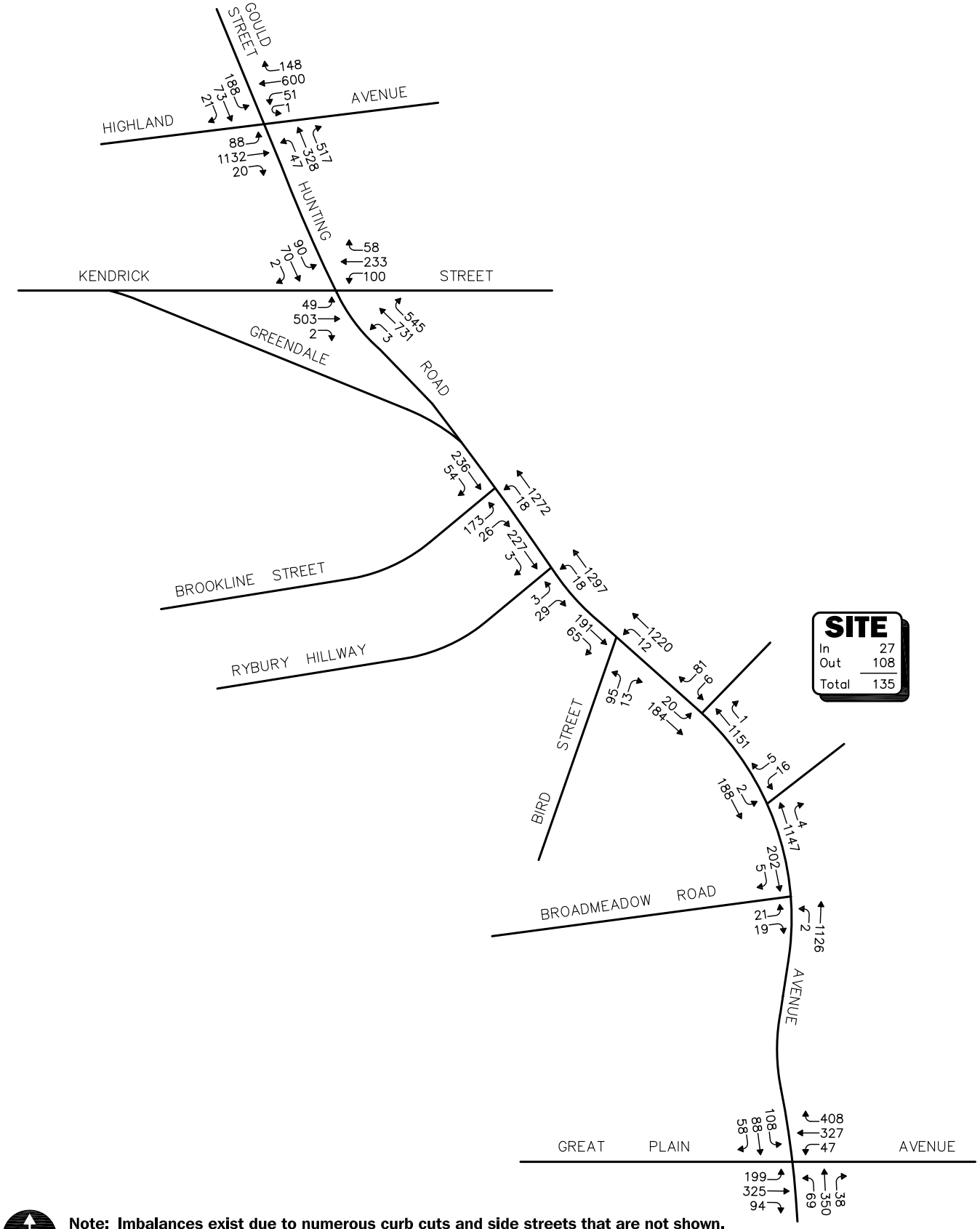


Figure 11

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 Build
Weekday Evening
Peak Hour Traffic Volumes
Without Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt10.dwg 9/24/2013 9:17:21 AM EDT



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

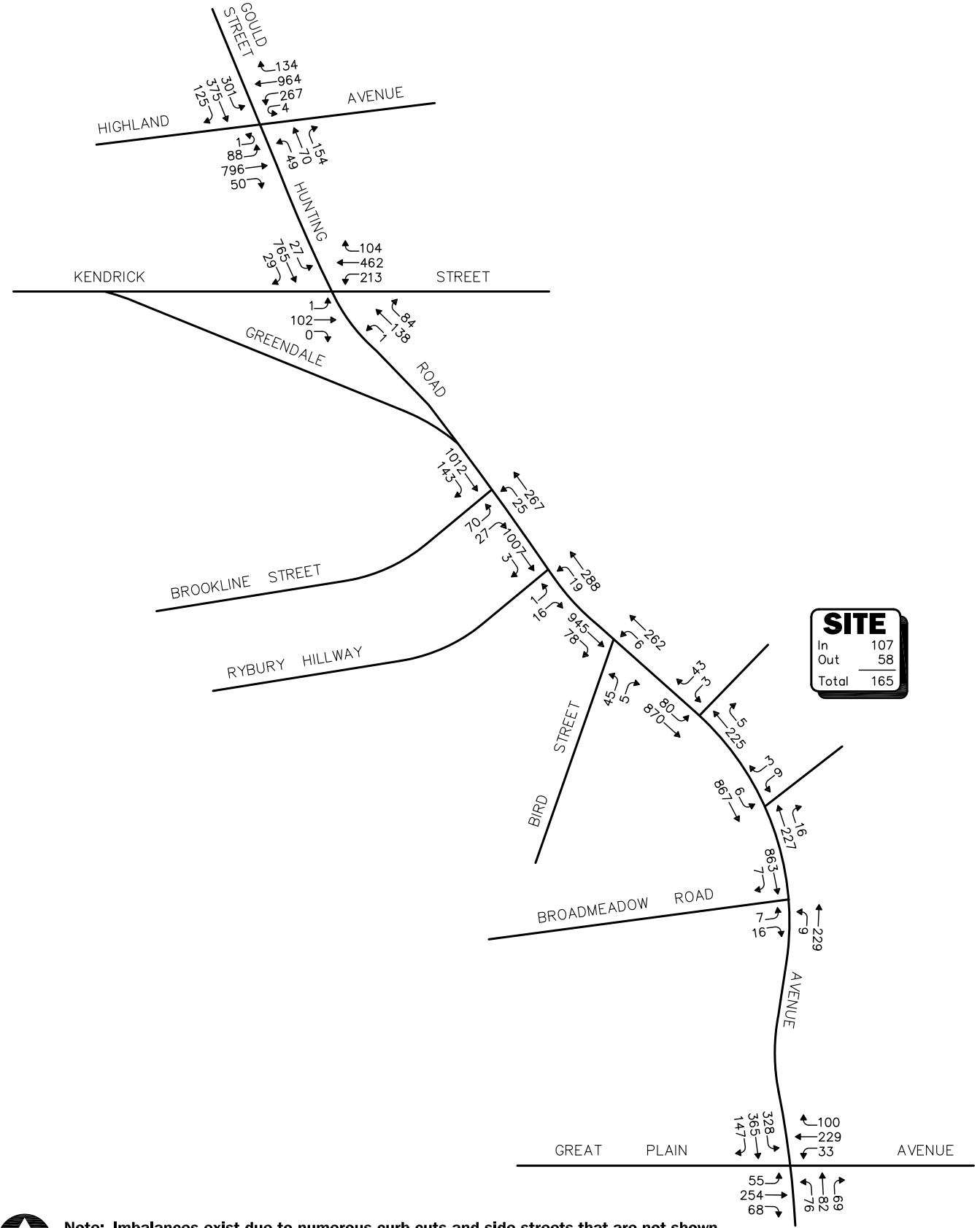
Not To Scale

Figure 12

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 Build
Weekday Morning
Peak Hour Traffic Volumes
With Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt11.dwg 9/18/2013 4:26:32 PM EDT



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

Not To Scale

Figure 13

Vanasse & Associates, Inc.
Transportation Engineers & Planners

2018 Build
Weekday Evening
Peak Hour Traffic Volumes
With Kendrick Street
Interchange Improvements

R:\6202\RTC\6202nt12.dwg 9/18/2013 4:37:38 PM EDT

TRAFFIC COUNT DATA

Automatic Traffic Recorder Counts
Manual Turning Movement Counts

Automatic Traffic Recorder Counts

Accurate Counts

978-664-2565

6202VOL1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA

Start	11-Sep-13	SB		Hour Totals		NB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	85			7	39				
12:15		2	73			4	48				
12:30		2	81			3	35				
12:45		6	67	17	306	1	56	15	178	32	484
01:00		8	74			2	45				
01:15		0	66			1	46				
01:30		4	78			1	33				
01:45		3	74	15	292	1	48	5	172	20	464
02:00		3	72			0	60				
02:15		1	89			1	52				
02:30		4	113			1	65				
02:45		1	105	9	379	0	62	2	239	11	618
03:00		1	99			0	58				
03:15		0	114			0	83				
03:30		0	129			1	66				
03:45		2	134	3	476	0	55	1	262	4	738
04:00		1	154			1	57				
04:15		2	189			1	49				
04:30		3	206			3	55				
04:45		4	217	10	766	8	58	13	219	23	985
05:00		4	235			3	51				
05:15		6	225			4	61				
05:30		4	202			10	68				
05:45		9	202	23	864	25	59	42	239	65	1103
06:00		4	184			15	59				
06:15		17	158			49	62				
06:30		14	144			54	38				
06:45		16	136	51	622	91	41	209	200	260	822
07:00		34	82			101	31				
07:15		57	78			151	31				
07:30		63	50			195	44				
07:45		87	63	241	273	251	39	698	145	939	418
08:00		37	58			250	33				
08:15		52	36			244	23				
08:30		66	20			299	24				
08:45		44	24	199	138	252	18	1045	98	1244	236
09:00		53	41			208	19				
09:15		45	27			186	15				
09:30		42	22			132	22				
09:45		46	27	186	117	129	16	655	72	841	189
10:00		49	21			92	4				
10:15		51	20			64	12				
10:30		63	14			61	5				
10:45		79	13	242	68	49	3	266	24	508	92
11:00		82	7			51	2				
11:15		94	9			44	5				
11:30		83	10			52	5				
11:45		88	6	347	32	40	0	187	12	534	44
Total		1343	4333			3138	1860			4481	6193
Percent		23.7%	76.3%			62.8%	37.2%			42.0%	58.0%

Accurate Counts
978-664-2565

6202VOL1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA

Start Time	12-Sep-13 Thu	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	80			4	47				
12:15		3	79			3	50				
12:30		7	66			2	51				
12:45		5	54	17	279	0	65	9	213	26	492
01:00		13	65			3	46				
01:15		3	77			1	58				
01:30		0	65			2	55				
01:45		1	77	17	284	0	63	6	222	23	506
02:00		2	67			0	41				
02:15		1	107			0	40				
02:30		2	118			1	68				
02:45		1	134	6	426	0	62	1	211	7	637
03:00		0	134			0	51				
03:15		1	127			0	84				
03:30		1	150			0	69				
03:45		1	167	3	578	1	42	1	246	4	824
04:00		0	168			2	56				
04:15		2	209			0	55				
04:30		3	218			3	49				
04:45		2	251	7	846	4	53	9	213	16	1059
05:00		2	254			5	54				
05:15		3	268			3	76				
05:30		6	199			8	69				
05:45		15	206	26	927	21	68	37	267	63	1194
06:00		6	192			14	61				
06:15		7	184			39	62				
06:30		17	170			50	58				
06:45		31	172	61	718	78	35	181	216	242	934
07:00		40	108			103	50				
07:15		57	99			141	22				
07:30		66	119			194	22				
07:45		70	107	233	433	238	34	676	128	909	561
08:00		58	61			257	29				
08:15		61	49			258	31				
08:30		59	41			309	28				
08:45		55	35	233	186	247	31	1071	119	1304	305
09:00		72	26			235	29				
09:15		56	28			197	30				
09:30		44	25			134	17				
09:45		53	22	225	101	149	11	715	87	940	188
10:00		43	13			68	21				
10:15		51	15			63	9				
10:30		33	11			55	2				
10:45		41	16	168	55	54	3	240	35	408	90
11:00		57	12			55	10				
11:15		62	10			51	8				
11:30		58	13			60	1				
11:45		78	7	255	42	54	4	220	23	475	65
Total		1251	4875			3166	1980			4417	6855
Percent		20.4%	79.6%			61.5%	38.5%			39.2%	60.8%
Grand Total		2594	9208			6304	3840			8898	13048
Percent		22.0%	78.0%			62.1%	37.9%			40.5%	59.5%
ADT		ADT 10,973		AADT 10,973							

Accurate Counts
978-664-2565

6202VOL1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA

Start	09-Sep-13		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	*	*	*	*	17	15	17	9	*	*	*	*	*	*	17	12
01:00	*	*	*	*	15	5	17	6	*	*	*	*	*	*	16	6
02:00	*	*	*	*	9	2	6	1	*	*	*	*	*	*	8	2
03:00	*	*	*	*	3	1	3	1	*	*	*	*	*	*	3	1
04:00	*	*	*	*	10	13	7	9	*	*	*	*	*	*	8	11
05:00	*	*	*	*	23	42	26	37	*	*	*	*	*	*	24	40
06:00	*	*	*	*	51	209	61	181	*	*	*	*	*	*	56	195
07:00	*	*	*	*	241	698	233	676	*	*	*	*	*	*	237	687
08:00	*	*	*	*	199	**1045**	233	**1071**	*	*	*	*	*	*	216	**1058**
09:00	*	*	*	*	186	655	225	715	*	*	*	*	*	*	206	685
10:00	*	*	*	*	242	266	168	240	*	*	*	*	*	*	205	253
11:00	*	*	*	*	**347**	187	**255**	220	*	*	*	*	*	*	**301**	204
12:00 PM	*	*	*	*	306	178	279	213	*	*	*	*	*	*	292	196
01:00	*	*	*	*	292	172	284	222	*	*	*	*	*	*	288	197
02:00	*	*	*	*	379	239	426	211	*	*	*	*	*	*	402	225
03:00	*	*	*	*	476	**262**	578	246	*	*	*	*	*	*	527	**254**
04:00	*	*	*	*	766	219	846	213	*	*	*	*	*	*	806	216
05:00	*	*	*	*	**864**	239	**927**	**267**	*	*	*	*	*	*	**896**	253
06:00	*	*	*	*	622	200	718	216	*	*	*	*	*	*	670	208
07:00	*	*	*	*	273	145	433	128	*	*	*	*	*	*	353	136
08:00	*	*	*	*	138	98	186	119	*	*	*	*	*	*	162	108
09:00	*	*	*	*	117	72	101	87	*	*	*	*	*	*	109	80
10:00	*	*	*	*	68	24	55	35	*	*	*	*	*	*	62	30
11:00	*	*	*	*	32	12	42	23	*	*	*	*	*	*	37	18
Lane	0	0	0	0	5676	4998	6126	5146	0	0	0	0	0	0	5901	5075
Day	0		0		10674		11272		0		0		0		10976	
AM Peak	-	-	-	-	11:00	08:00	11:00	08:00	-	-	-	-	-	-	11:00	08:00
Vol.	-	-	-	-	347	1045	255	1071	-	-	-	-	-	-	301	1058
PM Peak	-	-	-	-	17:00	15:00	17:00	17:00	-	-	-	-	-	-	17:00	15:00
Vol.	-	-	-	-	864	262	927	267	-	-	-	-	-	-	896	254

Comb. Total	0	0	10674	11272	0	0	0	10976

ADT ADT 10,973 AADT 10,973

Manual Turning Movement Counts

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

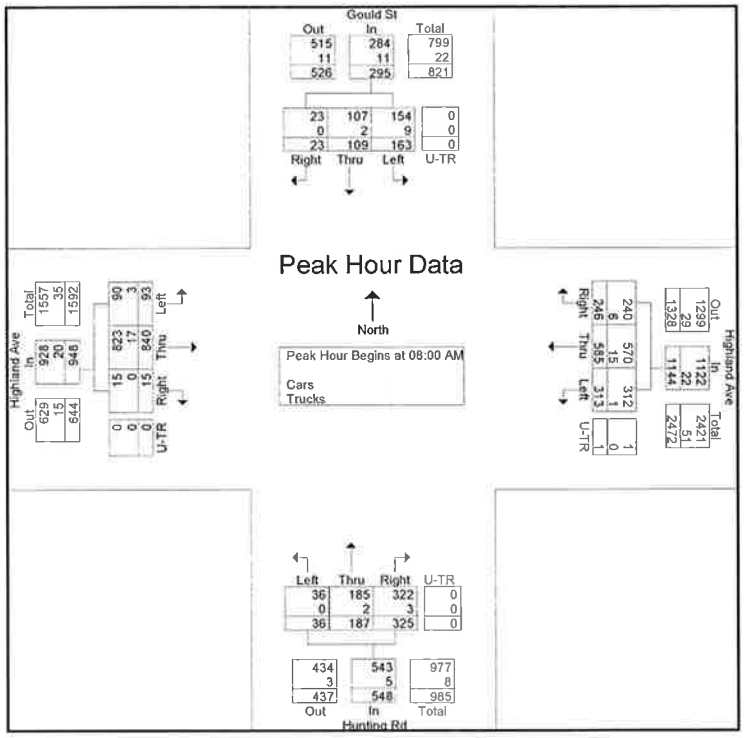
	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
07:00 AM	35	9	1	0	45	138	48	2	4	19	47	0	10	173	2	0	533
07:15 AM	28	24	3	0	70	145	44	1	7	20	64	0	11	207	3	0	627
07:30 AM	41	21	12	0	67	127	58	2	13	23	66	0	11	206	3	0	650
07:45 AM	44	20	9	0	90	123	56	0	6	27	84	0	13	207	2	0	681
Total	148	74	25	0	272	533	206	5	30	89	261	0	45	793	10	0	2491
08:00 AM	50	30	3	0	67	158	61	1	5	42	80	0	26	228	1	0	752
08:15 AM	34	18	8	0	86	153	61	0	11	43	75	0	16	203	4	0	712
08:30 AM	41	27	6	0	67	147	59	0	11	54	91	0	21	215	6	0	745
08:45 AM	38	34	6	0	93	127	65	0	9	48	79	0	30	194	4	0	727
Total	163	109	23	0	313	585	246	1	36	187	325	0	93	840	15	0	2936
Grand Total	311	183	48	0	585	1118	452	6	66	276	586	0	138	1633	25	0	5427
Apprch %	57.4	33.8	8.9	0	27.1	51.7	20.9	0.3	7.1	29.7	63.1	0	7.7	90.9	1.4	0	
Total %	5.7	3.4	0.9	0	10.8	20.6	8.3	0.1	1.2	5.1	10.8	0	2.5	30.1	0.5	0	
Cars	296	180	46	0	579	1089	435	6	64	274	580	0	134	1601	25	0	5309
% Cars	95.2	98.4	95.8	0	99	97.4	96.2	100	97	99.3	99	0	97.1	98	100	0	97.8
Trucks	15	3	2	0	6	29	17	0	2	2	6	0	4	32	0	0	118
% Trucks	4.8	1.6	4.2	0	1	2.6	3.8	0	3	0.7	1	0	2.9	2	0	0	2.2

	Gould St From North					Highland Ave From East					Hunting Rd From South					Highland Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	50	30	3	0	83	67	158	61	1	287	5	42	80	0	127	26	228	1	0	255	752
08:15 AM	34	18	8	0	60	86	153	61	0	300	11	43	75	0	129	16	203	4	0	223	712
08:30 AM	41	27	6	0	74	67	147	59	0	273	11	54	91	0	156	21	215	6	0	242	745
08:45 AM	38	34	6	0	78	93	127	65	0	285	9	48	79	0	136	30	194	4	0	228	727
Total Volume	163	109	23	0	295	313	585	246	1	1145	36	187	325	0	548	93	840	15	0	948	2936
% App. Total	55.3	36.9	7.8	0		27.3	51.1	21.5	0.1		6.6	34.1	59.3	0		9.8	88.6	1.6	0		
PHF	815	801	719	000	889	841	926	946	250	954	818	866	893	000	878	775	921	625	000	929	976
Cars	154	107	23	0	284	312	570	240	1	1123	36	185	322	0	543	90	823	15	0	928	2878
% Cars	94.5	98.2	100	0	96.3	99.7	97.4	97.6	100	98.1	100	98.9	99.1	0	99.1	96.8	98.0	100	0	97.9	98.0
Trucks	9	2	0	0	11	1	15	6	0	22	0	2	3	0	5	3	17	0	0	20	58
% Trucks	5.5	1.8	0	0	3.7	0.3	2.6	2.4	0	1.9	0	1.1	0.9	0	0.9	3.2	2.0	0	0	2.1	2.0

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at

	08:00 AM					08:00 AM					08:00 AM					08:00 AM				
+0 mins.	**50**	30	3	0	**83**	67	**158**	61	**1**	287	5	42	80	0	127	26	**228**	1	0	**255**
+15 mins.	34	18	**8**	0	60	86	153	61	**0**	**300**	**11**	43	75	0	129	16	203	**4**	0	223
+30 mins.	41	27	6	0	74	67	147	59	**0**	273	11	**54**	**91**	0	**156**	21	215	**6**	0	242
+45 mins.	**38**	**34**	**6**	**0**	**78**	**93**	**127**	**65**	**0**	285	9	48	79	0	136	**30**	194	**4**	0	228
Total Volume	163	109	23	0	295	313	585	246	1	1145	36	187	325	0	548	93	840	15	0	948
% App. Total	55.3	36.9	7.8	0		27.3	51.1	21.5	0.1		6.6	34.1	59.3	0		9.8	88.6	1.6	0	
PHF	**815**	**801**	**719**	**000**	**889**	**841**	**926**	**946**	**250**	**954**	**818**	**866**	**893**	**000**	**878**	**775**	**921**	**625**	**000**	**929**
Cars	**154**	**107**	**23**	**0**	**284**	**312**	570	240	1	1123	36	185	322	0	543	90	823	15	0	928
% Cars	94.5	98.2	100	0	96.3	99.7	97.4	97.6	100	98.1	100	98.9	99.1	0	99.1	96.8	98	100	0	97.9
Trucks	**9**	**2**	0	0	11	1	15	**6**	0	22	0	2	3	0	5	**3**	17	0	0	20

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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
07:00 AM	1	0	0	0	1	5	1	0	1	0	0	0	1	1	0	0	11
07:15 AM	1	1	0	0	2	2	5	0	0	0	0	0	0	2	0	0	13
07:30 AM	2	0	1	0	2	4	3	0	1	0	1	0	0	9	0	0	23
07:45 AM	2	0	1	0	0	3	2	0	0	0	2	0	0	3	0	0	13
Total	6	1	2	0	5	14	11	0	2	0	3	0	1	15	0	0	60
08:00 AM	6	0	0	0	0	4	0	0	0	1	1	0	0	6	0	0	18
08:15 AM	2	0	0	0	0	6	2	0	0	1	1	0	2	2	0	0	16
08:30 AM	1	0	0	0	0	5	0	0	0	0	1	0	0	6	0	0	13
08:45 AM	0	2	0	0	1	0	4	0	0	0	0	0	1	3	0	0	11
Total	9	2	0	0	1	15	6	0	0	2	3	0	3	17	0	0	58
Grand Total	15	3	2	0	6	29	17	0	2	2	6	0	4	32	0	0	118
Apprch %	75	15	10	0	11.5	55.8	32.7	0	20	20	60	0	11.1	88.9	0	0	
Total %	12.7	2.5	1.7	0	5.1	24.6	14.4	0	1.7	1.7	5.1	0	3.4	27.1	0	0	

	Gould St From North					Highland Ave From East					Hunting Rd From South					Highland Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	0	1	0	3	2	4	3	0	9	1	0	1	0	2	0	9	0	0	9	23
07:45 AM	2	0	1	0	3	0	3	2	0	5	0	0	2	0	2	0	3	0	0	3	13
08:00 AM	6	0	0	0	6	0	4	0	0	4	0	1	1	0	2	0	6	0	0	6	18
08:15 AM	2	0	0	0	2	0	6	2	0	8	0	1	1	0	2	2	2	0	0	4	16
Total Volume	12	0	2	0	14	2	17	7	0	26	1	2	5	0	8	2	20	0	0	22	70
% App. Total	85.7	0	14.3	0		7.7	65.4	26.9	0		12.5	25	62.5	0		9.1	90.9	0	0		
PHF	.500	.000	.500	.000	.583	.250	.708	.583	.000	.722	.250	.500	.625	.000	1.00	.250	.556	.000	.000	.611	.761

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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
07:00 AM	0	0	0	0	0	0	0	0	1	2	0	0	0	2	0	0	0	5	5
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:45 AM	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	0	1	4	5
Total	0	0	1	0	0	1	0	0	2	2	0	1	0	4	1	1	2	11	13
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
Total	0	0	0	1	0	1	0	0	0	1	0	1	0	1	0	1	3	3	6
Grand Total	0	0	1	1	0	2	0	0	2	3	0	2	0	5	1	2	5	14	19
Apprch %	0	0	100		0	100	0		40	60	0		0	83.3	16.7				
Total %	0	0	7.1		0	14.3	0		14.3	21.4	0		0	35.7	7.1		26.3	73.7	

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	1	2	0	3	0	2	0	2	5
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	1	1	0	0	0	0	1	0	0	1	0	1	1	2	4
Total Volume	0	0	1	1	0	1	0	1	2	2	0	4	0	4	1	5	11
% App. Total	0	0	100		0	100	0		50	50	0		0	80	20		
PHF	000	000	250	250	000	250	000	250	500	250	000	333	000	500	250	625	550

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

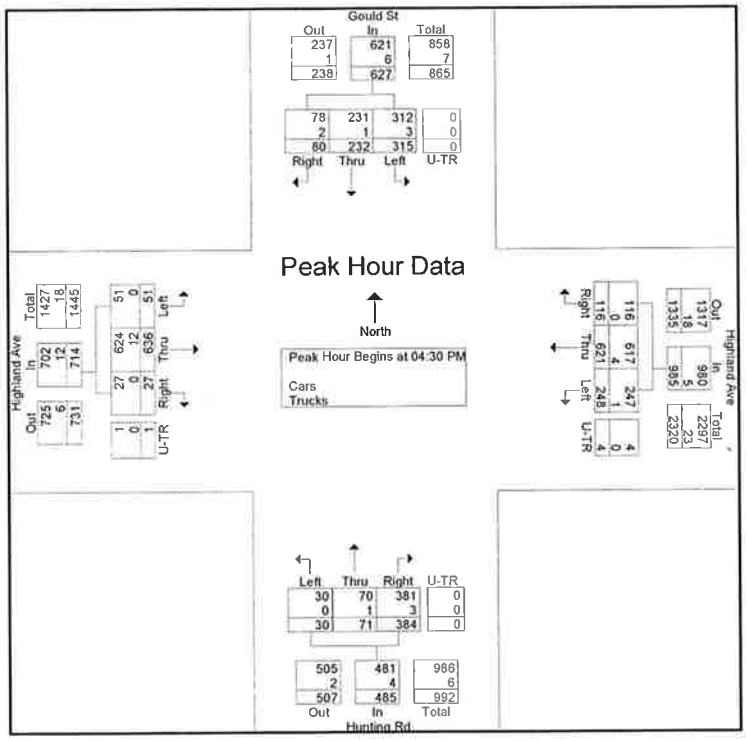
	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave From West				
Start Time	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Left	Thru	Right	U-TR	Int. Total
04:00 PM	74	46	25	0	42	141	22	8	2	14	65	0	14	159	4	0	616
04:15 PM	56	57	8	0	55	137	39	3	4	15	79	0	12	193	6	2	666
04:30 PM	95	66	15	0	47	141	29	0	7	15	96	0	23	161	5	0	700
04:45 PM	65	56	15	0	56	171	40	3	5	14	84	0	8	162	7	0	686
Total	290	225	63	0	200	590	130	14	18	58	324	0	57	675	22	2	2668
05:00 PM	83	57	20	0	67	132	20	1	10	23	106	0	10	141	9	1	680
05:15 PM	72	53	30	0	78	177	27	0	8	19	98	0	10	172	6	0	750
05:30 PM	57	44	17	0	78	145	37	1	9	23	87	0	10	142	9	0	659
05:45 PM	54	52	27	0	80	205	36	0	8	26	80	0	6	128	8	0	710
Total	266	206	94	0	303	659	120	2	35	91	371	0	36	583	32	1	2799
Grand Total	556	431	157	0	503	1249	250	16	53	149	695	0	93	1258	54	3	5467
Apprch %	48.6	37.7	13.7	0	24.9	61.9	12.4	0.8	5.9	16.6	77.5	0	6.6	89.3	3.8	0.2	
Total %	10.2	7.9	2.9	0	9.2	22.8	4.6	0.3	1	2.7	12.7	0	1.7	23	1	0.1	
Cars	552	428	155	0	499	1235	249	16	53	148	689	0	92	1237	54	3	5410
% Cars	99.3	99.3	98.7	0	99.2	98.9	99.6	100	100	99.3	99.1	0	98.9	98.3	100	100	99
Trucks	4	3	2	0	4	14	1	0	0	1	6	0	1	21	0	0	57
% Trucks	0.7	0.7	1.3	0	0.8	1.1	0.4	0	0	0.7	0.9	0	1.1	1.7	0	0	1

	Gould St From North					Highland Ave From East					Hunting Rd From South					Highland Ave 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 04:30 PM																					
04:30 PM	95	66	15	0	176	47	141	29	0	217	7	15	96	0	118	23	161	5	0	189	700
04:45 PM	65	56	15	0	136	56	171	40	3	270	5	14	84	0	103	8	162	7	0	177	686
05:00 PM	83	57	20	0	160	67	132	20	1	220	10	23	106	0	139	10	141	9	1	161	680
05:15 PM	72	53	30	0	155	78	177	27	0	282	8	19	98	0	125	10	172	6	0	188	750
Total Volume	315	232	80	0	627	248	621	116	4	989	30	71	384	0	485	51	636	27	1	715	2816
% App. Total	50.2	37	12.8	0		25.1	62.8	11.7	0.4		6.2	14.6	79.2	0		7.1	89	3.8	0.1		
PHF	.829	.879	.667	.000	.891	.795	.877	.725	.333	.877	.750	.772	.906	.000	.872	.554	.924	.750	.250	.946	.939
Cars	312	231	78	0	621	247	617	116	4	984	30	70	381	0	481	51	624	27	1	703	2789
% Cars	99.0	99.6	97.5	0	99.0	99.6	99.4	100	100	99.5	100	98.6	99.2	0	99.2	100	98.1	100	100	98.3	99.0
Trucks	3	1	2	0	6	1	4	0	0	5	0	1	3	0	4	0	12	0	0	12	27
% Trucks	1.0	0.4	2.5	0	1.0	0.4	0.6	0	0	0.5	0	1.4	0.8	0	0.8	0	1.9	0	0	1.7	1.0

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 2



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

Peak Hour for Each Approach Begins at

	04:30 PM					05:00 PM					05:00 PM					04:00 PM				
+0 mins	95	66	15	0	176	67	132	20	1	220	10	23	106	0	139	14	159	4	0	177
+15 mins	65	56	15	0	136	78	177	27	0	282	8	19	98	0	125	12	193	6	2	213
+30 mins	83	57	20	0	160	78	145	37	1	261	9	23	87	0	119	23	161	5	0	189
+45 mins	72	53	30	0	155	80	205	36	0	321	8	26	80	0	114	8	162	7	0	177
Total Volume	315	232	80	0	627	303	659	120	2	1084	35	91	371	0	497	57	675	22	2	756
% App Total	50.2	37	12.8	0		28	60.8	11.1	0.2		7	18.3	74.6	0		7.5	89.3	2.9	0.3	
PHF	829	879	667	000	891	947	804	811	500	844	875	875	875	000	894	620	874	786	250	887
Cars	312	231	78	0	621	299	654	120	2	1075	35	90	370	0	495	57	659	22	2	740
% Cars	99	99.6	97.5	0	99	98.7	99.2	100	100	99.2	100	98.9	99.7	0	99.6	100	97.6	100	100	97.9
Trucks	3	1	2	0	6	4	5	0	0	9	0	1	1	0	2	0	16	0	0	16

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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	1	0	0	0	3	0	0	0	0	1	0	0	3	0	0	8
04:15 PM	1	1	0	0	0	3	1	0	0	0	2	0	0	2	0	0	10
04:30 PM	2	0	0	0	0	1	0	0	0	0	2	0	0	5	0	0	10
04:45 PM	1	1	1	0	0	2	0	0	0	0	0	0	0	6	0	0	11
Total	4	3	1	0	0	9	1	0	0	0	5	0	0	16	0	0	39
05:00 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	4
05:30 PM	0	0	0	0	3	3	0	0	0	0	0	0	1	3	0	0	10
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	0	0	1	0	4	5	0	0	0	1	1	0	1	5	0	0	18
Grand Total	4	3	2	0	4	14	1	0	0	1	6	0	1	21	0	0	57
Apprch %	44.4	33.3	22.2	0	21.1	73.7	5.3	0	0	14.3	85.7	0	4.5	95.5	0	0	
Total %	7	5.3	3.5	0	7	24.6	1.8	0	0	1.8	10.5	0	1.8	36.8	0	0	

	Gould St From North					Highland Ave From East					Hunting Rd From South					Highland Ave 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 04:00 PM																					
04:00 PM	0	1	0	0	1	0	3	0	0	3	0	0	1	0	1	0	3	0	0	3	8
04:15 PM	1	1	0	0	2	0	3	1	0	4	0	0	2	0	2	0	2	0	0	2	10
04:30 PM	2	0	0	0	2	0	1	0	0	1	0	0	2	0	2	0	5	0	0	5	10
04:45 PM	1	1	1	0	3	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	11
Total Volume	4	3	1	0	8	0	9	1	0	10	0	0	5	0	5	0	16	0	0	16	39
% App. Total	50	37.5	12.5	0		0	90	10	0		0	0	100	0		0	100	0	0		
PHF	500	750	250	000	667	000	750	250	000	625	000	000	625	000	625	000	667	000	000	667	886

Accurate Counts
978-664-2565

N/S Street : Gould St / Hunting Rd
E/W Street: Highland Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S4
Site Code : 62020004
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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	5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	5	1	6
04:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2
Total	0	0	1	7	0	1	0	0	0	0	0	5	0	1	0	0	12	3	15
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	2	2	4
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	1	0	0	0	0	0	0	0	0	0	1	1	1	2
Total	0	0	0	2	0	3	0	0	0	0	0	0	0	1	0	1	3	4	7
Grand Total	0	0	1	9	0	4	0	0	0	0	0	5	0	2	0	1	15	7	22
Apprch %	0	0	100		0	100	0		0	0	0		0	100	0				
Total %	0	0	14.3		0	57.1	0		0	0	0		0	28.6	0		68.2	31.8	

	Gould St From North				Highland Ave From East				Hunting Rd From South				Highland Ave 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	1	1	0	0	0	0	0	0	0	0	0	1	0	1	2
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	1	1	0	2	0	2	0	0	0	0	0	2	0	2	5
% 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	.500	.000	.500	.625

