

August 25th, 2016

Jack and Karleen Halliwell
2 Webster Road
Nantucket, Massachusetts.
02554
(508) 325 6189 Home
(401) 862 50020 Mobile
jlhalliwell@heainc.com

Nantucket Planning Board
Barry Rector, Chairman
Leslie Woodson Snell, Deputy Director of Planning

RE: Richmond Development/ Proposed Tie-in to Skyline Drive

Chairman Rector and Members of the Planning Board,

My name is Jack Halliwell and I live at 2 Webster Road with my wife Karleen and our 3 small children. We have lived here for the past 16 years. I am writing to you at this time because I am extremely concerned about the potential in increased traffic flow on Webster Road from any potential tie-in to Skyline Drive from the proposed Richmond Development.

The traffic on Webster Road has been increasing over the past few years to the point where speeding cars and delivery trucks have made it necessary to install speed bumps in order to slow them down. Some do...but many others do not...and many veer into our driveway entrance to avoid other cars/trucks.

I have had to ban my kids from the area of our driveway entrance in order to protect them from the speeding traffic...on what should otherwise be a quiet country road.

Our deep concern is currently that this situation would become much worse if the Planning Board were to allow this new mega-development to tie into Skyline Drive. At least half of that traffic would then be routed through Webster...traffic from the residents along with the increased truck traffic for deliveries.

This road was never designed to handle that volume of traffic and we want to avoid this at all costs.

In addition, the intersection of Monahassett and Webster has become another dangerous intersection with two blind corners and speeding cars. Increasing the traffic volume here would exacerbate those conditions.

Based upon our concerns for the safety of our kids and the families in this area and that use this road...Please **DO NOT ALLOW THE RICHMOND GROUP TO TIE THEIR DEVELOPMENT INTO SKYLINE DRIVE.**

THANK YOU!!!

Jack, Karleen, Jackson, Cliff and Cody Halliwell.

Contract Summary

Contract Name:	TetraTech, Inc.		
Purpose:	Provide professional transportation services associated with the development of a mixed-use development project located on Old South Road, approximately between Lover's Lane and Daffodil Lane (the Project). The objective of the services is to provide a peer review of the Traffic Impact and Access Study (TIAS) prepared for the Project by Ron Muller & Associates (RMA), dated August 26, 2016.		
Total Cost of Contract:	\$10,000		
Cost per Year:	N/A		
Multi Year:	N/A		
Duration:	Renewal: N/A	Annual: N/A	New: 09/29/2016-09/29/2017
Cost Savings if any	N/A		
Additional Costs if any	N/A		
Prior Costs:	N/A		
Funding source	53G / Escrow Account no.8013		
Number of Bidders	N/A		
ENCUMBER FUNDS	YES or <u>NO</u>		

Purchase approved by Dept Head: _____ Date: _____

Dept Procurement Review Done: _____ Date: _____

Procurement Office Review Done: _____ Date: _____



Town of Nantucket

**AGREEMENT BETWEEN
THE TOWN OF NANTUCKET
AND
TETRATECH, INC.**

This AGREEMENT, effective the _____, 2016, made by and between the TOWN OF NANTUCKET, acting by and through its Town Administration, (hereinafter, the "TOWN") and TETRATECH, INC., 100 Nickerson Road, Marlborough, MA 01752 (hereinafter, the "CONTRACTOR").

A. Whereas, the TOWN desires to engage the CONTRACTOR as an independent contractor to perform the services set forth on EXHIBIT A, attached hereto (the "Services");

B. Whereas, the CONTRACTOR agrees to accept the engagement by the TOWN in accordance with the terms set forth herein;

NOW, THEREFORE, the parties, in consideration of the mutual covenants contained herein, agree as follows:

1. The TOWN hereby retains the CONTRACTOR to perform the Services and the CONTRACTOR agrees to perform the Services as provided herein. Any written or other materials or intellectual property produced by the CONTRACTOR for the TOWN hereunder shall be the property of the TOWN and, upon the expiration or termination of this Agreement the CONTRACTOR shall deliver copies of the originals of all such materials, as well as notes, work papers and the like, to the TOWN.

2. The term of this Agreement will commence on September 29, 2016, and terminate on September 29, 2017, or when the performance of the Services has been completed in a manner reasonably satisfactory to the TOWN. The TOWN shall have the right to terminate this Agreement at any time and for any reason upon written notice given to the CONTRACTOR.

3. The CONTRACTOR will perform the Services in a first class, professional manner and in compliance with all applicable federal, state and local laws, regulations and ordinances. The CONTRACTOR shall be subject to the administrative supervision of the Board of Selectmen, or its designee, who shall be responsible for scheduling the work to be done by the CONTRACTOR on a daily or other basis. The CONTRACTOR shall perform the Services in cooperation with TOWN personnel as appropriate.

4. The TOWN will pay the CONTRACTOR compensation in the amount of \$10,000 as payment in full for the Services. This agreement may be subject to budgetary limits and, in such case, the TOWN shall not be obligated to pay the CONTRACTOR any amount of fees or expense in excess of \$10,000 without the express prior written approval of the Board of Selectmen.

5. The parties acknowledge that the CONTRACTOR is an independent contractor and not an employee of the TOWN. The CONTRACTOR shall not be entitled to any employment fringe benefits to which TOWN employees are entitled.

6. To the extent permitted by the CONTRACTOR'S professional liabilities and/or liability insurance, the CONTRACTOR agrees to indemnify and hold harmless the TOWN and its agents, officers and employees from any losses, claims or costs, of whatever kind or nature, suffered by the TOWN or any third party which result from, or are related to, the performance (or failure to perform) by the CONTRACTOR of Services pursuant to this Agreement. The CONTRACTOR shall obtain and maintain such policies of insurance, written by companies licensed to do business in Massachusetts, as may be set forth on Exhibit A and shall add the TOWN as an additional insured thereunder.

IN WITNESS THEREOF:

CONTRACTOR
NAME

TOWN OF NANTUCKET:

Christopher E. Calnan, PE
Vice President

C. Elizabeth Gibson
Town Manager

DATE: _____

DATE: _____

FEIN/SSN:

Department Org./Obj. Code:

Purchase Order # _____

As to the Availability of Funds:

Brian E. Turbitt Finance Director or
Bob Dickinson – Assistant Town Accountant

Date

EXHIBIT A

1. Description of Services:

Provide professional transportation services associated with the development of a mixed-use development project located on Old South Road, approximately between Lover's Lane and Daffodil Lane (the Project). The objective of our services is to provide a peer review of the Traffic Impact and Access Study (TIAS) prepared for the Project by Ron Muller & Associates (RMA), dated August 26, 2016.

Task 1 Technical Review and Documentation

- a) Our technical review of the project will include the following:
- b) Discuss project with Nantucket Planning staff to determine what transportation concerns the staff and the Planning Board may have with regards to this application. Conduct a site visit and meet with Nantucket Planning staff if determined to be necessary.
- c) Conduct a review of the applicant's Traffic Impact and Access Study.
- d) Conduct a review of the proposed Site Plans from a traffic, bicycle and pedestrian circulation perspective.
- e) Prepare draft comments on the traffic assessment and site plans and provide copies of the draft comments to the Nantucket Planning staff, and subsequently the project applicant.
- f) Meet with the applicant's consultant to review draft comments (meeting assumed to occur at TT offices in Marlborough, MA).
- g) Review any supplemental information that may be prepared by the applicant in response to our draft comments and discuss with Nantucket Planning staff.
- h) Conduct follow-up discussions with the applicant's consultant (if necessary).
- i) Prepare Final Review letter for submittal to the Nantucket Planning Board.

Task 2 Meetings

- a) Tetra Tech will prepare for and attend a Nantucket Planning Board to present the findings of our review, as directed by the Client.

2. Other payment terms: 100% payment upon completion of work, submission of CONTRACTOR'S invoice and approval of invoice by the TOWN.

3. Insurance Required (if any):

- (a) Workers' Compensation, covering the obligations of the CONTRACTOR in accordance with applicable Workers' Compensation or Benefits laws.
- (b) Commercial General Liability Insurance on an occurrence basis with a combined single limit of not less than \$1 million. Coverage is to include premises and operations, coverage for liability of subcontractors. The policy shall contain an endorsement stating that the aggregate limits will apply separately to the work being performed under this Agreement.
- (c) Automobile Liability Insurance of not less than \$1 million combined single limit covering

owned, hired and non-hired vehicle use.

- (d) Errors and Omissions Insurance of not less than \$1 million per claim.
- (e) Such additional insurance as may be required to be carried by the CONTRACTOR by law.

EXHIBIT B

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Federal Employer Identification Number

By: Christopher E. Calnan, PE, Vice President
TetraTech, Inc.

Date:

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

By: Christopher E. Calnan, PE, Vice President
TetraTech, Inc.

Date:

1

Walter Mirrione
323 Manley Street
West Bridgewater, MA 02379
(508) 510-5727 Tel
(508) 857-0751 Fax
wmirrione@mirrionelaw.com

August 22, 2016

Via Electronic Mail to lsnell@nantucket-ma.gov
Via First Class Mail

Barry G. Rector, Chairman
Nantucket Planning Board
2 Fairgrounds Road
Nantucket, MA 02554

Re: Definitive Subdivision and Special Permit Applications of Richmond Great Point Development LLC (“Applicant”) relative to Property located off Old South Road, Nantucket, MA (“Richmond Project”)

Dear Chairman Rector:

This office represents the Naushop Homeowners Association Trust (hereinafter “Naushop”), a trust representing the individual owners and residents of the residential community containing approximately 196 single family homes directly across Old South Road from the Richmond Project. Our office and Naushop have reviewed the June 2016 definitive subdivision and special permit applications of the Applicant. Based upon that review, Naushop has significant concerns with the impacts of the Richmond Project on its property interests and is therefore closely monitoring the Planning Board’s (“Board”) review of the Richmond Project. Our client will continue to attend any and all public hearings and public meetings and will advise both the Applicant and the Board of any ongoing concerns so that both will have an opportunity to address same. Our initial review reveals the following.

Application No. 1 (Retail Buildings):

The first application that we reviewed seeks approval of a major commercial development special permit and major site plan review to allow for the construction of five “retail “line” buildings” located on five contiguous lots (\pm 2.39 total acres) with frontage on Old South Road beginning just east of Lovers Lane. The buildings are proposed to be one story and are integrated in the sense that the parking, travel ways, vehicular access, drainage, sewer, water, etc. are all interconnected to varying degrees. The size of the buildings are proposed as 5,170 gross square feet, 3,235 gross square feet, 2,400 gross square feet, 1,500 gross square feet and

Barry G. Rector, Chairman
Nantucket Planning Board
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3,200 gross square feet. Additionally, there is proposed a 1,200 square foot outdoor dining area adjacent to the 3,200 gross square feet building.

The location of the outdoor dining facility causes significant concern to Naushop due to the proximity of same in relation to the Naushop property. In order to minimize the impact, Naushop requests that the outdoor dining facility be relocated further west to the retail liner building located closest to Lovers Lane. Additionally, Naushop requests that the Board including consider the following conditions in any special permit that it may grant relative to the outdoor dining:

(a) Hours of operation be restricted as follows:

(i) Winter Season (Defined as November 1 through March 31)

Monday through Sunday: 11:00 AM to 9:00 PM

(ii) Summer Season (Defined as April 1 through October 31)

Monday through Thursday: 11:00 AM to 9:00 PM

Friday and Saturday: 11:00 AM to 10:00 PM

Sunday: 11:00 AM to 9:00 PM

- (b) Prohibit live entertainment, mechanical entertainment and so-called piped out music;
- (c) Limit use of the area to patrons being served food such that there is no use of the area for the consumption of alcoholic beverages outdoors;
- (d) Require that any outside lighting be installed so as not to interfere with the use and enjoyment of the nearby Naushop property; and
- (e) Limit the number of patrons in the area to no more than twenty-five.

Application No. 2 (Meadows II Rental Apartments):

The second application reviewed seeks approval of a special permit to create a "Workforce Rental Community" located on the southerly side of Old South Road southeast of the site referenced in Application No. 1. The project will be accessed from the "Primary Project Entrance" as shown on the Plan which is located directly across from Naushop. Specifically, the proposal includes 225 units constructed in 40 two-story structures scattered across \pm 14 acres. The proposal includes on-site parking that exceeds the requirements of the Bylaw and will be serviced by new infrastructure (water, sewer, drainage, lighting, landscaping, etc.). It includes a mix of studio units (22), one bedroom units (87), two bedroom units (94) and three bedroom units (22) which creates a total of 363 bedrooms. Fifty-six of those units, or 25%, will be so

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called affordable units, restricted in perpetuity, in accordance with the requirements of the Massachusetts Department of Housing and Community Development. All fifty-six of the units will qualify for Nantucket's Subsidized Housing Inventory List. These units will count towards the State requirement that 10% of the housing stock be qualified affordable housing units.

Naushop has no specific concerns with the rental apartments at this time.

Application No. 3 (Sandpipe Place – Single Family Lots):

The third application seeks a special permit and subdivision approval to create "Workforce Homeownership Housing" located on the southerly side of Old South Road immediately east of the site referenced in Application No. 2. Like the project described in Application No. 2, this project will also be accessed from the "Primary Project Entrance" which is located directly across from Naushop. This proposal seeks to create 100 single family house lots on \pm 17 acres of land along with the necessary infrastructure (water, sewer, drainage, lighting, landscaping, etc.) to service the project. Lot sizes range from a small of 4,000 square feet to a large of 4,500 square feet. Twenty-five of the lots, or 25%, will contain so called affordable homes, restricted in perpetuity, in accordance with the requirements of the Massachusetts Department of Housing and Community Development. All twenty-five of the homes will qualify for Nantucket's Subsidized Housing Inventory List. These homes will count towards the State requirement that 10% of the housing stock be qualified affordable housing units. The project also include a "community focal point" adjacent to the main entrance and shown on the plan submitted as "Community Focal Point/Meeting House and Park". This will be community space including a meeting house, barn, outdoor common area with patio and stage area as well as other landscaping improvements.

The location of the Community Focal Point/Meeting House and Park, as well as the use thereof, causes significant concern to Naushop due to the proximity of same in relation to the Naushop property. In order to minimize the impacts, Naushop requests that the outdoor dining facility be relocated further south into the Richmond Project. Lastly, Naushop requests that the Board consider including the following conditions in any special permit that it grants relative to the Community Focal Point/Meeting House and Park:

- (a) Hours of operation be restricted to Sunday thru Wednesday - 11:00 AM to 9:00 PM and Thursday thru Saturday - 9:00 AM to 10:00 PM;
- (b) Prohibit live entertainment, mechanical entertainment and so-called piped out music;
- (c) Limit use of the area to those residents and guests of Sandpiper Place. General public assembly is prohibited;
- (d) Require that any outside lighting be installed so as not to interfere with the use and enjoyment of the nearby Naushop property;

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- (e) Limit the number of occupants in the area to the less or 100 persons or as otherwise restricted by law;
- (f) Install significant live screening on the Richmond Project property to buffer the impacts of this area; and
- (g) Prohibit the consumption of alcoholic beverages outdoors.

Application No. 4 (Old South Road Crossing):

The fourth application seeks definitive subdivision approval for the series of roads and lots located immediately south of the land that makes up Application No. 1. The proposal is somewhat administrative in that there is no construction of structures proposed on this area of the Richmond Property. The primary objective of the subdivision is to reconfigure, re-route, and improve the engineering design, safety, and conditions of portions of the existing Nancy Ann Lane and Greglen Avenue roadways to better accommodate the proposals set forth above. This includes straightening, widening and improving the existing roadway layouts and the slight reconfiguration of fifteen existing lots (most of which are vacant and 13 of which appear to be owned by Richmond). Naushop has no specific concerns with this application at this time.

General Comments:

In addition to the above areas of concern, Naushop has the following general but significant areas of concern with the impacts of the overall Richmond Project.

Notwithstanding, the long term proposal to mitigate traffic impacts as set forth in the Old South Road Corridor Study, Naushop is concerned that the Richmond Project will cause significant traffic issues in this area that will impact Naushop's quality of living. Any mitigation measures offered by implementation of the aforesaid Study, will not be achieved in the near future, therefore, Naushop requests that the Board and the Applicant consider short term traffic mitigation including improvements to the roadway system located south of the Richmond Project. One specific improvement Naushop believes to be necessary is the widening of Old South Road up to Naushop's entrance at Goldfinch Drive East. The agreed upon mitigation should be completed prior to the issuance of any certificate of occupancy relative to the Richmond Project.

Additionally, Naushop is concerned with the impact of the Richmond Project on the municipal sewer system. These concerns are magnified by delays in finalizing the Sewer Connection and Dedication Agreement with Richmond Great Point Development, LLC. The lack of agreement has stalled the necessary implantation of the upgrades to the South Valley lift station which serves the area, including Naushop. Notwithstanding the lack of Agreement, the Town has allowed the Applicant to connect their new sewer main to the lift station in the area thus adding additional flow to an already troubled system. Naushop requests that the Board

Barry G. Rector, Chairman
Nantucket Planning Board
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include a condition in any permits issued that the aforesaid Agreement be finalized and the contemplated upgrades be performed prior to issuance of any building permits at the Richmond Project.

Our review of the Richmond Project reveals that the resulting impacts therefrom on the Naushop community will be varied and significant. Zoning regulations are designed to, amongst other things, lessen congestion in the streets, conserve health, secure safety, provide adequate light and air, prevent overcrowding of land, avoid undue concentration of land and facilitate adequate provision of water supply, drainage and sewerage facilities. It is our opinion that the proposed Richmond Project will not accomplish the aforesaid and this will have significant negative impacts on Naushop that can only be mitigated by addressing the concerns raised herein. Accordingly, Naushop requests that the Board and the Applicant give serious consideration to our client's concerns and proposals to address same so as to mitigate the impacts on the Naushop community.

Your consideration of this matter is greatly appreciated. Should you have any questions or comments, please do not hesitate to contact the undersigned. We look forward to being involved in future public meetings.

Sincerely,

MIRRIONE LAW GROUP, LLC



Walter Mirrione, Esq

cc: Ken Gentner Via Electronic Mail
kgentner@optonline.net



August 24, 2016

**BY ELECTRONIC MAIL: CAncero@nantucket-ma.gov
AND FIRST CLASS MAIL**

Nantucket Planning Board
Town of Nantucket
2 Fairgrounds Road
Nantucket, MA 02554

Re: Development Applications / Richmond Great Point Development, LLC
Off Old South Road, Nantucket

Dear Members of the Planning Board:

As you may recall, this firm represents the Cedar Crest III Homeowners Association Trust (“CCHAT”), the legal organization of homeowners within the Cedar Crest III subdivision comprised of homes on Mayflower Circle, Daffodil Lane and Evergreen Way on Nantucket, which abuts the 100-lot “Sandpiper Place” residential subdivision proposed by Richmond Great Point Development, LLC (the “Project” and the “Developer” or “Richmond”).

At the Board’s hearing on July 11, 2016, one of the members had asked whether the Declaration of Restrictions and Easements filed with the Nantucket Registry of Deeds as Document Number 91664, which I referenced at the hearing and in my previous letter dated July 11, 2016, was still enforceable. Certain land use restrictions expire by operation of law (G.L. c. 184, §27) thirty years after they are imposed, subject to the timely recording of extensions. The Declaration here was executed on July 24, 2000 and recorded shortly thereafter, and therefore we are still well within the thirty-year initial enforceability period. Moreover, the Declaration itself states a term of thirty years (§5.05), with the option for extensions of successive periods of twenty years, consistent with the statute. Therefore, the Declaration is currently enforceable.

I would also like to stress the importance of insisting upon the submission of a “traffic impact and access study” (“TIAS”) by the Developer for the Sandpiper Place special permit application (#43-16) and the other Richmond applications pending before you (#40-16, #39-16, #7988, and #7918). Through these applications, the Developer is proposing a series of connected development projects that will result in the most significant commercial and residential growth on Nantucket in years, and which will inevitably cause a substantial increase in motor vehicle, bicycle and pedestrian traffic on Old South Road and the local roads that intersect Old South Road between downtown and the airport. This stretch of Old South Road is

already congested during peak hours of the day, and has gotten busier with recent residential development growth.

I have personally spoken to representatives of Richmond about this issue, and they have so far demurred, insisting that a traffic study will be produced at some later date, without any firm commitment. Perhaps Richmond intends to try to delay the presentation of its TIAS until after it obtains special permits for its projects. Clearly, this would be to Richmond's advantage, as any traffic study will almost certainly shine a bright light on a major infrastructure challenge that cannot be ignored. If consideration of traffic issues is postponed until after the discretionary permits are issued, Richmond will have more leverage to resist contributing to the infrastructure costs of the inevitable widening, signaling and other upgrades to Old South Road and other neighborhood streets that will be necessary to accommodate the increased traffic and new traffic patterns. It's also possible that a review of a TIAS would lead to the conclusion that the existing roadway network simply cannot be expanded or improved so as to adequately mitigate the impacts and accommodate the proposed growth at the density proposed by Richmond, in which case a smaller or less-dense set of projects may be more appropriate.

For these reasons, the Board should not close its hearing and not issue any special permits until Richmond has submitted a complete TIAS using accepted engineering practices and Massachusetts Department of Transportation (MassDOT) traffic analysis procedures. The Developer's TIAS should then be thoroughly scrutinized by an independent traffic peer review engineer retained by the Planning Board, with advice given to the Board concerning whether the existing roadways can be expanded and improved to accommodate the increased traffic, and if so, how and at what expense.

Importantly, it would be perilous for the Board to delay its consideration of these issues until the subsequent Site Plan Review process. While I recognize that Nantucket's Site Plan Review bylaw, §139-23, gives the Planning Board authority to evaluate the adequacy of town services and infrastructure, and to deny a site plan review application if traffic management arrangements are inadequate, this legal framework is at odds with the state Zoning Act and most of the decisional law that has evolved under the Act. Specifically, the Supreme Judicial Court has repeatedly emphasized the distinction between special permits and site plan review, observing that the later can only be used to shape a project, not deny it. See, Presidential Ins. Co. of Am. v. Bd. of Appeals of Westwood, 23 Mass. App. Ct. 278 (1986). Moreover, a town's site plan review authority does not extend to "issues of density," which are directly relevant here if Richmond's projects create so much traffic that no improvements to Old South Road could possibly be made to adequately accommodate the growth. See, Castle Hill Apartments Ltd. Partnership v. Planning Bd. of Holyoke, 65 Mass. App. Ct. 840, 847 (2006). See also, M. Bobrowski, *Massachusetts Land Use and Planning Law*, §9.07 (3rd Ed. 2011) (copy enclosed).

Thus, the Board risks having a site plan review decision vacated by the courts if its decisionmaking exceeds its legal authority. In contrast, the Board would be on much safer ground to impose strict conditions or to deny a special permit on traffic grounds. If the Board has any doubt as to whether to consider traffic impact issues during this special permit proceeding

versus the anticipated site plan review proceeding, I strongly recommend that it seek guidance from Town Counsel. It goes without saying that traffic is of utmost concern to the residents of the Cedar Crest III Homeowners Association.

Thank you for your attention to this matter.

Very truly yours,


Daniel C. Hill

Encs.

cc: Andrew Burek, Esq.
Clients

ASPEN PUBLISHERS

**HANDBOOK OF
MASSACHUSETTS
LAND USE AND
PLANNING LAW**

**Zoning, Subdivision Control,
and Nonzoning Alternatives**

Third Edition

Mark Bobrowski



Wolters Kluwer

Law & Business

It is the intent of the subdivision control law that any subdivision plan filed with the planning board shall receive the approval of such board if such plan conforms to the recommendation of the board of health and to the reasonable rules and regulations of the planning board pertaining to the subdivisions of land. . . .

For a generation, the MRD model has been pervasively used to mandate cluster development or to exact affordable housing. Any municipal ordinance or bylaw *requiring* subdivisions of a certain number of lots to obtain a special permit for these purposes is suspect after *Wall Street*. However, regulations offering “increases in the permissible density of population or intensity of a particular use” by voluntary application for a special permit are unaffected by *Wall Street*.¹¹³

§ 9.07 SITE PLAN REVIEW

Site plan review establishes criteria for the layout, scale, appearance, safety, and environmental impacts of commercial or industrial development in an attempt to “fit” larger projects into the community.¹¹⁴ The Zoning Act contains no reference to site plan review.¹¹⁵ It is entirely the creature of the cities and towns and the judiciary. Because site plan review is often confused with or attached to the special permit process,¹¹⁶ discussion of the device is appropriate in this chapter.

The Supreme Judicial Court defined its understanding of site plan review as “regulation of a use rather than its prohibition . . . contemplating primarily the imposition for the public protection of reasonable terms and conditions.”¹¹⁷ The Supreme Judicial Court has repeatedly focused on this pronouncement to distinguish site plan review from the special permit process.¹¹⁸ Site plan review can only be used to shape a project.¹¹⁹ On the other hand, in the special permit process, the full range of discretion is available to the granting authority.¹²⁰

¹¹³ See § 9.06.

¹¹⁴ Site plan approval usually focuses on parking, traffic, drainage, roadway construction, signage, utilities, screening, lighting, and other aspects of the proposal to arrive at the best possible design for the location. In the usual format, site plan approval must be obtained before the building or special permit is issued. For a more detailed discussion of site plan review, see Mark Bobrowski, *Recent Developments in Community Growth Control*, 73 Mass. L. Rev. 36 (1988).

¹¹⁵ However, the concept is endorsed in the DCA Report.

¹¹⁶ See, e.g., *Bruno v. Board of Appeals of Wrentham*, 62 Mass. App. Ct. 527, 534-535 (2004).

¹¹⁷ *Y. D. Dugout v. Board of Appeals of Canton*, 357 Mass. 25, 31 (1970).

¹¹⁸ See *Prudential Ins. Co. of Am. v. Board of Appeals of Westwood*, 23 Mass. App. Ct. 278 (1986); *Auburn v. Planning Bd. of Dover*, 12 Mass. App. Ct. 998 (1981).

¹¹⁹ However, this power does not extend to “issues of density” which were previously resolved “in a legislative sense” when the city or town enacted the ordinance or bylaw permitting a certain density by right. *Castle Hill Apartments Ltd. P’ship v. Planning Bd. of Holyoke*, 65 Mass. App. Ct. 840, 847 (2006).

¹²⁰ See § 9.04.

Conceptually, uses or structures must be authorized by either a special permit or a building permit.¹²¹ Site plan review operates in conjunction with one of these two devices. It is important to identify the link between site plan review and one of these mechanisms because the nexus determines the procedures for appeal of adverse decisions.

Site plan review in conjunction with a special permit application is the earliest version of the device and remains quite common.¹²² Generally, any use requiring a special permit also requires review of a site plan. The site plan ostensibly serves to provide detailed information to the granting authority on aspects of the proposed development. The leading case of *Y. D. Dugout v. Board of Appeals of Canton*¹²³ found the process "in substance, . . . equivalent to permitting any commercial building construction . . . only upon special permit."¹²⁴ In *Auburn v. Planning Board of Dover*,¹²⁵ a bylaw provision required site plan approval for all buildings to be erected in a business district through issuance of a special permit.¹²⁶ The Court held that the "requirement that a site plan be approved before the issuance of a special permit does not impose impermissible restrictions on the allowed use."¹²⁷

Site plan review may also be attached to as-of-right uses. The process is used to impose reasonable conditions before the issuance of the building permit. In *Prudential Insurance Co. of America v. Board of Appeals of Westwood*,¹²⁸ the Court examined such a case.¹²⁹ Even though the plaintiff's proposed office buildings were a permitted use, the board of appeals denied site plan approval primarily because of traffic concerns raised by the project. The Appeals Court held that this result was contrary to *Y. D. Dugout*, which limited site plan review to "regulation of a use rather than its prohibition."¹³⁰

The Appeals Court has ruled that, unless the local ordinance or bylaw so requires, no written decision is required of the site plan review board,¹³¹ and the decision of the board may be made by simple majority vote, not the supermajority

¹²¹ See Mass. Gen. L. ch. 40A, §§ 7, 9. The variance procedure is not applicable, because it applies only to otherwise disallowed uses or structures. See Mass. Gen. L. ch. 40A, § 10.

¹²² See *Woods v. City of Newton*, 351 Mass. 98 (1966); *Coolidge v. Planning Bd. of North Andover*, 337 Mass. 648 (1958).

¹²³ 357 Mass. 25 (1970).

¹²⁴ *Y. D. Dugout*, 357 Mass. at 31.

¹²⁵ 12 Mass. App. Ct. 998 (1981).

¹²⁶ *Id.* Site plan approval was required "in order to ensure the most advantageous use of all properties within the . . . district and for the reasonable protection of the legitimate interests of adjoining property owners." Submitted site plans must satisfy nine criteria that are all concerned with proper and safe use of land.

¹²⁷ *Auburn*, 12 Mass. App. Ct. at 998.

¹²⁸ 23 Mass. App. Ct. 278 (1986).

¹²⁹ See also *Hallenborg v. Town Clerk of Billerica*, 360 Mass. 513 (1971); *Richardson v. Zoning Bd. of Appeals of Framingham*, 351 Mass. 372 (1966); *Salah v. Board of Appeals of Canton*, 2 Mass. App. Ct. 488 (1974).

¹³⁰ *Prudential*, 23 Mass. App. Ct. at 282.

¹³¹ *Bowen v. Board of Appeals of Franklin*, 36 Mass. App. Ct. 954, 955 (1994).

required for the issuance of a special permit.¹³² The powers of site plan review board were described by the Appeals Court in *Prudential*.¹³³ The Court held that such boards may: (1) reject a site plan that fails to furnish adequate information required by the bylaw; (2) impose reasonable conditions in connection with site plan approval (even at the expense of the applicant); and (3) reject a site plan that, “although proper in form, may be so intrusive on the needs of the public in one regulated aspect or another that rejection by the board would be tenable.”¹³⁴

[A] Problems

Notwithstanding *Prudential*'s clear statement of powers, site plan review remains a minefield for the unwary board or applicant.¹³⁵ Several problems persist and deserve the immediate attention of the Legislature.¹³⁶

First, there has been no decision detailing minimum procedural safeguards for site plan review. Virtually every decision has involved a bylaw that described minimum procedures or incorporated special permit procedures under Mass. Gen. L. ch. 40A, § 9.¹³⁷ Communities using site plan to shape as-of-right uses have sometimes relied on an informal process roughly equivalent to preliminary plan review under the Subdivision Control Act.¹³⁸ The review board conducts plan evaluation at a regular business meeting; notice is limited to observance of the Open Meeting Law.¹³⁹ This practice is consistent with procedures under the State

¹³² *Osberg v. Planning Bd. of Sturbridge*, 44 Mass. App. Ct. 56, 59 (1997).

¹³³ *Prudential*, 21 Mass. App. Ct. at 283-284 n.9. For a particularly instructive application of these standards, see *Gutierrez v. Town of Framingham*, Misc. Case No. (Land Ct. 1996).

¹³⁴ “This would typically be a case in which, despite best efforts, no form of reasonable conditions could be devised to satisfy the problem with the plan. . . .” *Id.* There has never been a case under this clause at the appellate level. However, the trial court is starting to see some action under clause (3) of *Prudential*. See, e.g., *New York Cellular v. Brugnoli*, Misc. Case No. 217445 and 263705 (Land Ct. 1999); *Wolcott-Marshall, Inc. v. Town of Rutland*, Misc. Case No. 246745 and 248309 (Land Ct. 1999). The Court found in either case no problem “so intractable that it could admit of no reasonable solution.” A site plan may also be denied where the use is not available as of right or by special permit under the local ordinance or bylaw. *Balzotti Corp. v. Baldassini*, Misc. Case No.: 260128 (Land Ct. 2002).

¹³⁵ For a thorough discussion of these problems, see Mark Bobrowski, *Reform of the Zoning Act: An Open Letter to the Legislature*, 34 Suffolk U. L. Rev. 19 (2000).

¹³⁶ The Appeals Court has, on two occasions, suggested that the Legislature ought to address the statutory silence regarding site plan review. See *Osberg v. Planning Bd. of Sturbridge*, 44 Mass. App. Ct. 56, 59 n.5 (1997); *Dufault v. Millenium Power Partners, L.P.*, 49 Mass. App. Ct. 137, 143 n.15 (2000).

¹³⁷ Section 9 requires special permit determinations to be made after a public hearing, duly advertised for two weeks prior to the hearing, with notice to abutters; the statute also requires a formal decision within 90 days of the hearing, with written findings.

¹³⁸ See Mass. Gen. L. ch. 41, § 81S, for preliminary plan procedures under the Subdivision Control Law.

¹³⁹ Interested parties make their views clear to the board through informal comments, written or oral, delivered at the meeting. The applicant interprets the site plan with the board, and notes the board's criticism and suggested modifications. The applicant and board may negotiate terms or conditions that might be imposed on the plan.

Building Code; the initial decision of the building inspector or building commissioner is not, under the regulations, the product of a formal hearing.¹⁴⁰

Since site plan review has been consistently characterized as functionally less than a special permit decision,¹⁴¹ the Massachusetts courts are likely to find that the same intricate procedural safeguards are unnecessary. Under *Prudential*, site plan review has been confirmed as regulation of a use, rather than its prohibition; a review board has only limited, if quasi-discretionary, powers. In effect, site plan review should not present such risks to the property rights of an applicant or abutters as to necessitate formal pre-deprivation hearings.¹⁴²

Second, how should a court reconcile conditions imposed in the course of site plan review with those imposed by the special permit-granting authority? Where the special permit-granting authority also serves as site plan review board, this result cannot occur. But where, hypothetically, the board of appeals serves as special permit-granting authority and the planning board sits in review of site plans, there is a potential for conflict.¹⁴³ Conditions imposed in the approval of the project by one board may run counter to those attached by the other. No appellate level decision reviews such a circumstance. Since site plan review powers have been clearly delineated to include the imposition of conditions,¹⁴⁴ it is unlikely that the special permit decision would supersede its counterpart. Given the usual tension between these two boards, the prospects for eventual judicial review of this quagmire are quite promising.

Third, does a site plan approval vest rights in light of zoning changes subsequently adopted by Town Meeting? In *Towermarc Canton Limited Partnership v. Town of Canton*,¹⁴⁵ a zoning amendment set a height limitation that seriously affected plaintiff's project, shown on an approved site plan. The Land Court held that the freeze provision of Mass. Gen. L. ch. 40A, § 6 does not apply to site plan

¹⁴⁰The Supreme Judicial Court has held, in *O'Donnell v. Board of Appeals of Billerica*, 349 Mass. 324 (1965), that code provisions functionally equivalent to 780 CMR 114.1 are not "in performance of judicature" and are not subject to procedural due process constraints at this point in the application trail. *Id.* at 327.

¹⁴¹See *Y.D. Dugout*, 357 Mass. at 31: "The board's authority to enforce compliance with (site plan review) is only to 'assure' protection of the public interest 'to a degree consistent with a reasonable use of the site for the purposes permitted or permissible by the regulations of the district. . . .'", *Prudential*, 23 Mass. App. Ct. at 282-283: "Thus, the judge was not required, as he would have been if a special permit had been in issue, simply to ascertain whether there was 'sufficient basis to warrant (the board's) decision.'"

¹⁴²See *Mathews v. Elridge*, 424 U.S. 319 (1976). See also *Massachusetts Outdoor Advertising Council v. Outdoor Advertising Bd.*, 9 Mass. App. Ct. 775, 789-792 (1980); *American Sign & Indicator Corp. v. Town of Framingham*, 9 Mass. App. Ct. 66, 71 (1980). Both decisions discuss due process concepts in decisions involving the licensing of signs.

¹⁴³This occurs fairly often. The reason may stem from the fact that planning boards were excluded from special permit granting authority until at least 1975, when amendments to Mass. Gen. L. ch. 40A first opened this door.

¹⁴⁴See § 9.07[B] for a discussion of *Prudential Ins. Co. of Am. v. Board of Appeals of Westwood*, 23 Mass. App. Ct. 278 (1986).

¹⁴⁵Misc. Case No. 131947 (Land Ct. 1989).

approval.¹⁴⁶ The absence of any reference to site plan approval in the freeze paragraphs of the statute was fatal to plaintiff's claim. Note, however, that this result is from a lower court.

Fourth, what is the effect of a constructive grant of site plan approval? Is the approval subject to modification, as in the case of a definitive subdivision plan?¹⁴⁷ There are no reported cases on this point.

Fifth, the lack of a clear appellate route is particularly troublesome. Mass. Gen. L. ch. 40A, § 17 establishes the appeal mechanism for all adjudicatory decisions made pursuant to the Zoning Act. Thus, the procedures for the appeal of a variance or a special permit are uniform. The spurned applicant or aggrieved person takes the matter directly to a court of competent jurisdiction, as set forth in the statute.¹⁴⁸

The appeal of a site plan review decision is not so predictable.¹⁴⁹ Several earlier decisions—notably, *Prudential*, *Auburn*, and *Y.D. Dugout*—mention, without comment, site plan decisions appealed directly to a § 17 Court.¹⁵⁰ However, in *McDonald's Corp. v. Town of Seekonk*,¹⁵¹ the Appeals Court reconfigured the appellate procedure for uses available as of right. The plaintiff was denied site plan approval by the planning board for a restaurant. Subsequently, the building inspector refused to issue the building permit, citing the action of the planning board. McDonald's appealed the planning board decision to the board of appeals but did not pursue that route, instead opting to appeal the site plan denial directly to Superior Court. The Appeals Court held that the proper appellate route was an appeal of the denied building permit to the board of appeals under Mass. Gen. L. ch. 40A, §§ 8 and 15, and dismissed the action for failure to exhaust administrative remedies.

In *Quincy v. Planning Board of Tewksbury*,¹⁵² the Appeals Court attempted a reconciliation of these alternatives. The local bylaw allowed certain retail uses as of right, subject to a site plan special permit issued by the planning board. The planning board denied the site plan special permit and the decision was appealed directly to Land Court. The jurisdictional question was raised for the first time at the Appeals Court. The Court observed that

¹⁴⁶ See § 5.02 for a discussion of freeze provisions.

¹⁴⁷ See § 5.04.

¹⁴⁸ Mass. Gen. L. ch. 40A, § 17 states that appeals may be filed in Land Court, Superior Court (in which the land concerned is situated), the Housing Court, if in Hampden County, or the District Court (in which the land concerned is situated), if in a county other than Hampden County, subject to the right of any party to file a claim for trial in the Superior Court within 25 days after service of the appeal is completed.

¹⁴⁹ The Appeals Court has ruled, however, that certiorari pursuant to Mass. Gen. L. ch. 249, § 4 was not the appropriate avenue for review when recourse was available under Mass. Gen. L. ch. § 40A, § 17. See *Cumberland Farms, Inc. v. Planning Bd. of Bourne*, 56 Mass. App. Ct. 605 (2002).

¹⁵⁰ Nor was the direct appeal of a site plan decision to a § 17 Court an issue in *Osberg*, decided in 1997, where the shopping center was available as of right.

¹⁵¹ 12 Mass. App. Ct. 351, 353 (1981).

¹⁵² 39 Mass. App. Ct. 17 (1995).

SPECIAL PERMITS

[s]ince the only decisions of the planning board that are appealable to the courts directly are those in which the planning board has acted as a special permit granting authority, the planning boards disapproval of the site plan had to be run through the board of appeals.¹⁵³

However, the Court further ruled that the “procedural framework [of the local bylaw], including the designation of the planning board as a special permit-granting authority, survived the . . . judgment intact.”¹⁵⁴ Hence, the court ruled that the denial of [this] site plan application constitutes a decision by the special permit-granting authority, which is directly appealable under G.L. c. 40A, § 17.”¹⁵⁵ Accordingly, where the local ordinance or bylaw makes the mistake of creating a site plan special permit, the review board should be treated as a special permit-granting authority for the purposes of appeal, and the matter should proceed to a § 17 Court. If the local ordinance or bylaw does not equate site plan review with a special permit, *Quincy* directs the appeal to the board of appeals.

The timing of this latter appeal to the board of appeals was established in *St. Botolph Citizens Committee, Inc. v. Boston Redevelopment Authority*.¹⁵⁶ The Supreme Judicial Court reviewed an “adequacy determination” by the Boston Redevelopment Authority, a process it equated to site plan review. The Court addressed the timing of an appeal for a use available as of right:

An approval after site plan review, when required in connection with the issuance of a building permit, is not a final action, but only a prerequisite to the grant of the permit. The Appeals Court has said, we think correctly, that the right of an aggrieved person to appeal a local planning board’s site plan decision arises only when the building permit for the proposed project is issued or denied by the building inspector.¹⁵⁷

In *Dufault v. Millenium Power Partners, L.P.*,¹⁵⁸ the Appeals Court ruled that the logic of *St. Botolph* applied to cities and towns governed by Chapter 40A.

Unfortunately, these decisions — *Quincy*, *St. Botolph*, and *Dufault* — only complicate the picture.¹⁵⁹ *Quincy* is limited to those circumstances in which the municipality has codified its misinterpretation of site plan review by equating it

¹⁵³ *Id.* at 20-21 (footnote omitted).

¹⁵⁴ *Id.* at 21.

¹⁵⁵ *Id.* at 22. In so ruling the Court guts the special permit granting authority. “[W]here the proposed use is one permitted by right the planning board may only apply substantive criteria consistent with *Prudential* . . . (i.e., it may impose reasonable terms and conditions on the proposed use, but it does not have discretionary power to deny the use).” *Id.* at 21. This is the same type of reduced special permit power the Appeals Court created in *Willard v. Board of Appeals of Orleans*, 25 Mass. App. Ct. 15, 21-22 (1987), in the review of proposed alterations to nonconforming single family homes, also with confusing results. See discussion in § 6.06.

¹⁵⁶ 429 Mass. 1 (1999).

¹⁵⁷ *Id.* at 9.

¹⁵⁸ 49 Mass. App. Ct. 137, 142 (2000).

¹⁵⁹ For more proof of the problem, see *Cumberland Farms, Inc. v. Planning Board of Bourne*, 67 Mass. App. Ct. 67 (2006).

with special permitting. A better result would have been to establish uniform procedures for site plan review, without regard to the vagaries of local draftsmanship. In ruling, when the use is as of right, that the planning board decision is appealable to the board of appeals, *St. Botolph* and *Dufault* have invented political and practical quagmires. The appellate route does not take into account the effect it will have on the intramural relations of these boards, particularly when the planning board's superior expertise in site design and layout are considered. Moreover, if the planning board decision is only appealable when the building permit is issued or denied by the building inspector, there are consequences for all sides. The applicant whose plan is denied or unreasonably conditioned must apply for a building permit with the knowledge that it will be denied; this is an expensive exercise in frustration. The person aggrieved by the approval of a site plan must monitor the building inspectors' office for the approval of the building permit, a task the Appeals Court has already ruled unfair.¹⁶⁰

The Legislature should address these deficiencies by taking, at a minimum, the following steps. First, site plan review should be defined in the Zoning Act in a manner consistent with the ruling in *Prudential*. Second, all site plan decisions should be reduced to a written form, and filed within 14 days in the office of the city or town clerk. Finally, appeals of site plan decisions should be taken, pursuant to Mass. Gen. L. ch. 40A, § 17, directly to a court of competent jurisdiction.¹⁶¹

[B] Scope of Review

In *Prudential*, the Appeals Court announced the scope of judicial review for site plan decisions for uses available as of right. Where the site plan is approved with conditions, the usual deference is granted. However, where site plan approval is denied, "[t]he judge . . . examines] the proposal to see if the . . . problem was so intractable that it could admit of no reasonable solution. Short of independently finding that, he was not obliged to give deference to the board's decision."¹⁶²

¹⁶⁰ *Vokes v. Avery W. Lovell, Inc.*, 18 Mass. App. Ct. 471, 482 n.17 (1984):

The problems arising out of an aggrieved party's being unaware of the issuance of a building permit still exist. The holder of a building permit has up to six months from the date of its issuance to commence work under the permit. See 780 Code of Mass. Regs. § 114.3 (1980) There is no public notice of the issuance of a building permit. A permit holder could keep the fact of the permit's issuance secret, refrain from beginning construction under the permit for the thirty-day period established by § 15, and thereby foreclose any further direct review of the legality of the permit's issuance.

¹⁶¹ In *Rehabilitative Servs., Inc. v. Planning Bd. of Sturbridge*, Case No.: 03-P-233 (App. Ct. 2004), the Appeals Court ruled that where the local bylaw provided for a direct appeal to Superior Court, this result was not inconsistent with the ruling in *St. Botolph*. See also *Castle Hill Apartments Ltd. P'ship v. Planning Bd. of Holyoke*, 65 Mass. App. Ct. 840, 846 (2006).

¹⁶² *Prudential Ins. Co. of Am. v. Board of Appeals of Westwood*, 23 Mass. App. Ct. 278, 283 (1986).

CHAPTER 9

SPECIAL PERMITS

§ 9.05 CONDITIONS

Page 286, add new note 72.1 after the word “conditions” in the first line of first paragraph:

... conditions,^{72.1} safeguards and limitations ...

^{72.1} In *Killoran v. Zoning Bd. of Appeals of Andover*, 80 Mass. App. Ct. 655 (2011), the Appeals Court ruled that a condition placed in a variance or special permit is not a “condition or restriction” subject to the thirty-year sunset clause limit in Mass. Gen. L. c. 184, § 23.

Page 286, add at end of note 77:

However, if renewal is not automatic, extension requests must be made prior to expiration of the term. *See Milton Legion Post No. 114 v. Alves*, 10 Misc. 427658 (Land Ct. 2011).

§ 9.07 SITE PLAN REVIEW

Page 294, add before Subsection [A]:

In *Jewish Cemetery Assoc. v. Board of Appeals of Wayland*, 08 MISC 386750 (Land Ct. 2010), the Land Court ushered in a new era of site plan review for religious, educational, and child care uses otherwise exempt pursuant to G.L. c. 40A, s. 3 “as long as such review is limited to reasonable regulations.” A long line of appellate cases, including *Bible Speaks*, *Tufts*, and *Petrucci*, held that site plan review could not be applied against a use protected by s. 3. *See also Bay Farm Montessori Academy, Inc. v. Town of Duxbury*, 08 MISC 329566 (Land Ct. 2008).

The Land Court’s position makes practical sense. If site plan review is limited to the imposition of “reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements” as per s. 3, the heavy lifting otherwise required of the building inspector as initial intake officer can be shifted to a board. When the building inspector denied the s. 3 use (as so often happened), the zoning board of appeals could reverse only with a supermajority. A limited site plan review would allow the matter to proceed by simple majority vote.

[A] Problems

Page 298, add at end of note 161:

In *Wildstar Farm, LLC v. Planning Board of Westwood*, 81 Mass. App. Ct. 1114 (2012) (published in table format), the Appeals Court examined a local by-law providing that an appeal of a site plan decision for an as of right use “shall be appealed in accordance with G.L. c. 40A, [§] 17[,] to a court of competent jurisdiction.” The court ruled this as a proper exercise of local authority because the “town has expressly instructed through its by-law that exhaustion will not be required.” See also *M&K Partners LLC v. Planning Board of Stoughton*, 14 MISC 481559 (Land Ct. 2014) and *Pandya v. Brushwood Nominee Trust*, 14 MISC 481861 (Land Ct. 2014) (appeal directly to court); *Bourne v. Sudbury Zoning Board of Appeals*, 10 MISC 434334 (Land Ct. 2014) (appeal of site plan decision by Board of Selectmen directly to ZBA as per local by-law consistent with *Wildstar*).

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1 3,235 SF RETAIL - SOUTHEAST PERSPECTIVE
P-00

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PRITON

RETAIL LINER BUILDINGS

DCML 13-362

The Richmond Company
SCHEMATIC DESIGN

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DRAWN BY: AWH CHECK BY:

ARCH D SCALE: NA

JULY 2016

3,235 SF RETAIL

P-00

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1 3,235 SF RETAIL - SOUTH ELEVATION
P-01

SCALE: 1/4" = 1'-0"



2 3,235 SF RETAIL - WEST ELEVATION
P-01

SCALE: 1/4" = 1'-0"

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3,235 SF RETAIL

P-01

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1 3,235 SF RETAIL - NORTH ELEVATION
P-02

SCALE: 1/4" = 1'-0"



2 3,235 SF RETAIL - EAST ELEVATION
P-02

SCALE: 1/4" = 1'-0"

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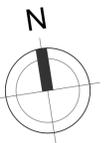
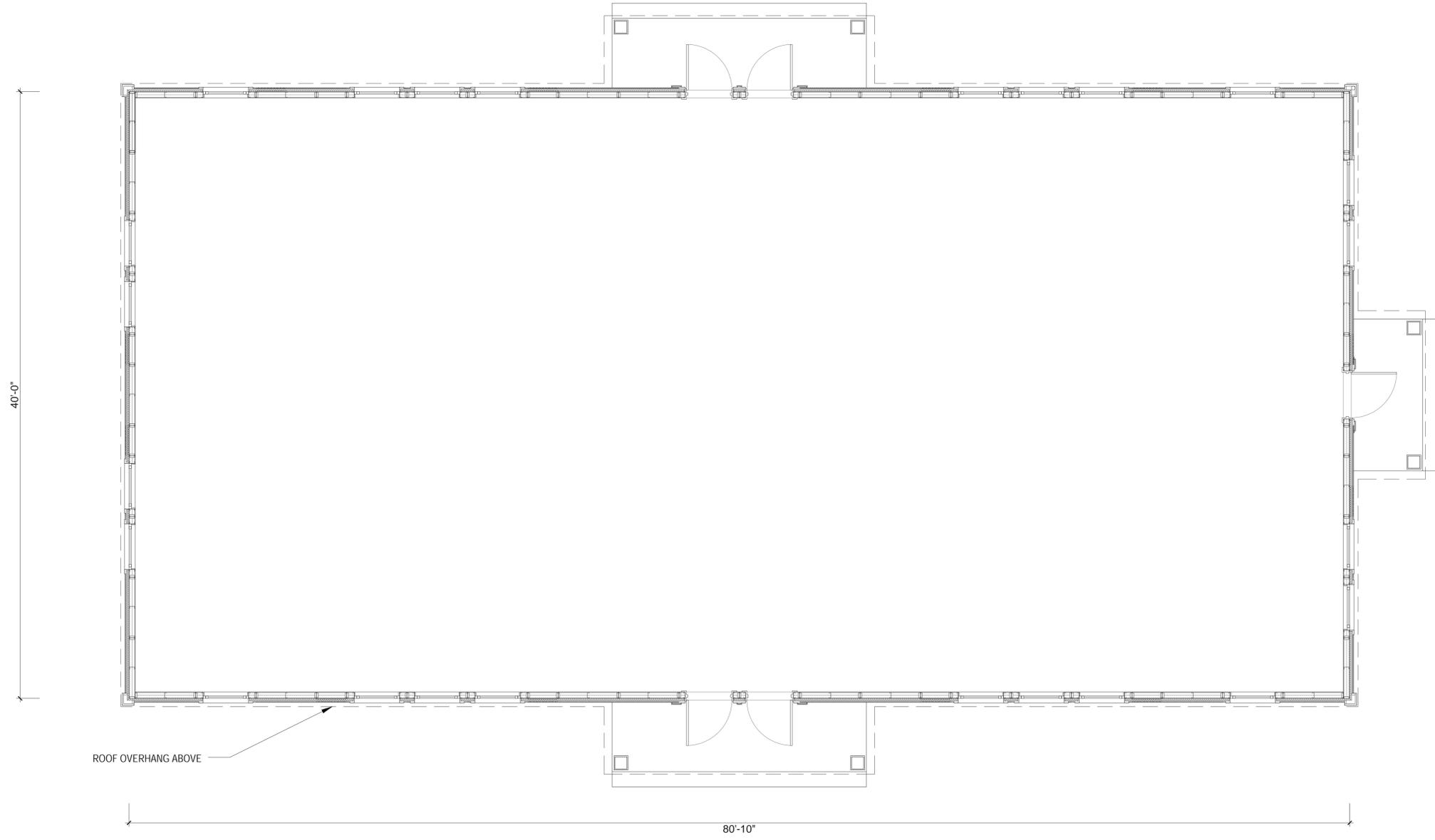
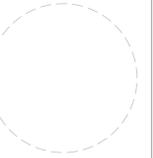
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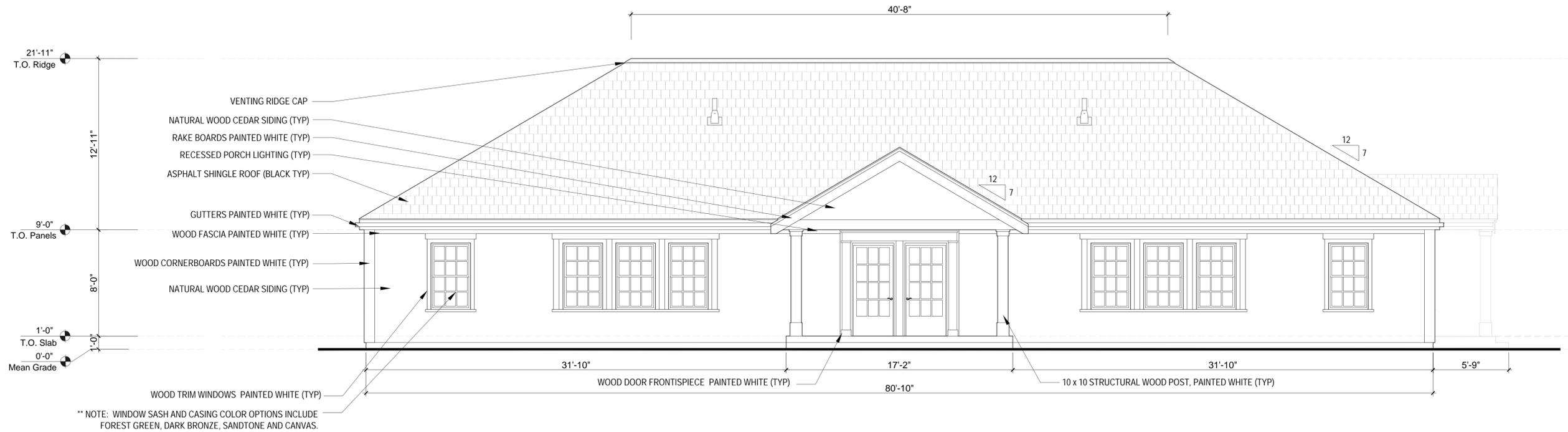
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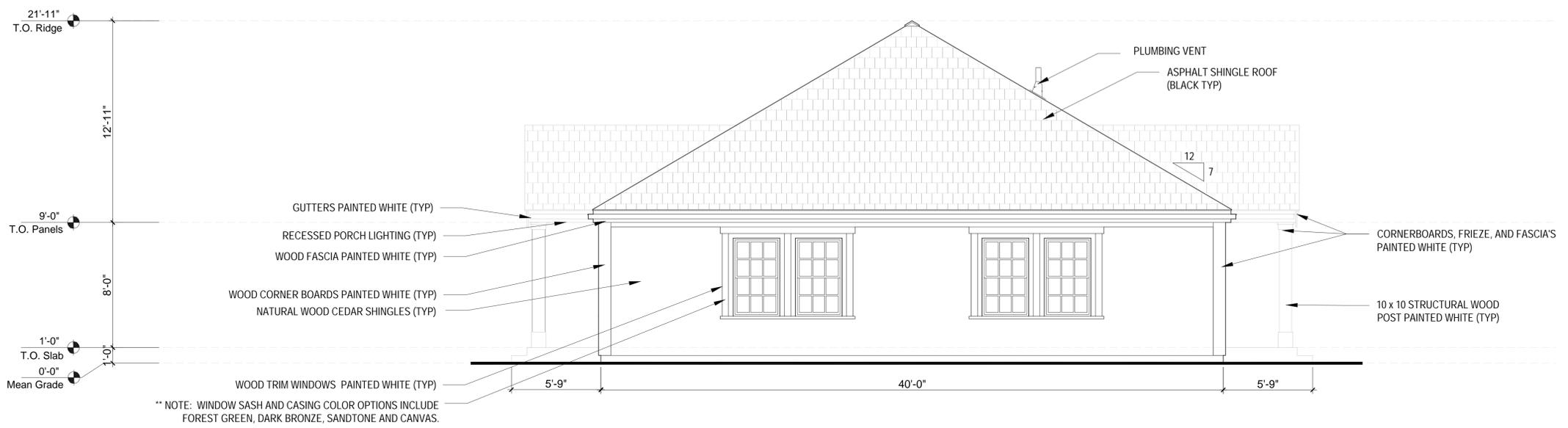
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A-01

SCALE: 1/4" = 1'-0"



2 3,235 SF RETAIL - WEST ELEVATION
A-01

SCALE: 1/4" = 1'-0"

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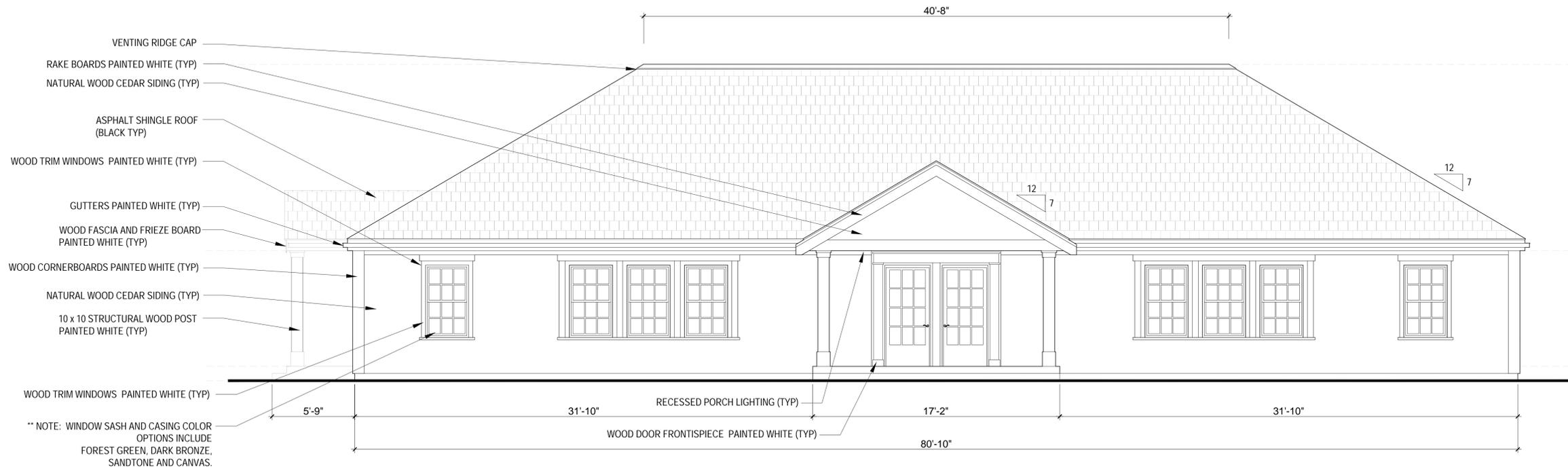
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1 3,235 SF RETAIL - NORTH ELEVATION
A-02

SCALE: 1/4" = 1'-0"

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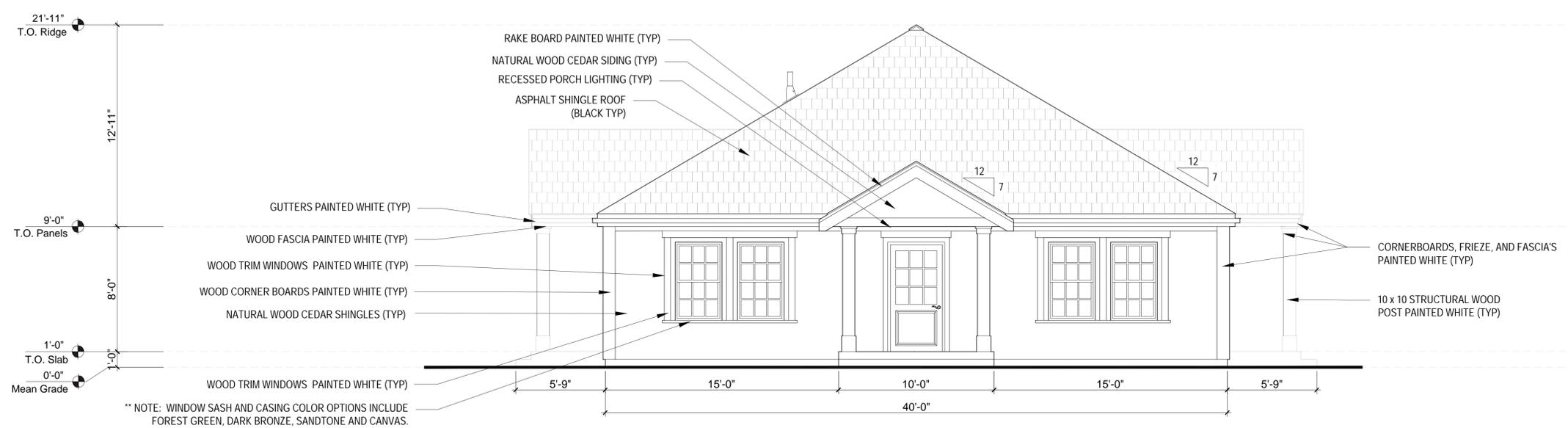
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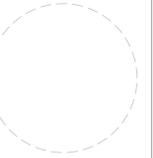
A-02

Project: Collaborator: Engineer: Architect: Stage: Client: Revision: Dwg Info: Date: Scale: Plan No.:



2 3,235 SF RETAIL - EAST ELEVATION
A-02

SCALE: 1/4" = 1'-0"



1 5,170 SF RETAIL - SOUTHEAST PERSPECTIVE
P-00

SCALE: NA

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Do not scale drawings: Contractors shall verify all dimensions prior to construction, and shall bring any discrepancies to the attention of the Architect.

The Contractor shall make no structural changes or substitutions without the written approval of the Architect.



200 Federal Street, Suite 435, Camden NJ 08103
Telephone: 856.479.9101 info@dcmae.com
Facsimile: 856.757.0082 www.DCM-AE.com

EDUARDO GUZMAN, R.A.

ROBERT BENSON, PE

Anton Levchenko
Andrew Hankermeyer



RETAIL
LINER BUILDINGS

DCML 13-362

The Richmond Company
SCHEMATIC DESIGN

- △ HDC COMMENTS
- △
- △
- △

DRAWN BY: AWH CHECK BY:

ARCH D NO SCALE

JULY 2016

5170 SF RETAIL

P-00

Project: Collaborator: Engineer: Architect: Stage: Client: Revisions: Dwg Info: Scale: Date: Plan: Plan No:



1
P-01 5,170 SF RETAIL - EAST ELEVATION

SCALE: 1/4" = 1'-0"



2
P-01 5,170 SF RETAIL - SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

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PRITON

RETAIL
LINER BUILDINGS

DCML 13-362

The Richmond Company

SCHEMATIC DESIGN

- △ HDC COMMENTS
- △
- △
- △

DRAWN BY: AWH CHECK BY:

ARCH D 1/4" = 1'-0"

JULY 2016

5170 SF RETAIL

P-01

Project: Collaborator: Engineer: Architect: Stage: Client: Revisions: Dwg Info: Date: Plan: Plan No.:



1 5,170 SF RETAIL - WEST ELEVATION
P-02

SCALE: 1/4" = 1'-0"



2 5,170 SF RETAIL - NORTH ELEVATION
P-02

SCALE: 1/4" = 1'-0"

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The Richmond Company

SCHEMATIC DESIGN

- △ HDC COMMENTS
- △
- △
- △

DRAWN BY: AWH CHECK BY:

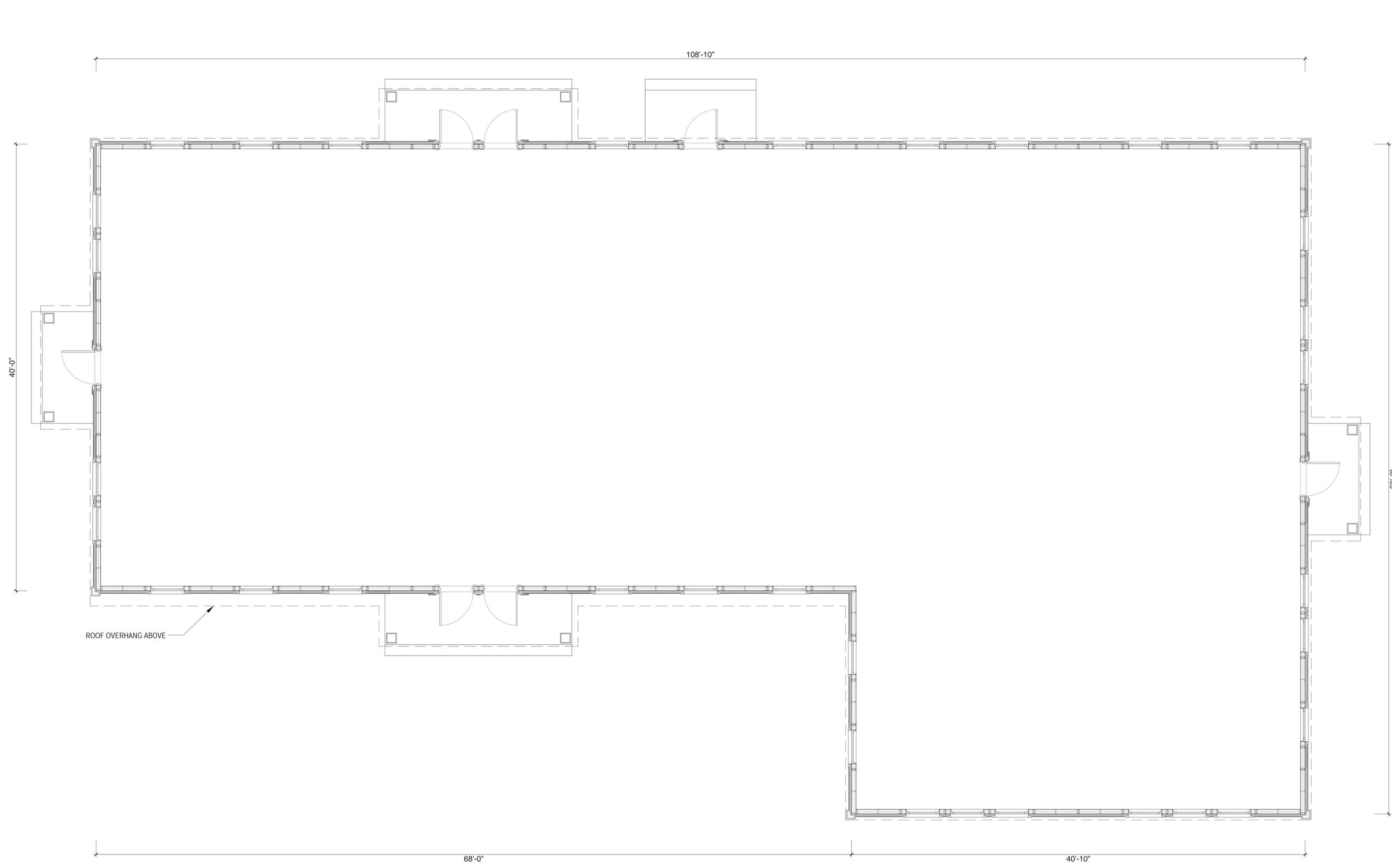
ARCH D 1/4" = 1'-0"

JULY 2016

5170 SF RETAIL

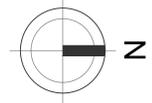
P-02

Project: Collaborator: Engineer: Architect: Stage: Client: Revisions: Dwg Info: Scale: Date: Plan: Plan No.:



1
A-00 5,170 SF RETAIL - PLAN

SCALE: 1/4" = 1'-0"



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Project: Collaborator: Engineer: Architect: EDUARDO GUZMAN, R.A.

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Anton Levchenko
Andrew Hankermeyer

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RETAIL
LINER BUILDINGS

DCML 13-362

The Richmond Company
SCHEMATIC DESIGN

Revision	Description
△	HDC COMMENTS
△	
△	
△	

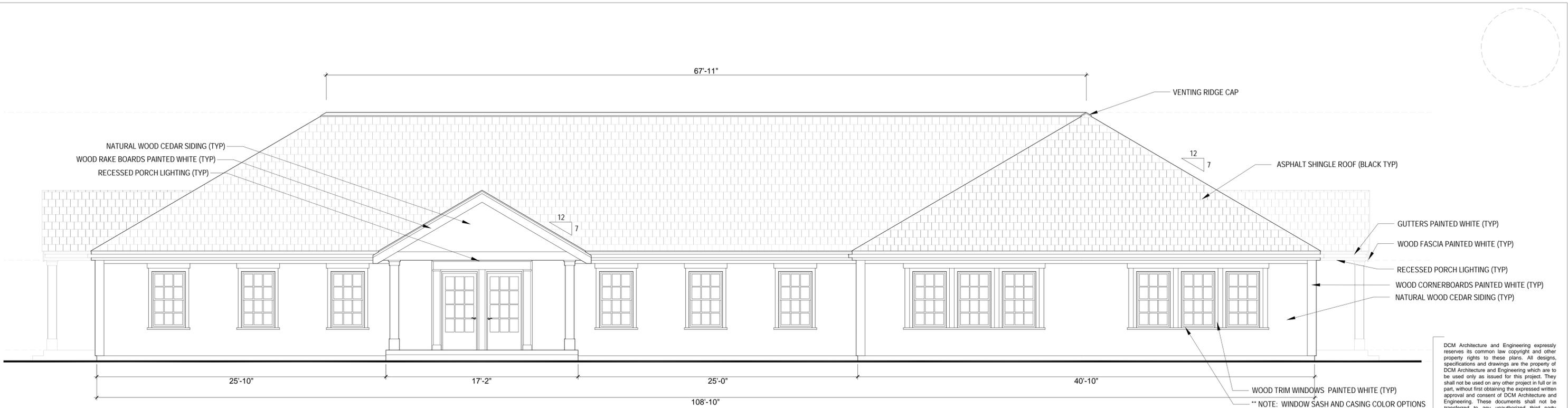
Drawn By: AWH Check By:

ARCH D 1/4" = 1'-0"

JULY 2016

5170 SF RETAIL

A-00



1 5,170 SF RETAIL - EAST ELEVATION
A-01

SCALE: 1/4" = 1'-0"

** NOTE: WINDOW SASH AND CASING COLOR OPTIONS INCLUDE FOREST GREEN, DARK BRONZE, SANDTONE AND CANVAS.

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Andrew Hankermeyer



RETAIL
LINER BUILDINGS

DCML 13-362

The Richmond Company
SCHEMATIC DESIGN

Revision:	Stage:	Client:
△	HDC COMMENTS	
△		
△		
△		

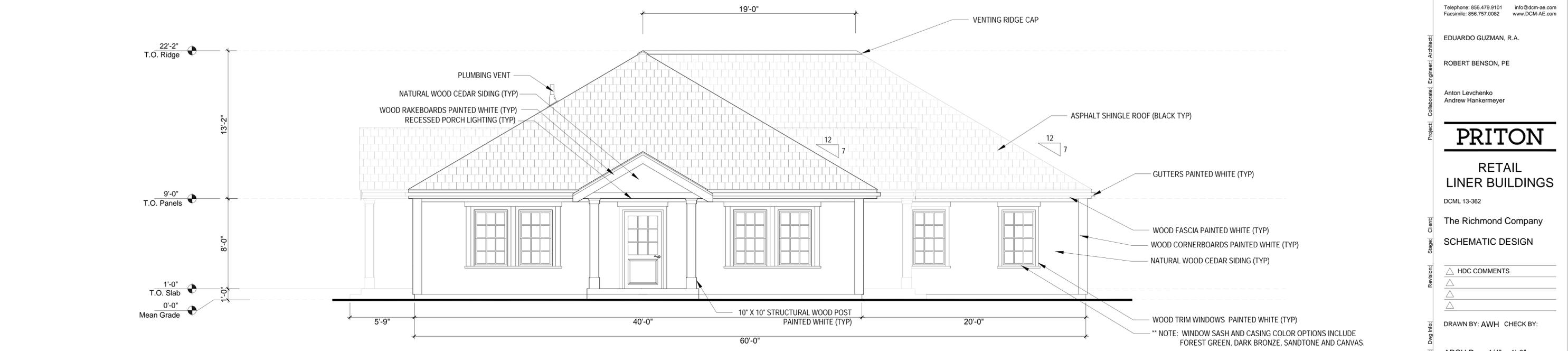
DRAWN BY: AWH CHECK BY:

ARCH D 1/4" = 1'-0"

JULY 2016

5170 SF RETAIL

A-01



2 5,170 SF RETAIL - SOUTH ELEVATION
A-01

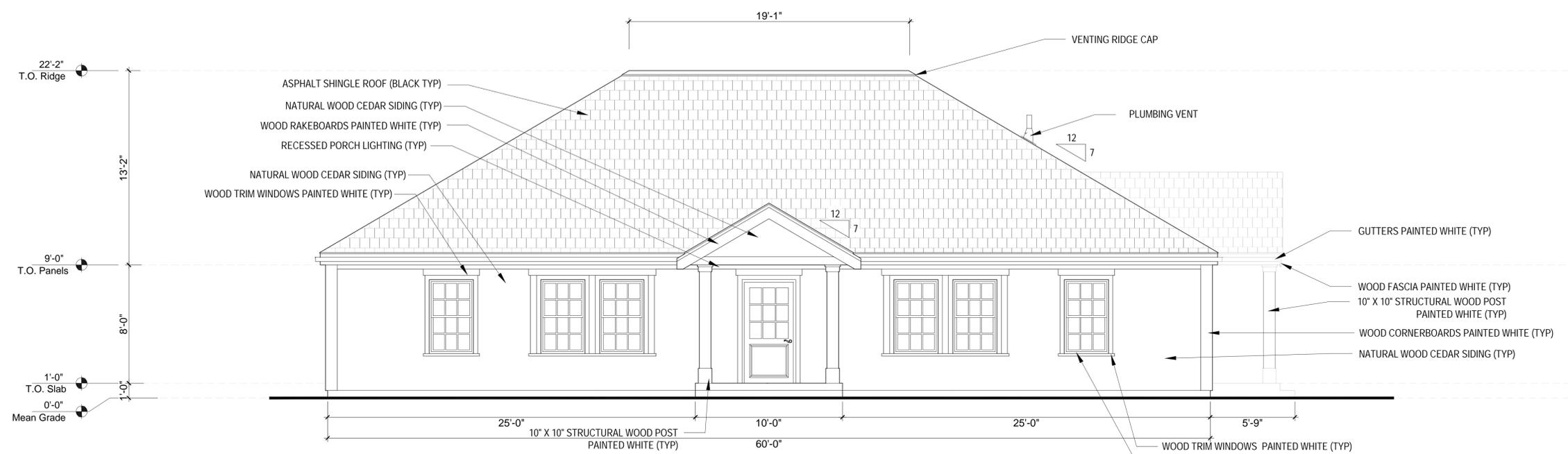
SCALE: 1/4" = 1'-0"

** NOTE: WINDOW SASH AND CASING COLOR OPTIONS INCLUDE FOREST GREEN, DARK BRONZE, SANDTONE AND CANVAS.



1 5,170 SF RETAIL - WEST ELEVATION
A-02

SCALE: 1/4" = 1'-0"



2 5,170 SF RETAIL - NORTH ELEVATION
A-02

SCALE: 1/4" = 1'-0"

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10 YEARS DCM
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EDUARDO GUZMAN, R.A.
 ROBERT BENSON, PE
 Anton Levchenko
 Andrew Hankermeyer

PRITON
 RETAIL LINER BUILDINGS
 DCML 13-362
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 SCHEMATIC DESIGN

△	HDC COMMENTS
△	
△	
△	

DRAWN BY: AWH CHECK BY:

ARCH D 1/4" = 1'-0"

JULY 2016

5170 SF RETAIL

A-02



NANTUCKET
EMORIUM

NANTUCKET
SEAFOOD

MARINE HOME
CENTER APTS.

VALERO & SONS
GARDEN CENTER

NAUSHOP RESIDENTIAL
COMMUNITY

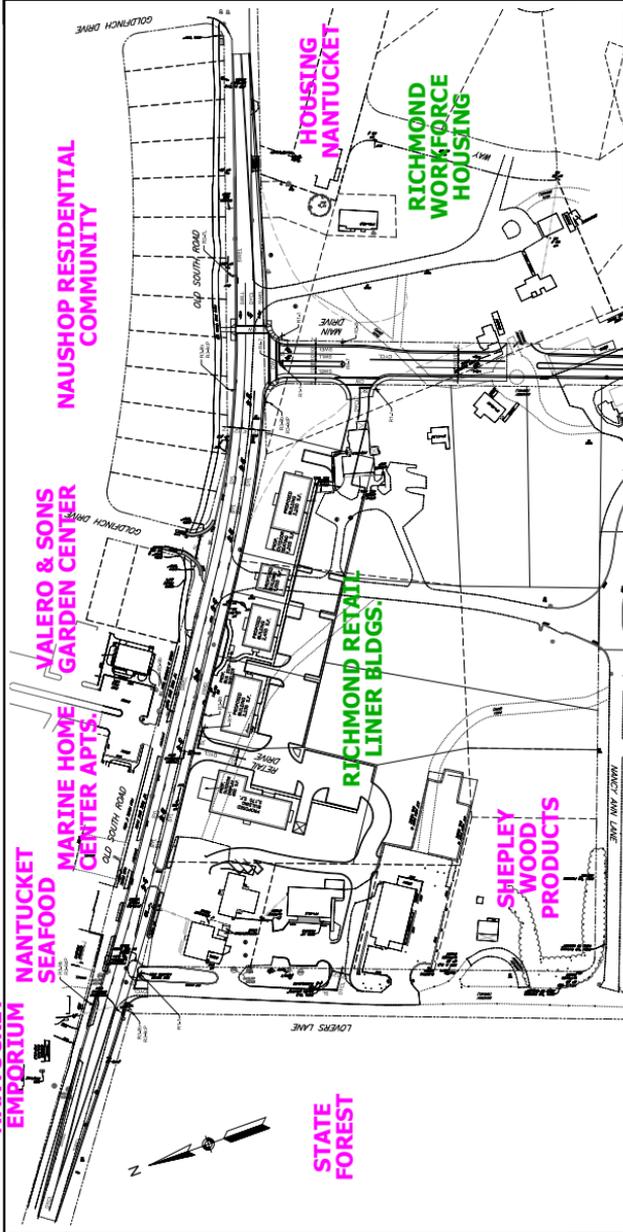
STATE
FOREST

SHEPLEY
WOOD
PRODUCTS

RICHMOND RETAIL
LINER BLDGS.

RICHMOND
WORKFORCE
HOUSING

HOUSING
NANTUCKET



SIGN LEGEND	
R1-1	
R1-2A	
R1-3	
R1-7	
R1-8	
R1-9	

PAVEMENT MARKING LEGEND	
DIVL	DOUBLE YELLOW CENTER LINE
SWEL	SOLID WHITE EDGE LINE
RYL	YELLOW CENTER LINE
RYL	BROKEN YELLOW LINE
SL	STOP LINE
SWL	SOLID WHITE LANE LINE
CVL	CROSSWALK



SCALE	DESIGNER	DATE
1" = 40'	ROB MILLER & ASSOCIATES	
Traffic Engineering and Consulting Services 200 WEST MAIN STREET, SUITE 200 NANTUCKET, MASSACHUSETTS 02543		
PROPOSED CENTER TURN LANE OLD SOUTH ROAD NANTUCKET, MASSACHUSETTS		
CONCEPTUAL IMPROVEMENT PLAN 8/18/16		
FIGURE 1		

SUBDIVISION PLAN OF LAND IN NANTUCKET

John J. Shugrue, Inc., Surveyors

March 12, 1986

16514-40

KEY SHEET
Sheet 1 of 6



SHEET	LOT INDEX
1	Lot 663
2	Lots 615 thru 626, and 628 thru 630
3	Lot 627 and 631 thru 638
4	Lots 639 thru 644 and 653 thru 661
5	Lots 648 thru 652 and Lot 664
6	Lots 645 thru 647 and Lot 662

Subdivision of the Remainder of Lot 402
Shown on Plan 16514-14
Filed with Cert. of Title No. 13923
Registry District of Nantucket County

Separate certificates of title may be issued for land
shown hereon and on Sheets 2 through 6 as Lots 615 through 664
By the Court.

