Warwick, Rhode Island

Proposed Commercial Redevelopment

October 2021
Revised May 2023

TRAFFIC IMPACT STUDY

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Proposed Commercial Redevelopment

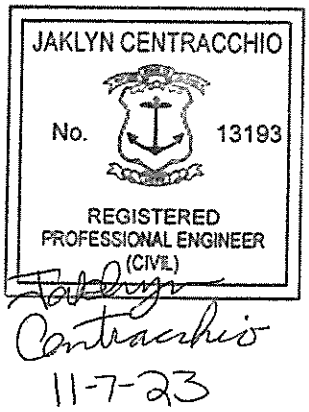
Post Road (Route 1)
Warwick, Rhode Island

TRAFFIC IMPACT STUDY

Prepared by: BETA GROUP, INC.

Prepared for: Mr. David Corsetti
Premier Land Development, Inc.
56 Pine Street, 3rd Floor
Providence, Rhode Island 02903

October 2021
Revised May 2023



October 29, 2021
Revised May 22, 2023

Mr. David Corsetti
Premier Land Development, Inc.
56 Pine Street, 3rd Floor
Providence, Rhode Island 02903

Re: Proposed Commercial Redevelopment
Mixed-Used Plaza
Post Road (Route 1)
Warwick, Rhode Island 02888

Dear Mr. Corsetti:

BETA Group, Inc., has completed an update to our original October 2021 Traffic Impact Study in order to address changes made to the site redevelopment proposal and RIDOT preliminary review comments for a project on Post Road in the City of Warwick, Rhode Island. The site is located on the westerly side of Post Road (Route 1) at its intersection with Airport Road. The 1.15-acre property consisting of multiple lots is partially developed with one building constructed decades ago for a *Carvel Ice Cream* store and later utilized for *The Office* bar/lounge and most recently the *Ozzi's Burger* restaurant. The latest business has been closed for a number of years and the building remains vacant. The land behind the commercial use is currently vacant and owned by the Rhode Island Airport Corporation (RIAC).

Based upon information provided by your office, and a review of the current site plan prepared by *DiPrete Engineering*, it is our understanding that the redevelopment project will include removal of the existing structure to allow construction of a single building accommodating 2,800 square feet of retail space and a 2,240 square foot bank with three drive through lanes. In addition, a portion of the property will be maintained as open space along Guilford Avenue. Main access to the site will be provided from a new driveway proposed at the signalized intersection of Post Road (Route 1) with Airport Road. Secondary access to the site will be provided at an existing modified driveway on Guilford Drive.

The study included herein, was conducted to determine the adequacy of the existing servicing roadways to accommodate anticipated traffic to be generated by the commercial redevelopment project. An analysis of potential impacts to the roadway capacity and safety has been completed and is discussed in the following report.

Very truly yours,
BETA Group, Inc.

Jaklyn Centracchio, PE, PTOE
Project Manager

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Associate

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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The objective of the following study is to assess the potential traffic impacts associated with a proposed commercial redevelopment project in the City of Warwick. The project is situated on a parcel of land on the westerly side of Post Road (US Route 1) between Pell Avenue to the north and Guilford Drive to the south, opposite Airport Road. The property is defined by Assessor's Plat 322, Lots 167, 168, 169, 170, 182, and 183 which together contain approximately 1.15 acres of partially developed land. Several of the vacant lots were formerly developed with single family homes that were purchased by the Rhode Island Airport Corporation (RIAC). The homes were razed as part of their clear zone and noise abatement program that has occurred over many years around the airport, that also allows for repurposing for uses compatible with the airport restrictions. Refer to the Figure 1, Project Vicinity Map, on the following page for the project location within the community.

The redevelopment proposal will consist of razing an existing commercial building to allow construction of a 5,040 square foot building containing retail space (2,800 SF) and a bank branch (2,240 SF) with three drive through lanes. A total of 26 parking spaces will be provided for both uses. Main access is proposed at the signalized intersection of Post Road with Airport Road that will modified to create a four-way junction. In addition, secondary access will be provided from a modified driveway on Guilford Drive, which will be restricted to full access in, and left turn exit only to minimize potential traffic impacts to the neighborhood.

The study summarized herein focused on both traffic flow efficiency and safety along Post Road (Route 1), Airport Road, and Guilford Drive in the immediate vicinity of the subject property, and specifically at the proposed site driveways. The impacts associated with the site related traffic have been defined and evaluated in accordance with standard traffic engineering guidelines and procedures.

The traffic engineering study completed for this project included the following:

- Traffic data collection to define the existing traffic patterns and operation characteristics along the servicing roadways. Record data was obtained from the Rhode Island Department of Transportation (RIDOT) and from previous traffic studies completed in the vicinity of the project area.
- An inventory of the physical roadway characteristics of Post Road (Route 1), Airport Road, and Guilford Drive in the project area to determine the adequacy of the existing roadway geometric features in reference to safety and operations.
- An analysis of crash records obtained from the local police department to define potential safety issues along the immediate servicing roadways adjacent to the site.
- An estimate of future traffic volumes for the proposed commercial redevelopment was calculated using data from the "Trip Generation" Manual, an informational report published by the Institute of Transportation Engineers (ITE).