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

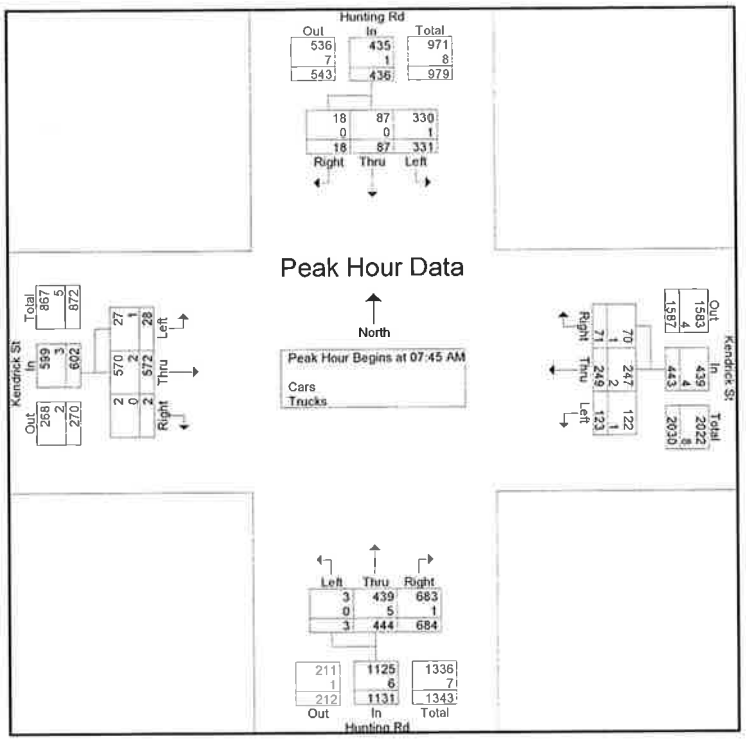
	Hunting Rd From North			Kendrick St From East			Hunting Rd From South			Kendrick St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	44	16	3	24	23	12	0	57	91	4	77	1	352
07:15 AM	63	26	6	23	48	5	1	50	120	9	119	0	470
07:30 AM	53	28	13	46	42	17	0	84	151	5	144	0	583
07:45 AM	90	22	8	36	59	15	2	97	187	12	201	0	729
Total	250	92	30	129	172	49	3	288	549	30	541	1	2134
08:00 AM	55	22	3	26	66	17	0	90	168	10	122	0	579
08:15 AM	92	20	4	32	61	15	1	131	175	2	107	1	641
08:30 AM	94	23	3	29	63	24	0	126	154	4	142	1	663
08:45 AM	80	14	3	23	65	25	3	84	142	1	153	0	593
Total	321	79	13	110	255	81	4	431	639	17	524	2	2476
Grand Total	571	171	43	239	427	130	7	719	1188	47	1065	3	4610
Apprch %	72.7	21.8	5.5	30	53.6	16.3	0.4	37.6	62.1	4.2	95.5	0.3	
Total %	12.4	3.7	0.9	5.2	9.3	2.8	0.2	15.6	25.8	1	23.1	0.1	
Cars	568	170	42	234	422	129	6	712	1183	45	1057	3	4571
% Cars	99.5	99.4	97.7	97.9	98.8	99.2	85.7	99	99.6	95.7	99.2	100	99.2
Trucks	3	1	1	5	5	1	1	7	5	2	8	0	39
% Trucks	0.5	0.6	2.3	2.1	1.2	0.8	14.3	1	0.4	4.3	0.8	0	0.8

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	90	22	8	120	36	59	15	110	2	97	187	286	12	201	0	213	729
08:00 AM	55	22	3	80	26	66	17	109	0	90	168	258	10	122	0	132	579
08:15 AM	92	20	4	116	32	61	15	108	1	131	175	307	2	107	1	110	641
08:30 AM	94	23	3	120	29	63	24	116	0	126	154	280	4	142	1	147	663
Total Volume	331	87	18	436	123	249	71	443	3	444	684	1131	28	572	2	602	2612
% App. Total	75.9	20	4.1		27.8	56.2	16		0.3	39.3	60.5		4.7	95	0.3		
PHF	880	946	563	908	854	943	740	955	375	847	914	921	583	711	500	707	896
Cars	330	87	18	435	122	247	70	439	3	439	683	1125	27	570	2	599	2598
% Cars	99.7	100	100	99.8	99.2	99.2	98.6	99.1	100	98.9	99.9	99.5	96.4	99.7	100	99.5	99.5
Trucks	1	0	0	1	1	2	1	4	0	5	1	6	1	2	0	3	14
% Trucks	0.3	0	0	0.2	0.8	0.8	1.4	0.9	0	1.1	0.1	0.5	3.6	0.3	0	0.5	0.5

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 2



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

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:45 AM				07:15 AM			
+0 mins	90	22	**8**	**120**	26	66	17	109	2	97	**187**	286	9	119	0	128
+15 mins	55	22	3	80	**32**	61	15	108	0	90	168	258	5	144	0	149
+30 mins	92	20	4	116	29	63	24	**116**	1	**131**	175	**307**	**12**	**201**	0	**213**
+45 mins	**94**	**23**	3	120	23	65	**25**	113	**0**	126	154	280	10	122	0	132
Total Volume	331	87	18	436	110	255	81	446	3	444	684	1131	36	586	0	622
% App. Total	75.9	20	4.1		24.7	57.2	18.2		0.3	39.3	60.5		5.8	94.2	0	
PHF	.880	.946	.563	.908	.859	.966	.810	.961	.375	.847	.914	.921	.750	.729	.000	.730
Cars	330	87	18	435	110	252	80	442	3	439	683	1125	35	581	0	616
% Cars	99.7	100	100	99.8	100	98.8	98.8	99.1	100	98.9	99.9	99.5	97.2	99.1	0	99
Trucks	1	0	0	1	0	3	1	4	0	5	1	6	1	5	0	6

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Hunting Rd From North			Kendrick St From East			Hunting Rd From South			Kendrick St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	1	2	0	0	0	0	1	1	0	0	5
07:15 AM	1	1	0	1	2	0	1	1	0	0	0	0	7
07:30 AM	0	0	0	1	0	0	0	1	2	0	3	0	7
07:45 AM	1	0	0	1	0	0	0	2	0	0	2	0	6
Total	2	1	1	5	2	0	1	4	3	1	5	0	25
08:00 AM	0	0	0	0	1	0	0	2	0	1	0	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	1	0	1	1	0	0	0	4
08:45 AM	1	0	0	0	1	0	0	0	1	0	3	0	6
Total	1	0	0	0	3	1	0	3	2	1	3	0	14
Grand Total	3	1	1	5	5	1	1	7	5	2	8	0	39
Apprch %	60	20	20	45.5	45.5	9.1	7.7	53.8	38.5	20	80	0	
Total %	7.7	2.6	2.6	12.8	12.8	2.6	2.6	17.9	12.8	5.1	20.5	0	

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	1	1	2	0	0	2	0	0	1	1	1	0	0	1	5
07:15 AM	1	1	0	2	1	2	0	3	1	1	0	2	0	0	0	0	7
07:30 AM	0	0	0	0	1	0	0	1	0	1	2	3	0	3	0	3	7
07:45 AM	1	0	0	1	1	0	0	1	0	2	0	2	0	2	0	2	6
Total Volume	2	1	1	4	5	2	0	7	1	4	3	8	1	5	0	6	25
% App. Total	50	25	25		71.4	28.6	0		12.5	50	37.5		16.7	83.3	0		
PHF	500	250	250	500	625	250	000	583	250	500	375	667	250	417	000	500	893

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes_Peds

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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
07:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3	3
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	2
07:45 AM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Total	0	0	0	0	5	2	0	0	0	0	2	0	0	1	0	0	0	10	10
08:00 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2
08:15 AM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	2
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
08:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	1	0	1	2	0	0	0	0	1	2	0	0	0	0	0	1	6	7
Grand Total	0	1	0	1	7	2	0	0	0	1	4	0	0	1	0	0	1	16	17
Apprch %	0	100	0		77.8	22.2	0		0	20	80		0	100	0				
Total %	0	6.2	0		43.8	12.5	0		0	6.2	25		0	6.2	0		5.9	94.1	

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2
07:45 AM	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	5	2	0	7	0	0	2	2	0	1	0	1	10
% App. Total	0	0	0		71.4	28.6	0		0	0	100		0	100	0		
PHF	.000	.000	.000	.000	.417	.500	.000	.583	.000	.000	.250	.250	.000	.250	.000	.250	.833

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

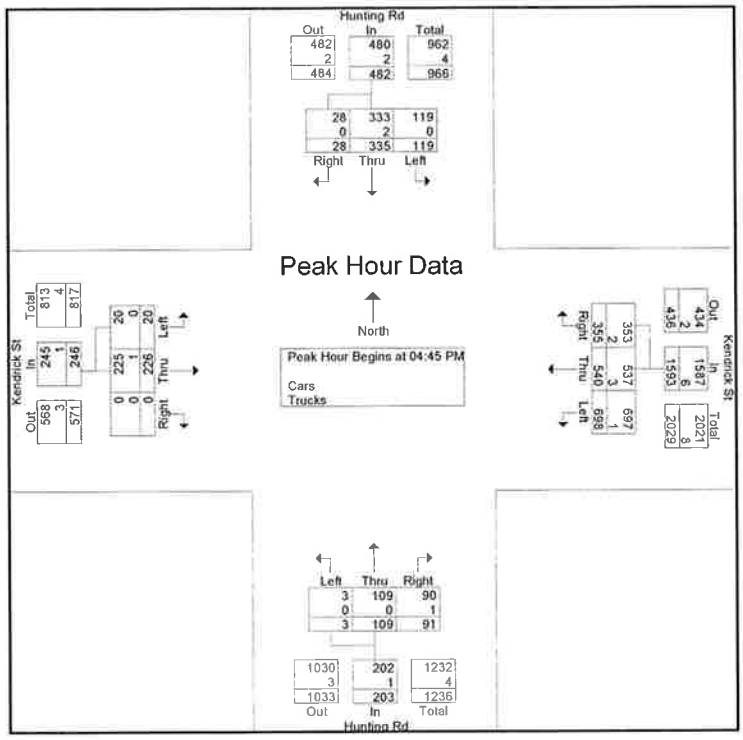
	Hunting Rd From North			Kendrick St From East			Hunting Rd From South			Kendrick St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	31	58	4	142	103	72	0	29	29	3	80	0	551
04:15 PM	25	66	7	133	90	58	0	31	15	4	55	0	484
04:30 PM	21	74	8	153	112	78	0	19	22	2	65	1	555
04:45 PM	22	71	11	170	141	82	1	26	20	1	57	0	602
Total	99	269	30	598	446	290	1	105	86	10	257	1	2192
05:00 PM	39	99	6	197	150	93	1	21	26	7	53	0	692
05:15 PM	25	82	6	162	122	91	0	29	15	5	66	0	603
05:30 PM	33	83	5	169	127	89	1	33	30	7	50	0	627
05:45 PM	39	67	11	141	122	67	1	27	31	4	53	1	564
Total	136	331	28	669	521	340	3	110	102	23	222	1	2486
Grand Total	235	600	58	1267	967	630	4	215	188	33	479	2	4678
Apprch %	26.3	67.2	6.5	44.2	33.8	22	1	52.8	46.2	6.4	93.2	0.4	
Total %	5	12.8	1.2	27.1	20.7	13.5	0.1	4.6	4	0.7	10.2	0	
Cars	234	598	58	1263	961	626	4	215	187	33	478	2	4659
% Cars	99.6	99.7	100	99.7	99.4	99.4	100	100	99.5	100	99.8	100	99.6
Trucks	1	2	0	4	6	4	0	0	1	0	1	0	19
% Trucks	0.4	0.3	0	0.3	0.6	0.6	0	0	0.5	0	0.2	0	0.4

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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 04:45 PM																	
04:45 PM	22	71	11	104	170	141	82	393	1	26	20	47	1	57	0	58	602
05:00 PM	39	99	6	144	197	150	93	440	1	21	26	48	7	53	0	60	692
05:15 PM	25	82	6	113	162	122	91	375	0	29	15	44	5	66	0	71	603
05:30 PM	33	83	5	121	169	127	89	385	1	33	30	64	7	50	0	57	627
Total Volume	119	335	28	482	698	540	355	1593	3	109	91	203	20	226	0	246	2524
% App. Total	24.7	69.5	5.8		43.8	33.9	22.3		1.5	53.7	44.8		8.1	91.9	0		
PHF	763	846	636	837	886	900	954	905	750	826	758	793	714	856	.000	866	912
Cars	119	333	28	480	697	537	353	1587	3	109	90	202	20	225	0	245	2514
% Cars	100	99.4	100	99.6	99.9	99.4	99.4	99.6	100	100	98.9	99.5	100	99.6	0	99.6	99.6
Trucks	0	2	0	2	1	3	2	6	0	0	1	1	0	1	0	1	10
% Trucks	0	0.6	0	0.4	0.1	0.6	0.6	0.4	0	0	1.1	0.5	0	0.4	0	0.4	0.4

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 2



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

Peak Hour for Each Approach Begins at

	05:00 PM				04:45 PM				05:00 PM				04:00 PM			
+0 mins	39	99	6	144	170	141	82	393	1	21	26	48	3	80	0	83
+15 mins	25	82	6	113	197	150	93	440	0	29	15	44	4	55	0	59
+30 mins	33	83	5	121	162	122	91	375	1	33	30	64	2	65	1	68
+45 mins	39	67	11	117	169	127	89	385	1	27	31	59	1	57	0	58
Total Volume	136	331	28	495	698	540	355	1593	3	110	102	215	10	257	1	268
% App Total	27.5	66.9	5.7		43.8	33.9	22.3		1.4	51.2	47.4		3.7	95.9	0.4	
PHF	.872	.836	.636	.859	886	900	.954	.905	.750	.833	.823	.840	.625	.803	.250	.807
Cars	136	329	28	493	697	537	353	1587	3	110	101	214	10	256	1	267
% Cars	100	99.4	100	99.6	99.9	99.4	99.4	99.6	100	100	99	99.5	100	99.6	100	99.6
Trucks	0	2	0	2	1	3	2	6	0	0	1	1	0	1	0	1

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Hunting Rd From North			Kendrick St From East			Hunting Rd From South			Kendrick St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	0	0	2	2	0	0	0	0	0	0	0	5
04:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	2
04:45 PM	0	0	0	1	0	0	0	0	0	0	1	0	2
Total	1	0	0	4	3	2	0	0	0	0	1	0	11
05:00 PM	0	0	0	0	3	1	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
05:30 PM	0	2	0	0	0	0	0	0	1	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	3	2	0	0	1	0	0	0	8
Grand Total	1	2	0	4	6	4	0	0	1	0	1	0	19
Apprch %	33.3	66.7	0	28.6	42.9	28.6	0	0	100	0	100	0	
Total %	5.3	10.5	0	21.1	31.6	21.1	0	0	5.3	0	5.3	0	

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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	0	0	1	2	2	0	4	0	0	0	0	0	0	0	0	5
04:15 PM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	1	0	0	1	4	3	2	9	0	0	0	0	0	1	0	1	11
% App. Total	100	0	0		44.4	33.3	22.2		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.500	.375	.500	.563	.000	.000	.000	.000	.000	.250	.000	.250	.550

Accurate Counts
978-664-2565

N/S Street : Hunting Road
E/W Street : Kendrick Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S1
Site Code : 62020001
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	4	4
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	1	2	3
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	19	0	0	0	0	19	1	20
Total	1	0	0	0	1	1	0	0	0	0	4	20	0	1	0	0	20	8	28
05:00 PM	0	0	0	0	2	3	0	0	0	0	1	5	0	0	0	0	5	6	11
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:30 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	3	3
05:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	0	0	0	6	5	0	0	0	0	2	5	0	0	0	0	5	13	18
Grand Total	1	0	0	0	7	6	0	0	0	0	6	25	0	1	0	0	25	21	46
Apprch %	100	0	0		53.8	46.2	0		0	0	100		0	100	0				
Total %	4.8	0	0		33.3	28.6	0		0	0	28.6		0	4.8	0		54.3	45.7	

	Hunting Rd From North				Kendrick St From East				Hunting Rd From South				Kendrick St 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 05:00 PM																	
05:00 PM	0	0	0	0	2	3	0	5	0	0	1	1	0	0	0	0	6
05:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0	3
05:45 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	6	5	0	11	0	0	2	2	0	0	0	0	13
% App Total	0	0	0		54.5	45.5	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.750	.417	.000	.550	.000	.000	.500	.500	.000	.000	.000	.000	.542

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

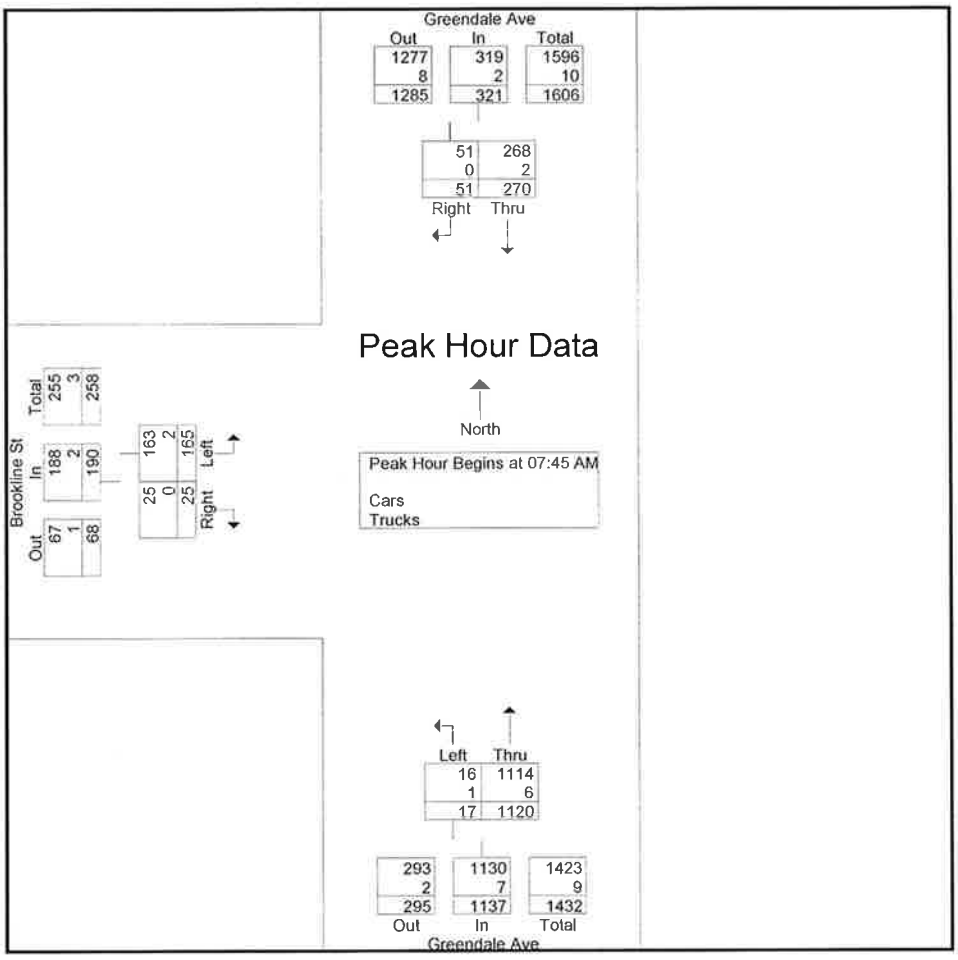
	Greendale Ave From North		Greendale Ave From South		Brookline St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	50	9	1	125	39	5	229
07:15 AM	55	10	7	176	33	7	288
07:30 AM	86	12	22	219	48	10	397
07:45 AM	68	13	8	240	55	7	391
Total	259	44	38	760	175	29	1305
08:00 AM	74	10	2	271	38	4	399
08:15 AM	56	12	3	309	40	5	425
08:30 AM	72	16	4	300	32	9	433
08:45 AM	56	10	4	272	38	8	388
Total	258	48	13	1152	148	26	1645
Grand Total	517	92	51	1912	323	55	2950
Apprch %	84.9	15.1	2.6	97.4	85.4	14.6	
Total %	17.5	3.1	1.7	64.8	10.9	1.9	
Cars	511	87	50	1897	321	55	2921
% Cars	98.8	94.6	98	99.2	99.4	100	99
Trucks	6	5	1	15	2	0	29
% Trucks	1.2	5.4	2	0.8	0.6	0	1

	Greendale Ave From North			Greendale Ave From South			Brookline St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	68	13	81	8	240	248	55	7	62	391
08:00 AM	74	10	84	2	271	273	38	4	42	399
08:15 AM	56	12	68	3	309	312	40	5	45	425
08:30 AM	72	16	88	4	300	304	32	9	41	433
Total Volume	270	51	321	17	1120	1137	165	25	190	1648
% App. Total	84.1	15.9		1.5	98.5		86.8	13.2		
PHF	.912	.797	.912	.531	.906	.911	.750	.694	.766	.952
Cars	268	51	319	16	1114	1130	163	25	188	1637
% Cars	99.3	100	99.4	94.1	99.5	99.4	98.8	100	98.9	99.3
Trucks	2	0	2	1	6	7	2	0	2	11
% Trucks	0.7	0	0.6	5.9	0.5	0.6	1.2	0	1.1	0.7

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			08:00 AM			07:30 AM		
+0 mins.	**86**	12	**98**	2	271	273	48	**10**	58
+15 mins.	68	**13**	81	3	**309**	**312**	**55**	7	**62**
+30 mins.	74	10	84	**4**	300	304	38	4	42
+45 mins.	56	12	68	4	272	276	40	5	45
Total Volume	284	47	331	13	1152	1165	181	26	207
% App. Total	85.8	14.2		1.1	98.9		87.4	12.6	
PHF	.826	.904	.844	.813	.932	.933	.823	.650	.835
Cars	282	47	329	12	1145	1157	179	26	205
% Cars	99.3	100	99.4	92.3	99.4	99.3	98.9	100	99
Trucks	2	0	2	1	7	8	2	0	2
% Trucks	0.7	0	0.6	7.7	0.6	0.7	1.1	0	1

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Brookline St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	3	2	0	3	0	0	8
07:15 AM	0	2	0	1	0	0	3
07:30 AM	1	0	0	3	0	0	4
07:45 AM	0	0	0	1	1	0	2
Total	4	4	0	8	1	0	17
08:00 AM	1	0	0	2	1	0	4
08:15 AM	0	0	1	0	0	0	1
08:30 AM	1	0	0	3	0	0	4
08:45 AM	0	1	0	2	0	0	3
Total	2	1	1	7	1	0	12
Grand Total	6	5	1	15	2	0	29
Apprch %	54.5	45.5	6.2	93.8	100	0	
Total %	20.7	17.2	3.4	51.7	6.9	0	

	Greendale Ave From North			Greendale Ave From South			Brookline St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**3**	**2**	**5**	0	**3**	**3**	0	0	0	**8**
07:15 AM	0	2	2	0	1	1	0	0	0	3
07:30 AM	1	0	1	0	3	3	0	0	0	4
07:45 AM	0	0	0	0	1	1	1	0	1	2
Total Volume	4	4	8	0	8	8	1	0	1	17
% App. Total	50	50		0	100		100	0		
PHF	.333	.500	.400	.000	.667	.667	.250	.000	.250	.531

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Brookline St From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	0	0	1	0	0	0	2	2	3	5
07:15 AM	0	1	0	0	2	0	0	0	1	1	3	4
07:30 AM	0	1	0	0	1	0	0	0	0	0	2	2
07:45 AM	1	0	0	0	5	0	0	0	1	1	6	7
Total	3	2	0	0	9	0	0	0	4	4	14	18
08:00 AM	3	0	0	0	5	0	0	0	0	0	8	8
08:15 AM	2	0	0	0	2	0	2	0	0	0	6	6
08:30 AM	0	0	0	0	1	0	0	0	3	3	1	4
08:45 AM	3	0	0	0	1	0	1	0	0	0	5	5
Total	8	0	0	0	9	0	3	0	3	3	20	23
Grand Total	11	2	0	0	18	0	3	0	7	7	34	41
Apprch %	84.6	15.4		0	100		100	0				
Total %	32.4	5.9		0	52.9		8.8	0		17.1	82.9	

	Greendale Ave From North			Greendale Ave From South			Brookline St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	1	1	0	1	1	0	0	0	2
07:45 AM	1	0	1	0	5	5	0	0	0	6
08:00 AM	3	0	3	0	5	5	0	0	0	8
08:15 AM	2	0	2	0	2	2	2	0	2	6
Total Volume	6	1	7	0	13	13	2	0	2	22
% App. Total	85.7	14.3		0	100		100	0		
PHF	.500	.250	.583	.000	.650	.650	.250	.000	.250	.688

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

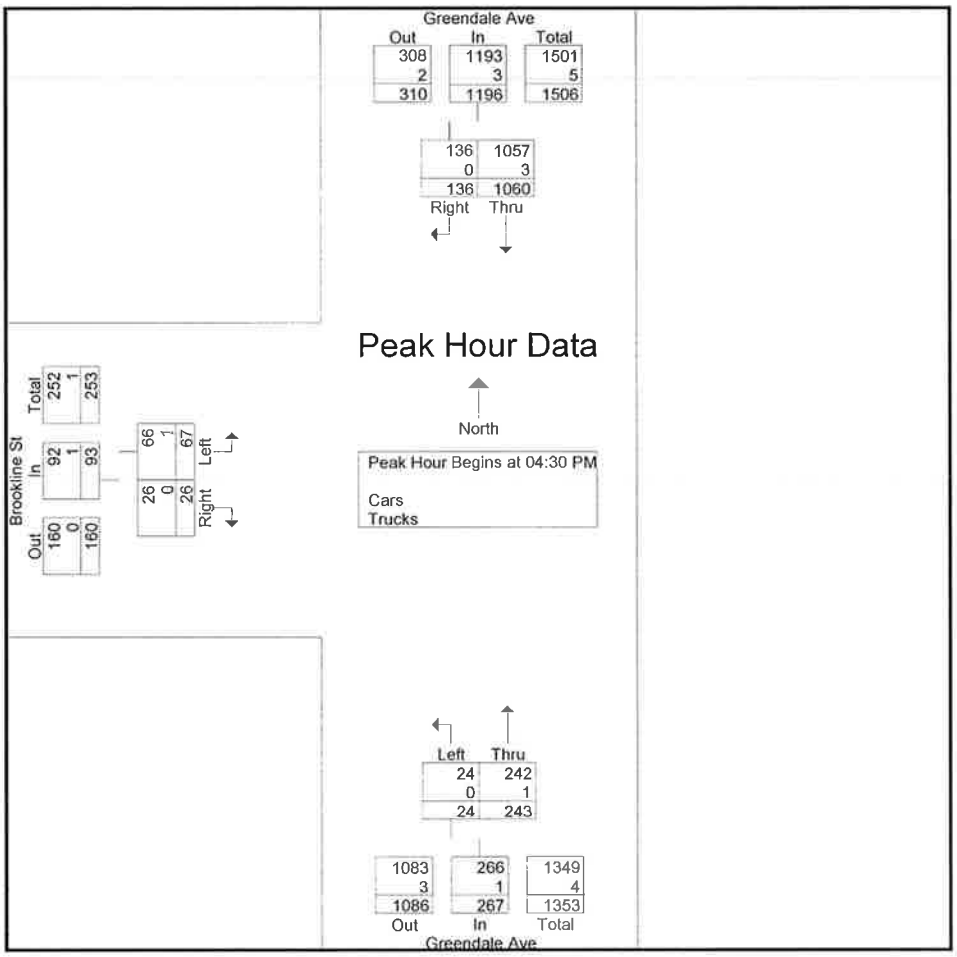
	Greendale Ave From North		Greendale Ave From South		Brookline St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	185	14	5	57	17	5	283
04:15 PM	227	28	14	49	14	6	338
04:30 PM	246	32	8	56	16	5	363
04:45 PM	261	27	6	51	15	6	366
Total	919	101	33	213	62	22	1350
05:00 PM	266	35	5	61	18	9	394
05:15 PM	287	42	5	75	18	6	433
05:30 PM	211	33	6	75	8	1	334
05:45 PM	240	46	8	71	17	3	385
Total	1004	156	24	282	61	19	1546
Grand Total	1923	257	57	495	123	41	2896
Apprch %	88.2	11.8	10.3	89.7	75	25	
Total %	66.4	8.9	2	17.1	4.2	1.4	
Cars	1916	257	57	493	122	41	2886
% Cars	99.6	100	100	99.6	99.2	100	99.7
Trucks	7	0	0	2	1	0	10
% Trucks	0.4	0	0	0.4	0.8	0	0.3

	Greendale Ave From North			Greendale Ave From South			Brookline St 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	246	32	278	**8**	56	64	16	5	**21**	363
04:45 PM	261	27	288	6	51	57	15	6	21	366
05:00 PM	266	35	301	5	61	66	**18**	**9**	**27**	394
05:15 PM	**287**	**42**	**329**	5	**75**	**80**	18	6	24	**433**
Total Volume	1060	136	1196	24	243	267	67	26	93	1556
% App. Total	88.6	11.4		9	91		72	28		
PHF	.923	.810	.909	.750	.810	.834	.931	.722	.861	.898
Cars	1057	136	1193	24	242	266	66	26	92	1551
% Cars	99.7	100	99.7	100	99.6	99.6	98.5	100	98.9	99.7
Trucks	3	0	3	0	1	1	1	0	1	5
% Trucks	0.3	0	0.3	0	0.4	0.4	1.5	0	1.1	0.3

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 2



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

	04:30 PM			05:00 PM			04:30 PM		
+0 mins.	246	32	278	5	61	66	16	5	21
+15 mins.	261	27	288	5	**75**	80	15	6	21
+30 mins.	266	35	301	6	75	**81**	**18**	**9**	**27**
+45 mins.	**287**	**42**	**329**	**8**	71	79	18	6	24
Total Volume	1060	136	1196	24	282	306	67	26	93
% App. Total	88.6	11.4		7.8	92.2		72	28	
PHF	.923	.810	.909	.750	.940	.944	.931	.722	.861
Cars	1057	136	1193	24	281	305	66	26	92
% Cars	99.7	100	99.7	100	99.6	99.7	98.5	100	98.9
Trucks	3	0	3	0	1	1	1	0	1
% Trucks	0.3	0	0.3	0	0.4	0.3	1.5	0	1.1

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Brookline St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	2	0	0	0	0	0	2
04:15 PM	1	0	0	0	0	0	1
04:30 PM	0	0	0	0	1	0	1
04:45 PM	1	0	0	1	0	0	2
Total	4	0	0	1	1	0	6
05:00 PM	0	0	0	0	0	0	0
05:15 PM	2	0	0	0	0	0	2
05:30 PM	0	0	0	1	0	0	1
05:45 PM	1	0	0	0	0	0	1
Total	3	0	0	1	0	0	4
Grand Total	7	0	0	2	1	0	10
Apprch %	100	0	0	100	100	0	
Total %	70	0	0	20	10	0	

	Greendale Ave From North			Greendale Ave From South			Brookline St 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	2	0	2	0	0	0	0	0	0	2
04:15 PM	1	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	1	0	1	1
04:45 PM	1	0	1	0	1	1	0	0	0	2
Total Volume	4	0	4	0	1	1	1	0	1	6
% App. Total	100	0		0	100		100	0		
PHF	.500	.000	.500	.000	.250	.250	.250	.000	.250	.750

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Brookline Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S5
Site Code : 62020005
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Brookline St From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	2	2	1	3
04:15 PM	3	0	0	0	1	0	0	0	2	2	4	6
04:30 PM	0	0	0	0	0	0	0	1	4	4	1	5
04:45 PM	0	0	0	0	3	0	0	0	0	0	3	3
Total	3	1	0	0	4	0	0	1	8	8	9	17
05:00 PM	1	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	9	0	0	0	0	0	0	0	0	0	9	9
05:30 PM	3	0	0	0	0	0	0	0	1	1	3	4
05:45 PM	1	1	0	0	0	0	0	1	0	0	3	3
Total	14	1	0	0	0	0	0	1	1	1	16	17
Grand Total	17	2	0	0	4	0	0	2	9	9	25	34
Apprch %	89.5	10.5		0	100		0	100				
Total %	68	8		0	16		0	8		26.5	73.5	

	Greendale Ave From North			Greendale Ave From South			Brookline St 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 04:45 PM										
04:45 PM	0	0	0	0	3	3	0	0	0	3
05:00 PM	1	0	1	0	0	0	0	0	0	1
05:15 PM	9	0	9	0	0	0	0	0	0	9
05:30 PM	3	0	3	0	0	0	0	0	0	3
Total Volume	13	0	13	0	3	3	0	0	0	16
% App. Total	100	0		0	100		0	0		
PHF	.361	.000	.361	.000	.250	.250	.000	.000	.000	.444

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

	Greendale Ave From North		Greendale Ave From South		Bird St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	46	10	1	105	13	4	179
07:15 AM	55	14	2	188	24	3	286
07:30 AM	75	21	3	177	25	2	303
07:45 AM	60	16	2	218	27	3	326
Total	236	61	8	688	89	12	1094
08:00 AM	59	19	3	255	19	3	358
08:15 AM	50	19	5	286	26	0	386
08:30 AM	66	12	1	281	27	6	393
08:45 AM	52	12	2	248	18	3	335
Total	227	62	11	1070	90	12	1472
Grand Total	463	123	19	1758	179	24	2566
Apprch %	79	21	1.1	98.9	88.2	11.8	
Total %	18	4.8	0.7	68.5	7	0.9	
Cars	456	120	17	1739	179	24	2535
% Cars	98.5	97.6	89.5	98.9	100	100	98.8
Trucks	7	3	2	19	0	0	31
% Trucks	1.5	2.4	10.5	1.1	0	0	1.2

	Greendale Ave From North			Greendale Ave From South			Bird St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	59	**19**	**78**	3	255	258	19	3	22	358
08:15 AM	50	19	69	**5**	**286**	**291**	26	0	26	386
08:30 AM	**66**	12	78	1	281	282	**27**	**6**	**33**	**393**
08:45 AM	52	12	64	2	248	250	18	3	21	335
Total Volume	227	62	289	11	1070	1081	90	12	102	1472
% App. Total	78.5	21.5		1	99		88.2	11.8		
PHF	.860	.816	.926	.550	.935	.929	.833	.500	.773	.936
Cars	224	61	285	11	1059	1070	90	12	102	1457
% Cars	98.7	98.4	98.6	100	99.0	99.0	100	100	100	99.0
Trucks	3	1	4	0	11	11	0	0	0	15
% Trucks	1.3	1.6	1.4	0	1.0	1.0	0	0	0	1.0

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
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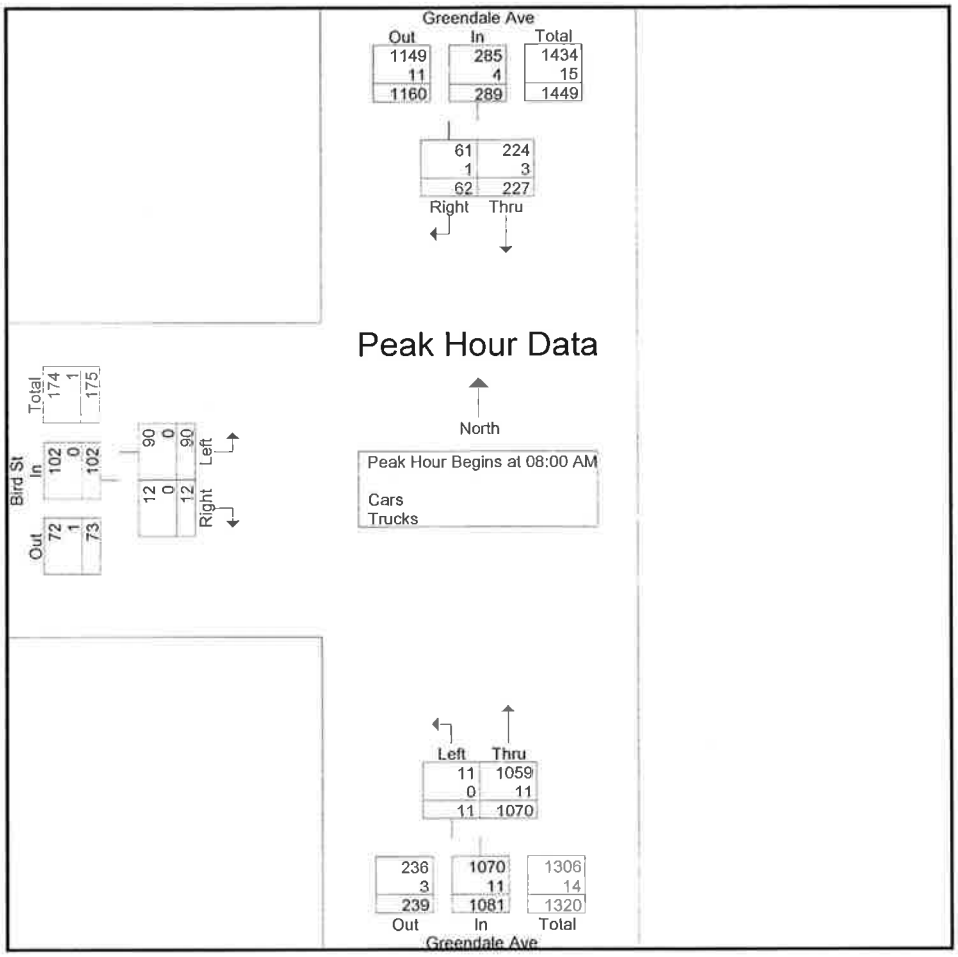