Charles M. Mearns
Recorder

JAN. 8, 2001
JMF-041V

Copy of part of plan
filed in
LAND REGISTRATION OFFICE
JAN. 8, 2001
Scale of this plan 200 feet to an inch
Louis A. Moore, Engineer for Court

APPENDIX

Traffic Count and Vehicle Speed Data
Crash Rate Worksheets
Sight Line Plan and Profile
Traffic Growth and Background Development Worksheets
Trip Generation Worksheets
Capacity Analysis Methodology and Worksheets
Old South Road Conceptual Improvement Plan

Traffic Count and Vehicle Speed Data



PRECISION
D A T A
INDUSTRIES, LLC

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

S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 A
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Milestone Road From East			Nobadeer Famr Road From South			Milestone Road From West			Int. Total
	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	
08:00 AM	63	18	0	32	41	0	34	55	0	243
08:15 AM	65	31	0	38	39	0	26	44	0	243
08:30 AM	84	25	0	30	52	0	36	47	0	274
08:45 AM	67	31	0	30	41	0	47	60	0	276
Total	279	105	0	130	173	0	143	206	0	1036
09:00 AM	55	24	0	36	49	0	39	49	0	252
09:15 AM	68	27	0	26	32	0	36	50	0	239
09:30 AM	60	23	0	45	36	0	22	70	0	256
09:45 AM	56	19	0	25	22	0	30	55	0	207
Total	239	93	0	132	139	0	127	224	0	954
10:00 AM	77	25	0	37	31	0	26	57	0	253
10:15 AM	69	33	0	36	36	0	22	50	0	246
10:30 AM	60	21	0	24	35	0	18	60	0	218
10:45 AM	73	24	0	25	13	0	27	67	0	229
Total	279	103	0	122	115	0	93	234	0	946
Grand Total	797	301	0	384	427	0	363	664	0	2936
Apprch %	72.6	27.4	0	47.3	52.7	0	35.3	64.7	0	
Total %	27.1	10.3	0	13.1	14.5	0	12.4	22.6	0	
Cars	731	268	0	338	383	0	338	584	0	2642
% Cars	91.7	89	0	88	89.7	0	93.1	88	0	90
Heavy Vehicles	66	33	0	46	44	0	25	80	0	294
% Heavy Vehicles	8.3	11	0	12	10.3	0	6.9	12	0	10

Start Time	Milestone Road From East				Nobadeer Famr Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
08:15 AM	65	31	0	96	38	39	0	77	26	44	0	70	243
08:30 AM	84	25	0	109	30	52	0	82	36	47	0	83	274
08:45 AM	67	31	0	98	30	41	0	71	47	60	0	107	276
09:00 AM	55	24	0	79	36	49	0	85	39	49	0	88	252
Total Volume	271	111	0	382	134	181	0	315	148	200	0	348	1045
% App. Total	70.9	29.1	0		42.5	57.5	0		42.5	57.5	0		
PHF	.807	.895	.000	.876	.882	.870	.000	.926	.787	.833	.000	.813	.947
Cars	249	100	0	349	119	168	0	287	142	178	0	320	956
% Cars	91.9	90.1	0	91.4	88.8	92.8	0	91.1	95.9	89.0	0	92.0	91.5
Heavy Vehicles	22	11	0	33	15	13	0	28	6	22	0	28	89
% Heavy Vehicles	8.1	9.9	0	8.6	11.2	7.2	0	8.9	4.1	11.0	0	8.0	8.5

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:15 AM



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S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 A
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Milestone Road From East			Nobadeer Famr Road From South			Milestone Road From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	3	0	0	0	3
10:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	0	0	0	3
Grand Total	0	0	0	0	0	3	0	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	

Start Time	Milestone Road From East				Nobadeer Famr Road From South				Milestone Road From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	3	3	0	0	0	0	3
Total Volume	0	0	0	0	0	0	3	3	0	0	0	0	3
% App. Total	0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 09:45 AM



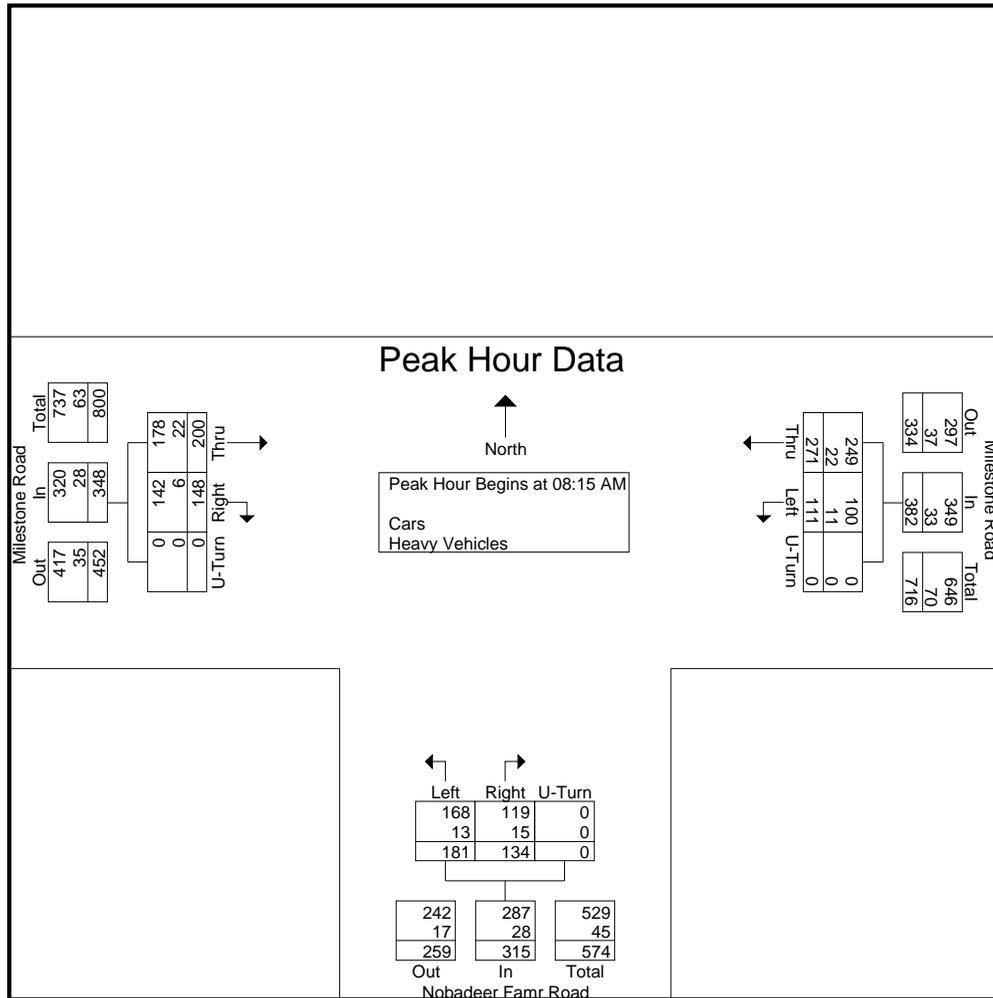
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Start Time	Milestone Road From East				Nobadeer Famr Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:15 AM													
08:15 AM	65	31	0	96	38	39	0	77	26	44	0	70	243
08:30 AM	84	25	0	109	30	52	0	82	36	47	0	83	274
08:45 AM	67	31	0	98	30	41	0	71	47	60	0	107	276
09:00 AM	55	24	0	79	36	49	0	85	39	49	0	88	252
Total Volume	271	111	0	382	134	181	0	315	148	200	0	348	1045
% App. Total	70.9	29.1	0		42.5	57.5	0		42.5	57.5	0		
PHF	.807	.895	.000	.876	.882	.870	.000	.926	.787	.833	.000	.813	.947
Cars	249	100	0	349	119	168	0	287	142	178	0	320	956
% Cars	91.9	90.1	0	91.4	88.8	92.8	0	91.1	95.9	89.0	0	92.0	91.5
Heavy Vehicles	22	11	0	33	15	13	0	28	6	22	0	28	89
% Heavy Vehicles	8.1	9.9	0	8.6	11.2	7.2	0	8.9	4.1	11.0	0	8.0	8.5





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Page No : 1

S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Milestone Road From East			Nobadeer Farm Road From South			Milestone Road From West			Int. Total
	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	
03:00 PM	52	29	0	43	37	0	32	55	0	248
03:15 PM	67	22	0	25	37	0	31	72	0	254
03:30 PM	84	18	0	39	27	0	28	76	0	272
03:45 PM	77	35	0	27	35	0	33	66	0	273
Total	280	104	0	134	136	0	124	269	0	1047
04:00 PM	75	20	0	40	36	0	43	63	0	277
04:15 PM	78	19	0	40	31	0	32	75	0	275
04:30 PM	67	37	0	29	41	0	37	73	0	284
04:45 PM	79	30	0	22	23	0	38	70	0	262
Total	299	106	0	131	131	0	150	281	0	1098
05:00 PM	57	26	0	29	34	0	34	81	0	261
05:15 PM	73	16	0	32	30	0	20	64	0	235
05:30 PM	68	22	0	27	12	0	15	72	0	216
05:45 PM	55	12	0	19	13	0	17	70	0	186
Total	253	76	0	107	89	0	86	287	0	898
Grand Total	832	286	0	372	356	0	360	837	0	3043
Apprch %	74.4	25.6	0	51.1	48.9	0	30.1	69.9	0	
Total %	27.3	9.4	0	12.2	11.7	0	11.8	27.5	0	
Cars	805	264	0	348	337	0	332	807	0	2893
% Cars	96.8	92.3	0	93.5	94.7	0	92.2	96.4	0	95.1
Heavy Vehicles	27	22	0	24	19	0	28	30	0	150
% Heavy Vehicles	3.2	7.7	0	6.5	5.3	0	7.8	3.6	0	4.9

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
03:45 PM	77	35	0	112	27	35	0	62	33	66	0	99	273
04:00 PM	75	20	0	95	40	36	0	76	43	63	0	106	277
04:15 PM	78	19	0	97	40	31	0	71	32	75	0	107	275
04:30 PM	67	37	0	104	29	41	0	70	37	73	0	110	284
Total Volume	297	111	0	408	136	143	0	279	145	277	0	422	1109
% App. Total	72.8	27.2	0		48.7	51.3	0		34.4	65.6	0		
PHF	.952	.750	.000	.911	.850	.872	.000	.918	.843	.923	.000	.959	.976
Cars	293	106	0	399	131	137	0	268	133	269	0	402	1069
% Cars	98.7	95.5	0	97.8	96.3	95.8	0	96.1	91.7	97.1	0	95.3	96.4
Heavy Vehicles	4	5	0	9	5	6	0	11	12	8	0	20	40
% Heavy Vehicles	1.3	4.5	0	2.2	3.7	4.2	0	3.9	8.3	2.9	0	4.7	3.6

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

Peak Hour for Entire Intersection Begins at 03:45 PM



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INDUSTRIES, LLC

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

S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 AA
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Milestone Road From East			Nobadeer Farm Road From South			Milestone Road From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0
Total %										

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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

Peak Hour for Entire Intersection Begins at 03:00 PM



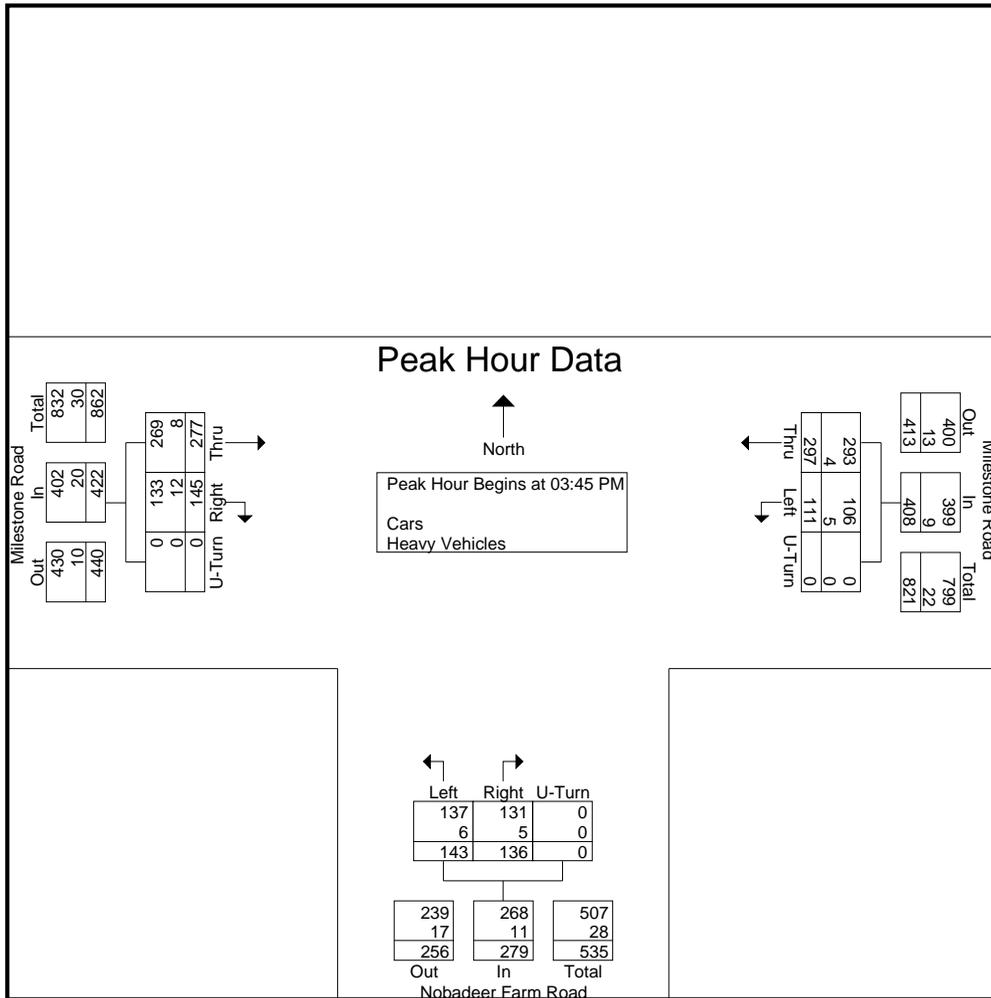
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S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 AA
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:45 PM													
03:45 PM	77	35	0	112	27	35	0	62	33	66	0	99	273
04:00 PM	75	20	0	95	40	36	0	76	43	63	0	106	277
04:15 PM	78	19	0	97	40	31	0	71	32	75	0	107	275
04:30 PM	67	37	0	104	29	41	0	70	37	73	0	110	284
Total Volume	297	111	0	408	136	143	0	279	145	277	0	422	1109
% App. Total	72.8	27.2	0		48.7	51.3	0		34.4	65.6	0		
PHF	.952	.750	.000	.911	.850	.872	.000	.918	.843	.923	.000	.959	.976
Cars	293	106	0	399	131	137	0	268	133	269	0	402	1069
% Cars	98.7	95.5	0	97.8	96.3	95.8	0	96.1	91.7	97.1	0	95.3	96.4
Heavy Vehicles	4	5	0	9	5	6	0	11	12	8	0	20	40
% Heavy Vehicles	1.3	4.5	0	2.2	3.7	4.2	0	3.9	8.3	2.9	0	4.7	3.6





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S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 AAA
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Milestone Road From East			Nobadeer Farm Road From South			Milestone Road From West			Int. Total
	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	
11:00 AM	65	24	0	22	16	0	19	67	0	213
11:15 AM	83	18	0	27	21	0	17	60	0	226
11:30 AM	71	25	0	24	25	0	23	76	0	244
11:45 AM	60	22	0	19	33	0	29	90	0	253
Total	279	89	0	92	95	0	88	293	0	936
12:00 PM	93	20	0	29	29	0	21	70	0	262
12:15 PM	67	26	0	22	27	0	18	81	0	241
12:30 PM	74	22	0	28	11	0	15	71	0	221
12:45 PM	75	20	0	34	12	0	21	86	0	248
Total	309	88	0	113	79	0	75	308	0	972
01:00 PM	67	20	0	22	16	0	10	61	0	196
01:15 PM	80	25	0	15	16	0	16	73	0	225
01:30 PM	70	21	0	33	21	0	14	67	0	226
01:45 PM	55	28	0	25	15	0	16	66	0	205
Total	272	94	0	95	68	0	56	267	0	852
Grand Total	860	271	0	300	242	0	219	868	0	2760
Apprch %	76	24	0	55.4	44.6	0	20.1	79.9	0	
Total %	31.2	9.8	0	10.9	8.8	0	7.9	31.4	0	
Cars	845	261	0	290	235	0	213	853	0	2697
% Cars	98.3	96.3	0	96.7	97.1	0	97.3	98.3	0	97.7
Heavy Vehicles	15	10	0	10	7	0	6	15	0	63
% Heavy Vehicles	1.7	3.7	0	3.3	2.9	0	2.7	1.7	0	2.3

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
11:30 AM	71	25	0	96	24	25	0	49	23	76	0	99	244
11:45 AM	60	22	0	82	19	33	0	52	29	90	0	119	253
12:00 PM	93	20	0	113	29	29	0	58	21	70	0	91	262
12:15 PM	67	26	0	93	22	27	0	49	18	81	0	99	241
Total Volume	291	93	0	384	94	114	0	208	91	317	0	408	1000
% App. Total	75.8	24.2	0		45.2	54.8	0		22.3	77.7	0		
PHF	.782	.894	.000	.850	.810	.864	.000	.897	.784	.881	.000	.857	.954
Cars	286	88	0	374	93	109	0	202	89	309	0	398	974
% Cars	98.3	94.6	0	97.4	98.9	95.6	0	97.1	97.8	97.5	0	97.5	97.4
Heavy Vehicles	5	5	0	10	1	5	0	6	2	8	0	10	26
% Heavy Vehicles	1.7	5.4	0	2.6	1.1	4.4	0	2.9	2.2	2.5	0	2.5	2.6

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:30 AM



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File Name : 143955 AAA
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Milestone Road From East			Nobadeer Farm Road From South			Milestone Road From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
11:00 AM	0	0	0	0	0	2	0	0	0	2
11:15 AM	0	0	0	0	0	1	0	0	0	1
11:30 AM	0	0	0	0	0	1	0	0	0	1
11:45 AM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	5	0	0	0	5
12:00 PM	0	3	0	3	0	0	1	2	0	9
12:15 PM	0	0	0	1	0	0	0	6	0	7
12:30 PM	0	3	0	1	0	0	1	4	0	9
12:45 PM	0	1	0	0	0	0	0	2	0	3
Total	0	7	0	5	0	0	2	14	0	28
01:00 PM	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	7	0	5	0	5	2	14	0	33
Apprch %	0	100	0	50	0	50	12.5	87.5	0	
Total %	0	21.2	0	15.2	0	15.2	6.1	42.4	0	

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
12:00 PM	0	3	0	3	3	0	0	3	1	2	0	3	9
12:15 PM	0	0	0	0	1	0	0	1	0	6	0	6	7
12:30 PM	0	3	0	3	1	0	0	1	1	4	0	5	9
12:45 PM	0	1	0	1	0	0	0	0	0	2	0	2	3
Total Volume	0	7	0	7	5	0	0	5	2	14	0	16	28
% App. Total	0	100	0		100	0	0		12.5	87.5	0		
PHF	.000	.583	.000	.583	.417	.000	.000	.417	.500	.583	.000	.667	.778

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 12:00 PM



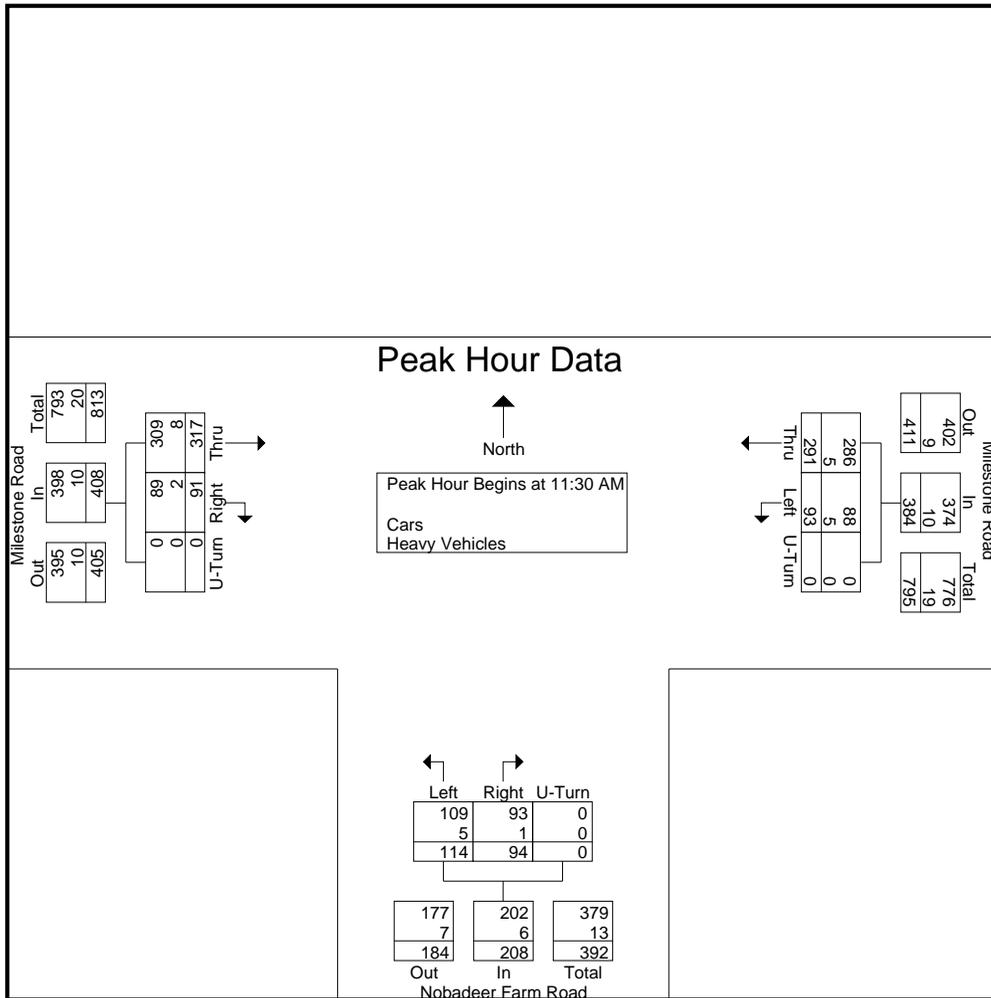
PRECISION
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INDUSTRIES, LLC

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S: Nobadeer Farm Road
E/W: Milestone Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 AAA
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Milestone Road From East				Nobadeer Farm Road From South				Milestone Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:30 AM													
11:30 AM	71	25	0	96	24	25	0	49	23	76	0	99	244
11:45 AM	60	22	0	82	19	33	0	52	29	90	0	119	253
12:00 PM	93	20	0	113	29	29	0	58	21	70	0	91	262
12:15 PM	67	26	0	93	22	27	0	49	18	81	0	99	241
Total Volume	291	93	0	384	94	114	0	208	91	317	0	408	1000
% App. Total	75.8	24.2	0		45.2	54.8	0		22.3	77.7	0		
PHF	.782	.894	.000	.850	.810	.864	.000	.897	.784	.881	.000	.857	.954
Cars	286	88	0	374	93	109	0	202	89	309	0	398	974
% Cars	98.3	94.6	0	97.4	98.9	95.6	0	97.1	97.8	97.5	0	97.5	97.4
Heavy Vehicles	5	5	0	10	1	5	0	6	2	8	0	10	26
% Heavy Vehicles	1.7	5.4	0	2.6	1.1	4.4	0	2.9	2.2	2.5	0	2.5	2.6





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S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 B
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
08:00 AM	45	2	0	5	17	0	17	76	0	162
08:15 AM	50	2	0	3	11	0	13	68	0	147
08:30 AM	57	4	0	2	13	0	17	71	0	164
08:45 AM	56	5	0	1	20	0	16	84	0	182
Total	208	13	0	11	61	0	63	299	0	655
09:00 AM	73	4	0	6	10	0	14	80	0	187
09:15 AM	53	5	0	5	16	0	20	55	0	154
09:30 AM	40	2	0	9	18	0	16	53	0	138
09:45 AM	44	8	0	0	14	0	13	49	0	128
Total	210	19	0	20	58	0	63	237	0	607
10:00 AM	40	6	0	4	19	0	17	69	0	155
10:15 AM	47	9	0	6	16	0	20	47	0	145
10:30 AM	36	9	0	4	20	0	25	40	0	134
10:45 AM	41	3	0	7	15	0	17	43	0	126
Total	164	27	0	21	70	0	79	199	0	560
Grand Total	582	59	0	52	189	0	205	735	0	1822
Apprch %	90.8	9.2	0	21.6	78.4	0	21.8	78.2	0	
Total %	31.9	3.2	0	2.9	10.4	0	11.3	40.3	0	
Cars	547	44	0	36	165	0	187	686	0	1665
% Cars	94	74.6	0	69.2	87.3	0	91.2	93.3	0	91.4
Heavy Vehicles	35	15	0	16	24	0	18	49	0	157
% Heavy Vehicles	6	25.4	0	30.8	12.7	0	8.8	6.7	0	8.6

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
08:30 AM	57	4	0	61	2	13	0	15	17	71	0	88	164
08:45 AM	56	5	0	61	1	20	0	21	16	84	0	100	182
09:00 AM	73	4	0	77	6	10	0	16	14	80	0	94	187
09:15 AM	53	5	0	58	5	16	0	21	20	55	0	75	154
Total Volume	239	18	0	257	14	59	0	73	67	290	0	357	687
% App. Total	93	7	0		19.2	80.8	0		18.8	81.2	0		
PHF	.818	.900	.000	.834	.583	.738	.000	.869	.838	.863	.000	.893	.918
Cars	227	11	0	238	8	48	0	56	62	275	0	337	631
% Cars	95.0	61.1	0	92.6	57.1	81.4	0	76.7	92.5	94.8	0	94.4	91.8
Heavy Vehicles	12	7	0	19	6	11	0	17	5	15	0	20	56
% Heavy Vehicles	5.0	38.9	0	7.4	42.9	18.6	0	23.3	7.5	5.2	0	5.6	8.2

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:30 AM



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File Name : 143955 B
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
08:00 AM	0	0	0	0	0	0	0	2	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	2	0	1	1	4
08:45 AM	0	0	0	0	0	0	0	4	0	4
Total	0	0	0	0	0	2	0	7	1	10
09:00 AM	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	2	0	1	0	0	0	0	3
09:30 AM	1	0	2	0	0	0	0	0	0	3
09:45 AM	0	0	0	0	0	0	0	1	0	1
Total	1	0	4	0	1	0	0	1	0	7
10:00 AM	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0
10:30 AM	1	0	0	0	0	0	2	2	0	5
10:45 AM	2	0	0	0	0	0	0	0	0	2
Total	3	0	0	0	0	0	2	2	0	7
Grand Total	4	0	4	0	1	2	2	10	1	24
Apprch %	50	0	50	0	33.3	66.7	15.4	76.9	7.7	
Total %	16.7	0	16.7	0	4.2	8.3	8.3	41.7	4.2	

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
08:30 AM	0	0	0	0	0	0	2	2	0	1	1	2	4
08:45 AM	0	0	0	0	0	0	0	0	0	4	0	4	4
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	2	2	0	1	0	1	0	0	0	0	3
Total Volume	0	0	2	2	0	1	2	3	0	5	1	6	11
% App. Total	0	0	100		0	33.3	66.7		0	83.3	16.7		
PHF	.000	.000	.250	.250	.000	.250	.250	.375	.000	.313	.250	.375	.688

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:30 AM

S: Nobadeer Farm Road
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

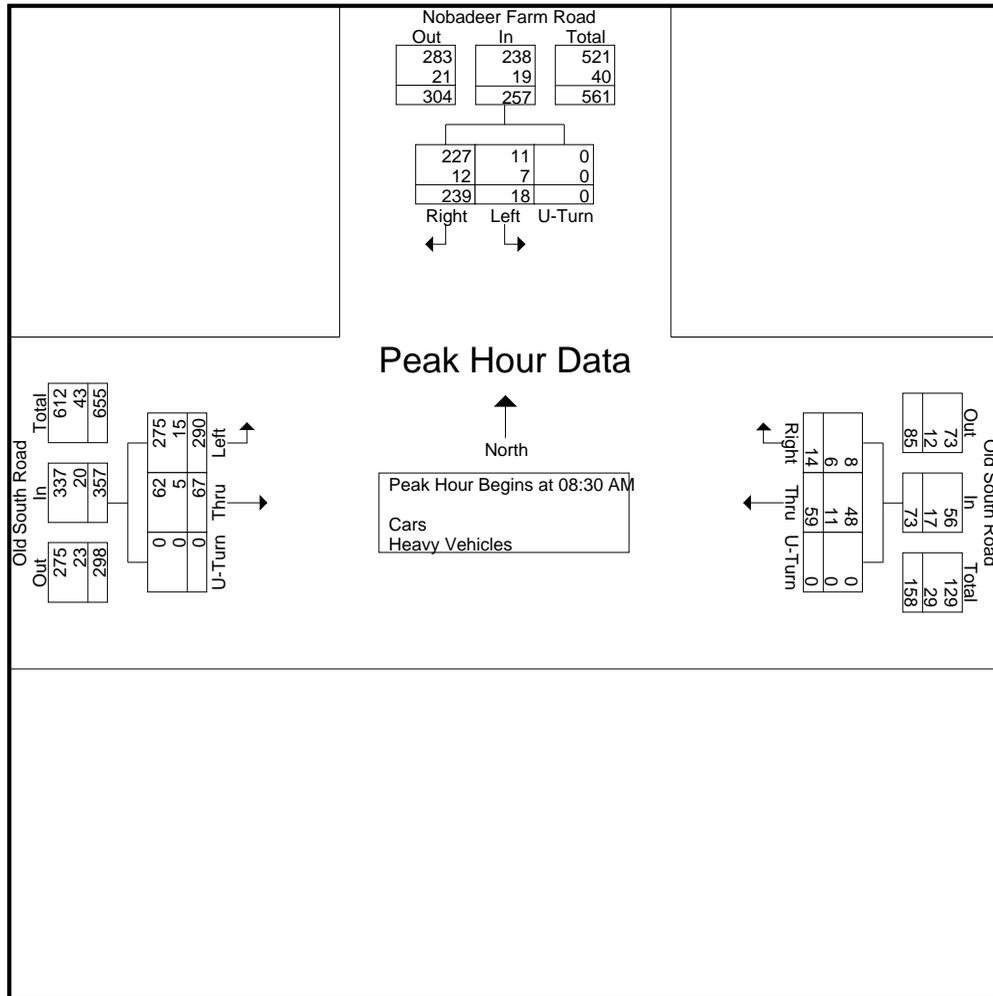


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Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:30 AM													
08:30 AM	57	4	0	61	2	13	0	15	17	71	0	88	164
08:45 AM	56	5	0	61	1	20	0	21	16	84	0	100	182
09:00 AM	73	4	0	77	6	10	0	16	14	80	0	94	187
09:15 AM	53	5	0	58	5	16	0	21	20	55	0	75	154
Total Volume	239	18	0	257	14	59	0	73	67	290	0	357	687
% App. Total	93	7	0		19.2	80.8	0		18.8	81.2	0		
PHF	.818	.900	.000	.834	.583	.738	.000	.869	.838	.863	.000	.893	.918
Cars	227	11	0	238	8	48	0	56	62	275	0	337	631
% Cars	95.0	61.1	0	92.6	57.1	81.4	0	76.7	92.5	94.8	0	94.4	91.8
Heavy Vehicles	12	7	0	19	6	11	0	17	5	15	0	20	56
% Heavy Vehicles	5.0	38.9	0	7.4	42.9	18.6	0	23.3	7.5	5.2	0	5.6	8.2





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City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 BB
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
03:00 PM	58	3	0	9	14	0	17	53	0	154
03:15 PM	53	5	0	6	11	0	16	55	0	146
03:30 PM	43	2	0	3	13	0	21	65	1	148
03:45 PM	53	6	0	7	20	0	17	54	1	158
Total	207	16	0	25	58	0	71	227	2	606
04:00 PM	56	6	0	5	25	0	25	64	0	181
04:15 PM	58	3	0	3	19	0	17	58	0	158
04:30 PM	59	3	0	2	19	0	16	56	0	155
04:45 PM	71	4	0	4	15	0	21	52	0	167
Total	244	16	0	14	78	0	79	230	0	661
05:00 PM	77	4	0	4	14	0	13	68	0	180
05:15 PM	47	4	0	3	16	0	10	70	0	150
05:30 PM	36	1	0	0	15	0	13	42	0	107
05:45 PM	33	0	0	1	10	0	12	37	0	93
Total	193	9	0	8	55	0	48	217	0	530
Grand Total	644	41	0	47	191	0	198	674	2	1797
Apprch %	94	6	0	19.7	80.3	0	22.7	77.1	0.2	
Total %	35.8	2.3	0	2.6	10.6	0	11	37.5	0.1	
Cars	618	34	0	39	179	0	168	640	2	1680
% Cars	96	82.9	0	83	93.7	0	84.8	95	100	93.5
Heavy Vehicles	26	7	0	8	12	0	30	34	0	117
% Heavy Vehicles	4	17.1	0	17	6.3	0	15.2	5	0	6.5

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	56	6	0	62	5	25	0	30	25	64	0	89	181
04:15 PM	58	3	0	61	3	19	0	22	17	58	0	75	158
04:30 PM	59	3	0	62	2	19	0	21	16	56	0	72	155
04:45 PM	71	4	0	75	4	15	0	19	21	52	0	73	167
Total Volume	244	16	0	260	14	78	0	92	79	230	0	309	661
% App. Total	93.8	6.2	0		15.2	84.8	0		25.6	74.4	0		
PHF	.859	.667	.000	.867	.700	.780	.000	.767	.790	.898	.000	.868	.913
Cars	235	13	0	248	13	74	0	87	66	222	0	288	623
% Cars	96.3	81.3	0	95.4	92.9	94.9	0	94.6	83.5	96.5	0	93.2	94.3
Heavy Vehicles	9	3	0	12	1	4	0	5	13	8	0	21	38
% Heavy Vehicles	3.7	18.8	0	4.6	7.1	5.1	0	5.4	16.5	3.5	0	6.8	5.7



PRECISION
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INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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File Name : 143955 BB
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	0	0	1	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	1	0	1	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	1	1	0	3
04:00 PM	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	1	1	0	2
04:30 PM	0	0	1	0	0	0	0	0	0	1
04:45 PM	1	0	0	0	0	0	0	1	0	2
Total	1	0	1	0	0	0	1	4	0	7
05:00 PM	0	0	0	0	1	0	0	1	0	2
05:15 PM	1	0	1	0	2	0	0	0	0	4
05:30 PM	0	0	0	0	1	0	0	0	0	1
05:45 PM	0	0	0	0	1	0	0	0	0	1
Total	1	0	1	0	5	0	0	1	0	8
Grand Total	2	0	2	0	6	0	2	6	0	18
Apprch %	50	0	50	0	100	0	25	75	0	
Total %	11.1	0	11.1	0	33.3	0	11.1	33.3	0	

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
04:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	1
04:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
05:00 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
05:15 PM	1	0	1	2	0	2	0	2	0	0	0	0	4
Total Volume	2	0	2	4	0	3	0	3	0	2	0	2	9
% App. Total	50	0	50		0	100	0		0	100	0		
PHF	.500	.000	.500	.500	.000	.375	.000	.375	.000	.500	.000	.500	.563

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

Peak Hour for Entire Intersection Begins at 04:30 PM



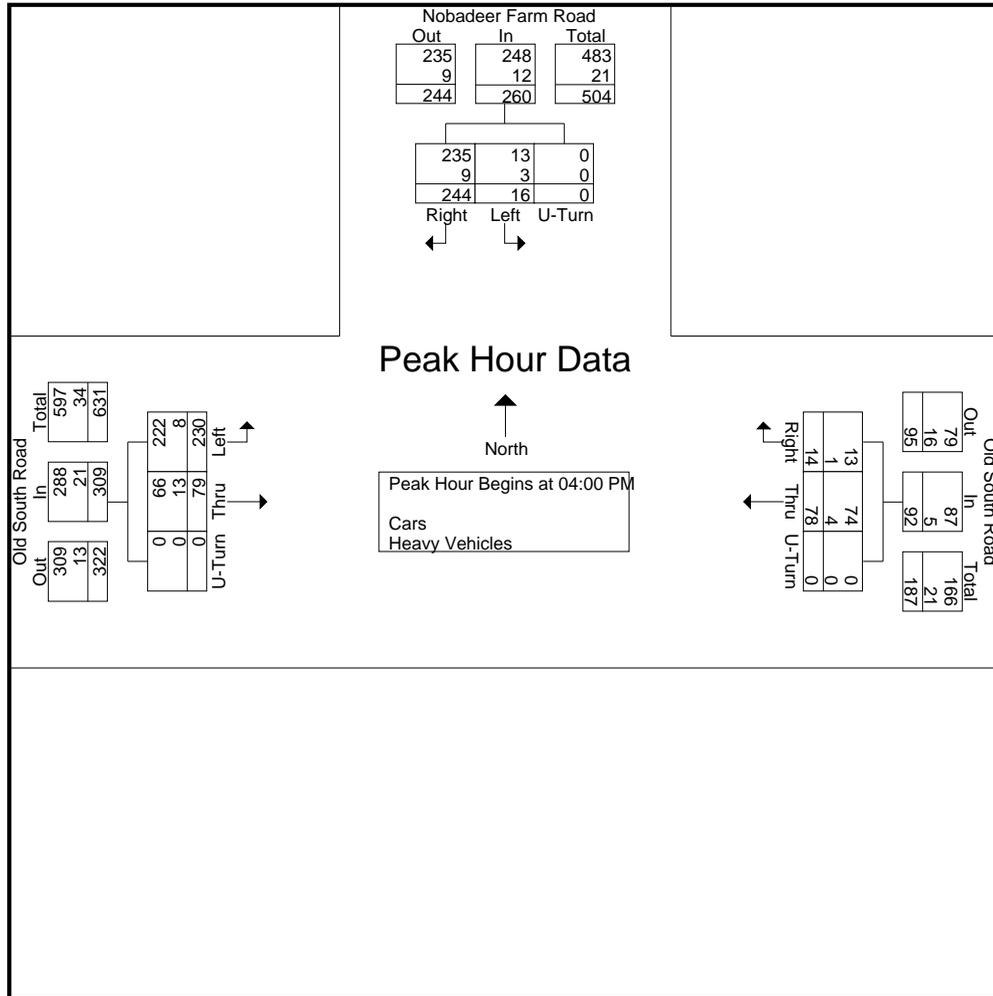
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D A T A
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P.O. Box 301 Berlin, MA 01503
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S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 BB
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	56	6	0	62	5	25	0	30	25	64	0	89	181
04:15 PM	58	3	0	61	3	19	0	22	17	58	0	75	158
04:30 PM	59	3	0	62	2	19	0	21	16	56	0	72	155
04:45 PM	71	4	0	75	4	15	0	19	21	52	0	73	167
Total Volume	244	16	0	260	14	78	0	92	79	230	0	309	661
% App. Total	93.8	6.2	0		15.2	84.8	0		25.6	74.4	0		
PHF	.859	.667	.000	.867	.700	.780	.000	.767	.790	.898	.000	.868	.913
Cars	235	13	0	248	13	74	0	87	66	222	0	288	623
% Cars	96.3	81.3	0	95.4	92.9	94.9	0	94.6	83.5	96.5	0	93.2	94.3
Heavy Vehicles	9	3	0	12	1	4	0	5	13	8	0	21	38
% Heavy Vehicles	3.7	18.8	0	4.6	7.1	5.1	0	5.4	16.5	3.5	0	6.8	5.7





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S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 BBB
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
11:00 AM	38	2	0	4	14	0	12	36	0	106
11:15 AM	42	5	0	4	11	0	11	52	0	125
11:30 AM	44	5	0	4	20	0	12	47	0	132
11:45 AM	47	7	0	3	10	0	11	41	0	119
Total	171	19	0	15	55	0	46	176	0	482
12:00 PM	44	3	0	3	12	0	8	41	0	111
12:15 PM	52	0	0	1	10	0	6	41	0	110
12:30 PM	45	2	0	1	12	0	7	43	1	111
12:45 PM	41	5	0	0	11	0	9	55	0	121
Total	182	10	0	5	45	0	30	180	1	453
01:00 PM	37	4	0	3	11	0	7	39	0	101
01:15 PM	57	1	0	0	3	0	4	37	0	102
01:30 PM	40	2	0	3	3	0	11	51	0	110
01:45 PM	39	0	0	2	9	0	7	38	0	95
Total	173	7	0	8	26	0	29	165	0	408
Grand Total	526	36	0	28	126	0	105	521	1	1343
Apprch %	93.6	6.4	0	18.2	81.8	0	16.7	83.1	0.2	
Total %	39.2	2.7	0	2.1	9.4	0	7.8	38.8	0.1	
Cars	508	33	0	26	117	0	96	503	1	1284
% Cars	96.6	91.7	0	92.9	92.9	0	91.4	96.5	100	95.6
Heavy Vehicles	18	3	0	2	9	0	9	18	0	59
% Heavy Vehicles	3.4	8.3	0	7.1	7.1	0	8.6	3.5	0	4.4

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
11:15 AM	42	5	0	47	4	11	0	15	11	52	0	63	125
11:30 AM	44	5	0	49	4	20	0	24	12	47	0	59	132
11:45 AM	47	7	0	54	3	10	0	13	11	41	0	52	119
12:00 PM	44	3	0	47	3	12	0	15	8	41	0	49	111
Total Volume	177	20	0	197	14	53	0	67	42	181	0	223	487
% App. Total	89.8	10.2	0		20.9	79.1	0		18.8	81.2	0		
PHF	.941	.714	.000	.912	.875	.663	.000	.698	.875	.870	.000	.885	.922
Cars	172	18	0	190	13	49	0	62	36	170	0	206	458
% Cars	97.2	90.0	0	96.4	92.9	92.5	0	92.5	85.7	93.9	0	92.4	94.0
Heavy Vehicles	5	2	0	7	1	4	0	5	6	11	0	17	29
% Heavy Vehicles	2.8	10.0	0	3.6	7.1	7.5	0	7.5	14.3	6.1	0	7.6	6.0

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:15 AM



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S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 BBB
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Nobadeer Farm Road From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	1	0	0	0	0	0	0	0	0	1
11:30 AM	1	0	1	0	0	0	1	1	0	4
11:45 AM	1	0	3	0	1	0	0	1	0	6
Total	3	0	4	0	1	0	1	2	0	11
12:00 PM	0	0	3	0	0	0	1	0	0	4
12:15 PM	0	0	2	0	1	0	0	0	0	3
12:30 PM	0	0	0	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	5	0	2	0	1	0	0	8
01:00 PM	0	0	0	0	1	0	0	0	0	1
01:15 PM	0	0	0	0	0	0	1	3	0	4
01:30 PM	0	0	0	0	0	0	0	0	1	1
01:45 PM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	1	0	1	3	1	7
Grand Total	4	0	9	0	4	0	3	5	1	26
Apprch %	30.8	0	69.2	0	100	0	33.3	55.6	11.1	
Total %	15.4	0	34.6	0	15.4	0	11.5	19.2	3.8	

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
11:30 AM	1	0	1	2	0	0	0	0	1	1	0	2	4
11:45 AM	1	0	3	4	0	1	0	1	0	1	0	1	6
12:00 PM	0	0	3	3	0	0	0	0	1	0	0	1	4
12:15 PM	0	0	2	2	0	1	0	1	0	0	0	0	3
Total Volume	2	0	9	11	0	2	0	2	2	2	0	4	17
% App. Total	18.2	0	81.8		0	100	0		50	50	0		
PHF	.500	.000	.750	.688	.000	.500	.000	.500	.500	.500	.000	.500	.708

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:30 AM



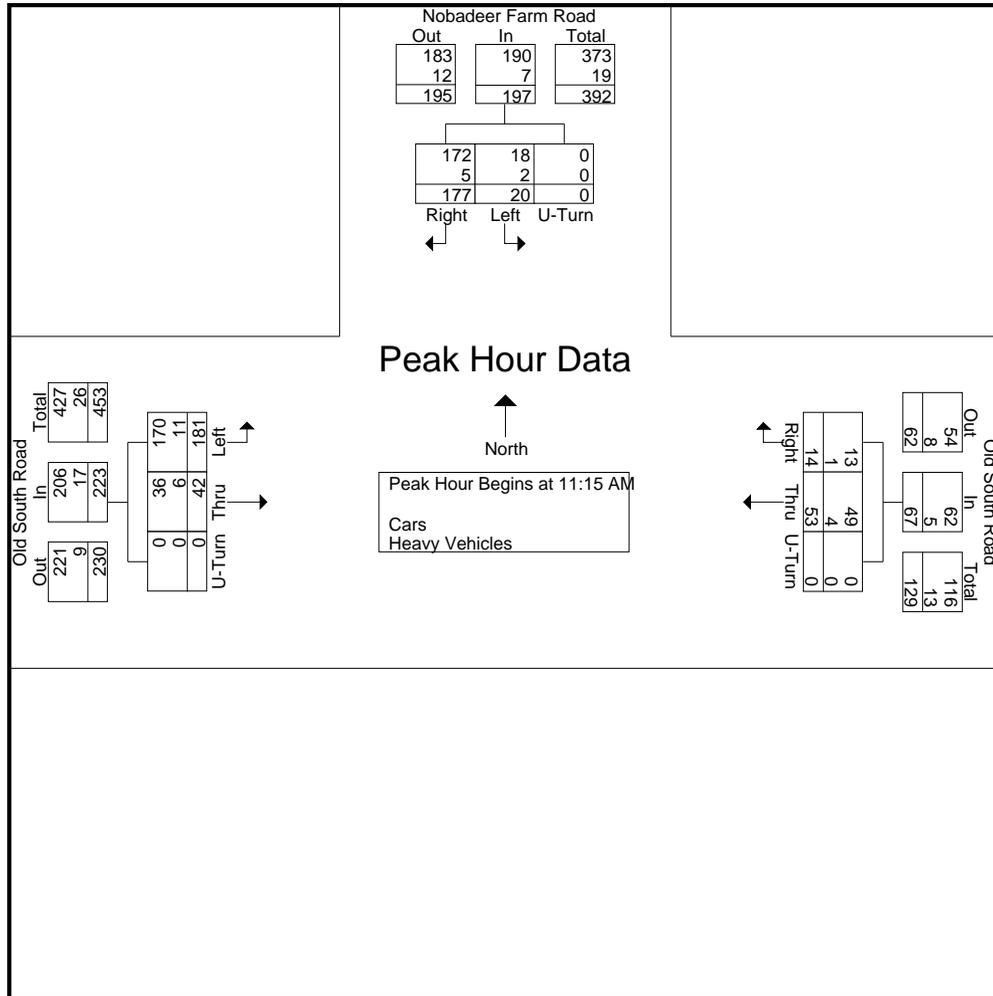
PRECISION
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S: Nobadeer Farm Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 BBB
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Nobadeer Farm Road From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:15 AM													
11:15 AM	42	5	0	47	4	11	0	15	11	52	0	63	125
11:30 AM	44	5	0	49	4	20	0	24	12	47	0	59	132
11:45 AM	47	7	0	54	3	10	0	13	11	41	0	52	119
12:00 PM	44	3	0	47	3	12	0	15	8	41	0	49	111
Total Volume	177	20	0	197	14	53	0	67	42	181	0	223	487
% App. Total	89.8	10.2	0		20.9	79.1	0		18.8	81.2	0		
PHF	.941	.714	.000	.912	.875	.663	.000	.698	.875	.870	.000	.885	.922
Cars	172	18	0	190	13	49	0	62	36	170	0	206	458
% Cars	97.2	90.0	0	96.4	92.9	92.5	0	92.5	85.7	93.9	0	92.4	94.0
Heavy Vehicles	5	2	0	7	1	4	0	5	6	11	0	17	29
% Heavy Vehicles	2.8	10.0	0	3.6	7.1	7.5	0	7.5	14.3	6.1	0	7.6	6.0





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N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 C
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	6	3	0	0	2	46	19	0	28	0	57	0	35	63	6	0	265
08:15 AM	11	0	1	0	0	42	22	0	20	1	38	0	46	70	3	0	254
08:30 AM	9	2	1	0	2	42	29	0	28	2	51	0	52	63	5	0	286
08:45 AM	7	1	3	0	0	49	29	0	27	0	52	0	58	71	4	0	301
Total	33	6	5	0	4	179	99	0	103	3	198	0	191	267	18	0	1106
09:00 AM	2	0	3	0	1	72	16	0	31	1	74	0	42	59	4	0	305
09:15 AM	6	0	3	0	3	51	16	0	19	0	52	0	39	54	7	0	250
09:30 AM	5	1	4	0	1	50	10	0	16	1	42	0	51	50	3	0	234
09:45 AM	7	2	0	0	3	38	20	0	21	1	59	3	49	42	6	0	251
Total	20	3	10	0	8	211	62	0	87	3	227	3	181	205	20	0	1040
10:00 AM	5	1	1	0	2	39	20	0	23	0	45	0	44	65	6	0	251
10:15 AM	2	0	0	0	4	51	11	0	21	1	32	0	32	53	1	0	208
10:30 AM	10	4	1	0	3	43	16	0	17	1	31	0	41	47	6	0	220
10:45 AM	4	1	3	0	3	38	11	0	17	2	43	0	38	48	6	0	214
Total	21	6	5	0	12	171	58	0	78	4	151	0	155	213	19	0	893
Grand Total	74	15	20	0	24	561	219	0	268	10	576	3	527	685	57	0	3039
Apprch %	67.9	13.8	18.3	0	3	69.8	27.2	0	31.3	1.2	67.2	0.4	41.5	54	4.5	0	
Total %	2.4	0.5	0.7	0	0.8	18.5	7.2	0	8.8	0.3	19	0.1	17.3	22.5	1.9	0	
Cars	70	12	20	0	23	512	207	0	257	9	546	3	498	628	53	0	2838
% Cars	94.6	80	100	0	95.8	91.3	94.5	0	95.9	90	94.8	100	94.5	91.7	93	0	93.4
Heavy Vehicles	4	3	0	0	1	49	12	0	11	1	30	0	29	57	4	0	201
% Heavy Vehicles	5.4	20	0	0	4.2	8.7	5.5	0	4.1	10	5.2	0	5.5	8.3	7	0	6.6

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
08:15 AM	11	0	1	0	12	0	42	22	0	64	20	1	38	0	59	46	70	3	0	119	254
08:30 AM	9	2	1	0	12	2	42	29	0	73	28	2	51	0	81	52	63	5	0	120	286
08:45 AM	7	1	3	0	11	0	49	29	0	78	27	0	52	0	79	58	71	4	0	133	301
09:00 AM	2	0	3	0	5	1	72	16	0	89	31	1	74	0	106	42	59	4	0	105	305
Total Volume	29	3	8	0	40	3	205	96	0	304	106	4	215	0	325	198	263	16	0	477	1146
% App. Total	72.5	7.5	20	0		1	67.4	31.6	0		32.6	1.2	66.2	0		41.5	55.1	3.4	0		
PHF	.659	.375	.667	.000	.833	.375	.712	.828	.000	.854	.855	.500	.726	.000	.767	.853	.926	.800	.000	.897	.939
Cars	27	2	8	0	37	3	185	93	0	281	102	3	207	0	312	189	246	16	0	451	1081
% Cars	93.1	66.7	100	0	92.5	100	90.2	96.9	0	92.4	96.2	75.0	96.3	0	96.0	95.5	93.5	100	0	94.5	94.3
Heavy Vehicles	2	1	0	0	3	0	20	3	0	23	4	1	8	0	13	9	17	0	0	26	65
% Heavy Vehicles	6.9	33.3	0	0	7.5	0	9.8	3.1	0	7.6	3.8	25.0	3.7	0	4.0	4.5	6.5	0	0	5.5	5.7

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:15 AM



PRECISION
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File Name : 143955 C
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	0	1	2	0	0	0	3	0	1	0	0	0	0	0	0	7
08:15 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
08:30 AM	0	1	0	3	2	0	0	3	0	3	0	0	0	0	0	0	12
08:45 AM	0	0	1	0	0	0	0	2	1	1	0	0	0	0	0	0	5
Total	0	1	2	7	4	0	0	8	1	5	0	0	0	0	0	0	28
09:00 AM	0	0	0	6	0	0	0	4	0	1	0	0	0	2	0	0	13
09:15 AM	0	0	0	8	0	0	0	3	0	1	0	1	0	0	0	0	13
09:30 AM	0	0	2	6	0	0	0	3	0	2	0	0	0	1	0	0	14
09:45 AM	0	0	0	7	0	0	0	2	0	0	0	0	0	1	0	0	10
Total	0	0	2	27	0	0	0	12	0	4	0	1	0	4	0	0	50
10:00 AM	0	0	0	4	0	0	0	2	0	0	0	1	0	0	0	0	7
10:15 AM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	6	0	0	0	4	0	0	0	1	0	0	0	0	11
Grand Total	0	1	4	40	4	0	0	24	1	9	0	2	0	4	0	0	89
Apprch %	0	2.2	8.9	88.9	14.3	0	0	85.7	8.3	75	0	16.7	0	100	0	0	
Total %	0	1.1	4.5	44.9	4.5	0	0	27	1.1	10.1	0	2.2	0	4.5	0	0	

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	0	0	6	6	0	0	0	4	4	0	1	0	0	1	0	2	0	0	2	13
09:15 AM	0	0	0	8	8	0	0	0	3	3	0	1	0	1	2	0	0	0	0	0	13
09:30 AM	0	0	2	6	8	0	0	0	3	3	0	2	0	0	2	0	1	0	0	1	14
09:45 AM	0	0	0	7	7	0	0	0	2	2	0	0	0	0	0	0	1	0	0	1	10
Total Volume	0	0	2	27	29	0	0	0	12	12	0	4	0	1	5	0	4	0	0	4	50
% App. Total	0	0	6.9	93.1		0	0	0	100		0	80	0	20		0	100	0	0		
PHF	.000	.000	.250	.844	.906	.000	.000	.000	.750	.750	.000	.500	.000	.250	.625	.000	.500	.000	.000	.500	.893



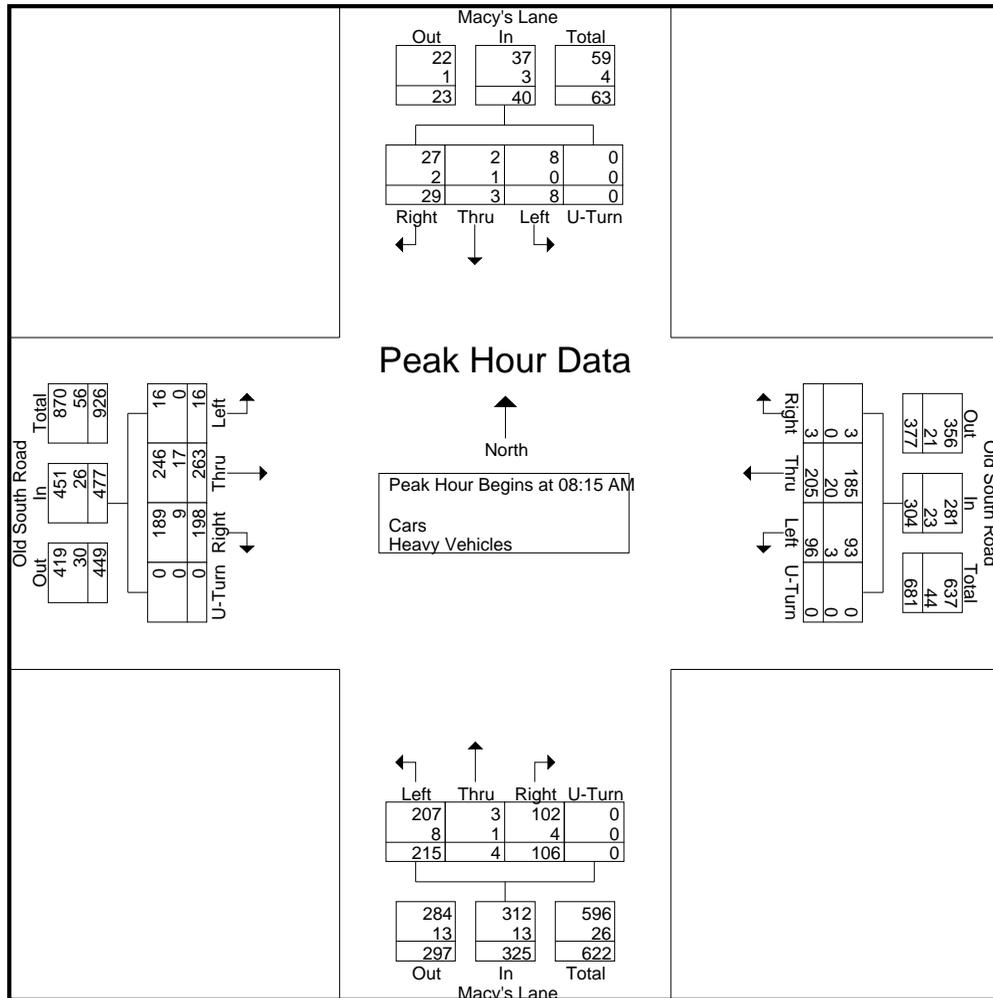
PRECISION
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INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 C
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	11	0	1	0	12	0	42	22	0	64	20	1	38	0	59	46	70	3	0	119	254
08:30 AM	9	2	1	0	12	2	42	29	0	73	28	2	51	0	81	52	63	5	0	120	286
08:45 AM	7	1	3	0	11	0	49	29	0	78	27	0	52	0	79	58	71	4	0	133	301
09:00 AM	2	0	3	0	5	1	72	16	0	89	31	1	74	0	106	42	59	4	0	105	305
Total Volume	29	3	8	0	40	3	205	96	0	304	106	4	215	0	325	198	263	16	0	477	1146
% App. Total	72.5	7.5	20	0		1	67.4	31.6	0		32.6	1.2	66.2	0		41.5	55.1	3.4	0		
PHF	.659	.375	.667	.000	.833	.375	.712	.828	.000	.854	.855	.500	.726	.000	.767	.853	.926	.800	.000	.897	.939
Cars	27	2	8	0	37	3	185	93	0	281	102	3	207	0	312	189	246	16	0	451	1081
% Cars	93.1	66.7	100	0	92.5	100	90.2	96.9	0	92.4	96.2	75.0	96.3	0	96.0	95.5	93.5	100	0	94.5	94.3
Heavy Vehicles	2	1	0	0	3	0	20	3	0	23	4	1	8	0	13	9	17	0	0	26	65
% Heavy Vehicles	6.9	33.3	0	0	7.5	0	9.8	3.1	0	7.6	3.8	25.0	3.7	0	4.0	4.5	6.5	0	0	5.5	5.7





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File Name : 143955 CC
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	7	0	2	0	4	54	24	0	21	2	49	0	35	56	7	0	261
03:15 PM	10	1	3	0	3	50	18	0	18	0	31	0	40	61	6	0	241
03:30 PM	3	3	1	0	3	44	19	0	17	0	30	0	46	67	7	0	240
03:45 PM	5	0	0	0	1	52	23	0	18	0	40	0	41	60	10	0	250
Total	25	4	6	0	11	200	84	0	74	2	150	0	162	244	30	0	992
04:00 PM	11	0	2	0	3	64	18	0	24	2	48	0	38	66	9	0	285
04:15 PM	6	0	2	0	7	54	19	0	21	1	48	0	52	58	4	0	272
04:30 PM	6	2	1	0	4	57	20	0	18	4	53	0	55	66	10	0	296
04:45 PM	6	3	1	0	5	63	26	0	19	0	40	0	48	57	6	0	274
Total	29	5	6	0	19	238	83	0	82	7	189	0	193	247	29	0	1127
05:00 PM	12	3	0	0	6	81	21	0	25	1	47	0	51	58	13	0	318
05:15 PM	9	2	1	0	4	50	21	0	20	3	32	0	50	68	11	0	271
05:30 PM	11	1	2	0	1	45	18	0	21	1	46	0	59	44	11	0	260
05:45 PM	3	2	2	0	0	35	22	0	15	3	37	0	46	44	3	0	212
Total	35	8	5	0	11	211	82	0	81	8	162	0	206	214	38	0	1061
Grand Total	89	17	17	0	41	649	249	0	237	17	501	0	561	705	97	0	3180
Apprch %	72.4	13.8	13.8	0	4.4	69.1	26.5	0	31.4	2.3	66.4	0	41.2	51.7	7.1	0	
Total %	2.8	0.5	0.5	0	1.3	20.4	7.8	0	7.5	0.5	15.8	0	17.6	22.2	3.1	0	
Cars	88	17	17	0	40	622	240	0	225	17	486	0	537	643	95	0	3027
% Cars	98.9	100	100	0	97.6	95.8	96.4	0	94.9	100	97	0	95.7	91.2	97.9	0	95.2
Heavy Vehicles	1	0	0	0	1	27	9	0	12	0	15	0	24	62	2	0	153
% Heavy Vehicles	1.1	0	0	0	2.4	4.2	3.6	0	5.1	0	3	0	4.3	8.8	2.1	0	4.8

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:15 PM	6	0	2	0	8	7	54	19	0	80	21	1	48	0	70	52	58	4	0	114	272
04:30 PM	6	2	1	0	9	4	57	20	0	81	18	4	53	0	75	55	66	10	0	131	296
04:45 PM	6	3	1	0	10	5	63	26	0	94	19	0	40	0	59	48	57	6	0	111	274
05:00 PM	12	3	0	0	15	6	81	21	0	108	25	1	47	0	73	51	58	13	0	122	318
Total Volume	30	8	4	0	42	22	255	86	0	363	83	6	188	0	277	206	239	33	0	478	1160
% App. Total	71.4	19	9.5	0		6.1	70.2	23.7	0		30	2.2	67.9	0		43.1	50	6.9	0		
PHF	.625	.667	.500	.000	.700	.786	.787	.827	.000	.840	.830	.375	.887	.000	.923	.936	.905	.635	.000	.912	.912
Cars	29	8	4	0	41	22	243	86	0	351	80	6	183	0	269	199	218	33	0	450	1111
% Cars	96.7	100	100	0	97.6	100	95.3	100	0	96.7	96.4	100	97.3	0	97.1	96.6	91.2	100	0	94.1	95.8
Heavy Vehicles	1	0	0	0	1	0	12	0	0	12	3	0	5	0	8	7	21	0	0	28	49
% Heavy Vehicles	3.3	0	0	0	2.4	0	4.7	0	0	3.3	3.6	0	2.7	0	2.9	3.4	8.8	0	0	5.9	4.2

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

Peak Hour for Entire Intersection Begins at 04:15 PM



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File Name : 143955 CC
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	4	0	0	0	0	0	1	0	1	0	0	0	0	6
03:15 PM	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	3	8
03:30 PM	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
03:45 PM	0	0	0	5	0	0	0	4	0	0	0	0	0	0	0	1	10
Total	0	0	1	15	0	0	0	5	0	1	0	1	0	0	0	4	27
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	9
04:30 PM	0	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	5
04:45 PM	0	0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	7
Total	0	0	0	4	0	0	0	19	0	0	0	1	0	0	0	0	24
05:00 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	8
05:15 PM	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	5
05:30 PM	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	6	13	0	0	0	0	0	0	0	0	0	0	0	19
Grand Total	0	0	1	25	13	0	0	24	0	1	0	2	0	0	0	4	70
Apprch %	0	0	3.8	96.2	35.1	0	0	64.9	0	33.3	0	66.7	0	0	0	100	
Total %	0	0	1.4	35.7	18.6	0	0	34.3	0	1.4	0	2.9	0	0	0	5.7	

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:15 PM	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	0	0	3	3	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	5
04:45 PM	0	0	0	1	1	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	7
05:00 PM	0	0	0	4	4	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8
Total Volume	0	0	0	8	8	4	0	0	17	21	0	0	0	0	0	0	0	0	0	0	29
% App. Total	0	0	0	100		19	0	0	81		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.500	.500	.250	.000	.000	.472	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.806

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

Peak Hour for Entire Intersection Begins at 04:15 PM



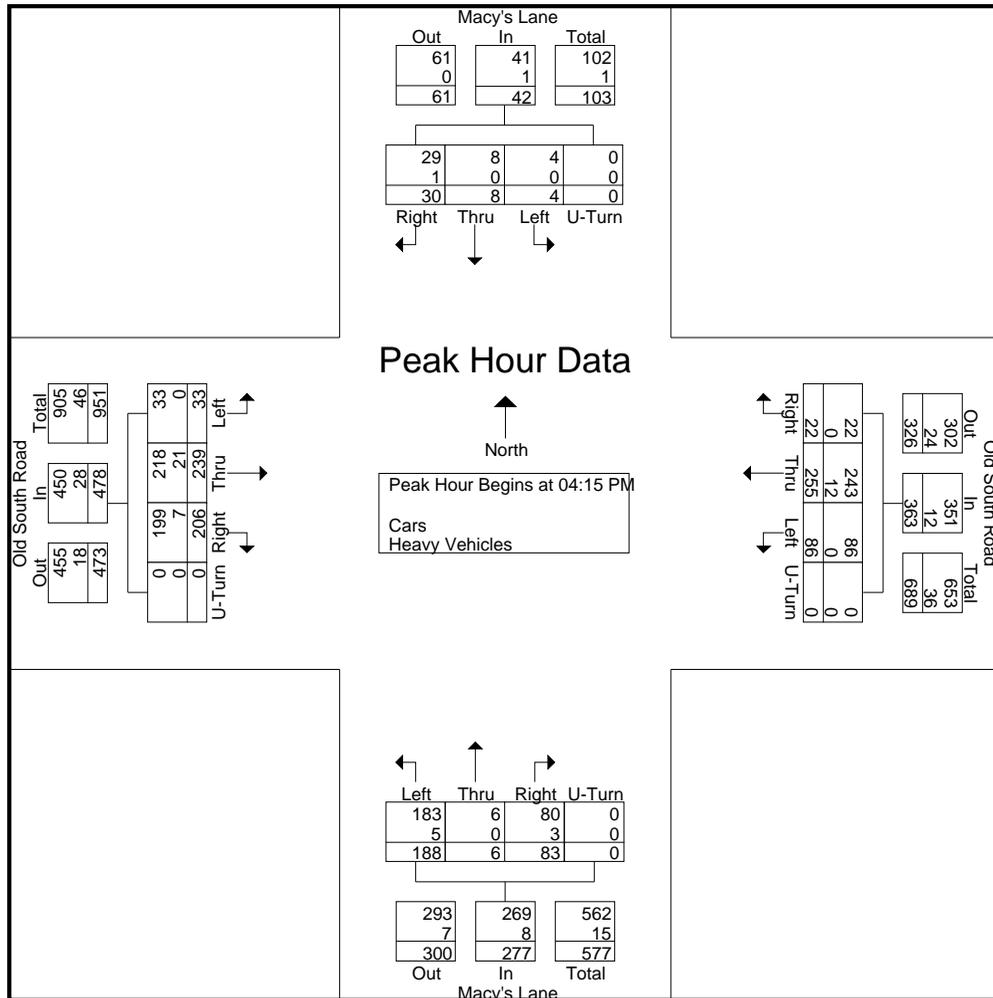
PRECISION
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N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 CC
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	6	0	2	0	8	7	54	19	0	80	21	1	48	0	70	52	58	4	0	114	272
04:30 PM	6	2	1	0	9	4	57	20	0	81	18	4	53	0	75	55	66	10	0	131	296
04:45 PM	6	3	1	0	10	5	63	26	0	94	19	0	40	0	59	48	57	6	0	111	274
05:00 PM	12	3	0	0	15	6	81	21	0	108	25	1	47	0	73	51	58	13	0	122	318
Total Volume	30	8	4	0	42	22	255	86	0	363	83	6	183	0	277	206	239	33	0	478	1160
% App. Total	71.4	19	9.5	0		6.1	70.2	23.7	0		30	2.2	67.9	0		43.1	50	6.9	0		
PHF	.625	.667	.500	.000	.700	.786	.787	.827	.000	.840	.830	.375	.887	.000	.923	.936	.905	.635	.000	.912	.912
Cars	29	8	4	0	41	22	243	86	0	351	80	6	183	0	269	199	218	33	0	450	1111
% Cars	96.7	100	100	0	97.6	100	95.3	100	0	96.7	96.4	100	97.3	0	97.1	96.6	91.2	100	0	94.1	95.8
Heavy Vehicles	1	0	0	0	1	0	12	0	0	12	3	0	5	0	8	7	21	0	0	28	49
% Heavy Vehicles	3.3	0	0	0	2.4	0	4.7	0	0	3.3	3.6	0	2.7	0	2.9	3.4	8.8	0	0	5.9	4.2





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N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 CCC
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	1	1	1	0	1	49	19	0	16	1	65	0	59	41	6	0	260
11:15 AM	6	1	0	0	1	39	19	0	23	2	39	0	38	45	5	0	218
11:30 AM	4	1	0	0	2	50	21	0	17	1	64	0	47	52	4	0	263
11:45 AM	6	1	0	0	3	46	23	0	18	4	45	0	52	46	4	0	248
Total	17	4	1	0	7	184	82	0	74	8	213	0	196	184	19	0	989
12:00 PM	4	1	0	0	3	44	26	0	18	6	46	0	51	47	0	0	246
12:15 PM	6	2	1	0	2	40	21	0	18	0	42	0	49	27	11	0	219
12:30 PM	2	2	0	0	0	40	27	0	19	0	65	1	51	41	6	0	254
12:45 PM	9	0	3	0	2	31	19	0	12	1	54	1	44	62	5	0	243
Total	21	5	4	0	7	155	93	0	67	7	207	2	195	177	22	0	962
01:00 PM	4	1	1	0	2	41	13	0	16	2	43	0	41	32	4	0	200
01:15 PM	4	2	1	0	4	42	23	0	9	2	46	0	49	38	9	0	229
01:30 PM	6	2	2	0	2	24	23	0	24	0	54	0	70	42	5	0	254
01:45 PM	2	1	2	0	2	24	26	0	15	1	55	0	68	32	7	0	235
Total	16	6	6	0	10	131	85	0	64	5	198	0	228	144	25	0	918
Grand Total	54	15	11	0	24	470	260	0	205	20	618	2	619	505	66	0	2869
Apprch %	67.5	18.8	13.8	0	3.2	62.3	34.5	0	24.3	2.4	73.1	0.2	52	42.4	5.5	0	
Total %	1.9	0.5	0.4	0	0.8	16.4	9.1	0	7.1	0.7	21.5	0.1	21.6	17.6	2.3	0	
Cars	52	15	9	0	21	448	255	0	203	20	604	1	606	477	62	0	2773
% Cars	96.3	100	81.8	0	87.5	95.3	98.1	0	99	100	97.7	50	97.9	94.5	93.9	0	96.7
Heavy Vehicles	2	0	2	0	3	22	5	0	2	0	14	1	13	28	4	0	96
% Heavy Vehicles	3.7	0	18.2	0	12.5	4.7	1.9	0	1	0	2.3	50	2.1	5.5	6.1	0	3.3

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	1	1	1	0	3	1	49	19	0	69	16	1	65	0	82	59	41	6	0	106	260
11:15 AM	6	1	0	0	7	1	39	19	0	59	23	2	39	0	64	38	45	5	0	88	218
11:30 AM	4	1	0	0	5	2	50	21	0	73	17	1	64	0	82	47	52	4	0	103	263
11:45 AM	6	1	0	0	7	3	46	23	0	72	18	4	45	0	67	52	46	4	0	102	248
Total Volume	17	4	1	0	22	7	184	82	0	273	74	8	213	0	295	196	184	19	0	399	989
% App. Total	77.3	18.2	4.5	0		2.6	67.4	30	0		25.1	2.7	72.2	0		49.1	46.1	4.8	0		
PHF	.708	1.00	.250	.000	.786	.583	.920	.891	.000	.935	.804	.500	.819	.000	.899	.831	.885	.792	.000	.941	.940
Cars	15	4	0	0	19	6	176	81	0	263	73	8	209	0	290	192	176	18	0	386	958
% Cars	88.2	100	0	0	86.4	85.7	95.7	98.8	0	96.3	98.6	100	98.1	0	98.3	98.0	95.7	94.7	0	96.7	96.9
Heavy Vehicles	2	0	1	0	3	1	8	1	0	10	1	0	4	0	5	4	8	1	0	13	31
% Heavy Vehicles	11.8	0	100	0	13.6	14.3	4.3	1.2	0	3.7	1.4	0	1.9	0	1.7	2.0	4.3	5.3	0	3.3	3.1

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



PRECISION
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INDUSTRIES, LLC

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N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 CCC
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Macy's Lane From North				Old South Road From East				Macy's Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	5
11:15 AM	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	3
11:30 AM	0	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	7
11:45 AM	0	0	0	4	0	0	0	2	0	0	0	2	0	0	0	0	8
Total	0	0	0	9	0	0	0	9	0	1	0	2	0	0	0	2	23
12:00 PM	0	0	1	5	0	0	0	4	0	1	0	0	0	0	0	0	11
12:15 PM	0	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	9
12:30 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
12:45 PM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	5
Total	0	0	1	11	0	0	0	14	0	1	0	0	0	0	0	0	27
01:00 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
01:15 PM	0	0	0	1	0	0	0	5	2	1	0	0	0	0	0	0	9
01:30 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
01:45 PM	0	0	0	1	0	1	0	5	0	0	0	0	0	0	0	0	7
Total	0	0	0	4	0	1	0	14	2	1	0	0	0	0	0	0	22
Grand Total	0	0	1	24	0	1	0	37	2	3	0	2	0	0	0	2	72
Apprch %	0	0	4	96	0	2.6	0	97.4	28.6	42.9	0	28.6	0	0	0	100	
Total %	0	0	1.4	33.3	0	1.4	0	51.4	2.8	4.2	0	2.8	0	0	0	2.8	

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	0	0	0	4	4	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	7
11:45 AM	0	0	0	4	4	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0	8
12:00 PM	0	0	1	5	6	0	0	0	4	4	0	1	0	0	1	0	0	0	0	0	11
12:15 PM	0	0	0	4	4	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	9
Total Volume	0	0	1	17	18	0	0	0	14	14	0	1	0	2	3	0	0	0	0	0	35
% App. Total	0	0	5.6	94.4	0	0	0	100	0	33.3	0	66.7	0	0	0	0	0	0	0	0	
PHF	.000	.000	.250	.850	.750	.000	.000	.000	.700	.700	.000	.250	.000	.250	.375	.000	.000	.000	.000	.000	.795



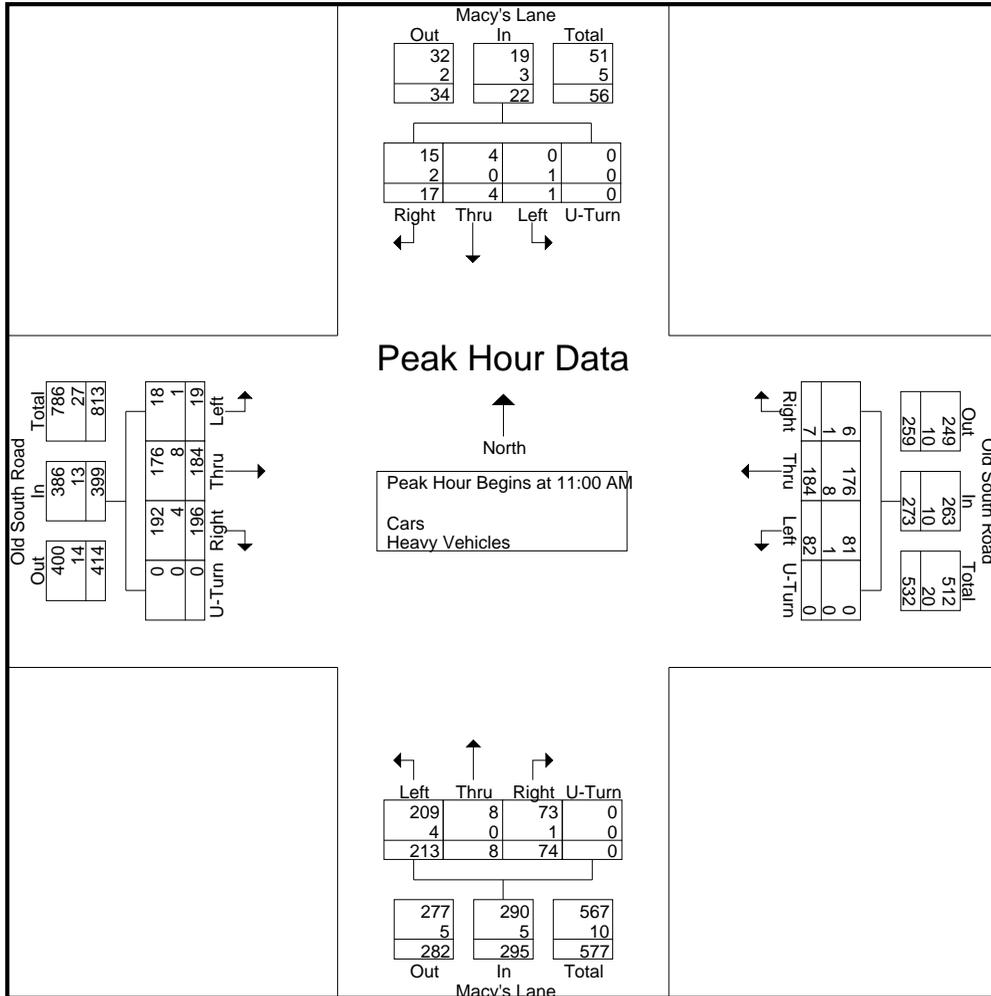
PRECISION
D A T A
INDUSTRIES, LLC

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

N/S: Macy's Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 CCC
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Macy's Lane From North					Old South Road From East					Macy's Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	1	1	1	0	3	1	49	19	0	69	16	1	65	0	82	59	41	6	0	106	260
11:15 AM	6	1	0	0	7	1	39	19	0	59	23	2	39	0	64	38	45	5	0	88	218
11:30 AM	4	1	0	0	5	2	50	21	0	73	17	1	64	0	82	47	52	4	0	103	263
11:45 AM	6	1	0	0	7	3	46	23	0	72	18	4	45	0	67	52	46	4	0	102	248
Total Volume	17	4	1	0	22	7	184	82	0	273	74	8	213	0	295	196	184	19	0	399	989
% App. Total	77.3	18.2	4.5	0		2.6	67.4	30	0		25.1	2.7	72.2	0		49.1	46.1	4.8	0		
PHF	.708	1.00	.250	.000	.786	.583	.920	.891	.000	.935	.804	.500	.819	.000	.899	.831	.885	.792	.000	.941	.940
Cars	15	4	0	0	19	6	176	81	0	263	73	8	209	0	290	192	176	18	0	386	958
% Cars	88.2	100	0	0	86.4	85.7	95.7	98.8	0	96.3	98.6	100	98.1	0	98.3	98.0	95.7	94.7	0	96.7	96.9
Heavy Vehicles	2	0	1	0	3	1	8	1	0	10	1	0	4	0	5	4	8	1	0	13	31
% Heavy Vehicles	11.8	0	100	0	13.6	14.3	4.3	1.2	0	3.7	1.4	0	1.9	0	1.7	2.0	4.3	5.3	0	3.3	3.1





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N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 D
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	10	2	3	0	0	122	3	0	4	0	17	0	13	91	1	0	266
08:15 AM	16	1	6	0	0	116	1	0	14	0	12	0	9	125	0	0	300
08:30 AM	11	2	3	0	0	101	3	0	9	0	8	0	8	120	0	0	265
08:45 AM	21	0	9	0	0	120	5	0	4	0	12	0	8	141	0	0	320
Total	58	5	21	0	0	459	12	0	31	0	49	0	38	477	1	0	1151
09:00 AM	14	1	3	0	0	145	4	0	4	0	11	0	8	106	0	0	296
09:15 AM	19	0	1	0	0	114	2	0	10	0	12	0	12	112	0	0	282
09:30 AM	22	0	2	0	0	98	4	0	4	0	14	0	15	110	0	0	269
09:45 AM	12	1	3	0	1	110	4	0	4	0	9	0	14	120	0	0	278
Total	67	2	9	0	1	467	14	0	22	0	46	0	49	448	0	0	1125
10:00 AM	16	0	3	0	0	90	3	0	8	0	5	0	5	126	0	0	256
10:15 AM	9	0	0	0	0	82	3	0	0	0	16	0	9	97	0	0	216
10:30 AM	20	0	2	0	0	93	1	0	2	0	5	0	5	116	0	0	244
10:45 AM	15	0	6	0	0	87	3	0	4	0	7	0	12	94	0	0	228
Total	60	0	11	0	0	352	10	0	14	0	33	0	31	433	0	0	944
Grand Total	185	7	41	0	1	1278	36	0	67	0	128	0	118	1358	1	0	3220
Apprch %	79.4	3	17.6	0	0.1	97.2	2.7	0	34.4	0	65.6	0	8	91.9	0.1	0	
Total %	5.7	0.2	1.3	0	0	39.7	1.1	0	2.1	0	4	0	3.7	42.2	0	0	
Cars	178	6	37	0	1	1194	29	0	52	0	104	0	105	1280	1	0	2987
% Cars	96.2	85.7	90.2	0	100	93.4	80.6	0	77.6	0	81.2	0	89	94.3	100	0	92.8
Heavy Vehicles	7	1	4	0	0	84	7	0	15	0	24	0	13	78	0	0	233
% Heavy Vehicles	3.8	14.3	9.8	0	0	6.6	19.4	0	22.4	0	18.8	0	11	5.7	0	0	7.2

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	16	1	6	0	23	0	116	1	0	117	14	0	12	0	26	9	125	0	0	134	300
08:30 AM	11	2	3	0	16	0	101	3	0	104	9	0	8	0	17	8	120	0	0	128	265
08:45 AM	21	0	9	0	30	0	120	5	0	125	4	0	12	0	16	8	141	0	0	149	320
09:00 AM	14	1	3	0	18	0	145	4	0	149	4	0	11	0	15	8	106	0	0	114	296
Total Volume	62	4	21	0	87	0	482	13	0	495	31	0	43	0	74	33	492	0	0	525	1181
% App. Total	71.3	4.6	24.1	0		0	97.4	2.6	0		41.9	0	58.1	0		6.3	93.7	0	0		
PHF	.738	.500	.583	.000	.725	.000	.831	.650	.000	.831	.554	.000	.896	.000	.712	.917	.872	.000	.000	.881	.923
Cars	60	3	20	0	83	0	450	12	0	462	24	0	31	0	55	31	471	0	0	502	1102
% Cars	96.8	75.0	95.2	0	95.4	0	93.4	92.3	0	93.3	77.4	0	72.1	0	74.3	93.9	95.7	0	0	95.6	93.3
Heavy Vehicles	2	1	1	0	4	0	32	1	0	33	7	0	12	0	19	2	21	0	0	23	79
% Heavy Vehicles	3.2	25.0	4.8	0	4.6	0	6.6	7.7	0	6.7	22.6	0	27.9	0	25.7	6.1	4.3	0	0	4.4	6.7



PRECISION
D A T A
INDUSTRIES, LLC

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Email: datarequests@pdillc.com