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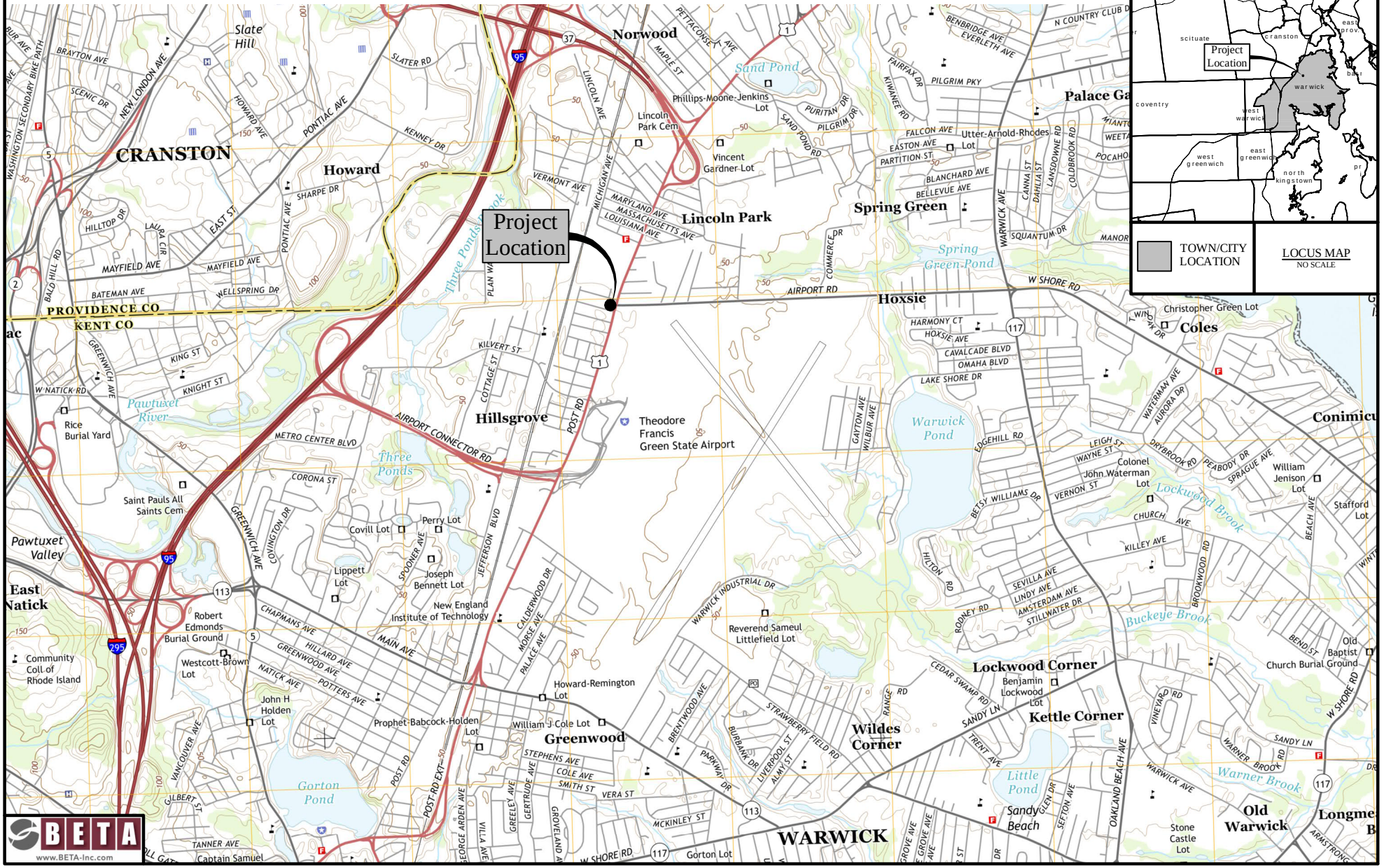
WARWICK, RHODE ISLAND

Figure 1 - Project Vicinity Map



- Evaluation and analysis of the traffic safety and operations for existing and future traffic conditions and development of recommendations if determined necessary, to maintain safe and adequate access to the redeveloped commercial property.

2.0 PROJECT AREA

As previously noted, the subject property is situated on the westerly side of the intersection of Post Road with Airport Road. The combined lots are partially developed with one commercial building and associated paved parking lot. The building has been vacant, and use of the site has been limited for a number of years. Figure 2 on the following page depicts the general project area, and the boundary lines of the subject property.

Land use in the project area is predominantly commercial in nature along both the Post Road and Airport Road corridors, though medium density residential neighborhoods are located off of intersecting side streets, including along both Pell Avenue and Guilford Drive. Immediately abutting the property to the north across Pell Avenue and south across Guildford Drive are single family homes and commercial businesses including an ice cream shop and an office, respectively. To the east across Post Road is a proposed convenience market/gas station (northeast corner) and a large commercial plaza (southeast corner) containing numerous retail businesses and restaurants. To the west are residential properties within the neighborhood. Further north along Route 1 are small commercial businesses including banks, gas stations, restaurants, and retail shops. Further south on Route 1 there are similar small commercial businesses and the main entrance to T.F. Green Airport. Further east along Airport Road is airport property and aviation related businesses, and the Rhode Island National Guard base.

Post Road (Route 1) will serve as the primary access route to the redeveloped property, with Guilford Drive providing secondary access. Based upon the operating characteristics along the servicing roadways, and the estimated volume and type of traffic associated with the commercial redevelopment, a study impact area was defined for the project. The limits of our analysis focused on Post Road between Coronado Road and Tennessee Avenue and Airport Road in the immediate site vicinity, specifically including their intersection and the site driveways.