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			08:00 AM			07:45 AM		
+0 mins.	55	14	69	3	255	258	**27**	3	30
+15 mins.	**75**	**21**	**96**	**5**	**286**	**291**	19	3	22
+30 mins.	60	16	76	1	281	282	26	0	26
+45 mins.	59	19	78	2	248	250	27	**6**	**33**
Total Volume	249	70	319	11	1070	1081	99	12	111
% App. Total	78.1	21.9		1	99		89.2	10.8	
PHF	.830	.833	.831	.550	.935	.929	.917	.500	.841
Cars	247	69	316	11	1059	1070	99	12	111
% Cars	99.2	98.6	99.1	100	99	99	100	100	100
Trucks	2	1	3	0	11	11	0	0	0
% Trucks	0.8	1.4	0.9	0	1	1	0	0	0

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Bird St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	3	1	1	3	0	0	8
07:15 AM	0	0	0	1	0	0	1
07:30 AM	1	0	0	3	0	0	4
07:45 AM	0	1	1	1	0	0	3
Total	4	2	2	8	0	0	16
08:00 AM	1	0	0	3	0	0	4
08:15 AM	0	0	0	4	0	0	4
08:30 AM	0	1	0	2	0	0	3
08:45 AM	2	0	0	2	0	0	4
Total	3	1	0	11	0	0	15
Grand Total	7	3	2	19	0	0	31
Apprch %	70	30	9.5	90.5	0	0	
Total %	22.6	9.7	6.5	61.3	0	0	

	Greendale Ave From North			Greendale Ave From South			Bird St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**3**	**1**	**4**	**1**	**3**	**4**	0	0	0	**8**
07:15 AM	0	0	0	0	1	1	0	0	0	1
07:30 AM	1	0	1	0	3	3	0	0	0	4
07:45 AM	0	1	1	1	1	2	0	0	0	3
Total Volume	4	2	6	2	8	10	0	0	0	16
% App. Total	66.7	33.3		20	80		0	0		
PHF	.333	.500	.375	.500	.667	.625	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Bird St From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	0	0	1	0	0	0	2	2	3	5
07:15 AM	0	0	0	0	2	0	1	0	1	1	3	4
07:30 AM	0	0	0	0	4	0	0	0	0	0	4	4
07:45 AM	1	0	0	0	3	0	2	0	4	4	6	10
Total	3	0	0	0	10	0	3	0	7	7	16	23
08:00 AM	2	0	0	0	2	0	0	0	0	0	4	4
08:15 AM	1	0	0	0	2	0	0	0	0	0	3	3
08:30 AM	0	0	0	0	1	0	0	0	0	0	1	1
08:45 AM	3	0	0	0	1	0	0	0	0	0	4	4
Total	6	0	0	0	6	0	0	0	0	0	12	12
Grand Total	9	0	0	0	16	0	3	0	7	7	28	35
Apprch %	100	0		0	100		100	0				
Total %	32.1	0		0	57.1		10.7	0		20	80	

	Greendale Ave From North			Greendale Ave From South			Bird St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	2	2	1	0	1	3
07:30 AM	0	0	0	0	4	4	0	0	0	4
07:45 AM	1	0	1	0	3	3	2	0	2	6
08:00 AM	2	0	2	0	2	2	0	0	0	4
Total Volume	3	0	3	0	11	11	3	0	3	17
% App. Total	100	0		0	100		100	0		
PHF	.375	.000	.375	.000	.688	.688	.375	.000	.375	.708

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

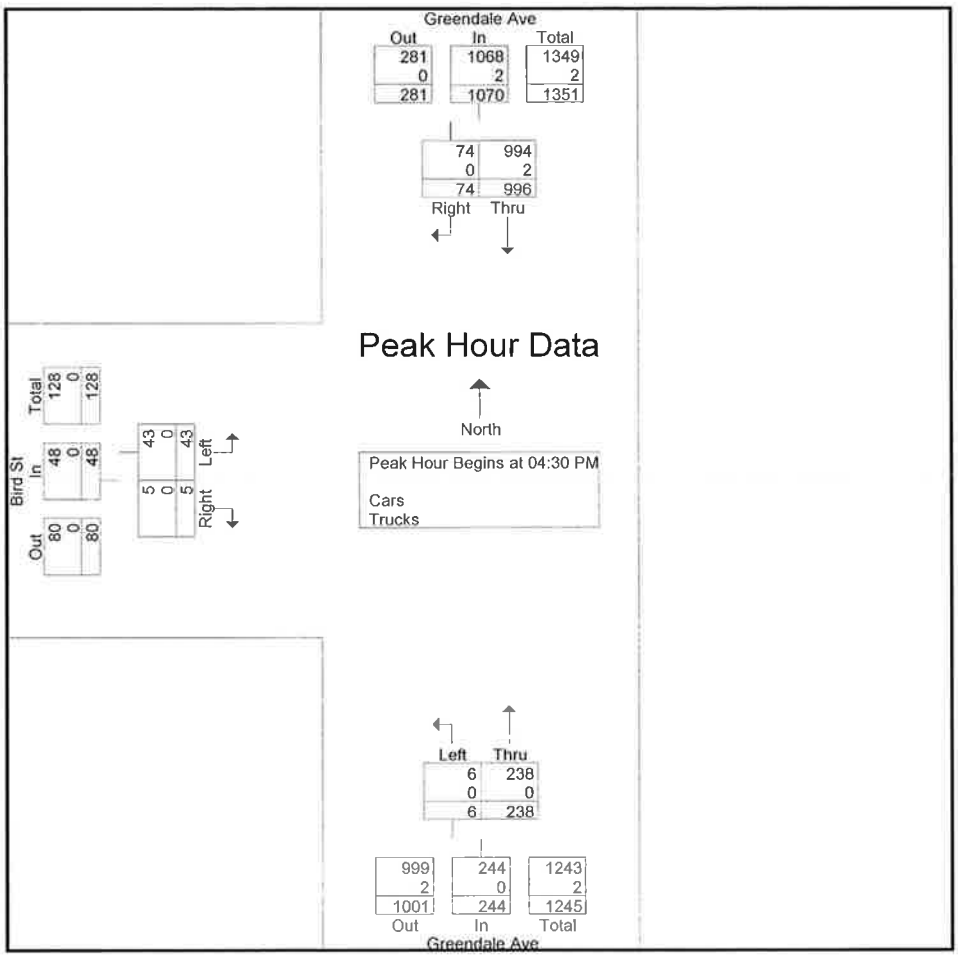
	Greendale Ave From North		Greendale Ave From South		Bird St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	169	13	1	58	6	0	247
04:15 PM	215	20	0	54	9	1	299
04:30 PM	284	15	0	61	15	0	375
04:45 PM	189	19	0	40	5	2	255
Total	857	67	1	213	35	3	1176
05:00 PM	257	22	2	61	11	1	354
05:15 PM	266	18	4	76	12	2	378
05:30 PM	193	24	0	66	11	4	298
05:45 PM	205	25	0	71	9	1	311
Total	921	89	6	274	43	8	1341
Grand Total	1778	156	7	487	78	11	2517
Apprch %	91.9	8.1	1.4	98.6	87.6	12.4	
Total %	70.6	6.2	0.3	19.3	3.1	0.4	
Cars	1773	155	7	486	78	11	2510
% Cars	99.7	99.4	100	99.8	100	100	99.7
Trucks	5	1	0	1	0	0	7
% Trucks	0.3	0.6	0	0.2	0	0	0.3

	Greendale Ave From North			Greendale Ave From South			Bird St 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	**284**	15	**299**	0	61	61	**15**	0	**15**	375
04:45 PM	189	19	208	0	40	40	5	**2**	7	255
05:00 PM	257	**22**	279	2	61	63	11	1	12	354
05:15 PM	266	18	284	**4**	**76**	**80**	12	2	14	**378**
Total Volume	996	74	1070	6	238	244	43	5	48	1362
% App. Total	93.1	6.9		2.5	97.5		89.6	10.4		
PHF	.877	.841	.895	.375	.783	.763	.717	.625	.800	.901
Cars	994	74	1068	6	238	244	43	5	48	1360
% Cars	99.8	100	99.8	100	100	100	100	100	100	99.9
Trucks	2	0	2	0	0	0	0	0	0	2
% Trucks	0.2	0	0.2	0	0	0	0	0	0	0.1

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 2



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

	04:30 PM			05:00 PM			05:00 PM		
+0 mins.	**284**	15	**299**	2	61	63	11	1	12
+15 mins.	189	19	208	**4**	**76**	**80**	**12**	2	14
+30 mins.	257	**22**	279	0	66	66	11	**4**	**15**
+45 mins.	266	18	284	0	71	71	9	1	10
Total Volume	996	74	1070	6	274	280	43	8	51
% App. Total	93.1	6.9		2.1	97.9		84.3	15.7	
PHF	.877	.841	.895	.375	.901	.875	.896	.500	.850
Cars	994	74	1068	6	273	279	43	8	51
% Cars	99.8	100	99.8	100	99.6	99.6	100	100	100
Trucks	2	0	2	0	1	1	0	0	0
% Trucks	0.2	0	0.2	0	0.4	0.4	0	0	0

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Bird St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	2	0	0	0	0	0	2
04:15 PM	1	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0
04:45 PM	1	0	0	0	0	0	1
Total	4	0	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	1
05:30 PM	0	0	0	1	0	0	1
05:45 PM	0	1	0	0	0	0	1
Total	1	1	0	1	0	0	3
Grand Total	5	1	0	1	0	0	7
Apprch %	83.3	16.7	0	100	0	0	
Total %	71.4	14.3	0	14.3	0	0	

	Greendale Ave From North			Greendale Ave From South			Bird St 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	2	0	2	0	0	0	0	0	0	2
04:15 PM	1	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	1	0	0	0	0	0	0	1
Total Volume	4	0	4	0	0	0	0	0	0	4
% App. Total	100	0		0	0		0	0		
PHF	.500	.000	.500	.000	.000	.000	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Bird Street
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S2
Site Code : 62020002
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Bird St 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	1	0	1	1	1	2
04:15 PM	1	0	0	0	1	0	0	0	1	1	2	3
04:30 PM	1	0	0	0	0	0	0	0	5	5	1	6
04:45 PM	0	0	0	0	3	0	0	0	1	1	3	4
Total	2	0	0	0	4	0	1	0	8	8	7	15
05:00 PM	1	0	0	0	1	0	0	0	0	0	2	2
05:15 PM	10	0	0	0	0	0	0	0	0	0	10	10
05:30 PM	3	0	0	0	0	0	0	0	0	0	3	3
05:45 PM	1	1	0	0	0	0	0	0	1	1	2	3
Total	15	1	0	0	1	0	0	0	1	1	17	18
Grand Total	17	1	0	0	5	0	1	0	9	9	24	33
Apprch %	94.4	5.6		0	100		100	0				
Total %	70.8	4.2		0	20.8		4.2	0		27.3	72.7	

	Greendale Ave From North			Greendale Ave From South			Bird St 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 04:45 PM										
04:45 PM	0	0	0	0	**3**	**3**	0	0	0	3
05:00 PM	**1**	0	1	0	1	1	0	0	0	2
05:15 PM	**10**	0	**10**	0	0	0	0	0	0	**10**
05:30 PM	3	0	3	0	0	0	0	0	0	3
Total Volume	14	0	14	0	4	4	0	0	0	18
% App. Total	100	0		0	100		0	0		
PHF	.350	.000	.350	.000	.333	.333	.000	.000	.000	.450

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Rybury Hillway
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S7
Site Code : 62020007
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

	Greendale Ave From North		Greendale Ave From South		Rybury Hillway From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	0	0	1	0	1	4	6
07:15 AM	0	0	2	0	1	4	7
07:30 AM	0	1	5	0	3	6	15
07:45 AM	0	0	0	0	1	5	6
Total	0	1	8	0	6	19	34
08:00 AM	0	2	7	0	1	7	17
08:15 AM	0	1	6	0	1	14	22
08:30 AM	0	0	1	0	0	4	5
08:45 AM	0	0	3	0	1	3	7
Total	0	3	17	0	3	28	51
Grand Total	0	4	25	0	9	47	85
Apprch %	0	100	100	0	16.1	83.9	
Total %	0	4.7	29.4	0	10.6	55.3	
Cars	0	4	21	0	9	43	77
% Cars	0	100	84	0	100	91.5	90.6
Trucks	0	0	4	0	0	4	8
% Trucks	0	0	16	0	0	8.5	9.4

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	1	1	5	0	5	3	6	9	15
07:45 AM	0	0	0	0	0	0	1	5	6	6
08:00 AM	0	2	2	7	0	7	1	7	8	17
08:15 AM	0	1	1	6	0	6	1	14	15	22
Total Volume	0	4	4	18	0	18	6	32	38	60
% App. Total	0	100		100	0		15.8	84.2		
PHF	.000	.500	.500	.643	.000	.643	.500	.571	.633	.682
Cars	0	4	4	15	0	15	6	31	37	56
% Cars	0	100	100	83.3	0	83.3	100	96.9	97.4	93.3
Trucks	0	0	0	3	0	3	0	1	1	4
% Trucks	0	0	0	16.7	0	16.7	0	3.1	2.6	6.7

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Rybury Hillway
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S7
Site Code : 62020007
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Rybury Hillway From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	1	1
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	2
08:00 AM	0	0	1	0	0	0	1
08:15 AM	0	0	2	0	0	1	3
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	1	0	0	1	2
Total	0	0	4	0	0	2	6
Grand Total	0	0	4	0	0	4	8
Apprch %	0	0	100	0	0	100	
Total %	0	0	50	0	0	50	

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	1	0	1	0	0	0	1
08:15 AM	0	0	0	2	0	2	0	1	1	3
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	1	0	1	1	2
Total Volume	0	0	0	4	0	4	0	2	2	6
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.500	.000	.500	.000	.500	.500	.500

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Rybury Hillway
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S7
Site Code : 62020007
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	6	6	0	6
07:15 AM	0	0	0	1	0	0	0	0	1	1	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	5	5	0	5
Total	0	0	0	1	0	0	0	0	12	12	1	13
08:00 AM	0	0	0	0	0	0	0	0	1	1	0	1
08:15 AM	0	0	0	0	0	0	0	0	2	2	0	2
08:30 AM	0	0	0	0	0	0	0	0	2	2	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	5	5	0	5
Grand Total	0	0	0	1	0	0	0	0	17	17	1	18
Apprch %	0	0		100	0		0	0				
Total %	0	0		100	0		0	0		94.4	5.6	

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

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Rybury Hillway
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S7
Site Code : 62020007
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars

	Greendale Ave From North		Greendale Ave From South		Rybury Hillway From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	0	0	3	0	0	2	5
04:15 PM	0	0	3	0	1	4	8
04:30 PM	0	0	2	0	0	2	4
04:45 PM	0	0	4	0	0	2	6
Total	0	0	12	0	1	10	23
05:00 PM	0	1	4	0	1	8	14
05:15 PM	0	2	8	0	0	3	13
05:30 PM	0	0	3	0	0	5	8
05:45 PM	0	4	4	0	0	2	10
Total	0	7	19	0	1	18	45
Grand Total	0	7	31	0	2	28	68
Apprch %	0	100	100	0	6.7	93.3	
Total %	0	10.3	45.6	0	2.9	41.2	

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway 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 05:00 PM										
05:00 PM	0	1	1	4	0	4	1	8	9	14
05:15 PM	0	2	2	8	0	8	0	3	3	13
05:30 PM	0	0	0	3	0	3	0	5	5	8
05:45 PM	0	4	4	4	0	4	0	2	2	10
Total Volume	0	7	7	19	0	19	1	18	19	45
% App. Total	0	100		100	0		5.3	94.7		
PHF	.000	.438	.438	.594	.000	.594	.250	.563	.528	.804

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Rybury Hillway
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S7
Site Code : 62020007
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway 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	1	1	0	1
04:15 PM	0	0	0	0	0	0	0	0	3	3	0	3
04:30 PM	0	0	0	0	0	0	0	0	3	3	0	3
04:45 PM	0	0	0	0	0	0	0	0	2	2	0	2
Total	0	0	0	0	0	0	0	0	9	9	0	9
05:00 PM	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
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	1	1	0	1
Total	0	0	0	0	0	0	0	0	1	1	0	1
Grand Total	0	0	0	0	0	0	0	0	10	10	0	10
Apprch %	0	0		0	0		0	0				
Total %										100	0	

	Greendale Ave From North			Greendale Ave From South			Rybury Hillway 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	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

	Greendale Ave From North		Greendale Ave From South		Broad Meadow Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	50	1	2	103	1	0	157
07:15 AM	48	4	6	166	6	3	233
07:30 AM	79	6	4	191	7	8	295
07:45 AM	57	3	5	221	1	4	291
Total	234	14	17	681	15	15	976
08:00 AM	53	0	0	259	4	1	317
08:15 AM	64	0	1	279	6	9	359
08:30 AM	64	2	1	263	8	6	344
08:45 AM	57	3	0	257	2	2	321
Total	238	5	2	1058	20	18	1341
Grand Total	472	19	19	1739	35	33	2317
Apprch %	96.1	3.9	1.1	98.9	51.5	48.5	
Total %	20.4	0.8	0.8	75.1	1.5	1.4	
Cars	466	19	18	1722	34	31	2290
% Cars	98.7	100	94.7	99	97.1	93.9	98.8
Trucks	6	0	1	17	1	2	27
% Trucks	1.3	0	5.3	1	2.9	6.1	1.2

	Greendale Ave From North			Greendale Ave From South			Broad Meadow Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	53	0	53	0	259	259	4	1	5	317
08:15 AM	**64**	0	64	**1**	**279**	**280**	6	**9**	**15**	**359**
08:30 AM	64	2	66	1	263	264	**8**	6	14	344
08:45 AM	57	**3**	60	0	257	257	2	2	4	321
Total Volume	238	5	243	2	1058	1060	20	18	38	1341
% App. Total	97.9	2.1		0.2	99.8		52.6	47.4		
PHF	.930	.417	.920	.500	.948	.946	.625	.500	.633	.934
Cars	235	5	240	1	1048	1049	20	18	38	1327
% Cars	98.7	100	98.8	50.0	99.1	99.0	100	100	100	99.0
Trucks	3	0	3	1	10	11	0	0	0	14
% Trucks	1.3	0	1.2	50.0	0.9	1.0	0	0	0	1.0

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
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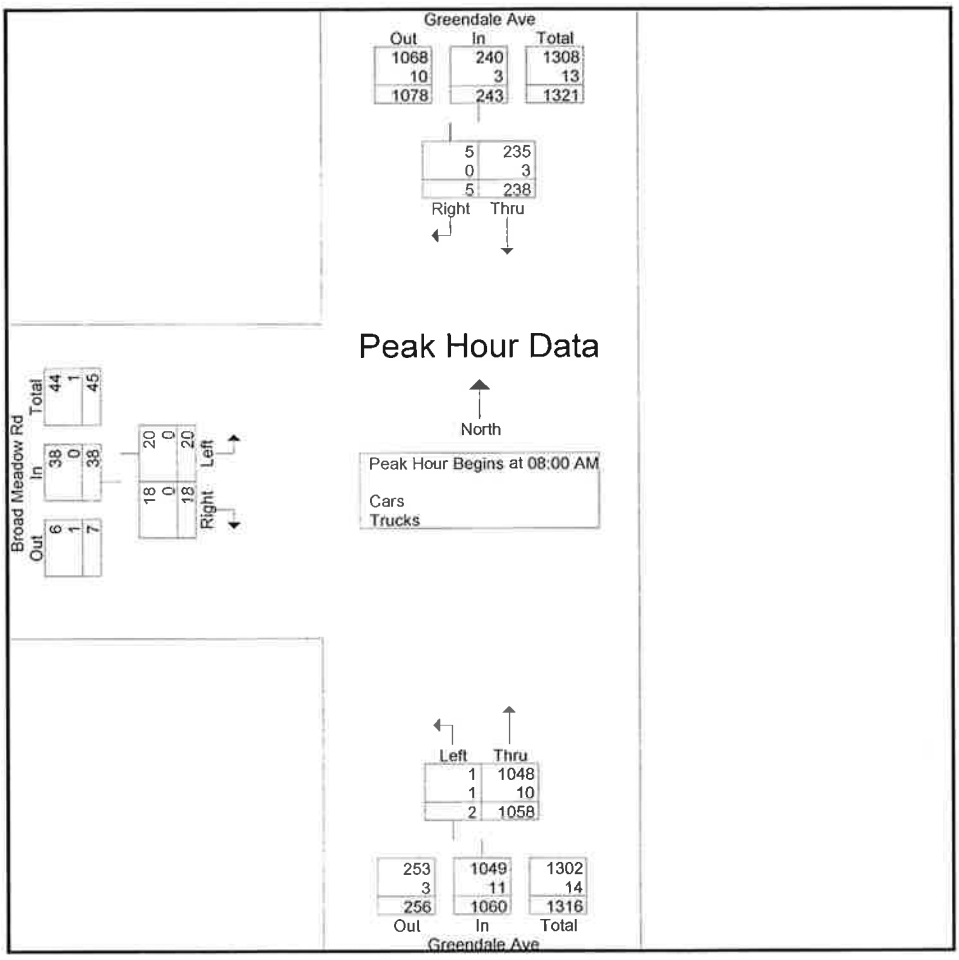


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			08:00 AM			07:30 AM		
+0 mins.	**79**	**6**	**85**	0	259	259	**7**	8	**15**
+15 mins.	57	3	60	**1**	**279**	**280**	1	4	5
+30 mins.	53	0	53	1	263	264	4	1	5
+45 mins.	64	0	64	0	257	257	6	**9**	15
Total Volume	253	9	262	2	1058	1060	18	22	40
% App. Total	96.6	3.4		0.2	99.8		45	55	
PHF	.801	.375	.771	.500	.948	.946	.643	.611	.667
Cars	250	9	259	1	1048	1049	17	21	38
% Cars	98.8	100	98.9	50	99.1	99	94.4	95.5	95
Trucks	3	0	3	1	10	11	1	1	2
% Trucks	1.2	0	1.1	50	0.9	1	5.6	4.5	5

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Broad Meadow Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	2	0	0	3	0	0	5
07:15 AM	0	0	0	1	0	1	2
07:30 AM	1	0	0	2	1	1	5
07:45 AM	0	0	0	1	0	0	1
Total	3	0	0	7	1	2	13
08:00 AM	1	0	0	3	0	0	4
08:15 AM	1	0	1	3	0	0	5
08:30 AM	0	0	0	2	0	0	2
08:45 AM	1	0	0	2	0	0	3
Total	3	0	1	10	0	0	14
Grand Total	6	0	1	17	1	2	27
Apprch %	100	0	5.6	94.4	33.3	66.7	
Total %	22.2	0	3.7	63	3.7	7.4	

	Greendale Ave From North			Greendale Ave From South			Broad Meadow Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	**1**	0	**1**	0	2	2	**1**	**1**	**2**	**5**
07:45 AM	0	0	0	0	1	1	0	0	0	1
08:00 AM	1	0	1	0	**3**	3	0	0	0	4
08:15 AM	1	0	1	**1**	**3**	**4**	0	0	0	5
Total Volume	3	0	3	1	9	10	1	1	2	15
% App. Total	100	0		10	90		50	50		
PHF	.750	.000	.750	.250	.750	.625	.250	.250	.250	.750

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Broad Meadow Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	0	0	1	0	0	0	4	4	3	7
07:15 AM	0	0	0	0	3	0	0	0	0	0	3	3
07:30 AM	0	0	1	0	4	0	0	0	2	3	4	7
07:45 AM	1	0	0	0	3	0	0	0	0	0	4	4
Total	3	0	1	0	11	0	0	0	6	7	14	21
08:00 AM	4	0	0	0	3	0	0	0	1	1	7	8
08:15 AM	1	0	0	0	1	1	1	0	3	4	3	7
08:30 AM	0	0	0	0	1	0	0	0	0	0	1	1
08:45 AM	3	0	0	0	1	0	0	0	0	0	4	4
Total	8	0	0	0	6	1	1	0	4	5	15	20
Grand Total	11	0	1	0	17	1	1	0	10	12	29	41
Apprch %	100	0		0	100		100	0				
Total %	37.9	0		0	58.6		3.4	0		29.3	70.7	

	Greendale Ave From North			Greendale Ave From South			Broad Meadow Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	3	3	0	0	0	3
07:30 AM	0	0	0	0	4	4	0	0	0	4
07:45 AM	1	0	1	0	3	3	0	0	0	4
08:00 AM	4	0	4	0	3	3	0	0	0	7
Total Volume	5	0	5	0	13	13	0	0	0	18
% App. Total	100	0		0	100		0	0		
PHF	.313	.000	.313	.000	.813	.813	.000	.000	.000	.643

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

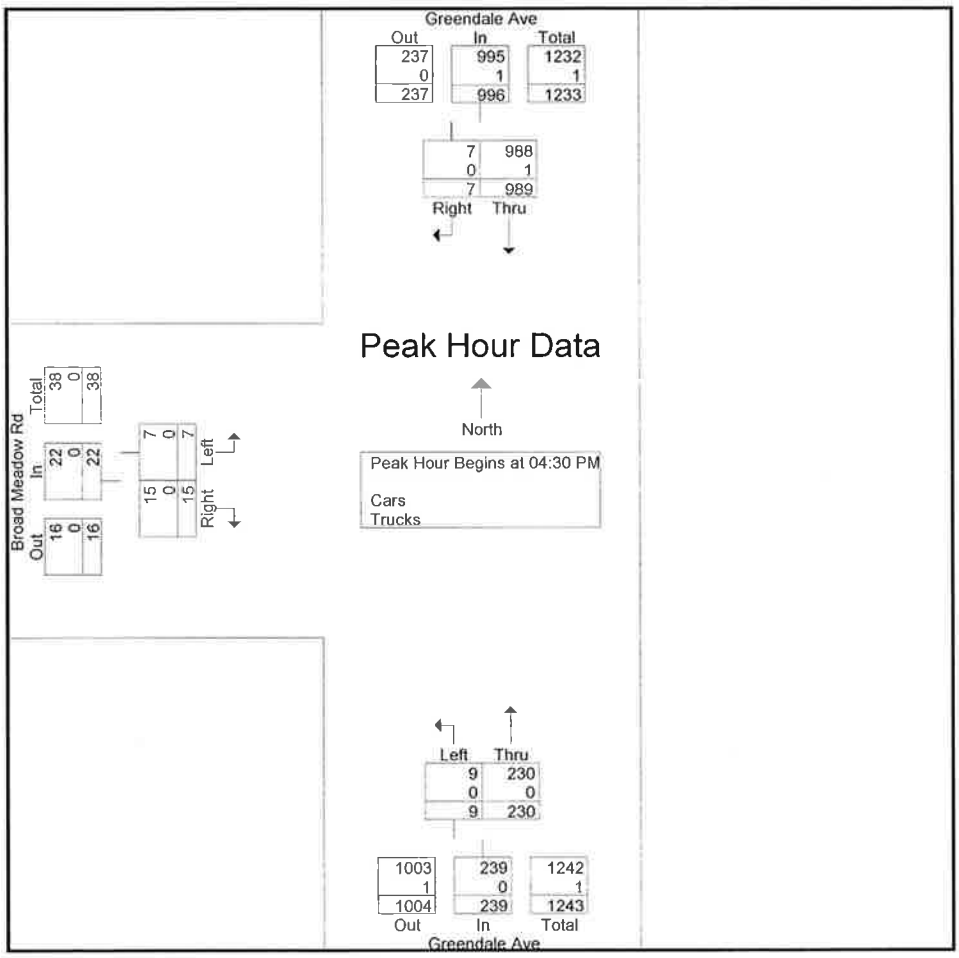
	Greendale Ave From North		Greendale Ave From South		Broad Meadow Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	168	2	2	60	2	7	241
04:15 PM	215	3	2	52	1	1	274
04:30 PM	223	2	1	50	1	6	283
04:45 PM	243	1	7	46	3	1	301
Total	849	8	12	208	7	15	1099
05:00 PM	254	3	1	57	0	5	320
05:15 PM	269	1	0	77	3	3	353
05:30 PM	201	4	1	65	3	3	277
05:45 PM	191	2	3	61	2	4	263
Total	915	10	5	260	8	15	1213
Grand Total	1764	18	17	468	15	30	2312
Apprch %	99	1	3.5	96.5	33.3	66.7	
Total %	76.3	0.8	0.7	20.2	0.6	1.3	
Cars	1761	18	17	467	15	30	2308
% Cars	99.8	100	100	99.8	100	100	99.8
Trucks	3	0	0	1	0	0	4
% Trucks	0.2	0	0	0.2	0	0	0.2

	Greendale Ave From North			Greendale Ave From South			Broad Meadow 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	223	2	225	1	50	51	1	6	7	283
04:45 PM	243	1	244	7	46	53	3	1	4	301
05:00 PM	254	3	257	1	57	58	0	5	5	320
05:15 PM	269	1	270	0	77	77	3	3	6	353
Total Volume	989	7	996	9	230	239	7	15	22	1257
% App. Total	99.3	0.7		3.8	96.2		31.8	68.2		
PHF	.919	.583	.922	.321	.747	.776	.583	.625	.786	.890
Cars	988	7	995	9	230	239	7	15	22	1256
% Cars	99.9	100	99.9	100	100	100	100	100	100	99.9
Trucks	1	0	1	0	0	0	0	0	0	1
% Trucks	0.1	0	0.1	0	0	0	0	0	0	0.1

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 2



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

	04:30 PM			05:00 PM			05:00 PM		
+0 mins.	223	2	225	1	57	58	0	**5**	5
+15 mins.	243	1	244	0	77	**77**	**3**	3	**6**
+30 mins.	254	**3**	257	1	65	66	3	3	6
+45 mins.	**269**	1	**270**	**3**	61	64	2	4	6
Total Volume	989	7	996	5	260	265	8	15	23
% App. Total	99.3	0.7		1.9	98.1		34.8	65.2	
PHF	.919	.583	.922	.417	.844	.860	.667	.750	.958
Cars	988	7	995	5	259	264	8	15	23
% Cars	99.9	100	99.9	100	99.6	99.6	100	100	100
Trucks	1	0	1	0	1	1	0	0	0
% Trucks	0.1	0	0.1	0	0.4	0.4	0	0	0

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North		Greendale Ave From South		Broad Meadow Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	2	0	0	0	0	0	2
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	2	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	1
05:30 PM	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	2
Grand Total	3	0	0	1	0	0	4
Apprch %	100	0	0	100	0	0	
Total %	75	0	0	25	0	0	

	Greendale Ave From North			Greendale Ave From South			Broad Meadow 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	2	0	2	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	2	0	0	0	0	0	0	2
% 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 : Greendale Avenue
E/W Street : Broad Meadow Road
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S6
Site Code : 62020006
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North			Greendale Ave From South			Broad Meadow 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	0	0	0	0	0	0	0	0	0	0
04:15 PM	1	0	0	0	1	0	0	0	0	0	2	2
04:30 PM	1	0	0	0	0	0	0	0	3	3	1	4
04:45 PM	0	0	0	0	3	0	0	1	0	0	4	4
Total	2	0	0	0	4	0	0	1	3	3	7	10
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	9	0	0	0	0	0	0	0	0	0	9	9
05:30 PM	4	0	0	0	0	0	0	0	0	0	4	4
05:45 PM	1	0	0	0	0	0	0	0	0	0	1	1
Total	14	0	0	0	0	0	0	0	0	0	14	14
Grand Total	16	0	0	0	4	0	0	1	3	3	21	24
Apprch %	100	0		0	100		0	100				
Total %	76.2	0		0	19		0	4.8		12.5	87.5	

	Greendale Ave From North			Greendale Ave From South			Broad Meadow 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 04:45 PM										
04:45 PM	0	0	0	0	**3**	**3**	0	**1**	**1**	4
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	**9**	0	**9**	0	0	0	0	0	0	**9**
05:30 PM	4	0	4	0	0	0	0	0	0	4
Total Volume	13	0	13	0	3	3	0	1	1	17
% App. Total	100	0		0	100		0	100		
PHF	.361	.000	.361	.000	.250	.250	.000	.250	.250	.472

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

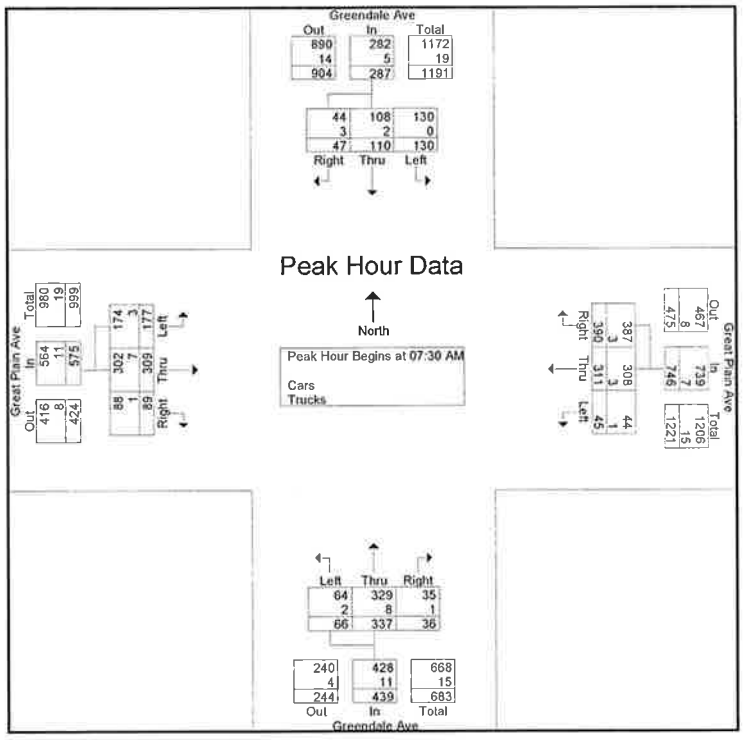
	Greendale Ave From North			Great Plain Ave From East			Greendale Ave From South			Great Plain Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	30	12	6	6	40	28	5	42	18	22	50	15	274
07:15 AM	27	30	6	10	61	43	19	54	19	28	66	25	388
07:30 AM	31	35	15	14	61	57	32	81	18	24	90	37	495
07:45 AM	27	32	6	14	106	85	12	66	6	49	119	31	553
Total	115	109	33	44	268	213	68	243	61	123	325	108	1710
08:00 AM	43	20	13	5	87	134	13	92	7	52	42	11	519
08:15 AM	29	23	13	12	57	114	9	98	5	52	58	10	480
08:30 AM	42	14	20	4	51	112	7	62	6	48	57	5	428
08:45 AM	32	29	9	7	41	106	5	79	4	33	30	18	393
Total	146	86	55	28	236	466	34	331	22	185	187	44	1820
Grand Total	261	195	88	72	504	679	102	574	83	308	512	152	3530
Apprch %	48	35.8	16.2	5.7	40.2	54.1	13.4	75.6	10.9	31.7	52.7	15.6	
Total %	7.4	5.5	2.5	2	14.3	19.2	2.9	16.3	2.4	8.7	14.5	4.3	
Cars	261	192	82	70	497	674	99	563	81	304	502	151	3476
% Cars	100	98.5	93.2	97.2	98.6	99.3	97.1	98.1	97.6	98.7	98	99.3	98.5
Trucks	0	3	6	2	7	5	3	11	2	4	10	1	54
% Trucks	0	1.5	6.8	2.8	1.4	0.7	2.9	1.9	2.4	1.3	2	0.7	1.5