N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 D
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total	
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds		
08:00 AM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	3
08:15 AM	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
08:30 AM	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
08:45 AM	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	5	0	10	0	0	0	0	0	2	0	0	0	0	0	0	0	17
09:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	3
09:15 AM	0	0	0	6	0	0	0	0	0	1	0	0	0	0	0	0	0	7
09:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
09:45 AM	0	0	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	6
Total	0	0	0	14	0	0	0	0	0	3	0	0	0	0	1	0	0	18
10:00 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
10:45 AM	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Total	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	14
Grand Total	0	5	0	38	0	0	0	0	0	5	0	0	0	0	1	0	0	49
Apprch %	0	11.6	0	88.4	0	0	0	0	0	100	0	0	0	0	100	0	0	
Total %	0	10.2	0	77.6	0	0	0	0	0	10.2	0	0	0	0	2	0	0	

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:30 AM																					
08:30 AM	0	3	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
08:45 AM	0	1	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
09:00 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
09:15 AM	0	0	0	6	6	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	7
Total Volume	0	4	0	14	18	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	20
% App. Total	0	22.2	0	77.8		0	0	0	0		0	100	0	0		0	100	0	0		
PHF	.000	.333	.000	.583	.750	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.714

N/S: Goldfinch Drive/ Gregien Avenue
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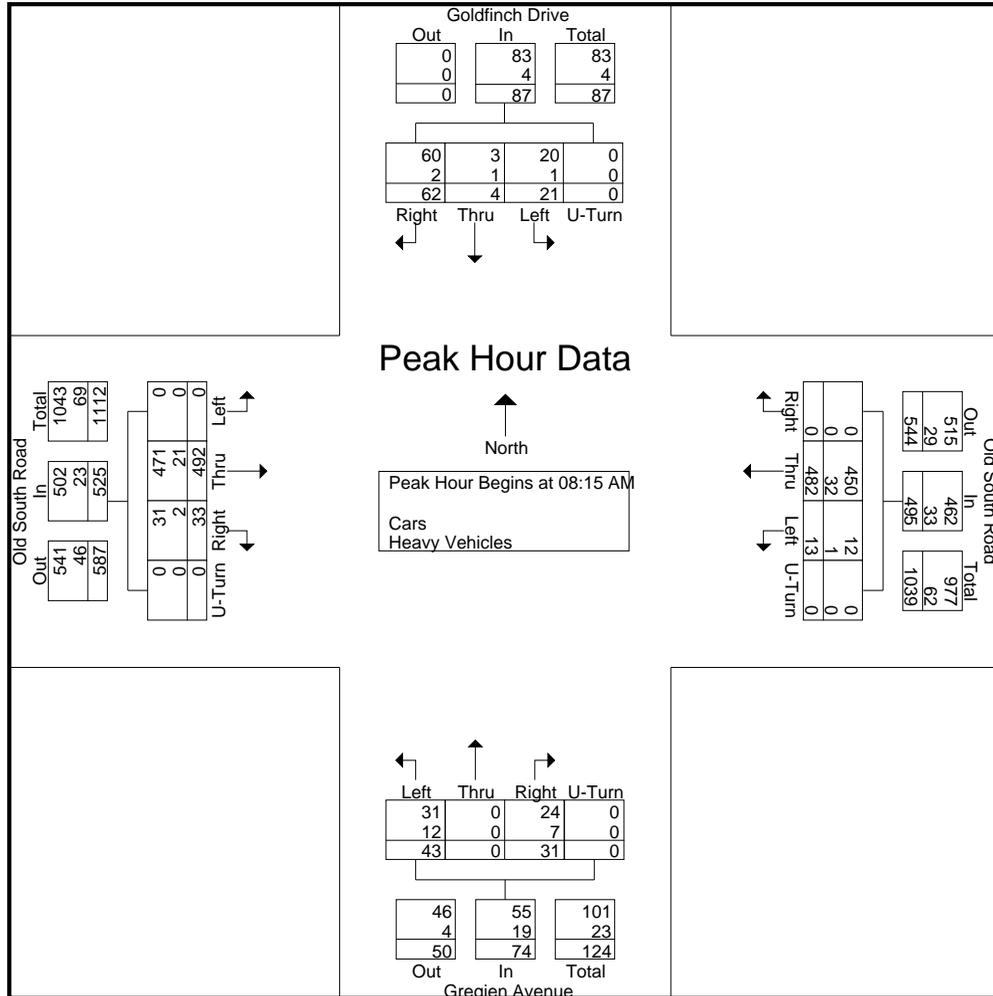


PRECISION
 DATA
 INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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 Email: datarequests@pdillc.com

File Name : 143955 D
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	16	1	6	0	23	0	116	1	0	117	14	0	12	0	26	9	125	0	0	134	300
08:30 AM	11	2	3	0	16	0	101	3	0	104	9	0	8	0	17	8	120	0	0	128	265
08:45 AM	21	0	9	0	30	0	120	5	0	125	4	0	12	0	16	8	141	0	0	149	320
09:00 AM	14	1	3	0	18	0	145	4	0	149	4	0	11	0	15	8	106	0	0	114	296
Total Volume	62	4	21	0	87	0	482	13	0	495	31	0	43	0	74	33	492	0	0	525	1181
% App. Total	71.3	4.6	24.1	0		0	97.4	2.6	0		41.9	0	58.1	0		6.3	93.7	0	0		
PHF	.738	.500	.583	.000	.725	.000	.831	.650	.000	.831	.554	.000	.896	.000	.712	.917	.872	.000	.000	.881	.923
Cars	60	3	20	0	83	0	450	12	0	462	24	0	31	0	55	31	471	0	0	502	1102
% Cars	96.8	75.0	95.2	0	95.4	0	93.4	92.3	0	93.3	77.4	0	72.1	0	74.3	93.9	95.7	0	0	95.6	93.3
Heavy Vehicles	2	1	1	0	4	0	32	1	0	33	7	0	12	0	19	2	21	0	0	23	79
% Heavy Vehicles	3.2	25.0	4.8	0	4.6	0	6.6	7.7	0	6.7	22.6	0	27.9	0	25.7	6.1	4.3	0	0	4.4	6.7





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File Name : 143955 DD
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	5	0	3	0	0	101	4	0	2	0	11	0	9	118	0	0	253
03:15 PM	15	0	3	0	0	98	0	0	3	0	12	0	11	126	0	0	268
03:30 PM	10	3	9	0	0	76	1	0	6	0	10	0	12	121	0	0	248
03:45 PM	19	0	7	0	0	96	2	0	12	0	6	0	18	135	0	0	295
Total	49	3	22	0	0	371	7	0	23	0	39	0	50	500	0	0	1064
04:00 PM	12	0	3	0	0	109	6	0	7	0	9	0	21	131	0	0	298
04:15 PM	7	1	3	0	0	109	5	0	2	0	14	0	12	146	0	0	299
04:30 PM	12	0	1	0	0	121	5	0	11	0	17	0	9	151	0	0	327
04:45 PM	9	0	6	0	0	116	6	0	3	0	13	0	21	158	0	0	332
Total	40	1	13	0	0	455	22	0	23	0	53	0	63	586	0	0	1256
05:00 PM	7	0	3	0	0	149	4	0	6	0	7	0	21	152	0	0	349
05:15 PM	13	1	7	0	0	110	5	0	8	0	11	0	16	142	0	0	313
05:30 PM	15	1	3	0	0	115	3	0	4	0	9	0	9	137	0	0	296
05:45 PM	15	0	1	0	0	79	2	0	2	0	8	0	8	116	0	0	231
Total	50	2	14	0	0	453	14	0	20	0	35	0	54	547	0	0	1189
Grand Total	139	6	49	0	0	1279	43	0	66	0	127	0	167	1633	0	0	3509
Apprch %	71.6	3.1	25.3	0	0	96.7	3.3	0	34.2	0	65.8	0	9.3	90.7	0	0	
Total %	4	0.2	1.4	0	0	36.4	1.2	0	1.9	0	3.6	0	4.8	46.5	0	0	
Cars	136	5	46	0	0	1246	37	0	57	0	117	0	138	1552	0	0	3334
% Cars	97.8	83.3	93.9	0	0	97.4	86	0	86.4	0	92.1	0	82.6	95	0	0	95
Heavy Vehicles	3	1	3	0	0	33	6	0	9	0	10	0	29	81	0	0	175
% Heavy Vehicles	2.2	16.7	6.1	0	0	2.6	14	0	13.6	0	7.9	0	17.4	5	0	0	5

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:30 PM	12	0	1	0	13	0	121	5	0	126	11	0	17	0	28	9	151	0	0	160	327
04:45 PM	9	0	6	0	15	0	116	6	0	122	3	0	13	0	16	21	158	0	0	179	332
05:00 PM	7	0	3	0	10	0	149	4	0	153	6	0	7	0	13	21	152	0	0	173	349
05:15 PM	13	1	7	0	21	0	110	5	0	115	8	0	11	0	19	16	142	0	0	158	313
Total Volume	41	1	17	0	59	0	496	20	0	516	28	0	48	0	76	67	603	0	0	670	1321
% App. Total	69.5	1.7	28.8	0		0	96.1	3.9	0		36.8	0	63.2	0		10	90	0	0		
PHF	.788	.250	.607	.000	.702	.000	.832	.833	.000	.843	.636	.000	.706	.000	.679	.798	.954	.000	.000	.936	.946
Cars	40	0	17	0	57	0	487	19	0	506	24	0	46	0	70	52	575	0	0	627	1260
% Cars	97.6	0	100	0	96.6	0	98.2	95.0	0	98.1	85.7	0	95.8	0	92.1	77.6	95.4	0	0	93.6	95.4
Heavy Vehicles	1	1	0	0	2	0	9	1	0	10	4	0	2	0	6	15	28	0	0	43	61
% Heavy Vehicles	2.4	100	0	0	3.4	0	1.8	5.0	0	1.9	14.3	0	4.2	0	7.9	22.4	4.6	0	0	6.4	4.6

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

Peak Hour for Entire Intersection Begins at 04:30 PM



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N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 DD
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
03:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
03:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	1	8
04:00 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0	0	5
04:30 PM	0	0	0	3	0	0	0	1	0	2	0	0	0	0	0	0	6
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	2	0	4	0	1	0	1	0	7	0	0	0	0	0	0	15
05:00 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	3
05:15 PM	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	2	0	0	0	1	0	1	0	0	0	1	0	0	6
Grand Total	0	3	0	11	0	1	0	2	0	10	0	0	0	1	0	1	29
Apprch %	0	21.4	0	78.6	0	33.3	0	66.7	0	100	0	0	0	50	0	50	
Total %	0	10.3	0	37.9	0	3.4	0	6.9	0	34.5	0	0	0	3.4	0	3.4	

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00 PM	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	1	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
04:30 PM	0	0	0	3	3	0	0	0	1	1	0	2	0	0	2	0	0	0	0	0	6
Total Volume	0	2	0	6	8	0	1	0	1	2	0	6	0	0	6	0	0	0	0	0	16
% App. Total	0	25	0	75		0	50	0	50		0	100	0	0		0	0	0	0		
PHF	.000	.250	.000	.500	.667	.000	.250	.000	.250	.500	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.667



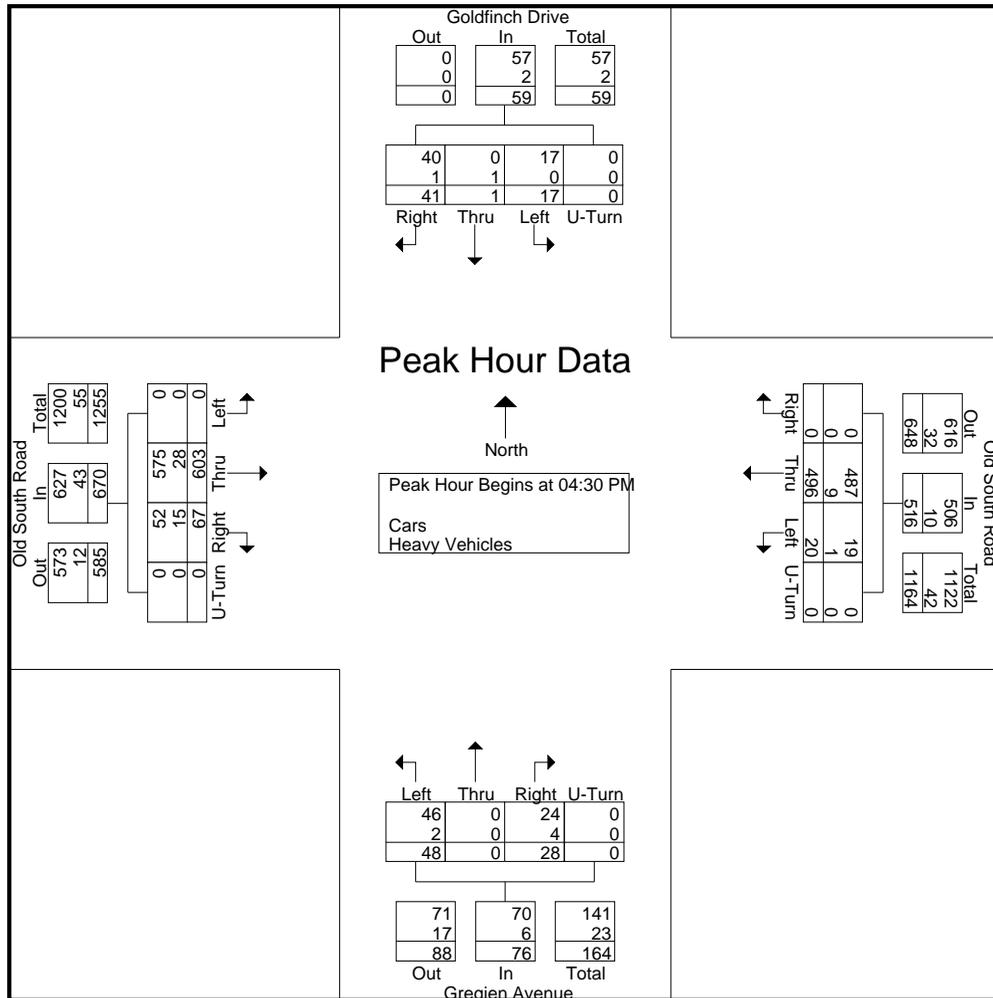
PRECISION
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N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 DD
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	12	0	1	0	13	0	121	5	0	126	11	0	17	0	28	9	151	0	0	160	327
04:45 PM	9	0	6	0	15	0	116	6	0	122	3	0	13	0	16	21	158	0	0	179	332
05:00 PM	7	0	3	0	10	0	149	4	0	153	6	0	7	0	13	21	152	0	0	173	349
05:15 PM	13	1	7	0	21	0	110	5	0	115	8	0	11	0	19	16	142	0	0	158	313
Total Volume	41	1	17	0	59	0	496	20	0	516	28	0	48	0	76	67	603	0	0	670	1321
% App. Total	69.5	1.7	28.8	0		0	96.1	3.9	0		36.8	0	63.2	0		10	90	0	0		
PHF	.788	.250	.607	.000	.702	.000	.832	.833	.000	.843	.636	.000	.706	.000	.679	.798	.954	.000	.000	.936	.946
Cars	40	0	17	0	57	0	487	19	0	506	24	0	46	0	70	52	575	0	0	627	1260
% Cars	97.6	0	100	0	96.6	0	98.2	95.0	0	98.1	85.7	0	95.8	0	92.1	77.6	95.4	0	0	93.6	95.4
Heavy Vehicles	1	1	0	0	2	0	9	1	0	10	4	0	2	0	6	15	28	0	0	43	61
% Heavy Vehicles	2.4	100	0	0	3.4	0	1.8	5.0	0	1.9	14.3	0	4.2	0	7.9	22.4	4.6	0	0	6.4	4.6





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N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 DDD
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	29	0	6	0	0	120	2	0	6	0	10	0	12	139	0	0	324
11:15 AM	23	2	3	0	0	91	6	0	10	0	6	0	16	93	0	0	250
11:30 AM	12	1	2	0	0	125	8	0	3	0	17	0	16	116	0	0	300
11:45 AM	20	2	4	0	0	98	4	0	4	0	14	0	15	134	0	0	295
Total	84	5	15	0	0	434	20	0	23	0	47	0	59	482	0	0	1169
12:00 PM	12	0	4	0	0	105	3	0	6	0	11	0	8	110	0	0	259
12:15 PM	13	0	3	0	0	87	2	0	4	0	8	0	11	93	0	0	221
12:30 PM	13	0	2	0	0	112	3	0	7	0	11	0	8	115	0	0	271
12:45 PM	11	1	3	0	0	91	3	1	4	0	6	0	9	110	0	0	239
Total	49	1	12	0	0	395	11	1	21	0	36	0	36	428	0	0	990
01:00 PM	22	0	1	0	0	91	2	0	4	0	11	0	6	102	0	0	239
01:15 PM	16	0	5	0	0	90	2	0	0	0	11	0	6	129	0	0	259
01:30 PM	10	0	5	0	0	79	4	0	3	0	4	0	8	122	0	0	235
01:45 PM	13	0	6	0	0	86	3	0	2	0	5	0	7	113	0	0	235
Total	61	0	17	0	0	346	11	0	9	0	31	0	27	466	0	0	968
Grand Total	194	6	44	0	0	1175	42	1	53	0	114	0	122	1376	0	0	3127
Apprch %	79.5	2.5	18	0	0	96.5	3.4	0.1	31.7	0	68.3	0	8.1	91.9	0	0	
Total %	6.2	0.2	1.4	0	0	37.6	1.3	0	1.7	0	3.6	0	3.9	4.4	0	0	
Cars	190	6	44	0	0	1143	37	1	47	0	103	0	108	1332	0	0	3011
% Cars	97.9	100	100	0	0	97.3	88.1	100	88.7	0	90.4	0	88.5	96.8	0	0	96.3
Heavy Vehicles	4	0	0	0	0	32	5	0	6	0	11	0	14	44	0	0	116
% Heavy Vehicles	2.1	0	0	0	0	2.7	11.9	0	11.3	0	9.6	0	11.5	3.2	0	0	3.7

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	29	0	6	0	35	0	120	2	0	122	6	0	10	0	16	12	139	0	0	151	324
11:15 AM	23	2	3	0	28	0	91	6	0	97	10	0	6	0	16	16	93	0	0	109	250
11:30 AM	12	1	2	0	15	0	125	8	0	133	3	0	17	0	20	16	116	0	0	132	300
11:45 AM	20	2	4	0	26	0	98	4	0	102	4	0	14	0	18	15	134	0	0	149	295
Total Volume	84	5	15	0	104	0	434	20	0	454	23	0	47	0	70	59	482	0	0	541	1169
% App. Total	80.8	4.8	14.4	0		0	95.6	4.4	0		32.9	0	67.1	0		10.9	89.1	0	0		
PHF	.724	.625	.625	.000	.743	.000	.868	.625	.000	.853	.575	.000	.691	.000	.875	.922	.867	.000	.000	.896	.902
Cars	80	5	15	0	100	0	422	18	0	440	21	0	46	0	67	51	466	0	0	517	1124
% Cars	95.2	100	100	0	96.2	0	97.2	90.0	0	96.9	91.3	0	97.9	0	95.7	86.4	96.7	0	0	95.6	96.2
Heavy Vehicles	4	0	0	0	4	0	12	2	0	14	2	0	1	0	3	8	16	0	0	24	45
% Heavy Vehicles	4.8	0	0	0	3.8	0	2.8	10.0	0	3.1	8.7	0	2.1	0	4.3	13.6	3.3	0	0	4.4	3.8

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



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File Name : 143955 DDD
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N/S: Goldfinch Drive/ Gregien Avenue
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Goldfinch Drive From North				Old South Road From East				Gregien Avenue From South				Old South Road From West				Int. Total	
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds		
11:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	13	0	0	0	0	0	0	0	0	1	1	0	0	0	15
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	14	0	0	0	0	0	0	0	0	2	1	0	0	0	17
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:30 PM	0	0	0	5	0	0	0	2	0	0	0	0	1	0	0	0	0	8
12:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	9	0	0	0	2	0	0	0	0	1	0	0	0	0	13
01:00 PM	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	5
01:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	2	0	3	0	0	0	0	0	0	0	6
Grand Total	0	1	0	24	0	0	0	4	0	3	0	0	3	1	0	0	0	36
Apprch %	0	4	0	96	0	0	0	100	0	100	0	0	75	25	0	0	0	
Total %	0	2.8	0	66.7	0	0	0	11.1	0	8.3	0	0	8.3	2.8	0	0	0	

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:30 PM	0	0	0	5	5	0	0	0	2	2	0	0	0	0	0	1	0	0	0	1	8
12:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:00 PM	0	0	0	0	0	0	0	0	2	2	0	3	0	0	3	0	0	0	0	0	5
Total Volume	0	1	0	9	10	0	0	0	4	4	0	3	0	0	3	1	0	0	0	1	18
% App. Total	0	10	0	90		0	0	0	100		0	100	0	0		100	0	0	0		
PHF	.000	.250	.000	.450	.500	.000	.000	.000	.500	.500	.000	.250	.000	.000	.250	.250	.000	.000	.000	.250	.563



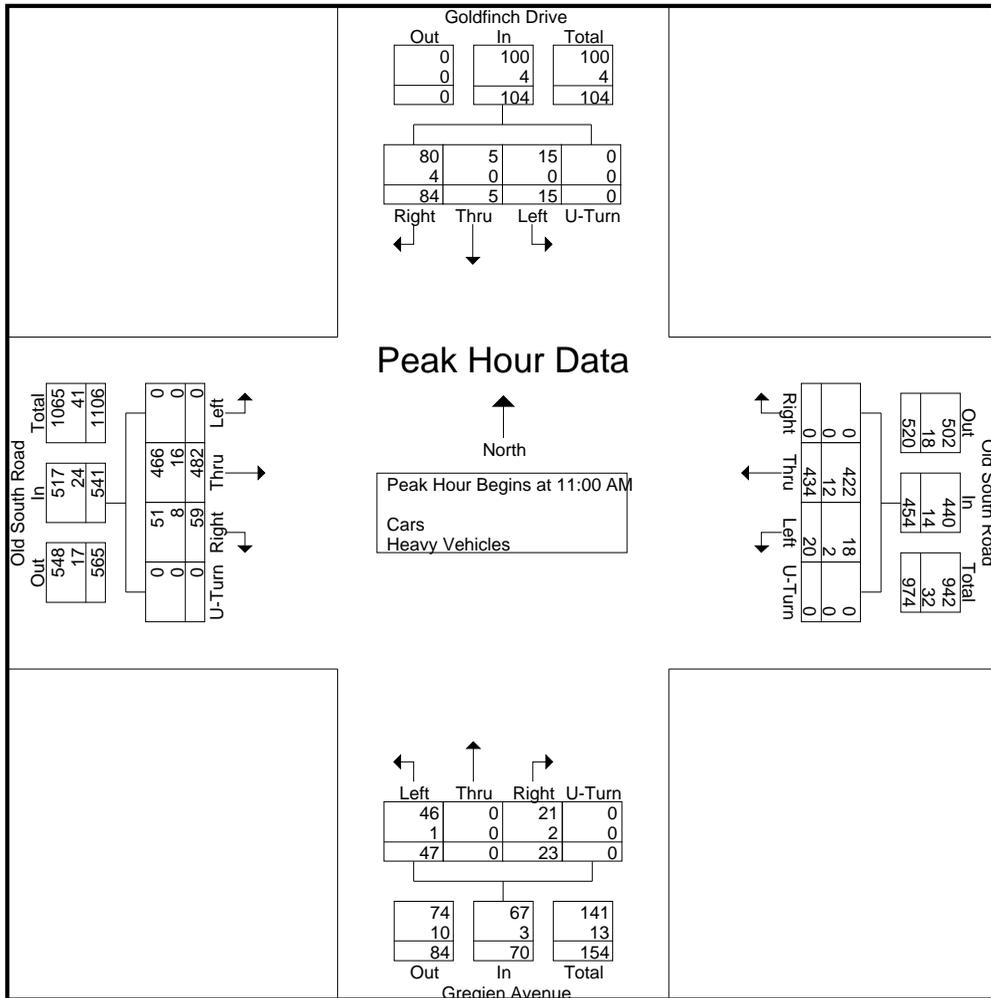
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Client: Ron Muller & Associates

File Name : 143955 DDD
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Goldfinch Drive From North					Old South Road From East					Gregien Avenue From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	29	0	6	0	35	0	120	2	0	122	6	0	10	0	16	12	139	0	0	151	324
11:15 AM	23	2	3	0	28	0	91	6	0	97	10	0	6	0	16	16	93	0	0	109	250
11:30 AM	12	1	2	0	15	0	125	8	0	133	3	0	17	0	20	16	116	0	0	132	300
11:45 AM	20	2	4	0	26	0	98	4	0	102	4	0	14	0	18	15	134	0	0	149	295
Total Volume	84	5	15	0	104	0	434	20	0	454	23	0	47	0	70	59	482	0	0	541	1169
% App. Total	80.8	4.8	14.4	0		0	95.6	4.4	0		32.9	0	67.1	0		10.9	89.1	0	0		
PHF	.724	.625	.625	.000	.743	.000	.868	.625	.000	.853	.575	.000	.691	.000	.875	.922	.867	.000	.000	.896	.902
Cars	80	5	15	0	100	0	422	18	0	440	21	0	46	0	67	51	466	0	0	517	1124
% Cars	95.2	100	100	0	96.2	0	97.2	90.0	0	96.9	91.3	0	97.9	0	95.7	86.4	96.7	0	0	95.6	96.2
Heavy Vehicles	4	0	0	0	4	0	12	2	0	14	2	0	1	0	3	8	16	0	0	24	45
% Heavy Vehicles	4.8	0	0	0	3.8	0	2.8	10.0	0	3.1	8.7	0	2.1	0	4.3	13.6	3.3	0	0	4.4	3.8





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File Name : 143955 E
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
08:00 AM	4	0	0	0	153	0	107	1	0	265
08:15 AM	6	0	0	0	145	0	135	0	0	286
08:30 AM	2	0	0	0	124	0	128	1	0	255
08:45 AM	2	0	0	0	152	0	149	2	0	305
Total	14	0	0	0	574	0	519	4	0	1111
09:00 AM	2	0	0	0	167	0	118	1	0	288
09:15 AM	1	1	0	2	145	0	120	1	0	270
09:30 AM	3	2	0	0	132	0	124	3	0	264
09:45 AM	4	3	0	1	133	0	130	2	0	273
Total	10	6	0	3	577	0	492	7	0	1095
10:00 AM	6	3	0	0	110	0	127	2	0	248
10:15 AM	3	0	0	1	107	0	109	2	0	222
10:30 AM	0	0	0	1	116	0	121	2	0	240
10:45 AM	6	0	0	0	106	0	107	7	0	226
Total	15	3	0	2	439	0	464	13	0	936
Grand Total	39	9	0	5	1590	0	1475	24	0	3142
Apprch %	81.2	18.8	0	0.3	99.7	0	98.4	1.6	0	
Total %	1.2	0.3	0	0.2	50.6	0	46.9	0.8	0	
Cars	37	9	0	5	1485	0	1379	24	0	2939
% Cars	94.9	100	0	100	93.4	0	93.5	100	0	93.5
Heavy Vehicles	2	0	0	0	105	0	96	0	0	203
% Heavy Vehicles	5.1	0	0	0	6.6	0	6.5	0	0	6.5

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
08:15 AM	6	0	0	6	0	145	0	145	135	0	0	135	286
08:30 AM	2	0	0	2	0	124	0	124	128	1	0	129	255
08:45 AM	2	0	0	2	0	152	0	152	149	2	0	151	305
09:00 AM	2	0	0	2	0	167	0	167	118	1	0	119	288
Total Volume	12	0	0	12	0	588	0	588	530	4	0	534	1134
% App. Total	100	0	0		0	100	0		99.3	0.7	0		
PHF	.500	.000	.000	.500	.000	.880	.000	.880	.889	.500	.000	.884	.930
Cars	10	0	0	10	0	548	0	548	505	4	0	509	1067
% Cars	83.3	0	0	83.3	0	93.2	0	93.2	95.3	100	0	95.3	94.1
Heavy Vehicles	2	0	0	2	0	40	0	40	25	0	0	25	67
% Heavy Vehicles	16.7	0	0	16.7	0	6.8	0	6.8	4.7	0	0	4.7	5.9

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:15 AM



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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 143955 E
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
08:00 AM	0	0	2	0	7	0	0	0	0	9
08:15 AM	0	0	3	0	8	0	0	0	0	11
08:30 AM	0	0	2	0	7	0	0	0	0	9
08:45 AM	0	0	8	0	7	0	0	0	0	15
Total	0	0	15	0	29	0	0	0	0	44
09:00 AM	0	0	6	0	5	0	4	0	0	15
09:15 AM	0	0	5	0	10	0	3	0	0	18
09:30 AM	0	0	4	0	11	0	3	0	0	18
09:45 AM	0	0	4	1	9	0	2	0	0	16
Total	0	0	19	1	35	0	12	0	0	67
10:00 AM	0	0	12	0	15	0	6	0	0	33
10:15 AM	0	0	8	0	13	0	1	0	0	22
10:30 AM	0	0	13	0	12	0	12	0	0	37
10:45 AM	0	1	18	0	7	0	4	0	0	30
Total	0	1	51	0	47	0	23	0	0	122
Grand Total	0	1	85	1	111	0	35	0	0	233
Apprch %	0	1.2	98.8	0.9	99.1	0	100	0	0	
Total %	0	0.4	36.5	0.4	47.6	0	15	0	0	

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
10:00 AM	0	0	12	12	0	15	0	15	6	0	0	6	33
10:15 AM	0	0	8	8	0	13	0	13	1	0	0	1	22
10:30 AM	0	0	13	13	0	12	0	12	12	0	0	12	37
10:45 AM	0	1	18	19	0	7	0	7	4	0	0	4	30
Total Volume	0	1	51	52	0	47	0	47	23	0	0	23	122
% App. Total	0	1.9	98.1		0	100	0		100	0	0		
PHF	.000	.250	.708	.684	.000	.783	.000	.783	.479	.000	.000	.479	.824

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 10:00 AM



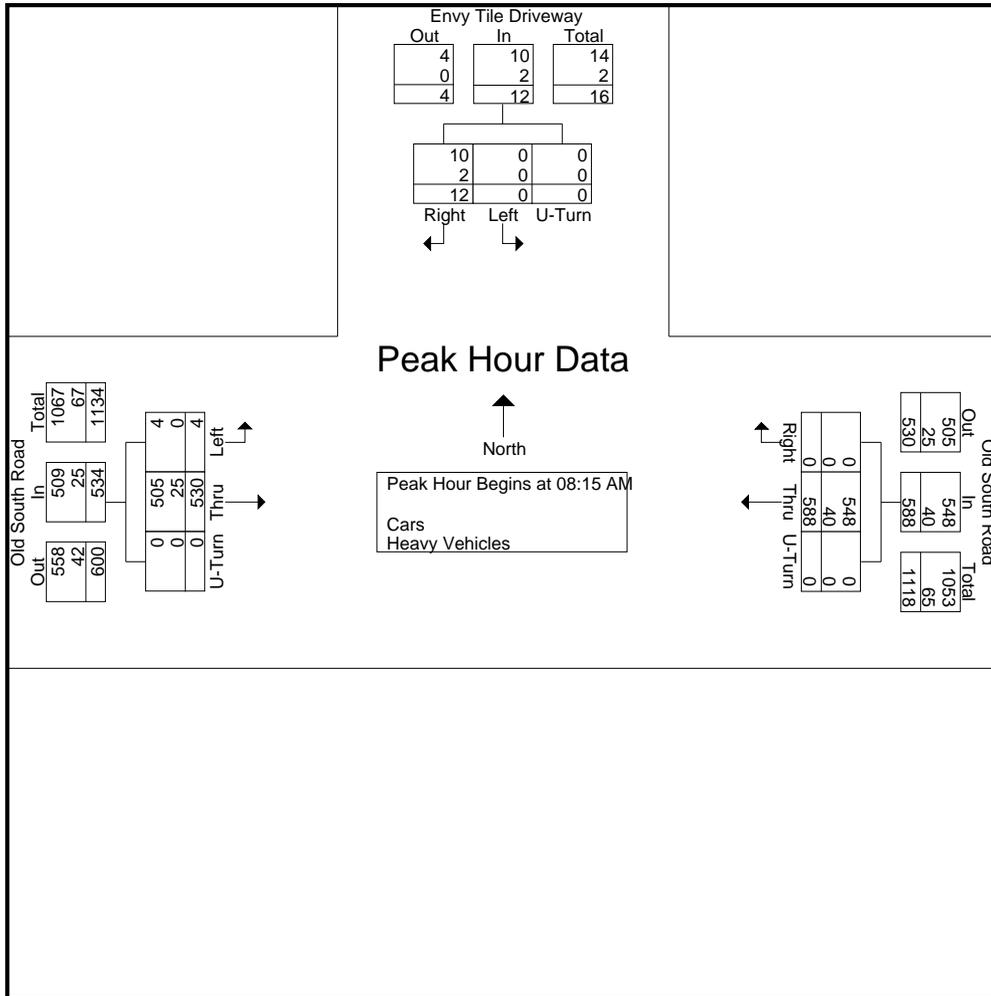
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P.O. Box 301 Berlin, MA 01503
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File Name : 143955 E
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:15 AM													
08:15 AM	6	0	0	6	0	145	0	145	135	0	0	135	286
08:30 AM	2	0	0	2	0	124	0	124	128	1	0	129	255
08:45 AM	2	0	0	2	0	152	0	152	149	2	0	151	305
09:00 AM	2	0	0	2	0	167	0	167	118	1	0	119	288
Total Volume	12	0	0	12	0	588	0	588	530	4	0	534	1134
% App. Total	100	0	0		0	100	0		99.3	0.7	0		
PHF	.500	.000	.000	.500	.000	.880	.000	.880	.889	.500	.000	.884	.930
Cars	10	0	0	10	0	548	0	548	505	4	0	509	1067
% Cars	83.3	0	0	83.3	0	93.2	0	93.2	95.3	100	0	95.3	94.1
Heavy Vehicles	2	0	0	2	0	40	0	40	25	0	0	25	67
% Heavy Vehicles	16.7	0	0	16.7	0	6.8	0	6.8	4.7	0	0	4.7	5.9





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File Name : 143955 EE
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
03:00 PM	7	5	0	0	117	0	122	4	0	255
03:15 PM	4	1	0	1	127	0	135	2	0	270
03:30 PM	4	0	0	5	90	0	134	0	0	233
03:45 PM	2	1	0	4	118	0	151	1	0	277
Total	17	7	0	10	452	0	542	7	0	1035
04:00 PM	7	3	0	0	127	0	150	1	0	288
04:15 PM	7	1	0	3	130	0	158	1	0	300
04:30 PM	0	1	0	2	149	0	159	0	0	311
04:45 PM	1	2	0	0	137	0	179	1	0	320
Total	15	7	0	5	543	0	646	3	0	1219
05:00 PM	4	0	0	0	168	0	176	1	0	349
05:15 PM	2	0	0	1	135	0	161	0	0	299
05:30 PM	5	1	0	2	137	0	144	3	0	292
05:45 PM	1	0	0	0	103	0	124	1	0	229
Total	12	1	0	3	543	0	605	5	0	1169
Grand Total	44	15	0	18	1538	0	1793	15	0	3423
Apprch %	74.6	25.4	0	1.2	98.8	0	99.2	0.8	0	
Total %	1.3	0.4	0	0.5	44.9	0	52.4	0.4	0	
Cars	42	15	0	17	1492	0	1673	15	0	3254
% Cars	95.5	100	0	94.4	97	0	93.3	100	0	95.1
Heavy Vehicles	2	0	0	1	46	0	120	0	0	169
% Heavy Vehicles	4.5	0	0	5.6	3	0	6.7	0	0	4.9

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
04:15 PM	7	1	0	8	3	130	0	133	158	1	0	159	300
04:30 PM	0	1	0	1	2	149	0	151	159	0	0	159	311
04:45 PM	1	2	0	3	0	137	0	137	179	1	0	180	320
05:00 PM	4	0	0	4	0	168	0	168	176	1	0	177	349
Total Volume	12	4	0	16	5	584	0	589	672	3	0	675	1280
% App. Total	75	25	0		0.8	99.2	0		99.6	0.4	0		
PHF	.429	.500	.000	.500	.417	.869	.000	.876	.939	.750	.000	.938	.917
Cars	12	4	0	16	5	570	0	575	636	3	0	639	1230
% Cars	100	100	0	100	100	97.6	0	97.6	94.6	100	0	94.7	96.1
Heavy Vehicles	0	0	0	0	0	14	0	14	36	0	0	36	50
% Heavy Vehicles	0	0	0	0	0	2.4	0	2.4	5.4	0	0	5.3	3.9

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

Peak Hour for Entire Intersection Begins at 04:15 PM



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File Name : 143955 EE
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
03:00 PM	0	0	1	0	2	0	3	0	0	6
03:15 PM	0	0	3	0	2	0	21	0	1	27
03:30 PM	1	0	3	1	6	0	8	0	0	19
03:45 PM	2	0	1	1	7	0	8	0	0	19
Total	3	0	8	2	17	0	40	0	1	71
04:00 PM	0	0	0	0	8	0	0	0	0	8
04:15 PM	0	0	1	0	3	0	5	0	0	9
04:30 PM	0	0	0	0	8	0	3	0	0	11
04:45 PM	0	0	0	1	7	0	0	0	0	8
Total	0	0	1	1	26	0	8	0	0	36
05:00 PM	0	1	0	0	5	0	9	0	0	15
05:15 PM	0	0	0	0	6	0	5	0	0	11
05:30 PM	0	0	0	0	7	0	3	0	0	10
05:45 PM	0	0	0	0	1	0	2	0	0	3
Total	0	1	0	0	19	0	19	0	0	39
Grand Total	3	1	9	3	62	0	67	0	1	146
Apprch %	23.1	7.7	69.2	4.6	95.4	0	98.5	0	1.5	
Total %	2.1	0.7	6.2	2.1	42.5	0	45.9	0	0.7	

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
03:15 PM	0	0	3	3	0	2	0	2	21	0	1	22	27
03:30 PM	1	0	3	4	1	6	0	7	8	0	0	8	19
03:45 PM	2	0	1	3	1	7	0	8	8	0	0	8	19
04:00 PM	0	0	0	0	0	8	0	8	0	0	0	0	8
Total Volume	3	0	7	10	2	23	0	25	37	0	1	38	73
% App. Total	30	0	70		8	92	0		97.4	0	2.6		
PHF	.375	.000	.583	.625	.500	.719	.000	.781	.440	.000	.250	.432	.676

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

Peak Hour for Entire Intersection Begins at 03:15 PM



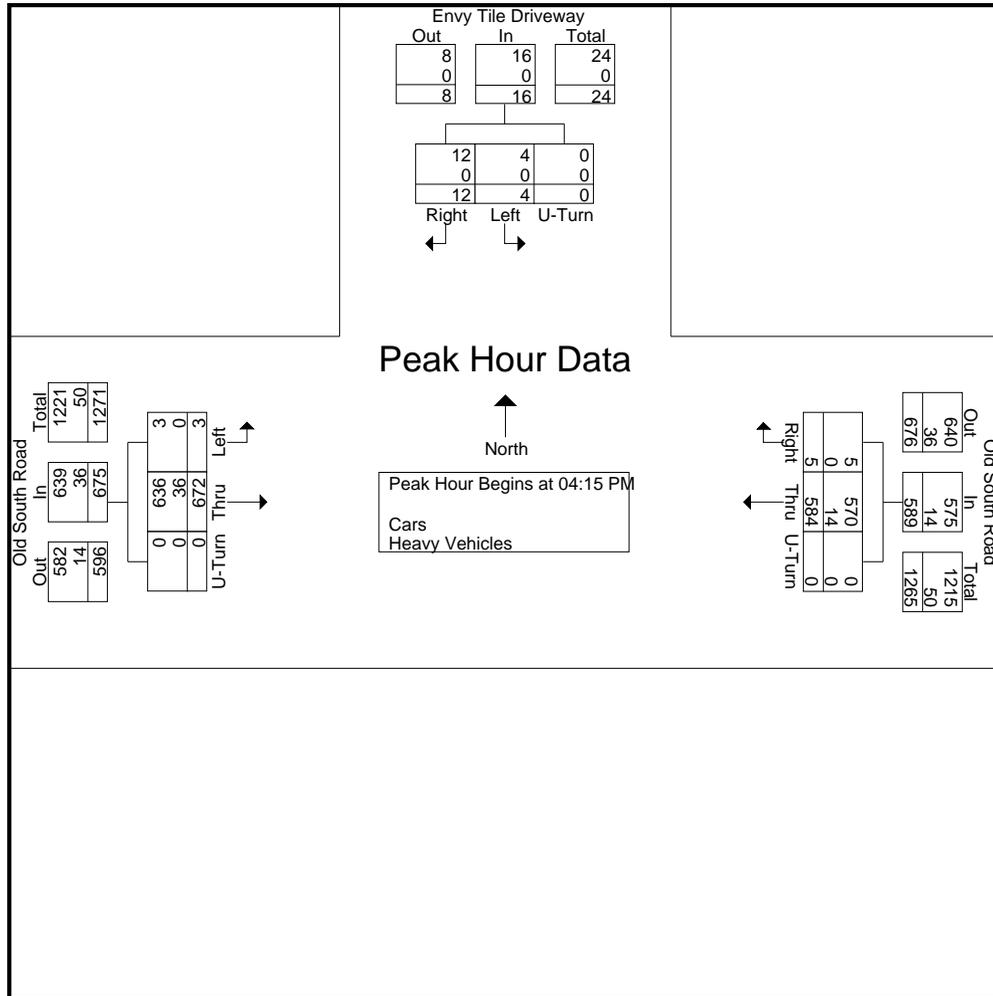
PRECISION
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P.O. Box 301 Berlin, MA 01503
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N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 EE
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	7	1	0	8	3	130	0	133	158	1	0	159	300
04:30 PM	0	1	0	1	2	149	0	151	159	0	0	159	311
04:45 PM	1	2	0	3	0	137	0	137	179	1	0	180	320
05:00 PM	4	0	0	4	0	168	0	168	176	1	0	177	349
Total Volume	12	4	0	16	5	584	0	589	672	3	0	675	1280
% App. Total	75	25	0		0.8	99.2	0		99.6	0.4	0		
PHF	.429	.500	.000	.500	.417	.869	.000	.876	.939	.750	.000	.938	.917
Cars	12	4	0	16	5	570	0	575	636	3	0	639	1230
% Cars	100	100	0	100	100	97.6	0	97.6	94.6	100	0	94.7	96.1
Heavy Vehicles	0	0	0	0	0	14	0	14	36	0	0	36	50
% Heavy Vehicles	0	0	0	0	0	2.4	0	2.4	5.4	0	0	5.3	3.9





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File Name : 143955 EEE
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	
11:00 AM	4	4	0	2	126	0	136	2	0	274
11:15 AM	0	1	0	2	122	0	133	1	0	259
11:30 AM	4	3	0	2	143	0	139	1	0	292
11:45 AM	1	2	0	1	127	0	134	3	0	268
Total	9	10	0	7	518	0	542	7	0	1093
12:00 PM	1	2	0	2	127	0	165	2	0	299
12:15 PM	6	3	0	1	153	0	174	6	0	343
12:30 PM	4	3	0	0	159	0	159	4	0	329
12:45 PM	3	2	0	0	134	0	154	3	0	296
Total	14	10	0	3	573	0	652	15	0	1267
01:00 PM	7	1	0	1	138	0	154	2	0	303
01:15 PM	7	2	0	0	141	0	126	3	0	279
01:30 PM	2	3	0	1	112	0	121	3	0	242
01:45 PM	3	1	0	2	137	0	137	4	0	284
Total	19	7	0	4	528	0	538	12	0	1108
Grand Total	42	27	0	14	1619	0	1732	34	0	3468
Apprch %	60.9	39.1	0	0.9	99.1	0	98.1	1.9	0	
Total %	1.2	0.8	0	0.4	46.7	0	49.9	1	0	
Cars	41	24	0	13	1539	0	1618	32	0	3267
% Cars	97.6	88.9	0	92.9	95.1	0	93.4	94.1	0	94.2
Heavy Vehicles	1	3	0	1	80	0	114	2	0	201
% Heavy Vehicles	2.4	11.1	0	7.1	4.9	0	6.6	5.9	0	5.8

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
12:15 PM	6	3	0	9	1	153	0	154	174	6	0	180	343
12:30 PM	4	3	0	7	0	159	0	159	159	4	0	163	329
12:45 PM	3	2	0	5	0	134	0	134	154	3	0	157	296
01:00 PM	7	1	0	8	1	138	0	139	154	2	0	156	303
Total Volume	20	9	0	29	2	584	0	586	641	15	0	656	1271
% App. Total	69	31	0		0.3	99.7	0		97.7	2.3	0		
PHF	.714	.750	.000	.806	.500	.918	.000	.921	.921	.625	.000	.911	.926
Cars	20	7	0	27	2	564	0	566	601	15	0	616	1209
% Cars	100	77.8	0	93.1	100	96.6	0	96.6	93.8	100	0	93.9	95.1
Heavy Vehicles	0	2	0	2	0	20	0	20	40	0	0	40	62
% Heavy Vehicles	0	22.2	0	6.9	0	3.4	0	3.4	6.2	0	0	6.1	4.9

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 12:15 PM



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File Name : 143955 EEE
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Envy Tile Driveway From North			Old South Road From East			Old South Road From West			Int. Total
	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	
11:00 AM	0	0	1	0	6	0	4	0	0	11
11:15 AM	0	0	2	0	7	0	3	0	1	13
11:30 AM	0	0	1	0	6	0	6	0	0	13
11:45 AM	0	0	5	1	5	0	3	0	0	14
Total	0	0	9	1	24	0	16	0	1	51
12:00 PM	0	0	4	0	4	0	5	0	0	13
12:15 PM	0	0	1	0	1	0	8	0	0	10
12:30 PM	1	0	4	0	3	0	0	0	0	8
12:45 PM	0	0	3	0	7	0	5	0	0	15
Total	1	0	12	0	15	0	18	0	0	46
01:00 PM	0	0	0	0	2	0	0	0	0	2
01:15 PM	0	0	0	0	11	0	0	0	0	11
01:30 PM	0	0	0	0	5	0	0	0	0	5
01:45 PM	0	0	0	0	6	0	0	0	0	6
Total	0	0	0	0	24	0	0	0	0	24
Grand Total	1	0	21	1	63	0	34	0	1	121
Apprch %	4.5	0	95.5	1.6	98.4	0	97.1	0	2.9	
Total %	0.8	0	17.4	0.8	52.1	0	28.1	0	0.8	

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	
11:15 AM	0	0	2	2	0	7	0	7	3	0	1	4	13
11:30 AM	0	0	1	1	0	6	0	6	6	0	0	6	13
11:45 AM	0	0	5	5	1	5	0	6	3	0	0	3	14
12:00 PM	0	0	4	4	0	4	0	4	5	0	0	5	13
Total Volume	0	0	12	12	1	22	0	23	17	0	1	18	53
% App. Total	0	0	100		4.3	95.7	0		94.4	0	5.6		
PHF	.000	.000	.600	.600	.250	.786	.000	.821	.708	.000	.250	.750	.946

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:15 AM



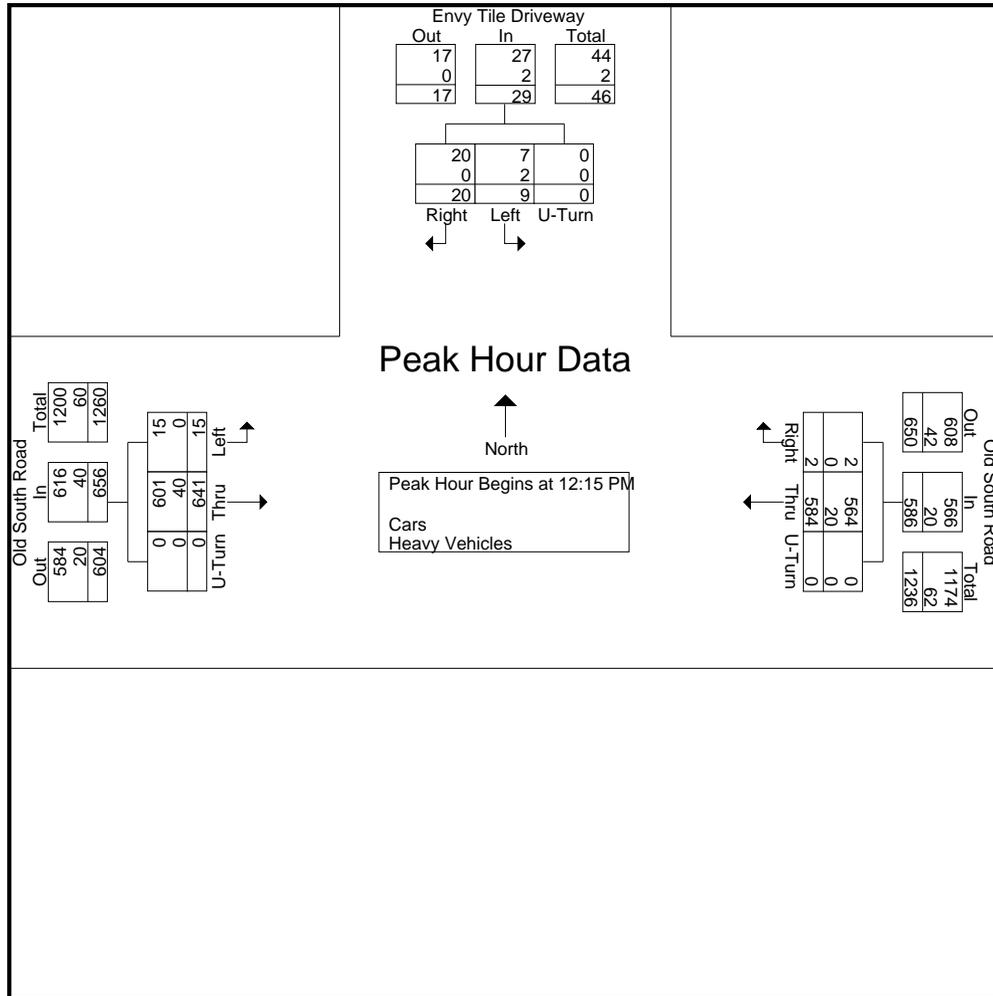
PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

File Name : 143955 EEE
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N: Envy Tile Driveway
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Start Time	Envy Tile Driveway From North				Old South Road From East				Old South Road From West				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 12:15 PM													
12:15 PM	6	3	0	9	1	153	0	154	174	6	0	180	343
12:30 PM	4	3	0	7	0	159	0	159	159	4	0	163	329
12:45 PM	3	2	0	5	0	134	0	134	154	3	0	157	296
01:00 PM	7	1	0	8	1	138	0	139	154	2	0	156	303
Total Volume	20	9	0	29	2	584	0	586	641	15	0	656	1271
% App. Total	69	31	0		0.3	99.7	0		97.7	2.3	0		
PHF	.714	.750	.000	.806	.500	.918	.000	.921	.921	.625	.000	.911	.926
Cars	20	7	0	27	2	564	0	566	601	15	0	616	1209
% Cars	100	77.8	0	93.1	100	96.6	0	96.6	93.8	100	0	93.9	95.1
Heavy Vehicles	0	2	0	2	0	20	0	20	40	0	0	40	62
% Heavy Vehicles	0	22.2	0	6.9	0	3.4	0	3.4	6.2	0	0	6.1	4.9





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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 F
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	2	0	0	0	3	153	0	0	4	1	9	0	0	104	3	0	279
08:15 AM	1	0	0	0	3	146	0	0	6	0	9	0	0	128	2	0	295
08:30 AM	1	1	0	0	2	123	0	0	9	0	4	0	0	120	2	0	262
08:45 AM	1	0	1	0	1	149	1	0	3	0	4	0	0	146	3	0	309
Total	5	1	1	0	9	571	1	0	22	1	26	0	0	498	10	0	1145
09:00 AM	2	0	0	0	0	170	0	0	5	0	3	0	0	115	3	0	298
09:15 AM	0	0	0	0	1	146	0	0	5	0	6	0	0	116	1	0	275
09:30 AM	0	0	0	0	1	135	0	0	6	0	3	0	0	120	3	0	268
09:45 AM	1	0	0	0	1	136	0	0	3	0	5	0	0	130	3	0	279
Total	3	0	0	0	3	587	0	0	19	0	17	0	0	481	10	0	1120
10:00 AM	0	0	0	0	1	113	0	0	3	0	1	0	0	125	3	0	246
10:15 AM	4	0	1	0	3	108	0	0	5	0	7	0	0	100	1	0	229
10:30 AM	1	0	0	0	1	117	0	0	9	0	3	0	0	115	2	0	248
10:45 AM	0	0	1	0	1	110	0	0	6	0	2	0	0	108	1	0	229
Total	5	0	2	0	6	448	0	0	23	0	13	0	0	448	7	0	952
Grand Total	13	1	3	0	18	1606	1	0	64	1	56	0	0	1427	27	0	3217
Apprch %	76.5	5.9	17.6	0	1.1	98.8	0.1	0	52.9	0.8	46.3	0	0	98.1	1.9	0	
Total %	0.4	0	0.1	0	0.6	49.9	0	0	2	0	1.7	0	0	44.4	0.8	0	
Cars	11	1	2	0	16	1496	1	0	58	1	51	0	0	1354	25	0	3016
% Cars	84.6	100	66.7	0	88.9	93.2	100	0	90.6	100	91.1	0	0	94.9	92.6	0	93.8
Heavy Vehicles	2	0	1	0	2	110	0	0	6	0	5	0	0	73	2	0	201
% Heavy Vehicles	15.4	0	33.3	0	11.1	6.8	0	0	9.4	0	8.9	0	0	5.1	7.4	0	6.2

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
08:15 AM	1	0	0	0	1	3	146	0	0	149	6	0	9	0	15	0	128	2	0	130	295
08:30 AM	1	1	0	0	2	2	123	0	0	125	9	0	4	0	13	0	120	2	0	122	262
08:45 AM	1	0	1	0	2	1	149	1	0	151	3	0	4	0	7	0	146	3	0	149	309
09:00 AM	2	0	0	0	2	0	170	0	0	170	5	0	3	0	8	0	115	3	0	118	298
Total Volume	5	1	1	0	7	6	588	1	0	595	23	0	20	0	43	0	509	10	0	519	1164
% App. Total	71.4	14.3	14.3	0		1	98.8	0.2	0		53.5	0	46.5	0		0	98.1	1.9	0		
PHF	.625	.250	.250	.000	.875	.500	.865	.250	.000	.875	.639	.000	.556	.000	.717	.000	.872	.833	.000	.871	.942
Cars	3	1	0	0	4	5	546	1	0	552	22	0	18	0	40	0	491	9	0	500	1096
% Cars	60.0	100	0	0	57.1	83.3	92.9	100	0	92.8	95.7	0	90.0	0	93.0	0	96.5	90.0	0	96.3	94.2
Heavy Vehicles	2	0	1	0	3	1	42	0	0	43	1	0	2	0	3	0	18	1	0	19	68
% Heavy Vehicles	40.0	0	100	0	42.9	16.7	7.1	0	0	7.2	4.3	0	10.0	0	7.0	0	3.5	10.0	0	3.7	5.8

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:15 AM



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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 F
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
09:00 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
09:15 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
09:30 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
09:45 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16
10:00 AM	0	0	0	11	0	0	0	1	0	0	0	1	0	0	0	1	14
10:15 AM	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
10:30 AM	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
10:45 AM	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	15
Total	0	0	0	50	0	0	0	1	0	0	0	1	0	0	0	1	53
Grand Total	0	0	0	66	0	0	0	2	0	0	0	1	0	0	0	1	70
Apprch %	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	
Total %	0	0	0	94.3	0	0	0	2.9	0	0	0	1.4	0	0	0	1.4	

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
10:00 AM	0	0	0	11	11	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	14
10:15 AM	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
10:30 AM	0	0	0	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
10:45 AM	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Total Volume	0	0	0	50	50	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	53
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.833	.833	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.883

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 10:00 AM

N/S: Valero Garden/ Old South Market
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

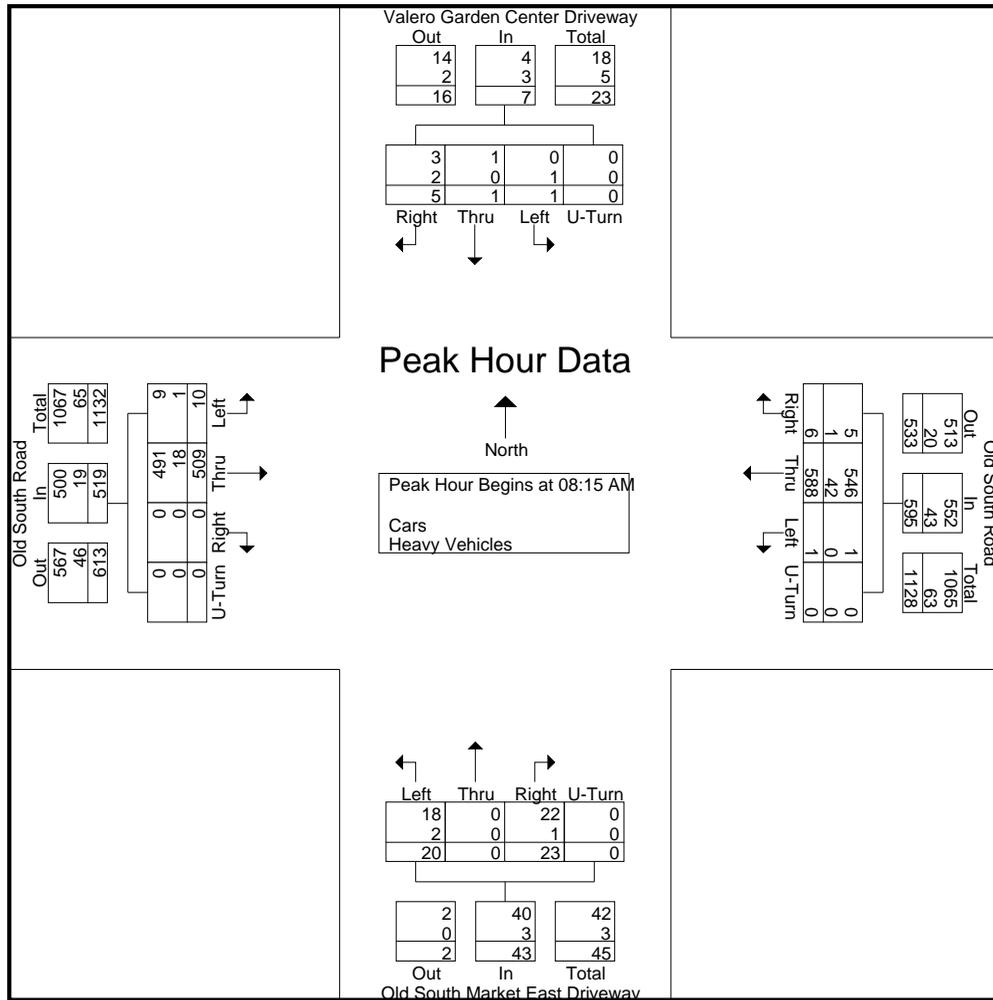


PRECISION
 DATA
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File Name : 143955 F
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	1	0	0	0	1	3	146	0	0	149	6	0	9	0	15	0	128	2	0	130	295
08:30 AM	1	1	0	0	2	2	123	0	0	125	9	0	4	0	13	0	120	2	0	122	262
08:45 AM	1	0	1	0	2	1	149	1	0	151	3	0	4	0	7	0	146	3	0	149	309
09:00 AM	2	0	0	0	2	0	170	0	0	170	5	0	3	0	8	0	115	3	0	118	298
Total Volume	5	1	1	0	7	6	588	1	0	595	23	0	20	0	43	0	509	10	0	519	1164
% App. Total	71.4	14.3	14.3	0		1	98.8	0.2	0		53.5	0	46.5	0		0	98.1	1.9	0		
PHF	.625	.250	.250	.000	.875	.500	.865	.250	.000	.875	.639	.000	.556	.000	.717	.000	.872	.833	.000	.871	.942
Cars	3	1	0	0	4	5	546	1	0	552	22	0	18	0	40	0	491	9	0	500	1096
% Cars	60.0	100	0	0	57.1	83.3	92.9	100	0	92.8	95.7	0	90.0	0	93.0	0	96.5	90.0	0	96.3	94.2
Heavy Vehicles	2	0	1	0	3	1	42	0	0	43	1	0	2	0	3	0	18	1	0	19	68
% Heavy Vehicles	40.0	0	100	0	42.9	16.7	7.1	0	0	7.2	4.3	0	10.0	0	7.0	0	3.5	10.0	0	3.7	5.8





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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 FF
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	0	0	0	0	1	124	0	0	3	1	1	0	0	123	5	0	258
03:15 PM	1	0	1	0	2	129	0	0	6	0	4	0	0	129	2	0	274
03:30 PM	0	0	1	0	0	92	1	0	3	0	2	0	0	131	2	0	232
03:45 PM	0	0	2	0	2	118	0	0	3	0	8	0	0	147	0	0	280
Total	1	0	4	0	5	463	1	0	15	1	15	0	0	530	9	0	1044
04:00 PM	2	0	0	0	3	131	1	0	2	0	2	0	0	149	2	0	292
04:15 PM	1	0	0	0	0	135	1	0	4	0	2	0	0	155	1	0	299
04:30 PM	1	0	0	0	0	147	0	0	4	0	3	0	0	155	0	0	310
04:45 PM	1	0	0	0	1	136	0	0	5	0	7	0	0	173	1	0	324
Total	5	0	0	0	4	549	2	0	15	0	14	0	0	632	4	0	1225
05:00 PM	0	0	1	0	0	170	2	0	5	0	4	0	0	169	0	0	351
05:15 PM	0	0	0	0	0	135	1	0	7	0	3	0	1	152	0	0	299
05:30 PM	0	0	0	0	0	143	1	0	8	0	8	0	0	140	0	0	300
05:45 PM	0	0	0	0	0	104	0	0	9	0	2	0	0	114	0	0	229
Total	0	0	1	0	0	552	4	0	29	0	17	0	1	575	0	0	1179
Grand Total	6	0	5	0	9	1564	7	0	59	1	46	0	1	1737	13	0	3448
Apprch %	54.5	0	45.5	0	0.6	99	0.4	0	55.7	0.9	43.4	0	0.1	99.2	0.7	0	
Total %	0.2	0	0.1	0	0.3	45.4	0.2	0	1.7	0	1.3	0	0	50.4	0.4	0	
Cars	5	0	5	0	8	1514	7	0	55	1	44	0	0	1631	12	0	3282
% Cars	83.3	0	100	0	88.9	96.8	100	0	93.2	100	95.7	0	0	93.9	92.3	0	95.2
Heavy Vehicles	1	0	0	0	1	50	0	0	4	0	2	0	1	106	1	0	166
% Heavy Vehicles	16.7	0	0	0	11.1	3.2	0	0	6.8	0	4.3	0	100	6.1	7.7	0	4.8

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:15 PM	1	0	0	0	1	0	135	1	0	136	4	0	2	0	6	0	155	1	0	156	299
04:30 PM	1	0	0	0	1	0	147	0	0	147	4	0	3	0	7	0	155	0	0	155	310
04:45 PM	1	0	0	0	1	1	136	0	0	137	5	0	7	0	12	0	173	1	0	174	324
05:00 PM	0	0	1	0	1	0	170	2	0	172	5	0	4	0	9	0	169	0	0	169	351
Total Volume	3	0	1	0	4	1	588	3	0	592	18	0	16	0	34	0	652	2	0	654	1284
% App. Total	75	0	25	0		0.2	99.3	0.5	0		52.9	0	47.1	0		0	99.7	0.3	0		
PHF	.750	.000	.250	.000	1.00	.250	.865	.375	.000	.860	.900	.000	.571	.000	.708	.000	.942	.500	.000	.940	.915
Cars	3	0	1	0	4	1	574	3	0	578	16	0	15	0	31	0	620	2	0	622	1235
% Cars	100	0	100	0	100	100	97.6	100	0	97.6	88.9	0	93.8	0	91.2	0	95.1	100	0	95.1	96.2
Heavy Vehicles	0	0	0	0	0	0	14	0	0	14	2	0	1	0	3	0	32	0	0	32	49
% Heavy Vehicles	0	0	0	0	0	0	2.4	0	0	2.4	11.1	0	6.3	0	8.8	0	4.9	0	0	4.9	3.8

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

Peak Hour for Entire Intersection Begins at 04:15 PM



PRECISION
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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 FF
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3
03:15 PM	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	2	7
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	4	0	1	0	1	0	0	0	1	0	0	0	4	11
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	6
05:00 PM	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	5
Grand Total	0	0	0	13	0	2	0	1	1	0	0	1	0	0	0	4	22
Apprch %	0	0	0	100	0	66.7	0	33.3	50	0	0	50	0	0	0	100	
Total %	0	0	0	59.1	0	9.1	0	4.5	4.5	0	0	4.5	0	0	0	18.2	

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	3
03:15 PM	0	0	0	4	4	0	1	0	0	1	0	0	0	0	0	0	0	0	2	2	7
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	4	4	0	1	0	1	2	0	0	0	1	1	0	0	0	4	4	11
% App. Total	0	0	0	100		0	50	0	50		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.250	.000	.250	.500	.000	.000	.000	.250	.250	.000	.000	.000	.500	.500	.393

Peak Hour for Entire Intersection Begins at 03:00 PM

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

N/S: Valero Garden/ Old South Market
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

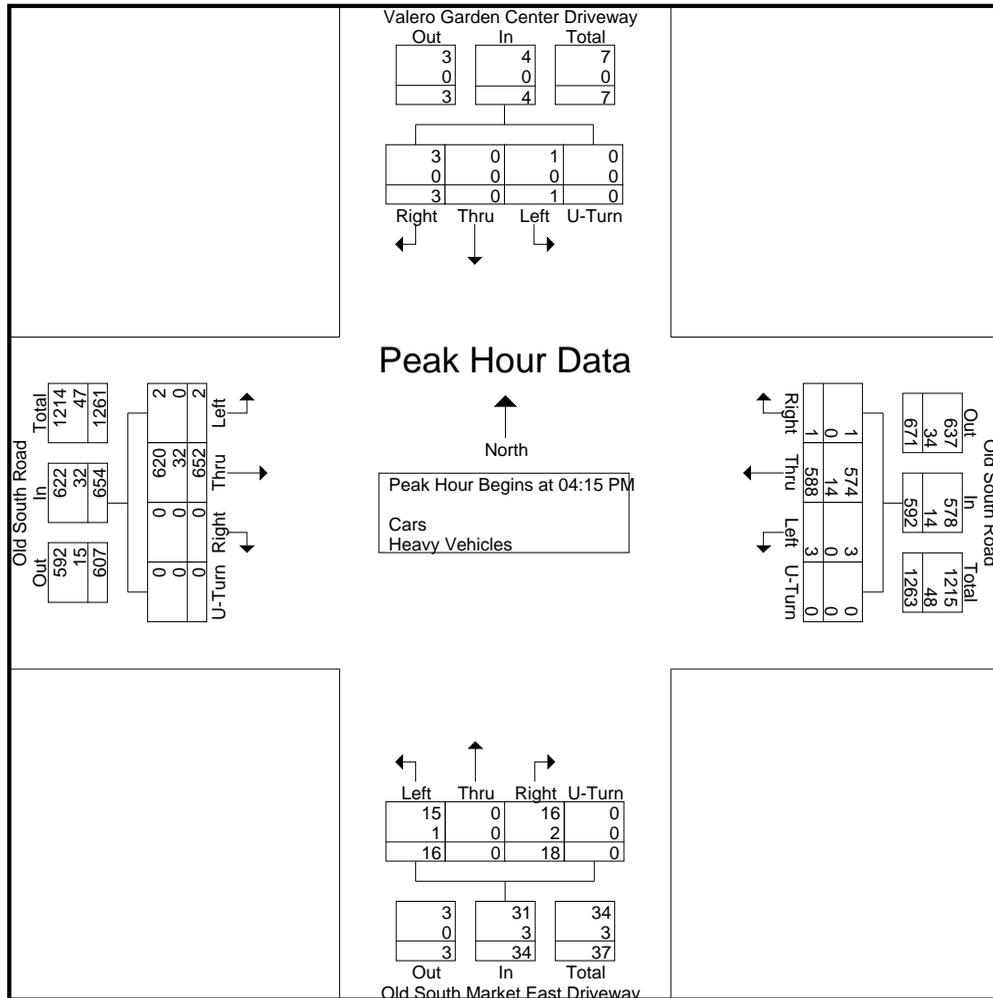


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 Email: datarequests@pdillc.com

File Name : 143955 FF
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	1	0	0	0	1	0	135	1	0	136	4	0	2	0	6	0	155	1	0	156	299
04:30 PM	1	0	0	0	1	0	147	0	0	147	4	0	3	0	7	0	155	0	0	155	310
04:45 PM	1	0	0	0	1	1	136	0	0	137	5	0	7	0	12	0	173	1	0	174	324
05:00 PM	0	0	1	0	1	0	170	2	0	172	5	0	4	0	9	0	169	0	0	169	351
Total Volume	3	0	1	0	4	1	588	3	0	592	18	0	16	0	34	0	652	2	0	654	1284
% App. Total	75	0	25	0		0.2	99.3	0.5	0		52.9	0	47.1	0		0	99.7	0.3	0		
PHF	.750	.000	.250	.000	1.00	.250	.865	.375	.000	.860	.900	.000	.571	.000	.708	.000	.942	.500	.000	.940	.915
Cars	3	0	1	0	4	1	574	3	0	578	16	0	15	0	31	0	620	2	0	622	1235
% Cars	100	0	100	0	100	100	97.6	100	0	97.6	88.9	0	93.8	0	91.2	0	95.1	100	0	95.1	96.2
Heavy Vehicles	0	0	0	0	0	0	14	0	0	14	2	0	1	0	3	0	32	0	0	32	49
% Heavy Vehicles	0	0	0	0	0	0	2.4	0	0	2.4	11.1	0	6.3	0	8.8	0	4.9	0	0	4.9	3.8





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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 FFF
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	2	0	0	0	2	162	0	0	6	0	4	0	0	148	4	0	328
11:15 AM	2	0	1	0	1	124	1	0	7	0	6	0	0	105	2	0	249
11:30 AM	1	0	0	0	0	155	0	0	9	0	5	0	0	124	4	0	298
11:45 AM	0	0	1	0	3	138	1	0	8	0	6	0	0	142	1	0	300
Total	5	0	2	0	6	579	2	0	30	0	21	0	0	519	11	0	1175
12:00 PM	0	0	0	0	1	129	1	0	7	0	7	0	0	112	1	0	258
12:15 PM	3	0	0	0	1	111	0	0	9	0	10	0	0	94	4	0	232
12:30 PM	0	0	0	0	1	138	1	0	4	0	2	0	1	126	0	0	273
12:45 PM	0	0	0	0	1	111	0	0	7	1	6	0	0	108	2	0	236
Total	3	0	0	0	4	489	2	0	27	1	25	0	1	440	7	0	999
01:00 PM	3	0	0	0	2	125	0	0	5	0	5	0	0	102	4	0	246
01:15 PM	1	0	0	0	1	118	0	0	5	0	5	0	2	131	1	0	264
01:30 PM	0	0	0	0	0	96	0	0	5	0	4	0	1	125	0	0	231
01:45 PM	0	0	0	0	2	102	0	0	6	0	1	0	0	115	0	0	226
Total	4	0	0	0	5	441	0	0	21	0	15	0	3	473	5	0	967
Grand Total	12	0	2	0	15	1509	4	0	78	1	61	0	4	1432	23	0	3141
Apprch %	85.7	0	14.3	0	1	98.8	0.3	0	55.7	0.7	43.6	0	0.3	98.1	1.6	0	
Total %	0.4	0	0.1	0	0.5	48	0.1	0	2.5	0	1.9	0	0.1	45.6	0.7	0	
Cars	12	0	2	0	14	1460	4	0	74	1	58	0	4	1377	22	0	3028
% Cars	100	0	100	0	93.3	96.8	100	0	94.9	100	95.1	0	100	96.2	95.7	0	96.4
Heavy Vehicles	0	0	0	0	1	49	0	0	4	0	3	0	0	55	1	0	113
% Heavy Vehicles	0	0	0	0	6.7	3.2	0	0	5.1	0	4.9	0	0	3.8	4.3	0	3.6

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	2	0	0	0	2	2	162	0	0	164	6	0	4	0	10	0	148	4	0	152	328
11:15 AM	2	0	1	0	3	1	124	1	0	126	7	0	6	0	13	0	105	2	0	107	249
11:30 AM	1	0	0	0	1	0	155	0	0	155	9	0	5	0	14	0	124	4	0	128	298
11:45 AM	0	0	1	0	1	3	138	1	0	142	8	0	6	0	14	0	142	1	0	143	300
Total Volume	5	0	2	0	7	6	579	2	0	587	30	0	21	0	51	0	519	11	0	530	1175
% App. Total	71.4	0	28.6	0		1	98.6	0.3	0		58.8	0	41.2	0		0	97.9	2.1	0		
PHF	.625	.000	.500	.000	.583	.500	.894	.500	.000	.895	.833	.000	.875	.000	.911	.000	.877	.688	.000	.872	.896
Cars	5	0	2	0	7	6	561	2	0	569	28	0	20	0	48	0	496	10	0	506	1130
% Cars	100	0	100	0	100	100	96.9	100	0	96.9	93.3	0	95.2	0	94.1	0	95.6	90.9	0	95.5	96.2
Heavy Vehicles	0	0	0	0	0	0	18	0	0	18	2	0	1	0	3	0	23	1	0	24	45
% Heavy Vehicles	0	0	0	0	0	0	3.1	0	0	3.1	6.7	0	4.8	0	5.9	0	4.4	9.1	0	4.5	3.8

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



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N/S: Valero Garden/ Old South Market
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 FFF
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Valero Garden Center Driveway From North				Old South Road From East				Old South Market East Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
11:15 AM	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	13
12:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:15 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	7	0	0	0	1	0	0	0	0	0	0	0	0	8
01:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	5
Grand Total	0	0	0	24	0	0	0	2	0	0	0	0	0	0	0	0	26
Apprch %	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	
Total %	0	0	0	92.3	0	0	0	7.7	0	0	0	0	0	0	0	0	

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
11:00 AM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
11:15 AM	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.361	.361	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.361

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM

N/S: Valero Garden/ Old South Market
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

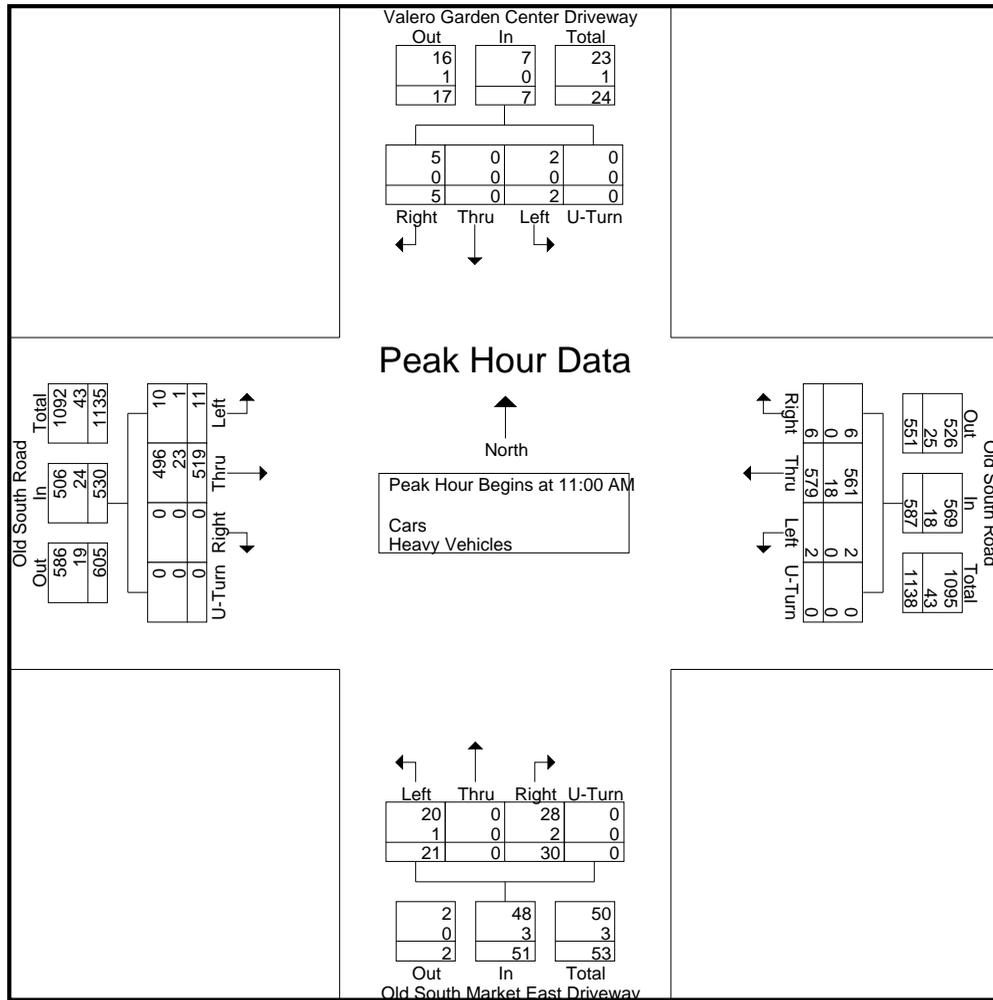


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File Name : 143955 FFF
 Site Code : TBA
 Start Date : 7/26/2014
 Page No : 1

Start Time	Valero Garden Center Driveway From North					Old South Road From East					Old South Market East Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	2	0	0	0	2	2	162	0	0	164	6	0	4	0	10	0	148	4	0	152	328
11:15 AM	2	0	1	0	3	1	124	1	0	126	7	0	6	0	13	0	105	2	0	107	249
11:30 AM	1	0	0	0	1	0	155	0	0	155	9	0	5	0	14	0	124	4	0	128	298
11:45 AM	0	0	1	0	1	3	138	1	0	142	8	0	6	0	14	0	142	1	0	143	300
Total Volume	5	0	2	0	7	6	579	2	0	587	30	0	21	0	51	0	519	11	0	530	1175
% App. Total	71.4	0	28.6	0		1	98.6	0.3	0		58.8	0	41.2	0		0	97.9	2.1	0		
PHF	.625	.000	.500	.000	.583	.500	.894	.500	.000	.895	.833	.000	.875	.000	.911	.000	.877	.688	.000	.872	.896
Cars	5	0	2	0	7	6	561	2	0	569	28	0	20	0	48	0	496	10	0	506	1130
% Cars	100	0	100	0	100	100	96.9	100	0	96.9	93.3	0	95.2	0	94.1	0	95.6	90.9	0	95.5	96.2
Heavy Vehicles	0	0	0	0	0	0	18	0	0	18	2	0	1	0	3	0	23	1	0	24	45
% Heavy Vehicles	0	0	0	0	0	0	3.1	0	0	3.1	6.7	0	4.8	0	5.9	0	4.4	9.1	0	4.5	3.8





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N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 G
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Driveway From North				Old South Road From East				Old South Market West Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	0	0	0	0	0	153	8	0	0	0	0	0	10	107	0	0	278
08:15 AM	0	0	0	0	0	151	5	0	0	0	0	0	10	129	0	0	295
08:30 AM	0	0	0	0	0	119	4	0	0	0	0	0	9	124	0	0	256
08:45 AM	0	0	0	0	0	146	3	0	0	0	1	0	7	149	0	0	306
Total	0	0	0	0	0	569	20	0	0	0	1	0	36	509	0	0	1135
09:00 AM	0	0	0	0	0	170	4	0	0	0	0	0	4	119	0	0	297
09:15 AM	0	0	0	0	0	150	3	0	0	0	0	0	7	119	0	0	279
09:30 AM	0	0	0	0	0	135	4	0	0	0	0	0	7	119	0	0	265
09:45 AM	0	0	0	0	0	140	2	0	0	0	0	0	3	135	0	0	280
Total	0	0	0	0	0	595	13	0	0	0	0	0	21	492	0	0	1121
10:00 AM	0	0	0	0	0	109	5	0	0	0	0	0	2	131	0	0	247
10:15 AM	0	0	0	0	0	118	2	0	0	0	0	0	9	101	0	0	230
10:30 AM	0	0	0	0	0	118	2	0	0	0	0	0	9	118	0	0	247
10:45 AM	0	0	0	0	0	108	3	0	0	0	0	0	5	111	0	0	227
Total	0	0	0	0	0	453	12	0	0	0	0	0	25	461	0	0	951
Grand Total	0	0	0	0	0	1617	45	0	0	0	1	0	82	1462	0	0	3207
Apprch %	0	0	0	0	0	97.3	2.7	0	0	0	100	0	5.3	94.7	0	0	
Total %	0	0	0	0	0	50.4	1.4	0	0	0	0	0	2.6	45.6	0	0	
Cars	0	0	0	0	0	1510	41	0	0	0	1	0	71	1372	0	0	2995
% Cars	0	0	0	0	0	93.4	91.1	0	0	0	100	0	86.6	93.8	0	0	93.4
Heavy Vehicles	0	0	0	0	0	107	4	0	0	0	0	0	11	90	0	0	212
% Heavy Vehicles	0	0	0	0	0	6.6	8.9	0	0	0	0	0	13.4	6.2	0	0	6.6