3.0 EXISTING CONDITIONS

3.1 ROADWAYS

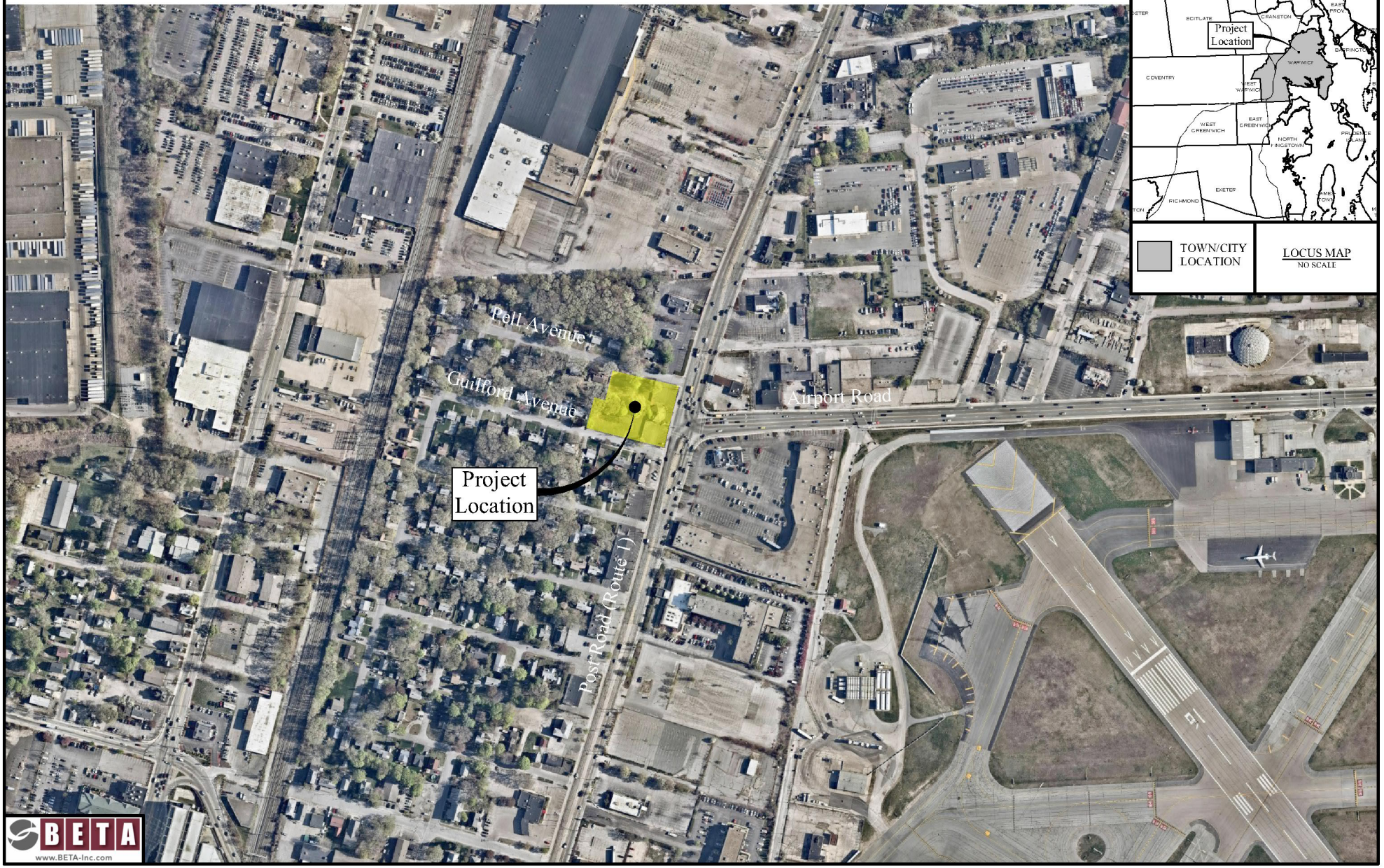
Post Road (Route 1)

Post Road (Route 1) is a north/south urban principal arterial extending from Main Avenue (Route 113) to the south to Elmwood Avenue to the north. The roadway provides immediate local access to abutting properties but also links to higher order facilities including Route 37 to the north and the Airport Connector Road to the south. Post Road varies in typical section from a four-lane roadway north of the site to a five-lane roadway with a two-way left turn center lane south of the site. In the project area, Post Road is wider than the roadway typical section due to its close proximity to the junction with Airport Road where additional turning lanes are provided on the approaches to the intersection for improved capacity.

Proposed Commercial Redevelopment

WARWICK, RHODE ISLAND

Figure 2 - Project Area Map



To the north of the signalized intersection, Post Road is approximately 76 feet wide consisting of two 11-foot travel lanes and a 1-foot shoulder in the northbound direction and two 11-foot travel lanes, two 11-foot left turn lanes separated by a 4-foot painted median and a 1-foot shoulder in the southbound direction including a 4-foot wide painted median separating the northbound and southbound traffic. The pavement surface can be classified as being in fair condition with visible block cracking and minor rutting.

Cement concrete curbing and sidewalks are provided on both sides of Route 1. Cobra-head light fixtures on utility poles are located sporadically along the westerly side of the corridor for nighttime illumination. The speed limit is posted at 35 mph in the site vicinity. The adjacent aerial depicts the typical characteristics of Post Road within the immediate area of the study intersection with the subject property in the upper center portion of the image.

Airport Road

Airport Road is an east/west urban principal arterial extending from Post Road to the west to Warwick Avenue (Route 117/117A) to the east. In the project area, Airport Road is approximately 56 feet wide consisting of two 12-foot travel lanes and 4-foot shoulder in each direction. A double yellow centerline and white shoulder markings delineate the lanes of travel. The pavement surface can be classified as being in fair condition with visible longitudinal cracking and minor rutting.

Cement concrete curbing and sidewalks are provided on both sides of Airport Road. There was no observed lighting along the roadway due to its proximity to the airport runways as can be seen in the above aerial that also depicts the typical characteristics as described. The speed limit is posted at 35 mph in the site vicinity.

Guilford Drive

Guilford Drive is a short 750-foot long local roadway running parallel (east/west) to Pell Avenue between Post Road and Airway Road. The roadway services residential properties including the subject site. Guilford Drive is approximately 28 feet wide consisting of a 14-foot travel lane in each direction with no pavement markings for delineation. The pavement surface can be classified as being in good condition with no visible major pavement distress. Sporadic curbing with varying material is provided along the roadway including granite, paver, and landscape timbers with no sidewalks. These features appear to be installed by the abutting homeowners and are not part of the roadway typical section.

Cobra-head light fixtures on utility poles are located along the northerly side of the road for nighttime illumination. There was no observed posted speed limit along the roadway and was assumed to be 25 mph due to the urban residential nature of the area, coupled with the short length of the roadway including a *Slow Children* sign posted at the entrance from Post Road. The above photograph depicts the typical characteristics of Guilford Drive looking west from its easterly terminus with Post Road.

3.2 INTERSECTIONS

Post Road (Route 1) at Airport Road

Post Road intersects Airport Road to form a three-way, "T" type signalized intersection as depicted on the adjacent aerial. The Post Road northbound approach provides two thru lanes and a right turn lane. The Post Road southbound approach provides two left turn lanes and two thru lanes separated by a 4-foot wide painted median. The Airport Road westbound approach provides two left turn lanes and a right turn lane.

The traffic signal system appears to be in good working condition. The layout of the equipment consists of mast arm mounted signal heads with in-road and video vehicle detectors. In addition, pedestrian accommodations are provided at the intersection, including marked

crosswalks across the northbound and westbound approaches with curb ramps and pedestal mounted pedestrian signal heads with push buttons, which are ADA compliant.