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	31	35	15	81	14	61	57	132	32	81	18	131	24	90	37	151	495
07:45 AM	27	32	6	65	14	106	85	205	12	66	6	84	49	119	31	199	553
08:00 AM	43	20	13	76	5	87	134	226	13	92	7	112	52	42	11	105	519
08:15 AM	29	23	13	65	12	57	114	183	9	98	5	112	52	58	10	120	480
Total Volume	130	110	47	287	45	311	390	746	66	337	36	439	177	309	89	575	2047
% App. Total	45.3	38.3	16.4		6	41.7	52.3		15	76.8	8.2		30.8	53.7	15.5		
PHF	756	786	783	886	804	733	728	825	516	860	500	838	851	649	601	722	925
Cars	130	108	44	282	44	308	387	739	64	329	35	428	174	302	88	564	2013
% Cars	100	98.2	93.6	98.3	97.8	99.0	99.2	99.1	97.0	97.6	97.2	97.5	98.3	97.7	98.9	98.1	98.3
Trucks	0	2	3	5	1	3	3	7	2	8	1	11	3	7	1	11	34
% Trucks	0	1.8	6.4	1.7	2.2	1.0	0.8	0.9	3.0	2.4	2.8	2.5	1.7	2.3	1.1	1.9	1.7

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 2



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

Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:30 AM				07:30 AM			
+0 mins.	31	**35**	**15**	**81**	**14**	**106**	85	205	**32**	81	**18**	**131**	24	90	**37**	151
+15 mins.	27	32	6	65	5	87	**134**	**226**	12	66	6	84	49	**119**	31	**199**
+30 mins.	**43**	20	13	76	12	57	114	183	13	92	7	112	**52**	42	11	105
+45 mins.	29	23	13	65	4	51	112	167	9	**98**	5	112	52	58	10	120
Total Volume	130	110	47	287	35	301	445	781	66	337	36	439	177	309	89	575
% App. Total	45.3	38.3	16.4		4.5	38.5	57		15	76.8	8.2		30.8	53.7	15.5	
PHF	756	786	783	.886	625	710	.830	864	516	860	500	838	851	649	.601	722
Cars	130	108	44	282	35	298	442	775	64	329	35	428	174	302	88	564
% Cars	100	98.2	93.6	98.3	100	99	99.3	99.2	97	97.6	97.2	97.5	98.3	97.7	98.9	98.1
Trucks	0	2	**3**	**5**	0	3	**3**	6	2	8	**1**	11	3	7	1	11

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North			Great Plain Ave From East			Greendale Ave From South			Great Plain Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	1	1	3	0	1	1	1	0	2	0	11
07:15 AM	0	0	1	0	1	1	0	0	0	0	0	0	3
07:30 AM	0	1	0	1	0	0	1	5	0	0	2	0	10
07:45 AM	0	1	0	0	2	1	0	1	0	1	4	1	11
Total	0	3	2	2	6	2	2	7	1	1	8	1	35
08:00 AM	0	0	1	0	1	0	1	1	1	1	1	0	7
08:15 AM	0	0	2	0	0	2	0	1	0	1	0	0	6
08:30 AM	0	0	0	0	0	0	0	1	0	1	1	0	3
08:45 AM	0	0	1	0	0	1	0	1	0	0	0	0	3
Total	0	0	4	0	1	3	1	4	1	3	2	0	19
Grand Total	0	3	6	2	7	5	3	11	2	4	10	1	54
Apprch %	0	33.3	66.7	14.3	50	35.7	18.8	68.8	12.5	26.7	66.7	6.7	
Total %	0	5.6	11.1	3.7	13	9.3	5.6	20.4	3.7	7.4	18.5	1.9	

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	1	1	2	1	3	0	4	1	1	1	3	0	2	0	2	11
07:15 AM	0	0	1	1	0	1	1	2	0	0	0	0	0	0	0	0	3
07:30 AM	0	1	0	1	1	0	0	1	1	5	0	6	0	2	0	2	10
07:45 AM	0	1	0	1	0	2	1	3	0	1	0	1	1	4	1	6	11
Total Volume	0	3	2	5	2	6	2	10	2	7	1	10	1	8	1	10	35
% App. Total	0	60	40		20	60	20		20	70	10		10	80	10		
PHF	.000	.750	.500	.625	.500	.500	.500	.625	.500	.350	.250	.417	.250	.500	.250	.417	.795

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 62020083
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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
07:00 AM	0	0	0	1	1	2	0	0	0	0	0	3	1	0	0	0	4	4	8
07:15 AM	0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0	1	3	4
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	1	0	2	3	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	2	3
Total	0	0	0	2	1	3	0	1	0	0	0	5	5	2	1	0	8	12	20
08:00 AM	0	0	1	2	0	0	0	0	0	2	0	1	0	0	0	1	4	3	7
08:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	1	1	3	0	0	0	0	0	2	0	1	1	0	0	1	5	5	10
Grand Total	0	1	1	5	1	3	0	1	0	2	0	6	6	2	1	1	13	17	30
Apprch %	0	50	50		25	75	0		0	100	0		66.7	22.2	11.1				
Total %	0	5.9	5.9		5.9	17.6	0		0	11.8	0		35.3	11.8	5.9		43.3	56.7	

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	1	2	0	3	0	0	0	0	1	0	0	1	4
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	2	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	3	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
Total Volume	0	0	0	0	1	3	0	4	0	0	0	0	5	2	1	8	12
% App. Total	0	0	0		25	75	0		0	0	0		62.5	25	12.5		
PHF	.000	.000	.000	.000	.250	.375	.000	.333	.000	.000	.000	.000	.625	.500	.250	.667	.750

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Cars - Trucks

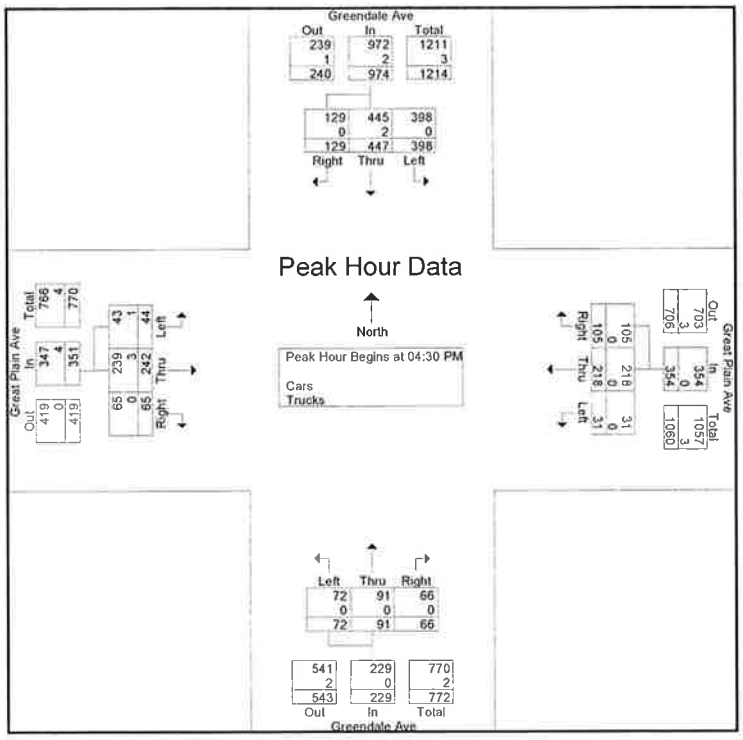
	Greendale Ave From North			Great Plain Ave From East			Greendale Ave From South			Great Plain Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	89	71	27	11	37	35	7	14	6	7	76	9	389
04:15 PM	88	90	35	5	44	17	7	12	10	13	58	14	393
04:30 PM	89	108	25	6	45	18	17	18	10	7	60	18	421
04:45 PM	96	101	32	10	62	22	10	19	25	16	56	15	464
Total	362	370	119	32	188	92	41	63	51	43	250	56	1667
05:00 PM	114	112	37	8	57	28	26	32	18	11	66	19	528
05:15 PM	99	126	35	7	54	37	19	22	13	10	60	13	495
05:30 PM	86	84	21	5	59	27	13	17	9	20	54	8	403
05:45 PM	78	83	39	8	75	25	21	21	7	6	53	21	437
Total	377	405	132	28	245	117	79	92	47	47	233	61	1863
Grand Total	739	775	251	60	433	209	120	155	98	90	483	117	3530
Apprch %	41.9	43.9	14.2	8.5	61.7	29.8	32.2	41.6	26.3	13	70	17	
Total %	20.9	22	7.1	1.7	12.3	5.9	3.4	4.4	2.8	2.5	13.7	3.3	
Cars	739	772	250	60	432	209	120	154	97	89	477	117	3516
% Cars	100	99.6	99.6	100	99.8	100	100	99.4	99	98.9	98.8	100	99.6
Trucks	0	3	1	0	1	0	0	1	1	1	6	0	14
% Trucks	0	0.4	0.4	0	0.2	0	0	0.6	1	1.1	1.2	0	0.4

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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	89	108	25	222	6	45	18	69	17	18	10	45	7	60	18	85	421
04:45 PM	96	101	32	229	10	62	22	94	10	19	25	54	16	56	15	87	464
05:00 PM	114	112	37	263	8	57	28	93	26	32	18	76	11	66	19	96	528
05:15 PM	99	126	35	260	7	54	37	98	19	22	13	54	10	60	13	83	495
Total Volume	398	447	129	974	31	218	105	354	72	91	66	229	44	242	65	351	1908
% App. Total	40.9	45.9	13.2		8.8	61.6	29.7		31.4	39.7	28.8		12.5	68.9	18.5		
PHF	873	887	872	926	775	879	709	903	692	711	660	753	688	917	855	914	903
Cars	398	445	129	972	31	218	105	354	72	91	66	229	43	239	65	347	1902
% Cars	100	99.6	100	99.8	100	100	100	100	100	100	100	100	97.7	98.8	100	98.9	99.7
Trucks	0	2	0	2	0	0	0	0	0	0	0	0	1	3	0	4	6
% Trucks	0	0.4	0	0.2	0	0	0	0	0	0	0	0	2.3	1.2	0	1.1	0.3

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 2



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

Peak Hour for Each Approach Begins at

	04:30 PM				05:00 PM				04:30 PM				04:15 PM			
+0 mins.	89	108	25	222	8	57	28	93	17	18	10	45	13	58	14	85
+15 mins.	96	101	32	229	7	54	37	98	10	19	25	54	7	60	18	85
+30 mins.	114	112	37	263	5	59	27	91	26	32	18	76	16	56	15	87
+45 mins.	99	126	35	260	8	75	25	108	19	22	13	54	11	66	19	96
Total Volume	398	447	129	974	28	245	117	390	72	91	66	229	47	240	66	353
% App. Total	40.9	45.9	13.2		7.2	62.8	30		31.4	39.7	28.8		13.3	68	18.7	
PHF	873	887	872	926	875	817	791	903	692	711	660	753	734	909	868	919
Cars	398	445	129	972	28	245	117	390	72	91	66	229	46	237	66	349
% Cars	100	99.6	100	99.8	100	100	100	100	100	100	100	100	97.9	98.8	100	98.9
Trucks	0	2	0	2	0	0	0	0	0	0	0	0	1	3	0	4

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Trucks

	Greendale Ave From North			Great Plain Ave From East			Greendale Ave From South			Great Plain Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	1	0	0	0	0	0	0	0	1	0	3
04:15 PM	0	0	0	0	1	0	0	0	1	0	1	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	2
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	1	0	1	0	0	0	1	1	3	0	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	1	0	0	0	0	0	1	0	0	3	0	5
Grand Total	0	3	1	0	1	0	0	1	1	1	6	0	14
Apprch %	0	75	25	0	100	0	0	50	50	14.3	85.7	0	
Total %	0	21.4	7.1	0	7.1	0	0	7.1	7.1	7.1	42.9	0	

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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	1	1	2	0	0	0	0	0	0	0	0	0	1	0	1	3
04:15 PM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	2	1	3	0	1	0	1	0	0	1	1	1	3	0	4	9
% App. Total	0	66.7	33.3		0	100	0		0	0	100		25	75	0		
PHF	.000	.500	.250	.375	.000	.250	.000	.250	.000	.000	.250	.250	.250	.750	.000	.500	.750

Accurate Counts
978-664-2565

N/S Street : Greendale Avenue
E/W Street : Great Plain Avenue
City/State : Needham, MA
Weather : Cloudy

File Name : 620200S3
Site Code : 62020003
Start Date : 9/12/2013
Page No : 1

Groups Printed- Bikes Peds

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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	1	0	0	0	1	1	0	0	0	2	1	3
04:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
04:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	2	2	4
Total	0	1	2	1	0	0	0	1	0	0	0	1	3	1	0	1	4	7	11
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	2	5	0	0	0	0	1	1	0	0	0	0	0	0	0	1	8	9
05:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	3
05:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	3	3
Total	0	2	7	0	0	0	1	1	1	0	0	0	0	2	1	0	1	14	15
Grand Total	0	3	9	1	0	0	1	2	1	0	0	1	3	3	1	1	5	21	26
Apprch %	0	25	75		0	0	100		100	0	0		42.9	42.9	14.3				
Total %	0	14.3	42.9		0	0	4.8		4.8	0	0		14.3	14.3	4.8		19.2	80.8	

	Greendale Ave From North				Great Plain Ave From East				Greendale Ave From South				Great Plain Ave 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 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	2	5	7	0	0	0	0	1	0	0	1	0	0	0	0	8
05:30 PM	0	0	2	2	0	0	0	0	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	2	3
Total Volume	0	2	7	9	0	0	1	1	1	0	0	1	0	2	1	3	14
% App. Total	0	22.2	77.8		0	0	100		100	0	0		0	66.7	33.3		
PHF	.000	.250	.350	.321	.000	.000	.250	.250	.250	.000	.000	.250	.000	.500	.250	.375	.438

VEHICLE TRAVEL SPEED DATA

Accurate Counts
978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
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
09/11/13	0	0	0	0	0	4	6	6	1	0	0	0	0	0	17	48	51
01:00	0	0	0	0	0	3	10	2	0	0	0	0	0	0	15	45	48
02:00	0	0	0	0	0	1	1	6	0	**1**	0	0	0	0	9	50	57
03:00	0	0	0	0	0	2	0	1	0	0	0	0	0	0	3	47	49
04:00	0	1	0	1	0	2	2	2	1	1	0	0	0	0	10	52	57
05:00	0	3	3	1	2	5	3	3	2	1	0	0	0	0	23	48	54
06:00	0	3	0	0	3	19	20	4	2	0	0	0	0	0	51	45	49
07:00	0	0	**7**	**7**	**18**	**80**	106	19	4	0	0	0	0	0	241	44	47
08:00	**1**	4	1	2	17	77	72	24	1	0	0	0	0	0	199	45	48
09:00	0	2	1	1	14	50	81	27	9	1	0	0	0	0	186	46	50
10:00	1	**8**	3	0	6	59	108	51	6	0	0	0	0	0	242	46	49
11:00	0	1	2	0	2	61	**184**	**77**	**20**	0	0	0	0	0	**347**	47	51
12 PM	2	1	5	2	8	56	131	90	11	0	0	0	0	0	306	48	50
13:00	0	**5**	0	1	5	47	128	87	16	**3**	0	0	0	0	292	48	51
14:00	**3**	3	3	3	15	103	185	56	7	1	0	0	0	0	379	46	49
15:00	2	5	3	2	9	92	263	87	12	1	0	0	0	0	476	46	49
16:00	0	3	2	1	15	168	405	150	**21**	1	0	0	0	0	766	46	49
17:00	0	1	**9**	**10**	**22**	**236**	**445**	136	5	0	0	0	0	0	**864**	45	48
18:00	1	4	8	1	18	131	289	**157**	13	0	0	0	0	0	622	47	49
19:00	0	4	0	0	13	82	120	51	3	0	0	0	0	0	273	46	49
20:00	0	0	0	0	8	39	60	27	4	0	0	0	0	0	138	46	49
21:00	0	0	0	0	5	35	51	20	6	0	0	0	0	0	117	47	50
22:00	0	0	0	0	4	22	26	12	2	2	0	0	0	0	68	47	51
23:00	0	0	0	0	0	6	18	7	1	0	0	0	0	0	32	47	50
Total	10	48	47	32	184	1380	2714	1102	147	12	0	0	0	0	5676		
Percent	0.2%	0.8%	0.8%	0.6%	3.2%	24.3%	47.8%	19.4%	2.6%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	10:00	07:00	07:00	07:00	07:00	11:00	11:00	11:00	02:00					11:00		
Vol.	1	8	7	7	18	80	184	77	20	1					347		
PM Peak	14:00	13:00	17:00	17:00	17:00	17:00	17:00	18:00	16:00	13:00					17:00		
Vol.	3	5	9	10	22	236	445	157	21	3					864		

Accurate Counts

978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
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
09/12/13	0	0	0	0	1	4	7	3	2	0	0	0	0	0	17	49	52
01:00	0	0	0	0	0	2	9	4	1	1	0	0	0	0	17	49	55
02:00	0	0	0	0	0	0	3	1	2	0	0	0	0	0	6	52	54
03:00	0	0	0	0	0	1	1	0	1	0	0	0	0	0	3	52	54
04:00	0	0	0	0	2	1	2	2	0	0	0	0	0	0	7	47	49
05:00	0	2	3	2	2	6	4	5	2	0	0	0	0	0	26	47	51
06:00	0	5	**6**	0	1	15	23	9	1	1	0	0	0	0	61	46	49
07:00	0	2	0	1	**16**	72	**117**	21	4	0	0	0	0	0	233	45	48
08:00	1	4	2	**8**	14	**77**	105	17	5	0	0	0	0	0	233	44	48
09:00	2	3	0	4	10	58	103	**41**	4	0	0	0	0	0	225	46	49
10:00	1	4	3	3	7	30	82	32	**6**	0	0	0	0	0	168	46	50
11:00	**7**	**9**	5	4	4	73	111	37	3	**2**	0	0	0	0	**255**	45	49
12 PM	0	5	1	0	5	39	144	71	**14**	0	0	0	0	0	279	48	50
13:00	1	1	1	0	3	46	155	62	14	**1**	0	0	0	0	284	47	50
14:00	2	3	1	0	25	92	217	73	13	0	0	0	0	0	426	46	49
15:00	**3**	**7**	0	4	18	124	301	108	12	1	0	0	0	0	578	46	49
16:00	1	0	1	0	15	203	470	142	13	1	0	0	0	0	846	46	49
17:00	0	2	**4**	4	**37**	**234**	**494**	140	11	1	0	0	0	0	**927**	45	48
18:00	0	5	1	3	25	164	367	**144**	9	0	0	0	0	0	718	46	49
19:00	0	0	2	**6**	19	140	209	54	3	0	0	0	0	0	433	45	48
20:00	0	0	0	2	5	50	83	39	6	1	0	0	0	0	186	47	50
21:00	1	0	0	0	8	30	41	19	2	0	0	0	0	0	101	46	49
22:00	0	0	0	0	5	21	20	6	3	0	0	0	0	0	55	46	50
23:00	0	0	0	1	5	12	20	4	0	0	0	0	0	0	42	44	47
Total	19	52	30	42	227	1494	3088	1034	131	9	0	0	0	0	6126		
Percent	0.3%	0.8%	0.5%	0.7%	3.7%	24.4%	50.4%	16.9%	2.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	06:00	08:00	07:00	08:00	07:00	09:00	10:00	11:00					11:00		
Vol.	7	9	6	8	16	77	117	41	6	2					255		
PM Peak	15:00	15:00	17:00	19:00	17:00	17:00	17:00	18:00	12:00	13:00					17:00		
Vol.	3	7	4	6	37	234	494	144	14	1					927		
Total	29	100	77	74	411	2874	5802	2136	278	21	0	0	0	0	11802		
Percent	0.2%	0.8%	0.7%	0.6%	3.5%	24.4%	49.2%	18.1%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 36 MPH
50th Percentile : 41 MPH
85th Percentile : 46 MPH
95th Percentile : 49 MPH

Stats

10 MPH Pace Speed : 38-47 MPH
Number in Pace : 8329
Percent in Pace : 70.6%
Number of Vehicles > 40 MPH : 8237
Percent of Vehicles > 40 MPH : 69.8%
Mean Speed(Average) : 42 MPH

Accurate Counts
978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
Northbound

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
09/11/13	0	0	0	1	3	2	6	3	0	0	0	0	0	0	15	46	48
01:00	0	0	0	0	0	0	3	1	1	0	0	0	0	0	5	51	53
02:00	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	53	55
03:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	49	50
04:00	0	0	0	0	0	2	8	2	1	0	0	0	0	0	13	47	51
05:00	0	0	0	0	7	15	17	2	1	0	0	0	0	0	42	44	47
06:00	**2**	**1**	0	3	6	84	87	24	2	0	0	0	0	0	209	45	48
07:00	0	0	0	5	118	340	220	14	1	0	0	0	0	0	698	42	45
08:00	0	1	**32**	**54**	**244**	**545**	156	13	0	0	0	0	0	0	**1045**	40	43
09:00	0	0	1	24	101	249	**248**	**31**	1	0	0	0	0	0	655	43	46
10:00	0	0	0	0	20	105	114	24	**3**	0	0	0	0	0	266	44	47
11:00	0	0	0	0	6	62	95	21	2	**1**	0	0	0	0	187	45	48
12 PM	0	0	0	1	17	68	75	16	1	0	0	0	0	0	178	44	47
13:00	0	0	0	1	13	60	76	**21**	1	0	0	0	0	0	172	45	48
14:00	0	0	0	6	**43**	95	80	13	**2**	0	0	0	0	0	239	43	46
15:00	**2**	0	**1**	3	39	**101**	100	15	1	0	0	0	0	0	**262**	43	46
16:00	0	0	0	2	17	90	90	18	2	0	0	0	0	0	219	44	47
17:00	0	0	0	1	18	81	**119**	19	1	0	0	0	0	0	239	44	47
18:00	1	0	1	1	11	79	87	19	1	0	0	0	0	0	200	44	47
19:00	0	0	1	**7**	20	57	47	12	1	0	0	0	0	0	145	44	47
20:00	0	0	1	1	10	43	36	6	1	0	0	0	0	0	98	44	46
21:00	0	0	0	3	9	37	16	7	0	0	0	0	0	0	72	43	47
22:00	0	0	0	0	1	9	8	4	2	0	0	0	0	0	24	47	51
23:00	0	0	0	1	0	5	6	0	0	0	0	0	0	0	12	43	45
Total	5	2	37	115	703	2129	1694	286	26	1	0	0	0	0	4998		
Percent	0.1%	0.0%	0.7%	2.3%	14.1%	42.6%	33.9%	5.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	08:00	08:00	08:00	08:00	09:00	09:00	10:00	11:00					08:00		
Vol.	2	1	32	54	244	545	248	31	3	1					1045		
PM Peak	15:00		15:00	19:00	14:00	15:00	17:00	13:00	14:00						15:00		
Vol.	2		1	7	43	101	119	21	2						262		

Accurate Counts
978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
Northbound

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
09/12/13	0	0	0	0	1	3	5	0	0	0	0	0	0	0	9	43	45
01:00	0	0	0	1	0	1	3	1	0	0	0	0	0	0	6	45	48
02:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	54	55
03:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	49	50
04:00	0	0	0	0	0	2	5	2	0	0	0	0	0	0	9	46	49
05:00	0	0	0	0	2	15	15	4	0	0	0	**1**	0	0	37	45	49
06:00	0	1	1	1	11	55	88	23	1	0	0	0	0	0	181	45	48
07:00	0	0	3	16	80	273	**274**	**30**	0	0	0	0	0	0	676	43	45
08:00	**3**	**11**	**25**	**54**	**198**	**541**	224	14	1	0	0	0	0	0	**1071**	41	44
09:00	0	1	8	33	80	304	258	28	3	0	0	0	0	0	715	43	45
10:00	0	0	0	2	17	93	98	27	3	0	0	0	0	0	240	45	48
11:00	0	1	3	8	31	83	77	13	**4**	0	0	0	0	0	220	44	47
12 PM	0	0	0	0	18	83	82	**25**	4	**1**	0	0	0	0	213	45	49
13:00	0	0	0	1	21	76	95	25	4	0	0	0	0	0	222	45	48
14:00	0	0	0	**9**	31	85	63	18	**5**	0	0	0	0	0	211	44	48
15:00	0	0	1	4	**33**	**109**	92	5	2	0	0	0	0	0	246	43	45
16:00	0	0	0	4	20	62	101	24	2	0	0	0	0	0	213	45	48
17:00	0	0	0	3	20	105	**117**	19	3	0	0	0	0	0	**267**	44	47
18:00	0	0	0	1	16	83	96	19	1	0	0	0	0	0	216	44	47
19:00	0	0	0	0	25	54	44	5	0	0	0	0	0	0	128	43	45
20:00	0	0	0	2	15	57	35	10	0	0	0	0	0	0	119	44	47
21:00	0	0	**4**	5	11	39	22	5	1	0	0	0	0	0	87	43	46
22:00	0	0	0	1	4	12	15	3	0	0	0	0	0	0	35	44	47
23:00	**1**	**1**	0	1	2	9	8	1	0	0	0	0	0	0	23	43	45
Total	4	15	45	146	636	2144	1817	302	35	1	0	1	0	0	5146		
Percent	0.1%	0.3%	0.9%	2.8%	12.4%	41.7%	35.3%	5.9%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	07:00	07:00	11:00			05:00			08:00		
Vol.	3	11	25	54	198	541	274	30	4			1			1071		
PM Peak	23:00	23:00	21:00	14:00	15:00	15:00	17:00	12:00	14:00	12:00					17:00		
Vol.	1	1	4	9	33	109	117	25	5	1					267		
Total	9	17	82	261	1339	4273	3511	588	61	2	0	1	0	0	10144		
Percent	0.1%	0.2%	0.8%	2.6%	13.2%	42.1%	34.6%	5.8%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	33 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	46 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	7104
Percent in Pace :	70.0%
Number of Vehicles > 40 MPH :	4163
Percent of Vehicles > 40 MPH :	41.0%
Mean Speed(Average) :	39 MPH

Accurate Counts
978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
Southbound, Northbound

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
09/11/13	0	0	0	1	3	6	12	9	1	0	0	0	0	0	32	47	50
01:00	0	0	0	0	0	3	13	3	1	0	0	0	0	0	20	46	50
02:00	0	0	0	1	0	1	1	6	1	**1**	0	0	0	0	11	51	57
03:00	0	0	0	0	0	2	0	2	0	0	0	0	0	0	4	48	50
04:00	0	1	0	1	0	4	10	4	2	1	0	0	0	0	23	49	54
05:00	0	3	3	1	9	20	20	5	3	1	0	0	0	0	65	45	51
06:00	**2**	4	0	3	9	103	107	28	4	0	0	0	0	0	260	45	48
07:00	0	0	7	12	136	420	326	33	5	0	0	0	0	0	939	43	45
08:00	1	5	**33**	**56**	**261**	**622**	228	37	1	0	0	0	0	0	**1244**	41	44
09:00	0	2	2	25	115	299	**329**	58	10	1	0	0	0	0	841	44	47
10:00	1	**8**	3	0	26	164	222	75	9	0	0	0	0	0	508	45	49
11:00	0	1	2	0	8	123	279	**98**	**22**	1	0	0	0	0	534	47	50
12 PM	2	1	5	3	25	124	206	106	12	0	0	0	0	0	484	47	49
13:00	0	**5**	0	2	18	107	204	108	17	**3**	0	0	0	0	464	47	50
14:00	3	3	3	9	**58**	198	265	69	9	1	0	0	0	0	618	45	48
15:00	**4**	5	4	5	48	193	363	102	13	1	0	0	0	0	738	45	49
16:00	0	3	2	3	32	258	495	168	**23**	1	0	0	0	0	985	46	49
17:00	0	1	**9**	**11**	40	**317**	**564**	155	6	0	0	0	0	0	**1103**	45	48
18:00	2	4	9	2	29	210	376	**176**	14	0	0	0	0	0	822	46	49
19:00	0	4	1	7	33	139	167	63	4	0	0	0	0	0	418	45	48
20:00	0	0	1	1	18	82	96	33	5	0	0	0	0	0	236	45	49
21:00	0	0	0	3	14	72	67	27	6	0	0	0	0	0	189	46	49
22:00	0	0	0	0	5	31	34	16	4	2	0	0	0	0	92	47	51
23:00	0	0	0	1	0	11	24	7	1	0	0	0	0	0	44	46	49
Total	15	50	84	147	887	3509	4408	1388	173	13	0	0	0	0	10674		
Percent	0.1%	0.5%	0.8%	1.4%	8.3%	32.9%	41.3%	13.0%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	10:00	08:00	08:00	08:00	08:00	09:00	11:00	11:00	02:00					08:00		
Vol.	2	8	33	56	261	622	329	98	22	1					1244		
PM Peak	15:00	13:00	17:00	17:00	14:00	17:00	17:00	18:00	16:00	13:00					17:00		
Vol.	4	5	9	11	58	317	564	176	23	3					1103		

Accurate Counts
978-664-2565

6202SPD1

Location : Greendale Avenue
Location : South of Bird Street
City/State: Needham, MA
Southbound, Northbound

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
09/12/13	0	0	0	0	2	7	12	3	2	0	0	0	0	0	26	46	51
01:00	0	0	0	1	0	3	12	5	1	1	0	0	0	0	23	48	54
02:00	0	0	0	0	0	0	3	1	3	0	0	0	0	0	7	53	55
03:00	0	0	0	0	0	1	1	1	1	0	0	0	0	0	4	51	54
04:00	0	0	0	0	2	3	7	4	0	0	0	0	0	0	16	47	49
05:00	0	2	3	2	4	21	19	9	2	0	0	**1**	0	0	63	46	50
06:00	0	6	7	1	12	70	111	32	2	1	0	0	0	0	242	45	48
07:00	0	2	3	17	96	345	**391**	51	4	0	0	0	0	0	909	44	46
08:00	**4**	**15**	**27**	**62**	**212**	**618**	329	31	6	0	0	0	0	0	**1304**	42	45
09:00	2	4	8	37	90	362	361	**69**	7	0	0	0	0	0	940	44	47
10:00	1	4	3	5	24	123	180	59	**9**	0	0	0	0	0	408	45	49
11:00	**7**	10	8	12	35	156	188	50	7	**2**	0	0	0	0	475	45	48
12 PM	0	5	1	0	23	122	226	96	**18**	**1**	0	0	0	0	492	47	50
13:00	1	1	1	1	24	122	250	87	18	1	0	0	0	0	506	46	50
14:00	2	3	1	**9**	56	177	280	91	18	0	0	0	0	0	637	46	49
15:00	**3**	**7**	1	8	51	233	393	113	14	1	0	0	0	0	824	45	49
16:00	1	0	1	4	35	265	571	**166**	15	1	0	0	0	0	1059	46	49
17:00	0	2	**4**	7	**57**	**339**	**611**	159	14	1	0	0	0	0	**1194**	45	48
18:00	0	5	1	4	41	247	463	163	10	0	0	0	0	0	934	46	49
19:00	0	0	2	6	44	194	253	59	3	0	0	0	0	0	561	45	47
20:00	0	0	0	4	20	107	118	49	6	1	0	0	0	0	305	46	49
21:00	1	0	4	5	19	69	63	24	3	0	0	0	0	0	188	45	48
22:00	0	0	0	1	9	33	35	9	3	0	0	0	0	0	90	45	49
23:00	1	1	0	2	7	21	28	5	0	0	0	0	0	0	65	44	46
Total	23	67	75	188	863	3638	4905	1336	166	10	0	1	0	0	11272		
Percent	0.2%	0.6%	0.7%	1.7%	7.7%	32.3%	43.5%	11.9%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	08:00	08:00	08:00	08:00	07:00	09:00	10:00	11:00		05:00			08:00		
Vol.	7	15	27	62	212	618	391	69	9	2		1			1304		
PM Peak	15:00	15:00	17:00	14:00	17:00	17:00	17:00	16:00	12:00	12:00					17:00		
Vol.	3	7	4	9	57	339	611	166	18	1					1194		
Total	38	117	159	335	1750	7147	9313	2724	339	23	0	1	0	0	21946		
Percent	0.2%	0.5%	0.7%	1.5%	8.0%	32.6%	42.4%	12.4%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	35 MPH
50th Percentile :	40 MPH
85th Percentile :	45 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	37-46 MPH
Number in Pace :	15035
Percent in Pace :	68.5%
Number of Vehicles > 40 MPH :	12400
Percent of Vehicles > 40 MPH :	56.5%
Mean Speed(Average) :	41 MPH

MASSDOT CRASH RATE WORKSHEETS

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Highland Avenue ST #

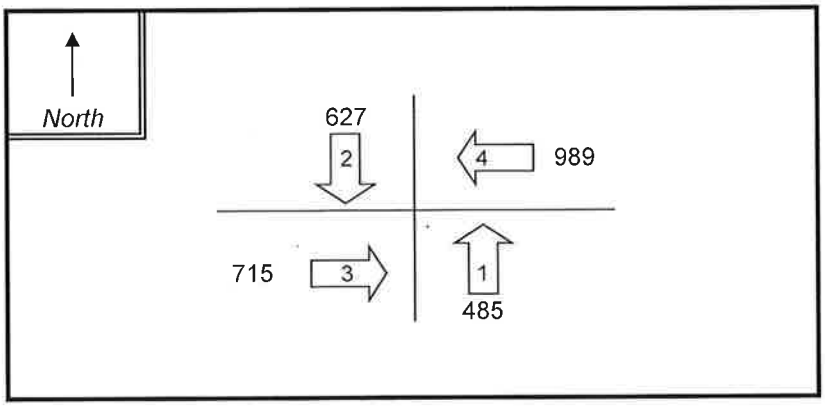
MINOR STREET(S) : Hunting Road ST #

Gould Street ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	485	627	715	989		2,816

" K " FACTOR : 0.090 APPROACH ADT : 31,289 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 15 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : 3.75

CRASH RATE CALCULATION : 0.33 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Highland Avenue ST #

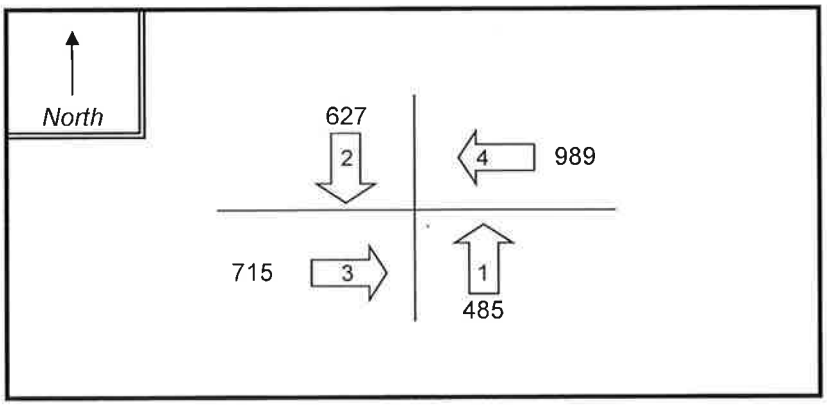
MINOR STREET(S) : Hunting Road ST #

Gould Street ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	485	627	715	989		2,816

" K " FACTOR : 0.090 APPROACH ADT : 31,289 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 1.40

CRASH RATE CALCULATION : 0.12 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Kendrick Street ST #