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	0	0	0	0	0	151	5	0	156	0	0	0	0	0	10	129	0	0	139	295
08:30 AM	0	0	0	0	0	0	119	4	0	123	0	0	0	0	0	9	124	0	0	133	256
08:45 AM	0	0	0	0	0	0	146	3	0	149	0	0	1	0	1	7	149	0	0	156	306
09:00 AM	0	0	0	0	0	0	170	4	0	174	0	0	0	0	0	4	119	0	0	123	297
Total Volume	0	0	0	0	0	0	586	16	0	602	0	0	1	0	1	30	521	0	0	551	1154
% App. Total	0	0	0	0	0	0	97.3	2.7	0		0	0	100	0		5.4	94.6	0	0		
PHF	.000	.000	.000	.000	.000	.000	.862	.800	.000	.865	.000	.000	.250	.000	.250	.750	.874	.000	.000	.883	.943
Cars	0	0	0	0	0	0	542	14	0	556	0	0	1	0	1	27	497	0	0	524	1081
% Cars	0	0	0	0	0	0	92.5	87.5	0	92.4	0	0	100	0	100	90.0	95.4	0	0	95.1	93.7
Heavy Vehicles	0	0	0	0	0	0	44	2	0	46	0	0	0	0	0	3	24	0	0	27	73
% Heavy Vehicles	0	0	0	0	0	0	7.5	12.5	0	7.6	0	0	0	0	0	10.0	4.6	0	0	4.9	6.3



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N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 G
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Driveway From North				Old South Road From East				Old South Market West Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
09:00 AM	0	0	0	8	0	0	0	0	0	1	0	0	0	0	0	0	9
09:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3
09:30 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
09:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	14	0	0	0	0	0	1	0	0	0	0	0	2	17
10:00 AM	0	0	0	8	0	0	0	0	0	1	0	0	0	0	0	0	9
10:15 AM	0	0	0	6	0	0	0	0	0	0	0	0	1	0	0	4	11
10:30 AM	0	0	0	16	0	0	0	1	0	0	0	0	0	0	0	1	18
10:45 AM	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	13
Total	0	0	0	43	0	0	0	1	0	1	0	0	1	0	0	5	51
Grand Total	0	0	0	57	0	0	0	1	0	2	0	0	1	1	0	7	69
Apprch %	0	0	0	100	0	0	0	100	0	100	0	0	11.1	11.1	0	77.8	
Total %	0	0	0	82.6	0	0	0	1.4	0	2.9	0	0	1.4	1.4	0	10.1	

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
10:00 AM	0	0	0	8	8	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	9
10:15 AM	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	1	0	0	4	5	11
10:30 AM	0	0	0	16	16	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	18
10:45 AM	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
Total Volume	0	0	0	43	43	0	0	0	1	1	0	1	0	0	1	1	0	0	5	6	51
% App. Total	0	0	0	100		0	0	0	100		0	100	0	0		16.7	0	0	83.3		
PHF	.000	.000	.000	.672	.672	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.250	.000	.000	.313	.300	.708

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 10:00 AM

N/S: Driveway/ Old South Market West Dr
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

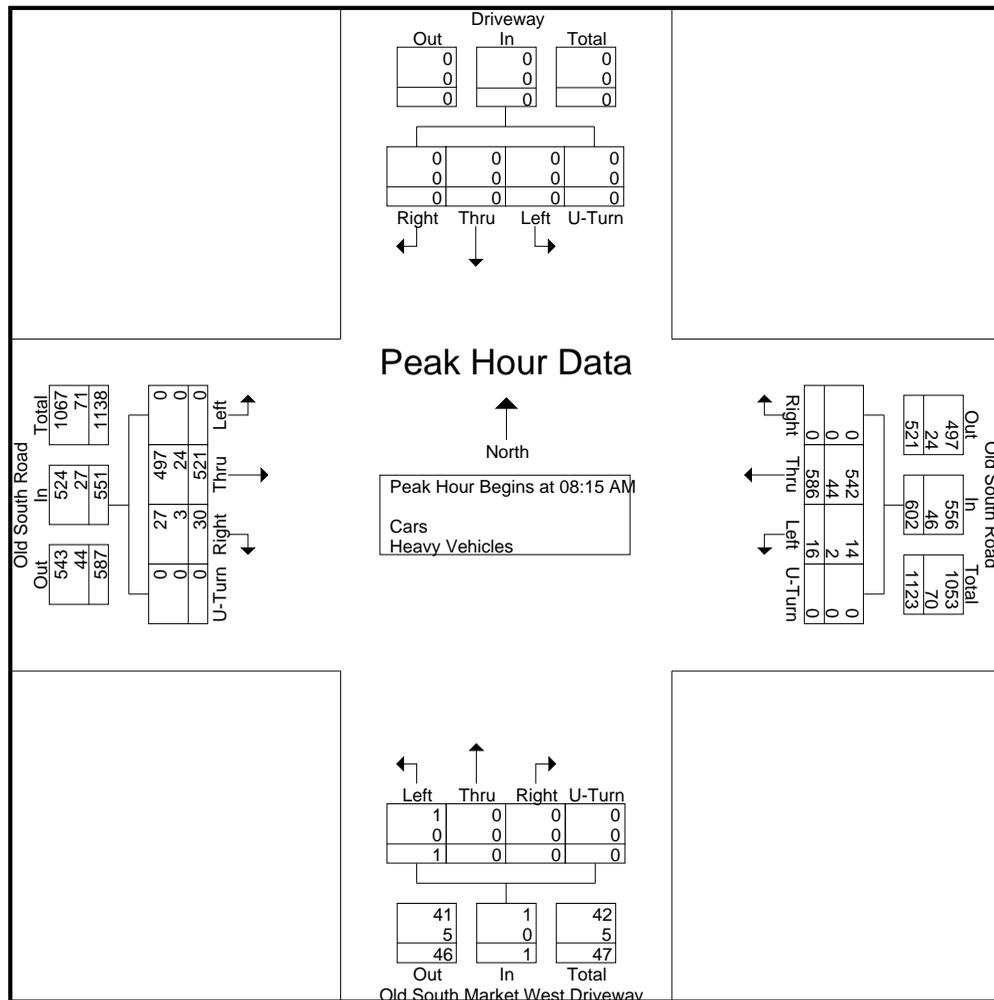


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File Name : 143955 G
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	0	0	0	0	0	151	5	0	156	0	0	0	0	0	10	129	0	0	139	295
08:30 AM	0	0	0	0	0	0	119	4	0	123	0	0	0	0	0	9	124	0	0	133	256
08:45 AM	0	0	0	0	0	0	146	3	0	149	0	0	1	0	1	7	149	0	0	156	306
09:00 AM	0	0	0	0	0	0	170	4	0	174	0	0	0	0	0	4	119	0	0	123	297
Total Volume	0	0	0	0	0	0	586	16	0	602	0	0	1	0	1	30	521	0	0	551	1154
% App. Total	0	0	0	0	0	0	97.3	2.7	0		0	0	100	0		5.4	94.6	0	0		
PHF	.000	.000	.000	.000	.000	.000	.862	.800	.000	.865	.000	.000	.250	.000	.250	.750	.874	.000	.000	.883	.943
Cars	0	0	0	0	0	0	542	14	0	556	0	0	1	0	1	27	497	0	0	524	1081
% Cars	0	0	0	0	0	0	92.5	87.5	0	92.4	0	0	100	0	100	90.0	95.4	0	0	95.1	93.7
Heavy Vehicles	0	0	0	0	0	0	44	2	0	46	0	0	0	0	0	3	24	0	0	27	73
% Heavy Vehicles	0	0	0	0	0	0	7.5	12.5	0	7.6	0	0	0	0	0	10.0	4.6	0	0	4.9	6.3





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N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 GG
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Driveway From North				Old South Road From East				Old South Market West Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	0	0	0	0	0	122	4	0	0	0	0	0	8	129	0	0	263
03:15 PM	0	0	0	0	0	132	1	0	0	0	0	0	6	132	0	0	271
03:30 PM	0	0	0	0	0	94	0	0	0	0	1	0	4	134	0	0	233
03:45 PM	1	0	0	0	0	120	4	0	0	0	0	0	5	146	0	0	276
Total	1	0	0	0	0	468	9	0	0	0	1	0	23	541	0	0	1043
04:00 PM	0	0	0	0	0	133	2	0	0	0	0	0	5	150	0	0	290
04:15 PM	0	0	0	0	0	138	1	0	0	0	0	0	4	159	0	0	302
04:30 PM	0	0	0	0	0	149	5	0	0	0	0	0	5	156	0	0	315
04:45 PM	1	0	0	0	0	144	4	0	0	0	0	0	6	173	1	0	329
Total	1	0	0	0	0	564	12	0	0	0	0	0	20	638	1	0	1236
05:00 PM	0	0	0	0	0	164	6	0	0	0	1	0	7	173	1	0	352
05:15 PM	0	0	0	0	0	133	6	0	0	0	0	0	5	154	1	0	299
05:30 PM	0	0	0	0	0	144	5	0	2	0	0	0	8	139	0	0	298
05:45 PM	0	0	0	0	0	103	4	0	0	0	0	0	5	115	0	0	227
Total	0	0	0	0	0	544	21	0	2	0	1	0	25	581	2	0	1176
Grand Total	2	0	0	0	0	1576	42	0	2	0	2	0	68	1760	3	0	3455
Apprch %	100	0	0	0	0	97.4	2.6	0	50	0	50	0	3.7	96.1	0.2	0	
Total %	0.1	0	0	0	0	45.6	1.2	0	0.1	0	0.1	0	2	50.9	0.1	0	
Cars	2	0	0	0	0	1538	40	0	2	0	2	0	65	1652	3	0	3304
% Cars	100	0	0	0	0	97.6	95.2	0	100	0	100	0	95.6	93.9	100	0	95.6
Heavy Vehicles	0	0	0	0	0	38	2	0	0	0	0	0	3	108	0	0	151
% Heavy Vehicles	0	0	0	0	0	2.4	4.8	0	0	0	0	0	4.4	6.1	0	0	4.4

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:15 PM	0	0	0	0	0	0	138	1	0	139	0	0	0	0	0	4	159	0	0	163	302
04:30 PM	0	0	0	0	0	0	149	5	0	154	0	0	0	0	0	5	156	0	0	161	315
04:45 PM	1	0	0	0	1	0	144	4	0	148	0	0	0	0	0	6	173	1	0	180	329
05:00 PM	0	0	0	0	0	0	164	6	0	170	0	0	1	0	1	7	173	1	0	181	352
Total Volume	1	0	0	0	1	0	595	16	0	611	0	0	1	0	1	22	661	2	0	685	1298
% App. Total	100	0	0	0		0	97.4	2.6	0		0	0	100	0		3.2	96.5	0.3	0		
PHF	.250	.000	.000	.000	.250	.000	.907	.667	.000	.899	.000	.000	.250	.000	.250	.786	.955	.500	.000	.946	.922
Cars	1	0	0	0	1	0	582	16	0	598	0	0	1	0	1	20	630	2	0	652	1252
% Cars	100	0	0	0	100	0	97.8	100	0	97.9	0	0	100	0	100	90.9	95.3	100	0	95.2	96.5
Heavy Vehicles	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	2	31	0	0	33	46
% Heavy Vehicles	0	0	0	0	0	0	2.2	0	0	2.1	0	0	0	0	0	9.1	4.7	0	0	4.8	3.5

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

Peak Hour for Entire Intersection Begins at 04:15 PM



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N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 GG
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Driveway From North				Old South Road From East				Old South Market West Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
03:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
03:30 PM	0	0	0	4	0	0	0	0	0	0	0	0	1	0	0	0	5
03:45 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	3
Total	0	0	0	8	0	0	0	0	0	0	1	0	4	0	0	1	14
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	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	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Grand Total	0	0	0	8	0	0	0	0	0	0	1	2	4	0	0	1	16
Apprch %	0	0	0	100	0	0	0	0	0	0	33.3	66.7	80	0	0	20	
Total %	0	0	0	50	0	0	0	0	0	0	6.2	12.5	25	0	0	6.2	

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
03:15 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03:30 PM	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
03:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	3
Total Volume	0	0	0	8	8	0	0	0	0	0	0	0	1	0	1	4	0	0	1	5	14
% App. Total	0	0	0	100		0	0	0	0		0	0	100	0		80	0	0	20		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.333	.000	.000	.250	.417	.700

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

Peak Hour for Entire Intersection Begins at 03:00 PM



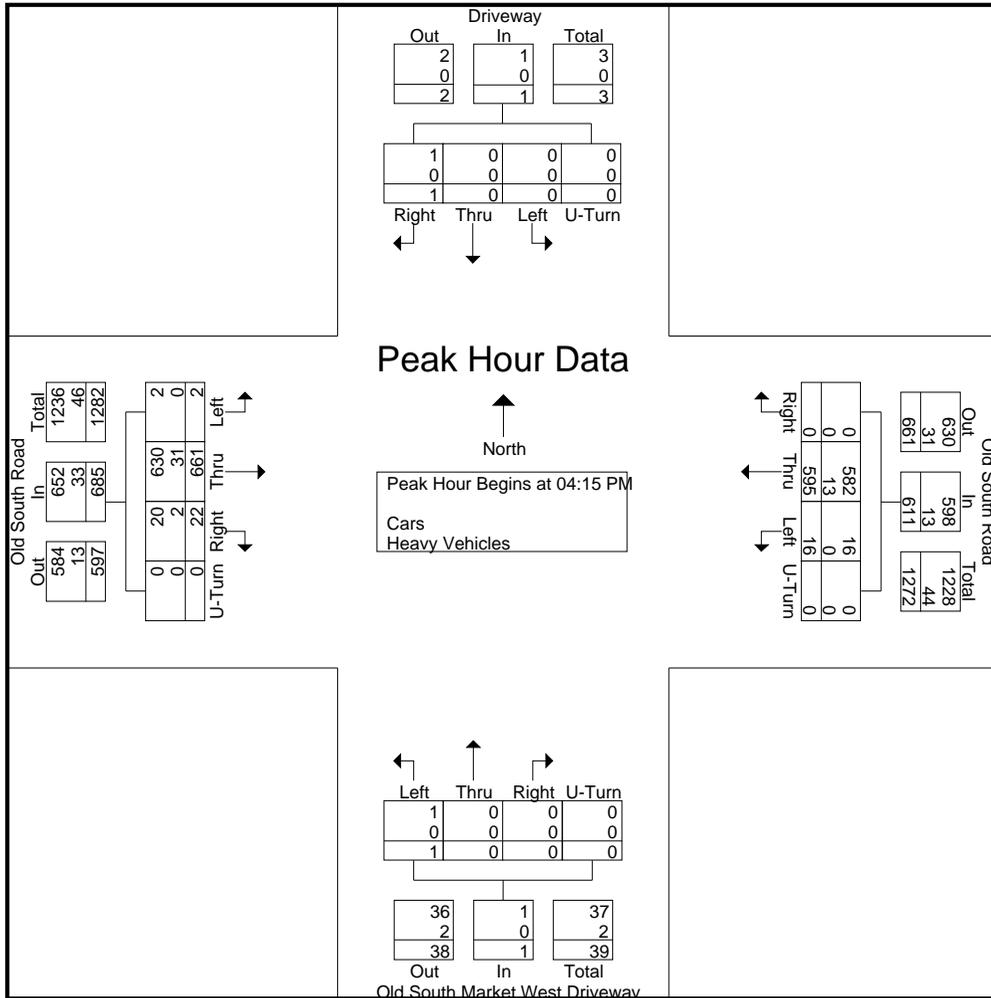
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N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 GG
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	138	1	0	139	0	0	0	0	0	4	159	0	0	163	302
04:30 PM	0	0	0	0	0	0	149	5	0	154	0	0	0	0	0	5	156	0	0	161	315
04:45 PM	1	0	0	0	1	0	144	4	0	148	0	0	0	0	0	6	173	1	0	180	329
05:00 PM	0	0	0	0	0	0	164	6	0	170	0	0	1	0	1	7	173	1	0	181	352
Total Volume	1	0	0	0	1	0	595	16	0	611	0	0	1	0	1	22	661	2	0	685	1298
% App. Total	100	0	0	0	0	0	97.4	2.6	0	0	0	0	100	0	0	3.2	96.5	0.3	0	0	
PHF	.250	.000	.000	.000	.250	.000	.907	.667	.000	.899	.000	.000	.250	.000	.250	.786	.955	.500	.000	.946	.922
Cars	1	0	0	0	1	0	582	16	0	598	0	0	1	0	1	20	630	2	0	652	1252
% Cars	100	0	0	0	100	0	97.8	100	0	97.9	0	0	100	0	100	90.9	95.3	100	0	95.2	96.5
Heavy Vehicles	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	2	31	0	0	33	46
% Heavy Vehicles	0	0	0	0	0	0	2.2	0	0	2.1	0	0	0	0	0	9.1	4.7	0	0	4.8	3.5





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Client: Ron Muller & Associates

File Name : 143955 GGG
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Driveway From North				Old South Road From East				Old South Market West Driveway From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	0	0	0	0	0	164	5	0	0	0	0	0	8	158	0	0	335
11:15 AM	0	0	0	0	0	121	7	0	0	0	1	0	9	104	0	0	242
11:30 AM	0	0	0	0	0	162	3	0	0	0	0	0	10	129	0	0	304
11:45 AM	0	0	0	0	0	136	8	0	0	0	0	0	16	141	0	0	301
Total	0	0	0	0	0	583	23	0	0	0	1	0	43	532	0	0	1182
12:00 PM	1	0	0	0	0	125	6	0	0	0	0	0	11	114	0	0	257
12:15 PM	0	0	0	0	0	113	5	0	0	0	0	0	2	97	0	0	217
12:30 PM	0	0	0	0	0	129	4	0	0	0	0	0	4	126	0	0	263
12:45 PM	1	0	0	0	0	104	6	0	0	0	1	0	8	110	0	0	230
Total	2	0	0	0	0	471	21	0	0	0	1	0	25	447	0	0	967
01:00 PM	0	0	0	0	0	130	5	0	0	0	0	0	6	105	0	0	246
01:15 PM	0	0	1	0	0	121	3	0	0	0	0	0	6	134	0	0	265
01:30 PM	0	0	0	0	0	97	3	0	0	0	0	0	7	127	0	0	234
01:45 PM	0	0	0	0	0	100	3	0	0	0	0	0	4	115	0	1	223
Total	0	0	1	0	0	448	14	0	0	0	0	0	23	481	0	1	968
Grand Total	2	0	1	0	0	1502	58	0	0	0	2	0	91	1460	0	1	3117
Apprch %	66.7	0	33.3	0	0	96.3	3.7	0	0	0	100	0	5.9	94.1	0	0.1	
Total %	0.1	0	0	0	0	48.2	1.9	0	0	0	0.1	0	2.9	46.8	0	0	
Cars	2	0	1	0	0	1450	53	0	0	0	2	0	87	1401	0	0	2996
% Cars	100	0	100	0	0	96.5	91.4	0	0	0	100	0	95.6	96	0	0	96.1
Heavy Vehicles	0	0	0	0	0	52	5	0	0	0	0	0	4	59	0	1	121
% Heavy Vehicles	0	0	0	0	0	3.5	8.6	0	0	0	0	0	4.4	4	0	100	3.9

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	0	0	0	0	0	0	164	5	0	169	0	0	0	0	0	8	158	0	0	166	335
11:15 AM	0	0	0	0	0	0	121	7	0	128	0	0	1	0	1	9	104	0	0	113	242
11:30 AM	0	0	0	0	0	0	162	3	0	165	0	0	0	0	0	10	129	0	0	139	304
11:45 AM	0	0	0	0	0	0	136	8	0	144	0	0	0	0	0	16	141	0	0	157	301
Total Volume	0	0	0	0	0	0	583	23	0	606	0	0	1	0	1	43	532	0	0	575	1182
% App. Total	0	0	0	0	0	0	96.2	3.8	0		0	0	100	0		7.5	92.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.889	.719	.000	.896	.000	.000	.250	.000	.250	.672	.842	.000	.000	.866	.882
Cars	0	0	0	0	0	0	566	21	0	587	0	0	1	0	1	40	505	0	0	545	1133
% Cars	0	0	0	0	0	0	97.1	91.3	0	96.9	0	0	100	0	100	93.0	94.9	0	0	94.8	95.9
Heavy Vehicles	0	0	0	0	0	0	17	2	0	19	0	0	0	0	0	3	27	0	0	30	49
% Heavy Vehicles	0	0	0	0	0	0	2.9	8.7	0	3.1	0	0	0	0	0	7.0	5.1	0	0	5.2	4.1

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



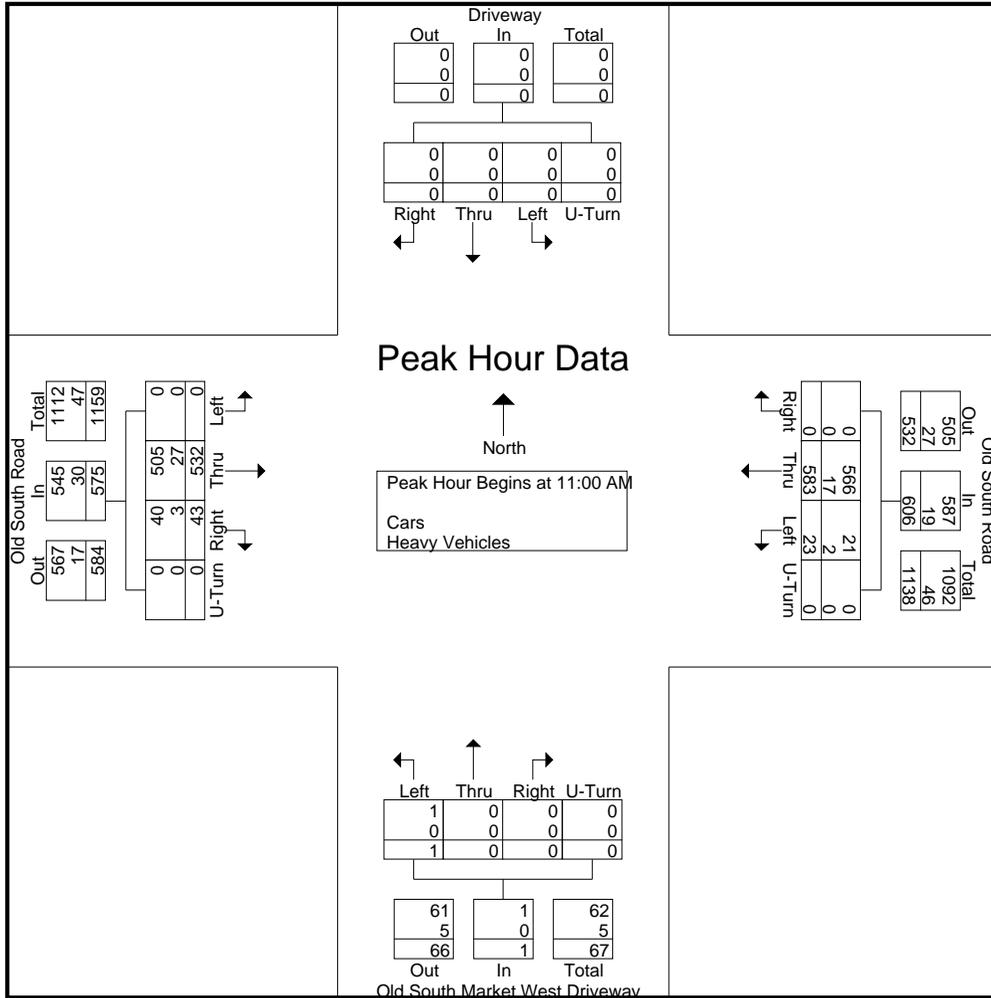
PRECISION
D A T A
INDUSTRIES, LLC

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

N/S: Driveway/ Old South Market West Dr
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 GGG
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Driveway From North					Old South Road From East					Old South Market West Driveway From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	164	5	0	169	0	0	0	0	0	8	158	0	0	166	335
11:15 AM	0	0	0	0	0	0	121	7	0	128	0	0	1	0	1	9	104	0	0	113	242
11:30 AM	0	0	0	0	0	0	162	3	0	165	0	0	0	0	0	10	129	0	0	139	304
11:45 AM	0	0	0	0	0	0	136	8	0	144	0	0	0	0	0	16	141	0	0	157	301
Total Volume	0	0	0	0	0	0	583	23	0	606	0	0	1	0	1	43	532	0	0	575	1182
% App. Total	0	0	0	0	0	0	96.2	3.8	0		0	0	100	0		7.5	92.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.889	.719	.000	.896	.000	.000	.250	.000	.250	.672	.842	.000	.000	.866	.882
Cars	0	0	0	0	0	0	566	21	0	587	0	0	1	0	1	40	505	0	0	545	1133
% Cars	0	0	0	0	0	0	97.1	91.3	0	96.9	0	0	100	0	100	93.0	94.9	0	0	94.8	95.9
Heavy Vehicles	0	0	0	0	0	0	17	2	0	19	0	0	0	0	0	3	27	0	0	30	49
% Heavy Vehicles	0	0	0	0	0	0	2.9	8.7	0	3.1	0	0	0	0	0	7.0	5.1	0	0	5.2	4.1





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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 H
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovers Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	0	0	0	0	0	154	3	1	5	0	6	0	2	112	0	0	283
08:15 AM	0	0	0	0	0	150	1	1	2	0	4	0	2	137	0	0	297
08:30 AM	0	0	0	0	0	120	3	0	2	0	7	0	3	129	1	0	265
08:45 AM	0	0	0	0	0	149	5	1	1	0	3	0	2	156	3	0	320
Total	0	0	0	0	0	573	12	3	10	0	20	0	9	534	4	0	1165
09:00 AM	1	0	0	0	0	166	5	4	1	0	4	0	7	122	2	0	312
09:15 AM	0	0	0	0	0	149	0	3	1	0	1	0	9	127	0	0	290
09:30 AM	1	0	1	0	1	128	1	4	4	0	3	0	7	121	1	0	272
09:45 AM	0	0	0	0	0	136	2	2	4	0	3	0	2	133	1	0	283
Total	2	0	1	0	1	579	8	13	10	0	11	0	25	503	4	0	1157
10:00 AM	0	0	2	0	0	108	1	0	3	0	4	0	3	128	2	0	251
10:15 AM	1	0	0	0	0	115	2	0	2	0	8	0	8	109	0	0	245
10:30 AM	2	0	0	0	1	118	1	0	4	0	2	0	4	122	1	0	255
10:45 AM	1	0	0	0	0	106	2	0	1	0	4	0	4	115	2	0	235
Total	4	0	2	0	1	447	6	0	10	0	18	0	19	474	5	0	986
Grand Total	6	0	3	0	2	1599	26	16	30	0	49	0	53	1511	13	0	3308
Apprch %	66.7	0	33.3	0	0.1	97.3	1.6	1	38	0	62	0	3.4	95.8	0.8	0	
Total %	0.2	0	0.1	0	0.1	48.3	0.8	0.5	0.9	0	1.5	0	1.6	45.7	0.4	0	
Cars	4	0	2	0	2	1497	25	11	27	0	44	0	50	1418	11	0	3091
% Cars	66.7	0	66.7	0	100	93.6	96.2	68.8	90	0	89.8	0	94.3	93.8	84.6	0	93.4
Heavy Vehicles	2	0	1	0	0	102	1	5	3	0	5	0	3	93	2	0	217
% Heavy Vehicles	33.3	0	33.3	0	0	6.4	3.8	31.2	10	0	10.2	0	5.7	6.2	15.4	0	6.6

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
08:15 AM	0	0	0	0	0	0	150	1	1	152	2	0	4	0	6	2	137	0	0	139	297
08:30 AM	0	0	0	0	0	0	120	3	0	123	2	0	7	0	9	3	129	1	0	133	265
08:45 AM	0	0	0	0	0	0	149	5	1	155	1	0	3	0	4	2	156	3	0	161	320
09:00 AM	1	0	0	0	1	0	166	5	4	175	1	0	4	0	5	7	122	2	0	131	312
Total Volume	1	0	0	0	1	0	585	14	6	605	6	0	18	0	24	14	544	6	0	564	1194
% App. Total	100	0	0	0		0	96.7	2.3	1		25	0	75	0		2.5	96.5	1.1	0		
PHF	.250	.000	.000	.000	.250	.000	.881	.700	.375	.864	.750	.000	.643	.000	.667	.500	.872	.500	.000	.876	.933
Cars	1	0	0	0	1	0	545	14	4	563	6	0	15	0	21	13	518	6	0	537	1122
% Cars	100	0	0	0	100	0	93.2	100	66.7	93.1	100	0	83.3	0	87.5	92.9	95.2	100	0	95.2	94.0
Heavy Vehicles	0	0	0	0	0	0	40	0	2	42	0	0	3	0	3	1	26	0	0	27	72
% Heavy Vehicles	0	0	0	0	0	0	6.8	0	33.3	6.9	0	0	16.7	0	12.5	7.1	4.8	0	0	4.8	6.0

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:15 AM



PRECISION
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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 H
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovers Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	0	0	2	0	7	0	0	0	0	0	0	0	1	0	0	10
08:15 AM	0	0	0	5	0	8	0	0	1	0	0	0	1	2	0	0	17
08:30 AM	0	0	0	3	0	11	0	1	1	0	0	0	0	2	0	0	18
08:45 AM	0	0	0	7	0	7	0	1	1	0	0	0	0	5	0	0	21
Total	0	0	0	17	0	33	0	2	3	0	0	0	1	10	0	0	66
09:00 AM	0	0	0	6	0	5	0	1	0	0	0	0	0	0	0	0	12
09:15 AM	0	0	0	7	0	9	0	4	0	0	0	0	0	0	0	0	20
09:30 AM	0	0	0	7	0	15	0	3	0	0	0	0	0	0	0	0	25
09:45 AM	0	0	0	5	0	11	0	0	0	0	0	0	0	0	0	0	16
Total	0	0	0	25	0	40	0	8	0	0	0	0	0	0	0	0	73
10:00 AM	0	0	0	0	0	12	0	1	0	0	0	0	0	6	0	0	19
10:15 AM	0	0	0	0	0	16	0	4	0	0	1	0	0	6	0	0	27
10:30 AM	0	0	0	0	0	12	0	0	0	0	0	0	0	13	0	0	25
10:45 AM	0	0	0	1	0	7	0	0	0	0	0	0	0	2	0	0	10
Total	0	0	0	1	0	47	0	5	0	0	1	0	0	27	0	0	81
Grand Total	0	0	0	43	0	120	0	15	3	0	1	0	1	37	0	0	220
Apprch %	0	0	0	100	0	88.9	0	11.1	75	0	25	0	2.6	97.4	0	0	
Total %	0	0	0	19.5	0	54.5	0	6.8	1.4	0	0.5	0	0.5	16.8	0	0	

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:30 AM																					
09:30 AM	0	0	0	7	7	0	15	0	3	18	0	0	0	0	0	0	0	0	0	0	25
09:45 AM	0	0	0	5	5	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	16
10:00 AM	0	0	0	0	0	0	12	0	1	13	0	0	0	0	0	0	6	0	0	6	19
10:15 AM	0	0	0	0	0	0	16	0	4	20	0	0	1	0	1	0	6	0	0	6	27
Total Volume	0	0	0	12	12	0	54	0	8	62	0	0	1	0	1	0	12	0	0	12	87
% App. Total	0	0	0	100		0	87.1	0	12.9		0	0	100	0		0	100	0	0		
PHF	.000	.000	.000	.429	.429	.000	.844	.000	.500	.775	.000	.000	.250	.000	.250	.000	.500	.000	.000	.500	.806

N/S: Nantucket Seafood/ Lovers Lane
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

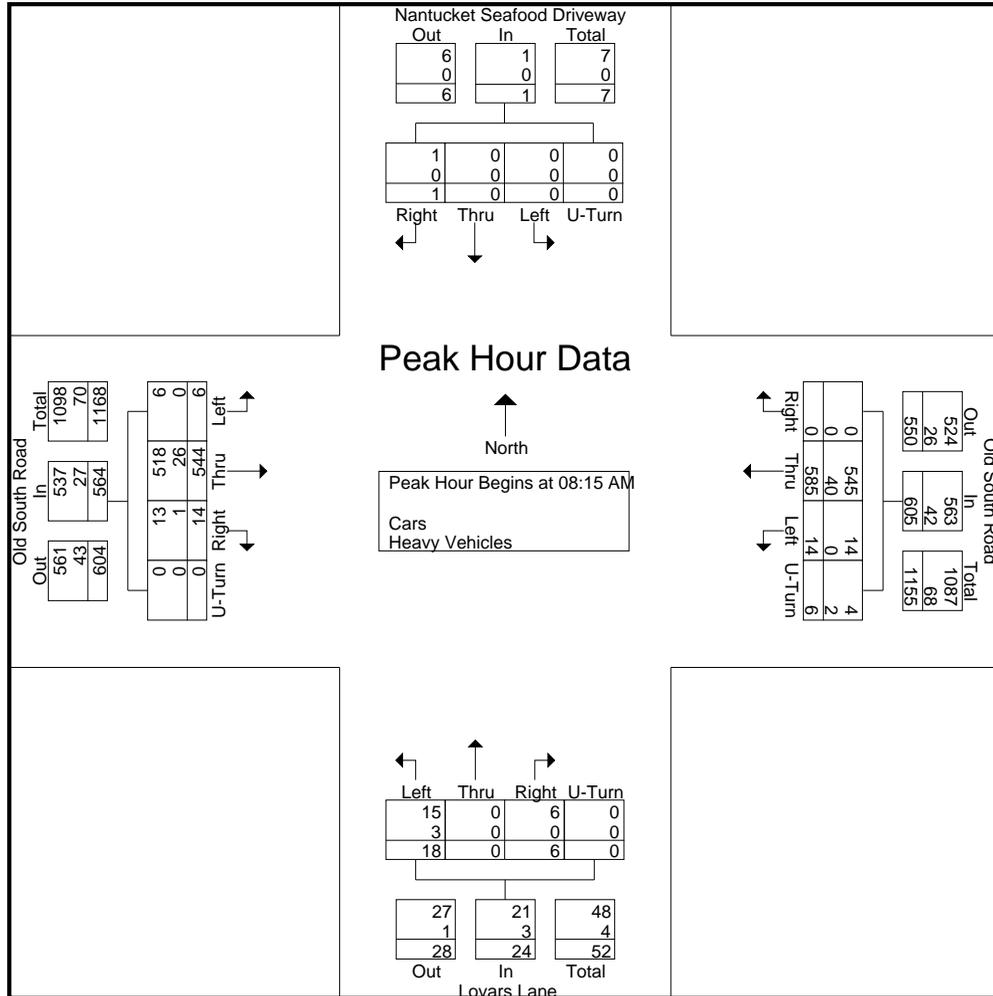


PRECISION
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File Name : 143955 H
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	0	0	0	0	0	150	1	1	152	2	0	4	0	6	2	137	0	0	139	297
08:30 AM	0	0	0	0	0	0	120	3	0	123	2	0	7	0	9	3	129	1	0	133	265
08:45 AM	0	0	0	0	0	0	149	5	1	155	1	0	3	0	4	2	156	3	0	161	320
09:00 AM	1	0	0	0	1	0	166	5	4	175	1	0	4	0	5	7	122	2	0	131	312
Total Volume	1	0	0	0	1	0	585	14	6	605	6	0	18	0	24	14	544	6	0	564	1194
% App. Total	100	0	0	0	0	0	96.7	2.3	1	0	25	0	75	0	0	2.5	96.5	1.1	0	0	0
PHF	.250	.000	.000	.000	.250	.000	.881	.700	.375	.864	.750	.000	.643	.000	.667	.500	.872	.500	.000	.876	.933
Cars	1	0	0	0	1	0	545	14	4	563	6	0	15	0	21	13	518	6	0	537	1122
% Cars	100	0	0	0	100	0	93.2	100	66.7	93.1	100	0	83.3	0	87.5	92.9	95.2	100	0	95.2	94.0
Heavy Vehicles	0	0	0	0	0	0	40	0	2	42	0	0	3	0	3	1	26	0	0	27	72
% Heavy Vehicles	0	0	0	0	0	0	6.8	0	33.3	6.9	0	0	16.7	0	12.5	7.1	4.8	0	0	4.8	6.0





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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 HH
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovers Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	1	0	0	0	0	115	6	0	6	0	10	0	8	130	1	0	277
03:15 PM	1	0	0	0	0	132	1	0	5	0	6	0	10	133	2	0	290
03:30 PM	2	0	2	0	0	91	3	0	4	0	7	0	8	131	4	0	252
03:45 PM	1	0	2	0	1	119	2	0	3	0	3	0	4	147	3	0	285
Total	5	0	4	0	1	457	12	0	18	0	26	0	30	541	10	0	1104
04:00 PM	0	0	2	0	0	132	1	0	3	0	4	0	1	150	1	0	294
04:15 PM	0	0	1	0	0	133	4	0	5	0	12	0	9	155	2	0	321
04:30 PM	1	0	3	0	1	142	5	2	7	1	7	0	9	150	9	0	337
04:45 PM	0	0	2	0	0	136	7	3	4	0	6	0	13	175	2	0	348
Total	1	0	8	0	1	543	17	5	19	1	29	0	32	630	14	0	1300
05:00 PM	3	0	1	0	3	157	9	0	8	0	10	0	12	171	2	0	376
05:15 PM	5	0	1	0	2	123	8	0	6	0	9	0	15	152	2	0	323
05:30 PM	3	0	0	0	1	137	7	0	10	0	5	0	8	138	2	0	311
05:45 PM	2	1	1	0	1	97	4	0	9	0	6	0	9	111	1	0	242
Total	13	1	3	0	7	514	28	0	33	0	30	0	44	572	7	0	1252
Grand Total	19	1	15	0	9	1514	57	5	70	1	85	0	106	1743	31	0	3656
Apprch %	54.3	2.9	42.9	0	0.6	95.5	3.6	0.3	44.9	0.6	54.5	0	5.6	92.7	1.6	0	
Total %	0.5	0	0.4	0	0.2	41.4	1.6	0.1	1.9	0	2.3	0	2.9	47.7	0.8	0	
Cars	18	1	15	0	9	1464	55	5	65	1	82	0	99	1634	30	0	3478
% Cars	94.7	100	100	0	100	96.7	96.5	100	92.9	100	96.5	0	93.4	93.7	96.8	0	95.1
Heavy Vehicles	1	0	0	0	0	50	2	0	5	0	3	0	7	109	1	0	178
% Heavy Vehicles	5.3	0	0	0	0	3.3	3.5	0	7.1	0	3.5	0	6.6	6.3	3.2	0	4.9

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:30 PM	1	0	3	0	4	1	142	5	2	150	7	1	7	0	15	9	150	9	0	168	337
04:45 PM	0	0	2	0	2	0	136	7	3	146	4	0	6	0	10	13	175	2	0	190	348
05:00 PM	3	0	1	0	4	3	157	9	0	169	8	0	10	0	18	12	171	2	0	185	376
05:15 PM	5	0	1	0	6	2	123	8	0	133	6	0	9	0	15	15	152	2	0	169	323
Total Volume	9	0	7	0	16	6	544	29	5	598	25	1	32	0	58	49	648	15	0	712	1384
% App. Total	56.2	0	43.8	0		1	93.3	4.8	0.8		43.1	1.7	55.2	0		6.9	91	2.1	0		
PHF	.450	.000	.583	.000	.667	.500	.889	.806	.417	.885	.781	.250	.800	.000	.806	.817	.926	.417	.000	.937	.920
Cars	8	0	7	0	15	6	544	29	5	584	23	1	32	0	56	44	606	15	0	665	1320
% Cars	88.9	0	100	0	93.8	100	97.5	100	100	97.7	92.0	100	100	0	96.6	89.8	93.5	100	0	93.4	95.4
Heavy Vehicles	1	0	0	0	1	0	14	0	0	14	2	0	0	0	2	5	42	0	0	47	64
% Heavy Vehicles	11.1	0	0	0	6.3	0	2.5	0	0	2.3	8.0	0	0	0	3.4	10.2	6.5	0	0	6.6	4.6

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

Peak Hour for Entire Intersection Begins at 04:30 PM



PRECISION
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File Name : 143955 HH
Site Code : TBA
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Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovars Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
03:30 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	7
03:45 PM	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	23
04:00 PM	0	0	0	0	0	3	0	2	0	0	3	0	1	4	0	0	13
04:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	7	0	0	10
04:30 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	1	0	0	7
04:45 PM	0	0	0	0	0	4	0	0	0	0	1	0	0	8	0	0	13
Total	0	0	0	0	0	16	0	2	0	0	4	0	1	20	0	0	43
05:00 PM	0	0	0	0	0	7	0	0	0	0	0	0	2	5	0	0	14
05:15 PM	0	0	0	0	0	6	0	1	0	0	0	0	1	4	0	0	12
05:30 PM	0	0	0	0	0	9	0	0	0	0	1	0	0	3	0	2	15
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	1	1	2	0	1	6
Total	0	0	0	0	0	23	0	1	0	0	1	1	4	14	0	3	47
Grand Total	0	0	0	0	0	62	0	3	0	0	5	1	5	34	0	3	113
Apprch %	0	0	0	0	0	95.4	0	4.6	0	0	83.3	16.7	11.9	81	0	7.1	
Total %	0	0	0	0	0	54.9	0	2.7	0	0	4.4	0.9	4.4	30.1	0	2.7	

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovars Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	8	0	0	8	13
05:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	2	5	0	0	7	14
05:15 PM	0	0	0	0	0	0	6	0	1	7	0	0	0	0	0	1	4	0	0	5	12
05:30 PM	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	0	3	0	2	5	15
Total Volume	0	0	0	0	0	0	26	0	1	27	0	0	2	0	2	3	20	0	2	25	54
% App. Total	0	0	0	0	0	0	96.3	0	3.7		0	0	100	0		12	80	0	8		
PHF	.000	.000	.000	.000	.000	.000	.722	.000	.250	.750	.000	.000	.500	.000	.500	.375	.625	.000	.250	.781	.900

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:45 PM

N/S: Nantucket Seafood/ Lovers Lane
 E/W: Old South Road
 City, State: Nantucket, MA
 Client: Ron Muller & Associates

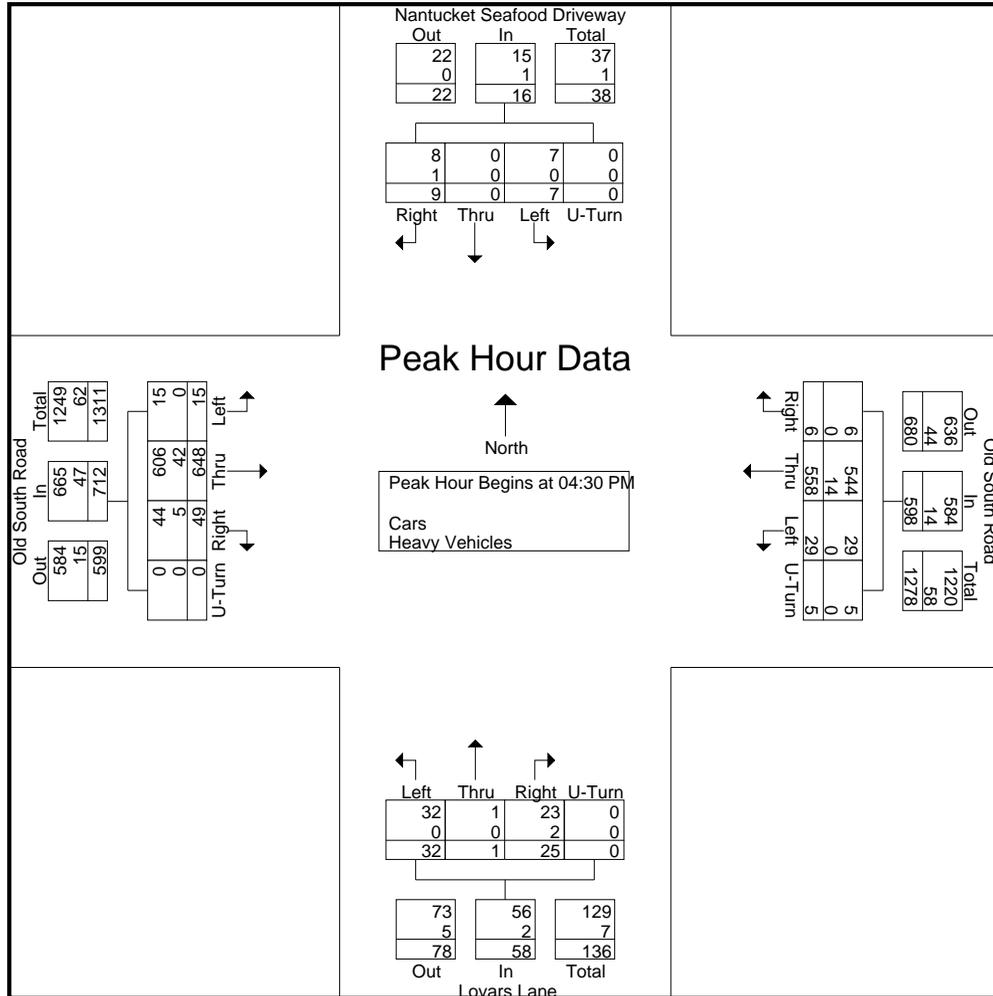


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 INDUSTRIES, LLC

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File Name : 143955 HH
 Site Code : TBA
 Start Date : 7/24/2014
 Page No : 1

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	0	3	0	4	1	142	5	2	150	7	1	7	0	15	9	150	9	0	168	337
04:45 PM	0	0	2	0	2	0	136	7	3	146	4	0	6	0	10	13	175	2	0	190	348
05:00 PM	3	0	1	0	4	3	157	9	0	169	8	0	10	0	18	12	171	2	0	185	376
05:15 PM	5	0	1	0	6	2	123	8	0	133	6	0	9	0	15	15	152	2	0	169	323
Total Volume	9	0	7	0	16	6	558	29	5	598	25	1	32	0	58	49	648	15	0	712	1384
% App. Total	56.2	0	43.8	0		1	93.3	4.8	0.8		43.1	1.7	55.2	0		6.9	91	2.1	0		
PHF	.450	.000	.583	.000	.667	.500	.889	.806	.417	.885	.781	.250	.800	.000	.806	.817	.926	.417	.000	.937	.920
Cars	8	0	7	0	15	6	544	29	5	584	23	1	32	0	56	44	606	15	0	665	1320
% Cars	88.9	0	100	0	93.8	100	97.5	100	100	97.7	92.0	100	100	0	96.6	89.8	93.5	100	0	93.4	95.4
Heavy Vehicles	1	0	0	0	1	0	14	0	0	14	2	0	0	0	2	5	42	0	0	47	64
% Heavy Vehicles	11.1	0	0	0	6.3	0	2.5	0	0	2.3	8.0	0	0	0	3.4	10.2	6.5	0	0	6.6	4.6





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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 HHH
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovers Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	2	0	0	0	0	161	4	2	4	0	3	0	9	162	2	0	349
11:15 AM	0	3	2	0	1	113	7	2	4	0	7	0	5	106	2	0	252
11:30 AM	3	0	0	0	1	156	6	3	3	1	7	0	13	136	3	0	332
11:45 AM	1	1	1	0	0	127	10	4	9	1	6	0	10	146	2	0	318
Total	6	4	3	0	2	557	27	11	20	2	23	0	37	550	9	0	1251
12:00 PM	0	1	0	0	0	126	4	5	5	0	7	0	11	119	0	0	278
12:15 PM	2	0	1	0	1	114	5	5	1	0	5	0	8	98	1	0	241
12:30 PM	0	0	0	0	1	129	6	4	1	0	5	0	4	128	2	0	280
12:45 PM	4	0	0	0	0	105	4	6	2	0	7	0	8	116	3	0	255
Total	6	1	1	0	2	474	19	20	9	0	24	0	31	461	6	0	1054
01:00 PM	4	0	0	0	0	124	5	3	1	0	4	0	3	111	4	0	259
01:15 PM	0	0	1	0	0	115	7	3	6	0	4	0	4	134	2	0	276
01:30 PM	0	0	2	0	0	95	2	2	3	0	7	0	4	129	1	0	245
01:45 PM	2	0	0	0	0	97	3	3	5	0	6	0	3	114	2	1	236
Total	6	0	3	0	0	431	17	11	15	0	21	0	14	488	9	1	1016
Grand Total	18	5	7	0	4	1462	63	42	44	2	68	0	82	1499	24	1	3321
Apprch %	60	16.7	23.3	0	0.3	93.1	4	2.7	38.6	1.8	59.6	0	5.1	93.3	1.5	0.1	
Total %	0.5	0.2	0.2	0	0.1	44	1.9	1.3	1.3	0.1	2	0	2.5	45.1	0.7	0	
Cars	16	5	7	0	4	1417	60	39	43	2	65	0	80	1436	23	1	3198
% Cars	88.9	100	100	0	100	96.9	95.2	92.9	97.7	100	95.6	0	97.6	95.8	95.8	100	96.3
Heavy Vehicles	2	0	0	0	0	45	3	3	1	0	3	0	2	63	1	0	123
% Heavy Vehicles	11.1	0	0	0	0	3.1	4.8	7.1	2.3	0	4.4	0	2.4	4.2	4.2	0	3.7

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	2	0	0	0	2	0	161	4	2	167	4	0	3	0	7	9	162	2	0	173	349
11:15 AM	0	3	2	0	5	1	113	7	2	123	4	0	7	0	11	5	106	2	0	113	252
11:30 AM	3	0	0	0	3	1	156	6	3	166	3	1	7	0	11	13	136	3	0	152	332
11:45 AM	1	1	1	0	3	0	127	10	4	141	9	1	6	0	16	10	146	2	0	158	318
Total Volume	6	4	3	0	13	2	557	27	11	597	20	2	23	0	45	37	550	9	0	596	1251
% App. Total	46.2	30.8	23.1	0		0.3	93.3	4.5	1.8		44.4	4.4	51.1	0		6.2	92.3	1.5	0		
PHF	.500	.333	.375	.000	.650	.500	.865	.675	.688	.894	.556	.500	.821	.000	.703	.712	.849	.750	.000	.861	.896
Cars	5	4	3	0	12	2	544	24	11	581	19	2	22	0	43	37	520	9	0	566	1202
% Cars	83.3	100	100	0	92.3	100	97.7	88.9	100	97.3	95.0	100	95.7	0	95.6	100	94.5	100	0	95.0	96.1
Heavy Vehicles	1	0	0	0	1	0	13	3	0	16	1	0	1	0	2	0	30	0	0	30	49
% Heavy Vehicles	16.7	0	0	0	7.7	0	2.3	11.1	0	2.7	5.0	0	4.3	0	4.4	0	5.5	0	0	5.0	3.9

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 HHH
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Nantucket Seafood Driveway From North				Old South Road From East				Lovers Lane From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	0	8	0	8	0	8	0	0	0	0	0	16	0	0	40
11:15 AM	0	0	0	8	0	11	0	3	0	0	0	0	0	3	0	0	25
11:30 AM	0	0	0	1	0	11	0	0	0	0	0	0	0	0	0	0	12
11:45 AM	0	0	0	1	0	8	0	0	1	0	0	0	0	7	0	0	17
Total	0	0	0	18	0	38	0	11	1	0	0	0	0	26	0	0	94
12:00 PM	0	0	0	0	0	11	0	4	0	0	0	0	0	10	0	0	25
12:15 PM	0	0	0	0	0	4	0	0	0	0	0	2	0	2	0	0	8
12:30 PM	0	0	0	1	0	2	0	1	0	0	0	0	2	2	0	0	8
12:45 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	5	0	0	10
Total	0	0	0	1	0	22	0	5	0	0	0	2	2	19	0	0	51
01:00 PM	0	0	0	0	0	7	0	1	0	0	0	0	0	3	0	0	11
01:15 PM	0	0	0	0	0	3	0	2	0	0	0	0	1	10	0	0	16
01:30 PM	0	0	0	0	0	9	0	1	2	0	0	2	0	6	0	1	21
01:45 PM	0	0	0	0	0	11	0	0	0	0	0	0	0	6	0	0	17
Total	0	0	0	0	0	30	0	4	2	0	0	2	1	25	0	1	65
Grand Total	0	0	0	19	0	90	0	20	3	0	0	4	3	70	0	1	210
Apprch %	0	0	0	100	0	81.8	0	18.2	42.9	0	0	57.1	4.1	94.6	0	1.4	
Total %	0	0	0	9	0	42.9	0	9.5	1.4	0	0	1.9	1.4	33.3	0	0.5	

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
11:00 AM	0	0	0	8	8	0	8	0	8	16	0	0	0	0	0	0	16	0	0	16	40
11:15 AM	0	0	0	8	8	0	11	0	3	14	0	0	0	0	0	0	3	0	0	3	25
11:30 AM	0	0	0	1	1	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	12
11:45 AM	0	0	0	1	1	0	8	0	0	8	1	0	0	0	1	0	7	0	0	7	17
Total Volume	0	0	0	18	18	0	38	0	11	49	1	0	0	0	1	0	26	0	0	26	94
% App. Total	0	0	0	100	0	77.6	0	22.4	100	0	0	0	0	100	0	0					
PHF	.000	.000	.000	.563	.563	.000	.864	.000	.344	.766	.250	.000	.000	.000	.250	.000	.406	.000	.000	.406	.588

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 11:00 AM



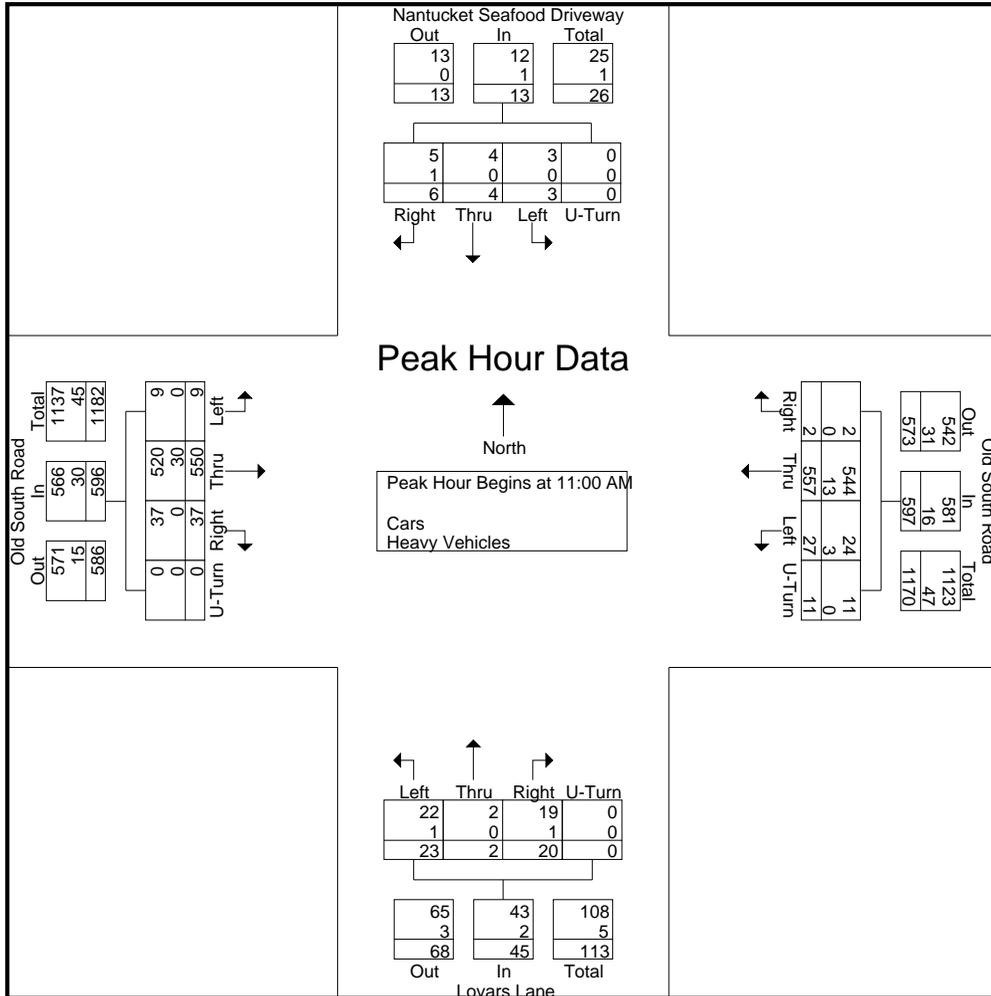
PRECISION
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N/S: Nantucket Seafood/ Lovers Lane
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 HHH
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Nantucket Seafood Driveway From North					Old South Road From East					Lovers Lane From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	2	0	0	0	2	0	161	4	2	167	4	0	3	0	7	9	162	2	0	173	349
11:15 AM	0	3	2	0	5	1	113	7	2	123	4	0	7	0	11	5	106	2	0	113	252
11:30 AM	3	0	0	0	3	1	156	6	3	166	3	1	7	0	11	13	136	3	0	152	332
11:45 AM	1	1	1	0	3	0	127	10	4	141	9	1	6	0	16	10	146	2	0	158	318
Total Volume	6	4	3	0	13	2	557	27	11	597	20	2	23	0	45	37	550	9	0	596	1251
% App. Total	46.2	30.8	23.1	0		0.3	93.3	4.5	1.8		44.4	4.4	51.1	0		6.2	92.3	1.5	0		
PHF	.500	.333	.375	.000	.650	.500	.865	.675	.688	.894	.556	.500	.821	.000	.703	.712	.849	.750	.000	.861	.896
Cars	5	4	3	0	12	2	544	24	11	581	19	2	22	0	43	37	520	9	0	566	1202
% Cars	83.3	100	100	0	92.3	100	97.7	88.9	100	97.3	95.0	100	95.7	0	95.6	100	94.5	100	0	95.0	96.1
Heavy Vehicles	1	0	0	0	1	0	13	3	0	16	1	0	1	0	2	0	30	0	0	30	49
% Heavy Vehicles	16.7	0	0	0	7.7	0	2.3	11.1	0	2.7	5.0	0	4.3	0	4.4	0	5.5	0	0	5.0	3.9



Turning Movement Peak Hour Data (4:00 PM)

Start Time	Southbound						Fairgrounds Road Northbound						Old South Road Eastbound							
	Old South Road Westbound			Fairgrounds Road Northbound			Old South Road Westbound			Fairgrounds Road Northbound			Old South Road Eastbound			Fairgrounds Road Northbound				
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total	
4:00 PM	0	0	0	0	0	0	97	53	0	0	150	59	0	33	0	0	0	0	92	416
4:15 PM	0	0	0	0	0	155	93	62	0	0	155	77	0	34	0	0	0	3	111	407
4:30 PM	0	0	0	0	0	134	86	48	0	0	134	62	0	41	0	0	0	1	103	390
4:45 PM	0	0	0	0	0	154	103	51	0	0	154	87	0	38	0	0	0	2	125	423
Total	0	0	0	0	0	593	379	214	0	0	593	285	0	146	0	0	0	6	431	1636
Approach %	NaN	NaN	NaN	NaN	-	-	63.9	36.1	0.0	-	-	66.1	0.0	33.9	0.0	-	-	-	-	-
Total %	0.0	0.0	0.0	0.0	-	36.2	23.2	13.1	0.0	-	36.2	17.4	0.0	8.9	0.0	-	-	-	26.3	37.4
PHF	0.000	0.000	0.000	0.000	-	0.956	0.920	0.863	0.000	-	0.956	0.819	0.000	0.890	0.000	-	-	-	0.862	0.967
Motorcycles	0	0	0	0	0	12	4	8	0	-	12	5	0	5	0	0	0	0	10	32
% Motorcycles	-	-	-	-	-	2.0	1.1	3.7	-	-	2.0	1.8	-	3.4	-	-	-	-	2.3	1.6
Cars	0	0	0	0	0	443	290	153	0	-	443	194	0	121	0	0	0	-	315	1164
% Cars	-	-	-	-	-	74.7	76.5	71.5	-	-	74.7	68.1	-	82.9	-	-	-	-	73.1	66.3
Light Goods Vehicles	0	0	0	0	0	122	73	49	0	-	122	66	0	13	0	0	0	-	79	358
% Light Goods Vehicles	-	-	-	-	-	20.6	19.3	22.9	-	-	20.6	23.2	-	8.9	-	-	-	-	18.3	21.9
Buses	0	0	0	0	0	2	2	0	0	-	2	0	0	4	0	0	0	-	4	15
% Buses	-	-	-	-	-	0.3	0.5	0.0	-	-	0.3	0.0	-	2.7	-	-	-	-	0.9	0.9
Single-Unit Trucks	0	0	0	0	0	12	8	4	0	-	12	19	0	3	0	0	0	-	22	58
% Single-Unit Trucks	-	-	-	-	-	2.0	2.1	1.9	-	-	2.0	6.7	-	2.1	-	-	-	-	5.1	3.5
Articulated Trucks	0	0	0	0	0	1	1	0	0	-	1	1	0	0	0	0	0	-	1	4
% Articulated Trucks	-	-	-	-	-	0.2	0.3	0.0	-	-	0.2	0.4	-	0.0	-	-	-	-	0.2	0.2
Bicycles on Road	0	0	0	0	0	1	1	0	0	-	1	0	0	0	0	0	0	-	0	5
% Bicycles on Road	-	-	-	-	-	0.2	0.3	0.0	-	-	0.2	0.0	-	0.0	-	-	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3	-	-



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S: Fairgrounds Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 III
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Old South Road From East			Fairgrounds Road From South			Old South Road From West			Int. Total
	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	
11:00 AM	127	49	0	60	20	0	26	108	0	390
11:15 AM	112	47	0	45	32	0	38	87	0	361
11:30 AM	114	45	0	58	27	0	55	117	0	416
11:45 AM	105	43	0	51	25	0	28	98	0	350
Total	458	184	0	214	104	0	147	410	0	1517
12:00 PM	102	45	0	40	21	0	32	114	0	354
12:15 PM	92	41	0	42	27	0	38	98	0	338
12:30 PM	111	35	0	46	22	0	30	100	0	344
12:45 PM	94	39	0	46	19	0	30	100	0	328
Total	399	160	0	174	89	0	130	412	0	1364
01:00 PM	104	38	0	39	23	0	37	113	0	354
01:15 PM	88	39	0	35	15	0	32	114	0	323
01:30 PM	88	35	0	47	24	0	29	109	0	332
01:45 PM	84	40	0	39	31	1	25	95	0	315
Total	364	152	0	160	93	1	123	431	0	1324
Grand Total	1221	496	0	548	286	1	400	1253	0	4205
Apprch %	71.1	28.9	0	65.6	34.3	0.1	24.2	75.8	0	
Total %	29	11.8	0	13	6.8	0	9.5	29.8	0	
Cars	1196	486	0	528	272	1	385	1207	0	4075
% Cars	98	98	0	96.4	95.1	100	96.2	96.3	0	96.9
Heavy Vehicles	25	10	0	20	14	0	15	46	0	130
% Heavy Vehicles	2	2	0	3.6	4.9	0	3.8	3.7	0	3.1

Start Time	Old South Road From East				Fairgrounds Road From South				Old South Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	127	49	0	176	60	20	0	80	26	108	0	134	390
11:15 AM	112	47	0	159	45	32	0	77	38	87	0	125	361
11:30 AM	114	45	0	159	58	27	0	85	55	117	0	172	416
11:45 AM	105	43	0	148	51	25	0	76	28	98	0	126	350
Total Volume	458	184	0	642	214	104	0	318	147	410	0	557	1517
% App. Total	71.3	28.7	0		67.3	32.7	0		26.4	73.6	0		
PHF	.902	.939	.000	.912	.892	.813	.000	.935	.668	.876	.000	.810	.912
Cars	450	177	0	627	205	98	0	303	142	392	0	534	1464
% Cars	98.3	96.2	0	97.7	95.8	94.2	0	95.3	96.6	95.6	0	95.9	96.5
Heavy Vehicles	8	7	0	15	9	6	0	15	5	18	0	23	53
% Heavy Vehicles	1.7	3.8	0	2.3	4.2	5.8	0	4.7	3.4	4.4	0	4.1	3.5



PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 143955 III
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

S: Fairgrounds Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Old South Road From East			Fairgrounds Road From South			Old South Road From West			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
11:00 AM	0	0	1	0	0	0	4	0	0	5
11:15 AM	0	0	2	0	0	1	0	0	0	3
11:30 AM	0	0	3	0	0	0	0	0	0	3
11:45 AM	2	0	4	0	0	4	0	0	0	10
Total	2	0	10	0	0	5	4	0	0	21
12:00 PM	1	0	0	0	0	1	2	0	0	4
12:15 PM	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	1	0	0	1	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0
Total	2	0	1	0	0	2	2	0	0	7
01:00 PM	0	0	1	0	0	0	0	0	0	1
01:15 PM	0	0	2	0	0	0	0	0	0	2
01:30 PM	0	0	0	0	0	0	0	1	0	1
01:45 PM	2	2	0	0	0	0	0	0	0	4
Total	2	2	3	0	0	0	0	1	0	8
Grand Total	6	2	14	0	0	7	6	1	0	36
Apprch %	27.3	9.1	63.6	0	0	100	85.7	14.3	0	
Total %	16.7	5.6	38.9	0	0	19.4	16.7	2.8	0	

Start Time	Old South Road From East				Fairgrounds Road From South				Old South Road From West				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
11:00 AM	0	0	1	1	0	0	0	0	4	0	0	4	5
11:15 AM	0	0	2	2	0	0	1	1	0	0	0	0	3
11:30 AM	0	0	3	3	0	0	0	0	0	0	0	0	3
11:45 AM	2	0	4	6	0	0	4	4	0	0	0	0	10
Total Volume	2	0	10	12	0	0	5	5	4	0	0	4	21
% App. Total	16.7	0	83.3		0	0	100		100	0	0		
PHF	.250	.000	.625	.500	.000	.000	.313	.313	.250	.000	.000	.250	.525

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



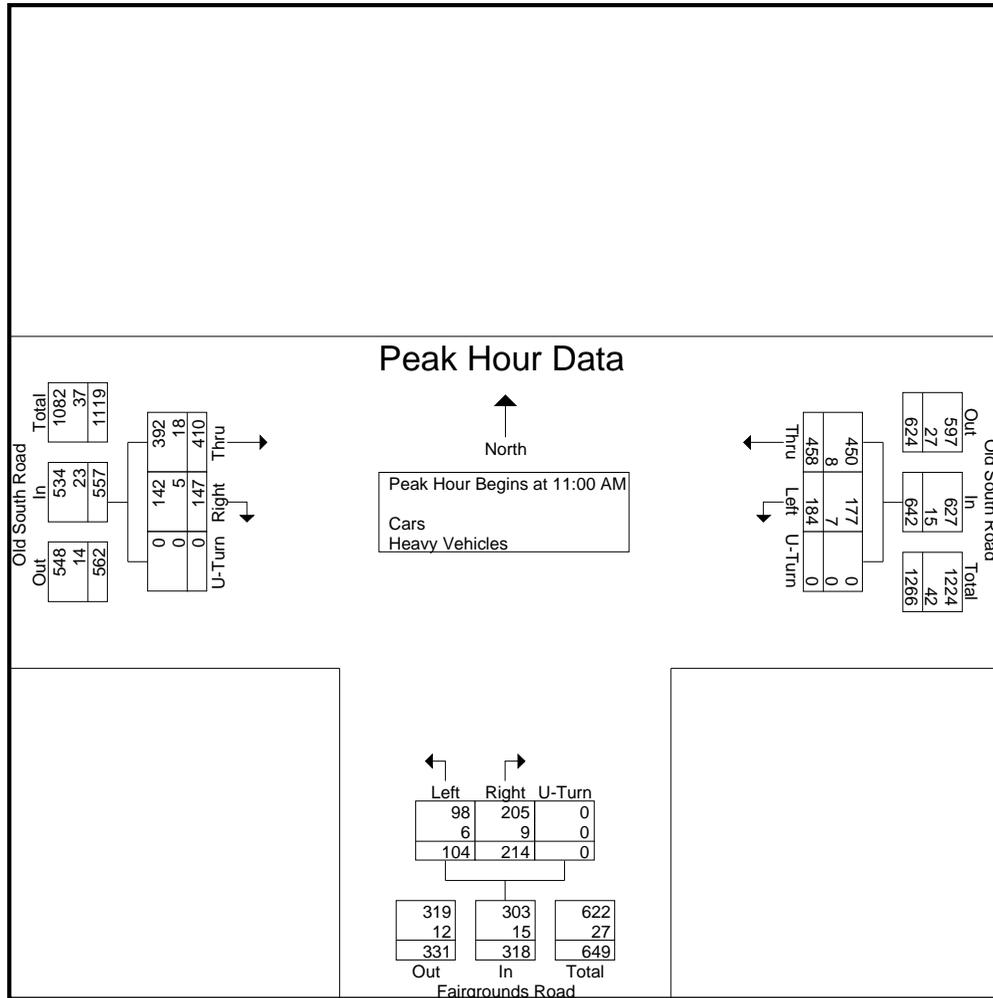
PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

S: Fairgrounds Road
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 III
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Old South Road From East				Fairgrounds Road From South				Old South Road From West				Int. Total
	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	127	49	0	176	60	20	0	80	26	108	0	134	390
11:15 AM	112	47	0	159	45	32	0	77	38	87	0	125	361
11:30 AM	114	45	0	159	58	27	0	85	55	117	0	172	416
11:45 AM	105	43	0	148	51	25	0	76	28	98	0	126	350
Total Volume	458	184	0	642	214	104	0	318	147	410	0	557	1517
% App. Total	71.3	28.7	0		67.3	32.7	0		26.4	73.6	0		
PHF	.902	.939	.000	.912	.892	.813	.000	.935	.668	.876	.000	.810	.912
Cars	450	177	0	627	205	98	0	303	142	392	0	534	1464
% Cars	98.3	96.2	0	97.7	95.8	94.2	0	95.3	96.6	95.6	0	95.9	96.5
Heavy Vehicles	8	7	0	15	9	6	0	15	5	18	0	23	53
% Heavy Vehicles	1.7	3.8	0	2.3	4.2	5.8	0	4.7	3.4	4.4	0	4.1	3.5





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File Name : 143955 J
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Old South Road Bike Path From North				Old South Road From East				Youngs Way From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	0	0	0	0	0	158	7	0	3	0	12	0	11	120	0	0	311
08:15 AM	0	0	0	0	0	153	15	0	12	0	7	0	22	132	0	0	341
08:30 AM	0	0	0	0	0	121	4	0	1	0	7	0	8	142	0	0	283
08:45 AM	0	0	0	0	0	159	7	0	4	0	4	0	5	155	0	0	334
Total	0	0	0	0	0	591	33	0	20	0	30	0	46	549	0	0	1269
09:00 AM	0	0	0	0	0	168	4	0	5	0	6	0	10	150	0	0	343
09:15 AM	0	0	0	0	0	167	5	0	7	0	10	0	18	133	0	0	340
09:30 AM	0	0	0	0	0	134	3	0	14	0	20	0	20	126	0	0	317
09:45 AM	0	0	0	0	0	148	5	0	4	0	14	0	12	140	0	0	323
Total	0	0	0	0	0	617	17	0	30	0	50	0	60	549	0	0	1323
10:00 AM	0	0	0	0	0	120	2	0	3	0	9	0	6	135	0	0	275
10:15 AM	0	0	0	0	0	116	8	0	4	0	12	0	7	118	0	0	265
10:30 AM	0	0	0	0	0	118	7	0	5	0	7	0	8	126	0	0	271
10:45 AM	0	0	0	0	0	112	8	0	7	0	9	0	14	114	0	0	264
Total	0	0	0	0	0	466	25	0	19	0	37	0	35	493	0	0	1075
Grand Total	0	0	0	0	0	1674	75	0	69	0	117	0	141	1591	0	0	3667
Apprch %	0	0	0	0	0	95.7	4.3	0	37.1	0	62.9	0	8.1	91.9	0	0	
Total %	0	0	0	0	0	45.7	2	0	1.9	0	3.2	0	3.8	43.4	0	0	
Cars	0	0	0	0	0	1544	72	0	63	0	111	0	136	1490	0	0	3416
% Cars	0	0	0	0	0	92.2	96	0	91.3	0	94.9	0	96.5	93.7	0	0	93.2
Heavy Vehicles	0	0	0	0	0	130	3	0	6	0	6	0	5	101	0	0	251
% Heavy Vehicles	0	0	0	0	0	7.8	4	0	8.7	0	5.1	0	3.5	6.3	0	0	6.8

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:45 AM																					
08:45 AM	0	0	0	0	0	0	159	7	0	166	4	0	4	0	8	5	155	0	0	160	334
09:00 AM	0	0	0	0	0	0	168	4	0	172	5	0	6	0	11	10	150	0	0	160	343
09:15 AM	0	0	0	0	0	0	167	5	0	172	7	0	10	0	17	18	133	0	0	151	340
09:30 AM	0	0	0	0	0	0	134	3	0	137	14	0	20	0	34	20	126	0	0	146	317
Total Volume	0	0	0	0	0	0	628	19	0	647	30	0	40	0	70	53	564	0	0	617	1334
% App. Total	0	0	0	0	0	0	97.1	2.9	0		42.9	0	57.1	0		8.6	91.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.935	.679	.000	.940	.536	.000	.500	.000	.515	.663	.910	.000	.000	.964	.972
Cars	0	0	0	0	0	0	574	17	0	591	27	0	37	0	64	53	534	0	0	587	1242
% Cars	0	0	0	0	0	0	91.4	89.5	0	91.3	90.0	0	92.5	0	91.4	100	94.7	0	0	95.1	93.1
Heavy Vehicles	0	0	0	0	0	0	54	2	0	56	3	0	3	0	6	0	30	0	0	30	92
% Heavy Vehicles	0	0	0	0	0	0	8.6	10.5	0	8.7	10.0	0	7.5	0	8.6	0	5.3	0	0	4.9	6.9



PRECISION
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INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

File Name : 143955 J
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Old South Road Bike Path From North				Old South Road From East				Youngs Way From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	0	0	0	2	0	0	0	3	0	0	0	0	7
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
09:15 AM	0	1	1	0	0	0	0	0	0	0	0	3	0	0	0	0	5
09:30 AM	0	0	0	1	0	0	0	2	0	0	0	0	1	2	0	0	6
09:45 AM	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	0	5
Total	0	1	1	2	0	0	0	3	0	0	0	7	1	2	0	0	17
10:00 AM	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	5
10:15 AM	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	4
10:30 AM	0	0	0	0	0	0	1	0	0	2	0	3	0	0	0	0	6
10:45 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3
Total	0	2	0	0	0	0	1	3	0	5	0	7	0	0	0	0	18
Grand Total	0	5	1	2	0	0	1	8	0	5	0	17	1	2	0	0	42
Apprch %	0	62.5	12.5	25	0	0	11.1	88.9	0	22.7	0	77.3	33.3	66.7	0	0	
Total %	0	11.9	2.4	4.8	0	0	2.4	19	0	11.9	0	40.5	2.4	4.8	0	0	

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
09:15 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	5
09:30 AM	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	1	2	0	0	3	6
09:45 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	3	3	0	0	0	0	0	5
10:00 AM	0	0	0	0	0	0	0	0	2	2	0	2	0	1	3	0	0	0	0	0	5
Total Volume	0	1	1	2	4	0	0	0	5	5	0	2	0	7	9	1	2	0	0	3	21
% App. Total	0	25	25	50		0	0	0	100		0	22.2	0	77.8		33.3	66.7	0	0		
PHF	.000	.250	.250	.500	.500	.000	.000	.000	.625	.625	.000	.250	.000	.583	.750	.250	.250	.000	.000	.250	.875

Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 09:15 AM



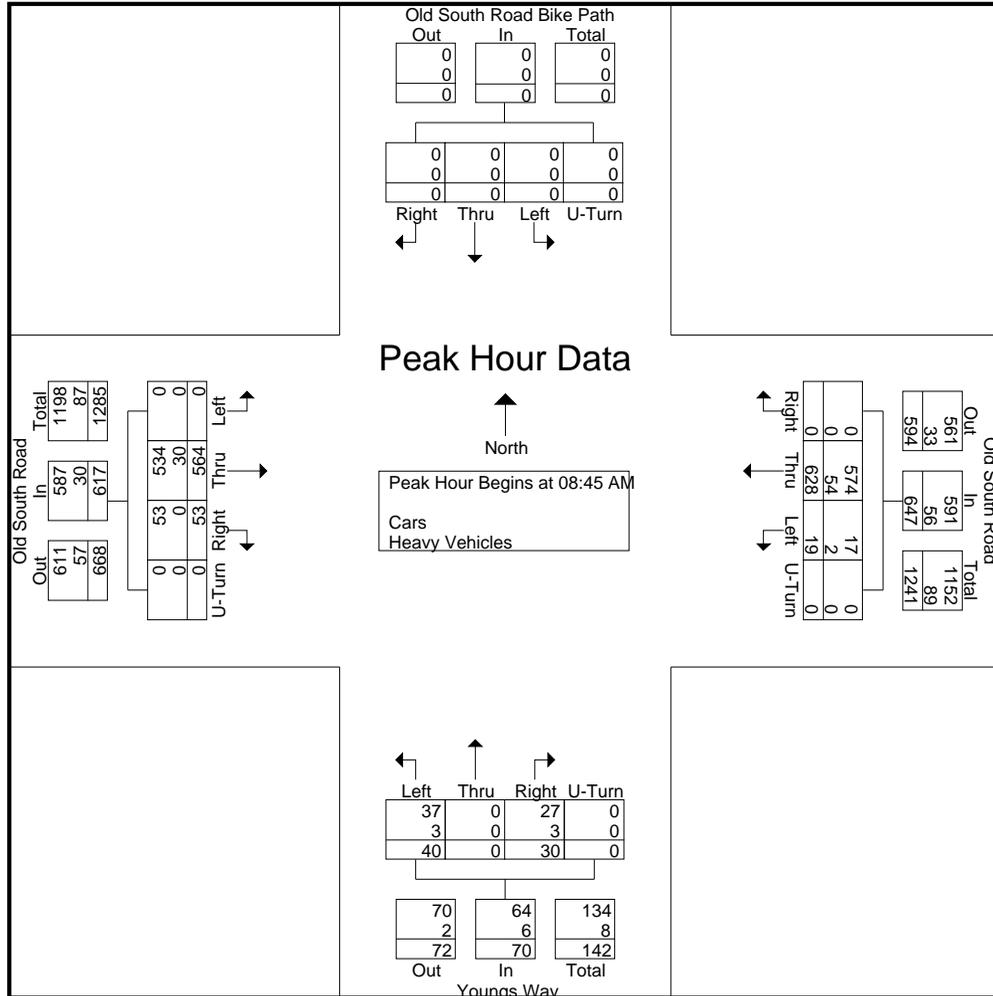
PRECISION
D A T A
INDUSTRIES, LLC

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

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 J
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:45 AM																					
08:45 AM	0	0	0	0	0	0	159	7	0	166	4	0	4	0	8	5	155	0	0	160	334
09:00 AM	0	0	0	0	0	0	168	4	0	172	5	0	6	0	11	10	150	0	0	160	343
09:15 AM	0	0	0	0	0	0	167	5	0	172	7	0	10	0	17	18	133	0	0	151	340
09:30 AM	0	0	0	0	0	0	134	3	0	137	14	0	20	0	34	20	126	0	0	146	317
Total Volume	0	0	0	0	0	0	628	19	0	647	30	0	40	0	70	53	564	0	0	617	1334
% App. Total	0	0	0	0	0	0	97.1	2.9	0		42.9	0	57.1	0		8.6	91.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.935	.679	.000	.940	.536	.000	.500	.000	.515	.663	.910	.000	.000	.964	.972
Cars	0	0	0	0	0	0	574	17	0	591	27	0	37	0	64	53	534	0	0	587	1242
% Cars	0	0	0	0	0	0	91.4	89.5	0	91.3	90.0	0	92.5	0	91.4	100	94.7	0	0	95.1	93.1
Heavy Vehicles	0	0	0	0	0	0	54	2	0	56	3	0	3	0	6	0	30	0	0	30	92
% Heavy Vehicles	0	0	0	0	0	0	8.6	10.5	0	8.7	10.0	0	7.5	0	8.6	0	5.3	0	0	4.9	6.9





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File Name : 143955 JJ
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Page No : 1

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Old South Road Bike Path From North				Old South Road From East				Youngs Way From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	0	0	0	0	0	120	6	0	6	0	8	0	8	140	0	0	288
03:15 PM	0	0	0	0	0	139	6	0	6	0	10	0	4	144	0	0	309
03:30 PM	0	0	0	0	0	105	4	0	4	0	8	0	7	145	0	0	273
03:45 PM	0	0	0	0	0	123	3	0	5	0	6	0	12	155	0	0	304
Total	0	0	0	0	0	487	19	0	21	0	32	0	31	584	0	0	1174
04:00 PM	0	1	0	0	0	138	5	0	3	0	5	0	8	151	0	0	311
04:15 PM	0	0	0	0	0	143	4	0	8	0	6	0	10	168	0	0	339
04:30 PM	0	0	0	0	0	159	3	0	4	0	10	0	5	166	0	0	347
04:45 PM	0	0	0	0	0	141	4	0	8	0	4	0	11	186	0	0	354
Total	0	1	0	0	0	581	16	0	23	0	25	0	34	671	0	0	1351
05:00 PM	0	0	0	0	0	155	9	0	4	0	16	0	8	179	0	0	371
05:15 PM	0	0	0	0	0	137	7	1	7	0	8	0	12	163	0	0	335
05:30 PM	0	0	0	0	0	148	1	0	4	0	9	0	5	140	0	0	307
05:45 PM	0	0	0	0	0	105	4	0	1	0	4	0	3	124	0	0	241
Total	0	0	0	0	0	545	21	1	16	0	37	0	28	606	0	0	1254
Grand Total	0	1	0	0	0	1613	56	1	60	0	94	0	93	1861	0	0	3779
Apprch %	0	100	0	0	0	96.6	3.4	0.1	39	0	61	0	4.8	95.2	0	0	
Total %	0	0	0	0	0	42.7	1.5	0	1.6	0	2.5	0	2.5	49.2	0	0	
Cars	0	1	0	0	0	1565	53	0	58	0	94	0	91	1741	0	0	3603
% Cars	0	100	0	0	0	97	94.6	0	96.7	0	100	0	97.8	93.6	0	0	95.3
Heavy Vehicles	0	0	0	0	0	48	3	1	2	0	0	0	2	120	0	0	176
% Heavy Vehicles	0	0	0	0	0	3	5.4	100	3.3	0	0	0	2.2	6.4	0	0	4.7