The intersection was determined to operate in a fully actuated-adaptive mode with multiple phases including four vehicle phases and one pedestrian phase. The signal system is part of the RIDOT's adaptive signal system along the Airport Road corridor extending to Hoxie Four Corners. Post Road is serviced under three phases including an advanced protected southbound left/through with an Airport Road westbound right turn overlap, followed by through/right northbound and southbound concurrent movements. A separate pedestrian phase crossing Post Road is available upon activation and runs concurrent with the southbound left turn on Post Road. The Airport Road westbound approach is serviced under a single-phase including a Post Road northbound right turn overlap.

3.3 Traffic Flow Data

Existing traffic flow characteristics for this area were obtained from record data available from previous traffic studies completed in the general project area and from the RIDOT. Count data was obtained from several sources including review of an Environmental Assessment report prepared by the RIDOT for the proposed *Warwick Intermodal Station* project at T.F. Green Airport and review of a Traffic Impact Study for the proposed *Warwick Station Redevelopment District* project for the City of Warwick. Specifically, from the RIDOT a recent May 2019 ATR traffic count on Post Road south of Airport Road and a December 2019 turning movement count at the Post Road intersection with Airport Road were reviewed.

Based on a comparison of the traffic data obtained from the multiple sources, the traffic volume data collected in May 2019 was found to have higher overall existing traffic volumes on Post Road in this area. A comparison to the traffic data collected as part of the earlier studies with the recent 2019 data obtained from the RIDOT, it was determined that Post Road has seen a minor increase (0.17% annual growth rate) in traffic volumes over the past 20 years.

The May 2019 ATR count data obtained from the RIDOT found that Post Road south of Airport Road services on a weekday, approximately 31,900 vehicles per day. On a typical weekday along Post Road, traffic volumes begin to increase at 5:00 AM with the morning peak hour occurring between 8:00 and 9:00 AM. During this hour, an average of approximately 2,000 vehicles was recorded. After 9:00 AM, volumes decrease slightly and then increases consistently until the afternoon peak of approximately 2,465 vehicles serviced between 4:00 and 5:00 PM.

Also, as previously noted, record manual turning movement count data was collected in December 2019 by the RIDOT at the Post Road intersection with Airport Road. This data was used as a basis for the analysis completed as part of this study as it represents pre-Covid traffic conditions along the arterials. Based upon review of the TMC data, Post Road north of Airport Road, was found to service approximately 2,280 vehicles during the weekday morning peak hour between 7:30 and 8:30 AM with approximately 1,340 vehicles northbound and 940 vehicles southbound. During the same time period, Airport Road was found to service 2,270 vehicles with 740 vehicles eastbound and 1,530 vehicles westbound. During the weekday afternoon peak hour between 4:30 and 5:30 PM, Post Road serviced 2,455 vehicles with approximately 1,200 vehicles northbound and 1,255 vehicles southbound. During the same time period, Airport Road

was found to service 2,270 vehicles with 1,165 vehicles eastbound and 1,105 vehicles westbound. Figure 3 on the following page depicts the daily peak hour turning movement volumes at the study intersection.

4.0 Safety Analysis

To determine if there are any limiting factors affecting safety relating to access to the proposed commercial project, the physical characteristics of Post Road and Guilford Drive in the project area, and specifically at the site driveway locations were investigated. These limiting factors would potentially include horizontal or vertical alignment changes or roadside obstructions that limit sight distances for vehicles traveling along the road or entering the road from a side street or driveway location. In this instance, the sight distance standard is necessary to permit turning vehicles to safely enter and exit the site driveways.

The horizontal and vertical alignment of Post Road (Route 1) in the project area can be described as generally straight and level. Based upon the existing roadway geometry as described, the available sight distances at the Guilford Drive intersection with Post Road are greater than 500 feet through the signalized intersection with Airport Road to the north and in excess of 500 feet to the south. These values are greater than AASHTO's recommended minimum sight distance of 250 feet based on the posted speed limit of 35 mph and are sufficient for speeds in excess of 50 mph. It should be noted that speeds are highly variable due to the adjacent signalized junction, where vehicles are turning off or onto Post Road at a low speed or slowing to the stop line at the traffic signal.

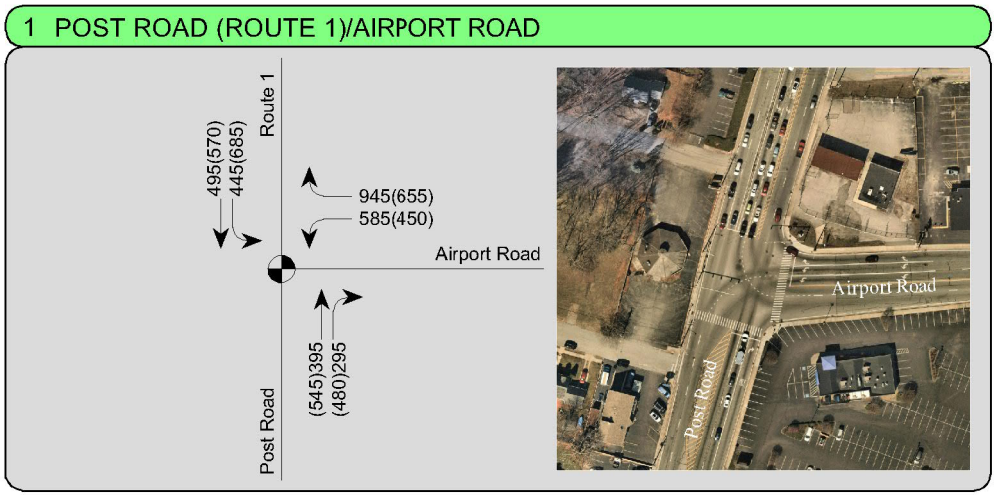
The horizontal and vertical alignment of Guilford Drive in the project area can be described as relatively straight and generally level. Based upon the existing roadway geometry as described, the available sight distances at the modified site driveway on Guilford Drive extend through its intersection with Route 1 and more than 300 feet to the west. The value to the west is greater than AASHTO's recommended minimum sight distance of 155 feet based on the assumed speeds of 25 mph and low travel speeds on the residential street. The value to the east is sufficient where drivers can see vehicles turning onto Guildford Drive from Post Road in either direction at very low speeds (10-15 mph) allowing for safe access to the subject property.