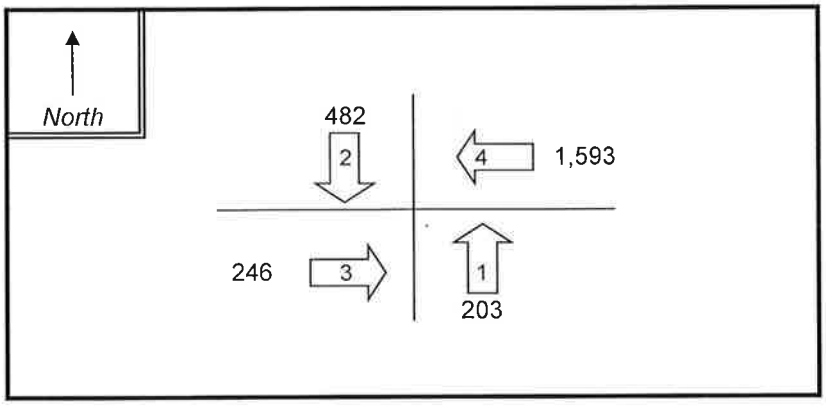
MINOR STREET(S) : Hunting Road ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	203	482	246	1,593		2,524

" K " FACTOR : **0.090** APPROACH ADT : **28,044** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 13 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : **3.25**

CRASH RATE CALCULATION : **0.32** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Kendrick Street ST #

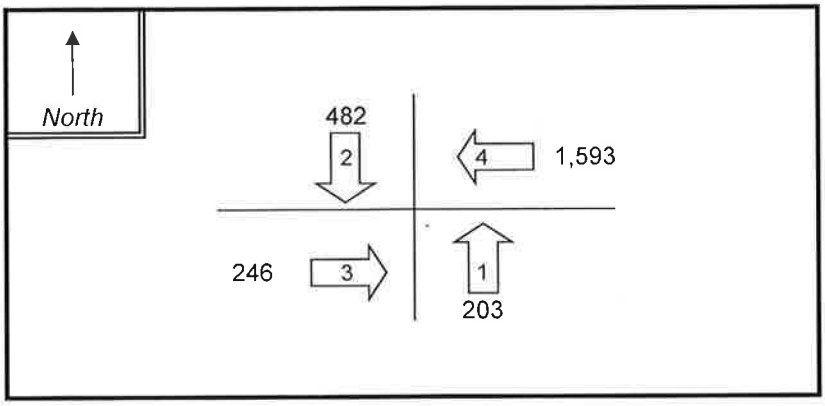
MINOR STREET(S) : Hunting Road ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	203	482	246	1,593		**2,524**

" K " FACTOR : **0.090** APPROACH ADT : **28,044** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 30 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : **6.00**

CRASH RATE CALCULATION : **0.59** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

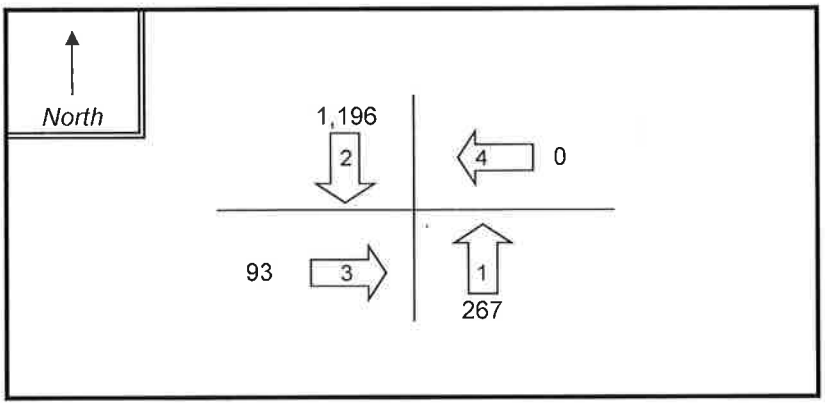
MINOR STREET(S) : Brookline Street ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	267	1,196	93	0		**1,556**

" K " FACTOR : **0.090** APPROACH ADT : **17,289** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 5 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : **1.25**

CRASH RATE CALCULATION : **0.20** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

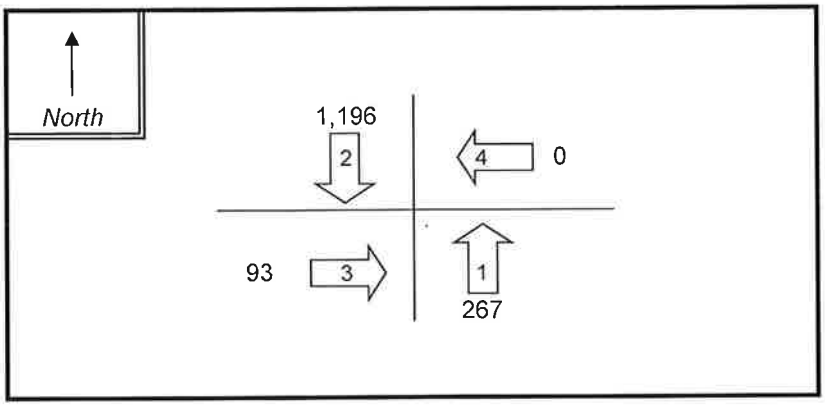
MINOR STREET(S) : Brookline Street ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	267	1,196	93	0		1,556

" K " FACTOR : 0.090 APPROACH ADT : 17,289 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 8 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 1.60

CRASH RATE CALCULATION : 0.25 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

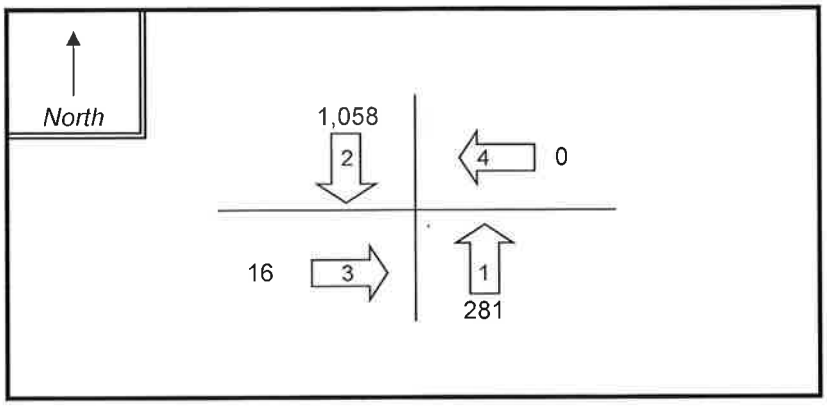
MINOR STREET(S) : Rybury Hillway ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	281	1,058	16	0		1,355

" K " FACTOR : 0.090 APPROACH ADT : 15,056 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 1 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : 0.25

CRASH RATE CALCULATION : 0.05 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

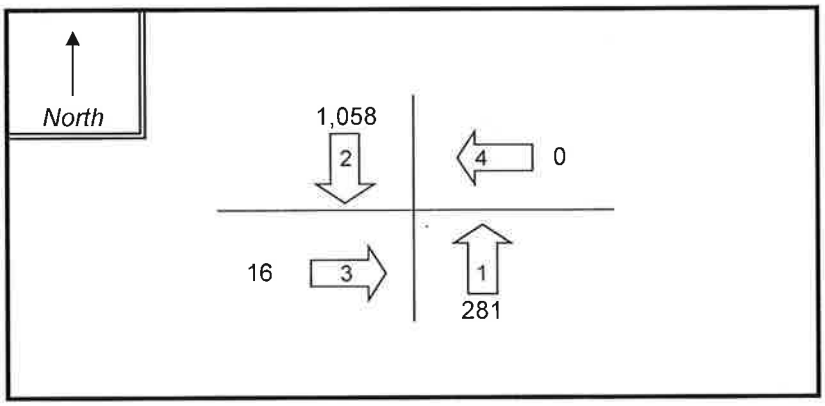
MINOR STREET(S) : Rybury Hillway ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	281	1,058	16	0		**1,355**

" K " FACTOR : **0.090** APPROACH ADT : **15,056** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 0 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : **0.00**

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

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

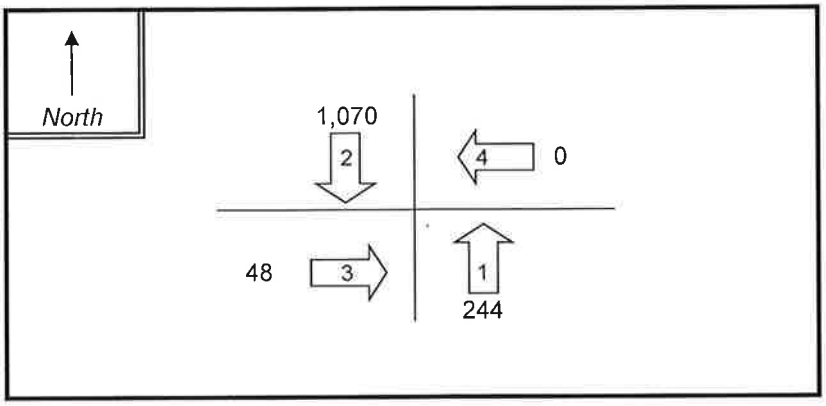
MINOR STREET(S) : Bird Street ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	244	1,070	48	0		1,362

" K " FACTOR : 0.090 APPROACH ADT : 15,133 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 3 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : 0.75

CRASH RATE CALCULATION : 0.14 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

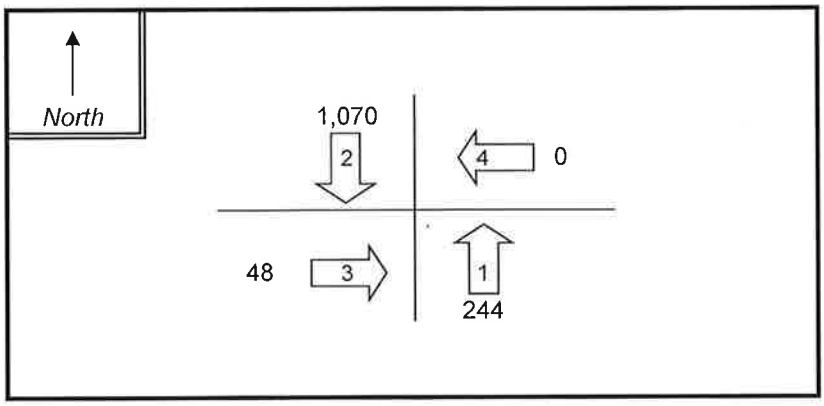
MINOR STREET(S) : Bird Street ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	244	1,070	48	0		1,362

" K " FACTOR : 0.090 APPROACH ADT : 15,133 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 5 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 1.00

CRASH RATE CALCULATION : 0.18 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

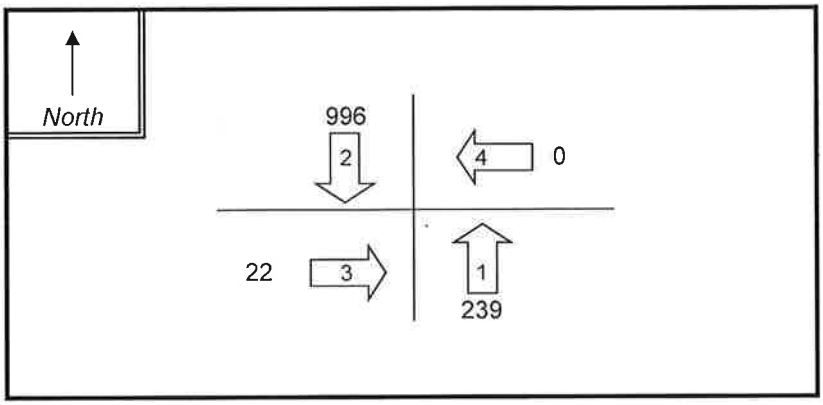
MINOR STREET(S) : Broadmeadow Road ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	239	996	22	0		1,257

" K " FACTOR : 0.090 APPROACH ADT : 13,967 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 2 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : 0.50

CRASH RATE CALCULATION : 0.10 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Greendale Avenue ST #

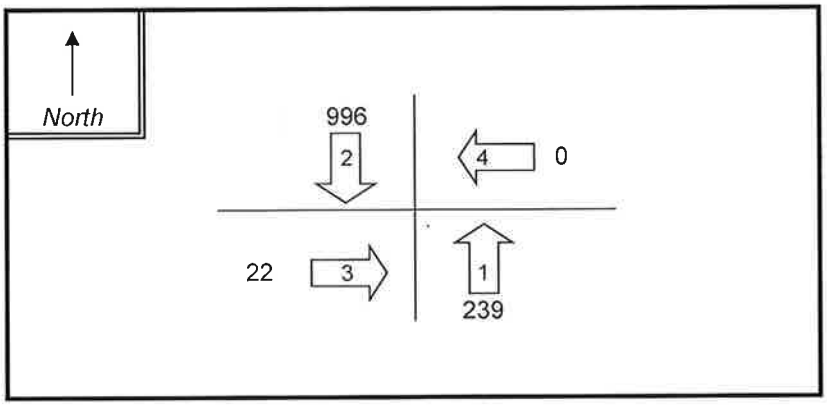
MINOR STREET(S) : Broadmeadow Road ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	239	996	22	0		1,257

" K " FACTOR : 0.090 APPROACH ADT : 13,967 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS :	3	# OF YEARS :	5	AVERAGE # OF ACCIDENTS (**A**) :	0.60

CRASH RATE CALCULATION : 0.12 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Great Plain Avenue ST #

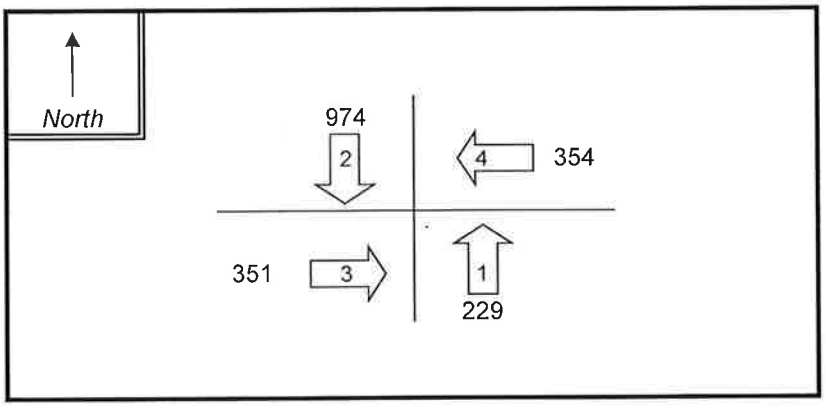
MINOR STREET(S) : Greendale Avenue ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	229	974	351	354		1,908

" K " FACTOR : 0.090 APPROACH ADT : 21,200 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 15 # OF YEARS : 4 AVERAGE # OF ACCIDENTS (**A**) : 3.75

CRASH RATE CALCULATION : 0.48 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

Needham Police Department Records

MassDOT

CRASH RATE WORKSHEET

CITY/TOWN : Needham COUNT DATE : 2013

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : Yes

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Great Plain Avenue ST #

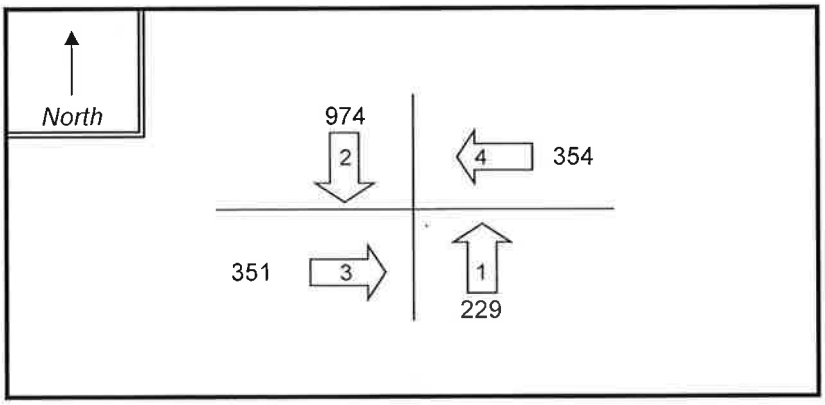
MINOR STREET(S) : Greendale Avenue ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM (Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/**PM**) :	229	974	351	354		1,908

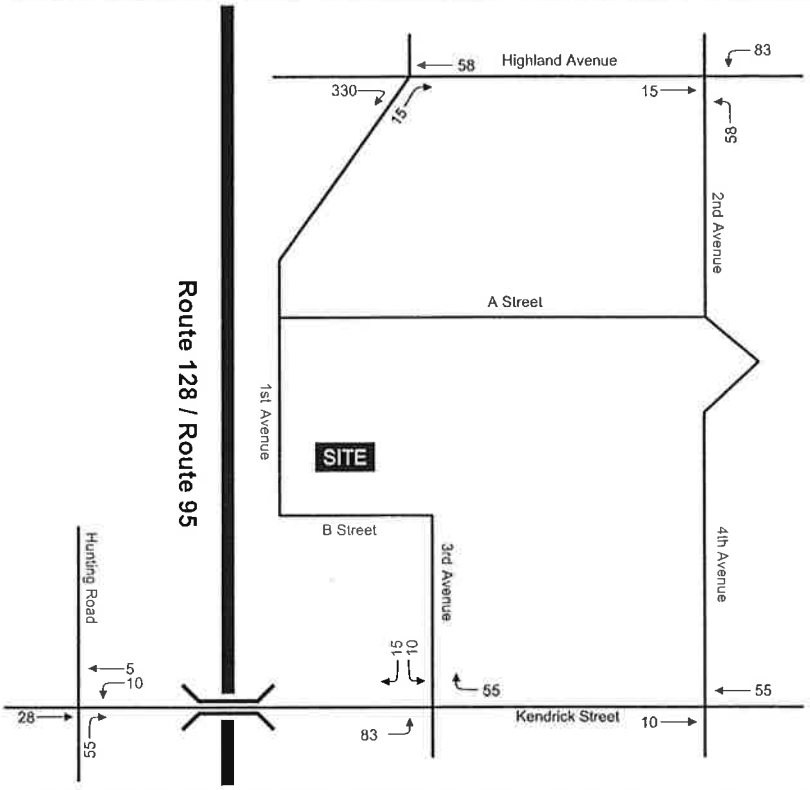
" K " FACTOR : 0.090 APPROACH ADT : 21,200 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 21 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 4.20

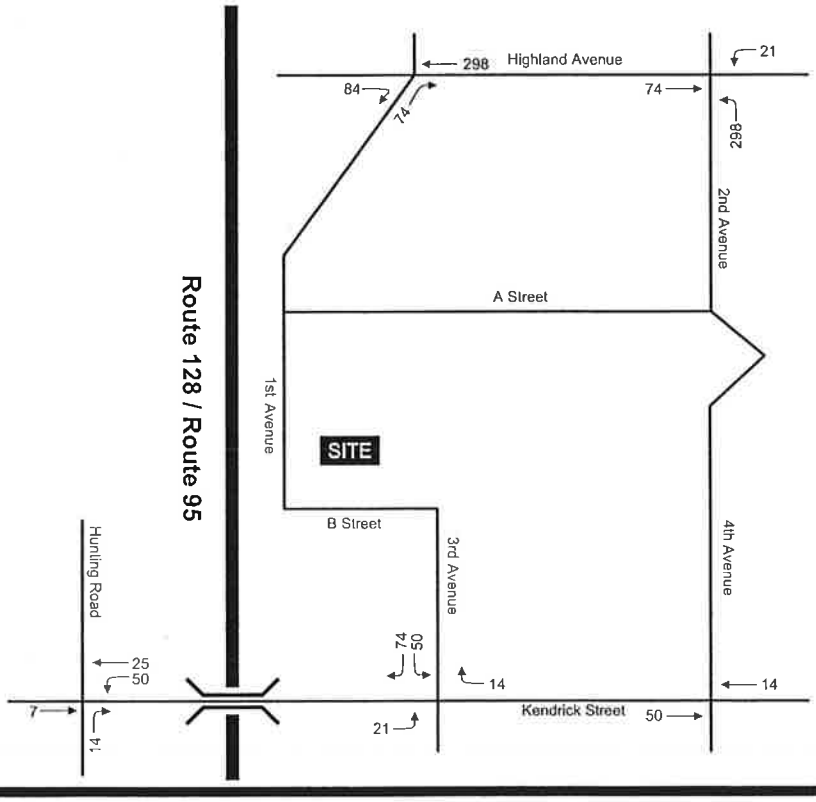
CRASH RATE CALCULATION : 0.54 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Crash rate is significant if > 0.58 crashes per mev for an unsignalized intersection and >0.76 crashes per mev for a signalized intersection for MassDOT District 6.

SITE-SPECIFIC DEVELOPMENT TRAFFIC-VOLUME NETWORKS



AM Peak Hour



PM Peak Hour

NOT TO SCALE

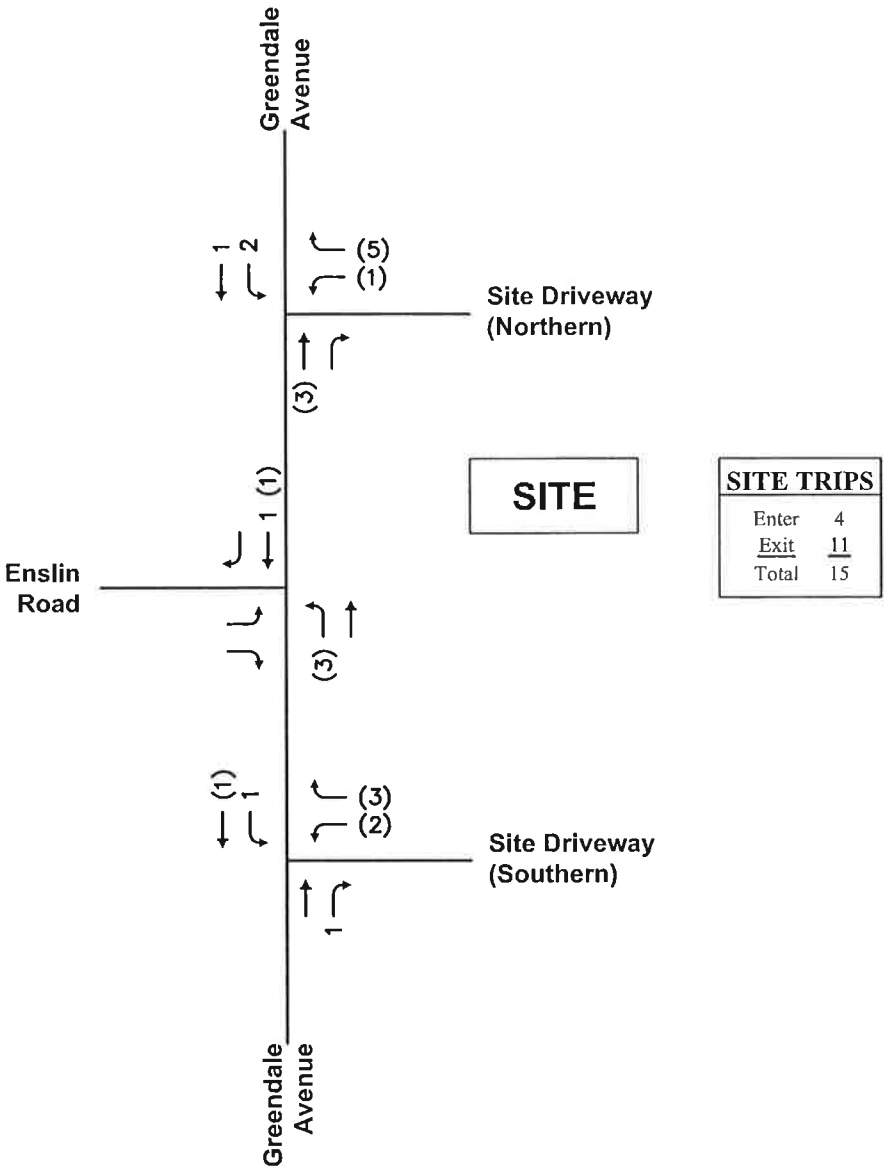
TETRATECH

One Grant Street
Framingham, MA 01701-9005
508.903.2000
www.tetratech.com

Center 128
Needham, Massachusetts

Morning and Afternoon Project Trips

Figure 7



North
Scale: Not to Scale

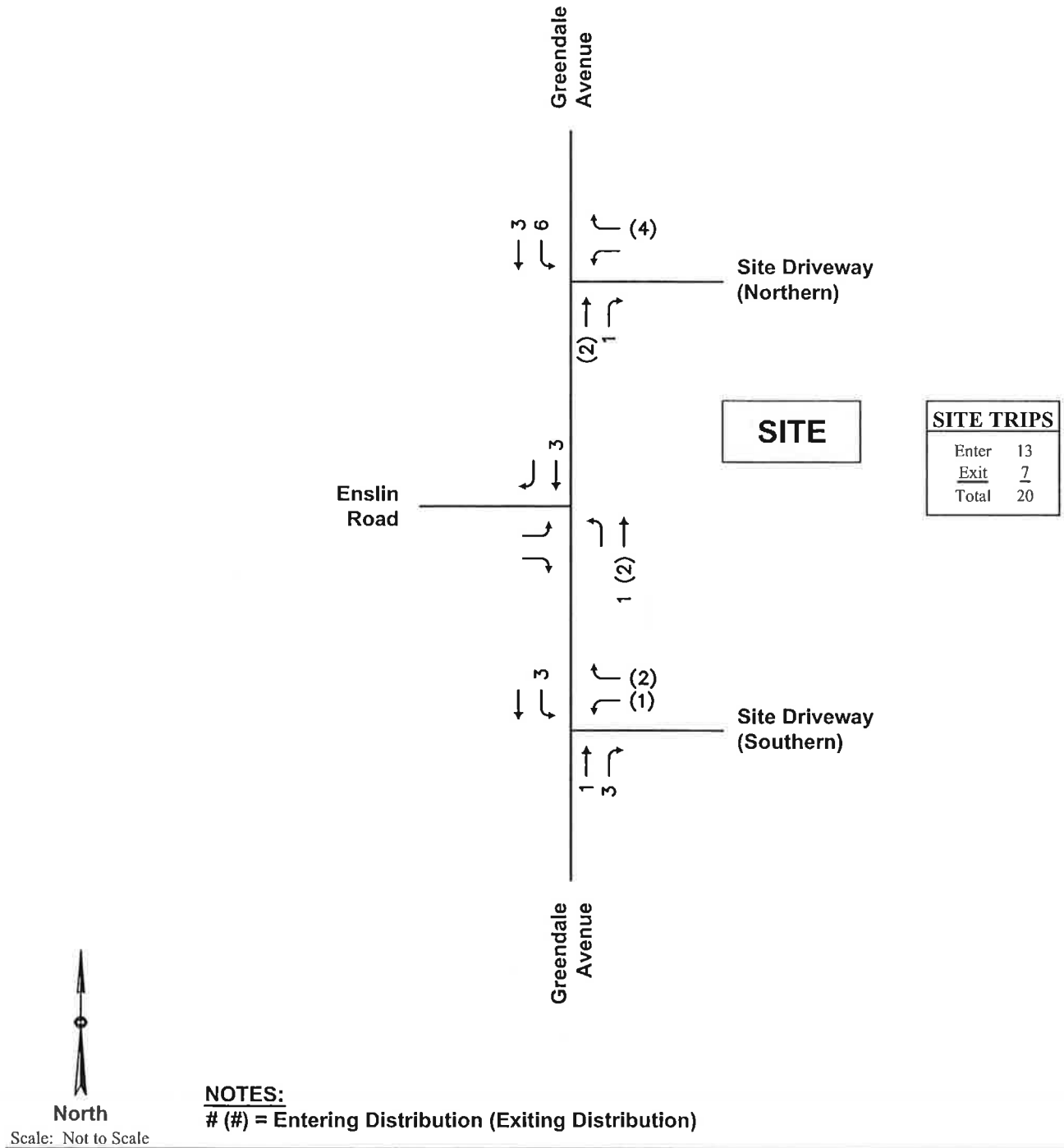
NOTES:
 # (#) = Entering Distribution (Exiting Distribution)

Figure 8

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Site-Generated Trips
Weekday Morning Peak Hour

Date: November 2012
Dwg No. 693 TIAS.dwg



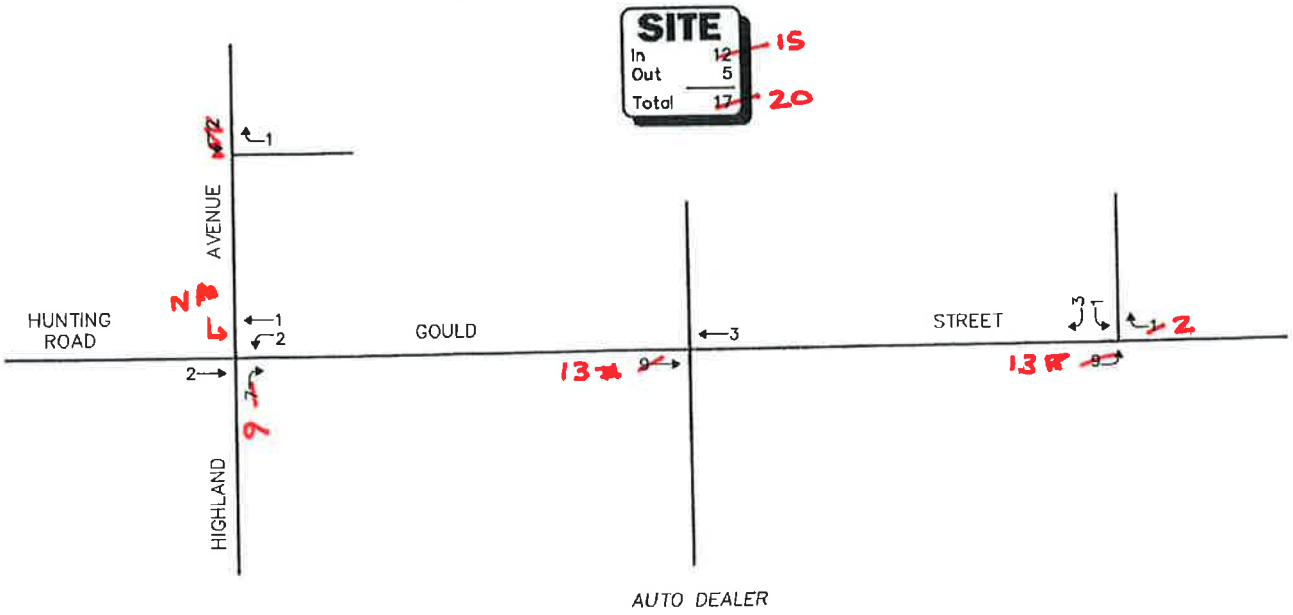
MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Figure 9

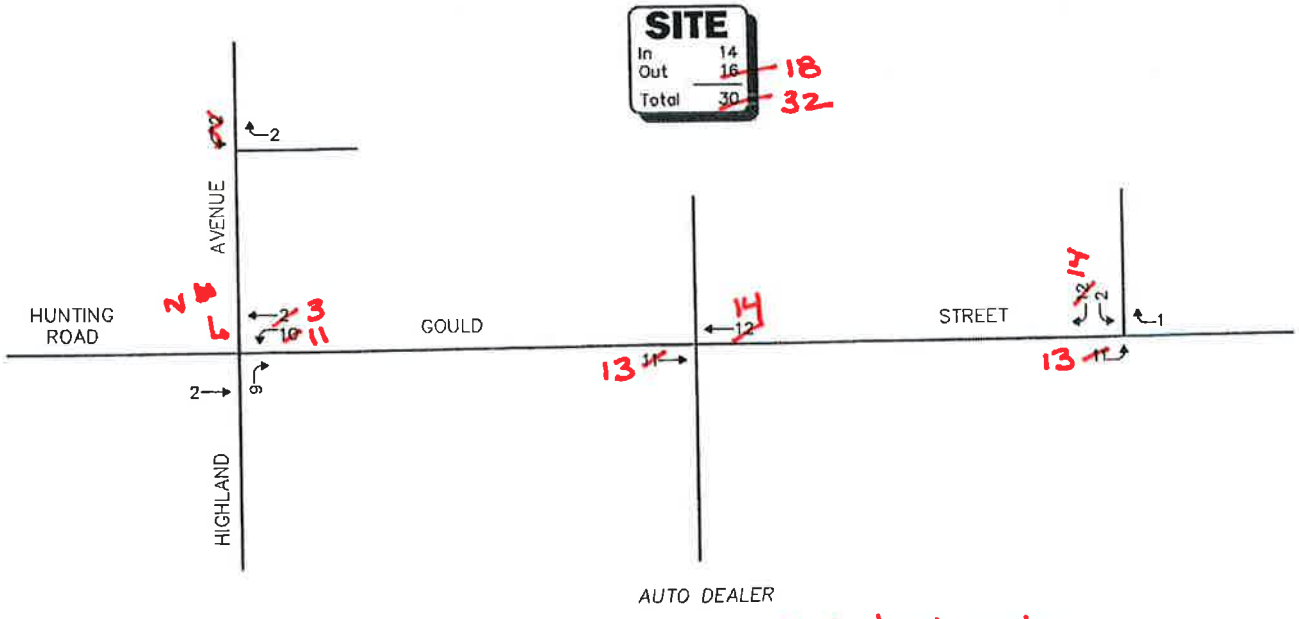
Site-Generated Trips
Weekday Evening Peak Hour

Date: November 2012
Dwg No. 693 TIAS.dwg

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Note: Highland Ave driveway right-in/out only.
Note: Development Program changed.

Not To Scale

Figure 4

Site-Generated Peak Hour Traffic Volumes

Vanasse & Associates, Inc.