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	143	4	0	147	8	0	6	0	14	10	168	0	0	178	339
04:30 PM	0	0	0	0	0	0	159	3	0	162	4	0	10	0	14	5	166	0	0	171	347
04:45 PM	0	0	0	0	0	0	141	4	0	145	8	0	4	0	12	11	186	0	0	197	354
05:00 PM	0	0	0	0	0	0	155	9	0	164	4	0	16	0	20	8	179	0	0	187	371
Total Volume	0	0	0	0	0	0	598	20	0	618	24	0	36	0	60	34	699	0	0	733	1411
% App. Total	0	0	0	0	0	0	96.8	3.2	0		40	0	60	0		4.6	95.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.940	.556	.000	.942	.750	.000	.563	.000	.750	.773	.940	.000	.000	.930	.951
Cars	0	0	0	0	0	0	585	18	0	603	22	0	36	0	58	34	663	0	0	697	1358
% Cars	0	0	0	0	0	0	97.8	90.0	0	97.6	91.7	0	100	0	96.7	100	94.8	0	0	95.1	96.2
Heavy Vehicles	0	0	0	0	0	0	13	2	0	15	2	0	0	0	2	0	36	0	0	36	53
% Heavy Vehicles	0	0	0	0	0	0	2.2	10.0	0	2.4	8.3	0	0	0	3.3	0	5.2	0	0	4.9	3.8



PRECISION
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INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 143955 JJ
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Old South Road Bike Path From North				Old South Road From East				Youngs Way From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3
04:00 PM	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	4
04:30 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
Total	0	3	0	0	0	0	1	2	0	2	0	2	1	0	0	0	11
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	2	0	2	0	0	0	1	0	0	5
Grand Total	0	3	0	0	0	0	1	6	0	4	0	3	1	1	0	0	19
Apprch %	0	100	0	0	0	0	14.3	85.7	0	57.1	0	42.9	50	50	0	0	
Total %	0	15.8	0	0	0	0	5.3	31.6	0	21.1	0	15.8	5.3	5.3	0	0	

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	2	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2	1	0	0	0	1	4
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2
Total Volume	0	3	0	0	3	0	0	1	2	3	0	2	0	2	4	1	0	0	0	1	11
% App. Total	0	100	0	0		0	0	33.3	66.7		0	50	0	50		100	0	0	0		
PHF	.000	.375	.000	.000	.375	.000	.000	.250	.500	.750	.000	.500	.000	.500	.500	.250	.000	.000	.000	.250	.688



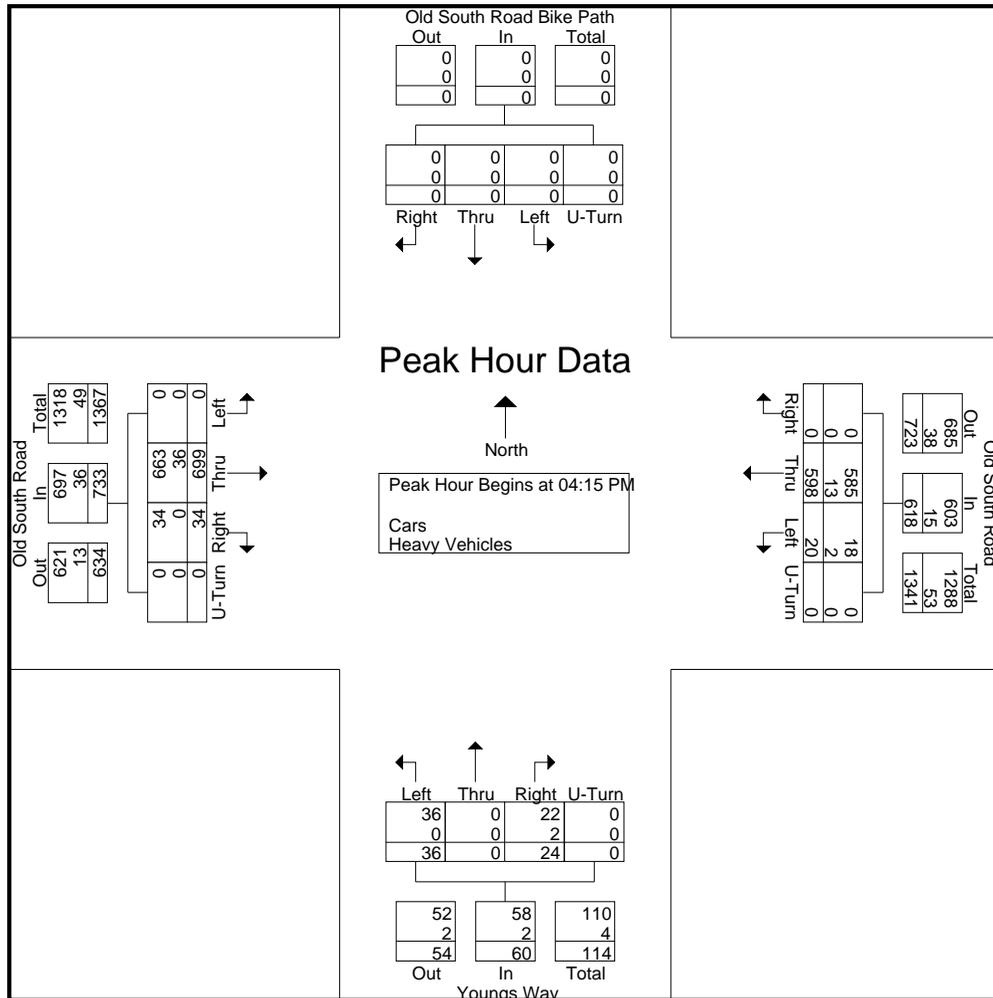
PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 JJ
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	143	4	0	147	8	0	6	0	14	10	168	0	0	178	339
04:30 PM	0	0	0	0	0	0	159	3	0	162	4	0	10	0	14	5	166	0	0	171	347
04:45 PM	0	0	0	0	0	0	141	4	0	145	8	0	4	0	12	11	186	0	0	197	354
05:00 PM	0	0	0	0	0	0	155	9	0	164	4	0	16	0	20	8	179	0	0	187	371
Total Volume	0	0	0	0	0	0	598	20	0	618	24	0	36	0	60	34	699	0	0	733	1411
% App. Total	0	0	0	0	0	0	96.8	3.2	0		40	0	60	0		4.6	95.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.940	.556	.000	.942	.750	.000	.563	.000	.750	.773	.940	.000	.000	.930	.951
Cars	0	0	0	0	0	0	585	18	0	603	22	0	36	0	58	34	663	0	0	697	1358
% Cars	0	0	0	0	0	0	97.8	90.0	0	97.6	91.7	0	100	0	96.7	100	94.8	0	0	95.1	96.2
Heavy Vehicles	0	0	0	0	0	0	13	2	0	15	2	0	0	0	2	0	36	0	0	36	53
% Heavy Vehicles	0	0	0	0	0	0	2.2	10.0	0	2.4	8.3	0	0	0	3.3	0	5.2	0	0	4.9	3.8





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File Name : 143955 JJJ
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Old South Road Bike Path From North				Old South Road From East				Youngs Way From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	0	1	0	0	0	166	6	0	7	0	8	0	4	170	0	0	362
11:15 AM	0	0	0	0	0	135	3	0	4	0	6	0	4	112	0	0	264
11:30 AM	0	0	0	0	0	158	5	0	3	0	6	0	6	151	0	0	329
11:45 AM	0	0	0	0	0	135	3	0	5	0	2	0	5	145	0	0	295
Total	0	1	0	0	0	594	17	0	19	0	22	0	19	578	0	0	1250
12:00 PM	0	0	0	0	0	133	3	0	4	0	4	0	10	131	0	0	285
12:15 PM	0	0	0	0	0	129	0	0	1	0	3	0	2	113	0	0	248
12:30 PM	0	0	0	0	0	124	1	0	2	0	6	0	5	132	0	0	270
12:45 PM	0	0	0	0	0	127	3	0	3	0	5	0	8	133	0	0	279
Total	0	0	0	0	0	513	7	0	10	0	18	0	25	509	0	0	1082
01:00 PM	0	0	0	0	0	131	1	0	2	0	4	0	8	125	0	0	271
01:15 PM	0	0	0	0	0	119	1	0	3	0	7	0	6	133	0	0	269
01:30 PM	0	0	0	0	0	101	1	0	0	0	1	0	3	141	0	0	247
01:45 PM	0	0	0	0	0	115	1	0	2	0	4	0	5	114	0	0	241
Total	0	0	0	0	0	466	4	0	7	0	16	0	22	513	0	0	1028
Grand Total	0	1	0	0	0	1573	28	0	36	0	56	0	66	1600	0	0	3360
Apprch %	0	100	0	0	0	98.3	1.7	0	39.1	0	60.9	0	4	96	0	0	
Total %	0	0	0	0	0	46.8	0.8	0	1.1	0	1.7	0	2	47.6	0	0	
Cars	0	0	0	0	0	1524	26	0	35	0	56	0	65	1536	0	0	3242
% Cars	0	0	0	0	0	96.9	92.9	0	97.2	0	100	0	98.5	96	0	0	96.5
Heavy Vehicles	0	1	0	0	0	49	2	0	1	0	0	0	1	64	0	0	118
% Heavy Vehicles	0	100	0	0	0	3.1	7.1	0	2.8	0	0	0	1.5	4	0	0	3.5

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	0	1	0	0	1	0	166	6	0	172	7	0	8	0	15	4	170	0	0	174	362
11:15 AM	0	0	0	0	0	0	135	3	0	138	4	0	6	0	10	4	112	0	0	116	264
11:30 AM	0	0	0	0	0	0	158	5	0	163	3	0	6	0	9	6	151	0	0	157	329
11:45 AM	0	0	0	0	0	0	135	3	0	138	5	0	2	0	7	5	145	0	0	150	295
Total Volume	0	1	0	0	1	0	594	17	0	611	19	0	22	0	41	19	578	0	0	597	1250
% App. Total	0	100	0	0	0	0	97.2	2.8	0	46.3	0	53.7	0	3.2	96.8	0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.895	.708	.000	.888	.679	.000	.688	.000	.683	.792	.850	.000	.000	.858	.863
Cars	0	0	0	0	0	0	575	17	0	592	18	0	22	0	40	18	553	0	0	571	1203
% Cars	0	0	0	0	0	0	96.8	100	0	96.9	94.7	0	100	0	97.6	94.7	95.7	0	0	95.6	96.2
Heavy Vehicles	0	1	0	0	1	0	19	0	0	19	1	0	0	0	1	1	25	0	0	26	47
% Heavy Vehicles	0	100	0	0	100	0	3.2	0	0	3.1	5.3	0	0	0	2.4	5.3	4.3	0	0	4.4	3.8

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



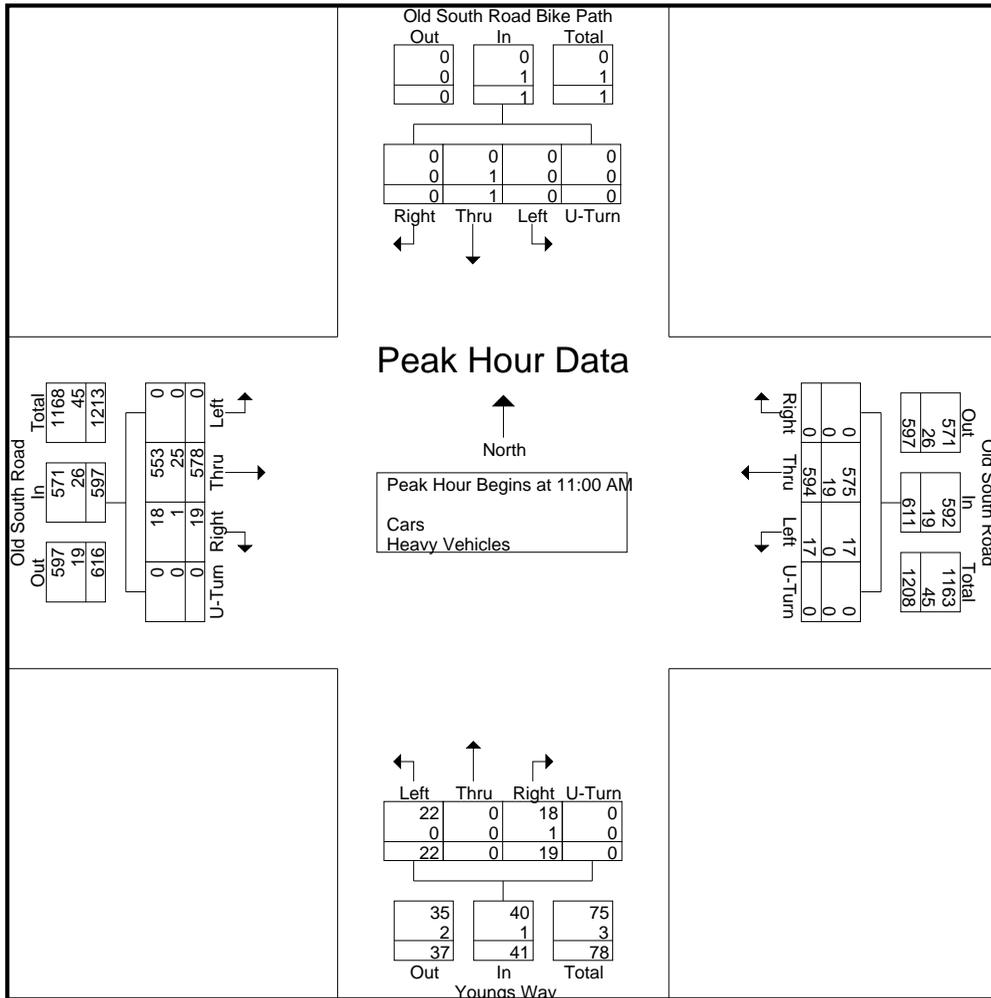
PRECISION
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INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N/S: Bike Path/ Youngs Way
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 JJJ
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Old South Road Bike Path From North					Old South Road From East					Youngs Way From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	1	0	0	1	0	166	6	0	172	7	0	8	0	15	4	170	0	0	174	362
11:15 AM	0	0	0	0	0	0	135	3	0	138	4	0	6	0	10	4	112	0	0	116	264
11:30 AM	0	0	0	0	0	0	158	5	0	163	3	0	6	0	9	6	151	0	0	157	329
11:45 AM	0	0	0	0	0	0	135	3	0	138	5	0	2	0	7	5	145	0	0	150	295
Total Volume	0	1	0	0	1	0	594	17	0	611	19	0	22	0	41	19	578	0	0	597	1250
% App. Total	0	100	0	0	0	0	97.2	2.8	0	0	46.3	0	53.7	0	0	3.2	96.8	0	0	0	0
PHF	.000	.250	.000	.000	.250	.000	.895	.708	.000	.888	.679	.000	.688	.000	.683	.792	.850	.000	.000	.858	.863
Cars	0	0	0	0	0	0	575	17	0	592	18	0	22	0	40	18	553	0	0	571	1203
% Cars	0	0	0	0	0	0	96.8	100	0	96.9	94.7	0	100	0	97.6	94.7	95.7	0	0	95.6	96.2
Heavy Vehicles	0	1	0	0	1	0	19	0	0	19	1	0	0	0	1	1	25	0	0	26	47
% Heavy Vehicles	0	100	0	0	100	0	3.2	0	0	3.1	5.3	0	0	0	2.4	5.3	4.3	0	0	4.4	3.8





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File Name : 143955 K
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
08:00 AM	0	0	0	0	0	160	10	0	5	1	9	0	9	122	0	0	316
08:15 AM	0	0	0	0	0	148	11	0	6	0	6	0	15	148	0	0	334
08:30 AM	0	0	0	0	0	119	10	0	9	0	9	0	14	138	0	0	299
08:45 AM	0	0	0	0	0	153	8	0	2	0	7	0	12	166	0	0	348
Total	0	0	0	0	0	580	39	0	22	1	31	0	50	574	0	0	1297
09:00 AM	0	0	0	0	0	165	12	0	5	0	9	0	15	157	0	0	363
09:15 AM	0	0	0	0	0	165	13	0	9	1	17	0	10	140	0	0	355
09:30 AM	0	0	0	0	0	146	11	0	9	0	10	0	15	145	0	0	336
09:45 AM	0	0	0	0	0	155	12	0	10	0	9	0	30	141	0	0	357
Total	0	0	0	0	0	631	48	0	33	1	45	0	70	583	0	0	1411
10:00 AM	0	0	0	0	0	113	12	0	13	0	18	0	9	135	0	0	300
10:15 AM	0	0	0	0	0	118	8	0	5	0	13	0	9	123	0	0	276
10:30 AM	0	0	0	0	0	117	8	0	7	0	7	0	9	123	0	0	271
10:45 AM	0	0	0	0	0	113	3	0	7	0	11	0	14	121	0	0	269
Total	0	0	0	0	0	461	31	0	32	0	49	0	41	502	0	0	1116
Grand Total	0	0	0	0	0	1672	118	0	87	2	125	0	161	1659	0	0	3824
Apprch %	0	0	0	0	0	93.4	6.6	0	40.7	0.9	58.4	0	8.8	91.2	0	0	
Total %	0	0	0	0	0	43.7	3.1	0	2.3	0.1	3.3	0	4.2	43.4	0	0	
Cars	0	0	0	0	0	1547	112	0	83	0	121	0	156	1555	0	0	3574
% Cars	0	0	0	0	0	92.5	94.9	0	95.4	0	96.8	0	96.9	93.7	0	0	93.5
Heavy Vehicles	0	0	0	0	0	125	6	0	4	2	4	0	5	104	0	0	250
% Heavy Vehicles	0	0	0	0	0	7.5	5.1	0	4.6	100	3.2	0	3.1	6.3	0	0	6.5

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	0	0	0	0	0	165	12	0	177	5	0	9	0	14	15	157	0	0	172	363
09:15 AM	0	0	0	0	0	0	165	13	0	178	9	1	17	0	27	10	140	0	0	150	355
09:30 AM	0	0	0	0	0	0	146	11	0	157	9	0	10	0	19	15	145	0	0	160	336
09:45 AM	0	0	0	0	0	0	155	12	0	167	10	0	9	0	19	30	141	0	0	171	357
Total Volume	0	0	0	0	0	0	631	48	0	679	33	1	45	0	79	70	583	0	0	653	1411
% App. Total	0	0	0	0	0	0	92.9	7.1	0		41.8	1.3	57	0		10.7	89.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.956	.923	.000	.954	.825	.250	.662	.000	.731	.583	.928	.000	.000	.949	.972
Cars	0	0	0	0	0	0	582	47	0	629	32	0	45	0	77	68	551	0	0	619	1325
% Cars	0	0	0	0	0	0	92.2	97.9	0	92.6	97.0	0	100	0	97.5	97.1	94.5	0	0	94.8	93.9
Heavy Vehicles	0	0	0	0	0	0	49	1	0	50	1	1	0	0	2	2	32	0	0	34	86
% Heavy Vehicles	0	0	0	0	0	0	7.8	2.1	0	7.4	3.0	100	0	0	2.5	2.9	5.5	0	0	5.2	6.1



PRECISION
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File Name : 143955 K
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
08:00 AM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	1	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	1	4
Total	0	3	0	0	0	0	0	0	1	2	0	0	2	0	0	2	10
09:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	5	7
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
09:30 AM	0	0	0	0	0	0	0	2	0	3	0	0	0	2	0	0	7
09:45 AM	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3
Total	0	1	0	0	0	0	0	2	0	4	0	3	0	2	0	6	18
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
10:15 AM	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	5	9
10:30 AM	0	2	0	3	1	0	0	0	0	0	0	2	0	2	0	2	12
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	3	0	6	1	0	0	0	0	0	0	2	0	2	0	9	23
Grand Total	0	7	0	6	1	0	0	2	1	6	0	5	2	4	0	17	51
Apprch %	0	53.8	0	46.2	33.3	0	0	66.7	8.3	50	0	41.7	8.7	17.4	0	73.9	
Total %	0	13.7	0	11.8	2	0	0	3.9	2	11.8	0	9.8	3.9	7.8	0	33.3	

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:45 AM																					
09:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	3
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
10:15 AM	0	1	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	9
10:30 AM	0	2	0	3	5	1	0	0	0	1	0	0	0	2	2	0	2	0	2	4	12
Total Volume	0	4	0	6	10	1	0	0	0	1	0	0	0	4	4	0	2	0	8	10	25
% App. Total	0	40	0	60		100	0	0	0		0	0	0	100		0	20	0	80		
PHF	.000	.500	.000	.500	.500	.250	.000	.000	.000	.250	.000	.000	.000	.500	.500	.000	.250	.000	.400	.500	.521



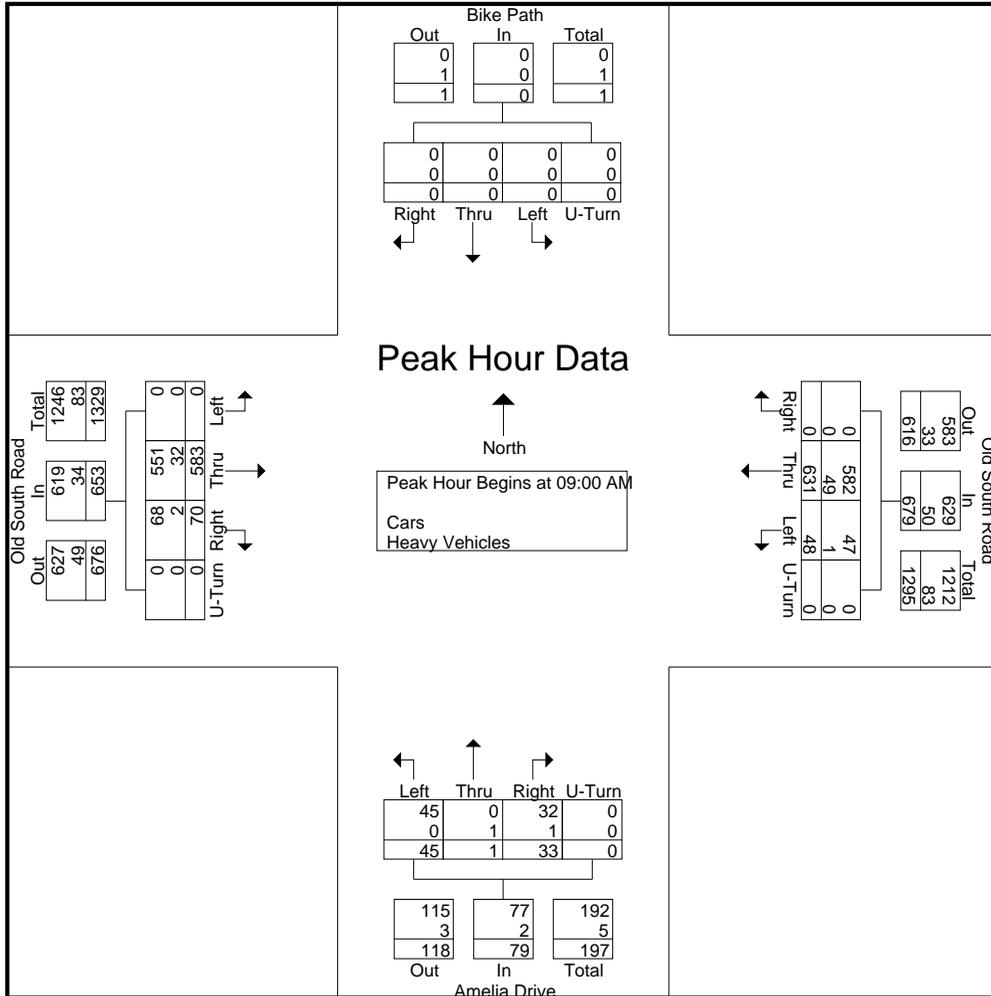
PRECISION
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N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 K
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 08:00 AM to 10:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	0	0	0	0	0	165	12	0	177	5	0	9	0	14	15	157	0	0	172	363
09:15 AM	0	0	0	0	0	0	165	13	0	178	9	1	17	0	27	10	140	0	0	150	355
09:30 AM	0	0	0	0	0	0	146	11	0	157	9	0	10	0	19	15	145	0	0	160	336
09:45 AM	0	0	0	0	0	0	155	12	0	167	10	0	9	0	19	30	141	0	0	171	357
Total Volume	0	0	0	0	0	0	631	48	0	679	33	1	45	0	79	70	583	0	0	653	1411
% App. Total	0	0	0	0	0	0	92.9	7.1	0		41.8	1.3	57	0		10.7	89.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.956	.923	.000	.954	.825	.250	.662	.000	.731	.583	.928	.000	.000	.949	.972
Cars	0	0	0	0	0	0	582	47	0	629	32	0	45	0	77	68	551	0	0	619	1325
% Cars	0	0	0	0	0	0	92.2	97.9	0	92.6	97.0	0	100	0	97.5	97.1	94.5	0	0	94.8	93.9
Heavy Vehicles	0	0	0	0	0	0	49	1	0	50	1	1	0	0	2	2	32	0	0	34	86
% Heavy Vehicles	0	0	0	0	0	0	7.8	2.1	0	7.4	3.0	100	0	0	2.5	2.9	5.5	0	0	5.2	6.1





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N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 KK
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
03:00 PM	0	0	0	0	0	125	6	0	8	0	18	0	14	139	0	0	310
03:15 PM	0	0	0	0	0	138	9	0	7	0	12	0	23	147	0	0	336
03:30 PM	0	0	0	0	0	107	5	0	7	0	10	0	14	143	0	0	286
03:45 PM	0	0	0	0	0	131	2	0	10	0	11	0	17	157	0	0	328
Total	0	0	0	0	0	501	22	0	32	0	51	0	68	586	0	0	1260
04:00 PM	0	0	0	0	0	130	10	0	9	0	17	0	18	152	0	0	336
04:15 PM	0	0	0	0	0	134	13	0	13	0	9	0	15	171	0	0	355
04:30 PM	0	0	0	0	0	157	12	0	8	0	13	0	14	163	0	0	367
04:45 PM	0	0	0	0	0	137	11	0	14	0	10	0	20	178	0	0	370
Total	0	0	0	0	0	558	46	0	44	0	49	0	67	664	0	0	1428
05:00 PM	0	0	0	0	0	154	17	0	18	0	10	0	24	162	0	0	385
05:15 PM	0	0	0	0	0	137	14	0	8	0	10	0	17	159	0	0	345
05:30 PM	0	0	0	0	0	151	6	0	6	0	13	0	11	137	0	0	324
05:45 PM	0	0	0	0	0	104	5	0	6	0	4	0	15	119	0	0	253
Total	0	0	0	0	0	546	42	0	38	0	37	0	67	577	0	0	1307
Grand Total	0	0	0	0	0	1605	110	0	114	0	137	0	202	1827	0	0	3995
Apprch %	0	0	0	0	0	93.6	6.4	0	45.4	0	54.6	0	10	90	0	0	
Total %	0	0	0	0	0	40.2	2.8	0	2.9	0	3.4	0	5.1	45.7	0	0	
Cars	0	0	0	0	0	1559	108	0	112	0	137	0	200	1707	0	0	3823
% Cars	0	0	0	0	0	97.1	98.2	0	98.2	0	100	0	99	93.4	0	0	95.7
Heavy Vehicles	0	0	0	0	0	46	2	0	2	0	0	0	2	120	0	0	172
% Heavy Vehicles	0	0	0	0	0	2.9	1.8	0	1.8	0	0	0	1	6.6	0	0	4.3

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
04:15 PM	0	0	0	0	0	0	134	13	0	147	13	0	9	0	22	15	171	0	0	186	355
04:30 PM	0	0	0	0	0	0	157	12	0	169	8	0	13	0	21	14	163	0	0	177	367
04:45 PM	0	0	0	0	0	0	137	11	0	148	14	0	10	0	24	20	178	0	0	198	370
05:00 PM	0	0	0	0	0	0	154	17	0	171	18	0	10	0	28	24	162	0	0	186	385
Total Volume	0	0	0	0	0	0	582	53	0	635	53	0	42	0	95	73	674	0	0	747	1477
% App. Total	0	0	0	0	0	0	91.7	8.3	0		55.8	0	44.2	0		9.8	90.2	0	0		
PHF	.000	.000	.000	.000	.000	.000	.927	.779	.000	.928	.736	.000	.808	.000	.848	.760	.947	.000	.000	.943	.959
Cars	0	0	0	0	0	0	568	51	0	619	52	0	42	0	94	73	641	0	0	714	1427
% Cars	0	0	0	0	0	0	97.6	96.2	0	97.5	98.1	0	100	0	98.9	100	95.1	0	0	95.6	96.6
Heavy Vehicles	0	0	0	0	0	0	14	2	0	16	1	0	0	0	1	0	33	0	0	33	50
% Heavy Vehicles	0	0	0	0	0	0	2.4	3.8	0	2.5	1.9	0	0	0	1.1	0	4.9	0	0	4.4	3.4

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

Peak Hour for Entire Intersection Begins at 04:15 PM



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File Name : 143955 KK
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
03:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	3
03:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	4
Total	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	6	8
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
04:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
04:30 PM	0	0	2	2	0	0	0	4	0	3	0	0	0	0	0	1	12
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	2	2	2	0	0	0	4	0	4	0	1	0	1	0	3	19
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	4
Total	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	2	5
Grand Total	0	3	2	2	0	0	0	5	0	6	0	1	0	2	0	11	32
Apprch %	0	42.9	28.6	28.6	0	0	0	100	0	85.7	0	14.3	0	15.4	0	84.6	
Total %	0	9.4	6.2	6.2	0	0	0	15.6	0	18.8	0	3.1	0	6.2	0	34.4	

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	3	3	4
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
04:15 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
04:30 PM	0	0	2	2	4	0	0	0	4	4	0	3	0	0	3	0	0	0	1	1	12
Total Volume	0	2	2	2	6	0	0	0	4	4	0	5	0	0	5	0	1	0	6	7	22
% App. Total	0	33.3	33.3	33.3		0	0	0	100		0	100	0	0		0	14.3	0	85.7		
PHF	.000	.250	.250	.250	.375	.000	.000	.000	.250	.250	.000	.417	.000	.000	.417	.000	.250	.000	.500	.583	.458



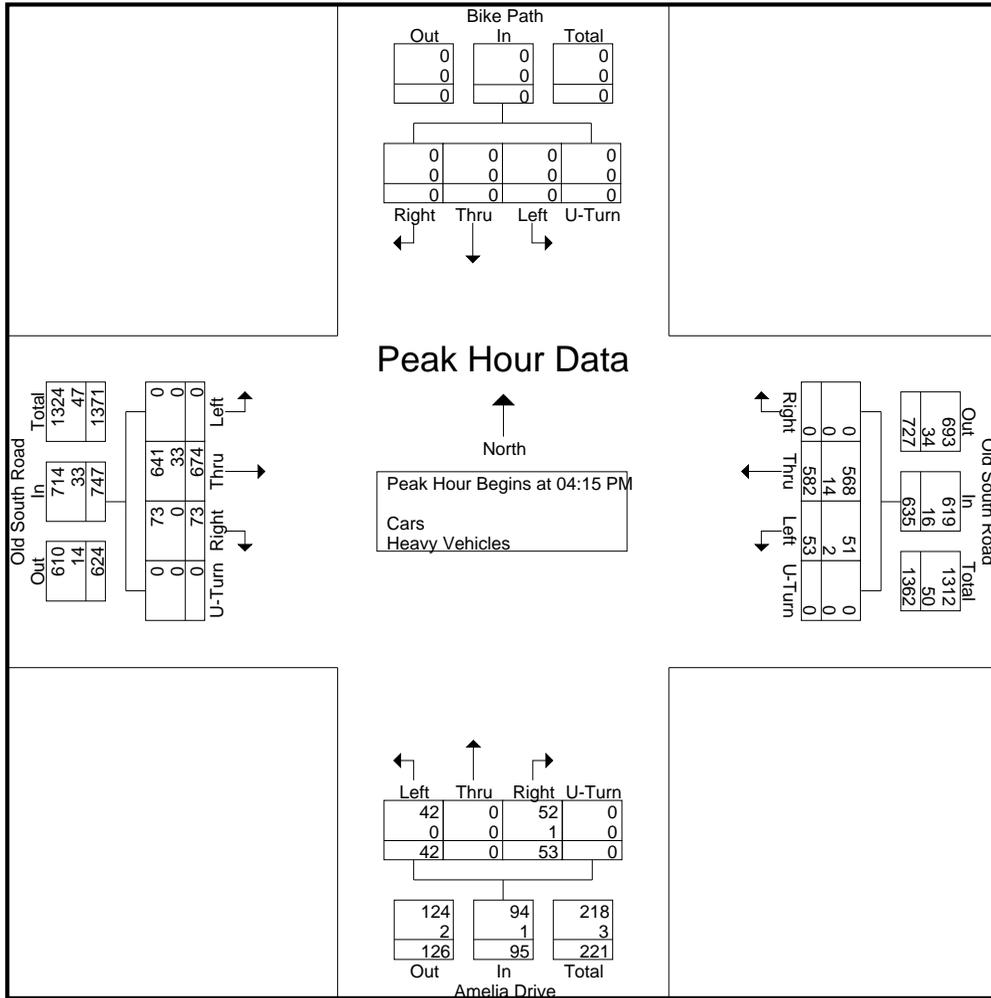
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N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 KK
Site Code : TBA
Start Date : 7/24/2014
Page No : 1

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	134	13	0	147	13	0	9	0	22	15	171	0	0	186	355
04:30 PM	0	0	0	0	0	0	157	12	0	169	8	0	13	0	21	14	163	0	0	177	367
04:45 PM	0	0	0	0	0	0	137	11	0	148	14	0	10	0	24	20	178	0	0	198	370
05:00 PM	0	0	0	0	0	0	154	17	0	171	18	0	10	0	28	24	162	0	0	186	385
Total Volume	0	0	0	0	0	0	582	53	0	635	53	0	42	0	95	73	674	0	0	747	1477
% App. Total	0	0	0	0	0	0	91.7	8.3	0		55.8	0	44.2	0		9.8	90.2	0	0		
PHF	.000	.000	.000	.000	.000	.000	.927	.779	.000	.928	.736	.000	.808	.000	.848	.760	.947	.000	.000	.943	.959
Cars	0	0	0	0	0	0	568	51	0	619	52	0	42	0	94	73	641	0	0	714	1427
% Cars	0	0	0	0	0	0	97.6	96.2	0	97.5	98.1	0	100	0	98.9	100	95.1	0	0	95.6	96.6
Heavy Vehicles	0	0	0	0	0	0	14	2	0	16	1	0	0	0	1	0	33	0	0	33	50
% Heavy Vehicles	0	0	0	0	0	0	2.4	3.8	0	2.5	1.9	0	0	0	1.1	0	4.9	0	0	4.4	3.4





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City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 KKK
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	0	0	0	0	0	163	11	0	17	0	16	0	14	155	0	0	376
11:15 AM	0	0	0	0	0	127	14	1	10	0	10	0	14	107	0	0	283
11:30 AM	0	0	0	0	0	155	9	0	9	0	6	0	20	153	0	1	353
11:45 AM	0	0	0	0	0	125	10	0	11	0	15	0	11	134	0	0	306
Total	0	0	0	0	0	570	44	1	47	0	47	0	59	549	0	1	1318
12:00 PM	0	0	0	0	0	128	8	0	6	0	11	0	19	137	0	0	309
12:15 PM	0	0	0	0	0	129	2	0	4	0	8	0	12	114	0	1	270
12:30 PM	0	0	0	0	0	127	6	0	13	0	13	0	13	122	0	0	294
12:45 PM	0	0	0	0	0	129	2	0	6	0	6	0	8	137	0	0	288
Total	0	0	0	0	0	513	18	0	29	0	38	0	52	510	0	1	1161
01:00 PM	0	0	0	0	0	131	5	0	5	0	9	0	17	124	0	0	291
01:15 PM	0	0	0	0	0	119	5	0	5	0	10	0	11	132	0	0	282
01:30 PM	0	0	0	0	0	100	3	0	8	0	11	0	13	140	0	0	275
01:45 PM	0	0	0	0	0	114	4	0	8	1	11	0	9	117	0	0	264
Total	0	0	0	0	0	464	17	0	26	1	41	0	50	513	0	0	1112
Grand Total	0	0	0	0	0	1547	79	1	102	1	126	0	161	1572	0	2	3591
Apprch %	0	0	0	0	0	95.1	4.9	0.1	44.5	0.4	55	0	9.3	90.6	0	0.1	
Total %	0	0	0	0	0	43.1	2.2	0	2.8	0	3.5	0	4.5	43.8	0	0.1	
Cars	0	0	0	0	0	1499	77	1	98	1	126	0	159	1509	0	2	3472
% Cars	0	0	0	0	0	96.9	97.5	100	96.1	100	100	0	98.8	96	0	100	96.7
Heavy Vehicles	0	0	0	0	0	48	2	0	4	0	0	0	2	63	0	0	119
% Heavy Vehicles	0	0	0	0	0	3.1	2.5	0	3.9	0	0	0	1.2	4	0	0	3.3

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:00 AM	0	0	0	0	0	0	163	11	0	174	17	0	16	0	33	14	155	0	0	169	376
11:15 AM	0	0	0	0	0	0	127	14	1	142	10	0	10	0	20	14	107	0	0	121	283
11:30 AM	0	0	0	0	0	0	155	9	0	164	9	0	6	0	15	20	153	0	1	174	353
11:45 AM	0	0	0	0	0	0	125	10	0	135	11	0	15	0	26	11	134	0	0	145	306
Total Volume	0	0	0	0	0	0	570	44	1	615	47	0	47	0	94	59	549	0	1	609	1318
% App. Total	0	0	0	0	0	0	92.7	7.2	0.2		50	0	50	0		9.7	90.1	0	0.2		
PHF	.000	.000	.000	.000	.000	.000	.874	.786	.250	.884	.691	.000	.734	.000	.712	.738	.885	.000	.250	.875	.876
Cars	0	0	0	0	0	0	557	42	1	600	43	0	47	0	90	57	525	0	1	583	1273
% Cars	0	0	0	0	0	0	97.7	95.5	100	97.6	91.5	0	100	0	95.7	96.6	95.6	0	100	95.7	96.6
Heavy Vehicles	0	0	0	0	0	0	13	2	0	15	4	0	0	0	4	2	24	0	0	26	45
% Heavy Vehicles	0	0	0	0	0	0	2.3	4.5	0	2.4	8.5	0	0	0	4.3	3.4	4.4	0	0	4.3	3.4

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 11:00 AM



PRECISION
D A T A
INDUSTRIES, LLC

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

N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 KKK
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Groups Printed- Peds and Bicycles

Start Time	Bike Path From North				Old South Road From East				Amelia Drive From South				Old South Road From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	4
11:45 AM	0	3	0	0	1	1	0	0	0	0	1	0	0	0	0	1	7
Total	0	8	0	0	2	1	0	0	0	0	1	1	0	0	0	2	15
12:00 PM	0	0	0	3	3	0	0	3	0	0	0	0	0	0	0	0	9
12:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	3	3	0	0	4	0	0	0	1	0	0	0	0	12
01:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
01:45 PM	0	0	0	0	0	3	0	0	0	1	0	2	0	0	0	6	12
Total	2	1	0	0	1	3	0	0	0	1	0	2	1	0	0	6	17
Grand Total	2	10	0	3	6	4	0	4	0	1	1	4	1	0	0	8	44
Apprch %	13.3	66.7	0	20	42.9	28.6	0	28.6	0	16.7	16.7	66.7	11.1	0	0	88.9	
Total %	4.5	22.7	0	6.8	13.6	9.1	0	9.1	0	2.3	2.3	9.1	2.3	0	0	18.2	

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
11:15 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4
11:30 AM	0	2	0	0	2	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	4
11:45 AM	0	3	0	0	3	1	1	0	0	2	0	0	1	0	1	0	0	0	1	1	7
12:00 PM	0	0	0	3	3	3	0	0	3	6	0	0	0	0	0	0	0	0	0	0	9
Total Volume	0	8	0	3	11	5	1	0	3	9	0	0	1	1	2	0	0	0	2	2	24
% App. Total	0	72.7	0	27.3	55.6	11.1	0	33.3	0	0	50	50	0	0	0	100					
PHF	.000	.667	.000	.250	.917	.417	.250	.000	.250	.375	.000	.000	.250	.250	.500	.000	.000	.000	.500	.500	.667

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 11:15 AM



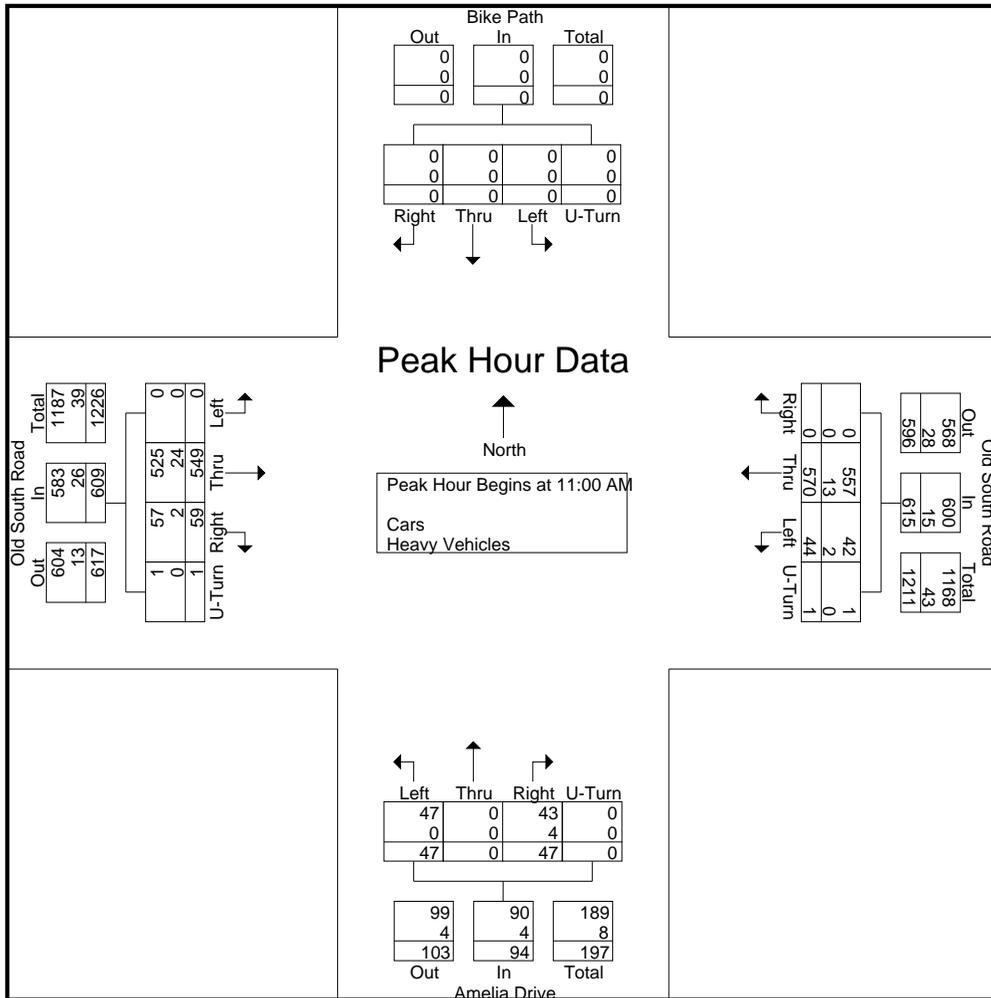
PRECISION
D A T A
INDUSTRIES, LLC

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

N/S: Bike Path/ Amelia Drive
E/W: Old South Road
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 KKK
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Bike Path From North					Old South Road From East					Amelia Drive From South					Old South Road From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	163	11	0	174	17	0	16	0	33	14	155	0	0	169	376
11:15 AM	0	0	0	0	0	0	127	14	1	142	10	0	10	0	20	14	107	0	0	121	283
11:30 AM	0	0	0	0	0	0	155	9	0	164	9	0	6	0	15	20	153	0	1	174	353
11:45 AM	0	0	0	0	0	0	125	10	0	135	11	0	15	0	26	11	134	0	0	145	306
Total Volume	0	0	0	0	0	0	570	44	1	615	47	0	47	0	94	59	549	0	1	609	1318
% App. Total	0	0	0	0	0	0	92.7	7.2	0.2		50	0	50	0		9.7	90.1	0	0.2		
PHF	.000	.000	.000	.000	.000	.000	.874	.786	.250	.884	.691	.000	.734	.000	.712	.738	.885	.000	.250	.875	.876
Cars	0	0	0	0	0	0	557	42	1	600	43	0	47	0	90	57	525	0	1	583	1273
% Cars	0	0	0	0	0	0	97.7	95.5	100	97.6	91.5	0	100	0	95.7	96.6	95.6	0	100	95.7	96.6
Heavy Vehicles	0	0	0	0	0	0	13	2	0	15	4	0	0	0	4	2	24	0	0	26	45
% Heavy Vehicles	0	0	0	0	0	0	2.3	4.5	0	2.4	8.5	0	0	0	4.3	3.4	4.4	0	0	4.3	3.4



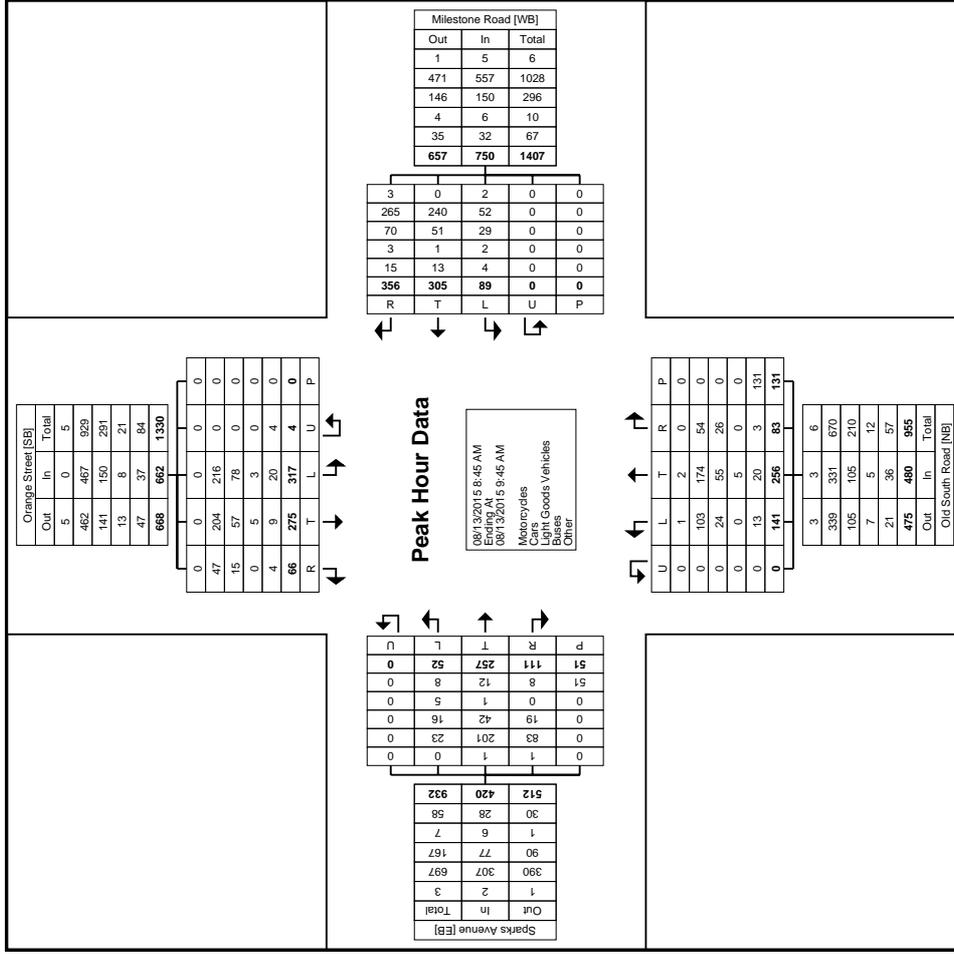
Nantucket Planning and Economic Development Commission (MA)
1 East Chestnut St.

Nantucket, Massachusetts, United States 12345
508 228 7237 mburns@nantucket-ma.gov

Count Name: Milestone Rotary Roundabout
Site Code:
Start Date: 08/13/2015
Page No: 6

Turning Movement Peak Hour Data (8:45 AM)

Start Time	Orange Street Southbound					Milestone Road Westbound					Old South Road Northbound					Sparks Avenue Eastbound									
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
8:45 AM	15	66	86	0	0	167	104	87	28	0	0	219	18	70	34	0	29	122	28	65	8	0	10	101	609
9:00 AM	24	62	90	4	0	180	83	80	19	0	0	182	16	66	32	0	31	114	28	69	10	0	12	107	583
9:15 AM	12	71	74	0	0	157	84	66	18	0	0	168	31	53	40	0	33	124	36	61	10	0	16	107	556
9:30 AM	15	76	67	0	0	158	85	72	24	0	0	181	18	67	35	0	38	120	19	62	24	0	13	105	564
Total	66	275	317	4	0	662	356	305	89	0	0	750	83	256	141	0	131	480	111	257	52	0	51	420	2312
Approach %	10.0	41.5	47.9	0.6	-	-	47.5	40.7	11.9	0.0	-	-	17.3	53.3	29.4	0.0	-	-	28.4	61.2	12.4	0.0	-	-	-
Total %	2.9	11.9	13.7	0.2	-	28.6	15.4	13.2	3.8	0.0	-	32.4	3.6	11.1	6.1	0.0	-	20.8	4.8	11.1	2.2	0.0	-	-	18.2
PHF	0.688	0.905	0.881	0.250	-	0.919	0.856	0.876	0.795	0.000	-	0.856	0.669	0.914	0.881	0.000	-	0.968	0.771	0.931	0.542	0.000	-	-	0.981
Motorcycles	0	0	0	0	0	0	3	0	2	0	0	5	0	2	1	0	0	3	1	1	0	0	0	2	10
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.8	0.0	2.2	-	-	0.7	0.0	0.8	0.7	-	-	0.6	0.9	0.4	0.0	-	-	-	0.5
Cars	47	204	216	0	0	467	265	240	52	0	0	557	54	174	103	0	0	331	83	201	23	0	0	0	307
% Cars	71.2	74.2	68.1	0.0	-	70.5	74.4	78.7	58.4	-	-	74.3	65.1	68.0	73.0	-	-	69.0	74.8	78.2	44.2	-	-	-	73.1
Light Goods Vehicles	15	57	78	0	0	150	70	51	29	0	0	150	26	55	24	0	0	105	19	42	16	0	0	0	77
% Light Goods Vehicles	22.7	20.7	24.6	0.0	-	22.7	19.7	16.7	32.6	-	-	20.0	31.3	21.5	17.0	-	-	21.9	17.1	16.3	30.8	-	-	-	18.3
Buses	0	5	3	0	0	8	3	1	2	0	0	6	0	5	0	0	0	5	0	1	5	0	0	0	6
% Buses	0.0	1.8	0.9	0.0	-	1.2	0.8	0.3	2.2	-	-	0.8	0.0	2.0	0.0	-	-	1.0	0.0	0.4	9.6	-	-	-	1.4
Single-Unit Trucks	2	4	14	0	0	20	13	11	4	0	0	28	3	13	13	0	0	29	8	11	3	0	0	0	22
% Single-Unit Trucks	3.0	1.5	4.4	0.0	-	3.0	3.7	3.6	4.5	-	-	3.7	3.6	5.1	9.2	-	-	6.0	7.2	4.3	5.8	-	-	-	5.2
Articulated Trucks	0	0	1	0	0	1	1	1	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	1
% Articulated Trucks	0.0	0.0	0.3	0.0	-	0.2	0.3	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	-	0.2
Bicycles on Road	2	5	5	4	0	16	1	1	0	0	0	2	0	7	0	0	0	7	0	0	5	0	0	0	5
% Bicycles on Road	3.0	1.8	1.6	100.0	-	2.4	0.3	0.3	0.0	-	-	0.3	0.0	2.7	0.0	-	-	1.5	0.0	0.0	9.6	-	-	-	1.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	100	-	-	-	-	-	-	21	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76.3	-	-	-	-	-	-	41.2	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	31	-	-	-	-	-	-	30	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	58.8	-



Turning Movement Peak Hour Data Plot (8:45 AM)



PRECISION
D A T A
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 143955 LLL
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N/S: Orange Street/ Old South Road
E/W: Milestone Road/ Sparks Avenue
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Cars - Heavy Vehicles

Start Time	Orange Street From North				Milestone Road From East				Old South Road From South				Sparks Avenue From West				Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
11:00 AM	25	72	49	1	68	85	20	0	24	64	39	1	26	63	12	0	549
11:15 AM	20	71	38	0	90	95	22	1	24	67	39	0	21	72	12	0	572
11:30 AM	29	81	74	2	74	96	25	1	32	66	32	0	29	66	6	0	613
11:45 AM	18	61	67	2	81	92	18	0	22	60	43	0	24	62	13	0	563
Total	92	285	228	5	313	368	85	2	102	257	153	1	100	263	43	0	2297
12:00 PM	24	70	68	5	87	103	17	1	23	47	40	0	34	57	12	0	588
12:15 PM	15	64	78	1	75	90	19	2	25	52	37	0	21	68	9	0	556
12:30 PM	15	65	70	0	58	75	14	2	14	56	43	0	21	68	10	0	511
12:45 PM	19	58	85	0	57	78	20	0	20	62	26	0	25	68	10	0	528
Total	73	257	301	6	277	346	70	5	82	217	146	0	101	261	41	0	2183
01:00 PM	13	73	53	1	53	62	15	0	20	65	31	1	36	56	7	0	486
01:15 PM	25	70	49	1	63	67	19	0	14	50	31	0	41	61	8	0	499
01:30 PM	22	58	51	1	45	67	10	0	30	39	30	0	39	64	8	0	464
01:45 PM	15	51	57	0	50	47	12	1	28	48	37	0	39	55	10	0	450
Total	75	252	210	3	211	243	56	1	92	202	129	1	155	236	33	0	1899
Grand Total	240	794	739	14	801	957	211	8	276	676	428	2	356	760	117	0	6379
Apprch %	13.4	44.4	41.4	0.8	40.5	48.4	10.7	0.4	20	48.9	31	0.1	28.9	61.6	9.5	0	
Total %	3.8	12.4	11.6	0.2	12.6	15	3.3	0.1	4.3	10.6	6.7	0	5.6	11.9	1.8	0	
Cars	236	756	722	14	789	944	208	8	273	644	421	2	344	733	102	0	6196
% Cars	98.3	95.2	97.7	100	98.5	98.6	98.6	100	98.9	95.3	98.4	100	96.6	96.4	87.2	0	97.1
Heavy Vehicles	4	38	17	0	12	13	3	0	3	32	7	0	12	27	15	0	183
% Heavy Vehicles	1.7	4.8	2.3	0	1.5	1.4	1.4	0	1.1	4.7	1.6	0	3.4	3.6	12.8	0	2.9

Start Time	Orange Street From North					Milestone Road From East					Old South Road From South					Sparks Avenue From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
11:15 AM	20	71	38	0	129	90	95	22	1	208	24	67	39	0	130	21	72	12	0	105	572
11:30 AM	29	81	74	2	186	74	96	25	1	196	32	66	32	0	130	29	66	6	0	101	613
11:45 AM	18	61	67	2	148	81	92	18	0	191	22	60	43	0	125	24	62	13	0	99	563
12:00 PM	24	70	68	5	167	87	103	17	1	208	23	47	40	0	110	34	57	12	0	103	588
Total Volume	91	283	247	9	630	332	386	82	3	803	101	240	154	0	495	108	257	43	0	408	2336
% App. Total	14.4	44.9	39.2	1.4		41.3	48.1	10.2	0.4		20.4	48.5	31.1	0		26.5	63	10.5	0		
PHF	.784	.873	.834	.450	.847	.922	.937	.820	.750	.965	.789	.896	.895	.000	.952	.794	.892	.827	.000	.971	.953
Cars	91	271	243	9	614	330	382	80	3	795	99	231	153	0	483	103	244	38	0	385	2277
% Cars	100	95.8	98.4	100	97.5	99.4	99.0	97.6	100	99.0	98.0	96.3	99.4	0	97.6	95.4	94.9	88.4	0	94.4	97.5
Heavy Vehicles	0	12	4	0	16	2	4	2	0	8	2	9	1	0	12	5	13	5	0	23	59
% Heavy Vehicles	0	4.2	1.6	0	2.5	0.6	1.0	2.4	0	1.0	2.0	3.8	0.6	0	2.4	4.6	5.1	11.6	0	5.6	2.5

Peak Hour for Entire Intersection Begins at 11:15 AM

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1



PRECISION
D A T A
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 143955 LLL
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

N/S: Orange Street/ Old South Road
E/W: Milestone Road/ Sparks Avenue
City, State: Nantucket, MA
Client: Ron Muller & Associates

Groups Printed- Peds and Bicycles

Start Time	Orange Street From North				Milestone Road From East				Old South Road From South				Sparks Avenue From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
11:00 AM	0	0	5	0	2	0	0	0	0	0	0	5	9	0	0	9	30
11:15 AM	0	0	3	0	0	2	0	0	0	0	0	7	1	0	0	2	15
11:30 AM	0	0	0	0	5	0	0	0	0	0	0	4	0	0	0	10	19
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	10	19
Total	0	0	8	0	7	2	0	0	0	0	0	25	10	0	0	31	83
12:00 PM	10	0	0	0	2	0	0	0	0	0	0	2	0	15	0	4	33
12:15 PM	0	0	2	0	0	1	0	0	0	0	0	1	1	24	0	0	29
12:30 PM	2	4	2	0	1	0	0	0	0	0	0	1	8	7	0	2	27
12:45 PM	4	1	0	0	0	0	0	0	0	0	0	1	5	5	1	2	19
Total	16	5	4	0	3	1	0	0	0	0	0	5	14	51	1	8	108
01:00 PM	2	1	0	0	2	1	0	0	0	0	0	0	3	5	2	4	20
01:15 PM	0	0	7	4	2	0	0	0	0	0	0	1	2	11	0	0	27
01:30 PM	2	1	1	0	0	0	0	0	0	0	0	8	0	17	0	3	32
01:45 PM	0	0	1	0	1	0	0	0	0	0	0	5	7	3	0	2	19
Total	4	2	9	4	5	1	0	0	0	0	0	14	12	36	2	9	98
Grand Total	20	7	21	4	15	4	0	0	0	0	0	44	36	87	3	48	289
Apprch %	38.5	13.5	40.4	7.7	78.9	21.1	0	0	0	0	0	100	20.7	50	1.7	27.6	
Total %	6.9	2.4	7.3	1.4	5.2	1.4	0	0	0	0	0	15.2	12.5	30.1	1	16.6	

Start Time	Orange Street From North					Milestone Road From East					Old South Road From South					Sparks Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0	0	0	10	10	19
12:00 PM	10	0	0	0	10	2	0	0	0	2	0	0	0	2	2	0	15	0	4	19	33
12:15 PM	0	0	2	0	2	0	1	0	0	1	0	0	0	1	1	1	24	0	0	25	29
12:30 PM	2	4	2	0	8	1	0	0	0	1	0	0	0	1	1	8	7	0	2	17	27
Total Volume	12	4	4	0	20	3	1	0	0	4	0	0	0	13	13	9	46	0	16	71	108
% App. Total	60	20	20	0		75	25	0	0		0	0	0	100		12.7	64.8	0	22.5		
PHF	.300	.250	.500	.000	.500	.375	.250	.000	.000	.500	.000	.000	.000	.361	.361	.281	.479	.000	.400	.710	.818

Peak Hour for Entire Intersection Begins at 11:45 AM

Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1



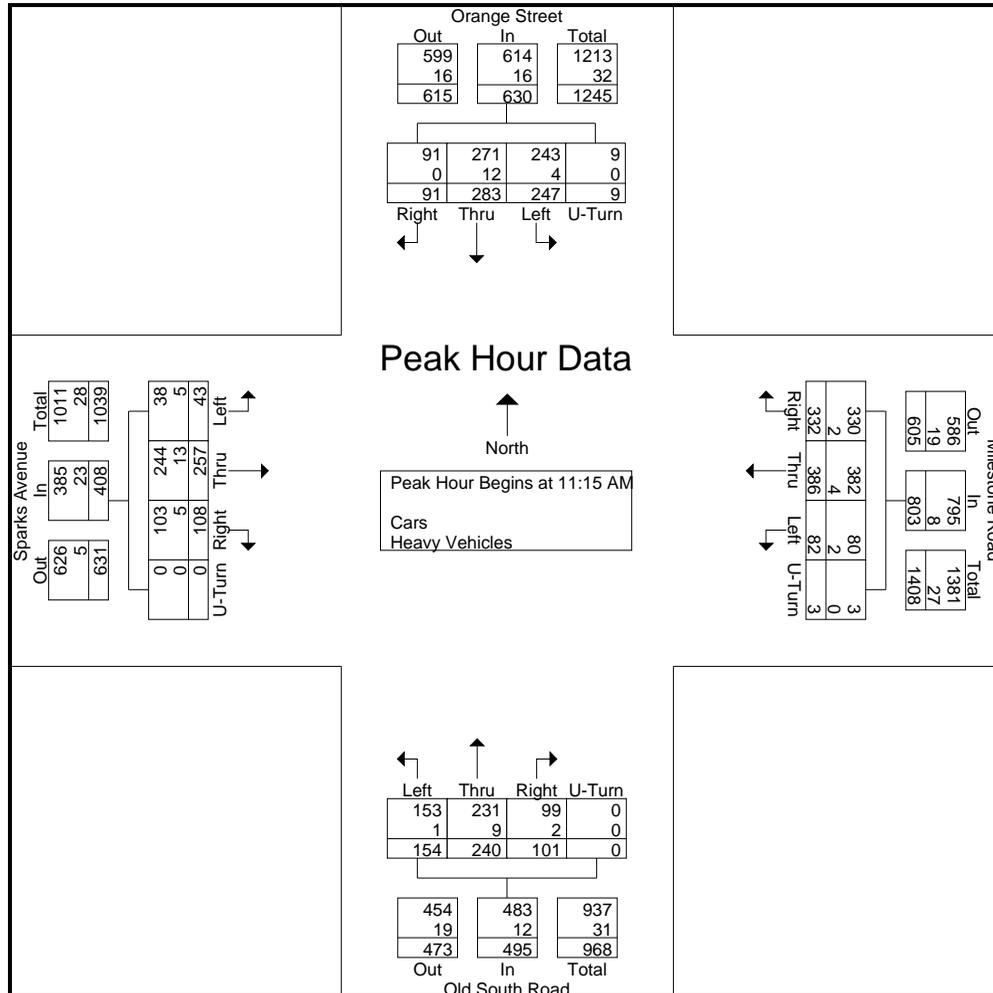
PRECISION
D A T A
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Orange Street/ Old South Road
E/W: Milestone Road/ Sparks Avenue
City, State: Nantucket, MA
Client: Ron Muller & Associates

File Name : 143955 LLL
Site Code : TBA
Start Date : 7/26/2014
Page No : 1

Start Time	Orange Street From North					Milestone Road From East					Old South Road From South					Sparks Avenue From West					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	20	71	38	0	129	90	95	22	1	208	24	67	39	0	130	21	72	12	0	105	572
11:30 AM	29	81	74	2	186	74	96	25	1	196	32	66	32	0	130	29	66	6	0	101	613
11:45 AM	18	61	67	2	148	81	92	18	0	191	22	60	43	0	125	24	62	13	0	99	563
12:00 PM	24	70	68	5	167	87	103	17	1	208	23	47	40	0	110	34	57	12	0	103	588
Total Volume	91	283	247	9	630	332	386	82	3	803	101	240	154	0	495	108	257	43	0	408	2336
% App. Total	14.4	44.9	39.2	1.4		41.3	48.1	10.2	0.4		20.4	48.5	31.1	0		26.5	63	10.5	0		
PHF	.784	.873	.834	.450	.847	.922	.937	.820	.750	.965	.789	.896	.895	.000	.952	.794	.892	.827	.000	.971	.953
Cars	91	271	243	9	614	330	382	80	3	795	99	231	153	0	483	103	244	38	0	385	2277
% Cars	100	95.8	98.4	100	97.5	99.4	99.0	97.6	100	99.0	98.0	96.3	99.4	0	97.6	95.4	94.9	88.4	0	94.4	97.5
Heavy Vehicles	0	12	4	0	16	2	4	2	0	8	2	9	1	0	12	5	13	5	0	23	59
% Heavy Vehicles	0	4.2	1.6	0	2.5	0.6	1.0	2.4	0	1.0	2.0	3.8	0.6	0	2.4	4.6	5.1	11.6	0	5.6	2.5



Ron Müller & Associates

Traffic Engineering and Consulting Services

56 Teresa Road, Hopkinton, MA 01748

(508) 395-1576

SPOT SPEED DATA

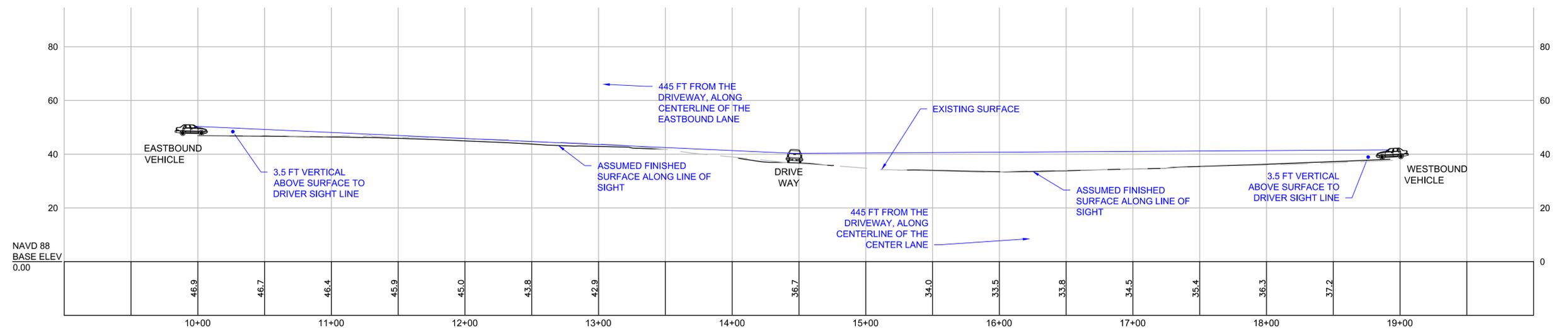
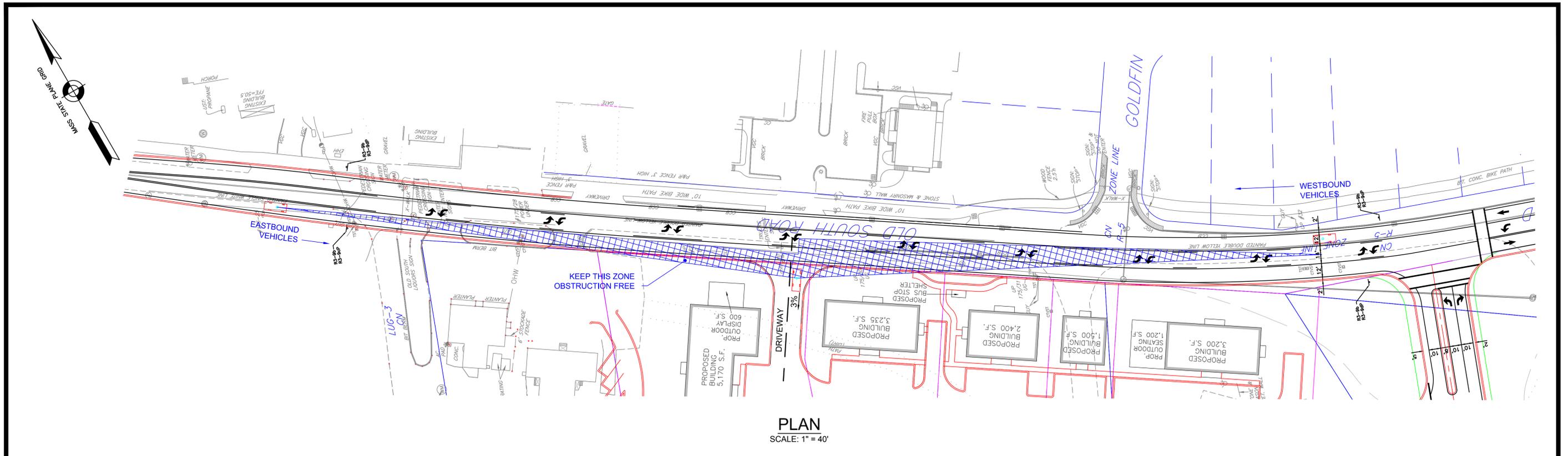
Location:	Old South Road between Goldfinch Drives	Date:	9/7/2013
Study Distance:	150 feet	Time:	1:00 PM
Weather:	Sunny	Speed Limit:	35

Time (sec)	Speed (mph)	Eastbound (toward airport)			Westbound (toward downtown)		
		Number	Cum.	Percent	Number	Cum.	Percent
4.0	25.6	1	1	2%		0	0%
3.9	26.2	1	2	5%	1	1	2%
3.8	26.9		2	5%	1	2	5%
3.7	27.6		2	5%		2	5%
3.6	28.4		2	5%	3	5	12%
3.5	29.2		2	5%	2	7	17%
3.4	30.1	1	3	7%	2	9	22%
3.3	31.0	2	5	12%	3	12	29%
3.2	32.0	5	10	24%	2	14	34%
3.1	33.0	3	13	31%	2	16	39%
3.0	34.1	1	14	33%	4	20	49%
2.9	35.3	6	20	48%	2	22	54%
2.8	36.5	9	29	69%	3	25	61%
2.7	37.9	3	32	76%	10	35	85%
2.6	39.3	3	35	83%	2	37	90%
2.5	40.9	3	38	90%	2	39	95%
2.4	42.6	1	39	93%	2	41	100%
2.3	44.5	2	41	98%		41	100%
2.2	46.5	1	42	100%		41	100%
2.1	48.7		42	100%		41	100%
2.0	51.1		42	100%		41	100%
1.9	53.8		42	100%		41	100%
1.8	56.8		42	100%		41	100%
1.7	60.2		42	100%		41	100%
1.6	63.9		42	100%		41	100%
1.5	68.2		42	100%		41	100%
1.4	73.1		42	100%		41	100%
1.3	78.7		42	100%		41	100%
1.2	85.2		42	100%		41	100%
1.1	93.0		42	100%		41	100%
1.0	102.3		42	100%		41	100%
TOTAL:		42			41		
Avg. Speed:		36 mph			35 mph		
85th % Speed:		40 mph			38 mph		

Crash Rate Worksheets

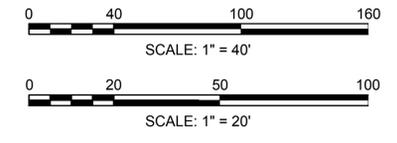
Sight Line Plan and Profile





**DRIVER IN DRIVEWAY WAITING TO TURN ONTO
OLD SOUTH ROAD**

HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 20'



GENERAL NOTES:

1. THE LONGITUDINAL GRADE ON THE DRIVEWAY WAS ASSUMED TO BE 3% ON THE APPROACH TO OLD SOUTH ROAD.
2. FOR BOTH OLD SOUTH ROAD AND THE DRIVEWAY, A 2% CROSS-SLOPE WERE ASSUMED.
3. THE MINIMUM CLEAR SIGHT DISTANCE TO THE DRIVEWAY IS 445 FT FOR VEHICLES TRAVELING ALONG OLD SOUTH ROAD.

REV. #	DESCRIPTION	DATE
--------	-------------	------

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**OLD SOUTH ROAD AT SITE DRIVE
NANTUCKET,
MASSACHUSETTS**

PROPOSED SIGHT TRIANGLES

DATE: **8/2/16** SHEET **1 OF 1**

Traffic Growth and Background Development Worksheets

MassDOT Transportation Data Management System

STATION 253516 - OLD SOUTH ROAD, NANTUCKET (Peak Month July-August Data)

YEAR #	YEAR	AADT	Traffic Growth Calculations																																				
			Year 1-2	Year 1-3	Year 1-4	Year 1-5	Year 1-6	Year 1-7	Year 1-8	Year 1-9	Year 1-10	Year 2-3	Year 2-4	Year 2-5	Year 2-6	Year 2-7	Year 2-8	Year 2-9	Year 2-10	Year 3-4	Year 3-5	Year 3-6	Year 3-7	Year 3-8	Year 3-9	Year 3-10	Year 4-5	Year 4-6	Year 4-7	Year 4-8	Year 4-9	Year 4-10	Year 5-6	Year 5-7	Year 5-8	Year 5-9	Year 5-10		
1	2007	15,978	-11.92%	-1.42%	-1.30%	-0.69%	-0.55%	-0.38%	-0.01%																														
2	2008	14,074																																					
3	2009	15,524																																					
4	2010	15,353																																					
5	2011																																						
6	2012	15,428																																					
7	2013	15,454																																					
8	2014	15,549																																					
9	2015																																						
10	2016	15,967																																					

2012-2016 Annual Growth:

Year 6-7	0.17%
Year 6-8	0.39%
Year 6-9	

Year 6-10	0.87%
Year 7-8	0.61%
Year 7-9	
Year 7-10	1.11%
Year 8-9	
Year 8-10	1.34%
Year 9-10	

Avg. Growth: 0.75%

2007-2016 Annual Average Traffic Growth Rate: 0.41%

Year 6-7	0.17%
Year 6-8	0.39%
Year 6-9	
Year 6-10	0.87%
Year 7-8	0.61%
Year 7-9	
Year 7-10	1.11%
Year 8-9	
Year 8-10	1.34%
Year 9-10	

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 850 - Supermarket

21 Old South Road Grocery

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 4.900

AVERAGE WEEKDAY DAILY

$T = 102.24 * (X)$
 $T = 1719.62$
 $T = 1,720$ vehicle trips
with 50% (860 vpd) entering and 50% (860 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 3.40 * (X)$
 $T = 16.66$
 $T = 17$ vehicle trips
with 62% (11 vph) entering and 39% (6 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 9.48 * (X)$
 $T = 46.45$
 $T = 46$ vehicle trips
with 51% (23 vph) entering and 49% (23 vph) exiting.

SATURDAY DAILY

$T = 177.59 * (X)$
 $T = 870.19$
 $T = 870$ vehicle trips
with 50% (435 vpd) entering and 50% (435 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 10.65 * (X)$
 $T = 52.19$
 $T = 52$ vehicle trips
with 51% (27 vpd) entering and 49% (25 vpd) exiting.

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

21 Old South Road Apartments

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 4

AVERAGE WEEKDAY DAILY

$T = 6.06 * (X) + 123.56$
 $T = 147.80$
 $T = 150$ vehicle trips
with 50% (75 vpd) entering and 50% (75 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.49 * (X) + 3.73$
 $T = 5.69$
 $T = 6$ vehicle trips
with 20% (1 vph) entering and 80% (5 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.55 * (X) + 17.65$
 $T = 19.85$
 $T = 20$ vehicle trips
with 65% (13 vph) entering and 35% (7 vph) exiting.

SATURDAY DAILY

$T = 7.85 * (X) - 256.19$
 $T = -224.79$
 $T = -220$ vehicle trips
with 50% (-110 vpd) entering and 50% (-110 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.41 * (X) + 19.23$
 $T = 20.87$
 $T = 21$ vehicle trips
with 50% (11 vph) entering and 50% (10 vph) exiting.

Use Avg. Rate for < 40 Units:

$T = 6.65 * (X)$
 $T = 26.60$
 $T = 30$ vehicle trips
with 15 vpd entering and 15 vpd exiting.

Use Max. Rate for < 40 Units:

$T = 1.02 * (X)$
 $T = 4.08$
 $T = 4$ vehicle trips
with 1 vph entering and 3 vph exiting.

Use Max. Rate for < 40 Units:

$T = 1.64 * (X)$
 $T = 6.56$
 $T = 7$ vehicle trips
with 5 vph entering and 2 vph exiting.

Use Avg. Rate for < 40 Units:

$T = 6.39 * (X)$
 $T = 25.56$
 $T = 30$ vehicle trips
with 15 vpd entering and 15 vpd exiting.

Use Avg. Rate for < 40 Units:

$T = 1.05 * (X)$
 $T = 4.20$
 $T = 4$ vehicle trips
with 2 vph entering and 2 vph exiting.

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 492 - Health/Fitness Club

86 Old South Road Health Club

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 21.700

AVERAGE WEEKDAY DAILY

$$T = 32.93 * (X)$$

$$T = 714.58$$

$$T = 710 \quad \text{vehicle trips}$$

with 50% (355 vpd) entering and 50% (355 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.41 * (X)$$

$$T = 30.60$$

$$T = 31 \quad \text{vehicle trips}$$

with 50% (16 vph) entering and 50% (15 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln(T) = 0.95 \ln(X) + 1.43$$

$$\ln(T) = 4.35$$

$$T = 77.75$$

$$T = 78 \quad \text{vehicle trips}$$

with 57% (44 vph) entering and 43% (34 vph) exiting.

SATURDAY DAILY

$$T = 20.87 * (X)$$

$$T = 452.88$$

$$T = 450 \quad \text{vehicle trips}$$

with 50% (225 vpd) entering and 50% (225 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 2.78 * (X)$$

$$T = 60.33$$

$$T = 60 \quad \text{vehicle trips}$$

with 45% (27 vpd) entering and 55% (33 vpd) exiting.

**Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 812 - Building Materials and Lumber Store**

6-8 Lovers Lane - RGPD, LLC

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 7.500 ksf

AVERAGE WEEKDAY DAILY

$$T = 38.51 * (X) + 61.48$$
$$T = 350.31$$

T = 350 vehicle trips
with 50% (175 vpd) entering and 50% (175 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 2.60 * (X)$$
$$T = 19.50$$

T = 20 vehicle trips
with 67% (13 vph) entering and 33% (7 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 4.49 * (X)$$
$$T = 33.68$$

T = 34 vehicle trips
with 47% (16 vph) entering and 53% (18 vph) exiting.

SATURDAY DAILY

$$T = 36.75 * (X) + 137.21$$
$$T = 2910.34$$

T = 2,910 vehicle trips
with 50% (1,455 vpd) entering and 50% (1,455 vpd) exiting.

SATURDAY DAILY AVERAGE RATE

$$T = 51.6 * (X)$$
$$T = 387$$

T = 390 Vehicle Trips
with 50% (195 vpd) entering and 50% (195 vpd) exiting

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\text{Ln } T = 0.95 \text{ Ln } (X) + 2.34$$
$$\text{Ln } T = 4.25$$

T = 70.40
T = 70 vehicle trips
with 51% (36 vph) entering and 49% (34 vph) exiting.

SATURDAY MIDDAY PEAK HOUR AVERAGE RATE

$$T = 9.58 * (X)$$
$$T = 71.85$$

T = 72 Vehicle Trips
with 51% (37 vph) entering and 49% (35 vph) exiting

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

1-13 Greglen Ave RGPD Apartments

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 36

AVERAGE WEEKDAY DAILY

$$T = 6.06 * (X) + 123.56$$

$$T = 341.72$$

$$T = 340 \quad \text{vehicle trips}$$

with 50% (170 vpd) entering and 50% (170 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.49 * (X) + 3.73$$

$$T = 21.37$$

$$T = 21 \quad \text{vehicle trips}$$

with 20% (4 vph) entering and 80% (17 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.55 * (X) + 17.65$$

$$T = 37.45$$

$$T = 37 \quad \text{vehicle trips}$$

with 65% (24 vph) entering and 35% (13 vph) exiting.