As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any significant physical roadway safety deficiencies exist within the defined study area. Also, as part of our analysis, a review of crash statistics was completed. Data was reviewed from the Warwick Police Department for the latest record full three-year period from January 2017 to December 2019, excluding 2020 data, to determine if any location in the project area experienced a high frequency or pattern of crashes. A total of 41 crashes (avg. 14 per year) occurred in the project area over the three-year study period, with seven involving injuries. Summarizing the data, all 41 of the crashes, with six involving injuries, occurred at the Post Road (Route 1) signalized intersection with Airport Road with no reported crashes at the unsignalized intersection of Post Road with Guilford Drive within the three-year study period.

Proposed Commercial Redevelopment

WARWICK, RHODE ISLAND

Figure 3 - Existing Traffic Volumes



LEGEND:

- TURN LANE
- XXX AM PEAK VOLUMES (7:30 TO 8:30)
- (XXX) PM PEAK VOLUMES (4:30 TO 5:30)
- 1 STUDY INTERSECTION
- TRAFFIC SIGNAL

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Thirty (73%) of the crashes at the signalized intersection were rear end crashes, six were sideswipes (5 same direction/one opposite direction), four were angle crashes, and one was a single vehicle crash. This is typical of signalized junctions where the majority of the crashes are rear end collisions due to the numerous starting and stopping movements required for the signal change intervals. Two of the angle crashes are attributed running a red light, one was an illegal right turn on red, and one can be attributed to not yielding the right of way. Three of the sideswipe (same direction) collisions occurred along the Post Road southbound double left turn lanes where vehicles are turning side by side, though skip striping is provided to guide vehicles through the turn, and two are attributed to vehicles changing lanes. The single sideswipe (opposite direction) collision involved an Airport Road westbound vehicle taking a wide right turn onto Post Road northbound and colliding with a southbound vehicle in the left turn lane. The single vehicle crash involved an Airport Road westbound left turning vehicle onto Post Road southbound losing control of the vehicle due to speed during the left turning maneuver.

Also, immediately east and south of the traffic signal, it was determined that 28 and 5 crashes occurred at the Airport Commercial Plaza full access driveways on Post Road and on Airport Road, respectively. The majority of which involved angle crashes with left turn exiting vehicles trying to turn across high volume four lane roadways in the vicinity of a traffic signal. Consequently, the proposed main site driveway on Post Road will be incorporated into the signalized intersection with Post Road and Airport Road, which will mitigate these types of potential angle crashes which are typically more severe.

Based upon the historical accident data obtained from the local police, and a review of existing roadway geometry and operations, roadway or traffic related safety improvements could be investigated including installation of traffic signal head backplates with retroreflective border for improved head visibility in an effort to reduce the overall number of crashes at this intersection.

5.0 Impact Analysis

5.1 Trip Generation

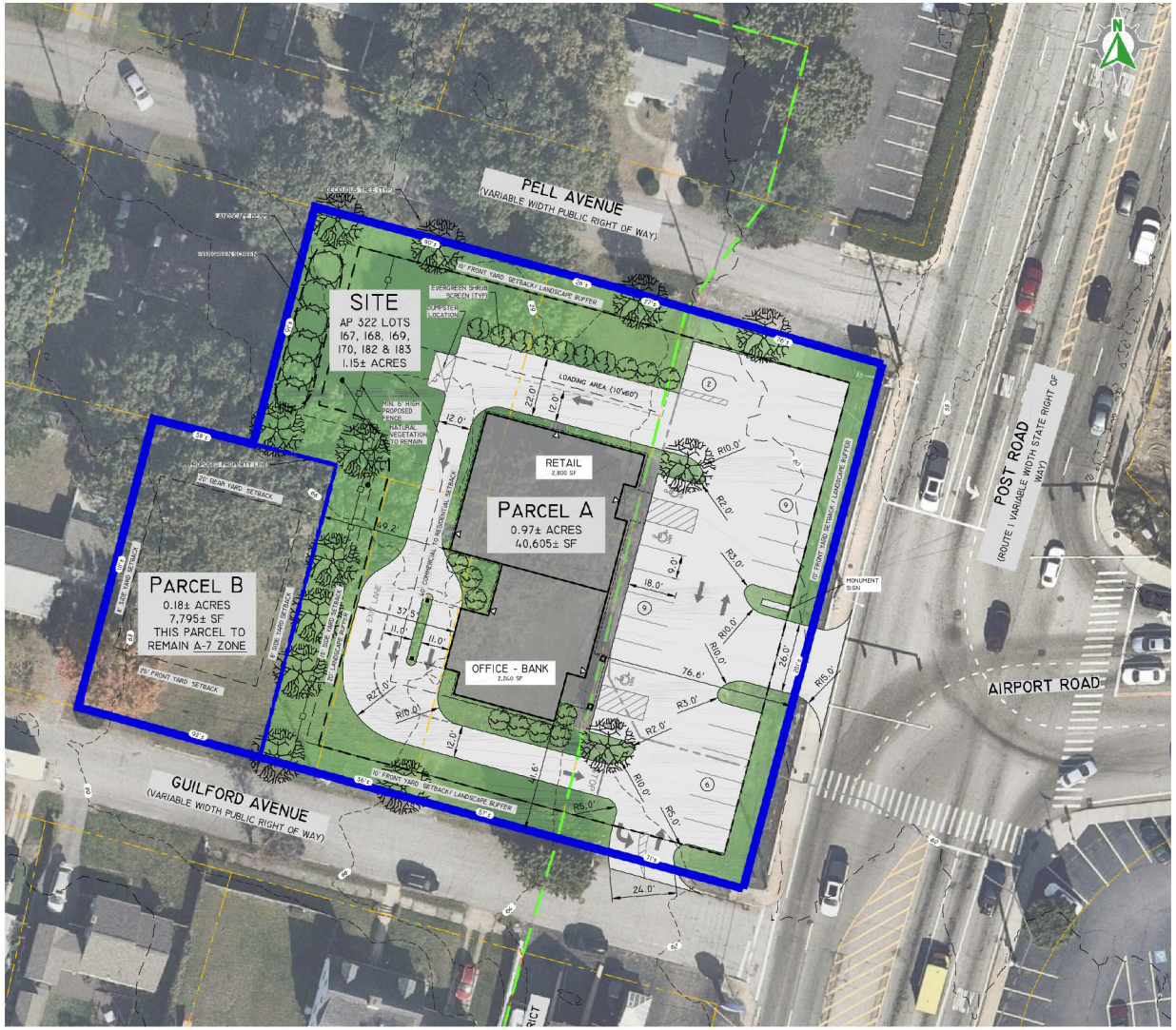
To determine the traffic impact of a proposed development, estimates of anticipated traffic to be generated by a particular land use must be calculated. As previously discussed, the redevelopment proposal consists of the construction of a single building containing a 2,800 square foot retail use and a 2,240 square foot bank with three drive through lanes. Main access/egress to the site will be provided at the signalized intersection of Post Road with Airport Road that will modified to create a four-way junction with secondary access on Guilford Drive. Figure 4 on the following page depicts the site layout and access plan, prepared by *DiPrete Engineering.*