Residences at Wingate

R:\5727\5727nt2.dwg 3/12/2010 9:29:01 AM EST

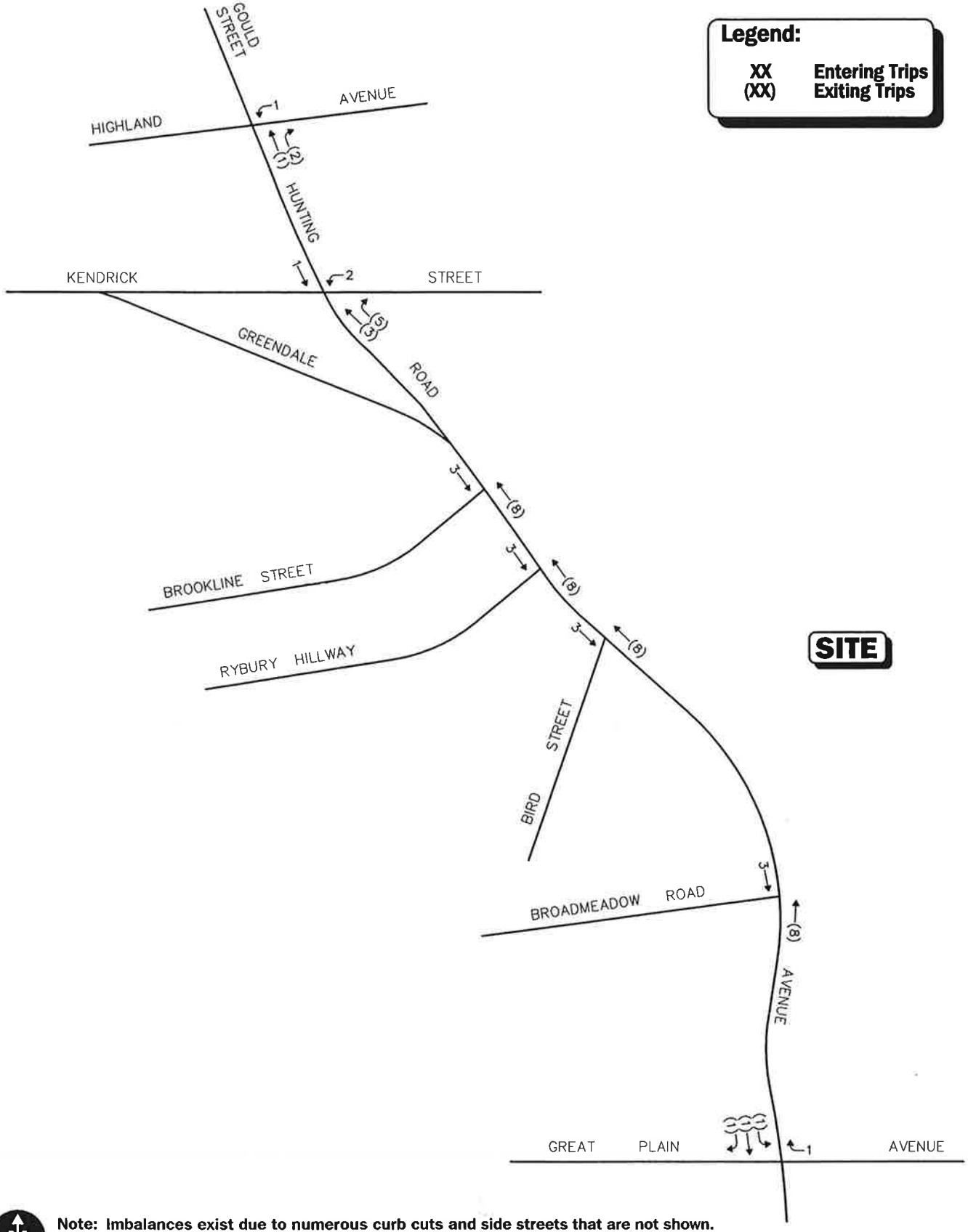
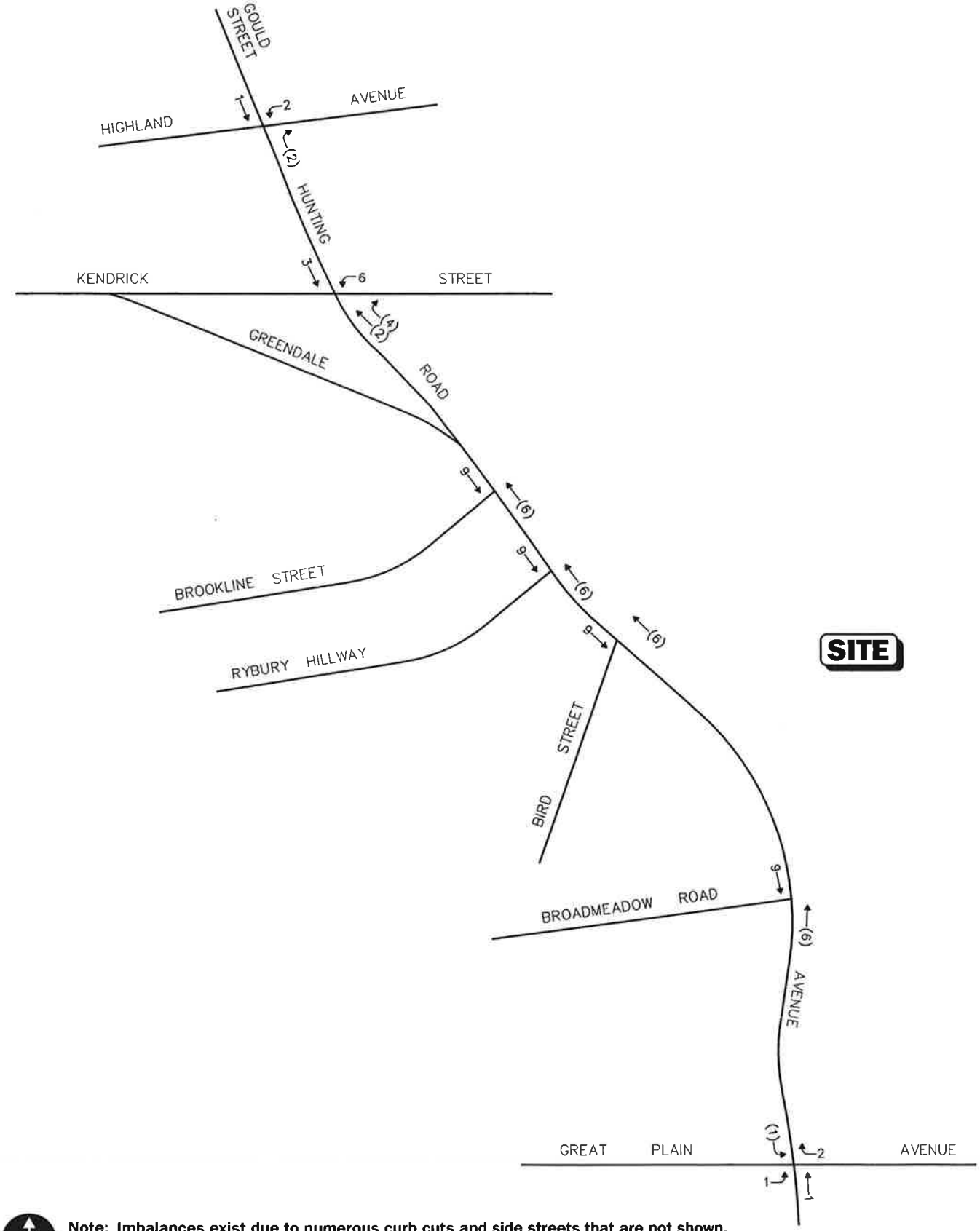


Figure A-1

Background Development
Greendale Village
Weekday Morning
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners



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

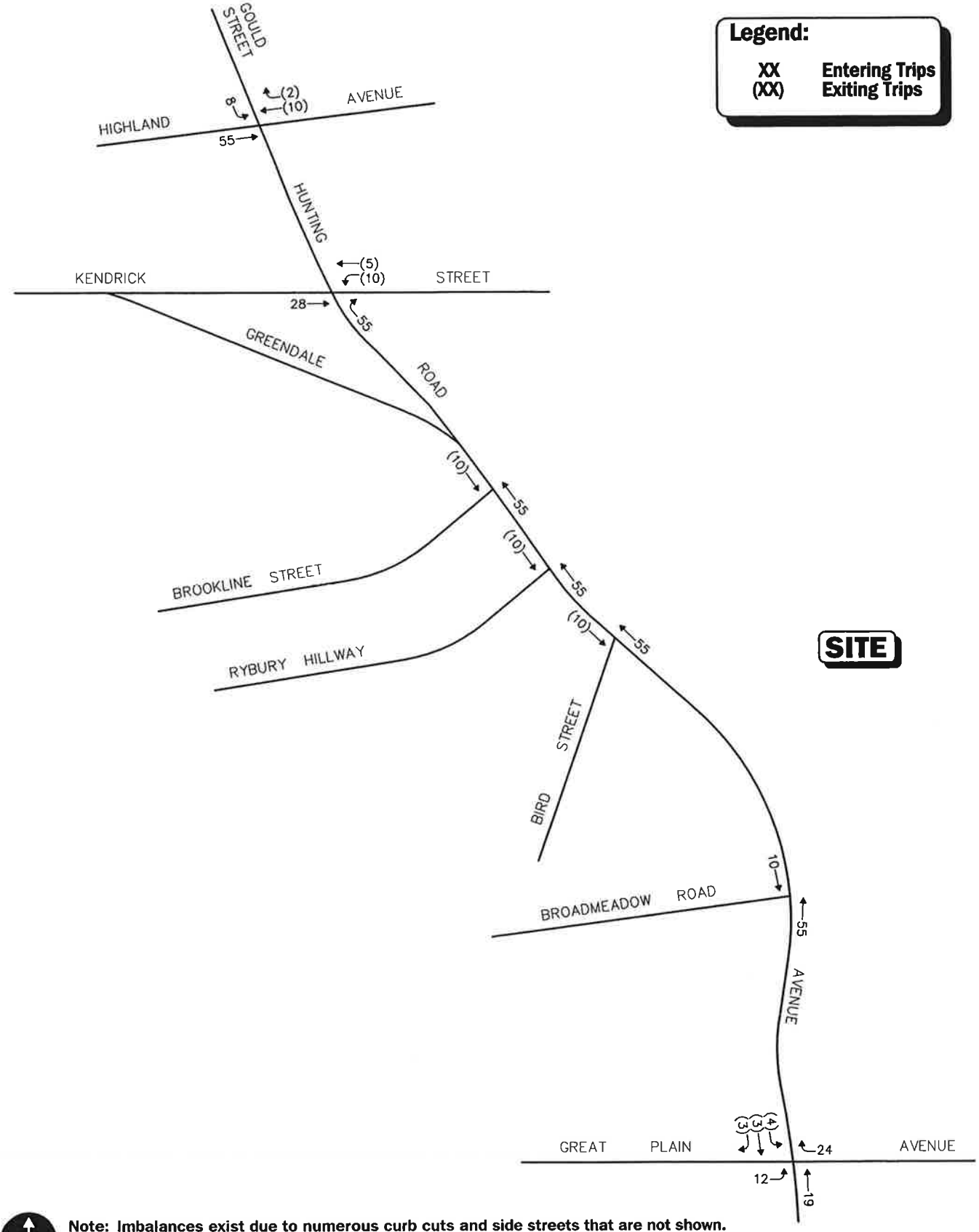
Not To Scale

Figure A-2

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Background Development
Greendale Village
Weekday Evening
Peak Hour Traffic Volumes

R:\6202\RTC\6202nt16.dwg 9/19/2013 1:30:24 PM EDT



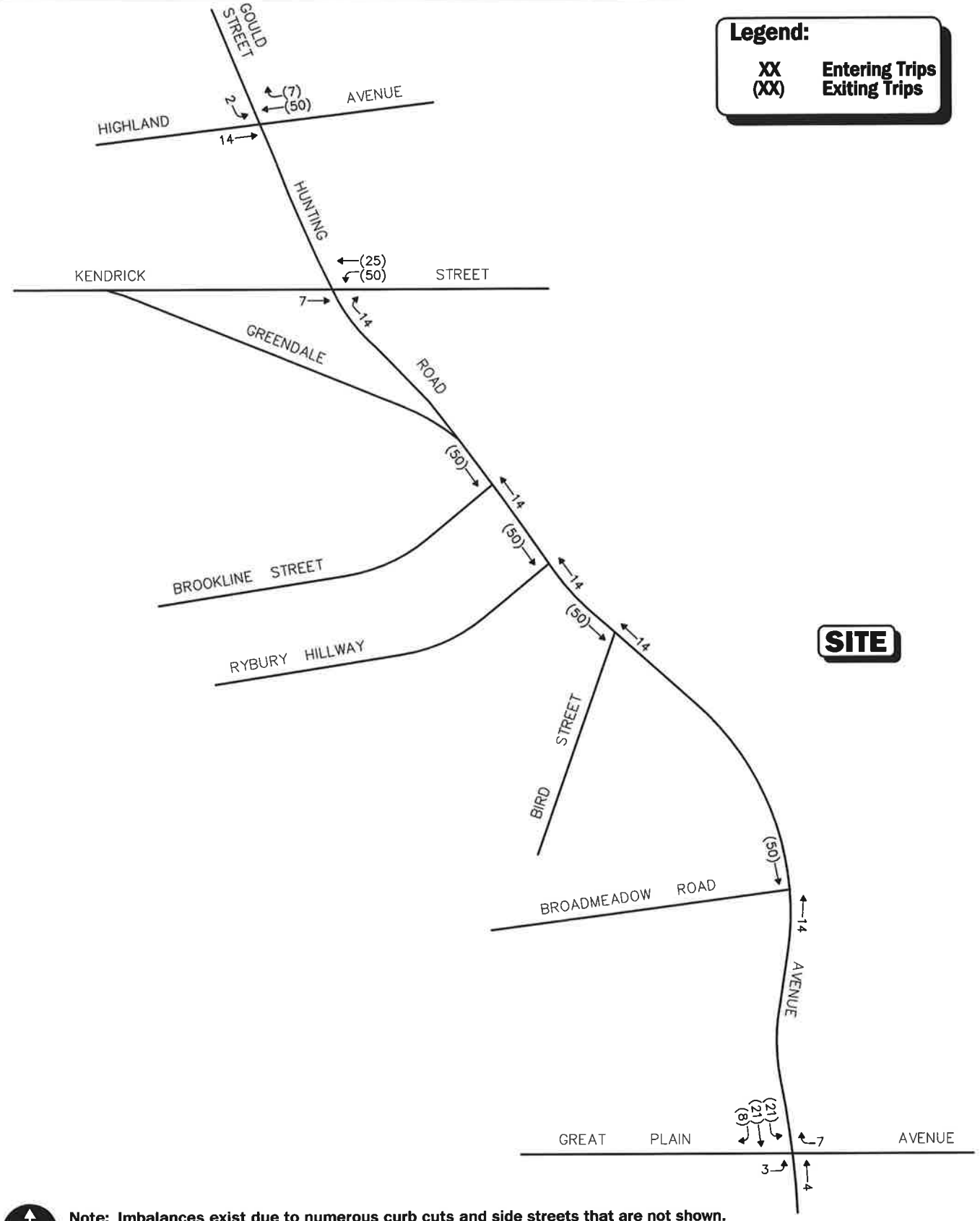
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure A-3

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Background Development
Center 128
Weekday Morning
Peak Hour Traffic Volumes



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

Not To Scale

Figure A-4

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Background Development
Center 128
Weekday Evening
Peak Hour Traffic Volumes

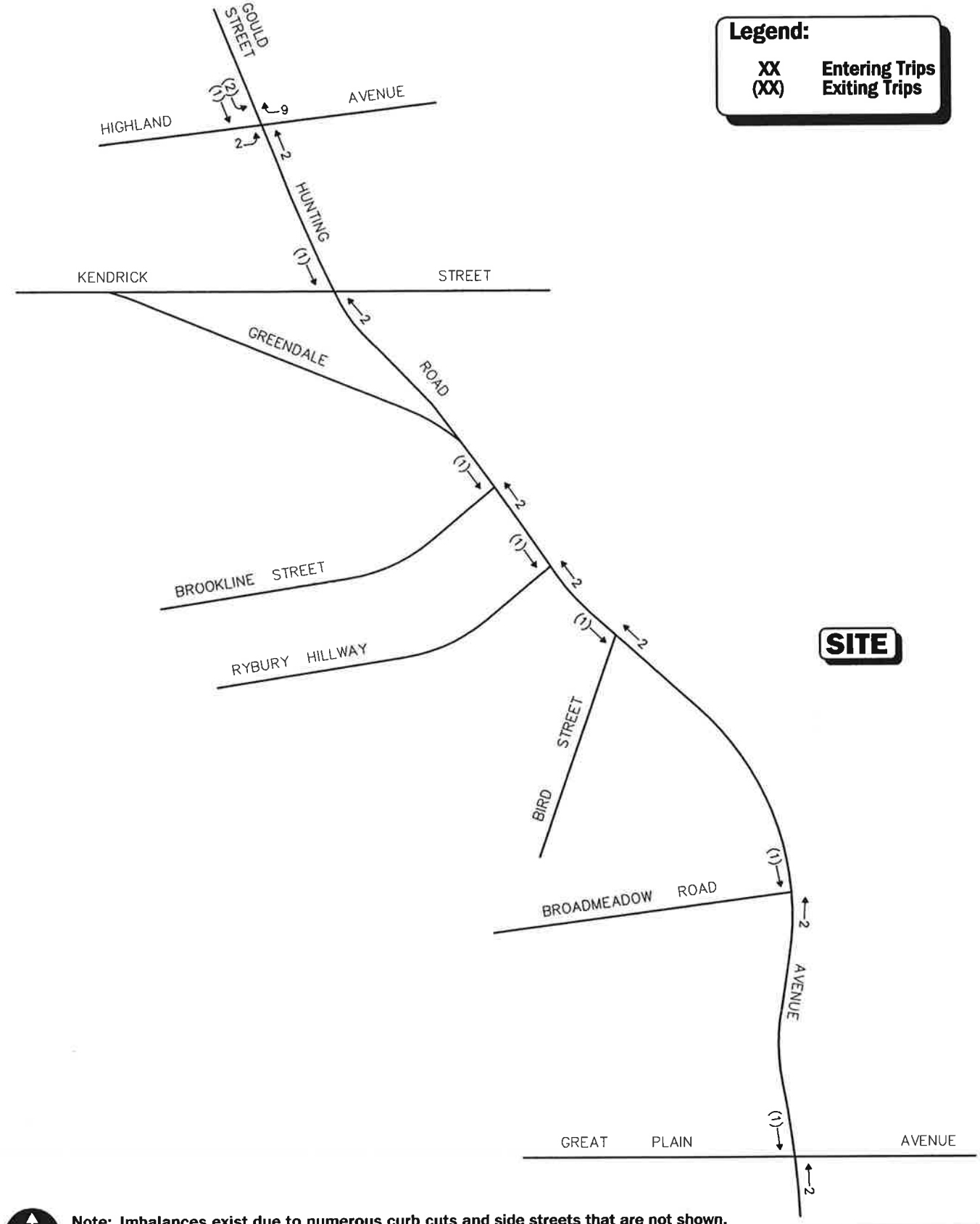
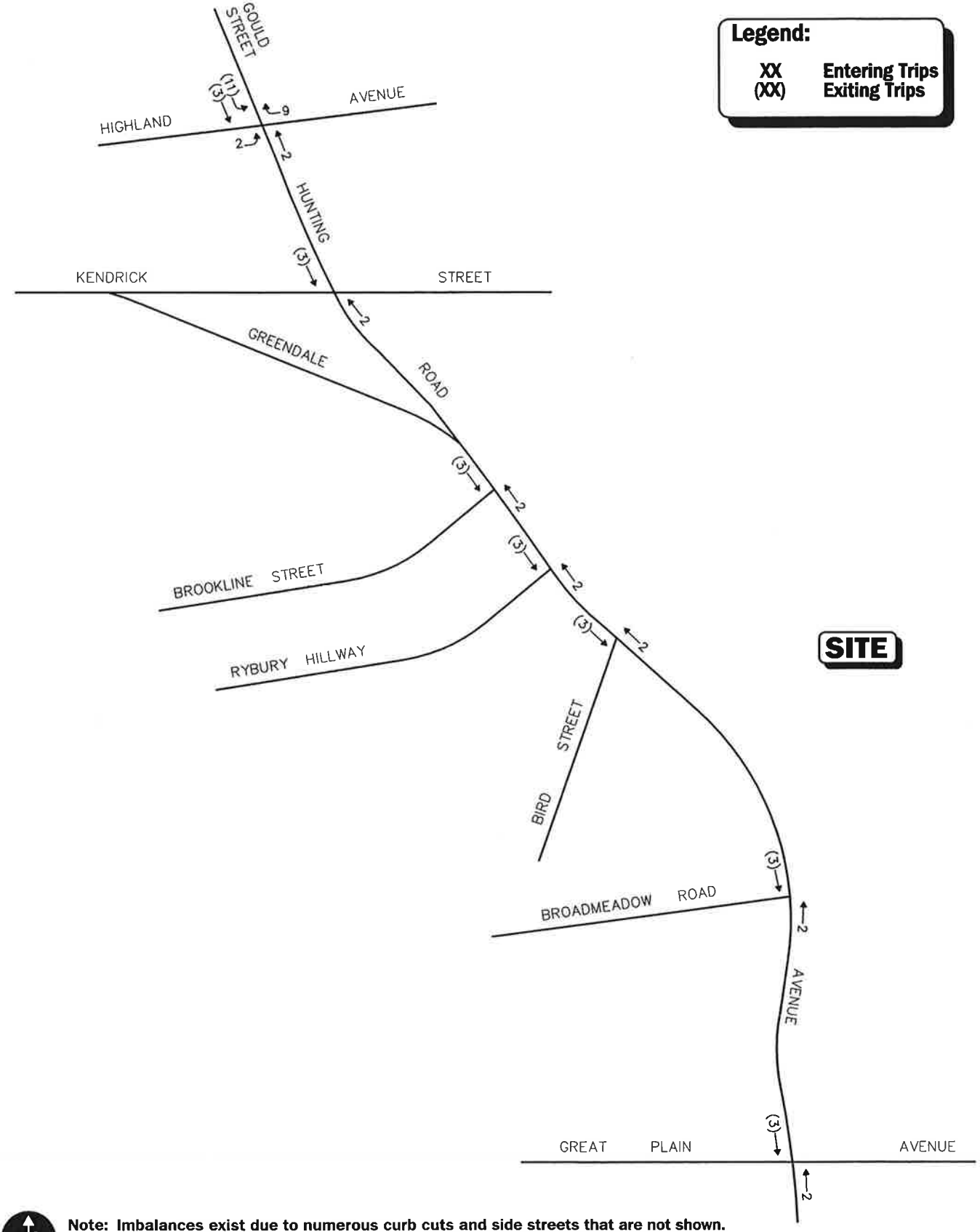


Figure A-5

Background Development
Residences at Wingate
Weekday Morning
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\6202\RTC\6202nt17.dwg 9/19/2013 1:41:50 PM EDT



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

Not To Scale

Figure A-6

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Background Development
Residences at Wingate
Weekday Evening
Peak Hour Traffic Volumes

R:\6202\RTC\6202nt18.dwg 9/19/2013 1:45:45 PM EDT

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
6739	NEEDHAM	CHAPEL ST.	SOUTH OF MAY ST.	10400			7900			9000			8900	-1.13%
6697	NEEDHAM	HIGHLAND AVE.	WEST OF GOULD ST.			23300						19200		-3.17%
6738	NEEDHAM	HIGHLAND AVE.	WEST OF ROSEMARY ST.			18600			17200			18200		-0.34%
6698	NEEDHAM	RTE.135	BTWN. HIGHLAND AVE. & RTE 16		14600			9400						-13.65%
6696	NEEDHAM	RTE 135	BTWN. I-95 & HIGHLAND AVE.		13100			11700			11300			-2.43%
6732	NEEDHAM	RTE 135	BTWN. WEBSTER & SCHOOL STS.			8900			9600			8600		-0.54%
6204	NEEDHAM	WEBSTER ST.	SOUTH OF DEDHAM AVE			2800			2300					-6.35%
														-3.94%

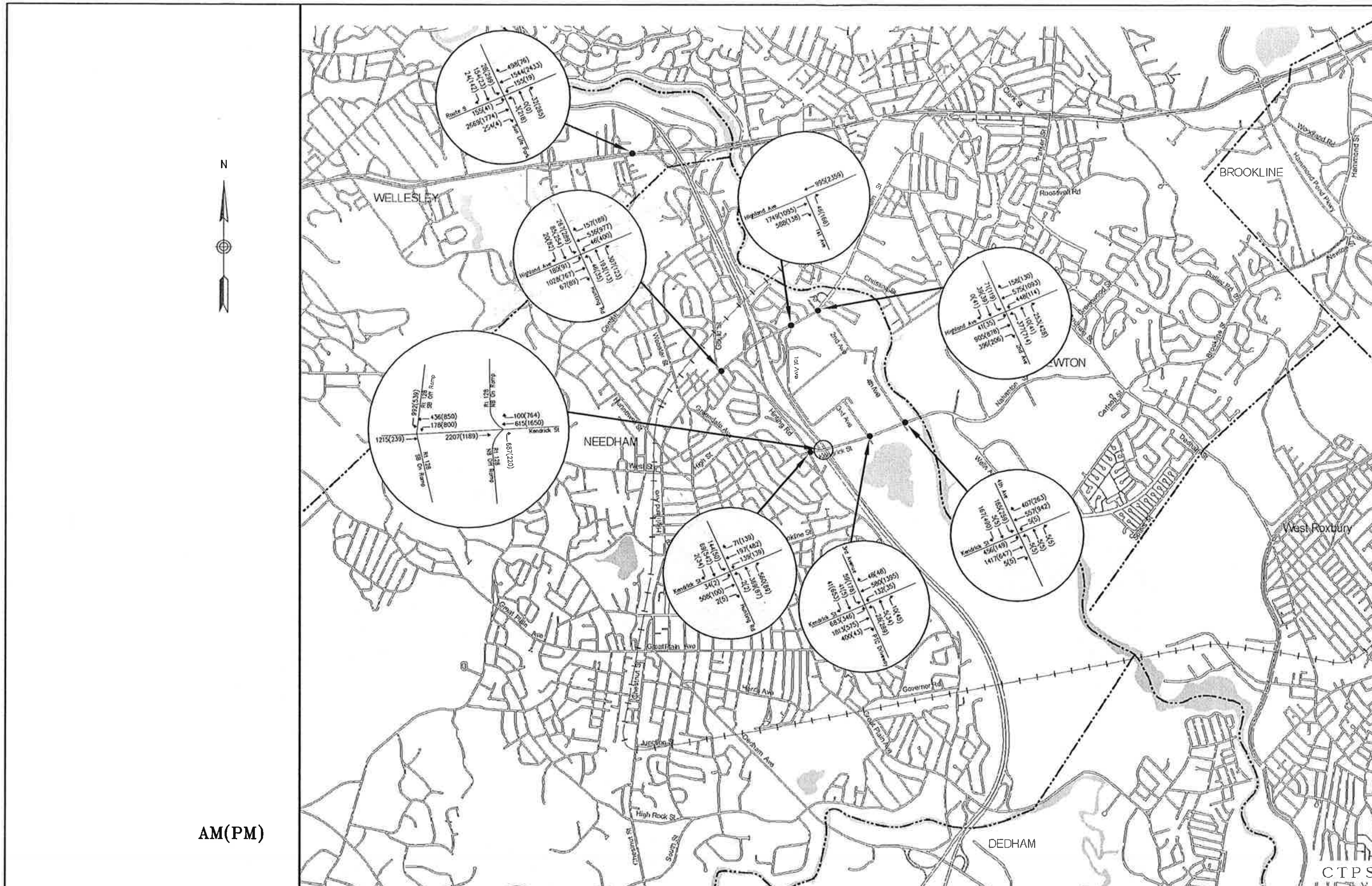
I-95/ROUTE 128 ADD-A-LANE TRAFFIC VOLUME REDISTRIBUTION

J:\Analysis\Edwards & Kelcey\Route 128\Graphics\figure 14 2017 No Build Volumes.dwg 04/30/08

Figure 14
2017 No Build Volumes
I-95 / Rt 128 Add-A-Lane
Rt 9 / Highland Ave / Kendrick St

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

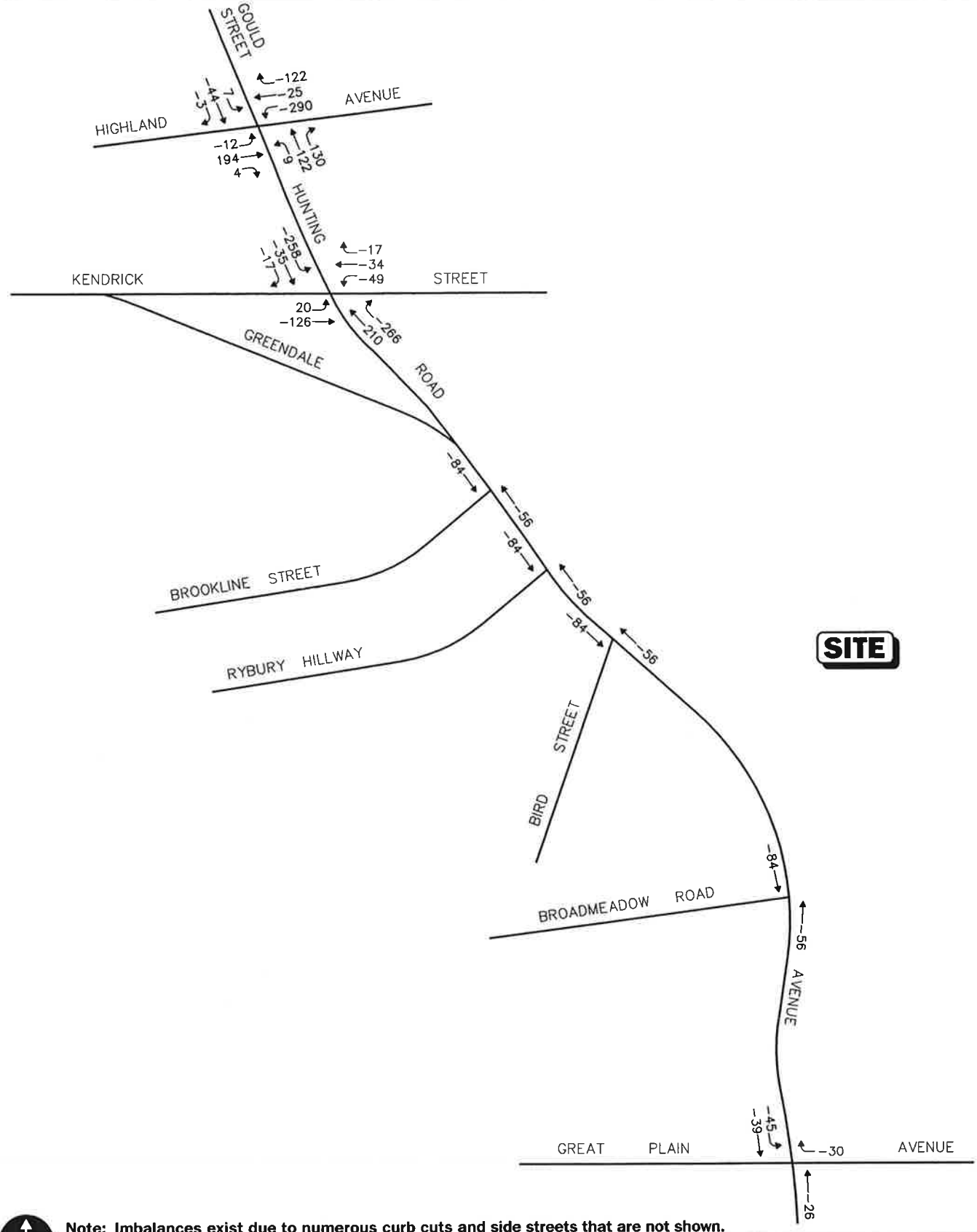
J:\Analysis\Edwards & Kelcey\Route 128\Graphics\figure 15 2017 Build Volumes.dwg 02/30/06



xx Adjustment Factor

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Figure 15
2017 Build Volumes
I-95 / Rt 128 Add-A-Lane
Rt 9 / Highland Ave / Kendrick St



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

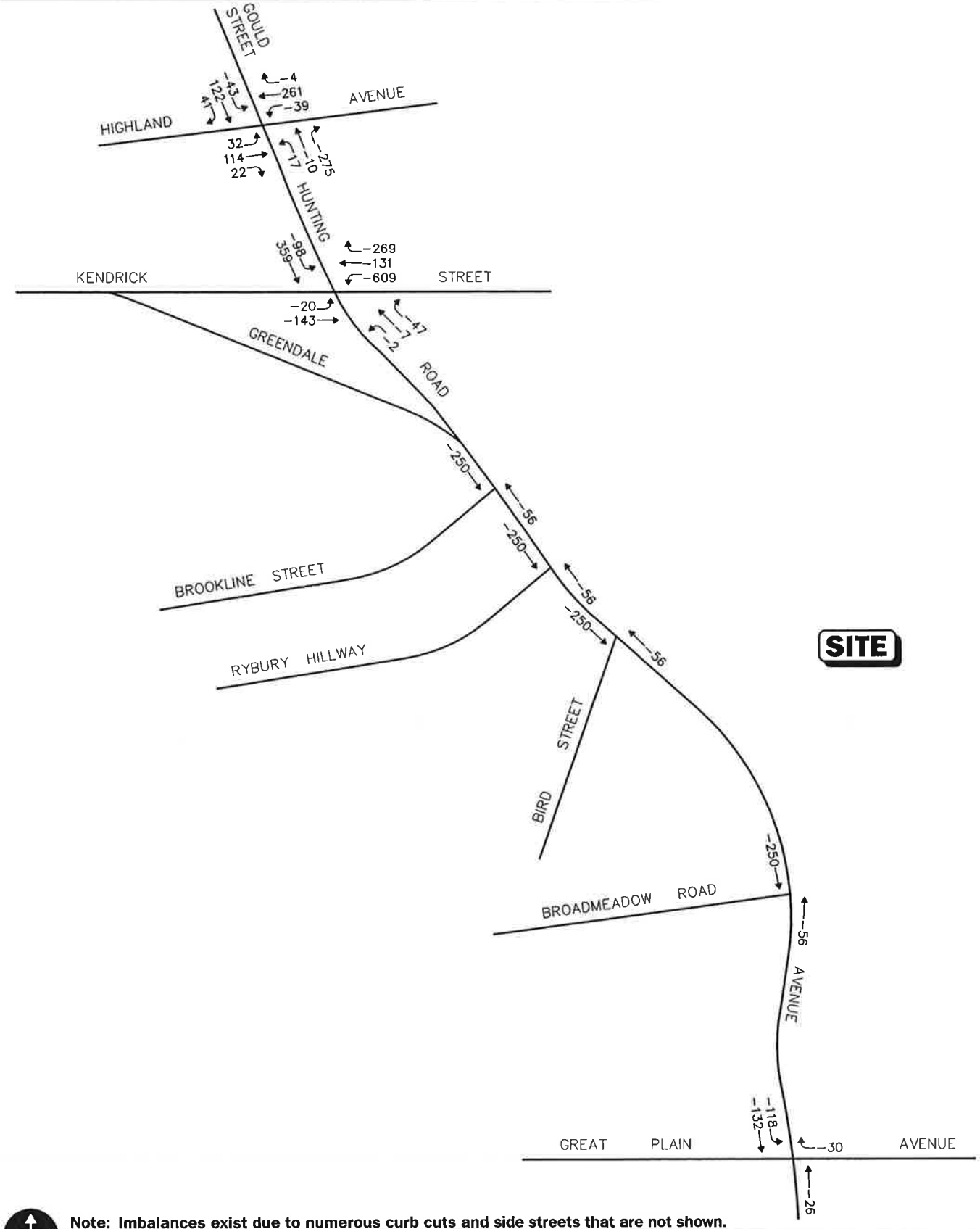
Not To Scale

Figure A-7

Roadway Development
I-95/Route 128 Add-A-Lane
Route 9/Highland Avenue/
Kendrick Street
Weekday Morning
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\6202\RTC\6202nt19.dwg 9/19/2013 1:59:54 PM EDT



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

Not To Scale

Figure A-8

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Roadway Improvement Project
I-95/Route 128 Add-A-Lane
Route 9/Highland Avenue/
Kendrick Street
Weekday Evening
Peak Hour Traffic Volumes

R:\6202\RTC\6202nt20.dwg 9/19/2013 2:15:56 PM EDT

TRIP-GENERATION CALCULATIONS

Institute of Transportation Engineers (ITE)
Trip Generation, 9 th Edition
Land Use Code (LUC) 220 - Apartment

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 268

AVERAGE WEEKDAY DAILY

T = 6.06 * (X) + 123.56
T = 6.06 * 268 + (123.56)
T = 1747.64
T = 1,748 vehicle trips
with 50% (874 vpd) entering and 50% (874 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.49 * (X) + 3.73
T = 0.49 * 268 + (3.73)
T = 135.05
T = 135 vehicle trips
with 20% (27 vph) entering and 80% (108 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.55 * (X) + 17.65
T = 0.55 * 268 + (17.65)
T = 165.05
T = 165 vehicle trips
with 65% (107 vph) entering and 35% (58 vph) exiting.