SATURDAY DAILY

$$T = 7.85 * (X) - 256.19$$

$$T = 26.41$$

$$T = 30 \quad \text{vehicle trips}$$

with 50% (15 vpd) entering and 50% (15 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.41 * (X) + 19.23$$

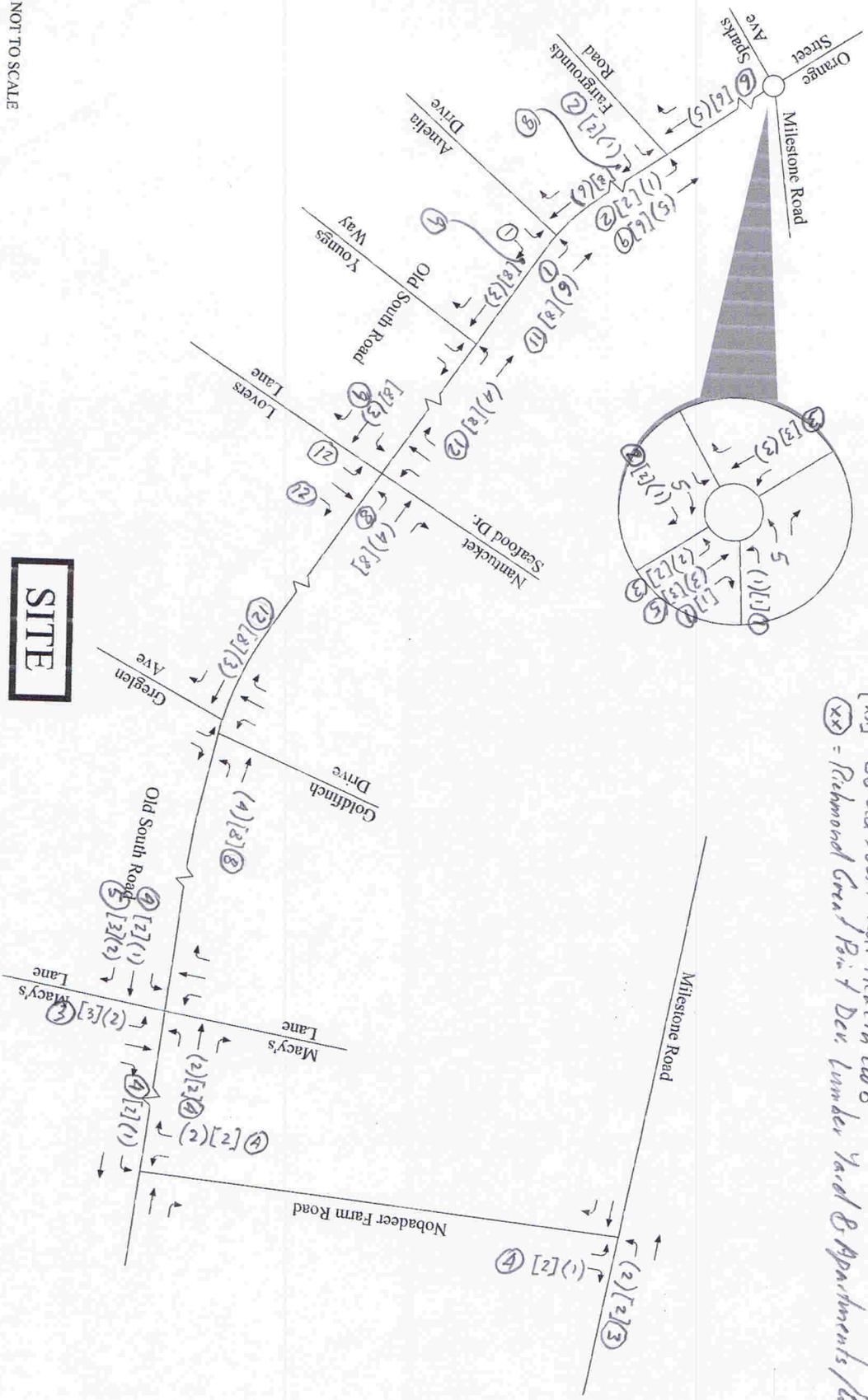
$$T = 33.99$$

$$T = 34 \quad \text{vehicle trips}$$

with 50% (17 vph) entering and 50% (17 vph) exiting.

Background Development
 AM Peak Hour Traffic Volumes

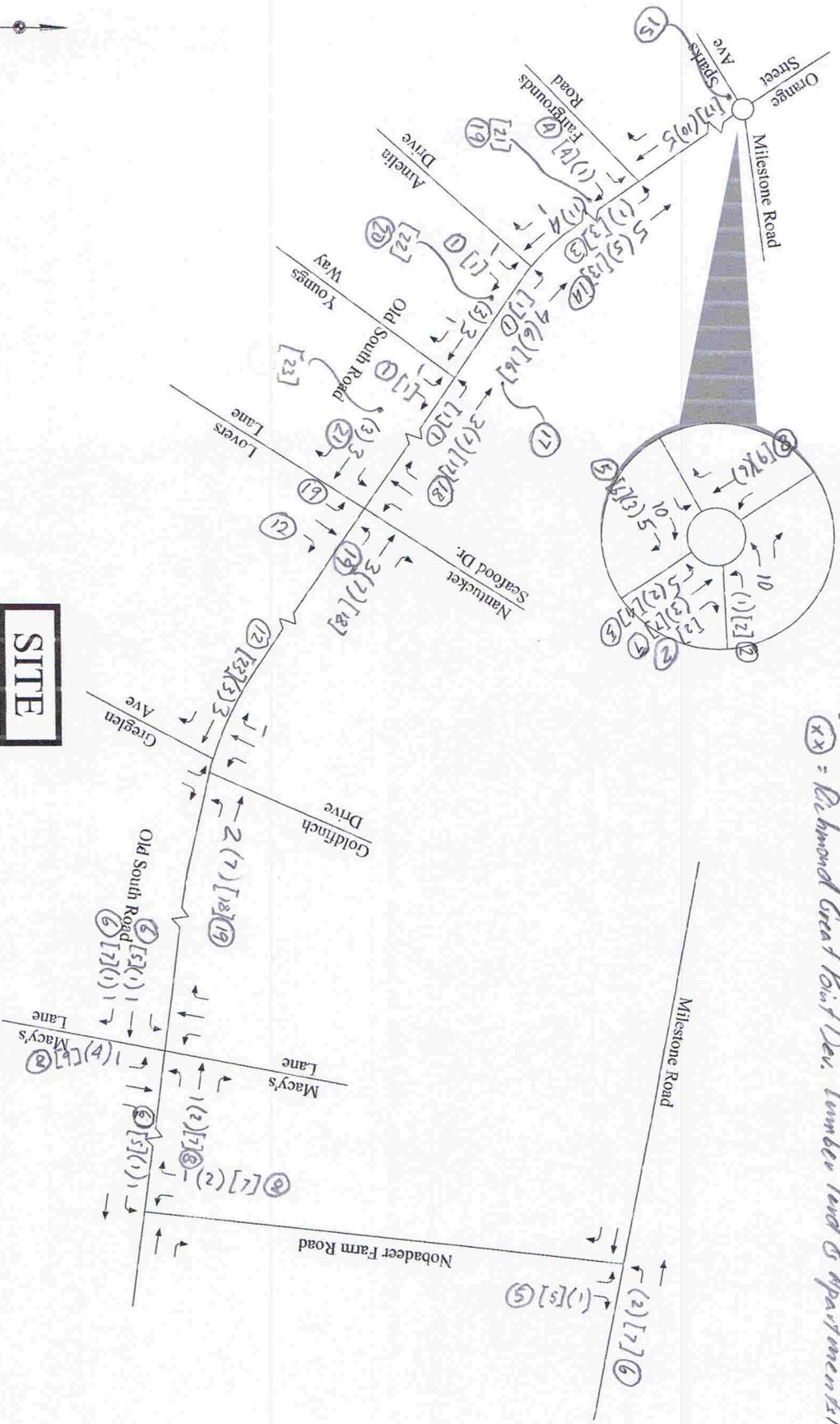
xx = Shop & Shop Expansion
 (xx) = 21 Old South Rd. Grocery & Appl.
 [xx] = 86 Old South Rd. Home 14, 16, 6
 (xx) = Richmond Green Park Dev. Lumber Yard & Apartments/Resides



NOT TO SCALE

Background Development
 P14 Peak Hour Traffic Volumes

XX = Shop & Shop Expansion
 (xx) = 21 Old South Rd. Grocery & Appl.
 [xx] = 86 Old South Rd. Health Club
 (xx) = Richmond Great Roof Dev. Lumber Yard & Apartments/Condos

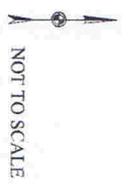
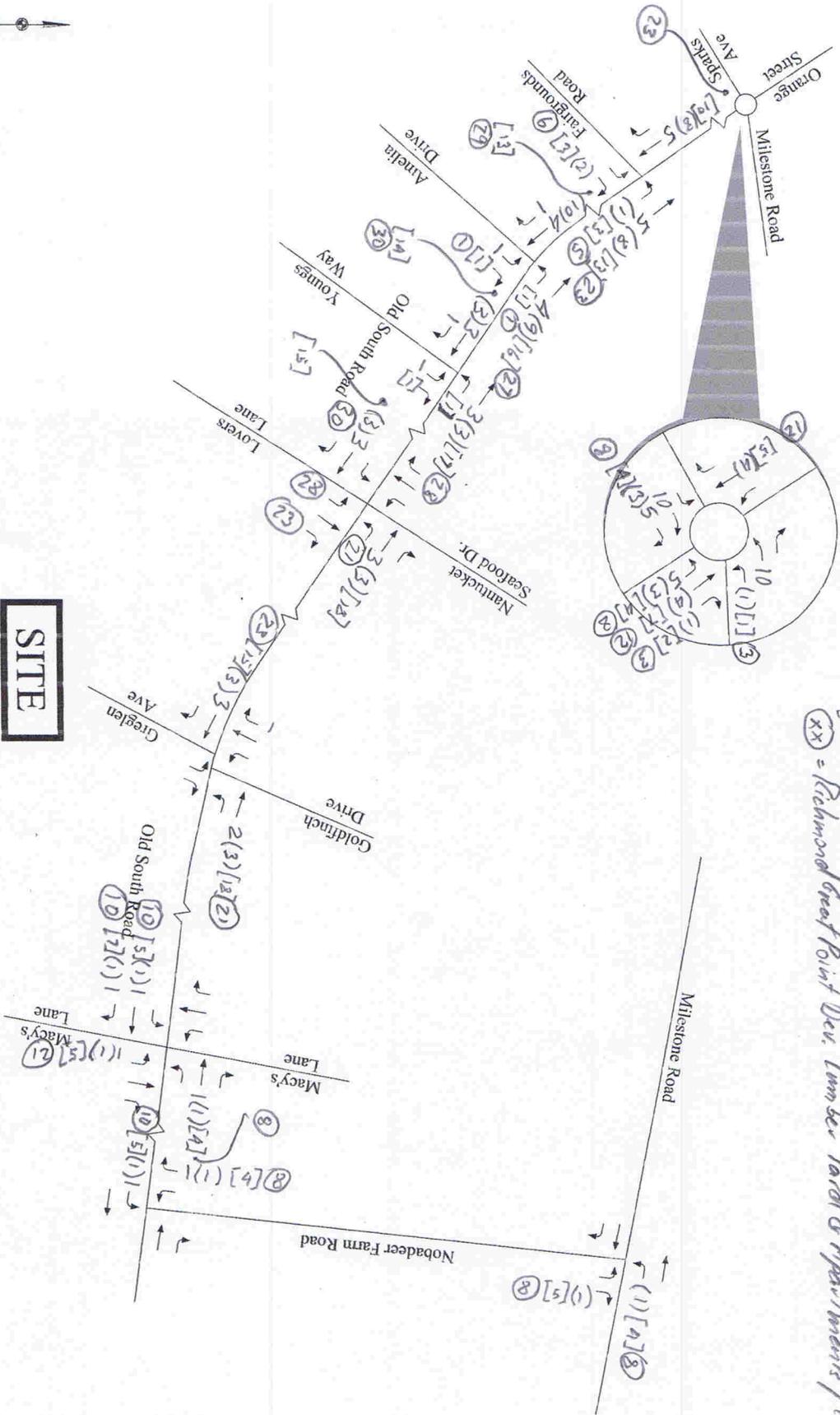


SITE

NOT TO SCALE

*Background Development
Sa, Peak Hour Traffic Volumes*

XX = Shop B-Shop Expansion
 (xx) = 21 Old South Rd. Grocery & App.
 $[xx]$ = 86 Old South Rd. Health Club
 (xx) = Richmond Great Point Dev. Lumber Yard & Apartments/Landos



Trip Generation Worksheets

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 210 - Single-Family Detached Housing

Average Vehicle Trips Ends vs: Dwelling Units
 Independent Variable (X): 100

WEEKDAY DAILY

$\ln T = 0.92 \ln (X) + 2.72$
 $\ln T = 6.96$
 $T = 1050.22$
 $T = 1,050$ vehicle trips
 with 50% (525 vpd) entering and 50% (525 vpd) exiting.

Use Average Rate for < 20 Units:

$T = 9.52 (X)$
 $T = 952.00$
 $T = 950$ vehicle trips
 with 475 vpd entering and 475 vpd exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.70 (X) + 9.74$
 $T = 79.74$
 $T = 80$ vehicle trips
 with 25% (20 vph) entering and 75% (60 vph) exiting.

Use Average Rate for < 20 Units:

$T = 0.75 (X)$
 $T = 75.00$
 $T = 75$ vehicle trips
 with 19 vpd entering and 56 vpd exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$\ln T = 0.90 \ln (X) + 0.51$
 $\ln T = 4.65$
 $T = 105.07$
 $T = 105$ vehicle trips
 with 63% (66 vph) entering and 37% (39 vph) exiting.

Use Average Rate for < 20 Units:

$T = 1.00 (X)$
 $T = 100.00$
 $T = 100$ vehicle trips
 with 63 vpd entering and 37 vpd exiting.

SATURDAY DAILY

$\ln T = 0.93 \ln (X) + 2.64$
 $\ln T = 6.92$
 $T = 1015.17$
 $T = 1,020$ vehicle trips
 with 50% (510 vpd) entering and 50% (510 vpd) exiting.

Use Average Rate for < 20 Units:

$T = 9.91 (X)$
 $T = 991.00$
 $T = 990$ vehicle trips
 with 495 vpd entering and 495 vpd exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.89 (X) + 8.77$
 $T = 97.77$
 $T = 98$ vehicle trips
 with 53% (52 vph) entering and 47% (46 vph) exiting.

Use Average Rate for < 20 Units:

$T = 0.93 (X)$
 $T = 93.00$
 $T = 93$ vehicle trips
 with 50 vpd entering and 43 vpd exiting.

SUNDAY DAILY

$T = 8.63 (X) - 0.63$
 $T = 862.37$
 $T = 860$ vehicle trips
 with 50% (430 vpd) entering and 50% (430 vpd) exiting.

Use Average Rate for < 20 Units:

$T = 8.62 (X)$
 $T = 862.00$
 $T = 860$ vehicle trips
 with 430 vpd entering and 430 vpd exiting.

SUNDAY MIDDAY PEAK HOUR OF GENERATOR

$\ln T = 0.91 \ln (X) + 0.31$
 $\ln T = 4.50$
 $T = 90.08$
 $T = 90$ vehicle trips
 with 53% (48 vph) entering and 47% (42 vph) exiting.

Use Average Rate for < 20 Units:

$T = 0.86 (X)$
 $T = 86.00$
 $T = 86$ vehicle trips
 with 46 vpd entering and 40 vpd exiting.

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 826 - Specialty Retail Center

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
 Independent Variable (X): 12.300 ksf

AVERAGE WEEKDAY DAILY

$$T = 42.78 * (X) + 37.66$$

$$T = 563.85$$

$$T = 560 \text{ vehicle trips}$$

with 50% (280 vpd) entering and 50% (280 vpd) exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\frac{\text{ITE LUC 820 Weekday Morning Trip Rate}}{\text{ITE LUC 820 Weekday Evening Trip Rate}} = \frac{\text{ITE LUC 826 Weekday Morning Trip Rate}}{\text{ITE LUC 826 Weekday Evening Trip Rate}}$$

$$\frac{0.96}{3.71} = \frac{(Y)}{4.15} \quad Y = 1.07$$

$$T = 1.07 * (X)$$

$$T = 13.2$$

$$T = 13 \text{ vehicle trips}$$

with 62% (8 vph) entering and 38% (5 vph) exiting.

(same distribution split as ITE LUC 820 during the weekday morning peak hour of adjacent street traffic)

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 2.40 * (X) + 21.48$$

$$T = 51.00$$

$$T = 51 \text{ vehicle trips}$$

with 44% (22 vph) entering and 56% (29 vph) exiting.

SATURDAY DAILY

$$T = 42.04 * (X)$$

$$T = 517.09$$

$$T = 520 \text{ vehicle trips}$$

with 50% (260 vpd) entering and 50% (260 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR

$$\frac{\text{ITE LUC 820 Saturday Midday Trip Rate}}{\text{ITE LUC 820 Weekday Evening Trip Rate}} = \frac{\text{ITE LUC 826 Saturday Midday Trip Rate}}{\text{ITE LUC 826 Weekday Evening Trip Rate}}$$

$$\frac{4.82}{3.71} = \frac{(Y)}{4.15} \quad Y = 5.39$$

$$T = 5.39 * (X)$$

$$T = 66.26$$

$$T = 66 \text{ vehicle trips}$$

with 52% (34 vph) entering and 48% (32 vph) exiting.

(same distribution split as ITE LUC 820 during the Saturday midday peak hour of generator)

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

Average Vehicle Trips Ends vs: Dwelling Units
 Independent Variable (X): 225

AVERAGE WEEKDAY DAILY

$T = 6.06 * (X) + 123.56$
 $T = 1487.06$
 $T = 1,490$ vehicle trips
 with 50% (745 vpd) entering and 50% (745 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.49 * (X) + 3.73$
 $T = 113.98$
 $T = 114$ vehicle trips
 with 20% (23 vph) entering and 80% (91 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.55 * (X) + 17.65$
 $T = 141.40$
 $T = 141$ vehicle trips
 with 65% (92 vph) entering and 35% (49 vph) exiting.

SATURDAY DAILY

$T = 7.85 * (X) - 256.19$
 $T = 1510.06$
 $T = 1,510$ vehicle trips
 with 50% (755 vpd) entering and 50% (755 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.41 * (X) + 19.23$
 $T = 111.48$
 $T = 111$ vehicle trips
 with 50% (56 vph) entering and 50% (55 vph) exiting.

Use Avg. Rate for < 40 Units:

$T = 6.65 * (X)$
 $T = 1496.25$
 $T = 1500$ vehicle trips
 with 750 vpd entering and 750 vpd exiting.

Use Max. Rate for < 40 Units:

$T = 1.02 * (X)$
 $T = 229.50$
 $T = 230$ vehicle trips
 with 46 vph entering and 184 vph exiting.

Use Max. Rate for < 40 Units:

$T = 1.64 * (X)$
 $T = 369.00$
 $T = 369$ vehicle trips
 with 240 vph entering and 129 vph exiting.

Use Avg. Rate for < 40 Units:

$T = 6.39 * (X)$
 $T = 1437.75$
 $T = 1440$ vehicle trips
 with 720 vpd entering and 720 vpd exiting.

Use Avg. Rate for < 40 Units:

$T = 1.05 * (X)$
 $T = 236.25$
 $T = 236$ vehicle trips
 with 118 vph entering and 118 vph exiting.

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 931 - Quality Restaurant

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 3.200 ksf

AVERAGE WEEKDAY DAILY

$$T = 89.95 * (X)$$

$$T = 287.84$$

T = 290 vehicle trips
with 50% (145 vpd) entering and 50% (145 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.81 * (X)$$

$$T = 2.59$$

T = 3 vehicle trips
with 55% (2 vph) entering and 45% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 7.49 * (X)$$

$$T = 23.97$$

T = 24 vehicle trips
with 67% (16 vph) entering and 33% (8 vph) exiting.

SATURDAY DAILY

$$T = 94.36 * (X)$$

$$T = 301.95$$

T = 300 vehicle trips
with 50% (150 vpd) entering and 50% (150 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 10.87 * (X) - 0.46$$

$$T = 34.32$$

T = 34 vehicle trips
with 59% (20 vph) entering and 41% (14 vph) exiting.

Capacity Analysis Methodology and Worksheets

General

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM); Transportation Research Board; Washington, D.C.; 2010. The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level of service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

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

- LOS A describes conditions with little to no delay to motorists.
- LOS B represents a desirable level with relatively low delay to motorists.
- LOS C describes conditions with average delays to motorists.
- LOS D describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- LOS E represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- LOS F is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometries on average *control* delay. Control delay includes queue move-up time and stopped delay. Table A-1 summarizes the relationship between level of service and average control delay.

Roundabouts

The level of service method used for roundabouts is based on both delay and the volume-to-capacity ratio as presented in the (HCM 2010). The control delay formulation for roundabouts is similar to that of two-way and all-way stop controlled intersections, adjusting for the effect of yield control. As such, the LOS criterion for automobiles in roundabouts is the same as that of unsignalized intersections. LOS F is assigned to a movement if the volume-to-capacity ratio exceeds 1.0 regardless of the movement control delay. Intersection and approach LOS values, however, are based on the average delay for all movements and are not governed by the volume-to-capacity ratio. Continuous right-turn by-pass lanes always operate at LOS A.

Table A-1
Level-of-Service Criteria for Intersections and Roundabouts

<u>Level of Service</u>	<u>Unsignalized and Roundabout Criteria Average Control Delay In Seconds Per Vehicle</u>	<u>Signalized Criteria Average Control Delay In Seconds Per Vehicle</u>
A	≤ 10	≤ 10
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	>50	>80

For signalized intersections and roundabouts, this delay criterion may be applied in assigning level of service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level of service designations to individual lane groups or to individual intersection approaches.

MOVEMENT SUMMARY

Site: Milestone Rotary

2016 Existing AM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	148	6.0	1.208	127.1	LOS F	41.4	1085.7	1.00	2.84	11.4
8	T1	269	6.0	1.208	123.0	LOS F	41.4	1085.7	1.00	2.84	11.4
18	R2	87	6.0	1.208	123.0	LOS F	41.4	1085.7	1.00	2.84	11.3
Approach		505	6.0	1.208	124.2	LOS F	41.4	1085.7	1.00	2.84	11.4
East: Milestone Rd											
1	L2	94	4.0	0.569	12.3	LOS B	4.9	127.0	0.81	0.88	27.3
6	T1	321	4.0	0.569	8.1	LOS A	4.9	127.0	0.81	0.88	27.3
16	R2	375	4.0	0.514	7.6	LOS A	4.0	104.2	0.78	0.84	27.1
Approach		789	4.0	0.569	8.4	LOS A	4.9	127.0	0.80	0.86	27.2
North: Orange St											
7	L2	338	3.0	0.510	12.9	LOS B	3.8	97.2	0.80	0.96	26.2
4	T1	289	3.0	0.542	9.2	LOS A	4.2	108.6	0.82	0.93	27.2
14	R2	69	3.0	0.542	9.6	LOS A	4.2	108.6	0.82	0.93	26.6
Approach		697	3.0	0.542	11.0	LOS B	4.2	108.6	0.81	0.94	26.6
West: Sparks Ave											
5	L2	55	5.0	1.127	91.0	LOS F	27.5	714.9	1.00	2.41	14.0
2	T1	271	5.0	1.127	86.9	LOS F	27.5	714.9	1.00	2.41	14.0
12	R2	117	5.0	1.127	86.9	LOS F	27.5	714.9	1.00	2.41	13.8
Approach		442	5.0	1.127	87.4	LOS F	27.5	714.9	1.00	2.41	13.9
All Vehicles		2434	4.3	1.208	47.5	LOS E	41.4	1085.7	0.88	1.58	18.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 7.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	290	67	59	14	18	239
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	23	23	7	7
Mvmt Flow	315	73	64	15	20	260

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	79	0	775
Stage 1	-	-	72
Stage 2	-	-	703
Critical Hdwy	4.16	-	6.47
Critical Hdwy Stg 1	-	-	5.47
Critical Hdwy Stg 2	-	-	5.47
Follow-up Hdwy	2.254	-	3.563
Pot Cap-1 Maneuver	1494	-	359
Stage 1	-	-	938
Stage 2	-	-	482
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1494	-	280
Mov Cap-2 Maneuver	-	-	280
Stage 1	-	-	938
Stage 2	-	-	376

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1494	-	-	-	831
HCM Lane V/C Ratio	0.211	-	-	-	0.336
HCM Control Delay (s)	8.1	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.8	-	-	-	1.5

Intersection

Int Delay, s/veh 8.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	200	148	111	271	181	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	9	9	9	9
Mvmt Flow	211	156	117	285	191	141

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	366
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.19
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.281
Pot Cap-1 Maneuver	-	-	1155
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1155
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	300	735	-	-	1155	-
HCM Lane V/C Ratio	0.635	0.192	-	-	0.101	-
HCM Control Delay (s)	35.7	11.1	-	-	8.5	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	4	0.7	-	-	0.3	-

Intersection

Intersection Delay, s/veh	22.3											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	16	263	198	0	96	205	3	0	215	4	106
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	6	6	6	2	8	8	8	2	4	4	4
Mvmt Flow	0	17	280	211	0	102	218	3	0	229	4	113
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	28.5	17.5	19.2
HCM LOS	D	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	66%	3%	32%	20%
Vol Thru, %	1%	55%	67%	8%
Vol Right, %	33%	42%	1%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	325	477	304	40
LT Vol	215	16	96	8
Through Vol	4	263	205	3
RT Vol	106	198	3	29
Lane Flow Rate	346	507	323	43
Geometry Grp	1	1	1	1
Degree of Util (X)	0.615	0.808	0.57	0.084
Departure Headway (Hd)	6.4	5.729	6.346	7.094
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	564	629	569	503
Service Time	4.445	3.768	4.392	5.169
HCM Lane V/C Ratio	0.613	0.806	0.568	0.085
HCM Control Delay	19.2	28.5	17.5	10.8
HCM Lane LOS	C	D	C	B
HCM 95th-tile Q	4.2	8.2	3.6	0.3

Intersection

Int Delay, s/veh 13.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	380	109	215	458	104	296
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	7	7	5	5	2	2
Mvmt Flow	392	112	222	472	107	305

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1363
Stage 1	-	-	448
Stage 2	-	-	915
Critical Hdwy	-	4.15	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.245	3.518
Pot Cap-1 Maneuver	-	1045	163
Stage 1	-	-	644
Stage 2	-	-	390
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1045	116
Mov Cap-2 Maneuver	-	-	116
Stage 1	-	-	644
Stage 2	-	-	278

Approach	EB	WB	NB
HCM Control Delay, s	0	3	47.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	116	611	-	-	1045	-
HCM Lane V/C Ratio	0.924	0.499	-	-	0.212	-
HCM Control Delay (s)	133.9	16.6	-	-	9.4	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	5.8	2.8	-	-	0.8	-

Intersection

Int Delay, s/veh 2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	584	70	48	631	45	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	7	7	3	3
Mvmt Flow	608	73	50	657	47	34

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	681	1402
Stage 1	-	-	645
Stage 2	-	-	757
Critical Hdwy	-	4.17	6.43
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	-	2.263	3.527
Pot Cap-1 Maneuver	-	889	153
Stage 1	-	-	520
Stage 2	-	-	461
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	889	139
Mov Cap-2 Maneuver	-	-	139
Stage 1	-	-	520
Stage 2	-	-	420

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	35.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	198	-	-	889	-
HCM Lane V/C Ratio	0.41	-	-	0.056	-
HCM Control Delay (s)	35.3	-	-	9.3	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.9	-	-	0.2	-

Intersection

Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	564	53	19	639	40	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	9	9	9	9
Mvmt Flow	581	55	20	659	41	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	636	0	1307	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	698	-
Critical Hdwy	-	-	4.19	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.281	-	3.581	3.381
Pot Cap-1 Maneuver	-	-	915	-	170	482
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	481	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	915	-	164	482
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	465	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	27.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	229	-	-	915	-
HCM Lane V/C Ratio	0.315	-	-	0.021	-
HCM Control Delay (s)	27.8	-	-	9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	544	14	14	585	0	18	0	6	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	7	7	7	13	13	13	0	0	0
Mvmt Flow	6	585	15	15	629	0	19	0	6	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	629	0	0	600	0	0	1265	1264	592	1268	1272	629
Stage 1	-	-	-	-	-	-	605	605	-	659	659	-
Stage 2	-	-	-	-	-	-	660	659	-	609	613	-
Critical Hdwy	4.15	-	-	4.17	-	-	7.23	6.63	6.33	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.263	-	-	3.617	4.117	3.417	3.5	4	3.3
Pot Cap-1 Maneuver	939	-	-	953	-	-	139	161	486	147	169	486
Stage 1	-	-	-	-	-	-	466	470	-	456	464	-
Stage 2	-	-	-	-	-	-	434	444	-	486	486	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	939	-	-	953	-	-	135	156	486	141	163	486
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	156	-	141	163	-
Stage 1	-	-	-	-	-	-	461	465	-	451	453	-
Stage 2	-	-	-	-	-	-	423	433	-	475	481	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	30.8	12.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	165	939	-	-	953	-	-	486
HCM Lane V/C Ratio	0.156	0.007	-	-	0.016	-	-	0.002
HCM Control Delay (s)	30.8	8.9	0	-	8.8	0	-	12.4
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	492	33	13	482	0	43	0	31	21	4	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	7	7	7	26	0	26	5	5	5
Mvmt Flow	0	535	36	14	524	0	47	0	34	23	4	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	524	0	0	571	0	0	1141	1105	553	1122	1123	524
Stage 1	-	-	-	-	-	-	553	553	-	552	552	-
Stage 2	-	-	-	-	-	-	588	552	-	570	571	-
Critical Hdwy	4.14	-	-	4.17	-	-	7.36	6.5	6.46	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.36	5.5	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.36	5.5	-	6.15	5.55	-
Follow-up Hdwy	2.236	-	-	2.263	-	-	3.734	4	3.534	3.545	4.045	3.345
Pot Cap-1 Maneuver	1032	-	-	977	-	-	160	213	489	181	203	547
Stage 1	-	-	-	-	-	-	477	518	-	513	510	-
Stage 2	-	-	-	-	-	-	456	518	-	501	500	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1032	-	-	977	-	-	136	209	489	166	199	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	209	-	166	199	-
Stage 1	-	-	-	-	-	-	477	518	-	513	500	-
Stage 2	-	-	-	-	-	-	388	508	-	466	500	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	35.8	19.9
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	195	1032	-	-	977	-	-	335
HCM Lane V/C Ratio	0.412	-	-	-	0.014	-	-	0.282
HCM Control Delay (s)	35.8	0	-	-	8.7	0	-	19.9
HCM Lane LOS	E	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	1.9	0	-	-	0	-	-	1.1

MOVEMENT SUMMARY

Site: Milestone Rotary

2016 Existing PM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	155	3.0	1.200	123.9	LOS F	40.9	1048.0	1.00	2.81	11.6
8	T1	238	3.0	1.200	119.8	LOS F	40.9	1048.0	1.00	2.81	11.6
18	R2	116	3.0	1.200	119.8	LOS F	40.9	1048.0	1.00	2.81	11.5
Approach		509	3.0	1.200	121.0	LOS F	40.9	1048.0	1.00	2.81	11.5
East: Milestone Rd											
1	L2	121	2.0	0.640	13.0	LOS B	6.4	162.0	0.85	0.92	27.1
6	T1	369	2.0	0.640	8.9	LOS A	6.4	162.0	0.85	0.92	27.0
16	R2	300	2.0	0.442	7.1	LOS A	3.0	76.2	0.73	0.79	27.3
Approach		791	2.0	0.640	8.9	LOS A	6.4	162.0	0.81	0.87	27.1
North: Orange St											
7	L2	339	4.0	0.565	14.9	LOS B	4.6	118.5	0.86	1.04	25.6
4	T1	300	4.0	0.635	12.2	LOS B	5.8	148.5	0.90	1.07	26.2
14	R2	81	4.0	0.635	12.6	LOS B	5.8	148.5	0.90	1.07	25.7
Approach		719	4.0	0.635	13.5	LOS B	5.8	148.5	0.88	1.06	25.8
West: Sparks Ave											
5	L2	65	6.0	1.087	77.8	LOS F	21.9	575.1	1.00	2.15	15.2
2	T1	264	6.0	1.087	73.6	LOS F	21.9	575.1	1.00	2.15	15.2
12	R2	68	6.0	1.087	73.7	LOS F	21.9	575.1	1.00	2.15	15.0
Approach		398	6.0	1.087	74.3	LOS F	21.9	575.1	1.00	2.15	15.2
All Vehicles		2417	3.5	1.200	44.6	LOS E	40.9	1048.0	0.90	1.55	19.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 7.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	230	79	78	14	16	244
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	7	5	5	5	5
Mvmt Flow	253	87	86	15	18	268

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	101	0	685
Stage 1	-	-	93
Stage 2	-	-	592
Critical Hdwy	4.17	-	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.263	-	3.545
Pot Cap-1 Maneuver	1461	-	409
Stage 1	-	-	923
Stage 2	-	-	547
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1461	-	335
Mov Cap-2 Maneuver	-	-	335
Stage 1	-	-	923
Stage 2	-	-	447

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1461	-	-	-	858
HCM Lane V/C Ratio	0.173	-	-	-	0.333
HCM Control Delay (s)	8	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	1.5

Intersection

Int Delay, s/veh 6.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	277	145	111	297	143	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	289	151	116	309	149	142

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	440
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1120
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1120
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	23.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	266	676	-	-	1120	-
HCM Lane V/C Ratio	0.56	0.21	-	-	0.103	-
HCM Control Delay (s)	34.5	11.7	-	-	8.6	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	3.1	0.8	-	-	0.3	-

Intersection

Intersection Delay, s/veh	24.3											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	33	239	206	0	86	255	22	0	188	5	83
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	6	6	6	2	3	3	3	2	3	3	3
Mvmt Flow	0	36	263	226	0	95	280	24	0	207	5	91
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	31.6	21.2	17.8
HCM LOS	D	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	68%	7%	24%	10%
Vol Thru, %	2%	50%	70%	19%
Vol Right, %	30%	43%	6%	71%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	276	478	363	42
LT Vol	188	33	86	4
Through Vol	5	239	255	8
RT Vol	83	206	22	30
Lane Flow Rate	303	525	399	46
Geometry Grp	1	1	1	1
Degree of Util (X)	0.558	0.838	0.679	0.092
Departure Headway (Hd)	6.624	5.74	6.13	7.15
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	543	630	590	498
Service Time	4.675	3.785	4.179	5.23
HCM Lane V/C Ratio	0.558	0.833	0.676	0.092
HCM Control Delay	17.8	31.6	21.2	11
HCM Lane LOS	C	D	C	B
HCM 95th-tile Q	3.4	9	5.2	0.3

Intersection

Int Delay, s/veh 30.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	458	154	214	379	146	285
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	6	6	3	3	6	6
Mvmt Flow	472	159	221	391	151	294

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	631	1384
Stage 1	-	-	552
Stage 2	-	-	832
Critical Hdwy	-	4.13	6.46
Critical Hdwy Stg 1	-	-	5.46
Critical Hdwy Stg 2	-	-	5.46
Follow-up Hdwy	-	2.227	3.554
Pot Cap-1 Maneuver	-	947	526
Stage 1	-	-	569
Stage 2	-	-	421
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	947	~ 109
Mov Cap-2 Maneuver	-	-	~ 109
Stage 1	-	-	569
Stage 2	-	-	296

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	111.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	109	526	-	-	947	-
HCM Lane V/C Ratio	1.381	0.559	-	-	0.233	-
HCM Control Delay (s)	290.7	20.2	-	-	10	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	10.5	3.4	-	-	0.9	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	680	73	53	582	42	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	4	3	3	1	1
Mvmt Flow	708	76	55	606	44	55

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	784	1463
Stage 1	-	-	746
Stage 2	-	-	717
Critical Hdwy	-	4.13	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	-	2.227	3.509
Pot Cap-1 Maneuver	-	830	142
Stage 1	-	-	471
Stage 2	-	-	485
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	830	128
Mov Cap-2 Maneuver	-	-	128
Stage 1	-	-	471
Stage 2	-	-	437

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	37.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	208	-	-	830	-
HCM Lane V/C Ratio	0.476	-	-	0.067	-
HCM Control Delay (s)	37.1	-	-	9.6	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	2.3	-	-	0.2	-

Intersection

Int Delay, s/veh 1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	699	34	20	599	36	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	2	2	3	3
Mvmt Flow	736	36	21	631	38	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	772	0	1427	754
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	673	-
Critical Hdwy	-	-	4.12	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	843	-	148	407
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	505	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	843	-	142	407
Mov Cap-2 Maneuver	-	-	-	-	142	-
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	486	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	32.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	192	-	-	843	-
HCM Lane V/C Ratio	0.329	-	-	0.025	-
HCM Control Delay (s)	32.7	-	-	9.4	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

Intersection

Int Delay, s/veh 2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	648	49	29	558	6	32	1	25	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	2	2	2	3	3	3	6	6	6
Mvmt Flow	16	704	53	32	607	7	35	1	27	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	613	0	0	758	0	0	1442	1440	731	1451	1463	610
Stage 1	-	-	-	-	-	-	764	764	-	673	673	-
Stage 2	-	-	-	-	-	-	678	676	-	778	790	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.13	6.53	6.23	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.527	4.027	3.327	3.554	4.054	3.354
Pot Cap-1 Maneuver	942	-	-	853	-	-	110	132	420	106	126	487
Stage 1	-	-	-	-	-	-	395	411	-	438	448	-
Stage 2	-	-	-	-	-	-	440	451	-	383	396	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	942	-	-	853	-	-	101	121	420	92	115	487
Mov Cap-2 Maneuver	-	-	-	-	-	-	101	121	-	92	115	-
Stage 1	-	-	-	-	-	-	383	399	-	425	422	-
Stage 2	-	-	-	-	-	-	407	425	-	347	384	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	44.9	28.7
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	151	942	-	-	853	-	-	169
HCM Lane V/C Ratio	0.418	0.017	-	-	0.037	-	-	0.103
HCM Control Delay (s)	44.9	8.9	0	-	9.4	0	-	28.7
HCM Lane LOS	E	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.1	-	-	0.3

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	603	67	20	496	0	48	0	28	17	1	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	92	95
Heavy Vehicles, %	6	6	6	2	2	2	8	8	8	3	3	3
Mvmt Flow	0	635	71	21	522	0	51	0	29	18	1	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	522	0	0	705	0	0	1256	1234	670	1249	1269	522
Stage 1	-	-	-	-	-	-	670	670	-	564	564	-
Stage 2	-	-	-	-	-	-	586	564	-	685	705	-
Critical Hdwy	4.16	-	-	4.12	-	-	7.18	6.58	6.28	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.13	5.53	-
Follow-up Hdwy	2.254	-	-	2.218	-	-	3.572	4.072	3.372	3.527	4.027	3.327
Pot Cap-1 Maneuver	1024	-	-	893	-	-	144	172	447	149	168	553
Stage 1	-	-	-	-	-	-	437	446	-	509	507	-
Stage 2	-	-	-	-	-	-	486	499	-	436	438	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1024	-	-	893	-	-	129	166	447	136	162	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	166	-	136	162	-
Stage 1	-	-	-	-	-	-	437	446	-	509	490	-
Stage 2	-	-	-	-	-	-	432	483	-	407	438	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	41.8	21
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	175	1024	-	-	893	-	-	287
HCM Lane V/C Ratio	0.457	-	-	-	0.024	-	-	0.217
HCM Control Delay (s)	41.8	0	-	-	9.1	0	-	21
HCM Lane LOS	E	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	2.1	0	-	-	0.1	-	-	0.8

MOVEMENT SUMMARY

Site: Milestone Rotary

2016 Existing Saturday
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	162	2.0	1.030	56.8	LOS F	24.5	623.4	1.00	1.95	17.7
8	T1	253	2.0	1.030	52.6	LOS F	24.5	623.4	1.00	1.95	17.7
18	R2	106	2.0	1.030	52.7	LOS F	24.5	623.4	1.00	1.95	17.4
Approach		521	2.0	1.030	53.9	LOS F	24.5	623.4	1.00	1.95	17.6
East: Milestone Rd											
1	L2	86	1.0	0.674	14.3	LOS B	7.2	180.4	0.90	1.00	26.7
6	T1	406	1.0	0.674	10.2	LOS B	7.2	180.4	0.90	1.00	26.7
16	R2	349	1.0	0.512	8.2	LOS A	4.0	101.1	0.80	0.87	26.9
Approach		842	1.0	0.674	9.8	LOS A	7.2	180.4	0.86	0.95	26.8
North: Orange St											
7	L2	260	3.0	0.490	14.7	LOS B	3.5	88.9	0.83	1.00	25.6
4	T1	298	3.0	0.669	13.4	LOS B	6.4	164.4	0.92	1.11	25.9
14	R2	96	3.0	0.669	13.8	LOS B	6.4	164.4	0.92	1.11	25.3
Approach		654	3.0	0.669	14.0	LOS B	6.4	164.4	0.89	1.07	25.7
West: Sparks Ave											
5	L2	45	6.0	1.300	161.3	LOS F	50.5	1322.8	1.00	3.34	9.7
2	T1	271	6.0	1.300	157.2	LOS F	50.5	1322.8	1.00	3.34	9.7
12	R2	219	6.0	1.300	157.2	LOS F	50.5	1322.8	1.00	3.34	9.6
Approach		535	6.0	1.300	157.5	LOS F	50.5	1322.8	1.00	3.34	9.7
All Vehicles		2552	2.8	1.300	50.8	LOS F	50.5	1322.8	0.93	1.68	18.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	181	42	53	14	20	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	4	4
Mvmt Flow	197	46	58	15	22	127

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	73	0	65
Stage 1	-	-	65
Stage 2	-	-	439
Critical Hdwy	4.18	-	6.24
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.272	-	3.336
Pot Cap-1 Maneuver	1490	-	993
Stage 1	-	-	953
Stage 2	-	-	646
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1490	-	993
Mov Cap-2 Maneuver	-	-	453
Stage 1	-	-	953
Stage 2	-	-	558

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1490	-	-	-	846
HCM Lane V/C Ratio	0.132	-	-	-	0.176
HCM Control Delay (s)	7.8	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.6

Intersection

Int Delay, s/veh 4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	317	91	93	291	114	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	334	96	98	306	120	99

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	429	884
Stage 1	-	-	382
Stage 2	-	-	502
Critical Hdwy	-	4.13	6.43
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	-	2.227	3.527
Pot Cap-1 Maneuver	-	1125	315
Stage 1	-	-	688
Stage 2	-	-	606
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1125	282
Mov Cap-2 Maneuver	-	-	282
Stage 1	-	-	688
Stage 2	-	-	542

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	282	663	-	-	1125	-
HCM Lane V/C Ratio	0.426	0.149	-	-	0.087	-
HCM Control Delay (s)	26.9	11.4	-	-	8.5	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	2	0.5	-	-	0.3	-

Intersection

Intersection Delay, s/veh	14.8											
Intersection LOS	B											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	19	184	196	0	82	184	7	0	213	8	74
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	4	4	4	2	2	2	2
Mvmt Flow	0	20	196	209	0	87	196	7	0	227	9	79
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	16.1	13.5	14.8
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	72%	5%	30%	5%
Vol Thru, %	3%	46%	67%	18%
Vol Right, %	25%	49%	3%	77%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	399	273	22
LT Vol	213	19	82	1
Through Vol	8	184	184	4
RT Vol	74	196	7	17
Lane Flow Rate	314	424	290	23
Geometry Grp	1	1	1	1
Degree of Util (X)	0.509	0.61	0.459	0.041
Departure Headway (Hd)	5.837	5.173	5.685	6.267
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	615	696	630	566
Service Time	3.895	3.228	3.745	4.36
HCM Lane V/C Ratio	0.511	0.609	0.46	0.041
HCM Control Delay	14.8	16.1	13.5	9.6
HCM Lane LOS	B	C	B	A
HCM 95th-tile Q	2.9	4.2	2.4	0.1

Intersection

Int Delay, s/veh 17.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	410	147	184	458	104	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	4	4	2	2	5	5
Mvmt Flow	451	162	202	503	114	235

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	612
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	967
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	967
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	77.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	102	542	-	-	967	-
HCM Lane V/C Ratio	1.12	0.434	-	-	0.209	-
HCM Control Delay (s)	203.5	16.6	-	-	9.7	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	7.4	2.2	-	-	0.8	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	550	59	44	572	47	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	2	2	4	4
Mvmt Flow	625	67	50	650	53	53

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	692
Stage 1	-	-	659
Stage 2	-	-	750
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	6.44
Critical Hdwy Stg 2	-	-	6.24
Follow-up Hdwy	-	-	5.44
Pot Cap-1 Maneuver	-	-	2.218
Stage 1	-	-	903
Stage 2	-	-	151
Platoon blocked, %	-	-	460
Mov Cap-1 Maneuver	-	-	511
Stage 1	-	-	463
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	903
Stage 2	-	-	138
	-	-	460
	-	-	138
	-	-	511
	-	-	423

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	38.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	212	-	-	903	-
HCM Lane V/C Ratio	0.504	-	-	0.055	-
HCM Control Delay (s)	38.1	-	-	9.2	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0.2	-

Intersection

Int Delay, s/veh	1
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	578	19	17	594	22	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	672	22	20	691	26	22

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	694	1413
Stage 1	-	-	683
Stage 2	-	-	730
Critical Hdwy	-	4.13	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.227	3.518
Pot Cap-1 Maneuver	-	897	152
Stage 1	-	-	502
Stage 2	-	-	477
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	897	147
Mov Cap-2 Maneuver	-	-	147
Stage 1	-	-	502
Stage 2	-	-	460

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	26.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	214	-	-	897	-
HCM Lane V/C Ratio	0.223	-	-	0.022	-
HCM Control Delay (s)	26.6	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	550	37	27	557	2	23	2	20	3	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	8	8	8
Mvmt Flow	10	611	41	30	619	2	26	2	22	3	4	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	621	0	0	652	0	0	1338	1333	632	1344	1352	620
Stage 1	-	-	-	-	-	-	652	652	-	680	680	-
Stage 2	-	-	-	-	-	-	686	681	-	664	672	-
Critical Hdwy	4.15	-	-	4.13	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.245	-	-	2.227	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	945	-	-	930	-	-	129	153	477	125	146	477
Stage 1	-	-	-	-	-	-	453	461	-	431	442	-
Stage 2	-	-	-	-	-	-	434	447	-	440	445	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	945	-	-	930	-	-	118	143	477	112	136	477
Mov Cap-2 Maneuver	-	-	-	-	-	-	118	143	-	112	136	-
Stage 1	-	-	-	-	-	-	445	453	-	424	420	-
Stage 2	-	-	-	-	-	-	403	425	-	410	437	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	32.7	25.6
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	179	945	-	-	930	-	-	189
HCM Lane V/C Ratio	0.279	0.011	-	-	0.032	-	-	0.076
HCM Control Delay (s)	32.7	8.8	0	-	9	0	-	25.6
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	0.2

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	482	59	20	434	0	47	0	23	15	5	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	4	4	4	4	4	4
Mvmt Flow	0	536	66	22	482	0	52	0	26	17	6	93

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	482	0	0	601	0	0	1144	1095	568	1108	1128	482
Stage 1	-	-	-	-	-	-	568	568	-	527	527	-
Stage 2	-	-	-	-	-	-	576	527	-	581	601	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1070	-	-	971	-	-	175	212	519	186	203	580
Stage 1	-	-	-	-	-	-	504	503	-	531	525	-
Stage 2	-	-	-	-	-	-	499	525	-	496	486	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1070	-	-	971	-	-	140	205	519	173	197	580
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	205	-	173	197	-
Stage 1	-	-	-	-	-	-	504	503	-	531	509	-
Stage 2	-	-	-	-	-	-	401	509	-	472	486	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	38.2	17.4
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	184	1070	-	-	971	-	-	405
HCM Lane V/C Ratio	0.423	-	-	-	0.023	-	-	0.285
HCM Control Delay (s)	38.2	0	-	-	8.8	0	-	17.4
HCM Lane LOS	E	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	1.9	0	-	-	0.1	-	-	1.2

MOVEMENT SUMMARY

Site: Milestone Rotary

2023 No-Build AM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	166	6.0	1.349	186.1	LOS F	59.4	1555.8	1.00	3.49	8.8
8	T1	300	6.0	1.349	181.9	LOS F	59.4	1555.8	1.00	3.49	8.8
18	R2	96	6.0	1.349	182.0	LOS F	59.4	1555.8	1.00	3.49	8.7
Approach		562	6.0	1.349	183.2	LOS F	59.4	1555.8	1.00	3.49	8.8
East: Milestone Rd											
1	L2	103	4.0	0.618	13.0	LOS B	5.9	151.1	0.85	0.92	27.1
6	T1	349	4.0	0.618	8.9	LOS A	5.9	151.1	0.85	0.92	27.0
16	R2	402	4.0	0.549	8.0	LOS A	4.6	118.5	0.80	0.86	27.0
Approach		855	4.0	0.618	9.0	LOS A	5.9	151.1	0.82	0.89	27.0
North: Orange St											
7	L2	362	3.0	0.575	14.5	LOS B	4.8	121.6	0.85	1.04	25.7
4	T1	320	3.0	0.626	11.4	LOS B	5.6	144.2	0.88	1.05	26.5
14	R2	75	3.0	0.626	11.7	LOS B	5.6	144.2	0.88	1.05	25.9
Approach		757	3.0	0.626	12.9	LOS B	5.6	144.2	0.87	1.04	26.0
West: Sparks Ave											
5	L2	59	5.0	1.346	182.3	LOS F	50.1	1301.6	1.00	3.43	8.9
2	T1	296	5.0	1.346	178.2	LOS F	50.1	1301.6	1.00	3.43	8.9
12	R2	137	5.0	1.346	178.2	LOS F	50.1	1301.6	1.00	3.43	8.8
Approach		492	5.0	1.346	178.7	LOS F	50.1	1301.6	1.00	3.43	8.9
All Vehicles		2665	4.3	1.349	78.1	LOS F	59.4	1555.8	0.91	1.95	14.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	318	72	63	15	19	264
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	23	23	7	7
Mvmt Flow	346	78	68	16	21	287

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	85	0	847
Stage 1	-	-	77
Stage 2	-	-	770
Critical Hdwy	4.16	-	6.47
Critical Hdwy Stg 1	-	-	5.47
Critical Hdwy Stg 2	-	-	5.47
Follow-up Hdwy	2.254	-	3.563
Pot Cap-1 Maneuver	1487	-	326
Stage 1	-	-	934
Stage 2	-	-	448
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1487	-	247
Mov Cap-2 Maneuver	-	-	247
Stage 1	-	-	934
Stage 2	-	-	339

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1487	-	-	-	811
HCM Lane V/C Ratio	0.232	-	-	-	0.379
HCM Control Delay (s)	8.2	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.9	-	-	-	1.8

Intersection

Int Delay, s/veh 11.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	214	159	126	291	194	151
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	9	9	9	9
Mvmt Flow	225	167	133	306	204	159

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	393
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.19
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.281
Pot Cap-1 Maneuver	-	-	1128
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1128
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	264	715	-	-	1128	-
HCM Lane V/C Ratio	0.774	0.222	-	-	0.118	-
HCM Control Delay (s)	53.4	11.5	-	-	8.6	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	5.8	0.8	-	-	0.4	-

Intersection

Intersection Delay, s/veh	34.1											
Intersection LOS	D											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	17	289	222	0	103	228	3	0	238	4	114
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	6	6	6	2	8	8	8	2	4	4	4
Mvmt Flow	0	18	307	236	0	110	243	3	0	253	4	121
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	49.5	22.4	25.1
HCM LOS	E	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	3%	31%	21%
Vol Thru, %	1%	55%	68%	7%
Vol Right, %	32%	42%	1%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	356	528	334	43
LT Vol	238	17	103	9
Through Vol	4	289	228	3
RT Vol	114	222	3	31
Lane Flow Rate	379	562	355	46
Geometry Grp	1	1	1	1
Degree of Util (X)	0.713	0.946	0.666	0.1
Departure Headway (Hd)	6.776	6.066	6.75	7.886
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	530	595	533	457
Service Time	4.849	4.134	4.83	5.886
HCM Lane V/C Ratio	0.715	0.945	0.666	0.101
HCM Control Delay	25.1	49.5	22.4	11.8
HCM Lane LOS	D	E	C	B
HCM 95th-tile Q	5.7	12.6	4.9	0.3

Intersection

Int Delay, s/veh 23.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	424	117	235	511	111	322
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	7	7	5	5	2	2
Mvmt Flow	437	121	242	527	114	332

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	558
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.15
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.245
Pot Cap-1 Maneuver	-	-	998
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	998
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	88.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	87	573	-	-	998	-
HCM Lane V/C Ratio	1.315	0.579	-	-	0.243	-
HCM Control Delay (s)	289.2	19.6	-	-	9.8	0
HCM Lane LOS	F	C	-	-	A	A
HCM 95th %tile Q(veh)	8.5	3.7	-	-	1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	648	75	52	701	48	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	7	7	3	3
Mvmt Flow	675	78	54	730	50	38

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	753	1553
Stage 1	-	-	714
Stage 2	-	-	839
Critical Hdwy	-	4.17	6.43
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	-	2.263	3.527
Pot Cap-1 Maneuver	-	835	124
Stage 1	-	-	483
Stage 2	-	-	422
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	835	110
Mov Cap-2 Maneuver	-	-	110
Stage 1	-	-	483
Stage 2	-	-	376

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	50.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	162	-	-	835	-
HCM Lane V/C Ratio	0.54	-	-	0.065	-
HCM Control Delay (s)	50.7	-	-	9.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	2.7	-	-	0.2	-

Intersection

Int Delay, s/veh	2					
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	625	57	20	709	43	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	9	9	9	9
Mvmt Flow	644	59	21	731	44	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	703	0	1446	674
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	772	-
Critical Hdwy	-	-	4.19	-	6.49	6.29
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.281	-	3.581	3.381
Pot Cap-1 Maneuver	-	-	863	-	140	443
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	444	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	863	-	134	443
Mov Cap-2 Maneuver	-	-	-	-	134	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	426	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	36.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	191	-	-	863	-
HCM Lane V/C Ratio	0.405	-	-	0.024	-
HCM Control Delay (s)	36.1	-	-	9.3	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	594	24	23	639	0	31	0	18	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	7	7	7	13	13	13	0	0	0
Mvmt Flow	6	639	26	25	687	0	33	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	687	0	0	665	0	0	1402	1402	652	1411	1414	687
Stage 1	-	-	-	-	-	-	665	665	-	737	737	-
Stage 2	-	-	-	-	-	-	737	737	-	674	677	-
Critical Hdwy	4.15	-	-	4.17	-	-	7.23	6.63	6.33	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.263	-	-	3.617	4.117	3.417	3.5	4	3.3
Pot Cap-1 Maneuver	893	-	-	901	-	-	111	133	449	117	139	450
Stage 1	-	-	-	-	-	-	432	441	-	413	428	-
Stage 2	-	-	-	-	-	-	394	409	-	448	455	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	893	-	-	901	-	-	106	126	449	107	131	450
Mov Cap-2 Maneuver	-	-	-	-	-	-	106	126	-	107	131	-
Stage 1	-	-	-	-	-	-	427	436	-	408	409	-
Stage 2	-	-	-	-	-	-	375	391	-	424	450	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	42.6	13
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	147	893	-	-	901	-	-	450
HCM Lane V/C Ratio	0.358	0.007	-	-	0.027	-	-	0.002
HCM Control Delay (s)	42.6	9.1	0	-	9.1	0	-	13
HCM Lane LOS	E	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0

Intersection

Int Delay, s/veh 7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	598	35	14	669	0	46	0	33	21	4	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	7	7	7	26	0	26	5	5	5
Mvmt Flow	0	650	38	15	727	0	50	0	36	23	4	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	727	0	0	688	0	0	1462	1427	669	1445	1446	727
Stage 1	-	-	-	-	-	-	669	669	-	758	758	-
Stage 2	-	-	-	-	-	-	793	758	-	687	688	-
Critical Hdwy	4.14	-	-	4.17	-	-	7.36	6.5	6.46	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.36	5.5	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.36	5.5	-	6.15	5.55	-
Follow-up Hdwy	2.236	-	-	2.263	-	-	3.734	4	3.534	3.545	4.045	3.345
Pot Cap-1 Maneuver	867	-	-	883	-	-	94	136	418	108	130	419
Stage 1	-	-	-	-	-	-	410	459	-	395	411	-
Stage 2	-	-	-	-	-	-	348	418	-	432	442	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	867	-	-	883	-	-	75	132	418	97	126	419
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	132	-	97	126	-
Stage 1	-	-	-	-	-	-	410	459	-	395	399	-
Stage 2	-	-	-	-	-	-	280	406	-	395	442	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	98.5	33.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	114	867	-	-	883	-	-	220
HCM Lane V/C Ratio	0.753	-	-	-	0.017	-	-	0.43
HCM Control Delay (s)	98.5	0	-	-	9.1	0	-	33.2
HCM Lane LOS	F	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	4.2	0	-	-	0.1	-	-	2

MOVEMENT SUMMARY

 Site: Milestone Rotary

2023 No-Build PM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	183	3.0	1.368	193.7	LOS F	63.2	1618.6	1.00	3.58	8.5
8	T1	272	3.0	1.368	189.6	LOS F	63.2	1618.6	1.00	3.58	8.5
18	R2	129	3.0	1.368	189.6	LOS F	63.2	1618.6	1.00	3.58	8.5
Approach		584	3.0	1.368	190.9	LOS F	63.2	1618.6	1.00	3.58	8.5
East: Milestone Rd											
1	L2	136	2.0	0.707	14.4	LOS B	8.1	205.1	0.91	0.99	26.6
6	T1	406	2.0	0.707	10.2	LOS B	8.1	205.1	0.91	0.99	26.6
16	R2	321	2.0	0.480	7.6	LOS A	3.5	88.1	0.75	0.82	27.1
Approach		863	2.0	0.707	9.9	LOS A	8.1	205.1	0.85	0.93	26.8
North: Orange St											
7	L2	363	4.0	0.669	18.5	LOS C	6.3	162.8	0.94	1.14	24.6
4	T1	345	4.0	0.780	18.6	LOS C	9.2	236.4	1.00	1.27	24.4
14	R2	87	4.0	0.780	19.0	LOS C	9.2	236.4	1.00	1.27	23.9
Approach		795	4.0	0.780	18.6	LOS C	9.2	236.4	0.97	1.21	24.4
West: Sparks Ave											
5	L2	70	6.0	1.379	197.7	LOS F	49.4	1293.9	1.00	3.40	8.4
2	T1	294	6.0	1.379	193.6	LOS F	49.4	1293.9	1.00	3.40	8.4
12	R2	93	6.0	1.379	193.6	LOS F	49.4	1293.9	1.00	3.40	8.3
Approach		457	6.0	1.379	194.2	LOS F	49.4	1293.9	1.00	3.40	8.4
All Vehicles		2699	3.5	1.379	82.8	LOS F	63.2	1618.6	0.94	2.01	14.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	260	85	84	15	17	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	7	5	5	5	5
Mvmt Flow	286	93	92	16	19	308

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	109	0	766
Stage 1	-	-	101
Stage 2	-	-	665
Critical Hdwy	4.17	-	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.263	-	3.545
Pot Cap-1 Maneuver	1451	-	367
Stage 1	-	-	916
Stage 2	-	-	506
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1451	-	291
Mov Cap-2 Maneuver	-	-	291
Stage 1	-	-	916
Stage 2	-	-	401

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1451	-	-	-	838
HCM Lane V/C Ratio	0.197	-	-	-	0.389
HCM Control Delay (s)	8.1	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.7	-	-	-	1.9

Intersection

Int Delay, s/veh 9.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	297	155	134	318	153	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	309	161	140	331	159	164

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	471
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1091
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1091
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	32.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	225	654	-	-	1091	-
HCM Lane V/C Ratio	0.708	0.25	-	-	0.128	-
HCM Control Delay (s)	52.4	12.3	-	-	8.8	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	4.7	1	-	-	0.4	-

Intersection

Intersection Delay, s/veh	42.8											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	35	269	236	0	92	291	24	0	224	6	89
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	6	6	6	2	3	3	3	2	3	3	3
Mvmt Flow	0	38	296	259	0	101	320	26	0	246	7	98
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	63	34.8	24.6
HCM LOS	F	D	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	70%	6%	23%	29%
Vol Thru, %	2%	50%	71%	2%
Vol Right, %	28%	44%	6%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	319	540	407	59
LT Vol	224	35	92	17
Through Vol	6	269	291	1
RT Vol	89	236	24	41
Lane Flow Rate	351	593	447	65
Geometry Grp	1	1	1	1
Degree of Util (X)	0.689	1	0.833	0.146
Departure Headway (Hd)	7.071	6.368	6.706	8.079
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	508	570	541	445
Service Time	5.167	4.394	4.717	6.107
HCM Lane V/C Ratio	0.691	1.04	0.826	0.146
HCM Control Delay	24.6	63	34.8	12.5
HCM Lane LOS	C	F	D	B
HCM 95th-tile Q	5.2	14.5	8.5	0.5

Intersection

Int Delay, s/veh 63.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	538	165	236	443	157	315
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	6	6	3	3	6	6
Mvmt Flow	555	170	243	457	162	325

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	725
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.13
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.227
Pot Cap-1 Maneuver	-	-	873
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	873
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	245.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	73	468	-	-	873	-
HCM Lane V/C Ratio	2.217	0.694	-	-	0.279	-
HCM Control Delay (s)	\$ 680.6	28.4	-	-	10.7	0
HCM Lane LOS	F	D	-	-	B	A
HCM 95th %tile Q(veh)	15.1	5.3	-	-	1.1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	784	79	59	667	46	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	4	3	3	1	1
Mvmt Flow	817	82	61	695	48	61

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	899	1676
Stage 1	-	-	858
Stage 2	-	-	818
Critical Hdwy	-	4.13	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	-	2.227	3.509
Pot Cap-1 Maneuver	-	751	105
Stage 1	-	-	417
Stage 2	-	-	435
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	751	91
Mov Cap-2 Maneuver	-	-	91
Stage 1	-	-	417
Stage 2	-	-	378

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	68.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	157	-	-	751	-
HCM Lane V/C Ratio	0.697	-	-	0.082	-
HCM Control Delay (s)	68.5	-	-	10.2	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	4.1	-	-	0.3	-

Intersection

Int Delay, s/veh 2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	797	37	23	687	40	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	2	2	3	3
Mvmt Flow	839	39	24	723	42	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	878	0	1630	858
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	772	-
Critical Hdwy	-	-	4.12	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	769	-	111	355
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	454	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	769	-	105	355
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	430	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	50.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	148	-	-	769	-
HCM Lane V/C Ratio	0.484	-	-	0.031	-
HCM Control Delay (s)	50.2	-	-	9.8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Intersection

Int Delay, s/veh 9.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	16	701	74	50	626	6	53	1	39	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	2	2	2	3	3	3	6	6	6
Mvmt Flow	17	762	80	54	680	7	58	1	42	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	687	0	0	842	0	0	1634	1633	802	1651	1669	684
Stage 1	-	-	-	-	-	-	837	837	-	792	792	-
Stage 2	-	-	-	-	-	-	797	796	-	859	877	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.13	6.53	6.23	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.527	4.027	3.327	3.554	4.054	3.354
Pot Cap-1 Maneuver	884	-	-	794	-	-	80	101	382	77	94	442
Stage 1	-	-	-	-	-	-	360	381	-	377	395	-
Stage 2	-	-	-	-	-	-	379	398	-	346	361	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	884	-	-	794	-	-	70	87	382	60	81	442
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	87	-	60	81	-
Stage 1	-	-	-	-	-	-	347	367	-	363	352	-
Stage 2	-	-	-	-	-	-	330	354	-	295	348	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.7	146.5	41.1
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	107	884	-	-	794	-	-	117
HCM Lane V/C Ratio	0.945	0.02	-	-	0.068	-	-	0.149
HCM Control Delay (s)	146.5	9.2	0	-	9.9	0	-	41.1
HCM Lane LOS	F	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	5.8	0.1	-	-	0.2	-	-	0.5

Intersection

Int Delay, s/veh 5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	687	72	21	578	0	51	0	30	17	1	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	92	95
Heavy Vehicles, %	6	6	6	2	2	2	8	8	8	3	3	3
Mvmt Flow	0	723	76	22	608	0	54	0	32	18	1	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	608	0	0	799	0	0	1436	1414	761	1430	1452	608
Stage 1	-	-	-	-	-	-	761	761	-	653	653	-
Stage 2	-	-	-	-	-	-	675	653	-	777	799	-
Critical Hdwy	4.16	-	-	4.12	-	-	7.18	6.58	6.28	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.13	5.53	-
Follow-up Hdwy	2.254	-	-	2.218	-	-	3.572	4.072	3.372	3.527	4.027	3.327
Pot Cap-1 Maneuver	951	-	-	824	-	-	108	134	396	112	130	494
Stage 1	-	-	-	-	-	-	389	405	-	455	462	-
Stage 2	-	-	-	-	-	-	434	454	-	388	396	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	951	-	-	824	-	-	95	129	396	100	125	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	95	129	-	100	125	-
Stage 1	-	-	-	-	-	-	389	405	-	455	444	-
Stage 2	-	-	-	-	-	-	378	436	-	357	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	72.1	26.7
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	132	951	-	-	824	-	-	228
HCM Lane V/C Ratio	0.646	-	-	-	0.027	-	-	0.277
HCM Control Delay (s)	72.1	0	-	-	9.5	0	-	26.7
HCM Lane LOS	F	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	3.4	0	-	-	0.1	-	-	1.1

MOVEMENT SUMMARY

Site: Milestone Rotary

2023 No-Build Saturday
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	195	2.0	1.268	148.2	LOS F	55.4	1406.9	1.00	3.25	10.3
8	T1	295	2.0	1.268	144.1	LOS F	55.4	1406.9	1.00	3.25	10.3
18	R2	120	2.0	1.268	144.1	LOS F	55.4	1406.9	1.00	3.25	10.2
Approach		609	2.0	1.268	145.4	LOS F	55.4	1406.9	1.00	3.25	10.3
East: Milestone Rd											
1	L2	98	1.0	0.733	15.6	LOS C	8.8	222.0	0.94	1.06	26.3
6	T1	446	1.0	0.733	11.4	LOS B	8.8	222.0	0.94	1.06	26.3
16	R2	375	1.0	0.546	8.5	LOS A	4.5	113.4	0.81	0.89	26.8
Approach		919	1.0	0.733	10.7	LOS B	8.8	222.0	0.89	0.99	26.5
North: Orange St											
7	L2	279	3.0	0.579	17.5	LOS C	4.6	117.5	0.89	1.08	24.9
4	T1	341	3.0	0.810	20.6	LOS C	10.2	260.9	1.00	1.32	23.9
14	R2	103	3.0	0.810	21.0	LOS C	10.2	260.9	1.00	1.32	23.4
Approach		723	3.0	0.810	19.5	LOS C	10.2	260.9	0.96	1.22	24.2
West: Sparks Ave											
5	L2	48	6.0	1.304	164.0	LOS F	47.1	1233.3	1.00	3.25	9.6
2	T1	301	6.0	1.304	159.8	LOS F	47.1	1233.3	1.00	3.25	9.6
12	R2	143	6.0	1.304	159.8	LOS F	47.1	1233.3	1.00	3.25	9.5
Approach		493	6.0	1.304	160.2	LOS F	47.1	1233.3	1.00	3.25	9.6
All Vehicles		2744	2.6	1.304	69.8	LOS F	55.4	1406.9	0.95	1.96	15.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	211	45	57	15	21	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	4	4
Mvmt Flow	229	49	62	16	23	151

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	78	0	70
Stage 1	-	-	70
Stage 2	-	-	508
Critical Hdwy	4.18	-	6.24
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.272	-	3.336
Pot Cap-1 Maneuver	1483	-	987
Stage 1	-	-	948
Stage 2	-	-	600
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1483	-	987
Mov Cap-2 Maneuver	-	-	399
Stage 1	-	-	948
Stage 2	-	-	505

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	827
HCM Lane V/C Ratio	0.155	-	-	-	0.21
HCM Control Delay (s)	7.9	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.8

Intersection

Int Delay, s/veh 6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	340	98	113	312	122	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	358	103	119	328	128	121

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	461
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.13
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.227
Pot Cap-1 Maneuver	-	-	1095
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1095
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	24.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	241	640	-	-	1095	-
HCM Lane V/C Ratio	0.533	0.189	-	-	0.109	-
HCM Control Delay (s)	35.8	11.9	-	-	8.7	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	2.8	0.7	-	-	0.4	-

Intersection

Intersection Delay, s/veh	21
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	20	231	229	0	88	211	8	0	247	9	79
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	4	4	4	2	2	2	2
Mvmt Flow	0	21	246	244	0	94	224	9	0	263	10	84
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	25.6	16.8	19.1
HCM LOS	D	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	74%	4%	29%	4%
Vol Thru, %	3%	48%	69%	17%
Vol Right, %	24%	48%	3%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	335	480	307	23
LT Vol	247	20	88	1
Through Vol	9	231	211	4
RT Vol	79	229	8	18
Lane Flow Rate	356	511	327	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.618	0.78	0.562	0.048
Departure Headway (Hd)	6.357	5.601	6.193	7.095
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	570	649	585	506
Service Time	4.357	3.601	4.196	5.116
HCM Lane V/C Ratio	0.625	0.787	0.559	0.047
HCM Control Delay	19.1	25.6	16.8	10.5
HCM Lane LOS	C	D	C	B
HCM 95th-tile Q	4.2	7.5	3.5	0.2

Intersection

Int Delay, s/veh 36.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	486	158	206	540	111	240
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	5	5
Mvmt Flow	528	172	224	587	121	261

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	700	1649
Stage 1	-	-	614
Stage 2	-	-	1035
Critical Hdwy	-	4.12	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	-	2.218	3.545
Pot Cap-1 Maneuver	-	897	~ 107
Stage 1	-	-	534
Stage 2	-	-	338
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	897	~ 67
Mov Cap-2 Maneuver	-	-	~ 67
Stage 1	-	-	534
Stage 2	-	-	213

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	176.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	67	486	-	-	897	-
HCM Lane V/C Ratio	1.801	0.537	-	-	0.25	-
HCM Control Delay (s)	\$ 514.6	20.7	-	-	10.3	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	10.9	3.1	-	-	1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	646	64	49	669	51	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	4	4
Mvmt Flow	702	70	53	727	55	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	772	1571
Stage 1	-	-	737
Stage 2	-	-	834
Critical Hdwy	-	4.12	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	-	2.218	3.536
Pot Cap-1 Maneuver	-	843	415
Stage 1	-	-	470
Stage 2	-	-	423
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	843	415
Mov Cap-2 Maneuver	-	-	107
Stage 1	-	-	470
Stage 2	-	-	379

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	59
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	171	-	-	843	-
HCM Lane V/C Ratio	0.655	-	-	0.063	-
HCM Control Delay (s)	59	-	-	9.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	3.8	-	-	0.2	-

Intersection

Int Delay, s/veh 1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	670	21	19	685	25	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	728	23	21	745	27	24

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	751
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.13
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.227
Pot Cap-1 Maneuver	-	-	854
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	854
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	31.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	186	-	-	854	-
HCM Lane V/C Ratio	0.275	-	-	0.024	-
HCM Control Delay (s)	31.5	-	-	9.3	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection

Int Delay, s/veh 8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	611	70	50	621	2	53	2	44	3	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	8	8	8
Mvmt Flow	10	679	78	56	690	2	59	2	49	3	4	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	692	0	0	757	0	0	1546	1541	718	1565	1579	691
Stage 1	-	-	-	-	-	-	738	738	-	802	802	-
Stage 2	-	-	-	-	-	-	808	803	-	763	777	-
Critical Hdwy	4.15	-	-	4.13	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.245	-	-	2.227	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	889	-	-	849	-	-	92	114	426	88	106	434
Stage 1	-	-	-	-	-	-	407	421	-	369	388	-
Stage 2	-	-	-	-	-	-	372	393	-	388	398	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	889	-	-	849	-	-	79	100	426	69	93	434
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	100	-	69	93	-
Stage 1	-	-	-	-	-	-	399	413	-	362	346	-
Stage 2	-	-	-	-	-	-	323	351	-	335	390	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.7	117	36.1
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	125	889	-	-	849	-	-	130
HCM Lane V/C Ratio	0.88	0.011	-	-	0.065	-	-	0.111
HCM Control Delay (s)	117	9.1	0	-	9.5	0	-	36.1
HCM Lane LOS	F	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	5.6	0	-	-	0.2	-	-	0.4

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	561	63	21	509	0	50	0	25	15	5	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	4	4	3	3	3	4	4	4	4	4	4
Mvmt Flow	0	623	70	23	566	0	56	0	28	17	6	93

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	566	0	0	693	0	0	1320	1270	658	1284	1305	566
Stage 1	-	-	-	-	-	-	658	658	-	612	612	-
Stage 2	-	-	-	-	-	-	662	612	-	672	693	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	996	-	-	898	-	-	133	167	461	140	159	520
Stage 1	-	-	-	-	-	-	450	458	-	477	481	-
Stage 2	-	-	-	-	-	-	448	481	-	442	442	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	996	-	-	898	-	-	103	161	461	128	153	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	161	-	128	153	-
Stage 1	-	-	-	-	-	-	450	458	-	477	463	-
Stage 2	-	-	-	-	-	-	350	463	-	415	442	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	63.7	21.4
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	139	996	-	-	898	-	-	334
HCM Lane V/C Ratio	0.6	-	-	-	0.026	-	-	0.346
HCM Control Delay (s)	63.7	0	-	-	9.1	0	-	21.4
HCM Lane LOS	F	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	3.1	0	-	-	0.1	-	-	1.5

MOVEMENT SUMMARY

Site: Milestone Rotary

2023 Build AM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	199	6.0	1.547	272.1	LOS F	86.6	2268.4	1.00	4.28	6.6
8	T1	348	6.0	1.547	268.0	LOS F	86.6	2268.4	1.00	4.28	6.6
18	R2	104	6.0	1.547	268.0	LOS F	86.6	2268.4	1.00	4.28	6.5
Approach		652	6.0	1.547	269.2	LOS F	86.6	2268.4	1.00	4.28	6.6
East: Milestone Rd											
1	L2	105	4.0	0.626	13.2	LOS B	6.0	155.2	0.86	0.94	27.0
6	T1	349	4.0	0.626	9.1	LOS A	6.0	155.2	0.86	0.94	27.0
16	R2	402	4.0	0.554	8.2	LOS A	4.7	120.4	0.81	0.87	26.9
Approach		857	4.0	0.626	9.2	LOS A	6.0	155.2	0.83	0.91	26.9
North: Orange St											
7	L2	362	3.0	0.580	14.7	LOS B	4.8	123.7	0.86	1.05	25.6
4	T1	336	3.0	0.657	12.2	LOS B	6.2	159.3	0.90	1.08	26.2
14	R2	75	3.0	0.657	12.6	LOS B	6.2	159.3	0.90	1.08	25.7
Approach		773	3.0	0.657	13.4	LOS B	6.2	159.3	0.88	1.06	25.9
West: Sparks Ave											
5	L2	59	5.0	1.406	208.4	LOS F	55.9	1454.0	1.00	3.64	8.1
2	T1	296	5.0	1.406	204.2	LOS F	55.9	1454.0	1.00	3.64	8.1
12	R2	148	5.0	1.406	204.2	LOS F	55.9	1454.0	1.00	3.64	8.0
Approach		503	5.0	1.406	204.7	LOS F	55.9	1454.0	1.00	3.64	8.1
All Vehicles		2784	4.4	1.547	106.6	LOS F	86.6	2268.4	0.92	2.23	12.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 8.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	341	72	63	15	19	272
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	23	23	7	7
Mvmt Flow	371	78	68	16	21	296

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	85	0	897
Stage 1	-	-	77
Stage 2	-	-	820
Critical Hdwy	4.16	-	6.47
Critical Hdwy Stg 1	-	-	5.47
Critical Hdwy Stg 2	-	-	5.47
Follow-up Hdwy	2.254	-	3.563
Pot Cap-1 Maneuver	1487	-	304
Stage 1	-	-	934
Stage 2	-	-	424
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1487	-	225
Mov Cap-2 Maneuver	-	-	225
Stage 1	-	-	934
Stage 2	-	-	313

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1487	-	-	-	798
HCM Lane V/C Ratio	0.249	-	-	-	0.396
HCM Control Delay (s)	8.2	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	1	-	-	-	1.9

Intersection

Int Delay, s/veh 12.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	214	159	134	291	194	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	9	9	9	9
Mvmt Flow	225	167	141	306	204	183

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	393
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.19
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.281
Pot Cap-1 Maneuver	-	-	1128
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1128
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	36.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	256	715	-	-	1128	-
HCM Lane V/C Ratio	0.798	0.256	-	-	0.125	-
HCM Control Delay (s)	57.9	11.8	-	-	8.6	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	6.1	1	-	-	0.4	-

Intersection

Intersection Delay, s/veh	40.7											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	17	312	246	0	103	236	3	0	247	4	114
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	6	6	6	2	8	8	8	2	4	4	4
Mvmt Flow	0	18	332	262	0	110	251	3	0	263	4	121
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	62.1	23.4	26.6
HCM LOS	F	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	68%	3%	30%	21%
Vol Thru, %	1%	54%	69%	7%
Vol Right, %	31%	43%	1%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	575	342	43
LT Vol	247	17	103	9
Through Vol	4	312	236	3
RT Vol	114	246	3	31
Lane Flow Rate	388	612	364	46
Geometry Grp	1	1	1	1
Degree of Util (X)	0.736	1	0.685	0.101
Departure Headway (Hd)	6.825	6.202	6.774	7.958
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	532	587	531	453
Service Time	4.852	4.207	4.844	5.958
HCM Lane V/C Ratio	0.729	1.043	0.685	0.102
HCM Control Delay	26.6	62.1	23.4	11.9
HCM Lane LOS	D	F	C	B
HCM 95th-tile Q	6.2	14.7	5.2	0.3

Intersection

Int Delay, s/veh 38.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	452	117	259	596	111	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	7	7	5	5	2	2
Mvmt Flow	466	121	267	614	114	339

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	587	0	1674	526
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	1148	-
Critical Hdwy	-	-	4.15	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.245	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	973	-	~ 105	552
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	302	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	973	-	~ 61	552
Mov Cap-2 Maneuver	-	-	-	-	~ 61	-
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	176	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	157
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	61	552	-	-	973	-
HCM Lane V/C Ratio	1.876	0.614	-	-	0.274	-
HCM Control Delay (s)	\$ 558.9	21.4	-	-	10.1	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	10.7	4.1	-	-	1.1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh	4					
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	683	75	52	810	48	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	7	7	3	3
Mvmt Flow	711	78	54	844	50	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	790	0	1703	751
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	952	-
Critical Hdwy	-	-	4.17	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.263	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	808	-	100	409
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	373	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	808	-	87	409
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	326	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	75.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	131	-	-	808	-
HCM Lane V/C Ratio	0.668	-	-	0.067	-
HCM Control Delay (s)	75.4	-	-	9.8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	3.6	-	-	0.2	-

Intersection

Int Delay, s/veh 2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	660	57	20	818	43	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	9	9	9	9
Mvmt Flow	680	59	21	843	44	33

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	739	1595
Stage 1	-	-	710
Stage 2	-	-	885
Critical Hdwy	-	4.19	6.49
Critical Hdwy Stg 1	-	-	5.49
Critical Hdwy Stg 2	-	-	5.49
Follow-up Hdwy	-	2.281	3.581
Pot Cap-1 Maneuver	-	836	113
Stage 1	-	-	475
Stage 2	-	-	392
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	836	108
Mov Cap-2 Maneuver	-	-	108
Stage 1	-	-	475
Stage 2	-	-	374

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	47.9
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	158	-	-	836	-
HCM Lane V/C Ratio	0.489	-	-	0.025	-
HCM Control Delay (s)	47.9	-	-	9.4	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Intersection

Int Delay, s/veh 5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	611	42	27	725	0	54	0	18	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	7	7	7	13	13	13	0	0	0
Mvmt Flow	6	657	45	29	780	0	58	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	780	0	0	702	0	0	1530	1530	680	1540	1553	780
Stage 1	-	-	-	-	-	-	692	692	-	838	838	-
Stage 2	-	-	-	-	-	-	838	838	-	702	715	-
Critical Hdwy	4.15	-	-	4.17	-	-	7.23	6.63	6.33	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.263	-	-	3.617	4.117	3.417	3.5	4	3.3
Pot Cap-1 Maneuver	824	-	-	873	-	-	90	111	433	95	114	399
Stage 1	-	-	-	-	-	-	417	429	-	364	384	-
Stage 2	-	-	-	-	-	-	345	367	-	432	438	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	824	-	-	873	-	-	85	103	433	86	106	399
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	103	-	86	106	-
Stage 1	-	-	-	-	-	-	412	424	-	360	361	-
Stage 2	-	-	-	-	-	-	324	345	-	408	433	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	100.1	14
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	106	824	-	-	873	-	-	399
HCM Lane V/C Ratio	0.73	0.008	-	-	0.033	-	-	0.003
HCM Control Delay (s)	100.1	9.4	0	-	9.3	0	-	14
HCM Lane LOS	F	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	3.9	0	-	-	0.1	-	-	0

Intersection

Int Delay, s/veh 0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	597	5	3	732	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	7	0	0
Mvmt Flow	649	5	3	796	3	1

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	654
Stage 1	-	-	652
Stage 2	-	-	802
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	6.4
Critical Hdwy Stg 2	-	-	6.2
Follow-up Hdwy	-	-	5.4
Pot Cap-1 Maneuver	-	-	2.2
Stage 1	-	-	943
Stage 2	-	-	145
Platoon blocked, %	-	-	522
Mov Cap-1 Maneuver	-	-	445
Mov Cap-2 Maneuver	-	-	943
Stage 1	-	-	144
Stage 2	-	-	144
	-	-	522
	-	-	442

Approach	EB	WB	NB
HCM Control Delay, s	0	0	26.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	174	-	-	943	-
HCM Lane V/C Ratio	0.025	-	-	0.003	-
HCM Control Delay (s)	26.2	-	-	8.8	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	598	669	0	21	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	7	7	5	5
Mvmt Flow	0	650	727	0	23	72

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	727	0	1377
Stage 1	-	-	727
Stage 2	-	-	650
Critical Hdwy	4.14	-	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.236	-	3.545
Pot Cap-1 Maneuver	867	-	157
Stage 1	-	-	473
Stage 2	-	-	514
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	867	-	157
Mov Cap-2 Maneuver	-	-	157
Stage 1	-	-	473
Stage 2	-	-	514

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	299
HCM Lane V/C Ratio	-	-	-	-	0.316
HCM Control Delay (s)	0	-	-	-	22.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.3

Intersection

Int Delay, s/veh 8.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	572	47	29	540	129	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	0	0	7	0	0
Mvmt Flow	622	51	32	587	140	87

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	673
Stage 1	-	-	647
Stage 2	-	-	650
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	6.4
Critical Hdwy Stg 2	-	-	6.2
Follow-up Hdwy	-	-	5.4
Pot Cap-1 Maneuver	-	-	5.4
Stage 1	-	-	2.2
Stage 2	-	-	3.5
Platoon blocked, %	-	-	3.3
Mov Cap-1 Maneuver	-	-	927
Stage 1	-	-	180
Stage 2	-	-	475
Mov Cap-2 Maneuver	-	-	525
Stage 1	-	-	523
Stage 2	-	-	-
Stage 1	-	-	171
Stage 2	-	-	475
Stage 1	-	-	171
Stage 2	-	-	525
Stage 1	-	-	525
Stage 2	-	-	496