For this site, projected traffic volumes for the commercial project were based on use of trip generation factors. These factors are taken from the "Trip Generation" manual, an informational report published by the Institute of Transportation Engineers (ITE), a national professional organization for traffic and transportation engineers. The data provided in the ITE report are based on extensive traffic studies for various types of land uses (residential, commercial, industrial, etc.). This data has been found to be very reliable and provides a sound basis for estimating future trips to new developments. For the proposed

Proposed Commercial Redevelopment

WARWICK, RHODE ISLAND

Figure 4 - Site Layout



Site Plan provided by DiPrete Engineering

commercial redevelopment project, Land Use Codes 822 Strip Retail Plaza (<40k) and 912 Drive-in Bank were reviewed for applicability in preparing an estimate of site related vehicle trips. The appropriate worksheets from the manual are included in the Appendix along with the trip estimate calculations. Table 1 below summarizes the estimate trip volumes calculated for this project.

TABLE 1 – Trip Generation Estimate

	Description		Enter	Exit	Total
AM Peak Hour					
ITE Land Use Code 822	Strip Retail Plaza (<40k)		4	3	7
ITE Land Use Code 912	Drive-in Bank		14	9	23
		TOTAL	18	12	30
PM Peak Hour					
ITE Land Use Code 820	Shopping Center		9	9	18
ITE Land Use Code 912	Drive-in Bank		23	24	47
		TOTAL	32	33	65

5.2 Future Traffic Conditions

In order to properly assess the impacts of a development, future traffic conditions of area roadways should be estimated for the period when the development is constructed and fully occupied. Typically, the expansion of base traffic is calculated when a project is to be constructed over an extended period (+3 to 5 years). In all instances, area growth that may affect capacity results should be considered. For this project, a conservative annual growth rate of 1.0 percent was utilized for the future background traffic growth, though the project area has seen little to no growth and the city has seen a slight decline in population over the last decade. This rate was applied to the existing volumes to establish a future 2024 No-Build condition.

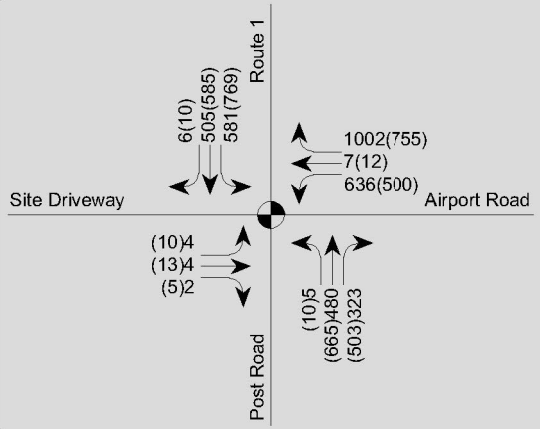
In addition to base traffic growth, a known commercial development project, *Neon Marketplace,* that was originally under construction in October 2021 is now fully operational on the northeast corner of the intersection of Post Road with Airport Road was added to the future background traffic growth. In addition, an industrial development (warehouse facility) is proposed to the east along Commerce Drive off of Airport Road and was also added to the future background traffic growth where data was obtained from a report entitled *NorthPoint Warehouse/Distribution Development* dated September 2021 prepared by vhb. The proposed commercial and industrial development projects were added to the No-Build condition to establish the Future 2024 Build traffic condition. Figure 5 on the following page depicts the estimated future traffic volumes at the study intersection of Post Road with Airport Road/Site Driveway including the new trips generated by the proposed commercial plaza.

Proposed Commercial Redevelopment

WARWICK, RHODE ISLAND

Figure 5 - Future Traffic Volumes

1 POST ROAD (ROUTE 1)/AIRPORT ROAD/SITE DRIVEWAY



LEGEND:

- TURN LANE
- XXX AM PEAK VOLUMES (7:30 TO 8:30)
- (XXX) PM PEAK VOLUMES (4:30 TO 5:30)
- 1 STUDY INTERSECTION
- TRAFFIC SIGNAL

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In developing the intersection volumes to be analyzed under build conditions, a directional distribution of the site traffic was estimated. The distribution was based on current traffic patterns in the area and its close proximity to Route 37. It is estimated that 55% of the site traffic will arrive from and depart to the north and 45% will arrive from and depart to the south during both the morning and afternoon peak hours. Detailed site distribution figures are provided in the Appendix for reference.

5.3 OPERATIONAL ANALYSIS

The key to any traffic impact analysis is the evaluation of roadway operations during peak traffic periods on the servicing roadway system. This situation would occur when the site-generated traffic, combined with the traffic volumes on the main roadway, result in the highest one-hour volume serviced along a roadway segment, or through an intersection. Review of record traffic data found that the weekday AM and PM peak hours would represent this worst-case combination of site-generated traffic with the servicing roadway peak traffic period.

The Highway Capacity Manual methodologies provide the most accurate means of evaluating traffic capacity and delays for roadways and intersections. The results of these procedures are expressed in terms of Level of Service (LOS). Level of Service is a qualitative measure of traffic flow efficiency based on anticipated vehicle delays. For example, LOS "A" represents the best condition with little or no delay, while LOS "F" indicates that the roadway/intersection is at full capacity resulting in extended vehicle delays and potential queuing. Table 2 below outlines the Level of Service delay criteria presented in the Highway Capacity Manual for signalized and unsignalized intersections.