CAPACITY ANALYSIS WORKSHEETS

Highland Avenue at Gould Street and Kendrick Street
Kendrick Street at Hunting Road
Greendale Avenue at Brookline Street
Greendale Avenue at Rybury Hillway
Greendale Avenue at Bird Street
Greendale Avenue at Broadmeadow Road
Great Plain Avenue at Greendale Avenue
Greendale Avenue at the Project North Driveway
Greendale Avenue at the Project South Driveway

Highland Avenue at Gould Street and Kendrick Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	840	15	314	585	246	36	187	325	163	109	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.997			0.956				0.850		0.977	
Flt Protected	0.950			0.950				0.992		0.950	0.995	
Satd. Flow (prot)	1694	3412	0	1728	3248	0	0	1807	1546	1510	1661	0
Flt Permitted	0.950			0.950				0.992		0.950	0.995	
Satd. Flow (perm)	1694	3412	0	1728	3248	0	0	1807	1546	1510	1661	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			62				168		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	100	903	16	331	616	259	41	212	369	183	122	26
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	100	919	0	331	875	0	0	253	369	165	166	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	33.0		32.0	50.0		25.0	25.0	32.0	30.0	30.0	
Total Split (%)	12.5%	27.5%		26.7%	41.7%		20.8%	20.8%	26.7%	25.0%	25.0%	
Maximum Green (s)	10.0	28.0		27.0	45.0		20.0	20.0	27.0	25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	9.5	28.3		24.3	43.0			18.4	47.7	17.1	17.1	
Actuated g/C Ratio	0.09	0.26		0.22	0.40			0.17	0.44	0.16	0.16	
v/c Ratio	0.68	1.03		0.86	0.66			0.82	0.48	0.69	0.62	
Control Delay	73.1	79.1		62.9	28.5			67.0	13.7	59.5	51.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	73.1	79.1		62.9	28.5			67.0	13.7	59.5	51.9	
LOS	E	E		E	C			E	B	E	D	
Approach Delay		78.5			37.9			35.4			55.7	
Approach LOS		E			D			D			E	

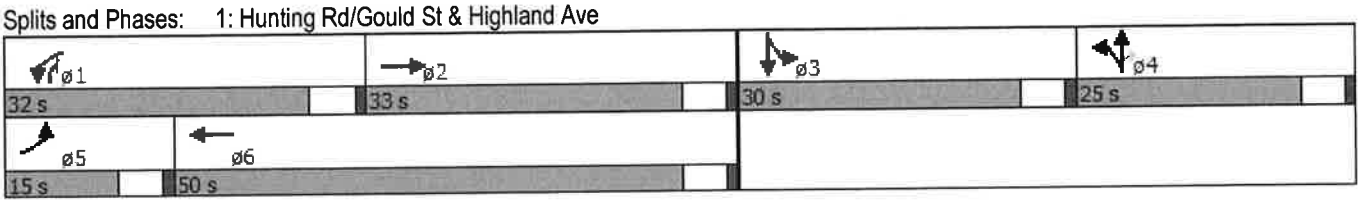
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108.3

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 52.3
Intersection Capacity Utilization 77.7%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	919	331	875	253	369	165	166
v/c Ratio	0.68	1.03	0.86	0.66	0.82	0.48	0.69	0.62
Control Delay	73.1	79.1	62.9	28.5	67.0	13.7	59.5	51.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.1	79.1	62.9	28.5	67.0	13.7	59.5	51.9
Queue Length 50th (ft)	71	~392	226	247	177	91	121	114
Queue Length 95th (ft)	#162	#575	#406	354	#318	183	194	186
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	158	892	435	1400	337	814	352	392
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	1.03	0.76	0.63	0.75	0.45	0.47	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	636	27	252	621	116	30	71	384	315	232	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994			0.976				0.850		0.965	
Flt Protected	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (prot)	1745	3403	0	1728	3377	0	0	1798	1546	1585	1651	0
Flt Permitted	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (perm)	1745	3403	0	1728	3377	0	0	1798	1546	1585	1651	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			20				77		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	55	669	28	286	706	132	34	82	441	354	261	90
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	55	697	0	286	838	0	0	116	441	319	386	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	31.0		32.0	48.0		25.0	25.0	32.0	32.0	32.0	
Total Split (%)	12.5%	25.8%		26.7%	40.0%		20.8%	20.8%	26.7%	26.7%	26.7%	
Maximum Green (s)	10.0	26.0		27.0	43.0		20.0	20.0	27.0	27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.4	26.2		22.3	42.5			12.3	39.6	27.2	27.2	
Actuated g/C Ratio	0.08	0.24		0.21	0.39			0.11	0.37	0.25	0.25	
v/c Ratio	0.41	0.84		0.80	0.62			0.57	0.72	0.80	0.91	
Control Delay	58.8	50.7		58.8	29.5			57.3	30.7	56.0	66.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	58.8	50.7		58.8	29.5			57.3	30.7	56.0	66.6	
LOS	E	D		E	C			E	C	E	E	
Approach Delay		51.3			37.0			36.3			61.8	
Approach LOS		D			D			D			E	

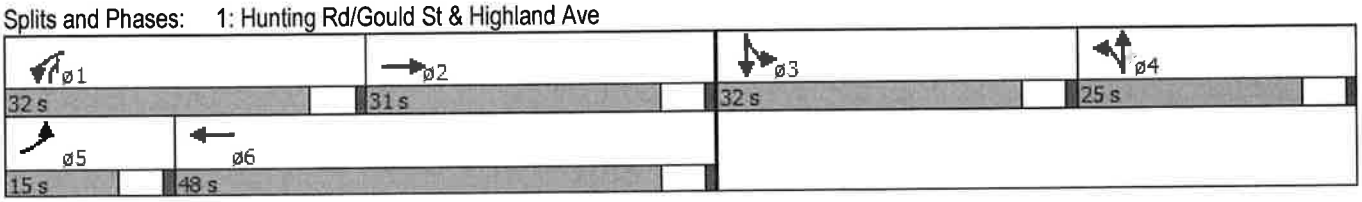
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 45.8
Intersection Capacity Utilization 72.0%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service C

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	55	697	286	838	116	441	319	386
v/c Ratio	0.41	0.84	0.80	0.62	0.57	0.72	0.80	0.91
Control Delay	58.8	50.7	58.8	29.5	57.3	30.7	56.0	66.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	50.7	58.8	29.5	57.3	30.7	56.0	66.6
Queue Length 50th (ft)	37	247	189	247	79	215	224	272
Queue Length 95th (ft)	83	#387	293	333	135	311	#409	#509
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	162	826	434	1383	334	682	398	424
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.84	0.66	0.61	0.35	0.65	0.80	0.91

Intersection Summary

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

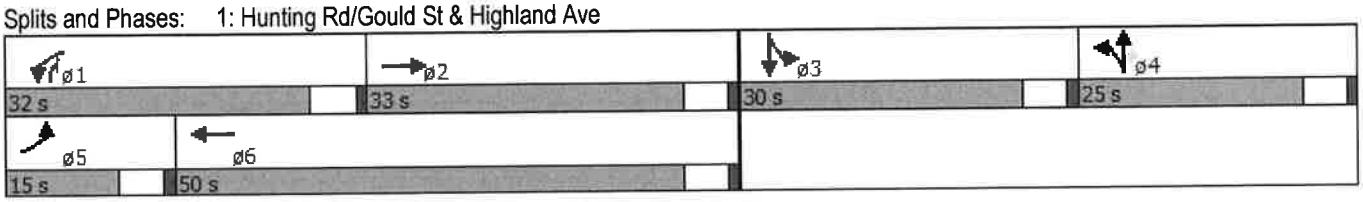
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	938	16	331	625	270	38	200	344	181	116	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998			0.955				0.850		0.978	
Flt Protected	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (prot)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Flt Permitted	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (perm)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			64				146		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	108	1009	17	348	658	284	43	227	391	203	130	27
Shared Lane Traffic (%)										12%		
Lane Group Flow (vph)	108	1026	0	348	942	0	0	270	391	179	181	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	33.0		32.0	50.0		25.0	25.0	32.0	30.0	30.0	
Total Split (%)	12.5%	27.5%		26.7%	41.7%		20.8%	20.8%	26.7%	25.0%	25.0%	
Maximum Green (s)	10.0	28.0		27.0	45.0		20.0	20.0	27.0	25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	9.7	28.2		25.2	43.8			19.2	49.4	18.1	18.1	
Actuated g/C Ratio	0.09	0.25		0.23	0.40			0.17	0.45	0.16	0.16	
v/c Ratio	0.73	1.18		0.89	0.71			0.87	0.51	0.73	0.66	
Control Delay	79.2	130.5		66.9	30.6			72.3	16.3	62.0	53.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	79.2	130.5		66.9	30.6			72.3	16.3	62.0	53.9	
LOS	E	F		E	C			E	B	E	D	
Approach Delay		125.7			40.4			39.2			57.9	
Approach LOS		F			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 110.8

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 70.1 Intersection LOS: E
Intersection Capacity Utilization 82.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	108	1026	348	942	270	391	179	181
v/c Ratio	0.73	1.18	0.89	0.71	0.87	0.51	0.73	0.66
Control Delay	79.2	130.5	66.9	30.6	72.3	16.3	62.0	53.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	130.5	66.9	30.6	72.3	16.3	62.0	53.9
Queue Length 50th (ft)	78	~486	244	281	193	119	132	126
Queue Length 95th (ft)	#180	#671	#435	391	#350	218	211	203
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	154	870	424	1365	328	795	343	382
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.18	0.82	0.69	0.82	0.49	0.52	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	682	28	267	703	138	32	77	406	344	248	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994			0.975				0.850		0.966	
Flt Protected	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (prot)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Flt Permitted	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (perm)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			21				64		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	60	718	29	303	799	157	37	89	467	387	279	94
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	60	747	0	303	956	0	0	126	467	348	412	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	31.0		32.0	48.0		25.0	25.0	32.0	32.0	32.0	
Total Split (%)	12.5%	25.8%		26.7%	40.0%		20.8%	20.8%	26.7%	26.7%	26.7%	
Maximum Green (s)	10.0	26.0		27.0	43.0		20.0	20.0	27.0	27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.5	26.1		23.2	43.4			13.0	41.3	27.1	27.1	
Actuated g/C Ratio	0.08	0.24		0.21	0.40			0.12	0.38	0.25	0.25	
v/c Ratio	0.44	0.92		0.83	0.71			0.59	0.75	0.89	0.99	
Control Delay	60.9	59.0		61.1	32.2			58.2	33.5	66.5	83.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	60.9	59.0		61.1	32.2			58.2	33.5	66.5	83.1	
LOS	E	E		E	C			E	C	E	F	
Approach Delay		59.2			39.2			38.7			75.5	
Approach LOS		E			D			D			E	

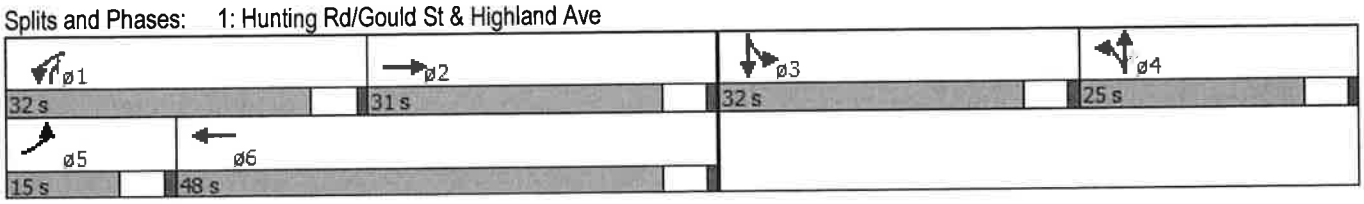
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109.6

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 51.9
Intersection Capacity Utilization 76.0%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	747	303	956	126	467	348	412
v/c Ratio	0.44	0.92	0.83	0.71	0.59	0.75	0.89	0.99
Control Delay	60.9	59.0	61.1	32.2	58.2	33.5	66.5	83.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	59.0	61.1	32.2	58.2	33.5	66.5	83.1
Queue Length 50th (ft)	42	279	205	302	88	245	257	~315
Queue Length 95th (ft)	89	#438	#333	400	145	348	#468	#563
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	160	813	427	1370	329	674	392	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.92	0.71	0.70	0.38	0.69	0.89	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

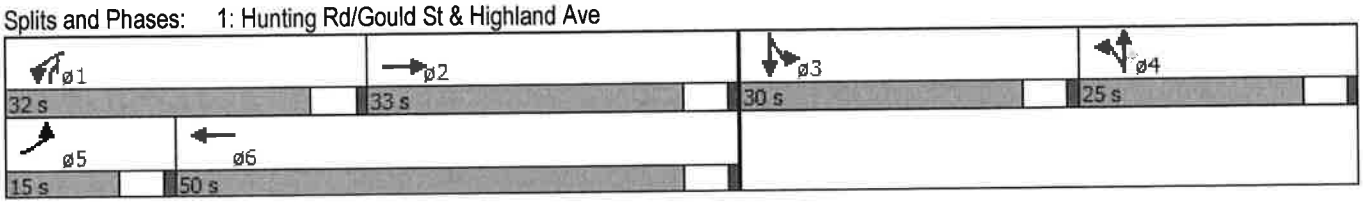
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	938	16	342	625	270	38	206	387	181	117	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998			0.955				0.850		0.978	
Flt Protected	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (prot)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Flt Permitted	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (perm)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			64				146		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	108	1009	17	360	658	284	43	234	440	203	131	27
Shared Lane Traffic (%)										12%		
Lane Group Flow (vph)	108	1026	0	360	942	0	0	277	440	179	182	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	33.0		32.0	50.0		25.0	25.0	32.0	30.0	30.0	
Total Split (%)	12.5%	27.5%		26.7%	41.7%		20.8%	20.8%	26.7%	25.0%	25.0%	
Maximum Green (s)	10.0	28.0		27.0	45.0		20.0	20.0	27.0	25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	9.7	28.1		26.0	44.4			19.5	50.4	18.1	18.1	
Actuated g/C Ratio	0.09	0.25		0.23	0.40			0.17	0.45	0.16	0.16	
v/c Ratio	0.73	1.19		0.90	0.71			0.88	0.57	0.73	0.66	
Control Delay	80.0	136.0		68.7	30.6			74.7	18.4	62.5	54.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	80.0	136.0		68.7	30.6			74.7	18.4	62.5	54.5	
LOS	F	F		E	C			E	B	E	D	
Approach Delay		130.7			41.1			40.1			58.5	
Approach LOS		F			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 111.8

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 71.6
Intersection LOS: E
Intersection Capacity Utilization 83.8%
ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	108	1026	360	942	277	440	179	182
v/c Ratio	0.73	1.19	0.90	0.71	0.88	0.57	0.73	0.66
Control Delay	80.0	136.0	68.7	30.6	74.7	18.4	62.5	54.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.0	136.0	68.7	30.6	74.7	18.4	62.5	54.5
Queue Length 50th (ft)	78	~486	254	281	199	150	132	127
Queue Length 95th (ft)	#180	#671	#457	391	#363	264	211	205
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	152	860	419	1350	325	792	339	378
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.19	0.86	0.70	0.85	0.56	0.53	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

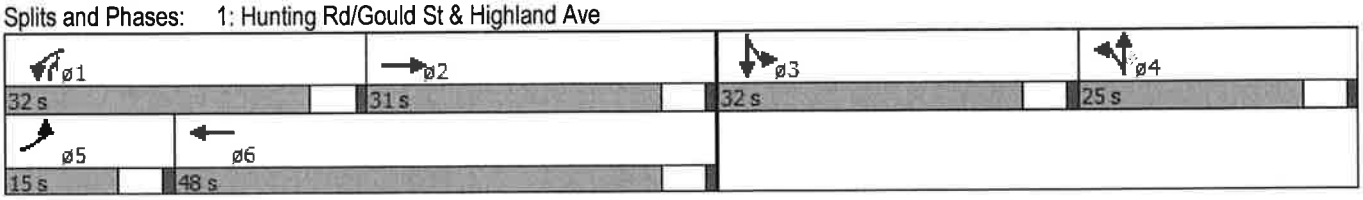
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	682	28	310	703	138	32	80	429	344	253	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994			0.975				0.850		0.966	
Flt Protected	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (prot)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Flt Permitted	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (perm)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			21				64		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	60	718	29	352	799	157	37	92	493	387	284	94
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	60	747	0	352	956	0	0	129	493	348	417	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	31.0		32.0	48.0		25.0	25.0	32.0	32.0	32.0	
Total Split (%)	12.5%	25.8%		26.7%	40.0%		20.8%	20.8%	26.7%	26.7%	26.7%	
Maximum Green (s)	10.0	26.0		27.0	43.0		20.0	20.0	27.0	27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.5	26.1		25.7	45.6			13.3	44.0	27.1	27.1	
Actuated g/C Ratio	0.08	0.23		0.23	0.41			0.12	0.39	0.24	0.24	
v/c Ratio	0.45	0.94		0.89	0.69			0.61	0.76	0.91	1.03	
Control Delay	62.1	64.0		67.7	31.6			59.5	34.1	71.6	93.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	62.1	64.0		67.7	31.6			59.5	34.1	71.6	93.6	
LOS	E	E		E	C			E	C	E	F	
Approach Delay		63.9			41.3			39.4			83.6	
Approach LOS		E			D			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 112.2

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 55.4
Intersection LOS: E
Intersection Capacity Utilization 78.3%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	747	352	956	129	493	348	417
v/c Ratio	0.45	0.94	0.89	0.69	0.61	0.76	0.91	1.03
Control Delay	62.1	64.0	67.7	31.6	59.5	34.1	71.6	93.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.1	64.0	67.7	31.6	59.5	34.1	71.6	93.6
Queue Length 50th (ft)	42	283	247	303	91	267	262	~338
Queue Length 95th (ft)	90	#439	#420	402	149	377	#470	#575
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	155	792	416	1385	321	663	382	406
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.94	0.85	0.69	0.40	0.74	0.91	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	1132	20	41	600	148	47	322	474	188	72	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.997			0.970				0.850		0.977	
Flt Protected	0.950			0.950				0.994		0.950	0.984	
Satd. Flow (prot)	1694	3412	0	1728	3293	0	0	1810	1546	1510	1628	0
Flt Permitted	0.950			0.950				0.994		0.950	0.984	
Satd. Flow (perm)	1694	3412	0	1728	3293	0	0	1810	1546	1510	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			31				69		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	95	1217	22	43	632	156	53	366	539	211	81	24
Shared Lane Traffic (%)										25%		
Lane Group Flow (vph)	95	1239	0	43	788	0	0	419	539	158	158	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	14.0	44.0		14.0	44.0		32.0	32.0	14.0	20.0	20.0	
Total Split (%)	12.7%	40.0%		12.7%	40.0%		29.1%	29.1%	12.7%	18.2%	18.2%	
Maximum Green (s)	9.0	39.0		9.0	39.0		27.0	27.0	9.0	15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.6	39.0		9.0	39.4			26.5	40.5	14.1	14.1	
Actuated g/C Ratio	0.08	0.36		0.08	0.36			0.24	0.37	0.13	0.13	
v/c Ratio	0.71	1.01		0.30	0.65			0.95	0.87	0.81	0.73	
Control Delay	77.0	63.5		53.5	31.1			73.4	44.0	76.5	63.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	77.0	63.5		53.5	31.1			73.4	44.0	76.5	63.5	
LOS	E	E		D	C			E	D	E	E	
Approach Delay		64.5			32.2			56.9			70.0	
Approach LOS		E			C			E			E	

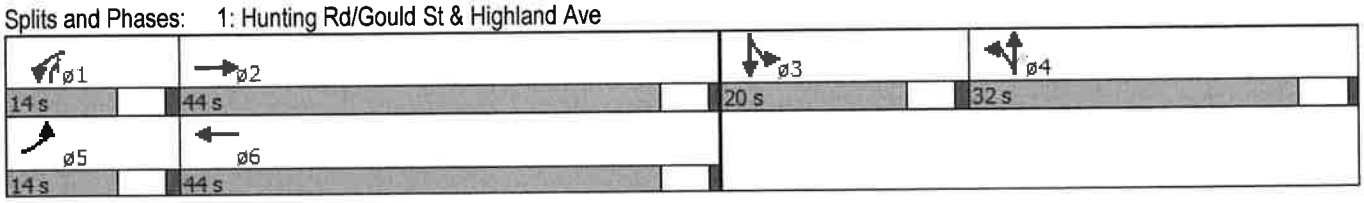
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 108.6

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 55.1
Intersection Capacity Utilization 81.5%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service D

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1239	43	788	419	539	158	158
v/c Ratio	0.71	1.01	0.30	0.65	0.95	0.87	0.81	0.73
Control Delay	77.0	63.5	53.5	31.1	73.4	44.0	76.5	63.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	63.5	53.5	31.1	73.4	44.0	76.5	63.5
Queue Length 50th (ft)	66	~491	29	235	292	311	114	108
Queue Length 95th (ft)	#145	#628	66	304	#467	#493	#222	#200
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	140	1227	143	1213	450	619	208	231
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.01	0.30	0.65	0.93	0.87	0.76	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	796	50	228	964	134	49	67	131	301	370	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.991			0.982				0.850		0.964	
Flt Protected	0.950			0.950				0.979		0.950	0.997	
Satd. Flow (prot)	1745	3394	0	1728	3397	0	0	1788	1546	1585	1653	0
Flt Permitted	0.950			0.950				0.979		0.950	0.997	
Satd. Flow (perm)	1745	3394	0	1728	3397	0	0	1788	1546	1585	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			12				151		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	94	838	53	259	1095	152	56	77	151	338	416	140
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	94	891	0	259	1247	0	0	133	151	304	590	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	14.0	47.0		31.0	64.0		16.0	16.0	31.0	56.0	56.0	
Total Split (%)	9.3%	31.3%		20.7%	42.7%		10.7%	10.7%	20.7%	37.3%	37.3%	
Maximum Green (s)	9.0	42.0		26.0	59.0		11.0	11.0	26.0	51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	9.0	42.0		24.8	57.8			11.0	40.8	51.0	51.0	
Actuated g/C Ratio	0.06	0.28		0.17	0.39			0.07	0.27	0.34	0.34	
v/c Ratio	0.90	0.93		0.90	0.94			1.01	0.28	0.56	1.03	
Control Delay	131.5	67.7		93.6	57.5			147.1	7.2	44.9	91.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	131.5	67.7		93.6	57.5			147.1	7.2	44.9	91.8	
LOS	F	E		F	E			F	A	D	F	
Approach Delay		73.8			63.7			72.7			75.8	
Approach LOS		E			E			E			E	

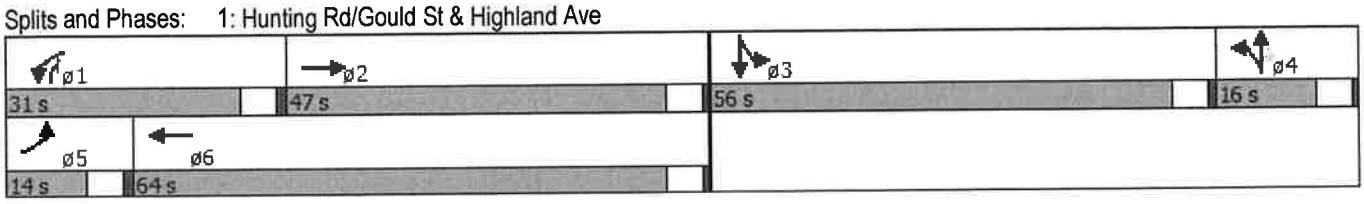
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 148.8

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 70.1
Intersection Capacity Utilization 81.0%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service D

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	891	259	1247	133	151	304	590
v/c Ratio	0.90	0.93	0.90	0.94	1.01	0.28	0.56	1.03
Control Delay	131.5	67.7	93.6	57.5	147.1	7.2	44.9	91.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.5	67.7	93.6	57.5	147.1	7.2	44.9	91.8
Queue Length 50th (ft)	93	448	250	606	~135	0	255	~644
Queue Length 95th (ft)	#208	#578	#390	#692	#267	50	358	#883
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	105	961	301	1354	132	544	542	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.93	0.86	0.92	1.01	0.28	0.56	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	1132	20	52	600	148	47	328	517	188	73	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.997			0.970				0.850		0.977	
Flt Protected	0.950			0.950				0.994		0.950	0.984	
Satd. Flow (prot)	1694	3412	0	1728	3293	0	0	1810	1546	1510	1628	0
Flt Permitted	0.950			0.950				0.994		0.950	0.984	
Satd. Flow (perm)	1694	3412	0	1728	3293	0	0	1810	1546	1510	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			31				69		7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	95	1217	22	55	632	156	53	373	588	211	82	24
Shared Lane Traffic (%)										25%		
Lane Group Flow (vph)	95	1239	0	55	788	0	0	426	588	158	159	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	14.0	44.0		14.0	44.0		32.0	32.0	14.0	20.0	20.0	
Total Split (%)	12.7%	40.0%		12.7%	40.0%		29.1%	29.1%	12.7%	18.2%	18.2%	
Maximum Green (s)	9.0	39.0		9.0	39.0		27.0	27.0	9.0	15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.7	39.0		9.0	39.4			26.8	40.8	14.1	14.1	
Actuated g/C Ratio	0.08	0.36		0.08	0.36			0.25	0.37	0.13	0.13	
v/c Ratio	0.71	1.01		0.39	0.65			0.96	0.95	0.81	0.73	
Control Delay	77.1	64.3		56.3	31.2			75.2	55.4	76.5	64.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	77.1	64.3		56.3	31.2			75.2	55.4	76.5	64.0	
LOS	E	E		E	C			E	E	E	E	
Approach Delay		65.2			32.8			63.7			70.2	
Approach LOS		E			C			E			E	

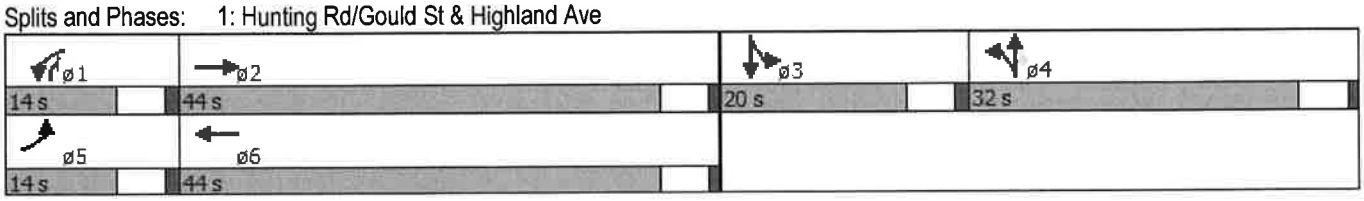
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 108.9

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 57.4
Intersection Capacity Utilization 84.2%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service E

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1239	55	788	426	588	158	159
v/c Ratio	0.71	1.01	0.39	0.65	0.96	0.95	0.81	0.73
Control Delay	77.1	64.3	56.3	31.2	75.2	55.4	76.5	64.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.1	64.3	56.3	31.2	75.2	55.4	76.5	64.0
Queue Length 50th (ft)	66	~491	38	235	298	362	114	109
Queue Length 95th (ft)	#145	#628	80	304	#477	#571	#222	#202
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	139	1224	142	1210	449	621	207	230
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.01	0.39	0.65	0.95	0.95	0.76	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

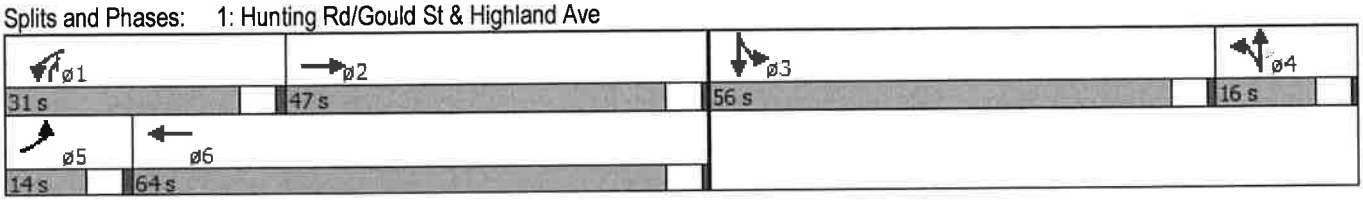
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	796	50	271	964	134	49	70	154	301	375	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.991			0.982				0.850		0.965	
Flt Protected	0.950			0.950				0.980		0.950	0.997	
Satd. Flow (prot)	1745	3394	0	1728	3397	0	0	1789	1546	1585	1654	0
Flt Permitted	0.950			0.950				0.980		0.950	0.997	
Satd. Flow (perm)	1745	3394	0	1728	3397	0	0	1789	1546	1585	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			12				172		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	94	838	53	308	1095	152	56	80	177	338	421	140
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	94	891	0	308	1247	0	0	136	177	304	595	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		11.0	11.0	11.0	11.0	11.0	
Total Split (s)	14.0	47.0		31.0	64.0		16.0	16.0	31.0	56.0	56.0	
Total Split (%)	9.3%	31.3%		20.7%	42.7%		10.7%	10.7%	20.7%	37.3%	37.3%	
Maximum Green (s)	9.0	42.0		26.0	59.0		11.0	11.0	26.0	51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	9.0	42.0		26.0	59.0			11.0	42.0	51.0	51.0	
Actuated g/C Ratio	0.06	0.28		0.17	0.39			0.07	0.28	0.34	0.34	
v/c Ratio	0.90	0.93		1.03	0.93			1.04	0.32	0.57	1.05	
Control Delay	133.5	69.5		119.2	55.7			154.1	7.7	45.4	96.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	133.5	69.5		119.2	55.7			154.1	7.7	45.4	96.6	
LOS	F	E		F	E			F	A	D	F	
Approach Delay		75.6			68.3			71.3			79.3	
Approach LOS		E			E			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 73.1
Intersection LOS: E
Intersection Capacity Utilization 83.7%
ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	891	308	1247	136	177	304	595
v/c Ratio	0.90	0.93	1.03	0.93	1.04	0.32	0.57	1.05
Control Delay	133.5	69.5	119.2	55.7	154.1	7.7	45.4	96.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.5	69.5	119.2	55.7	154.1	7.7	45.4	96.6
Queue Length 50th (ft)	93	448	~321	606	~143	4	255	~654
Queue Length 95th (ft)	#208	#578	#498	#692	#273	56	358	#893
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	104	953	299	1343	131	556	538	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.93	1.03	0.93	1.04	0.32	0.57	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	938	16	342	625	270	38	206	387	181	117	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998			0.955				0.850		0.978	
Flt Protected	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (prot)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Flt Permitted	0.950			0.950				0.992		0.950	0.993	
Satd. Flow (perm)	1694	3416	0	1728	3245	0	0	1807	1546	1510	1658	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			67				89		6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	3%	2%	0%	1%	3%	2%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	108	1009	17	360	658	284	43	234	440	203	131	27
Shared Lane Traffic (%)										12%		
Lane Group Flow (vph)	108	1026	0	360	942	0	0	277	440	179	182	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	16.0	37.0		32.0	53.0		26.0	26.0	32.0	25.0	25.0	
Total Split (%)	13.3%	30.8%		26.7%	44.2%		21.7%	21.7%	26.7%	20.8%	20.8%	
Maximum Green (s)	11.0	32.0		27.0	48.0		21.0	21.0	27.0	20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	10.4	32.1		26.0	47.8			20.0	51.1	17.4	17.4	
Actuated g/C Ratio	0.09	0.28		0.22	0.41			0.17	0.44	0.15	0.15	
v/c Ratio	0.72	1.08		0.93	0.68			0.88	0.60	0.79	0.72	
Control Delay	78.0	94.3		75.7	29.4			76.7	23.5	72.0	61.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	78.0	94.3		75.7	29.4			76.7	23.5	72.0	61.9	
LOS	E	F		E	C			E	C	E	E	
Approach Delay		92.7			42.2			44.0			66.9	
Approach LOS		F			D			D			E	

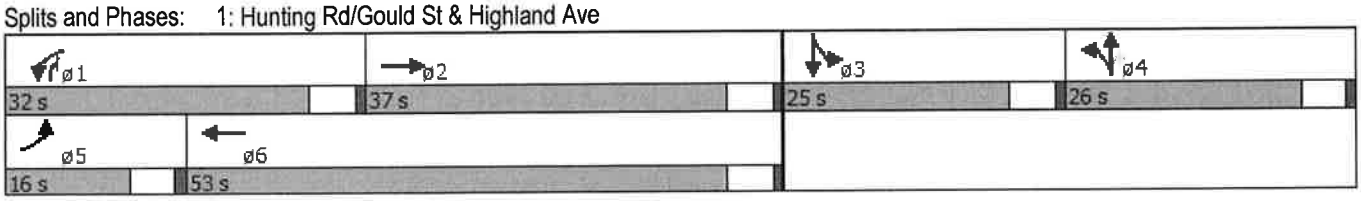
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 115.7

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 61.4
Intersection Capacity Utilization 83.8%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service E

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	108	1026	360	942	277	440	179	182
v/c Ratio	0.72	1.08	0.93	0.68	0.88	0.60	0.79	0.72
Control Delay	78.0	94.3	75.7	29.4	76.7	23.5	72.0	61.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.0	94.3	75.7	29.4	76.7	23.5	72.0	61.9
Queue Length 50th (ft)	82	~482	274	294	211	202	140	135
Queue Length 95th (ft)	#168	#621	#457	373	#351	302	#240	217
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	161	949	404	1390	329	745	262	292
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	1.08	0.89	0.68	0.84	0.59	0.68	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

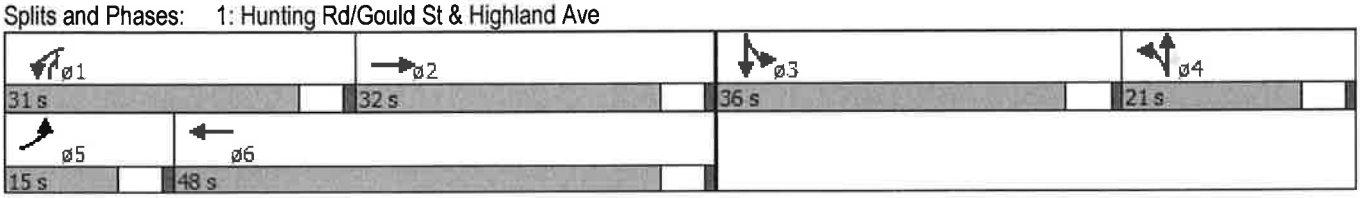
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	682	28	310	703	138	32	80	429	344	253	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994			0.975				0.850		0.966	
Flt Protected	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (prot)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Flt Permitted	0.950			0.950				0.986		0.950	0.995	
Satd. Flow (perm)	1745	3403	0	1728	3374	0	0	1798	1546	1585	1653	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			21				87		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		732			738			1359			383	
Travel Time (s)		16.6			16.8			30.9			8.7	
Peak Hour Factor	0.95	0.95	0.95	0.88	0.88	0.88	0.87	0.87	0.87	0.89	0.89	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	1%	1%	1%	1%	3%
Adj. Flow (vph)	60	718	29	352	799	157	37	92	493	387	284	94
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	60	747	0	352	956	0	0	129	493	348	417	0
Turn Type	Prot	NA		Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases									4			
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	21.0		11.0	21.0		21.0	21.0	11.0	11.0	11.0	
Total Split (s)	15.0	32.0		31.0	48.0		21.0	21.0	31.0	36.0	36.0	
Total Split (%)	12.5%	26.7%		25.8%	40.0%		17.5%	17.5%	25.8%	30.0%	30.0%	
Maximum Green (s)	10.0	27.0		26.0	43.0		16.0	16.0	26.0	31.0	31.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	None		None	None	None	None	None	
Act Effct Green (s)	8.6	27.0		25.4	46.2			13.0	43.4	30.5	30.5	
Actuated g/C Ratio	0.07	0.23		0.22	0.40			0.11	0.37	0.26	0.26	
v/c Ratio	0.47	0.94		0.93	0.70			0.64	0.78	0.84	0.94	
Control Delay	64.3	64.6		77.4	33.6			64.4	35.8	59.6	72.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	64.3	64.6		77.4	33.6			64.4	35.8	59.6	72.2	
LOS	E	E		E	C			E	D	E	E	
Approach Delay		64.6			45.4			41.7			66.4	
Approach LOS		E			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 116

Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 53.8
Intersection LOS: D
Intersection Capacity Utilization 78.3%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Hunting Rd/Gould St & Highland Ave



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	747	352	956	129	493	348	417
v/c Ratio	0.47	0.94	0.93	0.70	0.64	0.78	0.84	0.94
Control Delay	64.3	64.6	77.4	33.6	64.4	35.8	59.6	72.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	64.6	77.4	33.6	64.4	35.8	59.6	72.2
Queue Length 50th (ft)	44	295	263	324	95	272	263	318
Queue Length 95th (ft)	91	#433	#437	407	154	388	#431	#532
Internal Link Dist (ft)		652		658	1279			303
Turn Bay Length (ft)								
Base Capacity (vph)	150	795	387	1357	248	641	424	451
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.94	0.91	0.70	0.52	0.77	0.82	0.92