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	56.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	171	475	-	-	927	-
HCM Lane V/C Ratio	0.82	0.183	-	-	0.034	-
HCM Control Delay (s)	82.5	14.3	-	-	9	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	5.6	0.7	-	-	0.1	-

MOVEMENT SUMMARY

 **Site: Milestone Rotary**

2023 Build PM
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	204	3.0	1.460	232.7	LOS F	77.9	1993.5	1.00	4.00	7.4
8	T1	304	3.0	1.460	228.6	LOS F	77.9	1993.5	1.00	4.00	7.4
18	R2	135	3.0	1.460	228.6	LOS F	77.9	1993.5	1.00	4.00	7.4
Approach		643	3.0	1.460	229.9	LOS F	77.9	1993.5	1.00	4.00	7.4
East: Milestone Rd											
1	L2	121	2.0	0.649	13.3	LOS B	6.6	166.8	0.86	0.94	27.0
6	T1	369	2.0	0.649	9.1	LOS A	6.6	166.8	0.86	0.94	26.9
16	R2	300	2.0	0.449	7.3	LOS A	3.1	78.4	0.74	0.80	27.2
Approach		791	2.0	0.649	9.1	LOS A	6.6	166.8	0.82	0.89	27.0
North: Orange St											
7	L2	363	4.0	0.649	17.5	LOS C	5.9	151.7	0.91	1.11	24.9
4	T1	398	4.0	0.820	19.7	LOS C	10.8	277.5	1.00	1.32	24.1
14	R2	87	4.0	0.820	20.0	LOS C	10.8	277.5	1.00	1.32	23.7
Approach		848	4.0	0.820	18.7	LOS C	10.8	277.5	0.96	1.23	24.4
West: Sparks Ave											
5	L2	70	6.0	1.538	267.9	LOS F	64.3	1685.8	1.00	3.88	6.6
2	T1	294	6.0	1.538	263.7	LOS F	64.3	1685.8	1.00	3.88	6.6
12	R2	129	6.0	1.538	263.8	LOS F	64.3	1685.8	1.00	3.88	6.6
Approach		493	6.0	1.538	264.3	LOS F	64.3	1685.8	1.00	3.88	6.6
All Vehicles		2774	3.6	1.538	108.5	LOS F	77.9	1993.5	0.94	2.25	12.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	278	85	84	15	17	308
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	7	5	5	5	5
Mvmt Flow	305	93	92	16	19	338

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	109	0	101
Stage 1	-	-	101
Stage 2	-	-	704
Critical Hdwy	4.17	-	6.25
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.263	-	3.345
Pot Cap-1 Maneuver	1451	-	946
Stage 1	-	-	916
Stage 2	-	-	485
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1451	-	946
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	916
Stage 2	-	-	377

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1451	-	-	-	837
HCM Lane V/C Ratio	0.211	-	-	-	0.427
HCM Control Delay (s)	8.1	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.8	-	-	-	2.2

Intersection

Int Delay, s/veh 11.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	297	155	161	318	153	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	5	5	2	2	4	4
Mvmt Flow	309	161	168	331	159	181

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	471
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1091
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1091
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	39.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	654	-	-	1091	-
HCM Lane V/C Ratio	0.797	0.277	-	-	0.154	-
HCM Control Delay (s)	69.7	12.6	-	-	8.9	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	5.6	1.1	-	-	0.5	-

Intersection

Intersection Delay, s/veh	49.1											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	35	287	254	0	92	319	24	0	253	6	89
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	6	6	6	2	3	3	3	2	3	3	3
Mvmt Flow	0	38	315	279	0	101	351	26	0	278	7	98
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	64.7	47.7	31.1
HCM LOS	F	E	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	73%	6%	21%	29%
Vol Thru, %	2%	50%	73%	2%
Vol Right, %	26%	44%	6%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	348	576	435	59
LT Vol	253	35	92	17
Through Vol	6	287	319	1
RT Vol	89	254	24	41
Lane Flow Rate	382	633	478	65
Geometry Grp	1	1	1	1
Degree of Util (X)	0.774	1	0.916	0.152
Departure Headway (Hd)	7.284	6.657	6.895	8.433
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	497	544	526	425
Service Time	5.318	4.716	4.932	6.499
HCM Lane V/C Ratio	0.769	1.164	0.909	0.153
HCM Control Delay	31.1	64.7	47.7	13
HCM Lane LOS	D	F	E	B
HCM 95th-tile Q	6.9	14.2	10.9	0.5

Intersection

Int Delay, s/veh 102.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	634	165	251	501	157	342
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	6	6	3	3	6	6
Mvmt Flow	654	170	259	516	162	353

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	824
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.13
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.227
Pot Cap-1 Maneuver	-	-	802
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	802
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	\$ 414.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	49	411	-	-	802	-
HCM Lane V/C Ratio	3.303	0.858	-	-	0.323	-
HCM Control Delay (s)	\$ 1211.3	48.1	-	-	11.6	0
HCM Lane LOS	F	E	-	-	B	A
HCM 95th %tile Q(veh)	17.6	8.4	-	-	1.4	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 8.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	907	79	60	740	46	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	4	3	3	1	1
Mvmt Flow	945	82	62	771	48	62

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1882
Stage 1	-	-	986
Stage 2	-	-	896
Critical Hdwy	-	4.13	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	-	2.227	3.509
Pot Cap-1 Maneuver	-	672	78
Stage 1	-	-	363
Stage 2	-	-	400
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	672	65
Mov Cap-2 Maneuver	-	-	65
Stage 1	-	-	363
Stage 2	-	-	334

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	138.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	117	-	-	672	-
HCM Lane V/C Ratio	0.944	-	-	0.093	-
HCM Control Delay (s)	138.1	-	-	10.9	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	6	-	-	0.3	-

Intersection

Int Delay, s/veh 3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	921	37	23	761	40	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	2	2	3	3
Mvmt Flow	969	39	24	801	42	29

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1838
Stage 1	-	-	989
Stage 2	-	-	849
Critical Hdwy	-	4.12	6.43
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	-	2.218	3.527
Pot Cap-1 Maneuver	-	687	83
Stage 1	-	-	359
Stage 2	-	-	418
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	687	78
Mov Cap-2 Maneuver	-	-	78
Stage 1	-	-	359
Stage 2	-	-	392

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	81.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	112	-	-	687	-
HCM Lane V/C Ratio	0.639	-	-	0.035	-
HCM Control Delay (s)	81.8	-	-	10.4	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	3.2	-	-	0.1	-

Intersection

Int Delay, s/veh 34.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	16	789	110	51	674	6	79	1	39	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	2	2	2	3	3	3	6	6	6
Mvmt Flow	17	858	120	55	733	7	86	1	42	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	739	0	0	977	0	0	1804	1802	917	1821	1859	736
Stage 1	-	-	-	-	-	-	952	952	-	847	847	-
Stage 2	-	-	-	-	-	-	852	850	-	974	1012	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.13	6.53	6.23	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.527	4.027	3.327	3.554	4.054	3.354
Pot Cap-1 Maneuver	845	-	-	706	-	-	~ 61	79	328	58	72	412
Stage 1	-	-	-	-	-	-	310	337	-	351	372	-
Stage 2	-	-	-	-	-	-	353	375	-	298	312	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	845	-	-	706	-	-	~ 52	65	328	43	60	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 52	65	-	43	60	-
Stage 1	-	-	-	-	-	-	296	322	-	335	323	-
Stage 2	-	-	-	-	-	-	299	326	-	247	298	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.7	\$ 503.5	56.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	72	845	-	-	706	-	-	87
HCM Lane V/C Ratio	1.796	0.021	-	-	0.079	-	-	0.2
HCM Control Delay (s)	\$ 503.5	9.3	0	-	10.5	0	-	56.4
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	11.4	0.1	-	-	0.3	-	-	0.7

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	827	20	13	701	19	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	0	0	2	0	0
Mvmt Flow	899	22	14	762	21	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	921	0	1700	910
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	790	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	750	-	102	336
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	451	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	750	-	99	336
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	437	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	39.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	139	-	-	750	-
HCM Lane V/C Ratio	0.25	-	-	0.019	-
HCM Control Delay (s)	39.3	-	-	9.9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	840	671	0	17	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	2	2	3	3
Mvmt Flow	0	884	706	0	18	45

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	706	0	706
Stage 1	-	-	706
Stage 2	-	-	884
Critical Hdwy	4.16	-	6.23
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	2.254	-	3.327
Pot Cap-1 Maneuver	874	-	434
Stage 1	-	-	488
Stage 2	-	-	402
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	874	-	434
Mov Cap-2 Maneuver	-	-	118
Stage 1	-	-	488
Stage 2	-	-	402

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	874	-	-	-	247
HCM Lane V/C Ratio	-	-	-	-	0.256
HCM Control Delay (s)	0	-	-	-	24.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1

Intersection

Int Delay, s/veh 9.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	693	147	73	584	87	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	0	0	2	0	0
Mvmt Flow	753	160	79	635	95	66

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	913
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	755
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	755
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	105.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	96	372	-	-	755	-
HCM Lane V/C Ratio	0.985	0.178	-	-	0.105	-
HCM Control Delay (s)	168.1	16.8	-	-	10.3	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	5.9	0.6	-	-	0.4	-

MOVEMENT SUMMARY

Site: Milestone Rotary

2023 Build Saturday
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Old South Rd											
3	L2	220	2.0	1.365	189.2	LOS F	72.2	1834.7	1.00	3.77	8.7
8	T1	332	2.0	1.365	185.1	LOS F	72.2	1834.7	1.00	3.77	8.7
18	R2	127	2.0	1.365	185.1	LOS F	72.2	1834.7	1.00	3.77	8.6
Approach		679	2.0	1.365	186.4	LOS F	72.2	1834.7	1.00	3.77	8.7
East: Milestone Rd											
1	L2	105	1.0	0.756	16.6	LOS C	9.5	240.0	0.97	1.11	26.0
6	T1	446	1.0	0.756	12.4	LOS B	9.5	240.0	0.97	1.11	26.0
16	R2	375	1.0	0.559	9.0	LOS A	4.7	118.6	0.83	0.91	26.7
Approach		926	1.0	0.756	11.5	LOS B	9.5	240.0	0.91	1.03	26.3
North: Orange St											
7	L2	279	3.0	0.617	19.2	LOS C	5.1	129.6	0.91	1.11	24.4
4	T1	383	3.0	0.908	30.4	LOS D	14.9	382.7	1.00	1.53	21.6
14	R2	103	3.0	0.908	30.8	LOS D	14.9	382.7	1.00	1.53	21.2
Approach		765	3.0	0.908	26.4	LOS D	14.9	382.7	0.97	1.38	22.5
West: Sparks Ave											
5	L2	48	6.0	1.453	229.5	LOS F	61.9	1621.8	1.00	3.79	7.5
2	T1	301	6.0	1.453	225.4	LOS F	61.9	1621.8	1.00	3.79	7.5
12	R2	172	6.0	1.453	225.4	LOS F	61.9	1621.8	1.00	3.79	7.4
Approach		521	6.0	1.453	225.8	LOS F	61.9	1621.8	1.00	3.79	7.5
All Vehicles		2892	2.7	1.453	95.1	LOS F	72.2	1834.7	0.96	2.26	13.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection

Int Delay, s/veh 7.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	232	45	57	15	21	162
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	4	4
Mvmt Flow	252	49	62	16	23	176

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	78	0	623
Stage 1	-	-	70
Stage 2	-	-	553
Critical Hdwy	4.18	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.272	-	3.536
Pot Cap-1 Maneuver	1483	-	447
Stage 1	-	-	948
Stage 2	-	-	572
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1483	-	369
Mov Cap-2 Maneuver	-	-	369
Stage 1	-	-	948
Stage 2	-	-	472

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	828
HCM Lane V/C Ratio	0.17	-	-	-	0.24
HCM Control Delay (s)	7.9	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.9

Intersection

Int Delay, s/veh 7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	340	98	135	312	122	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	358	103	142	328	128	142

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	461	0	1022	409
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	613	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1095	-	260	640
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	539	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1095	-	219	640
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	453	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	26.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	640	-	-	1095	-
HCM Lane V/C Ratio	0.586	0.222	-	-	0.13	-
HCM Control Delay (s)	42.4	12.2	-	-	8.8	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	3.3	0.8	-	-	0.4	-

Intersection

Intersection Delay, s/veh	29.5											
Intersection LOS	D											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	20	252	250	0	88	234	8	0	272	9	79
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	4	4	4	2	2	2	2
Mvmt Flow	0	21	268	266	0	94	249	9	0	289	10	84
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	40	20.1	24
HCM LOS	E	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	76%	4%	27%	4%
Vol Thru, %	3%	48%	71%	17%
Vol Right, %	22%	48%	2%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	522	330	23
LT Vol	272	20	88	1
Through Vol	9	252	234	4
RT Vol	79	250	8	18
Lane Flow Rate	383	555	351	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.704	0.899	0.633	0.052
Departure Headway (Hd)	6.619	5.831	6.486	7.604
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	544	622	555	468
Service Time	4.671	3.881	4.543	5.702
HCM Lane V/C Ratio	0.704	0.892	0.632	0.051
HCM Control Delay	24	40	20.1	11.1
HCM Lane LOS	C	E	C	B
HCM 95th-tile Q	5.6	11	4.4	0.2

Intersection

Int Delay, s/veh 61.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	560	158	224	608	111	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	60
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	5	5
Mvmt Flow	609	172	243	661	121	283

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	780	1843
Stage 1	-	-	695
Stage 2	-	-	1148
Critical Hdwy	-	4.12	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	-	2.218	3.545
Pot Cap-1 Maneuver	-	837	~ 81
Stage 1	-	-	490
Stage 2	-	-	298
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	837	~ 44
Mov Cap-2 Maneuver	-	-	~ 44
Stage 1	-	-	490
Stage 2	-	-	161

Approach	EB	WB	NB
HCM Control Delay, s	0	3	\$ 313.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	44	437	-	-	837	-
HCM Lane V/C Ratio	2.742	0.647	-	-	0.291	-
HCM Control Delay (s)	\$ 983.4	27.1	-	-	11.1	0
HCM Lane LOS	F	D	-	-	B	A
HCM 95th %tile Q(veh)	13	4.5	-	-	1.2	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	740	64	50	755	51	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	4	4
Mvmt Flow	804	70	54	821	55	58

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	874
Stage 1	-	-	839
Stage 2	-	-	929
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	6.44
Critical Hdwy Stg 2	-	-	6.24
Follow-up Hdwy	-	-	5.44
Pot Cap-1 Maneuver	-	-	2.218
Stage 1	-	-	3.536
Stage 2	-	-	3.336
Platoon blocked, %	-	-	772
Mov Cap-1 Maneuver	-	-	91
Stage 1	-	-	421
Stage 2	-	-	381
Mov Cap-2 Maneuver	-	-	79
Stage 1	-	-	79
Stage 2	-	-	421
	-	-	332

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	109.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	131	-	-	772	-
HCM Lane V/C Ratio	0.863	-	-	0.07	-
HCM Control Delay (s)	109.4	-	-	10	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	5.5	-	-	0.2	-

Intersection

Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	765	21	19	772	25	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	832	23	21	839	27	24

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	854	1723
Stage 1	-	-	843
Stage 2	-	-	880
Critical Hdwy	-	4.13	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.227	3.518
Pot Cap-1 Maneuver	-	781	98
Stage 1	-	-	422
Stage 2	-	-	406
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	781	93
Mov Cap-2 Maneuver	-	-	93
Stage 1	-	-	422
Stage 2	-	-	386

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	43.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	143	-	-	781	-
HCM Lane V/C Ratio	0.357	-	-	0.026	-
HCM Control Delay (s)	43.5	-	-	9.7	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Intersection

Int Delay, s/veh 32.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	675	102	55	683	2	78	2	44	3	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	8	8	8
Mvmt Flow	10	750	113	61	759	2	87	2	49	3	4	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	761	0	0	863	0	0	1715	1710	807	1734	1765	760
Stage 1	-	-	-	-	-	-	827	827	-	882	882	-
Stage 2	-	-	-	-	-	-	888	883	-	852	883	-
Critical Hdwy	4.15	-	-	4.13	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.245	-	-	2.227	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	838	-	-	775	-	-	~ 70	90	378	66	81	396
Stage 1	-	-	-	-	-	-	363	383	-	333	356	-
Stage 2	-	-	-	-	-	-	336	361	-	346	356	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	838	-	-	775	-	-	~ 58	76	378	49	68	396
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 58	76	-	49	68	-
Stage 1	-	-	-	-	-	-	354	374	-	325	308	-
Stage 2	-	-	-	-	-	-	281	312	-	292	347	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.7	\$ 430.2	49
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	83	838	-	-	775	-	-	96
HCM Lane V/C Ratio	1.66	0.012	-	-	0.079	-	-	0.15
HCM Control Delay (s)	\$ 430.2	9.3	0	-	10	0	-	49
HCM Lane LOS	F	A	A	-	B	A	-	E
HCM 95th %tile Q(veh)	11.4	0	-	-	0.3	-	-	0.5

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh	1					
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	659	29	18	686	24	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	3	0	0
Mvmt Flow	716	32	20	746	26	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	748	0	1517	732
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	785	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	870	-	133	424
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	870	-	128	424
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	435	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	31.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	178	-	-	870	-
HCM Lane V/C Ratio	0.244	-	-	0.022	-
HCM Control Delay (s)	31.6	-	-	9.2	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	675	615	0	15	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	3	3	4	4
Mvmt Flow	0	750	683	0	17	99

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	683	0	683
Stage 1	-	-	683
Stage 2	-	-	750
Critical Hdwy	4.14	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.236	-	3.536
Pot Cap-1 Maneuver	901	-	446
Stage 1	-	-	498
Stage 2	-	-	463
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	901	-	446
Mov Cap-2 Maneuver	-	-	146
Stage 1	-	-	498
Stage 2	-	-	463

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	901	-	-	-	344
HCM Lane V/C Ratio	-	-	-	-	0.336
HCM Control Delay (s)	0	-	-	-	20.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Intersection

Int Delay, s/veh 6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	584	106	61	519	96	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	635	115	66	564	104	66

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	750
Stage 1	-	-	692
Stage 2	-	-	697
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	6.4
Critical Hdwy Stg 2	-	-	6.2
Follow-up Hdwy	-	-	5.4
Pot Cap-1 Maneuver	-	-	5.4
Stage 1	-	-	2.2
Stage 2	-	-	3.5
Platoon blocked, %	-	-	3.3
Mov Cap-1 Maneuver	-	-	868
Mov Cap-2 Maneuver	-	-	159
Stage 1	-	-	500
Stage 2	-	-	498
Mov Cap-1 Maneuver	-	-	868
Mov Cap-2 Maneuver	-	-	141
Stage 1	-	-	141
Stage 2	-	-	500
Stage 2	-	-	443

Approach	EB	WB	NB
HCM Control Delay, s	0	1	55.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	141	447	-	-	868	-
HCM Lane V/C Ratio	0.74	0.148	-	-	0.076	-
HCM Control Delay (s)	81.2	14.5	-	-	9.5	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	4.4	0.5	-	-	0.2	-

Intersection

Intersection Delay, s/veh	21.3											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	17	312	246	0	103	236	3	0	247	4	114
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	6	6	6	2	8	8	8	2	4	4	4
Mvmt Flow	0	18	332	262	0	110	251	3	0	263	4	121
Number of Lanes	0	0	1	1	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	19	23	24.5
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	68%	5%	0%	30%	21%
Vol Thru, %	1%	95%	0%	69%	7%
Vol Right, %	31%	0%	100%	1%	72%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	329	246	342	43
LT Vol	247	17	0	103	9
Through Vol	4	312	0	236	3
RT Vol	114	0	246	3	31
Lane Flow Rate	388	350	262	364	46
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.714	0.672	0.449	0.68	0.096
Departure Headway (Hd)	6.617	6.913	6.171	6.73	7.56
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	548	522	584	538	472
Service Time	4.655	4.66	3.917	4.775	5.634
HCM Lane V/C Ratio	0.708	0.67	0.449	0.677	0.097
HCM Control Delay	24.5	22.8	13.9	23	11.4
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	5.8	5	2.3	5.1	0.3

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	611	42	27	725	0	54	0	18	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	7	7	7	13	13	13	0	0	0
Mvmt Flow	6	657	45	29	780	0	58	0	19	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	780	0	0	702	0	0	1530	1530	680	1540	1553	780
Stage 1	-	-	-	-	-	-	692	692	-	838	838	-
Stage 2	-	-	-	-	-	-	838	838	-	702	715	-
Critical Hdwy	4.15	-	-	4.17	-	-	7.23	6.63	6.33	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.263	-	-	3.617	4.117	3.417	3.5	4	3.3
Pot Cap-1 Maneuver	824	-	-	873	-	-	90	111	433	95	114	399
Stage 1	-	-	-	-	-	-	417	429	-	364	384	-
Stage 2	-	-	-	-	-	-	345	367	-	432	438	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	824	-	-	873	-	-	85	103	433	86	106	399
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	218	-	208	222	-
Stage 1	-	-	-	-	-	-	412	424	-	360	361	-
Stage 2	-	-	-	-	-	-	324	345	-	408	433	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	28	14
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	233	824	-	-	873	-	-	399
HCM Lane V/C Ratio	0.332	0.008	-	-	0.033	-	-	0.003
HCM Control Delay (s)	28	9.4	0	-	9.3	0	-	14
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.4	0	-	-	0.1	-	-	0

Intersection

Int Delay, s/veh 0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	597	5	3	732	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	7	0	0
Mvmt Flow	649	5	3	796	3	1

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	654	1454
Stage 1	-	-	652
Stage 2	-	-	802
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	943	145
Stage 1	-	-	522
Stage 2	-	-	445
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	943	144
Mov Cap-2 Maneuver	-	-	284
Stage 1	-	-	522
Stage 2	-	-	442

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	315	-	-	943	-
HCM Lane V/C Ratio	0.014	-	-	0.003	-
HCM Control Delay (s)	16.6	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	598	669	0	21	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	7	7	5	5
Mvmt Flow	0	650	727	0	23	72

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	727	0	1377
Stage 1	-	-	727
Stage 2	-	-	650
Critical Hdwy	4.14	-	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.236	-	3.545
Pot Cap-1 Maneuver	867	-	157
Stage 1	-	-	473
Stage 2	-	-	514
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	867	-	157
Mov Cap-2 Maneuver	-	-	296
Stage 1	-	-	473
Stage 2	-	-	514

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	381
HCM Lane V/C Ratio	-	-	-	-	0.248
HCM Control Delay (s)	0	-	-	-	17.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1

Intersection

Int Delay, s/veh 3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	572	47	29	540	129	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	0	0	7	0	0
Mvmt Flow	622	51	32	587	140	87

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	673	1297
Stage 1	-	-	647
Stage 2	-	-	650
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	927	180
Stage 1	-	-	525
Stage 2	-	-	523
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	927	174
Mov Cap-2 Maneuver	-	-	314
Stage 1	-	-	525
Stage 2	-	-	505

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	314	475	-	-	927	-
HCM Lane V/C Ratio	0.447	0.183	-	-	0.034	-
HCM Control Delay (s)	25.4	14.3	-	-	9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2.2	0.7	-	-	0.1	-

Intersection

Intersection Delay, s/veh	31.5											
Intersection LOS	D											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	35	287	254	0	92	319	24	0	253	6	89
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	6	6	6	2	3	3	3	2	3	3	3
Mvmt Flow	0	38	315	279	0	101	351	26	0	278	7	98
Number of Lanes	0	0	1	1	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	22.7	47.1	29.7
HCM LOS	C	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	73%	11%	0%	21%	29%
Vol Thru, %	2%	89%	0%	73%	2%
Vol Right, %	26%	0%	100%	6%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	348	322	254	435	59
LT Vol	253	35	0	92	17
Through Vol	6	287	0	319	1
RT Vol	89	0	254	24	41
Lane Flow Rate	382	354	279	478	65
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.761	0.728	0.514	0.912	0.15
Departure Headway (Hd)	7.161	7.407	6.631	6.866	8.31
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	505	485	539	526	434
Service Time	5.237	5.198	4.423	4.947	6.31
HCM Lane V/C Ratio	0.756	0.73	0.518	0.909	0.15
HCM Control Delay	29.7	27.7	16.3	47.1	12.8
HCM Lane LOS	D	D	C	E	B
HCM 95th-tile Q	6.6	5.9	2.9	10.8	0.5

Intersection

Int Delay, s/veh 4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	16	789	110	51	674	6	79	1	39	7	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	2	2	2	3	3	3	6	6	6
Mvmt Flow	17	858	120	55	733	7	86	1	42	8	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	739	0	0	977	0	0	1804	1802	917	1821	1859	736
Stage 1	-	-	-	-	-	-	952	952	-	847	847	-
Stage 2	-	-	-	-	-	-	852	850	-	974	1012	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.13	6.53	6.23	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.16	5.56	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.527	4.027	3.327	3.554	4.054	3.354
Pot Cap-1 Maneuver	845	-	-	706	-	-	~ 61	79	328	58	72	412
Stage 1	-	-	-	-	-	-	310	337	-	351	372	-
Stage 2	-	-	-	-	-	-	353	375	-	298	312	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	845	-	-	706	-	-	~ 52	65	328	44	60	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	174	-	130	153	-
Stage 1	-	-	-	-	-	-	296	322	-	335	323	-
Stage 2	-	-	-	-	-	-	299	326	-	247	298	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.7	57.5	23.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	189	845	-	-	706	-	-	211
HCM Lane V/C Ratio	0.684	0.021	-	-	0.079	-	-	0.082
HCM Control Delay (s)	57.5	9.3	0	-	10.5	0	-	23.6
HCM Lane LOS	F	A	A	-	B	A	-	C
HCM 95th %tile Q(veh)	4.2	0.1	-	-	0.3	-	-	0.3

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	827	20	13	701	19	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	0	0	2	0	0
Mvmt Flow	899	22	14	762	21	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	921	0	1700	910
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	790	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	750	-	102	336
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	451	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	750	-	99	336
Mov Cap-2 Maneuver	-	-	-	-	235	-
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	437	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	268	-	-	750	-
HCM Lane V/C Ratio	0.13	-	-	0.019	-
HCM Control Delay (s)	20.4	-	-	9.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	840	671	0	17	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	2	2	3	3
Mvmt Flow	0	884	706	0	18	45

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	706	0	1590
Stage 1	-	-	706
Stage 2	-	-	884
Critical Hdwy	4.16	-	6.43
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.43
Follow-up Hdwy	2.254	-	3.527
Pot Cap-1 Maneuver	874	-	434
Stage 1	-	-	488
Stage 2	-	-	402
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	874	-	434
Mov Cap-2 Maneuver	-	-	254
Stage 1	-	-	488
Stage 2	-	-	402

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	874	-	-	-	361
HCM Lane V/C Ratio	-	-	-	-	0.175
HCM Control Delay (s)	0	-	-	-	17.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Intersection

Int Delay, s/veh 2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	693	147	73	584	87	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	100
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	0	0	2	0	0
Mvmt Flow	753	160	79	635	95	66

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	913
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	755
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	755
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	24.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	236	372	-	-	755	-
HCM Lane V/C Ratio	0.401	0.178	-	-	0.105	-
HCM Control Delay (s)	30.1	16.8	-	-	10.3	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	1.8	0.6	-	-	0.4	-

Intersection

Intersection Delay, s/veh	17.6											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	20	252	250	0	88	234	8	0	272	9	79
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	4	4	4	2	2	2	2
Mvmt Flow	0	21	268	266	0	94	249	9	0	289	10	84
Number of Lanes	0	0	1	1	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	14.8	18.8	21.1
HCM LOS	B	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	76%	7%	0%	27%	4%
Vol Thru, %	3%	93%	0%	71%	17%
Vol Right, %	22%	0%	100%	2%	78%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	272	250	330	23
LT Vol	272	20	0	88	1
Through Vol	9	252	0	234	4
RT Vol	79	0	250	8	18
Lane Flow Rate	383	289	266	351	24
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.667	0.526	0.428	0.611	0.049
Departure Headway (Hd)	6.271	6.539	5.788	6.265	7.2
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	571	547	617	572	500
Service Time	4.352	4.333	3.581	4.358	5.2
HCM Lane V/C Ratio	0.671	0.528	0.431	0.614	0.048
HCM Control Delay	21.1	16.5	12.9	18.8	10.6
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	5	3	2.1	4.1	0.2

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	675	102	55	683	2	78	2	44	3	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	3	3	3	4	4	4	8	8	8
Mvmt Flow	10	750	113	61	759	2	87	2	49	3	4	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	761	0	0	863	0	0	1715	1710	807	1734	1765	760
Stage 1	-	-	-	-	-	-	827	827	-	882	882	-
Stage 2	-	-	-	-	-	-	888	883	-	852	883	-
Critical Hdwy	4.15	-	-	4.13	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.245	-	-	2.227	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	838	-	-	775	-	-	~ 70	90	378	66	81	396
Stage 1	-	-	-	-	-	-	363	383	-	333	356	-
Stage 2	-	-	-	-	-	-	336	361	-	346	356	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	838	-	-	775	-	-	~ 59	76	378	50	68	396
Mov Cap-2 Maneuver	-	-	-	-	-	-	166	187	-	145	166	-
Stage 1	-	-	-	-	-	-	354	374	-	325	308	-
Stage 2	-	-	-	-	-	-	281	312	-	292	347	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.7	50.9	22.8
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	838	-	-	775	-	-	217
HCM Lane V/C Ratio	0.662	0.012	-	-	0.079	-	-	0.067
HCM Control Delay (s)	50.9	9.3	0	-	10	0	-	22.8
HCM Lane LOS	F	A	A	-	B	A	-	C
HCM 95th %tile Q(veh)	4	0	-	-	0.3	-	-	0.2

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	659	29	18	686	24	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	0	0	3	0	0
Mvmt Flow	716	32	20	746	26	17

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	748
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	870
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	870
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	313	-	-	870	-
HCM Lane V/C Ratio	0.139	-	-	0.022	-
HCM Control Delay (s)	18.3	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	675	615	0	15	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	3	3	4	4
Mvmt Flow	0	750	683	0	17	99

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	683	0	683
Stage 1	-	-	683
Stage 2	-	-	750
Critical Hdwy	4.14	-	6.44
Critical Hdwy Stg 1	-	-	5.44
Critical Hdwy Stg 2	-	-	5.44
Follow-up Hdwy	2.236	-	3.536
Pot Cap-1 Maneuver	901	-	446
Stage 1	-	-	498
Stage 2	-	-	463
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	901	-	446
Mov Cap-2 Maneuver	-	-	286
Stage 1	-	-	498
Stage 2	-	-	463

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	901	-	-	-	413
HCM Lane V/C Ratio	-	-	-	-	0.28
HCM Control Delay (s)	0	-	-	-	17.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.1

Intersection

Int Delay, s/veh 2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	584	106	61	519	96	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	635	115	66	564	104	66

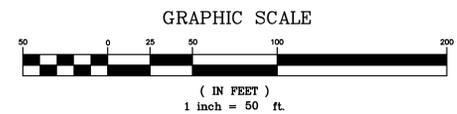
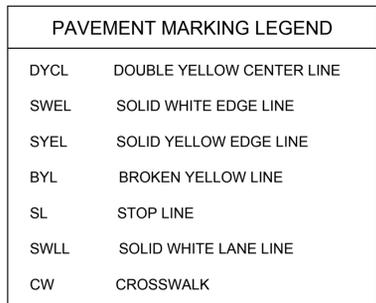
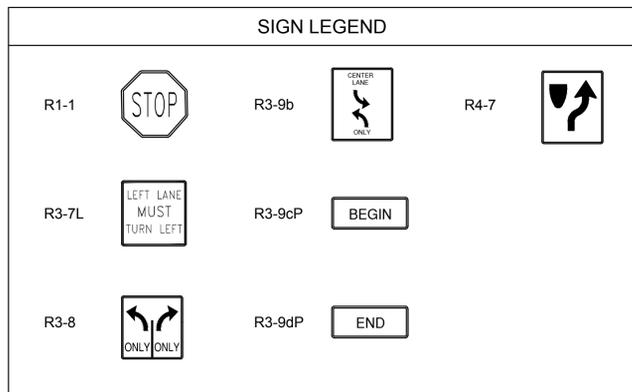
Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	750	1389
Stage 1	-	-	692
Stage 2	-	-	697
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	868	159
Stage 1	-	-	500
Stage 2	-	-	498
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	868	147
Mov Cap-2 Maneuver	-	-	286
Stage 1	-	-	500
Stage 2	-	-	460

Approach	EB	WB	NB
HCM Control Delay, s	0	1	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	286	447	-	-	868	-
HCM Lane V/C Ratio	0.365	0.148	-	-	0.076	-
HCM Control Delay (s)	24.6	14.5	-	-	9.5	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.6	0.5	-	-	0.2	-

Old South Road Conceptual Improvement Plan





REV. #	DESCRIPTION	DATE
<p>Ron Müller & Associates Traffic Engineering and Consulting Services 56 TERESA ROAD, HOPKINTON, MA, 01748 P. (508)395-1576 F. (508)433-2481</p>		
<p>PROPOSED CENTER TURN LANE OLD SOUTH ROAD NANTUCKET, MASSACHUSETTS</p>		
<p>CONCEPTUAL IMPROVEMENT PLAN</p>		
DATE:	8/18/16	FIGURE 1



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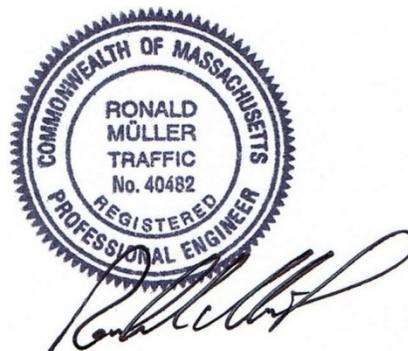
Traffic Impact and Access Study

Old South Road Mixed-Use Development Nantucket, Massachusetts

Prepared for:

Richmond Great Point Development LLC
20 Davkim Lane
Nantucket, MA 02554

August 26, 2016



Quality



Accuracy



Integrity





Traffic Impact and Access Study

To: Richmond Great Point
Development LLC
20 Davkim Lane
Nantucket, MA 02554

Reg: Old South Road
Mixed Use Development
Nantucket, MA

From: Ron Müller, P.E., Principal

Date: August 26, 2016
Project #: 12015

INTRODUCTION

Ron Müller & Associates (RMA) has conducted this Traffic Impact and Access Study (TIAS) to evaluate the traffic impacts of a mixed-use development project proposed by Richmond Great Point Development LLC (the ‘Project Proponent’) on approximately 35 acres of contiguous property located on the south side of Old South Road generally between Lover’s Lane and Daffodil Lane. The proposed development is comprised of a combination of 100 single-family homes, 225 apartment units, and approximately 15,500 square feet of retail and restaurant space (the ‘Project’).

Vehicular access to and from the Project is proposed via a (new) primary access road connecting to Old South Road to be located east of Goldfinch Drive (West), a (new) driveway connecting to Old South Road, primarily intended to serve the proposed retail space, and located further west of Goldfinch Drive (West), and a (new) driveway connecting to Lover’s Lane, that will also primarily serve the proposed retail space. The primary access road and site driveways will all be interconnected to allow travel through and between the various components of the Project, although it is expected that all of the residential units will be accessed via the (new) primary access road. The existing ‘extension’ of Greglen Avenue (which was not plotted or approved as a road, but was constructed by the prior owner of the properties and has been utilized as a means of providing vehicular access to Old South Road for several decades) will be terminated / eliminated between Old South Road and Nancy Ann Lane, once the (new) primary access road is constructed and other portions of Nancy Ann Lane have been relocated and incorporated into the new vehicular circulation system as part of the Project. The Project location in relation to the surrounding street network is shown on Figure 1.



Ron Müller & Associates

Traffic Engineering and Consulting Services

Figure 1
Site Location and Study Area Map



EXECUTIVE SUMMARY

This study provides an estimate of the expected traffic generation of the Project, evaluates the safety and capacity impacts of that traffic at the site's primary access road, at the site driveways, and on adjacent streets, and determines the necessity for and recommends appropriate improvements / mitigation to the area roadway system to improve traffic conditions.

This study was prepared in conformance with the Massachusetts Environmental Policy Act (MEPA) regulations and Massachusetts Department of Transportation (MassDOT) standards. Aspects of the scope and certain criteria for the study were also established in consultation between RMA staff and the transportation and planning staff of the Town of Nantucket Planning & Land Use Services (PLUS) Department.

- As further described in this study, the Project is expected to generate approximately 210, 293, and 277 new peak hour vehicle trips during the weekday AM peak hour, weekday PM peak hour, and Saturday midday peak hour, respectively, to the adjacent streets (new trips are comprised / defined as total trips after deducting "pass-by" trips that will already be traveling on the local street network, the methodology and calculations for which are documented in detail in the balance of this study).
- Once distributed onto the local roadway network, traffic generated by the Project is expected to increase peak hour volumes on Old South Road in the immediate vicinity of the Project site by a maximum of 198 new trips (during the weekday PM peak hour) or by +/- 14 percent compared to the year 2023 design horizon No-Build volumes.
- As traffic generated by the Project distributes onto the available access routes to and from the west of the site (to and from the Downtown area), peak hour traffic volumes at the Milestone Rotary at the western end of the Old South Road corridor are expected to increase by a maximum of 154 new trips (during the weekday PM peak hour) or by +/- 6 percent compared to the year 2023 design horizon No-Build volumes.
- As traffic generated by the Project distributes to and from the east (to and from the airport area), peak hour traffic volumes at the Macy's Lane (Airport Road) intersection with Old South Road are expected to increase by a maximum 93 new trips (during the weekday PM peak hour) or by +/- 7 percent, compared to the year 2023 design horizon No-Build volumes.

The impacts of these additional volumes (reflected as the decreases in current levels of service and increases in delays experienced by vehicles being driven through these roadway segments and intersections) will be mitigated / improved by the series of traffic improvements that are recommended and described in the balance of this study, to the point where traffic conditions, in almost all cases, will actually be better than those which are experienced under current conditions. This mitigation will include a combination of traffic improvements specifically

funded and constructed by the Project Proponent in conjunction with the development of the Project, as well as those that are already planned and anticipated to be constructed by the Town of Nantucket.

Sight distance analysis at the proposed (new) primary access road and the (new) site driveways indicates that the available sight lines exceed both minimum requirements and desirable distances, such that safe operation can therefore be expected. It is recommended that any proposed landscaping or obstructions in the vicinity of the access road and driveways be set back sufficiently so as not to impede sight distances for drivers exiting the site. It is recommended that the (new) primary access road be constructed providing two exiting lanes and one entering lane, separated by a raised median. The exiting lanes should be under STOP-sign control. The (new) retail driveways connecting to Old South Road and to Lover's Lane should be constructed providing one exiting lane (under STOP-sign control) and one entering lane, separated by a double yellow centerline.

Analysis of future traffic conditions (projected out to a seven-year design horizon to 2023, assuming that the entire Project has been developed and occupied at that time) anticipates that many of the nine (9) individual local intersections in the vicinity of the Project site that were analyzed for the study will operate at level of service (LOS) F by the year 2023 during all three peak hours (AM, PM, and Saturday midday), with or without any additional traffic generated by the Project.

However, several of the nine (9) intersections in the vicinity of the Project site will operate at level of service (LOS) F or at volume-to-capacity (v/c) ratios above 1.0 by the year 2023 specifically as a result of traffic generated by the Project. Accordingly, specific traffic improvements are recommended to be funded and constructed by the Project Proponent in conjunction with the development of the Project to mitigate those impacts. These include improvements to the Old South Road intersections with Lover's Lane, along the segment of Old South Road along and between the (new) retail driveway and the (new) primary access road, to and / or through the vicinity of the Goldfinch Drive (West) intersection, which serves as the exit road from the Naushop residential community on Old South Road, and at the intersection of Old South Road and Macy's Lane (Airport Road).

It is therefore recommended that Old South Road be widened to construct a two-way center-left-turn lane, extending +/- 1,500 feet in length from a point west of Lover's Lane to a point east of the (new) primary access road serving the Project. Construction of this center-left-turn lane will allow acceptable operating conditions at all of these locations as well as the many other driveways on both the north and south sides of this section of Old South Road, including Nantucket Seafood, the Nantucket Emporium, the cluster of existing retail uses owned by the Project Proponent near the intersection of Old South Road and Lover's Lane, and at the driveways providing access to and from the Valero & Sons Garden Center property.

As previously referenced, the existing "extension" of Greglen Avenue (which was not plotted or approved as a road, but was constructed by the prior owner of the surrounding properties and has

been utilized as a means of providing vehicular access to Old South Road for several decades) will also be terminated / eliminated between Old South Road and Nancy Ann Lane once the (new) primary access road is constructed. This will have a significant traffic safety and vehicle capacity benefit along this segment of Old South Road by eliminating the existing conflict that is created by the offset intersection that is currently formed by this “extension” of Greglen Avenue and Goldfinch Drive (West as they intersect with Old South Road).

Project traffic will also have a measurable impact at the Old South Road and Macy’s Lane (Airport Road) intersection during all peak hours (weekday AM, weekday PM, and Saturday midday). To mitigate these impacts, it is recommended that a +/- 250-foot long portion of Old South Road be widened to provide a two-lane approach on Old South Road, heading eastbound (toward Nantucket Municipal Airport) with a shared left/through lane and an exclusive right-turn lane. The ability to widen Old South Road in this area is subject to confirmation by an engineering survey. However, sufficient width appears to exist within the Old South Road right of way to accommodate this additional lane. With these improvements, the eastbound approach of this intersection improves substantially, from LOS F to D or better during all peak hours.

EXISTING CONDITIONS

Scope and Study Area Locations

Evaluation of the traffic impacts associated with the proposed Project requires an evaluation of existing and projected traffic volumes, the volume of traffic expected to be generated by the Project, and the impact that this traffic will have on the adjacent streets. Based on industry-standard methodology and in consultation with the transportation and planning staff of the Town of Nantucket Planning & Land Use Services (PLUS) Department, it was determined that the following nine (9) local intersections should be specifically analyzed and evaluated:

- Old South Road at Sparks Avenue, Milestone Road, and Orange Street (at the location where these road segments form the Milestone Rotary)
- Old South Road at Fairgrounds Road
- Old South Road at Amelia Drive
- Old South Road at Young's Way
- Old South Road at Lover's Lane and the Nantucket Seafood Driveway
- Old South Road at Goldfinch Drive (West) and the "extension" of Greglen Avenue
- Old South Road at Macy's Lane (Airport Road)
- Old South Road at Nobadeer Farm Road
- Milestone Road at Nobadeer Farm Road

Based on the anticipated traffic generation, as further documented in this study, the Project is expected to have a minimal effect on traffic operations beyond the geographic area comprising this study area. The nine (9) individual study area locations are shown on Figure 1.

Existing Traffic Volumes

Traffic volume information along Old South Road was obtained from the Town of Nantucket PLUS Department, as well as manual turning movement and vehicle classification counts collected by a traffic data collection firm in July of 2014 (during the "peak" local summer visitor and population period) at all nine (9) study area intersections. These counts were conducted during the weekday AM peak period (8:00 to 11:00 AM), the weekday PM peak period (3:00 to 6:00 PM), and the Saturday midday peak period (11:00 AM to 2:00 PM) and are provided in the Appendix. The traffic count data indicate that the weekday AM peak hour generally occurs from 8:15 to 9:15 AM, the weekday PM peak hour from 4:15 to 5:15 PM, and the Saturday peak hour from 11:00 AM to 12:00 PM. However, the actual peak hours observed at the individual intersections were used in this study, in order to present a more conservative analytical scenario.

To determine whether the 2014 traffic count data still represent current (2016) volume conditions, historical traffic data provided by the Town of Nantucket PLUS Department were reviewed. The results from 10 years of traffic counts taken on Old South Road east of

Fairgrounds Road confirmed that traffic has stayed fairly consistent over the past 10 years at an average rate of 0.41 percent per year. In addition, manual turning movement counts were collected by the Town of Nantucket PLUS Department at the Milestone Rotary and at the Old South Road and Fairgrounds Road intersection in August 2015. These counts were compared with the 2014 traffic count data in order to determine whether traffic has changed in a statistically meaningful way since these respective traffic counts were taken. A comparison of these traffic counts is provided in Table 1.

Table 1
Historical Volume Comparison

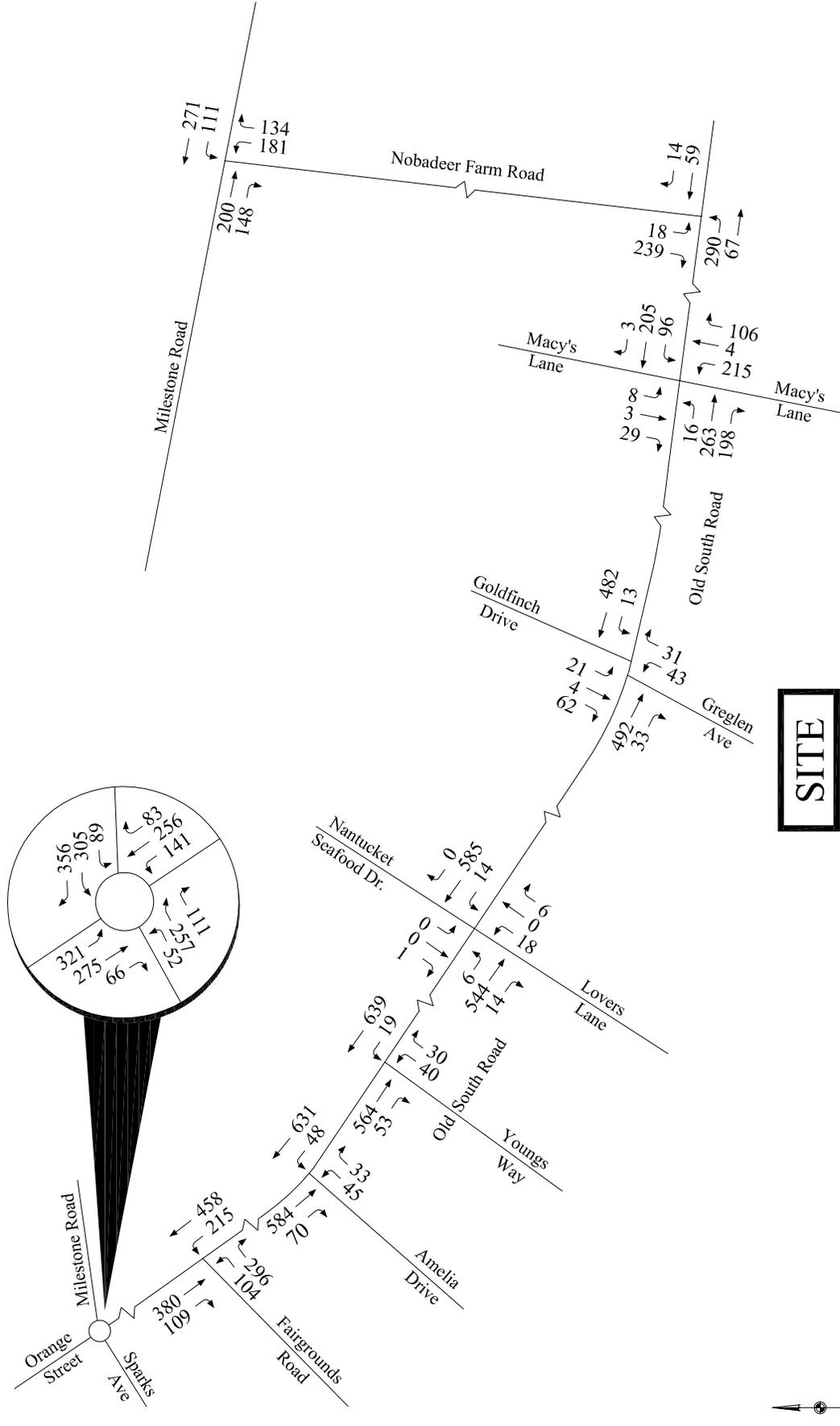
Location	2014 Counts ^a	2015 Counts ^a	Percent Change
Milestone Rotary			
AM Peak Hour	2,239	2,312	+3.3%
PM Peak Hour	2,374	2,369	-0.2%
Old South Road at Fairgrounds Road			
AM Peak Hour	1,598	1,562	-2.3%
PM Peak Hour	1,713	1,636	-4.5%
Total Both Intersections:	7,923	7,879	-0.6%

^a In vehicles per hour. Volumes represent total intersection entering volumes.

As shown, overall traffic volumes have not changed in a statistically meaningful way between the dates of the 2014 and 2015 counts. It is therefore reasonable to conclude that the July 2014 traffic counts are still valid and still represent current traffic volume conditions within the study area. As the Town of Nantucket PLUS Department traffic counts are more recent, these counts were used as the basis for the existing condition traffic volumes in this study. All traffic count data are provided in the Appendix.

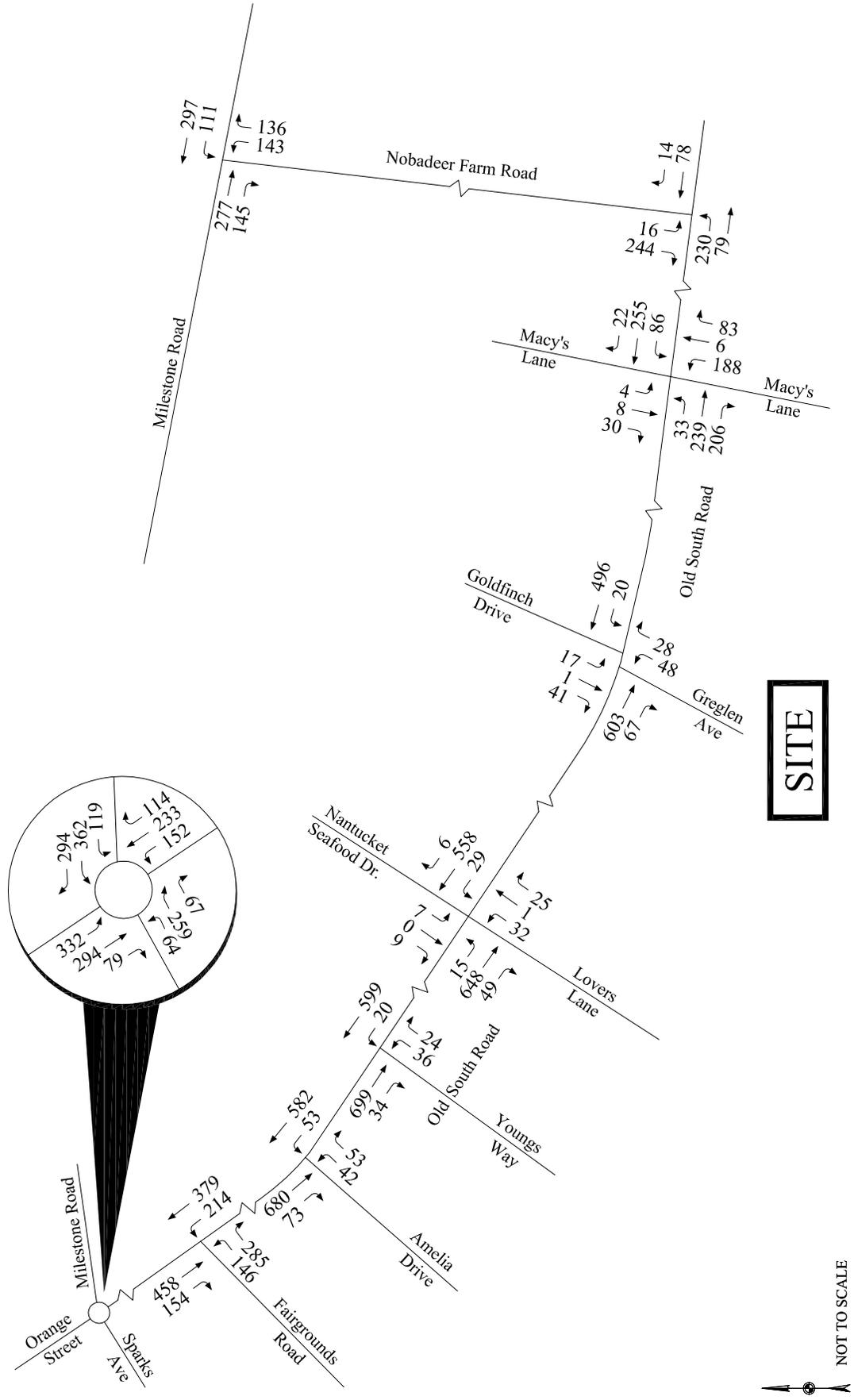
Based on discussions with Town of Nantucket PLUS Department staff, it was confirmed that the months of July and August represent peak-month traffic volume conditions. Therefore, no additional seasonal adjustments were made to the collected data. A summary of the traffic counts on Old South Road is provided in Table 2 and the 2016 Existing peak hour traffic flow networks are shown graphically on Figures 2 through 4.

Figure 2
 2016 Existing Weekday AM
 Peak Hour Traffic Volumes



NOT TO SCALE

Figure 3
 2016 Existing Weekday PM
 Peak Hour Traffic Volumes



NOT TO SCALE

Figure 4
 2016 Existing Saturday
 Peak Hour Traffic Volumes

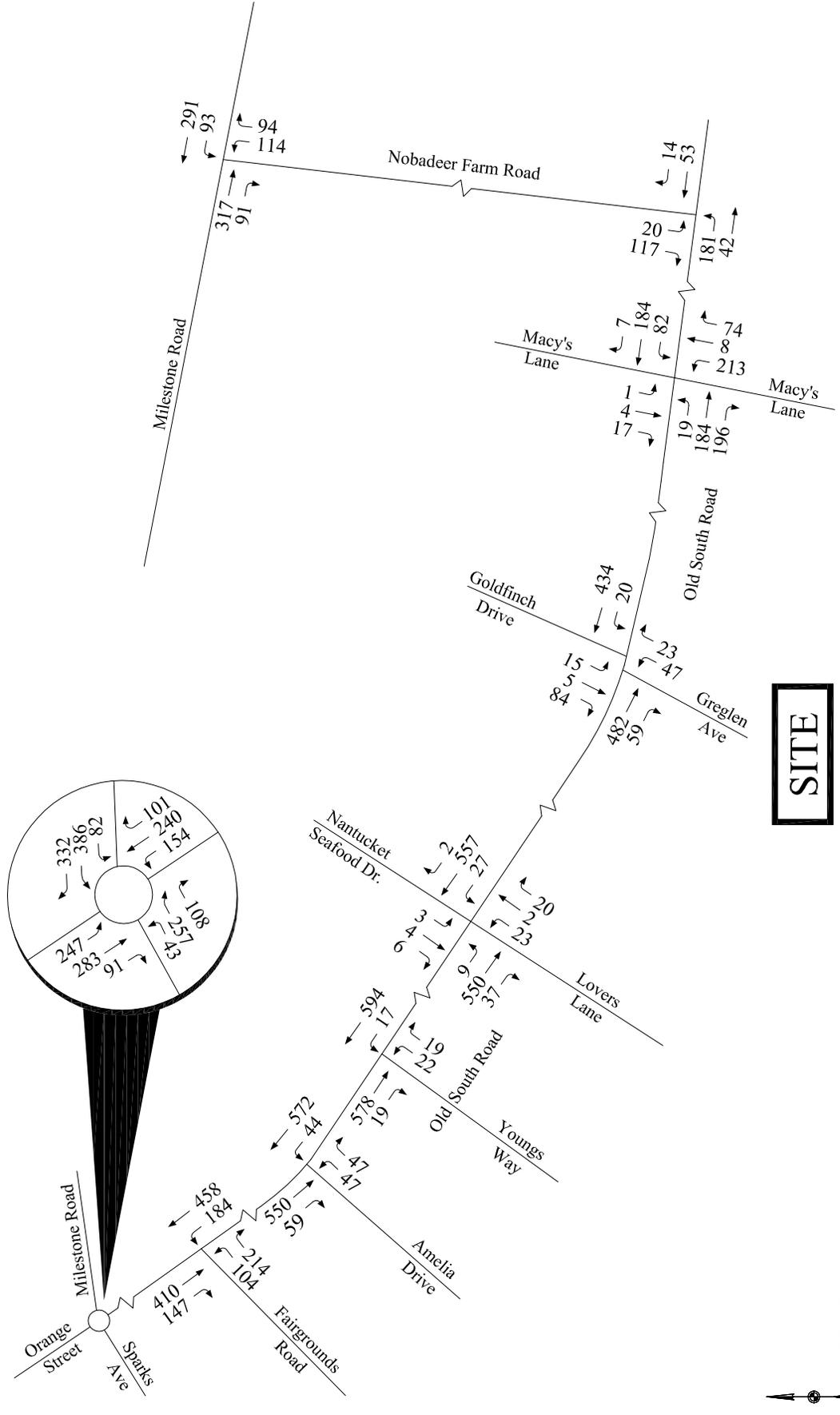


Table 2
Existing Peak Month Traffic Volume Summary

Location	Daily Volume ^a	Peak Hour Volume ^b	K-Factor ^c	Directional Distribution ^d
Old South Road adjacent to the site:				
Weekday	15,970	AM: 1,149 PM: 1,273	7.2% 8.0%	52% WB 53% EB
Saturday	14,840	Midday: 1,159	7.8%	51% WB

^a In vehicles per day. Daily volumes obtained from Nantucket PLUS Department for Old South Road east of Fairgrounds Road.

^b In vehicles per hour.

^c Percentage of daily traffic occurring during the peak hour.

^d EB = Eastbound; WB = Westbound.

Vehicle Accident History

Vehicle accident data for the nine (9) study area intersections were obtained from MassDOT for the period between 2012 and 2014, the latest three years of available data. A summary of the MassDOT accident data is provided in Table 3. In addition to the summary, accident occurrence should also be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the accident rate was calculated for the intersections and compared with the statewide and district-wide averages. An intersection accident rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). For unsignalized intersections, both the statewide and district-wide (District 5) average accident rate is 0.58 acc/mev. A comparison of the calculated accident rate to the statewide and district-wide averages can be used to establish the significance of accident occurrence and whether or not potential safety problems exist. The crash rate worksheets are provided in the Appendix.

As shown in Table 3, the Milestone Rotary, the Old South Road and Fairgrounds Road intersection, and the Milestone Road and Nobadeer Farm Road intersection experienced the highest number of accidents among the nine (9) study area intersections over the three year analysis period, with an average of approximately two to three accidents per year. However, the calculated crash rates are lower than the statewide and district-wide average and no particular trends are apparent in accident occurrence. All other study intersections experienced far fewer accidents with crash rates well below the state average. Given the low calculated crash rates, there are no particular trends or concerns apparent in accident incidence within the study area. It should be pointed out that nearly 70 percent of all accidents occurred during the summer months of June, July, and August, which is expected given the surge in traffic during these peak seasonal months.

Table 3
Accident Summary

Location	Number of Accidents			Severity ^a			Accident Type ^b						% During Wet/Icy Conditions
	Total	Avg./Year	Accident Rate ^c	PD	PI	F	CM	RE	HO	FO	Ped	Other	
Milestone Rotary	9	3.0	0.28	5	4	0	1	6	0	0	2	0	0%
Old South Road at Farigrounds Road	10	3.3	0.45	5	5	0	1	8	0	0	1	0	33%
Old South Road at Amelia Drive	3	1.0	0.15	2	1	0	0	2	0	0	0	1	0%
Old South Road at Young's Way	0	0.0	0.00	0	0	0	0	0	0	0	0	0	0%
Old South Road at Lover's Lane	1	0.3	0.05	0	1	0	0	1	0	0	0	0	100%
Old South Road at Goldfinch/Greglen	3	1.0	0.17	2	1	0	2	0	1	0	0	0	0%
Old South Road at Macy's Lane	0	0.0	0.00	0	0	0	0	0	0	0	0	0	0%
Old South Road at Nobadeer Farm	1	0.3	0.11	1	0	0	0	1	0	0	0	0	0%
Milestone Road at Nobadeer Farm	7	2.3	0.47	4	3	0	2	1	1	0	1	2	14%

Source: MassDOT Traffic Operations Safety Management System – 2012 through 2014 data.

^a PD = property damage only; PI = personal injury; F = fatality.

^b CM = cross movement/angle; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian or bicyclist.

^c Measured in accidents per million entering vehicles.

Vehicle Speeds

Vehicle speed measurements were conducted along Old South Road adjacent to the Project site to determine the minimum sight distance requirements as discussed further below. Vehicle speeds were recorded by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints and the speed is derived by dividing the elapsed time into the measured distance between checkpoints. The results of the vehicle speed measurements are summarized in Table 4 and the vehicle speed data are provided in the Appendix.

Table 4
Observed Travel Speeds ^a

<u>Location/Direction</u>	<u>Posted Speed Limit</u>	<u>Average Speed</u>	<u>85th Percentile Speed ^b</u>
Old South Road			
Eastbound	35	36	40
Westbound	35	35	38

^a In miles per hour (mph).

^b Speed at, or below which 85 percent of all observed vehicles travel.

As shown, the recorded average speeds are consistent with the posted speed limit, while 85th percentile speeds are approximately 5 miles per hour faster than the posted limit. These higher speeds were used as the basis for determining minimum sight distance requirements, as discussed below.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveways and the (new) primary access road to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)¹. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The MassDOT and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessment.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

¹A *Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *“If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.”* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveways on Old South Road and on Lover’s Lane and at the (new) primary access road were measured and compared to minimum requirements as established by AASHTO. Since the requirements are based on the speed of traffic on the adjacent street, the 85th percentile speeds as shown in Table 4 were used for this purpose. The required minimum sight distances for these speeds are compared to the available distances, as shown in Table 5.

Table 5
Sight Distance Summary

Direction	Intersection Sight Distance (feet)		
	Measured	Minimum Required ^a	Desirable ^b
Old South Road at Main Site Driveway			
East of Intersection	500+	305	390
West of Intersection	500+	305	390
Old South Road at Retail Driveway			
East of Intersection	500+	305	390
West of Intersection	445	305	390
Lover's Lane at Site Driveway			
North of Intersection	300	155	280
South of Intersection	300+	155	280

^a Values based on AASHTO SSD requirements for 85th percentile speeds on Old South Road of 40 mph and an assumed speed of 25 mph on Lover's Lane.

^b Values based on AASHTO ISD requirements for posted speed limit of 35 mph on Old South Road and an assumed speed limit on Lover's Lane of 25 mph.

As shown in the table, ample sight distances exist at all proposed site driveway locations and at the (new) primary access road, exceeding minimum requirements as well as desirable distances, and safe operation can therefore be expected. At the proposed retail driveway, the sight distance for drivers looking west, toward Fairgrounds Road, is limited by the existing topography of Old South Road. To more specifically assess the available sight distance in this direction, as shown in Table 5, a sight line plan and profile was prepared, which confirms that this sight distance in this direction exceeds the stated requirements. This plan is provided in the Appendix. It is recommended, however, that any proposed landscaping, signs, or any other obstructions in the vicinity of the driveways be set back outside the sight triangles (as defined by AASHTO) so as not to impede sight distances for drivers in vehicles exiting the site.

FUTURE TRAFFIC CONDITIONS

Future traffic conditions within the study area were projected out to the year 2023, representing a seven (7) year design horizon consistent with state guidelines for traffic impact assessment. To project traffic conditions within this design horizon, two distinct components of future traffic growth were included. First, an annual traffic growth rate was determined to account for additional traffic that will be generated as a result of general population growth as well as by smaller development projects that may impact traffic within the study area. Based on historical traffic volume data on Old South Road supplied by the Town of Nantucket PLUS Department for the period 2007 through 2016, traffic volumes have remained fairly consistent over the years. A summary of the historical count data is provided in the Appendix. These data show an average growth in traffic of 0.41 percent per year over this ten year period. However, given that this trend may not continue into the future and based on discussions with Town of Nantucket PLUS Department staff, a one percent (1.00%) per year traffic growth rate was used in this study, to ensure a more conservative analytical methodology.

Second, any planned or approved specific development projects in the area that would be expected to generate a statistically meaningful volume of traffic on study area roadways within the seven (7) year design horizon period were investigated. Based on discussions with Town of Nantucket PLUS Department staff, traffic to be generated by the following specific development projects were calculated and included in the traffic projections:

1. **Stop & Shop Supermarket Redevelopment (31 Sparks Avenue)** - although this project was completed and occupied in May of 2015, the traffic generated by this project was not included when the traffic counts utilized for this study were collected. Accordingly, the projected traffic volumes to be added through the study intersections as a result of this project were taken from the traffic study² conducted for this project.
2. **Nantucket Emporium (54 Old South Road)** - since collection of the traffic count data, this property has been redeveloped from 12,100 square feet of retail space to a combination of 1,700 square feet of retail, 2,350 square feet of office, and 7,750 square feet of self storage space. Based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*,³ the traffic generation of the current uses on the site are less than the prior use. However, to present a more conservative analytical methodology, no reduction in traffic was assumed from redevelopment of this site.
3. **John Reedy Trust Project (21 Old South Road)** - the currently vacant parcel is proposed be developed with 4,900 square feet of grocery store space and one apartment unit. The traffic to be generated by this project was estimated using the ITE *Trip Generation Manual* for Land Use Code 850 (Supermarket) and assigned to the roadway

² *Traffic Impact and Access Study, Proposed Stop & Shop Redevelopment, Nantucket, MA*; prepared for The Stop & Shop Supermarket Company; prepared by VHB, Inc.; January 2014.

³ *Trip Generation Manual, 9th Edition*; Institute of Transportation Engineers; Washington, DC, 2012.

network based on the retail and residential trip distribution patterns described later in this study.

4. **EZIA Athletic Club (86-88 Old South Road)** - the currently vacant parcel is proposed to be developed with a 21,700 square foot health/fitness club. The traffic to be generated by this project was estimated using the ITE *Trip Generation Manual* for Land Use Code 492 (Health/Fitness Club) and assigned to the roadway network based on the retail trip distribution pattern described later in this study.
5. **Shepley Wood Products, Inc. Development (6-8 Lovers Lane)** - the existing single family home site is being redeveloped into a 7,500 square foot lumber yard. The traffic to be generated by this project was estimated using the ITE *Trip Generation Manual* for Land Use Code 812 (Building Materials and Lumber Store) and assigned to the roadway network based on the retail trip distribution pattern described later in this study. No trip reduction was assumed for the elimination of the existing residential home.
6. **Richmond Great Point Development LLC Residential Development (1-3-5 Greglen Avenue and 11-13 Greglen Avenue)** - the six existing single family homes on these properties are being redeveloped into 28 apartment units and 8 condominium units (comprised of 4 duplex units). The traffic to be generated by this project was estimated using the ITE *Trip Generation Manual* for Land Use Code 220 (Apartment) and assigned to the roadway network based on the residential trip distribution pattern described later in this study. No trip reduction was assumed for the elimination of the existing occupied residential homes. (It is noted that the properties upon which the 8 condominium units are being developed, the 11-13 Greglen Avenue properties, have since been sold by Richmond Great Point Development LLC to individual buyers who are developing the properties for these uses).

The trip-generation worksheets and assignment of the specific traffic volumes that are expected to be generated from these development projects are detailed in the Appendix.

Previously Planned Study Area Roadway / Intersection Improvements

The Milestone Rotary: This rotary / intersection is proposed to be reconfigured by the Town of Nantucket to create a modern roundabout. The current approaches to the rotary do not provide sufficient deflection and allow higher than desired entry speeds, and do not provide adequate pedestrian and bicycle crossings. The Sparks Avenue and Old South Road approaches provide only single approach lanes that are not adequate to accommodate the existing or projected level of traffic. There are also access and parking conflicts, particularly in the southwest corner of the rotary between Old South Road and Sparks Avenue. The Town of Nantucket commissioned a study⁴ of this rotary / intersection to evaluate improvements. The initial plan is to add a

⁴ *Roundabout Implementatioin Report, Milestone Rotary*; prepared for NP&EDC; prepared by Ourston Roundabout Engineering; September 2006.

pedestrian crossing across the Milestone Road approach to improve pedestrian safety. The ultimate plan is to reconfigure the rotary to provide adequate deflection to reduce entry speeds, provide two lanes of traffic on every approach, provide safe pedestrian/bicycle crossings across all four approaches, and eliminate the access conflicts by controlling site access to the property in the southwest corner. Based on discussions with Town of Nantucket PLUS Department staff, these improvements are not expected to be implemented by the 2023 design year horizon and, accordingly, were not assumed to be completed within the design horizon of this study.

The Old South Road and Fairgrounds Road Intersection: This intersection is proposed to be modified by the Town of Nantucket into a modern roundabout. The existing STOP-sign controlled intersection is under significant capacity constraints due to the current volume of traffic on both roads, resulting in long delays and queues on the Fairgrounds Road approach, which currently operates at a level F. The Town of Nantucket has appropriated capital funds in Fiscal Year 2018 for the design of improvements that would replace the existing T-type intersection with a modern roundabout with single-lane approaches. Based on a study⁵ commissioned by the Town in 2006, these improvements would allow the intersection to operate at level C or better during all peak hours. As no time-frame has been established yet for construction of the improvements, they are not assumed to be completed by the 2023 design year horizon of this study.

Old South Road Corridor Improvements: Modifications in this area are contemplated to be made in the near future by the Town of Nantucket, including multi-modal access and congestion improvements. The Town of Nantucket Planning and Economic Development Commission (NP&EDC) will be initiating a study of the Old South Road corridor this coming winter in order to develop and evaluate various design alternatives. For the purpose of this study, no corridor improvements are assumed to be implemented by the 2023 design year horizon.

No-Build Traffic Conditions (Without the Project)

As described above, the 2023 year No-Build traffic volume networks were developed by applying a compounded one percent (1.00%) annual growth rate (equal a 7.2 percent increase over seven years) to the existing volumes, as well as by adding the traffic that is expected to be generated by the six (6) individual above-mentioned development projects. The 2023 No-Build peak-hour traffic-flow networks are shown on Figures 5 through 7.

Project Trip Generation

The proposed Project will consist of a combination of 225 apartment units, 100 single family homes, and approximately 15,500 square feet of retail and quality restaurant space. The traffic to be generated by the residential portion of the Project was estimated based on the ITE *Trip*

⁵ *Technical Memorandum, Alternative Traffic Control Analysis, Surfside Road and Old South Road at Fairgrounds Road, Nantucket, MA*; prepared for NP&EDC; prepared by Greenman-Pedersen, Inc.; September 12, 2006.

Figure 5
 2023 No-Build Weekday AM
 Peak Hour Traffic Volumes

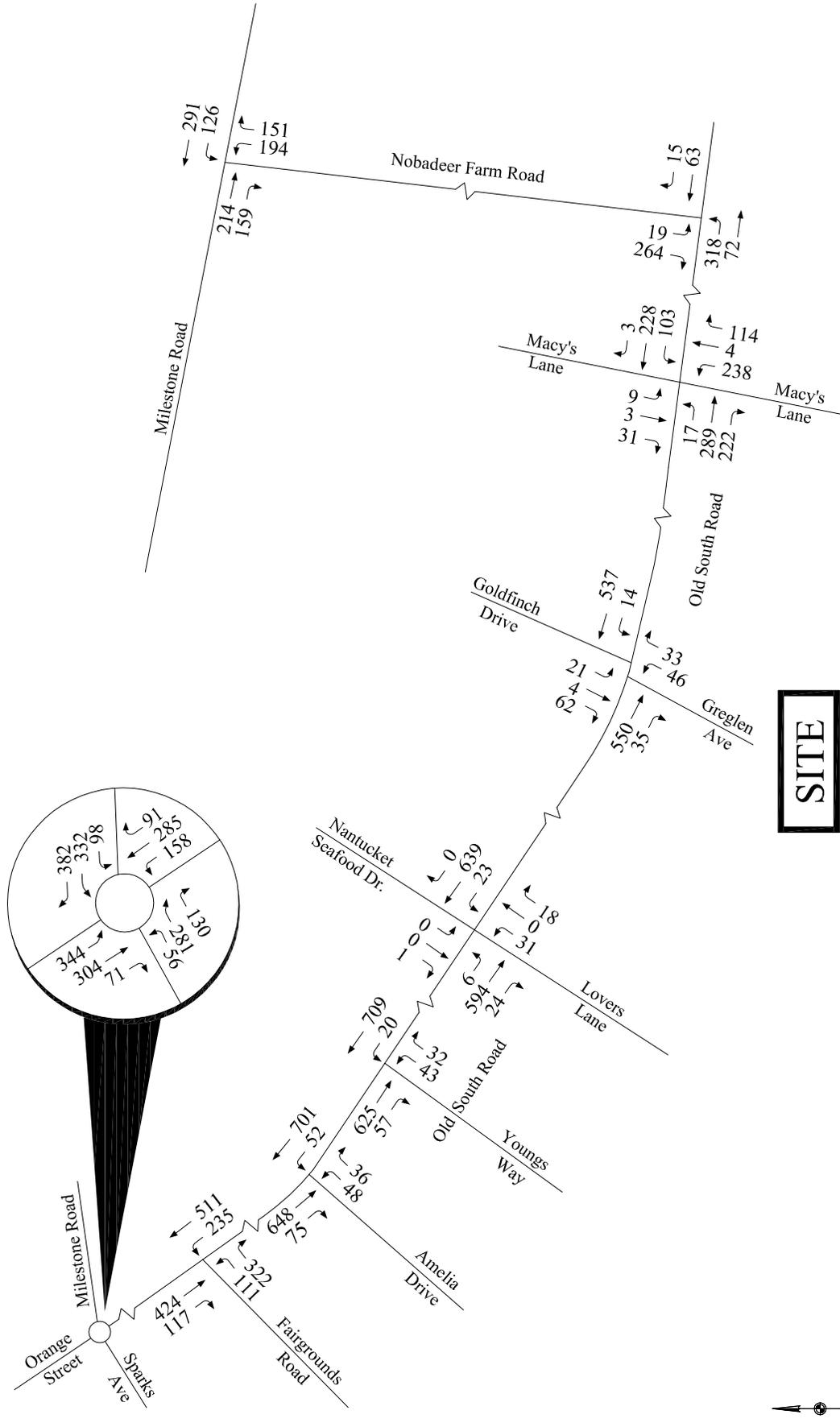


Figure 6
 2023 No-Build Weekday PM
 Peak Hour Traffic Volumes

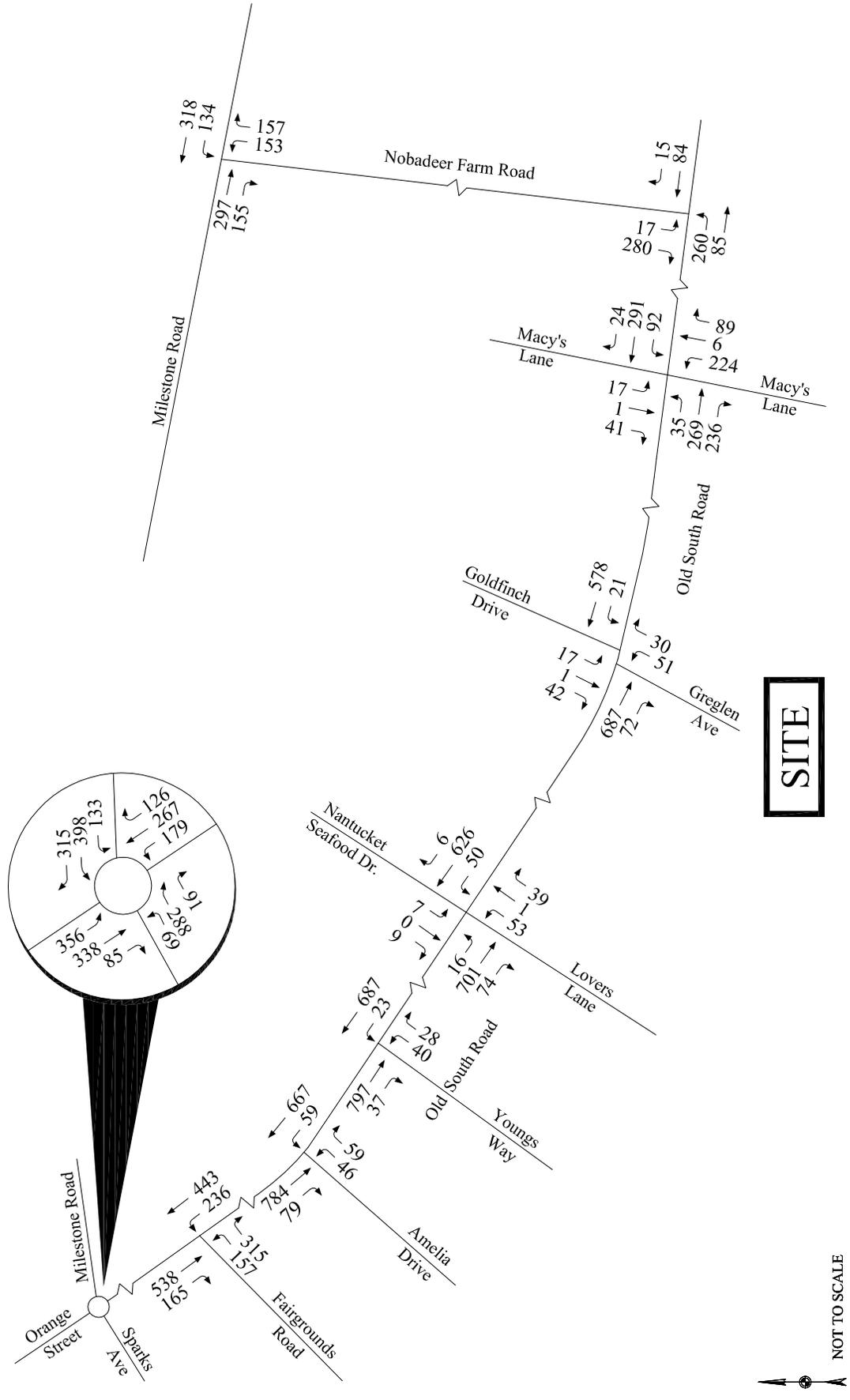
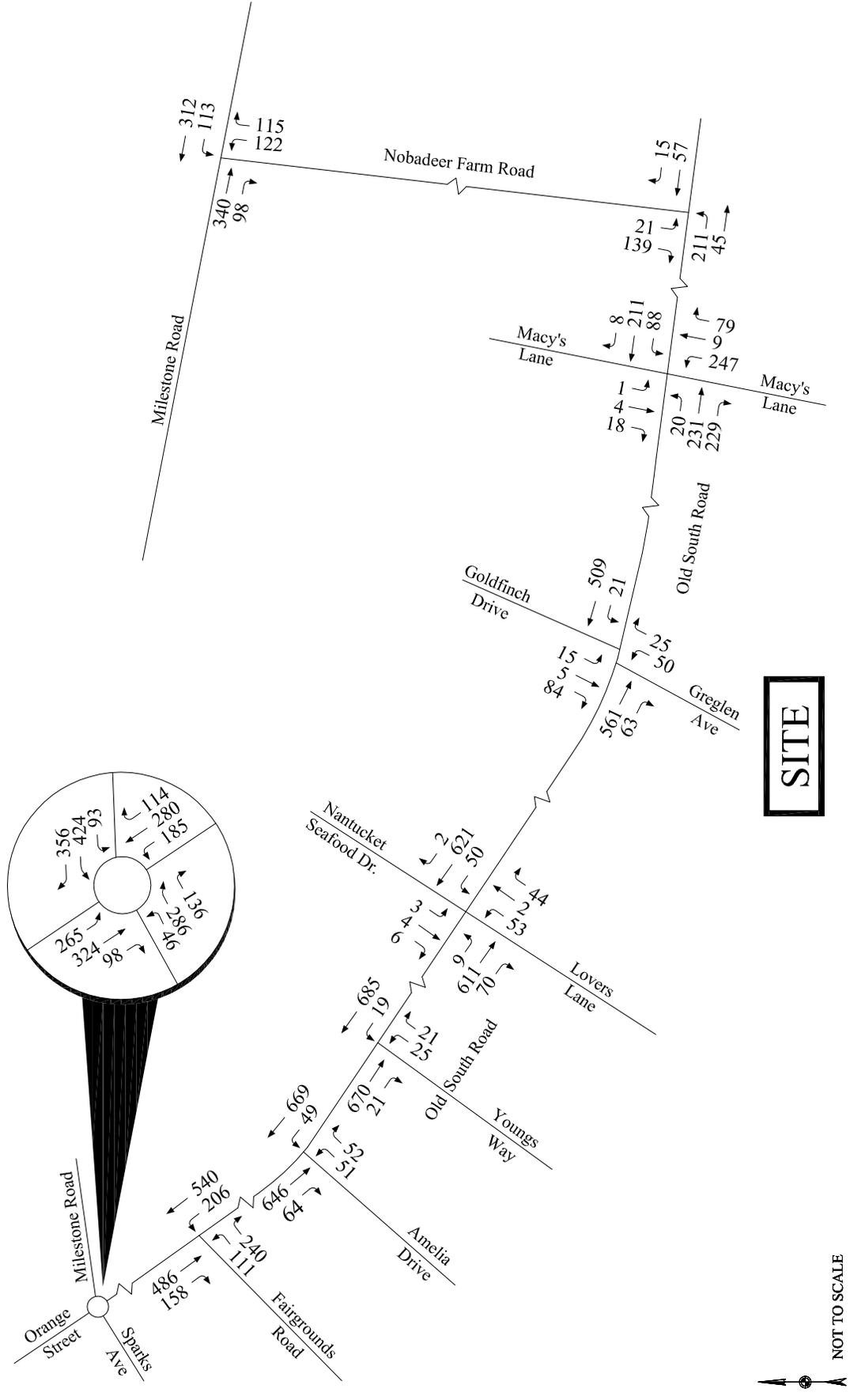


Figure 7
 2023 No-Build Saturday
 Peak Hour Traffic Volumes



Generation Manual using Land Use Codes 220 (Apartment) and 210 (Single Family Detached Housing).