TABLE 2 – Highway Capacity Manual Criteria

Level of Service	Unsignalized Delay Per Vehicle (sec)	Signalized Delay Per Vehicle (sec)
A	<10	<10
B	>10 and <15	>10 and <20
C	>15 and <25	>20 and <35
D	>25 and <35	>35 and <55
E	>35 and <50	>55 and <80
F	>50	>80

The Post Road (Route 1) intersections with Airport Road and the site driveway was analyzed for the weekday morning and afternoon peak hours, which as indicated would represent the worst-case operational condition along the servicing roadways. The capacity analysis worksheets are included in the Appendix and Tables 3 through 5 summarize the results of the analysis for Existing, Future No-Build, and Future Build Conditions at the study intersection.

As can be seen in Table 3 for Existing conditions, the signalized junction of Post Road with Airport Road currently operates overall at a good Level of Service (LOS) C with all critical movements experiencing LOS D or better during the daily morning and afternoon peak periods with acceptable delays. The greatest

queuing occurs in right turn lane on the Airport Road approach during the morning commuter peak associated with heavy traffic destined to the points north via Route 37, Route 95 and Route 295.

TABLE 3 – Level of Service Summary (Existing Conditions)

Location / Movement	EXISTING CONDITIONS							
	AM Peak Hour				PM Peak Hour			
	LOS	Delay	95th % Queue Length (veh.)	v/c	LOS	Delay	95th % Queue Length (veh.)	v/c
Post Road (Route 1) at Airport Road (S)								
Post Road NB Thru	D	36.3	7	0.65	D	35.6	11	0.68
Post Road NB Right	B	13.1	6	0.39	B	18.6	15	0.61
Post Road SB Left	C	22.4	7	0.39	C	27.7	12	0.64
Post Road SB Thru	A	8.4	4	0.25	A	7.0	5	0.27
Airport Road WB Left	C	31.2	9	0.69	D	35.5	9	0.62
Airport Road WB Right	C	21.8	32	0.90	B	14.2	17	0.70
OVERALL	C	22.5	-	-	C	22.6	-	-

(S) – Signalized
(U) – Unsignalized

TABLE 4 – Level of Service Summary (No-Build Conditions)

Location / Movement	2024 FUTURE NO-BUILD CONDITIONS							
	AM Peak Hour				PM Peak Hour			
	LOS	Delay	95th % Queue Length (veh.)	v/c	LOS	Delay	95th % Queue Length (veh.)	v/c
Post Road (Route 1) at Airport Road (S)								
Post Road NB Thru	D	41.4	8	0.71	D	45.6	15	0.78
Post Road NB Right	B	11.3	6	0.37	C	21.5	18	0.61
Post Road SB Left	C	33.2	10	0.62	D	35.4	14	0.71
Post Road SB Thru	B	11.6	4	0.28	A	8.2	5	0.28
Airport Road WB Left	C	29.9	11	0.59	D	42.7	11	0.61
Airport Road WB Right	D	35.7	40	0.97	C	21.5	25	0.79
OVERALL	C	29.3	-	-	C	29.3	-	-

(S) – Signalized
(U) – Unsignalized

Table 4 presents the Future No-Build design period taking into consideration the base traffic growth as previously noted, along with the known commercial and warehouse development. The base conditions of the signalized junction of Post Road with Airport Road are maintained consistent with existing conditions with no intersection improvements. The proposed commercial plaza project is not included in this No-Build scenario.

As can be seen in the table, under the Future No-Build conditions, the study intersection will experience greater delays but will continue to operate overall at a good Level of Service (LOS) C with delays of approximately 29 seconds during both the AM and PM peak hours. All critical movements will continue to operate at LOS D or better, with no movement experiencing excessive delays and only the Airport Road right turn noted previously, experiencing long queueing during the morning peak hour caused by commuters heading to work via Route 37 and Route 95.

Table 5 presents the estimated future build conditions at the study intersection. Under the future build condition, the signalized intersection will be modified to include the site driveway, forming a four-way junction. The new eastbound approach from the site will be introduced, along with converting the Airport Road westbound outside left turn lane into a shared left turn/thru lane to allow access to the site from the east. In order to accommodate left turn entering traffic from Post Road northbound, a new exclusive left turn lane will be developed through restriping the existing median area. The conceptual design as described is shown in the Appendix for reference. This left turn movement will be lagging and serviced concurrently with the Post Road northbound movement.

TABLE 5 – Level of Service Summary (Build Conditions)

Location / Movement	2024 FUTURE BUILD CONDITIONS							
	AM Peak Hour				PM Peak Hour			
	LOS	Delay	95th % Queue Length (veh.)	v/c	LOS	Delay	95th % Queue Length (veh.)	v/c
Post Road (Route 1) at Airport Road (S)								
Post Road NB Left	C	34.6	1	0.03	D	46.9	1	0.06
Post Road NB Thru	D	35.6	9	0.67	D	54.5	9	0.86
Post Road NB Right	B	11.6	9	0.38	C	26.9	10	0.65
Post Road SB Left	C	33.2	11	0.66	D	40.4	16	0.76
Post Road SB Thru/Right	B	16.6	11	0.31	B	19.0	13	0.34
Site Driveway EB	D	44.3	1	0.09	E	67.6	3	0.32
Airport Road WB Left	D	37.3	16	0.69	D	51.9	15	0.67
Airport Road WB Left/Thru	D	36.8	16	0.68	D	51.9	15	0.68
Airport Road WB Right	D	39.6	46	0.99	C	20.9	19	0.82
OVERALL	C	31.7	-	-	D	35.7	-	-

(S) – Signalized
(U) – Unsignalized

These results include traffic estimated from the proposed commercial redevelopment project, combined with the base traffic growth along the servicing roadways. Overall, as can be seen in the table, the Post Road intersection with Airport Road will operate at an acceptable LOS D or better with all critical movements on Post Road and Airport Road experiencing LOS D or better during both the morning and afternoon peak hours. Several movements though, including the Post Road northbound through and Airport Road westbound left, will experience an increase in delays of under 10 seconds during the afternoon peak period. It is estimated that a minor increase of between two and six seconds in overall intersection delays will be realized with the proposed intersection modification during daily peak hours, where the intersection will continue to operation overall in an acceptable manner. The signal phasing and timing adjustments needed to add the new driveway approach will be coordinated with the Rhode Island Department of Transportation (RIDOT) through the Physical Alteration Permit process.