Intersection Summary

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

Kendrick Street at Hunting Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	572	2	123	249	71	3	444	684	331	87	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.967				0.850		0.974	
Flt Protected		0.998		0.950						0.950		
Satd. Flow (prot)	0	3559	0	1787	1819	0	0	1881	1599	1728	1851	0
Flt Permitted		0.842		0.126				0.999		0.114		
Satd. Flow (perm)	0	3003	0	237	1819	0	0	1879	1599	207	1851	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12				215		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	39	806	3	128	259	74	3	483	743	364	96	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	848	0	128	333	0	0	486	743	364	116	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	40.0	40.0		15.0	55.0		35.0	35.0		30.0	65.0	
Total Split (%)	29.0%	29.0%		10.9%	39.9%		25.4%	25.4%		21.7%	47.1%	
Maximum Green (s)	35.0	35.0		10.0	50.0		30.0	30.0		25.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		35.1		49.7	49.7			30.1	123.5	60.2	60.2	
Actuated g/C Ratio		0.28		0.40	0.40			0.24	1.00	0.49	0.49	
v/c Ratio		0.99		0.60	0.45			1.06	0.46	0.89	0.13	
Control Delay		73.7		55.0	29.4			104.5	1.0	67.8	17.6	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		73.7		55.0	29.4			104.5	1.0	67.8	17.6	
LOS		E		E	C			F	A	E	B	
Approach Delay		73.7			36.5			41.9			55.7	

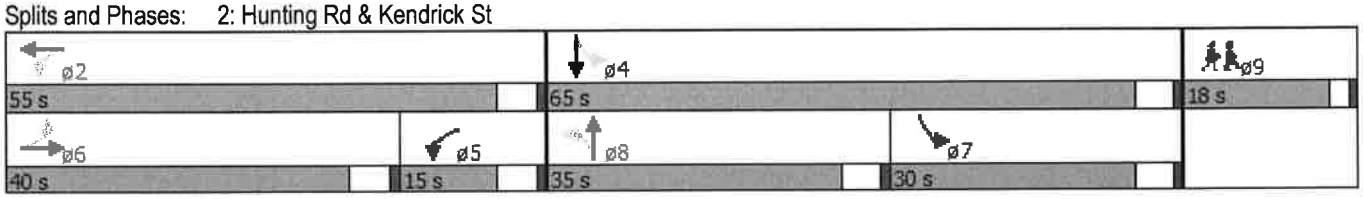
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 138
Actuated Cycle Length: 123.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 52.2
Intersection LOS: D
Intersection Capacity Utilization 92.6%
ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	848	128	333	486	743	364	116
v/c Ratio	0.99	0.60	0.45	1.06	0.46	0.89	0.13
Control Delay	73.7	55.0	29.4	104.5	1.0	67.8	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	55.0	29.4	104.5	1.0	67.8	17.6
Queue Length 50th (ft)	341	61	174	~405	0	221	42
Queue Length 95th (ft)	#397	#136	326	#759	0	#502	99
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	853	222	746	457	1599	410	907
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	0.99	0.58	0.45	1.06	0.46	0.89	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	226	0	698	540	355	3	109	91	119	335	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.940				0.850		0.989	
Flt Protected		0.996		0.950				0.999		0.950		
Satd. Flow (prot)	0	3563	0	1787	1768	0	0	1898	1599	1745	1862	0
Flt Permitted		0.571		0.483				0.536		0.569		
Satd. Flow (perm)	0	2043	0	909	1768	0	0	1018	1599	1045	1862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					32				153		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	23	260	0	767	593	390	4	138	115	142	399	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	283	0	767	983	0	0	142	115	142	432	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	25.0	25.0		50.0	75.0		25.0	25.0		25.0	50.0	
Total Split (%)	17.5%	17.5%		35.0%	52.4%		17.5%	17.5%		17.5%	35.0%	
Maximum Green (s)	20.0	20.0		45.0	70.0		20.0	20.0		20.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		20.2		70.7	70.7			20.2	119.3	35.2	35.2	
Actuated g/C Ratio		0.17		0.59	0.59			0.17	1.00	0.30	0.30	
v/c Ratio		0.82		0.88	0.93			0.83	0.07	0.39	0.78	
Control Delay		68.3		39.9	38.0			84.4	0.1	39.1	50.2	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		68.3		39.9	38.0			84.4	0.1	39.1	50.2	
LOS		E		D	D			F	A	D	D	
Approach Delay		68.3			38.8			46.7			47.4	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

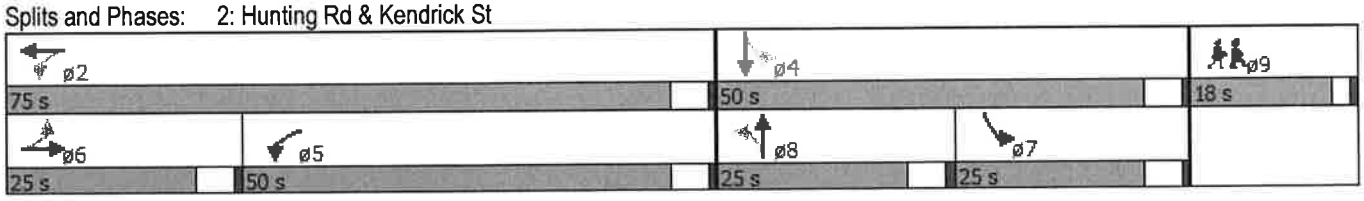
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 143
Actuated Cycle Length: 119.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 44.2
Intersection Capacity Utilization 88.7%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service E

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	283	767	983	142	115	142	432
v/c Ratio	0.82	0.88	0.93	0.83	0.07	0.39	0.78
Control Delay	68.3	39.9	38.0	84.4	0.1	39.1	50.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	39.9	38.0	84.4	0.1	39.1	50.2
Queue Length 50th (ft)	103	336	532	99	0	79	287
Queue Length 95th (ft)	#232	#1057	#1324	#235	0	149	451
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	345	873	1061	172	1599	516	711
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.88	0.93	0.83	0.07	0.28	0.61

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	629	2	141	267	75	3	472	779	348	93	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.967				0.850		0.974	
Flt Protected		0.998		0.950						0.950		
Satd. Flow (prot)	0	3563	0	1787	1819	0	0	1881	1599	1728	1851	0
Flt Permitted		0.815		0.100				0.999		0.114		
Satd. Flow (perm)	0	2909	0	188	1819	0	0	1879	1599	207	1851	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11				231		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	41	886	3	147	278	78	3	513	847	382	102	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	930	0	147	356	0	0	516	847	382	123	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	40.0	40.0		15.0	55.0		35.0	35.0		30.0	65.0	
Total Split (%)	29.0%	29.0%		10.9%	39.9%		25.4%	25.4%		21.7%	47.1%	
Maximum Green (s)	35.0	35.0		10.0	50.0		30.0	30.0		25.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		35.1		50.1	50.1			30.1	123.9	60.3	60.3	
Actuated g/C Ratio		0.28		0.40	0.40			0.24	1.00	0.49	0.49	
v/c Ratio		1.13		0.72	0.48			1.13	0.53	0.94	0.14	
Control Delay		113.5		66.8	30.1			125.9	1.3	75.6	17.8	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		113.5		66.8	30.1			125.9	1.3	75.6	17.8	
LOS		F		E	C			F	A	E	B	
Approach Delay		113.5			40.9			48.4			61.5	

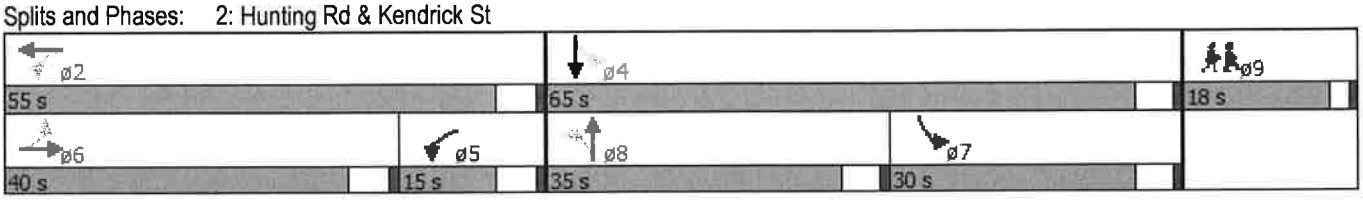
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 138
Actuated Cycle Length: 123.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 67.6 Intersection LOS: E
Intersection Capacity Utilization 97.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	930	147	356	516	847	382	123
v/c Ratio	1.13	0.72	0.48	1.13	0.53	0.94	0.14
Control Delay	113.5	66.8	30.1	125.9	1.3	75.6	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.5	66.8	30.1	125.9	1.3	75.6	17.8
Queue Length 50th (ft)	~428	71	190	~453	0	238	45
Queue Length 95th (ft)	#474	#199	352	#820	0	#541	105
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	825	205	743	456	1599	408	905
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.72	0.48	1.13	0.53	0.94	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	245	0	790	593	373	3	119	114	125	358	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.942				0.850		0.989	
Flt Protected		0.996		0.950				0.999		0.950		
Satd. Flow (prot)	0	3563	0	1787	1772	0	0	1898	1599	1745	1862	0
Flt Permitted		0.565		0.452				0.535		0.538		
Satd. Flow (perm)	0	2021	0	850	1772	0	0	1016	1599	988	1862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					31				153		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	24	282	0	868	652	410	4	151	144	149	426	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	0	868	1062	0	0	155	144	149	461	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	25.0	25.0		50.0	75.0		25.0	25.0		25.0	50.0	
Total Split (%)	17.5%	17.5%		35.0%	52.4%		17.5%	17.5%		17.5%	35.0%	
Maximum Green (s)	20.0	20.0		45.0	70.0		20.0	20.0		20.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		20.2		70.7	70.7			20.2	120.0	35.9	35.9	
Actuated g/C Ratio		0.17		0.59	0.59			0.17	1.00	0.30	0.30	
v/c Ratio		0.90		1.02	1.01			0.91	0.09	0.41	0.82	
Control Delay		79.2		65.3	54.3			98.9	0.1	39.8	53.0	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		79.2		65.3	54.3			98.9	0.1	39.8	53.0	
LOS		E		E	D			F	A	D	D	
Approach Delay		79.2			59.2			51.3			49.8	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

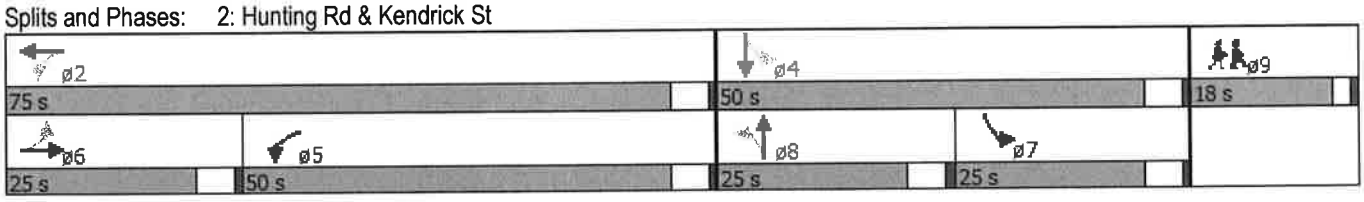
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 143
Actuated Cycle Length: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 58.6
Intersection Capacity Utilization 94.4%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service F

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	306	868	1062	155	144	149	461
v/c Ratio	0.90	1.02	1.01	0.91	0.09	0.41	0.82
Control Delay	79.2	65.3	54.3	98.9	0.1	39.8	53.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	65.3	54.3	98.9	0.1	39.8	53.0
Queue Length 50th (ft)	114	437	653	110	0	84	313
Queue Length 95th (ft)	#259	#1129	#1482	#260	0	155	487
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	339	855	1056	171	1599	501	706
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	0.90	1.02	1.01	0.91	0.09	0.30	0.65

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	629	2	149	267	75	3	521	811	348	105	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.967				0.850		0.977	
Flt Protected		0.998		0.950						0.950		
Satd. Flow (prot)	0	3563	0	1787	1819	0	0	1881	1599	1728	1856	0
Flt Permitted		0.815		0.100				0.999		0.114		
Satd. Flow (perm)	0	2909	0	188	1819	0	0	1879	1599	207	1856	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11				218		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	41	886	3	155	278	78	3	566	882	382	115	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	930	0	155	356	0	0	569	882	382	136	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	40.0	40.0		15.0	55.0		35.0	35.0		30.0	65.0	
Total Split (%)	29.0%	29.0%		10.9%	39.9%		25.4%	25.4%		21.7%	47.1%	
Maximum Green (s)	35.0	35.0		10.0	50.0		30.0	30.0		25.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		35.1		50.2	50.2			30.1	124.0	60.2	60.2	
Actuated g/C Ratio		0.28		0.40	0.40			0.24	1.00	0.49	0.49	
v/c Ratio		1.13		0.76	0.48			1.25	0.55	0.94	0.15	
Control Delay		114.0		69.8	30.1			168.7	1.4	75.8	18.4	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		114.0		69.8	30.1			168.7	1.4	75.8	18.4	
LOS		F		E	C			F	A	E	B	
Approach Delay		114.0			42.2			67.0			60.7	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

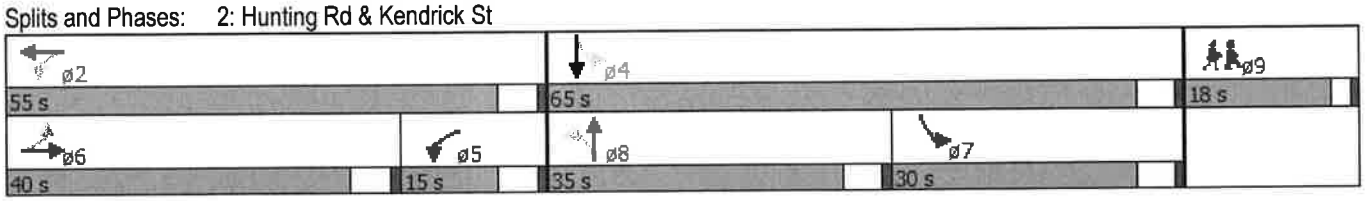
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 138
Actuated Cycle Length: 124
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.25
Intersection Signal Delay: 75.1
Intersection Capacity Utilization 100.4%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service G

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	930	155	356	569	882	382	136
v/c Ratio	1.13	0.76	0.48	1.25	0.55	0.94	0.15
Control Delay	114.0	69.8	30.1	168.7	1.4	75.8	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.0	69.8	30.1	168.7	1.4	75.8	18.4
Queue Length 50th (ft)	~428	75	190	~539	0	238	52
Queue Length 95th (ft)	#474	#218	352	#925	0	#541	117
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	824	205	742	456	1599	408	906
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.76	0.48	1.25	0.55	0.94	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	245	0	822	593	373	3	145	131	125	406	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.942				0.850		0.990	
Flt Protected		0.996		0.950				0.999		0.950		
Satd. Flow (prot)	0	3563	0	1787	1772	0	0	1898	1599	1745	1864	0
Flt Permitted		0.561		0.445				0.532		0.454		
Satd. Flow (perm)	0	2007	0	837	1772	0	0	1011	1599	834	1864	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					31				153		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	24	282	0	903	652	410	4	184	166	149	483	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	0	903	1062	0	0	188	166	149	518	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	25.0	25.0		50.0	75.0		25.0	25.0		25.0	50.0	
Total Split (%)	17.5%	17.5%		35.0%	52.4%		17.5%	17.5%		17.5%	35.0%	
Maximum Green (s)	20.0	20.0		45.0	70.0		20.0	20.0		20.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		20.2		70.6	70.6			20.2	123.4	39.3	39.3	
Actuated g/C Ratio		0.16		0.57	0.57			0.16	1.00	0.32	0.32	
v/c Ratio		0.93		1.09	1.03			1.14	0.10	0.40	0.87	
Control Delay		87.4		90.7	64.2			160.1	0.1	40.0	56.1	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		87.4		90.7	64.2			160.1	0.1	40.0	56.1	
LOS		F		F	E			F	A	D	E	
Approach Delay		87.4			76.3			85.1			52.5	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

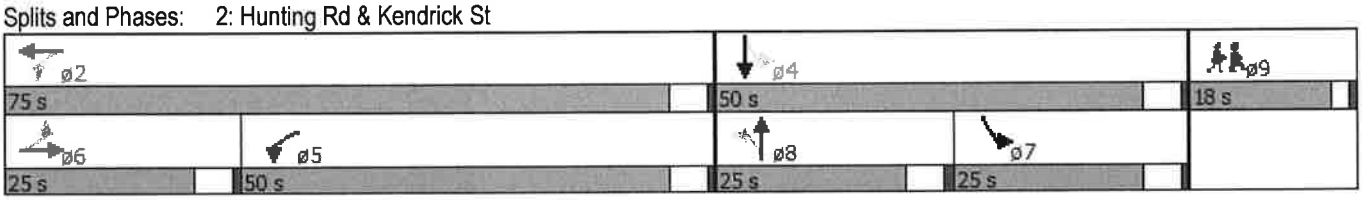
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			F			D	

Intersection Summary

Area Type: Other
Cycle Length: 143
Actuated Cycle Length: 123.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 73.5
Intersection Capacity Utilization 109.5%
Analysis Period (min) 15

Intersection LOS: E
ICU Level of Service H

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	306	903	1062	188	166	149	518
v/c Ratio	0.93	1.09	1.03	1.14	0.10	0.40	0.87
Control Delay	87.4	90.7	64.2	160.1	0.1	40.0	56.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	90.7	64.2	160.1	0.1	40.0	56.1
Queue Length 50th (ft)	124	~636	~864	~168	0	84	367
Queue Length 95th (ft)	#260	#1205	#1482	#328	0	155	#589
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	328	828	1027	165	1599	455	687
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.09	1.03	1.14	0.10	0.33	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	503	2	92	233	58	3	682	513	90	58	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.970				0.850		0.995	
Flt Protected		0.996		0.950						0.950		
Satd. Flow (prot)	0	3547	0	1787	1825	0	0	1881	1599	1728	1890	0
Flt Permitted		0.765		0.173				0.999		0.064		
Satd. Flow (perm)	0	2725	0	325	1825	0	0	1879	1599	116	1890	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9				145		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	69	708	3	96	243	60	3	741	558	99	64	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	780	0	96	303	0	0	744	558	99	66	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	46.0	46.0		12.0	58.0		62.0	62.0		12.0	74.0	
Total Split (%)	30.7%	30.7%		8.0%	38.7%		41.3%	41.3%		8.0%	49.3%	
Maximum Green (s)	41.0	41.0		7.0	53.0		57.0	57.0		7.0	69.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		41.1		53.2	53.2			57.2	136.0	69.2	69.2	
Actuated g/C Ratio		0.30		0.39	0.39			0.42	1.00	0.51	0.51	
v/c Ratio		0.95		0.48	0.42			0.94	0.35	0.70	0.07	
Control Delay		67.3		48.7	32.5			59.1	0.6	71.7	18.5	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		67.3		48.7	32.5			59.1	0.6	71.7	18.5	
LOS		E		D	C			E	A	E	B	
Approach Delay		67.3			36.4			34.0			50.4	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	12%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

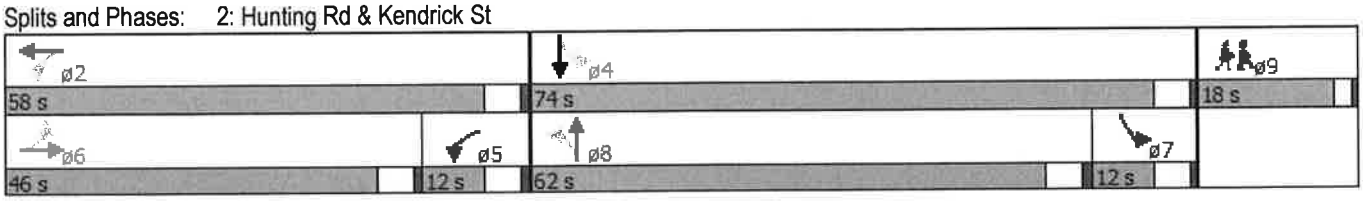
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 136
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 45.2
Intersection Capacity Utilization 92.2%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service F

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	780	96	303	744	558	99	66
v/c Ratio	0.95	0.48	0.42	0.94	0.35	0.70	0.07
Control Delay	67.3	48.7	32.5	59.1	0.6	71.7	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	48.7	32.5	59.1	0.6	71.7	18.5
Queue Length 50th (ft)	339	52	178	590	0	42	27
Queue Length 95th (ft)	370	111	321	#1056	0	#152	67
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	824	202	719	790	1599	142	962
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	0.95	0.48	0.42	0.94	0.35	0.70	0.07

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	102	0	181	462	104	1	112	67	27	717	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.973				0.850		0.994	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3575	0	1787	1830	0	0	1900	1599	1745	1871	0
Flt Permitted		0.681		0.677				0.768		0.616		
Satd. Flow (perm)	0	2434	0	1274	1830	0	0	1459	1599	1131	1871	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8				145		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	1	117	0	199	508	114	1	142	85	32	854	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	199	622	0	0	143	85	32	889	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	35.0	35.0		18.0	53.0		67.0	67.0		12.0	79.0	
Total Split (%)	23.3%	23.3%		12.0%	35.3%		44.7%	44.7%		8.0%	52.7%	
Maximum Green (s)	30.0	30.0		13.0	48.0		62.0	62.0		7.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		10.7		48.5	48.5			38.7	130.2	68.2	68.2	
Actuated g/C Ratio		0.08		0.37	0.37			0.30	1.00	0.52	0.52	
v/c Ratio		0.59		0.33	0.91			0.33	0.05	0.04	0.91	
Control Delay		72.1		35.4	57.9			48.6	0.1	16.7	42.4	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		72.1		35.4	57.9			48.6	0.1	16.7	42.4	
LOS		E		D	E			D	A	B	D	
Approach Delay		72.1			52.4			30.5			41.5	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	12%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

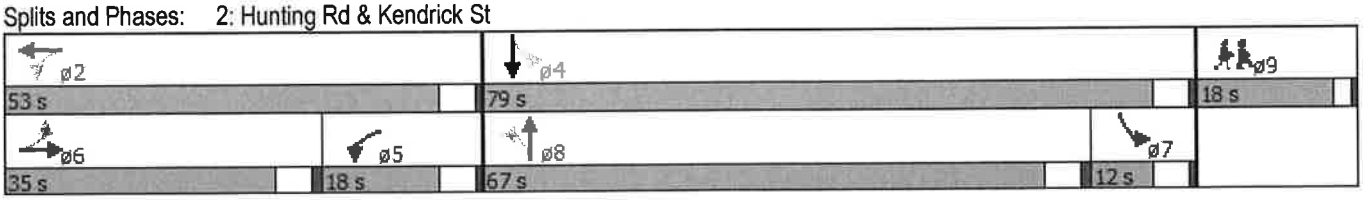
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 130.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 46.3
Intersection Capacity Utilization 78.5%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	199	622	143	85	32	889
v/c Ratio	0.59	0.33	0.91	0.33	0.05	0.04	0.91
Control Delay	72.1	35.4	57.9	48.6	0.1	16.7	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	35.4	57.9	48.6	0.1	16.7	42.4
Queue Length 50th (ft)	52	120	497	118	0	12	610
Queue Length 95th (ft)	92	227	#920	179	0	34	#1012
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	566	603	686	711	1599	732	1074
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	0.21	0.33	0.91	0.20	0.05	0.04	0.83

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	503	2	100	233	58	3	731	545	90	70	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.970				0.850		0.996	
Flt Protected		0.996		0.950						0.950		
Satd. Flow (prot)	0	3547	0	1787	1825	0	0	1881	1599	1728	1892	0
Flt Permitted		0.765		0.173				0.999		0.064		
Satd. Flow (perm)	0	2725	0	325	1825	0	0	1879	1599	116	1892	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9				145		1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	69	708	3	104	243	60	3	795	592	99	77	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	780	0	104	303	0	0	798	592	99	79	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	46.0	46.0		12.0	58.0		62.0	62.0		12.0	74.0	
Total Split (%)	30.7%	30.7%		8.0%	38.7%		41.3%	41.3%		8.0%	49.3%	
Maximum Green (s)	41.0	41.0		7.0	53.0		57.0	57.0		7.0	69.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		41.1		53.2	53.2			57.2	136.0	69.2	69.2	
Actuated g/C Ratio		0.30		0.39	0.39			0.42	1.00	0.51	0.51	
v/c Ratio		0.95		0.51	0.42			1.01	0.37	0.70	0.08	
Control Delay		67.3		51.0	32.5			73.9	0.7	71.7	18.6	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		67.3		51.0	32.5			73.9	0.7	71.7	18.6	
LOS		E		D	C			E	A	E	B	
Approach Delay		67.3			37.3			42.7			48.1	

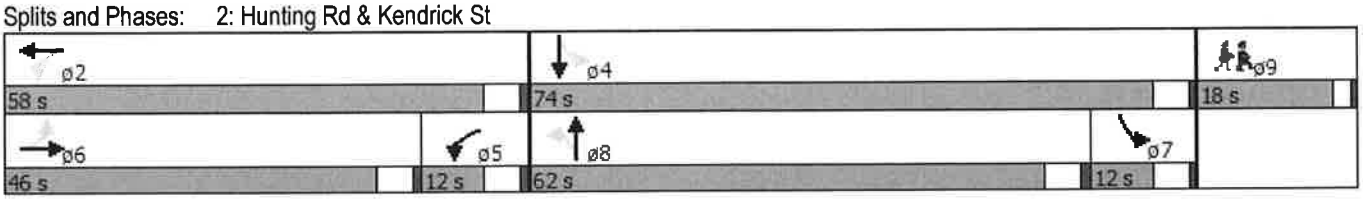
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	12%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 136
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 49.2
Intersection LOS: D
Intersection Capacity Utilization 94.8%
ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	780	104	303	798	592	99	79
v/c Ratio	0.95	0.51	0.42	1.01	0.37	0.70	0.08
Control Delay	67.3	51.0	32.5	73.9	0.7	71.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	51.0	32.5	73.9	0.7	71.7	18.6
Queue Length 50th (ft)	339	56	178	665	0	42	32
Queue Length 95th (ft)	370	119	321	#1171	0	#152	77
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	824	202	719	790	1599	142	963
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	0.95	0.51	0.42	1.01	0.37	0.70	0.08

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	102	0	213	462	104	1	138	84	27	765	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.973				0.850		0.994	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3575	0	1787	1830	0	0	1900	1599	1745	1871	0
Flt Permitted		0.682		0.677				0.784		0.578		
Satd. Flow (perm)	0	2438	0	1274	1830	0	0	1490	1599	1062	1871	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8				145		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	1	117	0	234	508	114	1	175	106	32	911	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	234	622	0	0	176	106	32	946	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	35.0	35.0		18.0	53.0		67.0	67.0		12.0	79.0	
Total Split (%)	23.3%	23.3%		12.0%	35.3%		44.7%	44.7%		8.0%	52.7%	
Maximum Green (s)	30.0	30.0		13.0	48.0		62.0	62.0		7.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lead	Lead		Lag			Lead	Lead		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		10.8		48.2	48.2			45.3	136.0	74.2	74.2	
Actuated g/C Ratio		0.08		0.35	0.35			0.33	1.00	0.55	0.55	
v/c Ratio		0.61		0.41	0.95			0.35	0.07	0.04	0.93	
Control Delay		75.0		38.7	68.0			45.9	0.1	16.7	44.5	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		75.0		38.7	68.0			45.9	0.1	16.7	44.5	
LOS		E		D	E			D	A	B	D	
Approach Delay		75.0			60.0			28.7			43.6	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	12%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

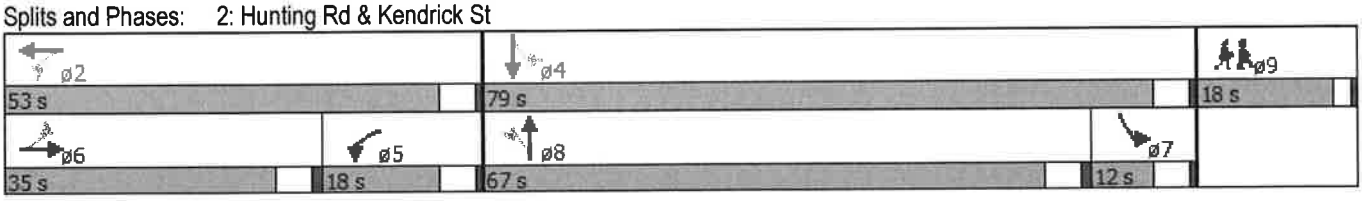
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 136
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 49.6
Intersection Capacity Utilization 81.0%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service D

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	234	622	176	106	32	946
v/c Ratio	0.61	0.41	0.95	0.35	0.07	0.04	0.93
Control Delay	75.0	38.7	68.0	45.9	0.1	16.7	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	38.7	68.0	45.9	0.1	16.7	44.5
Queue Length 50th (ft)	52	146	503	146	0	12	689
Queue Length 95th (ft)	92	265	#920	208	0	34	#1122
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	539	573	653	735	1599	724	1021
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	0.22	0.41	0.95	0.24	0.07	0.04	0.93

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	629	2	149	267	75	3	521	811	348	105	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.967				0.850		0.977	
Flt Protected		0.998		0.950						0.950		
Satd. Flow (prot)	0	3563	0	1787	1819	0	0	1881	1599	1728	1856	0
Flt Permitted		0.915		0.090				0.999		0.085		
Satd. Flow (perm)	0	3266	0	169	1819	0	0	1879	1599	155	1856	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					10				201		8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.71	0.71	0.71	0.96	0.96	0.96	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	41	886	3	155	278	78	3	566	882	382	115	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	930	0	155	356	0	0	569	882	382	136	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	44.0	44.0		14.0	58.0		47.0	47.0		27.0	74.0	
Total Split (%)	29.3%	29.3%		9.3%	38.7%		31.3%	31.3%		18.0%	49.3%	
Maximum Green (s)	39.0	39.0		9.0	53.0		42.0	42.0		22.0	69.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		39.1		53.2	53.2			42.1	136.0	69.2	69.2	
Actuated g/C Ratio		0.29		0.39	0.39			0.31	1.00	0.51	0.51	
v/c Ratio		0.99		0.90	0.50			0.98	0.55	1.14	0.14	
Control Delay		75.3		77.4	34.3			78.9	1.4	131.5	18.2	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		75.3		77.4	34.3			78.9	1.4	131.5	18.2	
LOS		E		E	C			E	A	F	B	
Approach Delay		75.3			47.4			31.8			101.8	

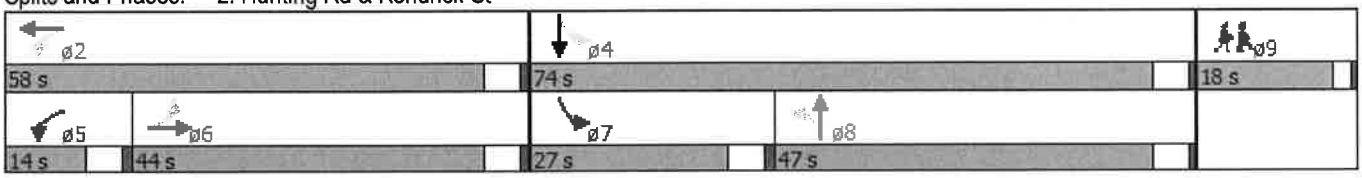
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	12%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			C			F	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 136
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 56.6 Intersection LOS: E
Intersection Capacity Utilization 100.4% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	930	155	356	569	882	382	136
v/c Ratio	0.99	0.90	0.50	0.98	0.55	1.14	0.14
Control Delay	75.3	77.4	34.3	78.9	1.4	131.5	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.3	77.4	34.3	78.9	1.4	131.5	18.2
Queue Length 50th (ft)	413	86	217	476	0	~325	55
Queue Length 95th (ft)	438	#264	384	#873	0	#643	119
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	939	173	717	581	1599	334	948
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	0.99	0.90	0.50	0.98	0.55	1.14	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	245	0	822	593	373	3	145	131	125	406	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	11	12	12
Storage Length (ft)	0		0	0		110	0		110	130		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.942				0.850		0.990	
Flt Protected		0.996		0.950				0.999		0.950		
Satd. Flow (prot)	0	3563	0	1787	1772	0	0	1898	1599	1745	1864	0
Flt Permitted		0.658		0.351				0.728		0.364		
Satd. Flow (perm)	0	2354	0	660	1772	0	0	1383	1599	669	1864	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					35				153		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		477			405			232			1359	
Travel Time (s)		10.8			9.2			5.3			30.9	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	0%	1%	0%	1%	1%	1%	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	24	282	0	903	652	410	4	184	166	149	483	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	0	903	1062	0	0	188	166	149	518	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		6		5	2			8		7	4	
Permitted Phases	6			2			8		Free	4		
Minimum Initial (s)	7.0	7.0		7.0	10.0		10.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	15.0		15.0	15.0		12.0	15.0	
Total Split (s)	28.0	28.0		55.0	83.0		29.0	29.0		13.0	42.0	
Total Split (%)	19.6%	19.6%		38.5%	58.0%		20.3%	20.3%		9.1%	29.4%	
Maximum Green (s)	23.0	23.0		50.0	78.0		24.0	24.0		8.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		23.1		78.3	78.3			24.1	129.0	37.1	37.1	
Actuated g/C Ratio		0.18		0.61	0.61			0.19	1.00	0.29	0.29	
v/c Ratio		0.73		1.08	0.98			0.73	0.10	0.58	0.96	
Control Delay		61.6		78.8	46.7			67.5	0.1	47.8	76.1	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		61.6		78.8	46.7			67.5	0.1	47.8	76.1	
LOS		E		E	D			E	A	D	E	
Approach Delay		61.6			61.4			35.9			69.8	

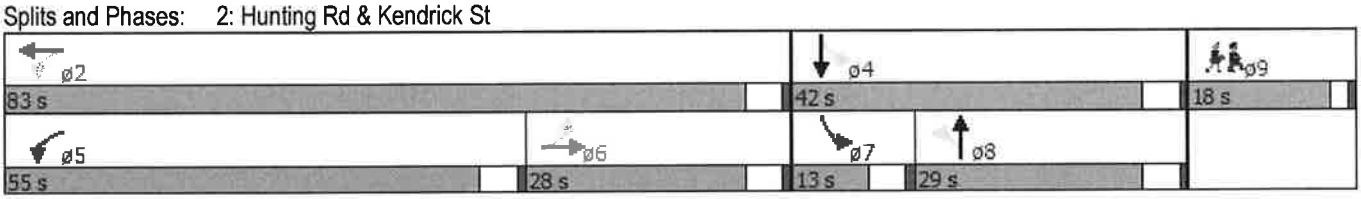
Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	18.0
Total Split (s)	18.0
Total Split (%)	13%
Maximum Green (s)	15.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 143
Actuated Cycle Length: 129
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 60.4 Intersection LOS: E
Intersection Capacity Utilization 109.5% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 2: Hunting Rd & Kendrick St



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	306	903	1062	188	166	149	518
v/c Ratio	0.73	1.08	0.98	0.73	0.10	0.58	0.96
Control Delay	61.6	78.8	46.7	67.5	0.1	47.8	76.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	78.8	46.7	67.5	0.1	47.8	76.1
Queue Length 50th (ft)	123	~666	726	144	0	93	407
Queue Length 95th (ft)	#210	#1177	#1383	#240	0	168	#694
Internal Link Dist (ft)	397		325	152			1279
Turn Bay Length (ft)					110	130	
Base Capacity (vph)	421	838	1088	258	1599	259	538
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	1.08	0.98	0.73	0.10	0.58	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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