Although specific tenants for the retail portion of the Project have not yet been identified, it is anticipated that the retail liner buildings will be occupied by general merchandise stores, a variety store, and a print shop. Similarly, no specific tenant or operator has been selected for the proposed restaurant space at this time; as a result, the size of this space (3,200 square feet) and the traffic volumes that are generated by the restaurant space are expected to be a maximum / worst-case scenario; the size may well be smaller and may well generate less traffic, but the trip generation utilized in the study have been calculated at the higher levels, in order to ensure a more conservative analytical methodology.

Accordingly, ITE Land Use Code 826 (Specialty Retail Center) trip rates were applied to 12,300 square feet of the retail space and ITE Land Use Code 931 (Quality Restaurant) trip rates were applied to the 3,200 square foot restaurant building. The volume of traffic to be generated by each of the above uses is summarized in Table 6 and the ITE trip-generation worksheets are provided in the Appendix.

Table 6
Trip Generation Summary

Time Period	225 Apartments ^a	100 Homes ^b	12,300 sf Retail ^c	3,200 sf Restaurant ^d	Total Trips
Weekday Daily	1,490	1,050	560	290	3,390
Weekday AM Peak Hour					
Enter	23	20	8	2	53
Exit	<u>91</u>	<u>60</u>	<u>5</u>	<u>1</u>	157
Total	114	80	13	3	210
Weekday PM Peak Hour					
Enter	92	66	22	16	196
Exit	<u>49</u>	<u>39</u>	<u>29</u>	<u>8</u>	125
Total	141	105	51	24	321
Saturday Peak Hour					
Enter	56	52	34	20	162
Exit	<u>55</u>	<u>46</u>	<u>32</u>	<u>14</u>	147
Total	111	98	66	34	309

^a ITE Land Use Code 220 (Apartment).

^b ITE Land Use Code 210 (Single Family Detached Housing).

^c ITE Land Use Code 826 (Specialty Retail Center).

^d ITE Land Use Code 931 (Quality Restaurant).

As shown, the Project will generate a total of 3,390 vehicle trips on a typical weekday (average daily trips) with half (1,695 vehicles) entering and half exiting the site over the course of the entire day. During the peak hours, the Project will generate 210 vehicle trips during the AM peak hour (53 entering and 157 exiting), 321 vehicles trips during the PM peak hour (196 entering and 125 exiting), and 309 vehicles trips during the Saturday peak hour (162 entering and 147 exiting). These vehicle trips will be realized at the (new) site driveways.

It is noted, however, that not all of the retail and restaurant trips will be new to the adjacent streets. Studies have shown that retail developments and in particular restaurants generate a substantial portion of their business from the traffic already present on the adjacent roadway. This traffic is referred to as “pass-by” trips. Based on data published in the ITE *Trip Generation Handbook*,⁶ an average of 44 percent of the total traffic generated by quality restaurants is typically pass-by traffic. For retail establishments, the ITE average pass-by rate is 34 percent for weekday conditions and 26 percent for Saturday conditions. Therefore, while the total traffic generated by the Project will be experienced at the site driveways, the impact of that traffic on the adjacent streets will be incrementally less than this (total) traffic. It should be noted that no pass-by adjustments were made to the retail and restaurant traffic generated during the weekday AM peak hour. Table 7 summarizes the expected volume of pass-by trips and the resulting new trips to be added to the surrounding roadways.

Table 7
New vs. Pass-By Trips

Time Period	Total Trips ^a	Pass-By Trips ^b	New Trips ^c
Weekday Daily	3,390	320	3,070
Weekday AM Peak Hour			
Enter	53	0	53
Exit	<u>157</u>	<u>0</u>	<u>157</u>
Total	210	0	210
Weekday PM Peak Hour			
Enter	196	14	185
Exit	<u>125</u>	<u>14</u>	<u>111</u>
Total	321	28	293
Saturday Peak Hour			
Enter	162	16	146
Exit	<u>147</u>	<u>16</u>	<u>131</u>
Total	309	32	277

^a From Table 6.

^b Volumes represent 44% of the restaurant trips identified in Table 6 for the weekday PM peak hour and Saturday peak hour plus 34 percent of the weekday PM peak hour retail trips and 26% of the Saturday peak hour trips.

^c Total trips less pass-by trips.

⁶ *Trip Generation Handbook; 3rd Edition*; Institute of Transportation Engineers; Washington, DC; August 2014.

As shown, the Project is expected to distribute increments of 210, 277, and 293 new peak hour vehicle trips to the adjacent streets during the weekday AM peak, weekday PM peak, and Saturday Midday peak hours (respectively) with the remaining traffic generated by the Project already present in the adjacent traffic stream, representing the increment of “pass-by” traffic.

Project Trip Distribution

The distribution of new traffic generated by the Project on the area roadways is based on an analysis of existing travel patterns, area employment opportunities, population densities, and turning movement counts collected at nearby residential roads and retail driveways. Two different trip distribution patterns were developed for the purposes of the analysis: one for the residential portion of the Project and one for the retail portion. A summary of the expected distribution of traffic is provided in Table 8.

Table 8
Trip Distribution Pattern

Route	Residential Distribution	Retail Distribution
Orange Street	30%	20%
Sparks Avenue	20%	13%
Milestone Road (East of the Rotary)	5%	5%
Fairgrounds Road	15%	10%
Amelia Drive	0%	3%
Young’s Way	0%	2%
Lover’s Lane	0%	2%
Old South Road residential streets (between Goldfinch Dr. and Macy’s Ln.)	0%	5%
Macy’s Lane (Airport Road)	15%	20%
Nobadeer Farm Rd. residential streets (between Old South Rd. and Milestone Rd.)	0%	5%
Milestone Road (East of Nobadeer Farm Rd.)	15%	15%
Total	100%	100%

As previously referenced, the existing “extension” of Greglen Avenue (which was not plotted or approved as a road, but was constructed by the prior owner of the surrounding properties and has been utilized as a means of providing vehicular access to Old South Road for several decades) will also be terminated / eliminated, between Old South Road and Nancy Ann Lane, once the (new) primary access road is constructed. Accordingly, the traffic currently using this portion of Greglen Avenue was re-distributed onto either Lover’s Lane or the (new) primary access road, depending on the anticipated direction of travel.

Build Traffic Conditions (With the Project)

Based on the traffic generation and distribution estimates as described above, the residential trips generated by the Project were assigned to the local roadway network as shown on Figures 8 through 10 and the retail trips were assigned to the local roadway network as shown on Figures 11 through 13. These traffic volumes and the re-distributed Greglen Avenue traffic volumes were added to the 2023 No-Build traffic volumes to develop the 2023 Build traffic volumes, which are shown graphically on Figures 14 through 16.

Traffic Increases (Resulting from the Project)

Development of the proposed Project will result in a range of different increases in traffic volumes on different portions of the study area roadways. The text description provided in the Executive Summary of this study and the data which are shown graphically in Figures 8 through 16 of the study depict the traffic volumes which are expected to be added by the development of the Project and the Build (year 2023 design horizon) traffic volumes that are expected to occur at the nine (9) study area intersections during all three of the peak traffic hours (weekday AM, weekday PM, and Saturday midday). The anticipated impacts of these additional (Build) traffic volumes on the nine (9) study area intersections (in terms of level of service, volume-to-capacity, queue, and delay) are summarized in the *Capacity Analysis* section of this study.

In addition to the information provided in the *Capacity Analysis* section of this study, Table 9 below summarizes the No-Build and Build traffic volumes on segments of the study area roadways which are located beyond the strict limits of the traffic study area. These data reflect the traffic volume increases that are expected to occur on these particular roadway segments further “downstream” and outside the study area intersections as a result of the development of the Project.

Figure 8
 Residential Trip Distribution
 AM Peak Hour Traffic Volumes

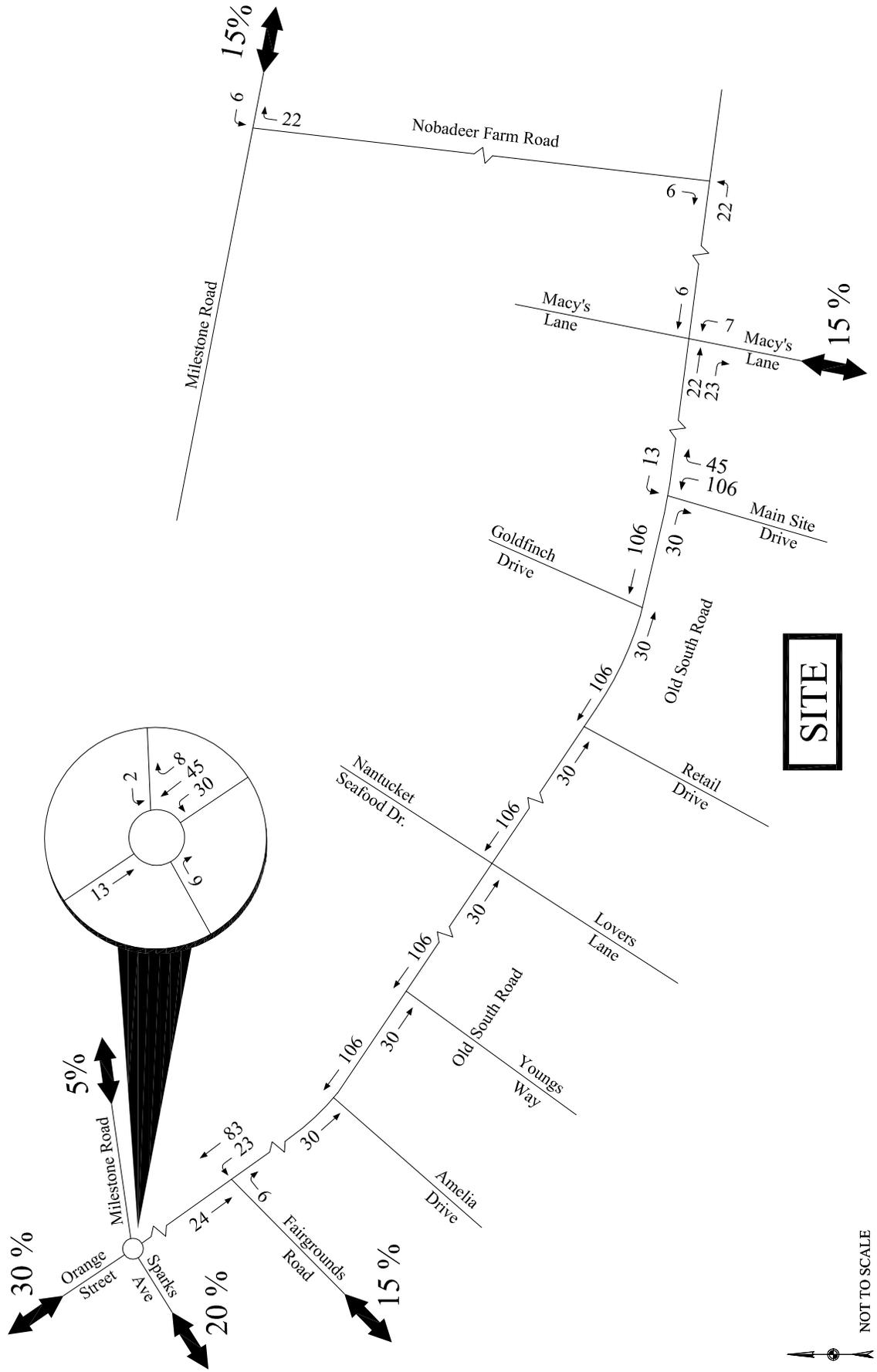


Figure 9
 Residential Trip Distribution
 PM Peak Hour Traffic Volumes

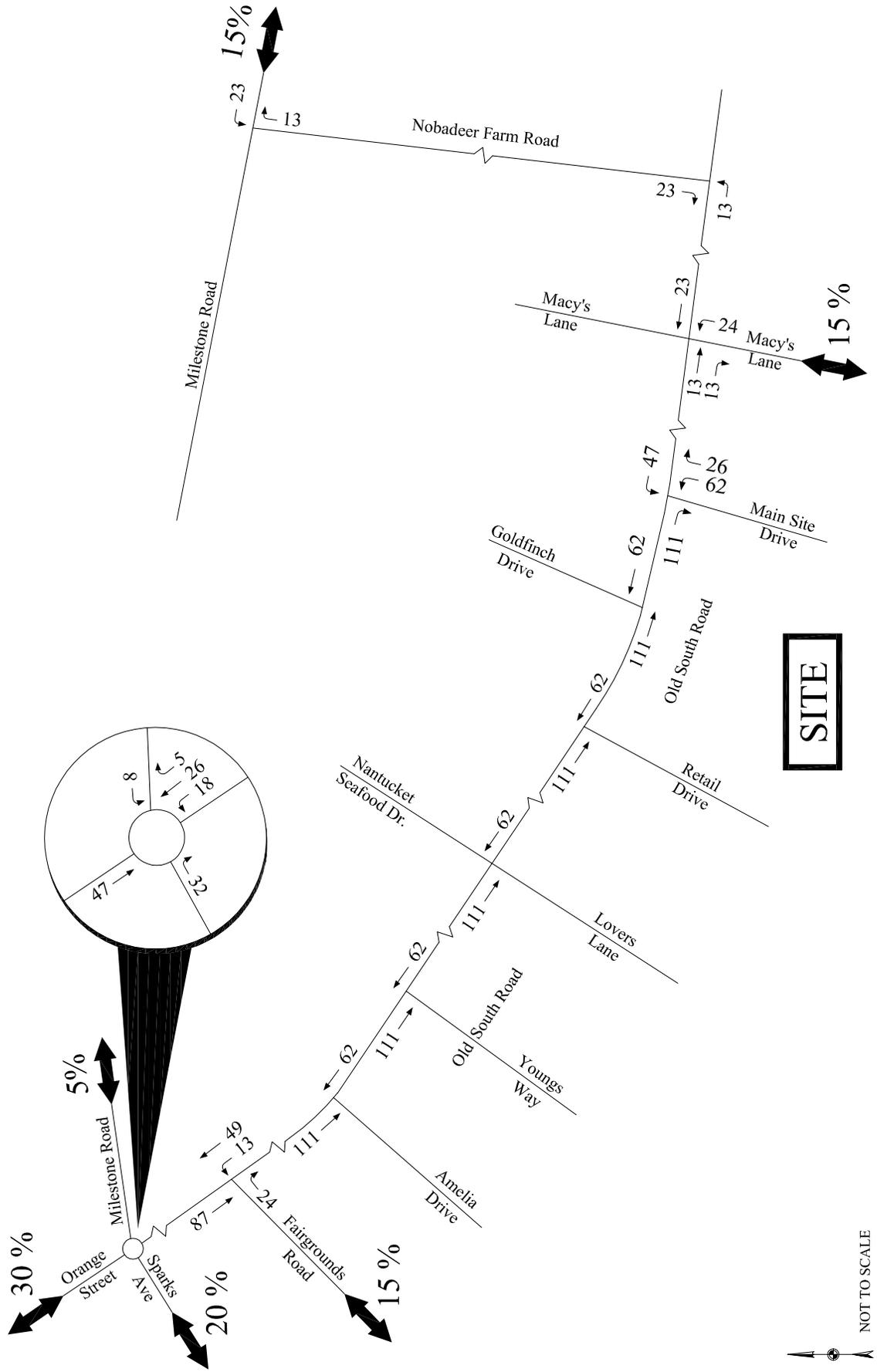
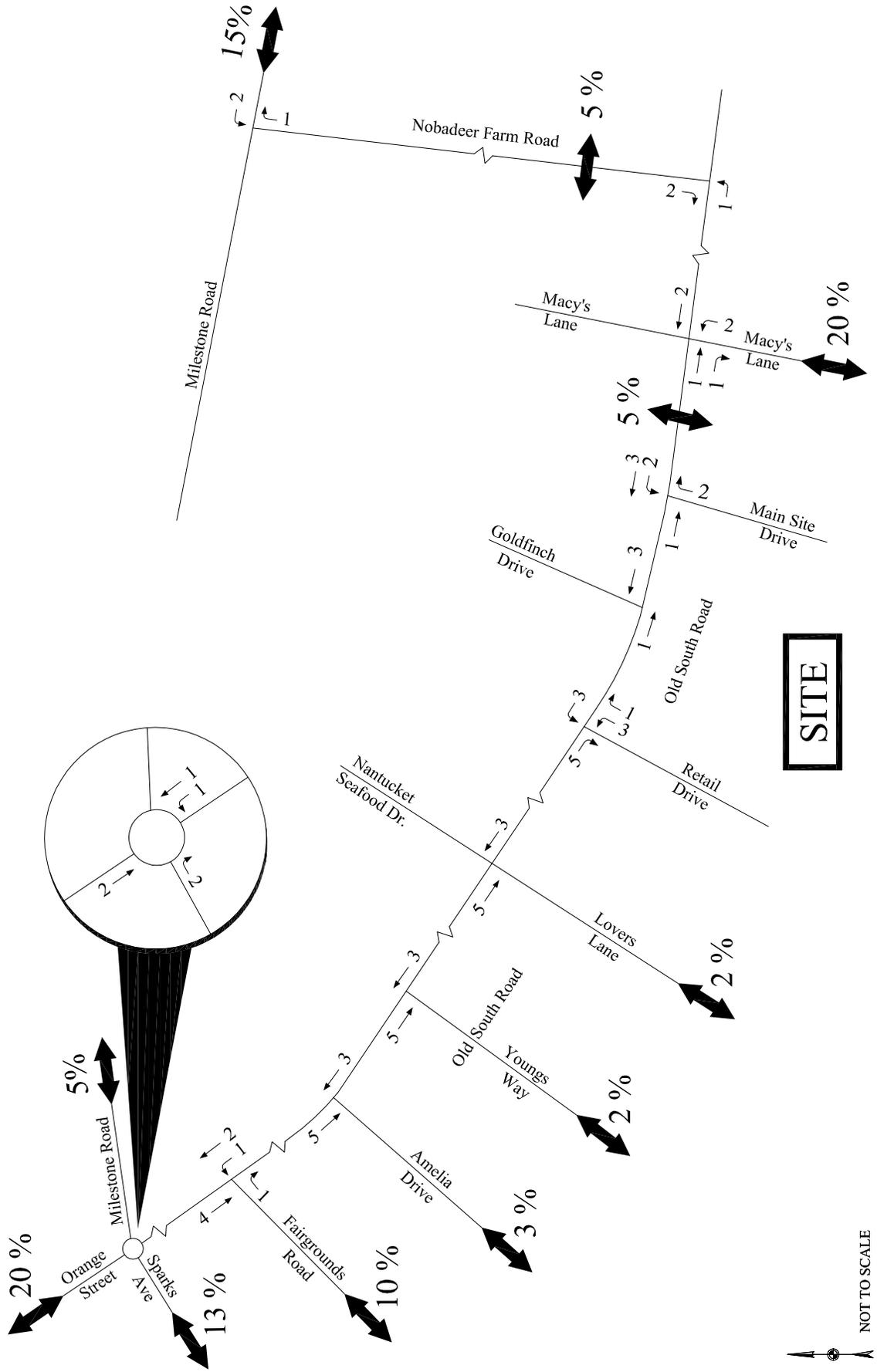


Figure 11
 Retail Trip Distribution
 AM Peak Hour Traffic Volumes



NOT TO SCALE

Figure 12
 Retail Trip Distribution
 PM Peak Hour Traffic Volumes

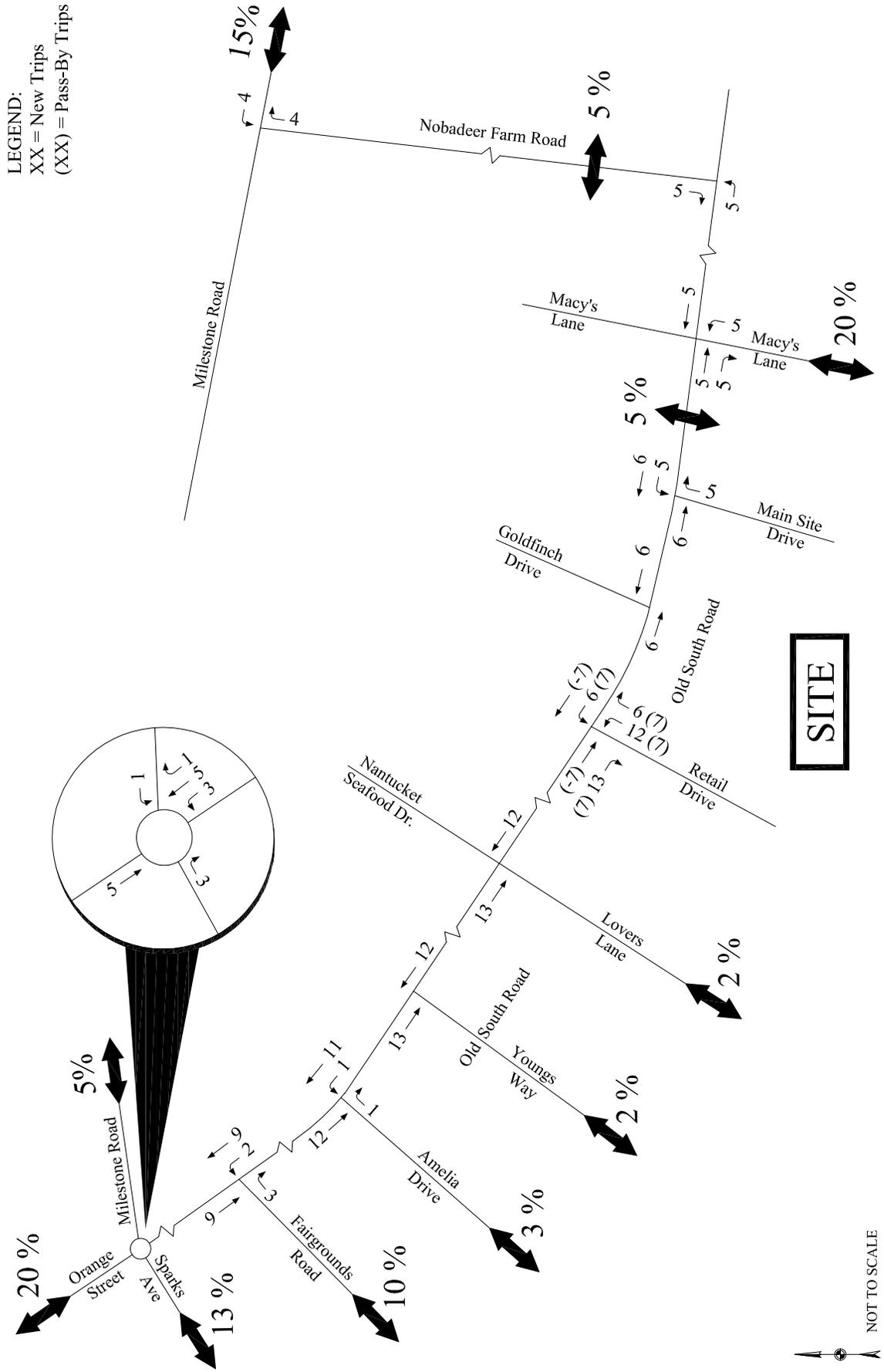


Figure 13
 Retail Trip Distribution
 Sat. Peak Hour Traffic Volumes

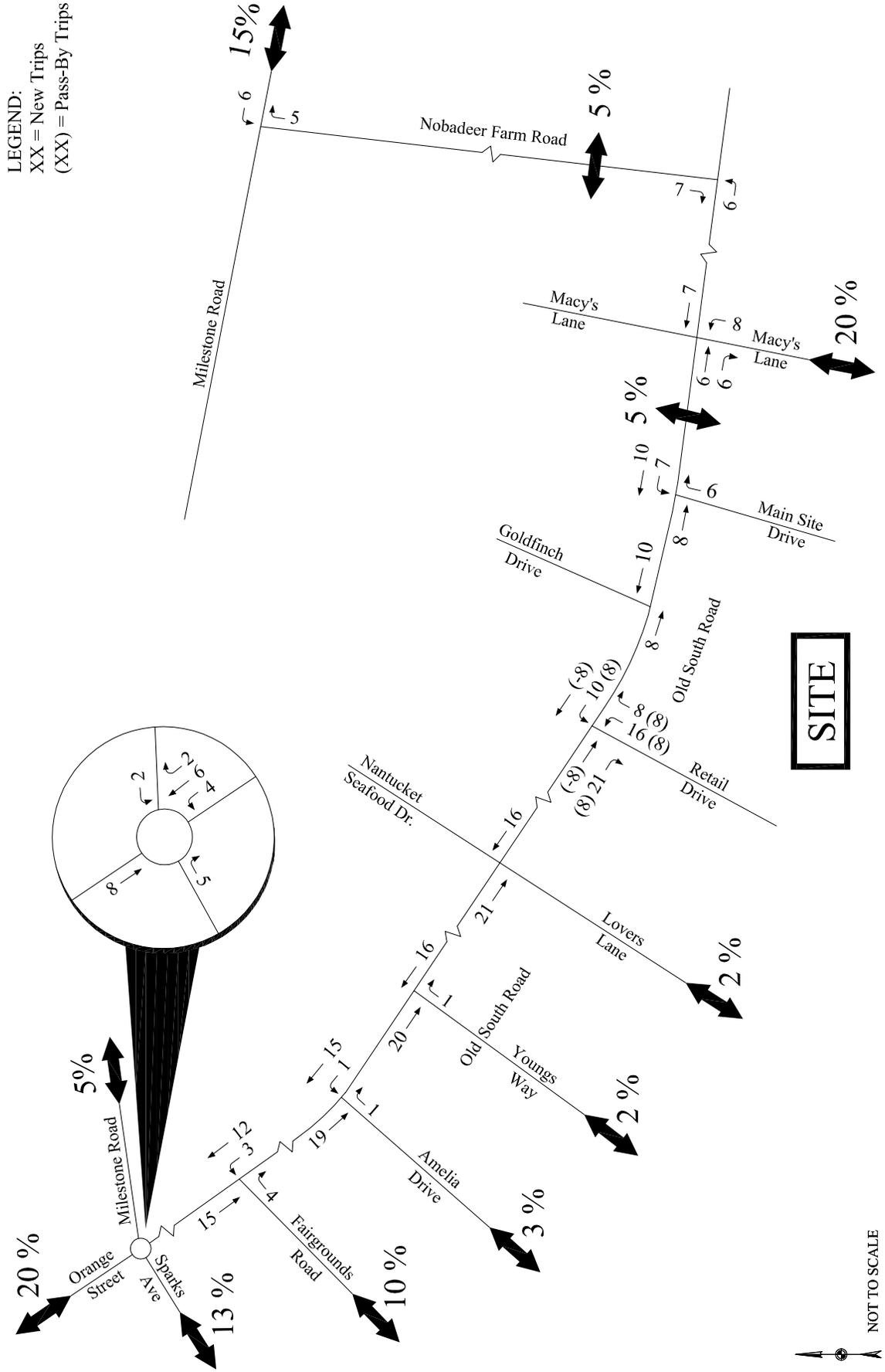


Figure 14
 2023 Build Weekday AM
 Peak Hour Traffic Volumes

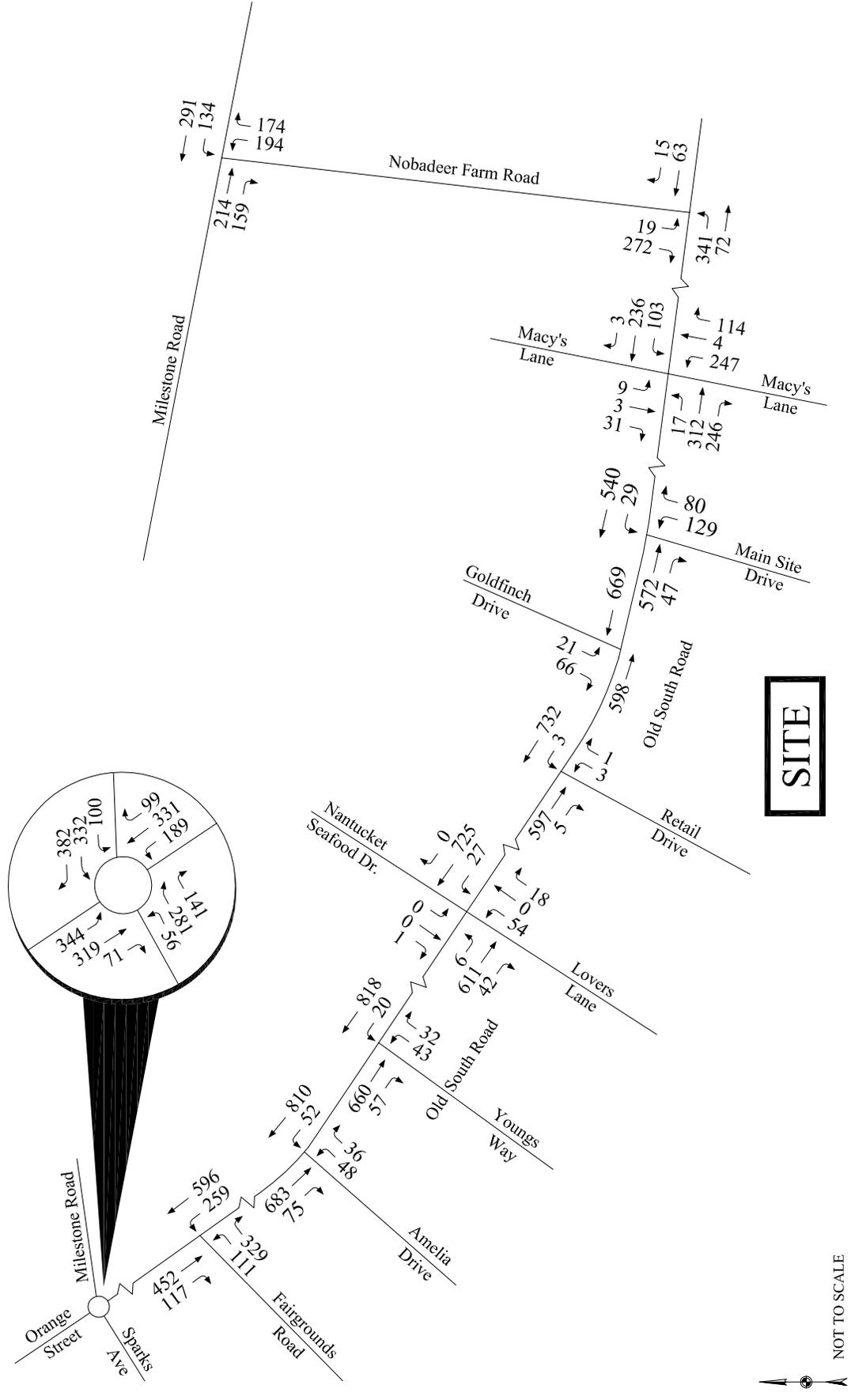


Figure 15
 2023 Build Weekday PM
 Peak Hour Traffic Volumes

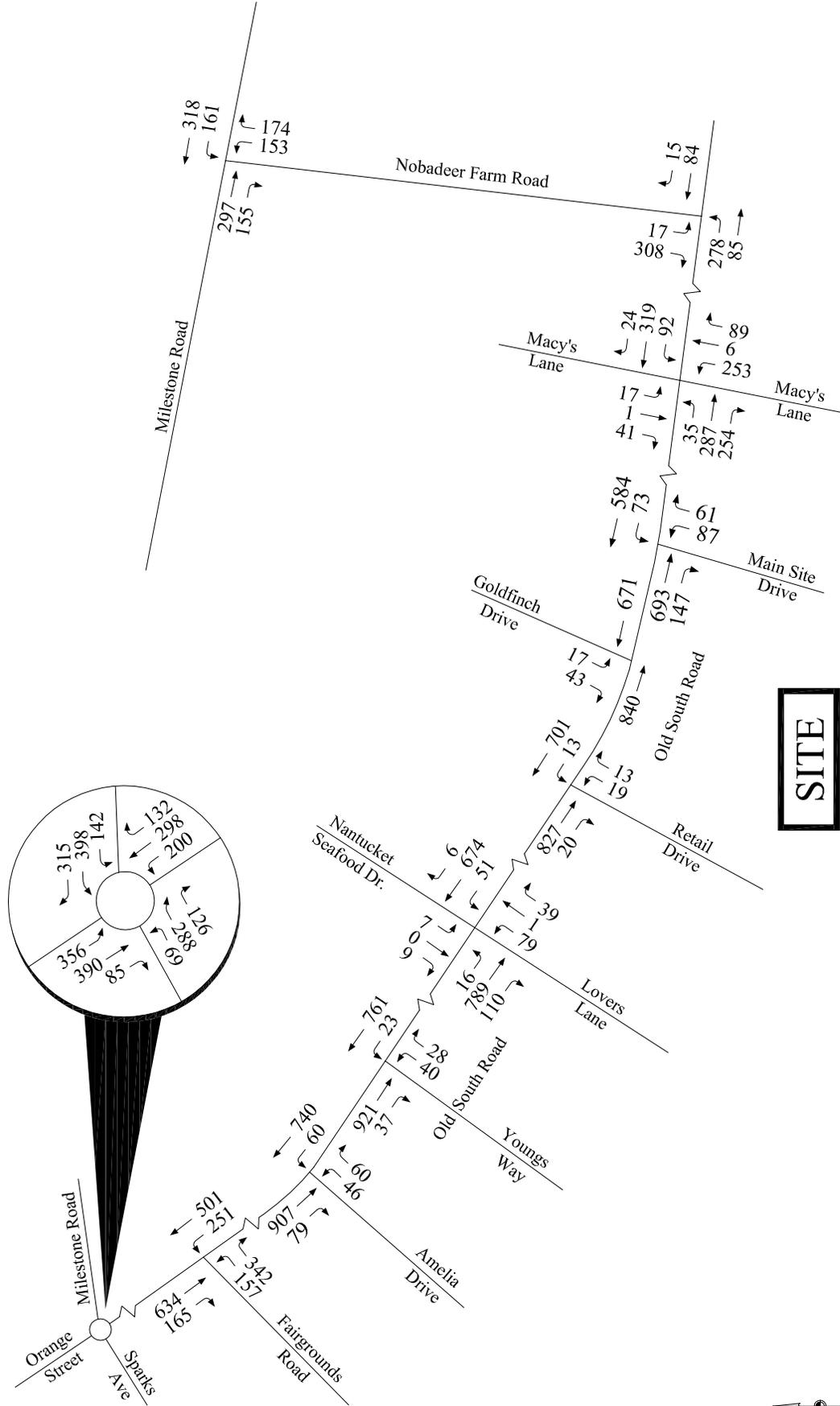


Figure 16
 2023 Build Saturday
 Peak Hour Traffic Volumes

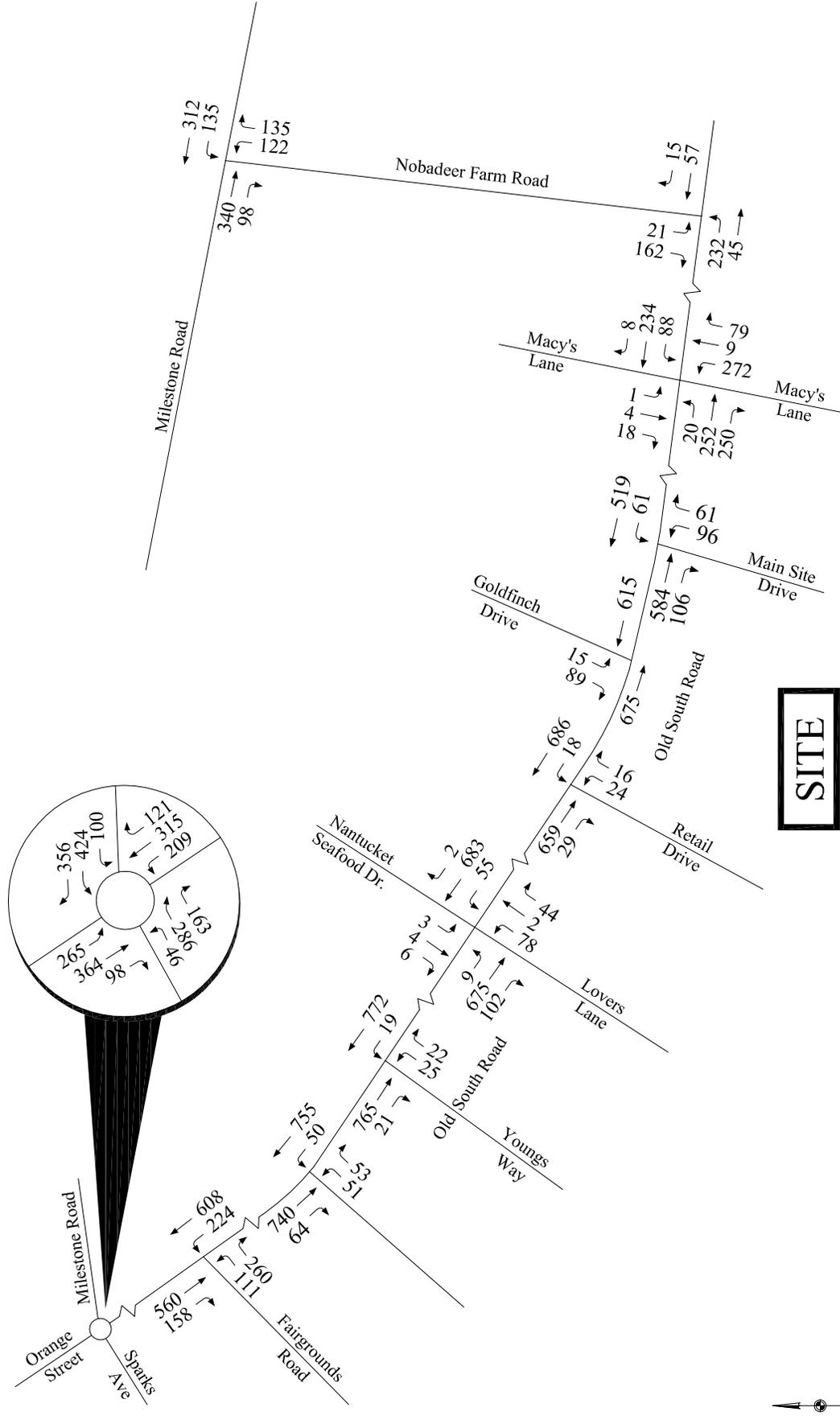


Table 9
Traffic Increases Outside of the Study Area

Route/Peak Hour	2023 No-Build Volumes	2023 Build Volumes	Volume Increase	Percent Increase
Orange Street				
Weekday AM Peak Hour	1,442	1,503	61	4.2%
Weekday PM Peak Hour	1,430	1,513	83	5.8%
Saturday Peak Hour	1,369	1,444	75	5.5%
Sparks Avenue				
Weekday AM Peak Hour	1,028	1,070	42	4.1%
Weekday PM Peak Hour	1,110	1,166	56	5.0%
Saturday Peak Hour	1,175	1,226	51	4.3%
Fairgrounds Road				
Weekday AM Peak Hour	785	816	31	3.9%
Weekday PM Peak Hour	873	915	42	4.8%
Saturday Peak Hour	715	753	38	5.3%
Macy's Lane (Airport Road)				
Weekday AM Peak Hour	684	717	33	4.8%
Weekday PM Peak Hour	648	695	47	7.3%
Saturday Peak Hour	656	702	46	7.0%
Milestone Road (East of Nobadeer Farm Rd.)				
Weekday AM Peak Hour	782	813	31	4.0%
Weekday PM Peak Hour	906	950	44	4.9%
Saturday Peak Hour	880	922	42	4.8%

As shown in Table 9, once distributed onto the available roadways, relatively small incremental increases in traffic volumes will be added further “downstream” from the study area. In general, along these “downstream” local roadways segments, such as Orange Street (northwest of the Milestone rotary), Sparks Avenue (west of the Milestone rotary), Fairgrounds Road (near the Nantucket Police Station), Macy’s Lane (toward Nantucket Municipal Airport), and Milestone Road (east of Nobadeer Farm Road), these traffic volume increases will range from an average of +/- 40 additional vehicles during the weekday AM peak hour, +/- 55 additional vehicles during the weekday PM peak hour, and +/- 50 additional vehicles during the Saturday midday peak hour. When compared with the year 2023 design horizon No-Build conditions, these volumes represent increases in traffic between four and five percent (+/- 4.0% to +/- 5.0%). Much smaller increases in traffic are expected during all other hours of the day.

Note that little to no additional traffic is anticipated to be generated by the Project on Lover’s Lane (south of its existing intersection with Nancy Ann Lane) and on Young’s Way and Amelia Drive, due to the fact that the percentage of retail traffic to/from these streets is too low to

produce a statistically meaningful value and the fact that none of the residential traffic is expected to use these streets.

Site Access (To and From the Project)

Access to the Project site is proposed via a combination of: (1) a (new) primary access road connecting to Old South Road, to be located east of Goldfinch Drive (West) (the existing exit road serving the Naushop residential community), (2) a (new) driveway connecting to Old South Road, which is primarily intended to serve the retail space, located further west of Goldfinch Drive (West), and (3) a (new) driveway connecting to Lover's Lane, which is also primarily intended to serve the retail space.

All site driveways will be interconnected within the Property, to allow for convenient travel between the various components of the Project, without vehicles having to exit and re-enter to and from Old South Road, although it is expected that all of the residential development will be accessed exclusively via the (new) primary access road.

As previously referenced, the existing "extension" of Greglen Avenue (which was not plotted or approved as a road, but was constructed by the prior owner of the surrounding properties and has been utilized as a means of providing vehicular access to Old South Road for several decades) will also be terminated / eliminated, between Old South Road and Nancy Ann Lane, once the (new) primary access road is constructed.

From a design and engineering standpoint, it is recommended that the (new) primary access road be constructed to provide two 10-foot wide exiting lanes with a 2-foot wide paved shoulder to allow separate left and right turns out of the Property. A STOP sign and stop line should be installed at the access road exit. Entering traffic should be separated from the exiting travel lanes by a raised median and should be 15 feet in width, providing a 10-foot wide travel lane and a 5-foot wide paved shoulder to allow motorists to by-pass any vehicles that may break down in the section of the access road where the raised median is located. The access road should provide 30-foot corner radii, to accommodate turning movements of larger single-unit trucks such as moving trucks, other delivery trucks (particularly those which will serve the proposed retail and restaurant uses) as well as to ensure that it can accommodate larger emergency vehicles. Five-foot wide sidewalks should be constructed along both sides of the access road, with crosswalks and handicap-accessible wheelchair ramps constructed across the access road and across Old South Road, in order to connect with the existing bike path that is located on the north side of Old South Road. This crosswalk connection should be located on the east side of the new intersection as traffic volumes are lower at this location.

The (new) retail driveway should be constructed as a 24-foot wide driveway, providing one entering and one exiting lane, separated by a double yellow centerline. A STOP sign and stop line should be installed at the driveway exit. The driveway should provide minimum 25-foot

corner radii to accommodate the turning movements of delivery trucks to the retail and restaurant establishments, without having to cross into oncoming traffic on Old South Road.

The (new) driveway connecting to Lover's Lane should be constructed as a 24-foot wide driveway, providing one entering and one exiting lane, separated by a double yellow centerline. A STOP sign and stop line should be installed at the driveway exit. As this driveway is not expected to be used by delivery vehicles, the corner radii should be a minimum of 10 feet.

Potential For Inter-Neighborhood Roadway Connections

During preliminary meetings and public hearings that have been held in conjunction with the applications filed with the Town of Nantucket for the Project, the Project Proponent has received some indication that Town officials, including the Planning Board, which has the primary jurisdiction over local subdivision plans, and the Board of Selectmen, which has the primary jurisdiction over local roadway layouts and improvements in its capacity as the Nantucket County Commissioners, may wish to require inter-neighborhood roadway connections at one or more locations to and from from the Project.

Given the substantial scale of the overall portfolio owned by the Project Proponent (totaling +/- sixty 60 acres) the mixed-use nature of the Project, its location abutting Old South Road and its adjacency to several prominent existing residential neighborhoods (including Cedar Crest, Naushop, and Surfside) as well as to several major existing or potential roadways such as Macy's Lane (Airport Road), Lovers Lane, Ticcoma Way, Rugged Road, and the Boulevarde, Town officials and the community at large may collectively want to consider the relative benefits and impacts of providing such inter-neighborhood roadway connections.

Because such a wide variety of alternative interconnections could be proposed and considered and are not known at this time and would need to be further refined and described by the Town Boards with jurisdiction over these issues, no specific analysis of the traffic volumes / impacts of these prospective interconnections could be analyzed within the scope of this study.

Accordingly, in the event that the concept for such inter-neighborhood roadway connections is proposed by either of the Town Boards with jurisdiction over these issues, the Town would need to establish the scope of, and then commission additional traffic impact analyses, in order to specifically assess the benefits and impacts of such connections in conjunction with these decisions.

CAPACITY ANALYSIS

Level-of-service (LOS) analyses were conducted at the nine (9) different study area intersections under existing and projected traffic volume conditions to determine the effect that the traffic generated by the Project will have on traffic operations. The capacity analysis methodology is based on the concepts and procedures set forth in the *Highway Capacity Manual*⁷ (HCM) and is described in the Appendix. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

The Synchro analysis program was used for capacity analyses of the unsignalized intersections. For the Milestone Rotary, the SIDRA Intersection 6.0, "Standard SIDRA" capacity model was used applying the HCM 2010 LOS criteria. The level-of-service and queue results are presented in Table 10 and are discussed below. All analysis worksheets are provided in the Appendix.

⁷*Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

Table 10
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Milestone Rotary												
<i>Weekday AM Peak</i>												
Old South Rd.	1.21	124.2	F	1086	1.35	183.2	F	1556	1.55	269.2	F	2268
Milestone Rd.	0.57	8.4	A	127	0.62	9.0	A	151	0.63	9.2	A	155
Orange St.	0.54	11.0	B	109	0.63	12.9	B	144	0.66	13.4	B	159
Sparks Ave.	1.13	87.4	F	715	1.35	178.7	F	1302	1.41	204.7	F	1454
<i>Weekday PM Peak</i>												
Old South Rd.	1.20	121.0	F	1048	1.37	190.9	F	1619	1.46	229.9	F	1994
Milestone Rd.	0.64	8.9	A	162	0.71	9.9	A	205	0.65	9.1	A	166
Orange St.	0.64	13.5	B	149	0.78	18.6	C	236	0.82	18.7	C	278
Sparks Ave.	1.09	74.3	F	575	1.38	194.2	F	1294	1.54	264.3	F	1686
<i>Sat Midday Peak</i>												
Old South Rd.	1.03	53.9	F	623	1.27	145.4	F	1407	1.37	186.4	F	1835
Milestone Rd.	0.67	9.8	A	180	0.73	10.7	B	222	0.76	11.5	B	240
Orange St.	0.67	14.0	B	164	0.81	19.5	C	261	0.91	26.4	D	383
Sparks Ave.	1.30	157.5	F	1323	1.30	160.2	F	1233	1.45	225.8	F	1622
Old South Road at Fairgrounds Road												
<i>Weekday AM Peak</i>												
NB Left	0.92	133.9	F	150	1.32	NA	F	225	1.88	NA	F	275
NB Right	0.50	16.6	C	75	0.58	19.6	C	100	0.61	21.4	C	125
WB Left	0.21	9.4	A	25	0.24	9.8	A	25	0.27	10.1	B	50
<i>Weekday PM Peak</i>												
NB Left	1.38	NA	F	275	2.22	NA	F	400	3.30	NA	F	450
NB Right	0.60	20.2	C	100	0.69	28.4	D	150	0.80	40.5	E	175
WB Left	0.23	10.0	A	25	0.28	10.7	B	50	0.32	11.6	B	50
<i>Sat Midday Peak</i>												
NB Left	1.12	203.5	F	200	1.80	NA	F	275	2.74	NA	F	325
NB Right	0.43	16.6	C	75	0.54	20.7	C	100	0.65	27.1	D	125
WB Left	0.21	9.7	A	25	0.25	10.3	B	25	0.29	11.1	B	50

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 10 (continued)
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Amelia Drive												
<i>Weekday AM Peak</i>												
NB All	0.41	35.3	E	50	0.54	50.7	F	75	0.67	75.4	F	100
WB Left	0.06	9.3	A	25	0.07	9.6	A	25	0.08	9.8	A	25
<i>Weekday PM Peak</i>												
NB All	0.48	37.1	E	75	0.70	68.5	F	125	0.94	138.1	F	150
WB Left	0.07	9.6	A	25	0.08	10.2	B	25	0.09	10.9	B	25
<i>Sat Midday Peak</i>												
NB All	0.50	38.1	E	75	0.66	59.0	F	100	0.86	109.4	F	150
WB Left	0.06	9.2	A	25	0.06	9.6	A	25	0.07	10.0	B	25
Old South Road at Young's Way												
<i>Weekday AM Peak</i>												
NB All	0.32	27.8	D	50	0.41	36.1	E	50	0.49	47.9	E	75
WB Left	0.02	9.0	A	25	0.02	9.3	A	25	0.03	9.4	A	25
<i>Weekday PM Peak</i>												
NB All	0.33	32.7	D	50	0.48	50.2	F	75	0.64	81.8	F	100
WB Left	0.03	9.4	A	25	0.03	9.8	A	25	0.04	10.4	B	25
<i>Sat Midday Peak</i>												
NB All	0.22	26.6	D	25	0.28	31.5	D	50	0.36	43.5	E	50
WB Left	0.02	9.1	A	25	0.02	9.3	A	25	0.03	9.7	A	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 10 (continued)
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Lover's Lane												
<i>Weekday AM Peak</i>												
NB All	0.16	30.8	D	25	0.36	42.6	E	50	0.73	100.1	F	100
EB Left	0.01	8.9	A	0	0.01	9.1	A	0	0.01	9.4	A	0
WB Left	0.02	8.8	A	0	0.03	9.1	A	25	0.03	9.3	A	25
SB All	0.00	12.4	B	0	0.00	13.0	B	0	0.00	14.0	B	0
<i>Weekday PM Peak</i>												
NB All	0.42	44.9	E	50	0.95	146.5	F	150	1.80	NA	F	300
EB Left	0.02	8.9	A	25	0.02	9.2	A	25	0.02	9.3	A	25
WB Left	0.04	9.4	A	25	0.07	9.9	A	25	0.08	10.5	B	25
SB All	0.10	28.4	D	25	0.15	41.1	E	25	0.20	56.4	F	25
<i>Sat Midday Peak</i>												
NB All	0.28	32.7	D	50	0.88	117.0	F	150	1.66	NA	F	300
EB Left	0.01	8.8	A	0	0.01	9.1	A	0	0.01	9.3	A	0
WB Left	0.03	9.0	A	25	0.07	9.5	A	25	0.08	10.0	B	25
SB All	0.08	25.6	D	25	0.11	36.1	E	25	0.15	49.0	E	25
Old South Road at Goldfinch Drive												
<i>Weekday AM Peak</i>												
NB All	0.41	35.8	E	50	0.75	98.5	F	125	---	---	---	---
WB Left	0.01	8.7	A	0	0.02	9.1	A	25	---	---	---	---
SB All	0.28	19.9	C	50	0.43	33.2	D	25	0.32	22.5	C	50
<i>Weekday PM Peak</i>												
NB All	0.46	41.8	E	75	0.65	72.1	F	100	---	---	---	---
WB Left	0.02	9.1	A	25	0.03	9.5	A	25	---	---	---	---
SB All	0.22	21.0	C	25	0.28	26.7	D	50	0.26	24.5	C	25
<i>Sat Midday Peak</i>												
NB All	0.42	38.2	E	50	0.60	63.7	F	100	---	---	---	---
WB Left	0.02	8.8	A	25	0.03	9.1	A	25	---	---	---	---
SB All	0.29	17.4	C	50	0.35	21.4	C	50	0.34	20.7	C	50

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 10 (continued)
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Macy's Lane												
<i>Weekday AM Peak</i>												
NB All	0.61	19.2	C	125	0.72	25.1	D	150	0.73	26.6	D	175
EB All	0.81	28.5	D	225	0.95	49.5	E	325	1.04	62.1	F	375
WB All	0.57	17.5	C	100	0.67	22.4	C	125	0.69	23.4	C	150
SB All	0.09	10.8	B	25	0.10	11.8	B	25	0.10	11.9	B	25
<i>Weekday PM Peak</i>												
NB All	0.56	17.8	C	100	0.69	24.6	C	150	0.77	31.1	D	175
EB All	0.83	31.6	D	225	1.04	63.0	F	375	1.16	64.7	F	375
WB All	0.68	21.2	C	150	0.83	34.8	D	225	0.91	47.7	E	275
SB All	0.09	11.0	B	25	0.15	12.5	B	25	0.15	13.0	B	25
<i>Sat Midday Peak</i>												
NB All	0.51	14.8	B	75	0.63	19.1	C	125	0.70	24.0	C	150
EB All	0.61	16.1	C	125	0.79	25.6	D	200	0.89	40.0	E	275
WB All	0.46	13.5	B	75	0.56	16.8	C	100	0.63	220.1	C	125
SB All	0.04	9.6	A	25	0.05	10.5	B	25	0.05	11.1	B	25
Old South Road at Nobadeer Farm Road												
<i>Weekday AM Peak</i>												
EB Left	0.21	8.1	A	25	0.23	8.2	A	25	0.25	8.2	A	25
SB All	0.34	11.5	B	50	0.38	12.1	B	50	0.40	12.4	B	50
<i>Weekday PM Peak</i>												
EB Left	0.17	8.0	A	25	0.20	8.1	A	25	0.21	8.1	A	25
SB All	0.33	11.3	B	50	0.39	12.0	B	50	0.43	12.5	B	75
<i>Sat Midday Peak</i>												
EB Left	0.13	7.8	A	25	0.16	7.9	A	25	0.17	7.9	A	25
SB All	0.18	10.2	B	25	0.21	10.5	B	25	0.24	10.7	B	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 10 (continued)
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Milestone Road at Nobadeer Farm Road												
<i>Weekday AM Peak</i>												
NB Left	0.64	35.7	E	100	0.77	53.4	F	150	0.80	57.9	F	175
NB Right	0.19	11.1	B	25	0.22	11.5	B	25	0.36	11.8	B	25
WB Left	0.10	8.5	A	25	0.12	8.6	A	25	0.13	8.6	A	25
<i>Weekday PM Peak</i>												
NB Left	0.56	34.5	D	100	0.71	52.4	F	150	0.80	69.7	F	150
NB Right	0.21	11.7	B	25	0.25	12.3	B	25	0.28	12.6	B	50
WB Left	0.10	8.6	A	25	0.13	8.8	A	25	0.15	8.9	A	25
<i>Sat Midday Peak</i>												
NB Left	0.43	26.9	D	50	0.53	35.8	E	75	0.59	42.4	E	100
NB Right	0.15	11.4	B	25	0.19	11.9	B	25	0.22	12.2	B	25
WB Left	0.09	8.5	A	25	0.11	8.7	A	25	0.13	8.8	A	25
Old South Road at Primary Access Road												
<i>Weekday AM Peak</i>												
NB Left	---	---	---	---	---	---	---	---	0.82	82.5	F	150
NB Right	---	---	---	---	---	---	---	---	0.18	14.3	B	25
WB Left	---	---	---	---	---	---	---	---	0.03	9.0	A	25
<i>Weekday PM Peak</i>												
NB Left	---	---	---	---	---	---	---	---	0.99	168.1	F	150
NB Right	---	---	---	---	---	---	---	---	0.18	16.8	C	25
WB Left	---	---	---	---	---	---	---	---	0.11	10.3	B	25
<i>Sat Midday Peak</i>												
NB Left	---	---	---	---	---	---	---	---	0.74	81.2	F	125
NB Right	---	---	---	---	---	---	---	---	0.15	14.5	B	25
WB Left	---	---	---	---	---	---	---	---	0.08	9.5	A	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 10 (continued)
Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2016 Existing				2023 No-Build				2023 Build			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c ^a	Del. ^b	LOS ^c	Queue	v/c ^a	Del. ^b	LOS ^c	Queue
Old South Road at Retail Site Driveway												
<i>Weekday AM Peak</i>												
NB All	---	---	---	---	---	---	---	---	0.03	26.2	D	25
WB Left	---	---	---	---	---	---	---	---	0.00	8.8	A	0
<i>Weekday PM Peak</i>												
NB All	---	---	---	---	---	---	---	---	0.25	39.3	E	25
WB Left	---	---	---	---	---	---	---	---	0.02	9.9	A	25
<i>Sat Midday Peak</i>												
NB All	---	---	---	---	---	---	---	---	0.24	31.6	D	25
WB Left	---	---	---	---	---	---	---	---	0.02	9.2	A	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Capacity Analysis Results

As shown in Table 10, the Milestone Rotary currently experiences significant capacity constraints, particularly on the Old South Road and Sparks Avenue approaches, where very long delays and queues are experienced, at level of service (LOS) F. It should be noted that the analysis model does not take into consideration the access and parking conflicts in the southwest corner of the intersection that can lead to additional delays and queues not reflected in the analysis results. These conditions will be exacerbated under the future volume conditions, with or without the additional traffic from the Project. As described previously, the Town of Nantucket is planning major upgrades and will be reconstructing this intersection into a modern roundabout, providing adequate deflection to reduce entry speeds, two lanes of traffic on every approach, safe pedestrian/bicycle crossings across all four approaches, and eliminating the access conflicts by controlling site access to the property in the southwest corner. As documented in the study commissioned by the Town, upon the construction of these improvements, a significant improvement in traffic operations would be realized on all approaches. These improvements should be advanced by the town at the earliest possible time, given the current level of operation.

Similarly, the Old South Road and Fairgrounds Road intersection currently operates at LOS F during all peak hours with very long delays and queues on the Fairgrounds Road approach (particularly for vehicles attempting to make a left turn, to the west, traveling toward the Milestone rotary and the Downtown area). The volume-to-capacity (v/c) ratio for existing traffic exiting Fairgrounds Road is calculated at well over 1.0 during the weekday PM and Saturday peak hours, indicating that there is insufficient capacity to accommodate the volume of traffic. As these volumes were counted going through the intersection, the volume-to-capacity (v/c) ratio cannot be greater than 1.0. This indicates that motorists are accepting gaps in traffic that are far shorter than those assumed in the analysis model. As shown in Table 10, these conditions will be exacerbated under the future volume conditions, with or without the additional traffic from the Project. The Town of Nantucket has plans to reconstruct this intersection into a modern roundabout, with single-lane approaches on all legs of the intersection. Based on the study commissioned by the Town, upon the construction of these improvements, the intersection would operate at LOS C or better during all peak hours. These improvements should be advanced by the Town at the earliest possible time, given the current level of operation.

Traffic exiting Amelia Drive during peak hours currently operates at LOS E, indicating long delays. By the 2023 design year, these movements will operate at LOS F with or without the additional traffic from the Project. However, v/c ratios will remain below 1.0, indicating that capacity remains to accommodate the traffic. At the Old South Road and Young's Way intersection, traffic exiting Young's Way currently operates at acceptable levels (LOS D) during all peak hours. By 2023, these movements will operate at levels ranging from E to F with or without additional traffic from the Project, with long delays for traffic exiting Young's Way. However, v/c ratios will remain well below 1.0, indicating that ample capacity remains to accommodate the traffic.

Traffic exiting Lover's Lane onto Old South Road currently operates at LOS D to E during peak hours. With the increase in through traffic along Old South Road under the 2023 No-Build condition, these traffic movements will operate at LOS E to F. As a result of the redistribution of traffic that will occur from the elimination of the existing "extension" of Greglen Avenue, as a result of the Project, as well as the increase in traffic on Old South Road as a result of the Project, Lover's Lane traffic will experience a significant increase in delay with v/c ratios well above 1.0. As a result, improvements are recommended to be made at this intersection, as further described in the *Mitigation* section of this study.

At the Old South Road and Greglen Avenue / Goldfinch Drive intersection, traffic exiting the existing "extension" of Greglen Avenue currently operates at LOS E and is projected to operate at LOS F under the 2023 No-Build conditions. These movements will be eliminated as a result of the development of the Project. As a result, traffic exiting the Goldfinch Drive (West) exit from the Naushop residential community actually improves in level of service, fairly substantially, from LOS D to C. Additional improvements in traffic operations for Goldfinch Drive traffic will also be experienced as a result of the improvements proposed and described in the *Mitigation* section of this study.

The Old South Road and Macy's Lane (Airport Road) intersection currently operates at acceptable levels during all peak hours, but vehicle queues of about nine (9) vehicles are noted on the Old South Road eastbound approach during the weekday AM and PM peak hours. Under the 2023 No-Build conditions, this approach is expected to operate at LOS F with long delays and queues of about fifteen (15) vehicles during the PM peak hour and a v/c ratio in excess of 1.0, indicating that the volume of traffic exceeds the capacity of this movement. The addition of traffic from the Project will cause additional delays and queues on this approach with LOS F traffic operations also occurring during the weekday AM peak hour. As a result of this impact, improvements are recommended at this intersection as described in the *Mitigation* section of this study.

The Old South Road and Nobadeer Farm Road intersection operates at desirable levels (LOS A to B) during all peak hours under all volume conditions. The Milestone Road and Nobadeer Farm Road intersection currently operates at LOS E during the weekday AM peak hour and at LOS D during all other peak hours. Under the 2023 No-Build conditions, the Nobadeer Farm Road approach is expected to operate at LOS F during both weekday peak hours with long delays and queues of about six (6) vehicles. The addition of site traffic from the Project under the 2023 Build conditions will create some additional delays, but no changes in level of service and all v/c ratios will remain below 1.0, indicating that capacity remains at the intersection to accommodate the projected volumes of traffic.

Absent any improvements, the (new) site driveway and (new) primary access roadway connecting to and from Old South Road are projected to operate at LOS E to F with long delays and v/c ratios nearing 1.0. As a result, improvements are recommended at these locations that will significantly improve traffic operations, as further described in the *Mitigation* section of this study. No capacity analyses were performed for the proposed site driveway on Lover's Lane as none of the site traffic was assigned to this driveway.

MITIGATION RECOMMENDATIONS

The final component of the traffic analysis process is to identify any measures that may be necessary to improve existing or projected traffic operations and to mitigate the effects of the Project on the area transportation system.

As described in the *Capacity Analysis* section of this study, both the Milestone Rotary and the Old South Road and Fairgrounds Road intersection currently operate at LOS F with insufficient capacity to accommodate the existing volume of peak hour traffic. The Town of Nantucket is proposing significant improvements to these locations that will not only resolve existing operational constraints, but will provide additional capacity to accommodate future traffic levels. These improvements should be advanced by the town at the earliest possible time.

There are several other study area intersections that are projected to operate at LOS F with or without the generation of any future traffic from the Project, but have sufficient remaining capacity (volume-to-capacity ratios of less than 1.0) to accommodate the future traffic levels. Improvements are therefore not required at these locations as part of the Project.

The Project will have a significant impact at several study area roadway segment and intersection locations, as described below, and specific traffic improvements are recommended to be implemented by the Project Proponent in order to mitigate these impacts.

Old South Road Corridor Improvements (Center-Left-Turn Lane)

Each of the proposed (new) primary access road, the (new) site driveway location, and the Lover's Lane intersection with Old South Road are projected to operate with long delays at LOS F and with v/c ratios over 1.0 as a result of traffic generated by the Project. To improve traffic operations for these intersections as well as all driveways along this section of Old South Road, it is recommended that Old South Road be widened (+/- 1,500 feet in length) to construct a two-way center-left-turn lane, extending from west of Lover's Lane to a point east of the proposed (new) primary access road. Such a center turn lane has the effect of allowing side-street traffic to make left turns in two stages, crossing first one direction of traffic on Old South Road, then waiting in the center turn lane to merge with the other direction of traffic. In addition, the center turn lane allows left turns from Old South Road a safe place to wait for a gap in traffic without affecting through traffic (which will no longer have to wait and cause a backup or delay until the turning vehicle has exited the main travel lane). Construction of a center turn lane will require widening Old South Road on both sides of the street and will also require acquisition of land from the Project site. A conceptual plan of such a center turn lane is provided in the Appendix. As shown on this plan, it is recommended that Old South Road be widened to provide 12-foot wide through lanes, a 14-foot wide center turn lane, and 2-foot wide shoulders. Appropriate signs should be installed identifying the beginning and end of the center turn lane.

The levels of service that will be experienced along Old South Road in this area as a result of the construction of these improvements are shown in Table 11 and all analysis worksheets are provided in the Appendix. As shown, delays for traffic exiting the proposed (new) primary access road, the (new) site driveway, and Goldfinch Drive (West) will be significantly improved to LOS C to D during all peak hours. Traffic exiting Lover's Lane will also experience a significant reduction in delay, although LOS F conditions would still exist during the weekday PM and Saturday peak hours. However, v/c ratios are projected at 0.68 or less, indicating that ample capacity remains to accommodate the traffic. Similar results would be expected at all of the other driveways within this section of Old South Road, including the driveways to Nantucket Seafood, the Nantucket Emporium, the cluster of existing retail uses owned by the Project Proponent near the intersection of Old South Road and Lovers Lane, and all of the driveways serving the Valero & Sons Garden Center. It is also important to point out that these operating conditions will exist only during the peak summer months, which has a short duration of 3-4 months. During the remainder of the year, volumes will be significantly lower and traffic operations accordingly better.

As previously described, construction of the (new) primary access road will eliminate the "extension" of Greglen Avenue located between Old South Road and Nancy Ann Lane. Greglen Avenue currently intersects Old South Road opposite Goldfinch Drive (West), but is offset slightly to the west. This often causes conflicts between vehicles turning right from Goldfinch Drive (West) traveling to the west (toward the Downtown area) and those turning left from Greglen Avenue, also traveling to the west (toward the Downtown area), which is by far the dominant turning movement and direction for traffic exiting these intersections. Eliminating this poorly located and designed existing "extension" of Greglen Avenue will accordingly have a significant traffic safety benefit.

While the additional traffic generated by the Project along this section of Old South Road represents an increase in traffic of only about 14 percent and the recommended improvements will have significant benefits to access and traffic safety for all other properties along the corridor, it is anticipated that the Project Proponent will solely fund and provide for the construction of these recommended improvements before any substantial component of the Project is actually built and occupied.

Table 11
Level-of-Service Analysis Summary - With Mitigation

Location/Peak Hour/Movement	2023 No-Build				2023 Build				2023 Build Mitigated			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Lover's Lane												
<i>Weekday AM Peak</i>												
NB All	0.36	42.6	E	50	0.73	100.1	F	100	0.33	28.0	D	50
EB Left	0.01	9.1	A	0	0.01	9.4	A	0	0.01	9.4	A	0
WB Left	0.03	9.1	A	25	0.03	9.3	A	25	0.03	9.3	A	25
SB All	0.00	13.0	B	0	0.00	14.0	B	0	0.00	14.0	B	0
<i>Weekday PM Peak</i>												
NB All	0.95	146.5	F	150	1.80	NA	F	300	0.68	57.5	F	125
EB Left	0.02	9.2	A	25	0.02	9.3	A	25	0.02	9.3	A	25
WB Left	0.07	9.9	A	25	0.08	10.5	B	25	0.08	10.5	B	25
SB All	0.15	41.1	E	25	0.20	56.4	F	25	0.08	23.6	C	25
<i>Sat Midday Peak</i>												
NB All	0.88	117.0	F	150	1.66	NA	F	300	0.66	50.9	F	100
EB Left	0.01	9.1	A	0	0.01	9.3	A	0	0.01	9.3	A	0
WB Left	0.07	9.5	A	25	0.08	10.0	B	25	0.08	10.0	B	25
SB All	0.11	36.1	E	25	0.15	49.0	E	25	0.07	22.8	C	25
Old South Road at Goldfinch Drive												
<i>Weekday AM Peak</i>												
NB All	0.75	98.5	F	125	---	---	---	---	---	---	---	---
WB Left	0.02	9.1	A	25	---	---	---	---	---	---	---	---
SB All	0.43	33.2	D	25	0.32	22.5	C	50	0.25	17.5	C	25
<i>Weekday PM Peak</i>												
NB All	0.65	72.1	F	100	---	---	---	---	---	---	---	---
WB Left	0.03	9.5	A	25	---	---	---	---	---	---	---	---
SB All	0.28	26.7	D	50	0.26	24.5	C	25	0.18	17.1	C	25
<i>Sat Midday Peak</i>												
NB All	0.60	63.7	F	100	---	---	---	---	---	---	---	---
WB Left	0.03	9.1	A	25	---	---	---	---	---	---	---	---
SB All	0.35	21.4	C	50	0.34	20.7	C	50	0.28	17.1	C	50

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 11 (continued)
Level-of-Service Analysis Summary - With Mitigation

Location/Peak Hour/Movement	2023 No-Build				2023 Build				2023 Build Mitigated			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Retail Site Driveway												
<i>Weekday AM Peak</i>												
NB All	---	---	---	---	0.03	26.2	D	25	0.01	16.6	C	0
WB Left	---	---	---	---	0.00	8.8	A	0	0.00	8.8	A	0
<i>Weekday PM Peak</i>												
NB All	---	---	---	---	0.25	39.3	E	25	0.13	20.4	C	25
WB Left	---	---	---	---	0.02	9.9	A	25	0.02	9.9	A	25
<i>Sat Midday Peak</i>												
NB All	---	---	---	---	0.24	31.6	D	25	0.14	18.3	C	25
WB Left	---	---	---	---	0.02	9.2	A	25	0.02	9.2	A	25
Old South Road at Primary Access Road												
<i>Weekday AM Peak</i>												
NB Left	---	---	---	---	0.82	82.5	F	150	0.45	25.4	D	75
NB Right	---	---	---	---	0.18	14.3	B	25	0.18	14.3	B	25
WB Left	---	---	---	---	0.03	9.0	A	25	0.03	9.0	A	25
<i>Weekday PM Peak</i>												
NB Left	---	---	---	---	0.99	168.1	F	150	0.40	30.1	D	50
NB Right	---	---	---	---	0.18	16.8	C	25	0.18	16.8	C	25
WB Left	---	---	---	---	0.11	10.3	B	25	0.11	10.3	B	25
<i>Sat Midday Peak</i>												
NB Left	---	---	---	---	0.74	81.2	F	125	0.37	24.6	C	50
NB Right	---	---	---	---	0.15	14.5	B	25	0.15	14.5	B	25
WB Left	---	---	---	---	0.08	9.5	A	25	0.08	9.5	A	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Table 11 (continued)
Level-of-Service Analysis Summary - With Mitigation

Location/Peak Hour/Movement	2023 No-Build				2023 Build				2023 Build Mitigated			
	v/c ^a	Del. ^b	LOS ^c	Queue ^d	v/c	Delay	LOS	Queue	v/c	Delay	LOS	Queue
Old South Road at Macy's Lane												
<i>Weekday AM Peak</i>												
NB All	0.72	25.1	D	150	0.73	26.6	D	175	0.71	24.5	C	150
EB All	0.95	49.5	E	325	1.04	62.1	F	375	0.67	22.8	C	125
EB Right	---	---	---	---	---	---	---	---	0.45	13.9	B	75
WB All	0.67	22.4	C	125	0.69	23.4	C	150	0.68	23.0	C	150
SB All	0.10	11.8	B	25	0.10	11.9	B	25	0.10	11.4	B	25
<i>Weekday PM Peak</i>												
NB All	0.69	24.6	C	150	0.77	31.1	D	175	0.76	29.7	D	175
EB All	1.04	63.0	F	375	1.16	64.7	F	375	0.73	27.7	D	150
EB Right	---	---	---	---	---	---	---	---	0.52	16.3	C	75
WB All	0.83	34.8	D	225	0.91	47.7	E	275	0.91	47.1	E	275
SB All	0.15	12.5	B	25	0.15	13.0	B	25	0.15	12.8	B	25
<i>Sat Midday Peak</i>												
NB All	0.63	19.1	C	125	0.70	24.0	C	150	0.67	21.1	C	125
EB All	0.79	25.6	D	200	0.89	40.0	E	275	0.53	16.5	C	75
EB Right	---	---	---	---	---	---	---	---	0.43	12.9	B	75
WB All	0.56	16.8	C	100	0.63	220.1	C	125	0.61	18.8	C	125
SB All	0.05	10.5	B	25	0.05	11.1	B	25	0.05	10.6	B	25

^a Volume-to-capacity ratio.

^b Average control delay (sec./vehicle).

^c Level of service.

^d 95th percentile queue in feet, assuming 25 feet/vehicle.

NA = not calculable.

Old South Road at Macy's Lane Intersection Improvements (Exclusive Right-Turn Lane)

This intersection currently operates with long delays and queues on the Old South Road eastbound approach to the intersection (for vehicles traveling east, toward Nantucket Memorial Airport), particularly during the weekday PM peak hour. Traffic growth by 2023 will exacerbate these conditions and the Project has a measurable impact on these conditions by causing the v/c ratio on the eastbound approach to exceed 1.0, resulting in the approach being well over capacity to accommodate this level of traffic.

It is accordingly recommended that Old South Road eastbound approach be widened along the south side to create a shared left/through lane and an exclusive right-turn lane. The turn lane should be 150 feet in length with a 100-foot taper to meet the existing pavement edge. The left/through lane should be 11 feet in width and the exclusive right-turn lane should be 10 feet in

width with a 2-foot paved shoulder. The intersection should continue to operate under ALL-WAY STOP control. A sketch of the recommended improvements is shown on Figure 17. With these improvements, the eastbound approach improves substantially, from LOS F to D or better during all peak hours, as shown in Table 11. All analysis worksheets are provided in the Appendix.

In instances where a specific development project generates an increment of traffic that causes an existing intersection on a public roadway system with poor levels of service and unacceptable v/c ratios to worsen further, industry standard methodology is to require the project to contribute funding for the necessary mitigation at a rate that is proportionate or “pro –rata” to its impact on the intersection. In this case, the traffic added by the proposed Project to the Macy’s Lane (Airport Road) and Old South Road intersection represents an increase of 5.1 percent during the weekday AM peak hour, 7.0 percent during the weekday PM peak hour, and 7.9 percent during the Saturday peak hour over the total traffic that is expected to travel through the intersection at the (future) 2023 design horizon.

Accordingly, based on this methodology, the Project Proponent should be required to fund 7.9% of the total cost of the recommended mitigation for this intersection. The proportion of funding of the total cost of the recommended mitigation should be negotiated with the local permitting authority with jurisdiction over the review and approval of the Project and / or the traffic improvements (which, in this case, is the Town of Nantucket Planning Board and / or the Town of Nantucket Board of Selectmen, acting as the Nantucket County Commissioners).



**Figure 17 - Conceptual Improvement Plan
Old South Road at Macy's Lane**



SUMMARY OF CONCLUSIONS

Existing and future traffic conditions at the nine (9) different study area intersections have been described and analyzed with respect to traffic operations and the impact of the proposed Project. Conclusions of this study and recommendations are summarized below.

Project Description

- The proposed Project includes the prospective development of a combination of 100 single-family homes, 225 apartment units, and approximately 15,500 square feet of retail and restaurant space. Site access is proposed via a (new) primary access road connecting to Old South Road east of Goldfinch Drive (West), a (new) driveway on Old South Road, primarily intended to serve the retail space and located further west of Goldfinch Drive (West), and a (new) driveway connecting to Lover's Lane that is also primarily intended to serve the retail space.

Existing Traffic Counts / Volumes

- Existing traffic conditions within the study area were developed by collecting manual turning movement and vehicle classification counts during peak month (July and August) conditions. While the majority of the counts were collected in 2014, historical count data provided by the Town of Nantucket Planning and Land Use Services (PLUS) Department indicates that traffic has remained fairly consistent over the past 10 years. The collected data therefore accurately reflect existing traffic volume conditions.

Vehicle Accident History

- A review of vehicle accident records revealed that none of the study intersections experienced a significant number of crashes and the calculated crash rates are well below the statewide average. Nearly seventy percent (70%) of all accidents occurred during the summer months of June, July, and August, which is expected given the surge in traffic during these peak seasonal months and the fact that more drivers that are unfamiliar with the local roadway system are driving during these periods (visitors / tourists, as opposed to local residents).

Site Distance Analysis

- Sight distance analysis conducted for the proposed (new) primary access road and the (new) site driveways indicates that the available sight lines exceed both minimum requirements and desirable distances and safe operation can therefore be expected. It is recommended that any proposed landscaping or obstructions in the vicinity of the driveways be set back sufficiently so as not to impede sight distances for drivers exiting the site.

Future Traffic Conditions

- Future traffic volumes were projected out to the year 2023 by applying a one percent (1.00%) compounded annual traffic growth rate to all volumes and by adding the traffic from six (6) other recently constructed and / or planned development projects.
- Due to long-standing capacity constraints at the Milestone Rotary and the Old South Road and Fairgrounds Road intersection, the Town of Nantucket has plans to modify these intersections that will significantly improve traffic conditions at these locations in the future. Based on discussions with Town of Nantucket PLUS Department staff however, these improvements are not expected to be implemented by the 2023 design year and accordingly were not assumed to be completed within the design horizon of this study. In addition, the Town of Nantucket PLUS Department will soon be undertaking a study of the Old South Road corridor to evaluate multi-modal access and congestion improvements.

Project Generated Traffic Volumes and Increases on Local Intersections / Roadways

- The Project is expected to generate approximately 210, 293, and 277 new peak hour vehicle trips during the weekday AM peak hour, weekday PM peak hour, and Saturday midday peak hour (respectively) to the adjacent streets.
- Once distributed onto the local roadway network, traffic generated by the Project is expected to increase peak hour volumes on Old South Road in the immediate vicinity of the Project site by a maximum of 198 new trips (during the weekday PM peak hour) or by +/- 14 percent compared to the year 2023 design horizon No-Build volumes..
- As traffic generated by the Project distributes onto the available access routes to and from the west of the site (to and from the Downtown area), peak hour traffic volumes at the Milestone Rotary at the western end of the Old South Road corridor are expected to increase by a maximum of 154 new trips (during the weekday PM peak hour) or by +/- 6 percent compared to the year 2023 design horizon No-Build volumes.
- As traffic generated by the Project distributes to and from the east (to and from the airport area), peak hour traffic volumes at the Macy's Lane (Airport Road) intersection with Old South Road are expected to increase by a maximum 93 new trips (during the weekday PM peak hour) or by +/- 7 percent, compared to the year 2023 design horizon No-Build volumes.
- Smaller incremental increases in traffic will also be generated further "downstream" from the study area. Along these "downstream" local roadways segments, such as Orange Street (northwest of the Milestone rotary), Sparks Avenue (west of the Milestone rotary), Fairgrounds Road (near the Nantucket Police Station), Macy's Lane (toward Nantucket Municipal Airport), and Milestone Road (east of Nobadeer Farm Road), these traffic

volume increases will range from an average of +/- 40 additional vehicles during the weekday AM peak hour, +/- 55 additional vehicles during the weekday PM peak hour, and +/- 50 additional vehicles during the Saturday midday peak hour. When compared with the year 2023 design horizon No-Build conditions, these volumes represent increases in traffic between four and five percent (+/- 4.0% to +/- 5.0%). Much smaller increases in traffic are expected during all other hours of the day.

Impacts of Project Generated Traffic and Recommended Mitigation / Improvements

- Analysis of future traffic conditions reveals that many of the study area intersections will operate at level of service (LOS) F by 2023, with or without any traffic from the Project. Both the Milestone Rotary and the Fairgrounds Road and Old South Road intersection will operate far above the capacity of these intersections. The Town of Nantucket has plans to improve both of these locations. Several other study area intersections will operate at LOS F with or without any traffic from the Project, but with volume-to-capacity (v/c) ratios remaining below 1.0, indicating that additional capacity remains to accommodate the anticipated demand.
- Several of the study area intersections will operate at LOS F or at v/c ratios above 1.0 directly as a result of additional traffic that will be generated by the Project and specific traffic improvements are recommended to mitigate those impacts. These include:
 - (1) Improvements along the entire segment of Old South Road in the vicinity of the Project, primarily comprised of a center-left-turn lane running from the intersection of Old South Road and Lover's Lane, to the east, past the (new) retail driveway connecting to Old South Road, and past the (new) primary access road serving the Project (located east of the Goldfinch Drive (West) intersection, which serves as the exit to the Naushop residential community).
 - (2) Improvements to the Macy's Lane (Airport Road) and Old South Road intersection, primarily comprised of a widening of the south side of the road, to accommodate a dedicated right-turn lane to allow improved operations at this intersection, particularly for vehicles seeking to turn right from Old South Road traveling toward Nantucket Memorial Airport.
- Implementation of the series of traffic improvements that are recommended in the body of this study, as summarized above, will result in substantial improvement to and mitigation of traffic operations (in terms of levels of service, volume-to-capacity ratios, delays, and queues) at these locations, to the point where traffic conditions will, in almost all cases, actually be better than those which are experienced under current conditions.
- In conjunction with the development of the Project, the existing "extension" of Greglen Avenue (which was not plotted or approved as a road, but was constructed by the prior owner of the surrounding properties and has been utilized as a means of providing

vehicular access to Old South Road for several decades) will also be terminated / eliminated between Old South Road and Nancy Ann Lane once the (new) primary access road is constructed. This modification will have a significant traffic safety and vehicle capacity benefit along this important segment of Old South Road, by eliminating the existing conflict that is created by the offset intersection that is currently formed by this “extension” of Greglen Avenue and the Goldfinch Drive (West) (exit) road from the Naushop residential community as they intersect with Old South Road.

Site Roadway Design Recommendations

- It is recommended that the proposed (new) primary access road for the Project should be constructed by providing two exiting lanes and one entering lane separated by a raised median. The exiting lanes (for vehicles seeking to make either a left hand turn or a right hand turn from the Project on to Old South Road) should be under STOP-sign control. The two (new) driveways connecting to Old South Road and to Lover’s Lane, primarily intended to serve the proposed retail uses, should be constructed providing one exiting lane (under STOP-sign control) and one entering lane, separated by a double yellow centerline.