6.0 CONCLUSIONS AND RECOMMENDATIONS

In summary, the study has shown that the proposed commercial redevelopment project access and site circulation plan have been designed to provide a level of traffic safety and efficiency along the servicing roadways and within the site. The safety of the adjacent roadways and specifically the study intersections were reviewed for geometry and sight distances. The intersections were determined to provide sufficient sight distances in accordance with AASHTO criteria for visibility and decision making of drivers attempting to enter/exit main street traffic from a side street or driveway location.

The findings of the operational analysis determined that the estimated increase in traffic during the peak periods resulting from the proposed commercial redevelopment project will result in increased delays on the Post Road and Airport Road approaches for some movements, though will remain at acceptable LOS of D or better during the daily peak hours with the recommended driveway and phasing/timing modifications. The low volume of driveway traffic will typically result in one to two vehicles being serviced during a phase call on the driveway, requiring minimal green time in the overall signal cycle and increases in overall intersection delay of only between two and six seconds. The modifications needed to the intersection to provide these acceptable operational conditions are depicted in a plan included in the Appendix for reference.

Therefore, based upon the data collected on the servicing roadways, the analysis completed as part of this study, along with the access design and recommendations proposed, the commercial redevelopment project was determined to have adequate and safe access to a public street, and should not have an adverse impact on public safety and welfare in the study area by allowing controlled access to the property in a high traffic area.

APPENDIX

A. Traffic Volume Data

B. Traffic Crash Data

C. Trip Generation

D. Operational Analysis

E. Off-Site Improvement Concept Plan

APPENDIX A – Traffic Volume Data

Automatic Traffic Recorder Counts

Post Road (Route 1)

Intersection Turning Movement Count

Post Road (Route 1) at Airport Road

A

Automatic Traffic Recorder Count

Post Road (Route 1)

Post Road (Route 1)

(Source; RIDOT May 2019)

State of Rhode Island Department of Transportation

Volume By Hour By Week for 5/13/2019 - 5/18/2019
Criteria: Location ID = 350082

District : **Location ID :** 350082 **County :** Kent **Factor Group :** OU

Located On : US- 1 Post Rd **Functional Class :** Other Principal Arterial **Area Type :** Urban

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AADT																			29630	28368

Start Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Avg	Avg Volume Graph	Pct. of Total
	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019			
12:00 AM	161	183	208	262	273	405	249		0.8%
1:00 AM	135	120	121	150	176	246	158		0.5%
2:00 AM	60	115	104	116	117	138	108		0.3%
3:00 AM	114	129	108	127	125	125	121		0.4%
4:00 AM	249	243	241	255	273	177	240		0.8%
5:00 AM	513	559	553	518	530	275	491		1.6%
6:00 AM	1053	1147	1110	1143	1062	540	1,009		3.2%
7:00 AM	1824	1968	1866	1940	1886	1081	1,761		5.6%
8:00 AM	1934	2008	1998	2014	2024	1490	1,911		6.1%
9:00 AM	1624	1601	1739	1790	1830	1859	1,741		5.5%
10:00 AM	1716	1589	1669	1774	1816	2156	1,787		5.7%
11:00 AM	1833	1880	1973	2014	2029	2277	2,001		6.3%
12:00 PM	2084	2164	2329	1899	2459	2311	2,208		7.0%
1:00 PM	2084	1984	2184	2165	2299	2173	2,148		6.8%
2:00 PM	2132	1990	2236	2220	2234	2088	2,150		6.8%
3:00 PM	2367	2327	2434	2309	2597	2074	2,351		7.4%
4:00 PM	2344	2606	2476	2412	2475	1919	2,372		7.5%
5:00 PM	2213	2456	2507	2517	2546	1845	2,347		7.4%
6:00 PM	1497	1798	1946	2059	2081	1624	1,834		5.8%
7:00 PM	1159	1313	1546	1651	1520	1412	1,434		4.5%
8:00 PM	822	1015	1137	1336	1357	1209	1,146		3.6%
9:00 PM	685	752	859	1017	1144	1013	912		2.9%
10:00 PM	444	513	519	595	856	824	625		2.0%
11:00 PM	301	343	388	453	652	616	459		1.5%
Total	**29348**	**30803**	**32251**	**32736**	**34361**	**29877**	**Avg**		
AM Pk Hr	8:00 AM	8:00 AM	8:00 AM	8:00 AM	11:00 AM	11:00 AM			
AM Peak	1934	2008	1998	2014	2029	2277	2043		
PM Pk Hr	3:00 PM	4:00 PM	5:00 PM	5:00 PM	3:00 PM	12:00 PM			
PM Peak	2367	2606	2507	2517	2597	2311	2484		
Peak %	8.07%	8.46%	7.77%	7.69%	7.56%	7.74%	7.88%		

Count Start:	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
Start	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019
End	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019	5/19/2019
24h Total	29348	30803	32251	32736	34361	29877

State of Rhode Island Department of Transportation

Volume By Hour By Week for 5/13/2019 - 5/18/2019
Criteria: Location ID = 350082

District :

Location ID : 350082_NB

County : Kent

Factor Group : OU

Located On : US- 1 Post Rd

Functional Class : Other Principal Arterial

Area Type : Urban

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AADT																			15420	14680

Start Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Avg	Avg Volume Graph	Pct. of Total
	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019			
12:00 AM	91	120	137	162	167	245	154		0.9%
1:00 AM	65	59	63	62	92	139	80		0.5%
2:00 AM	35	71	60	67	67	63	61		0.4%
3:00 AM	54	65	54	63	63	65	61		0.4%
4:00 AM	98	104	89	100	113	81	98		0.6%
5:00 AM	176	190	196	192	195	98	175		1.1%
6:00 AM	421	445	455	469	427	227	407		2.5%
7:00 AM	801	877	839	907	872	514	802		4.9%
8:00 AM	897	949	909	948	882	729	886		5.4%
9:00 AM	780	789	872	872	891	934	856		5.3%
10:00 AM	887	788	873	897	903	1118	911		5.6%
11:00 AM	965	952	1021	1031	1093	1107	1,028		6.3%
12:00 PM	1088	1129	1208	1034	1276	1148	1,147		7.0%
1:00 PM	1049	1026	1093	1126	1189	1100	1,097		6.7%
2:00 PM	1125	1030	1205	1186	1202	1074	1,137		7.0%
3:00 PM	1238	1257	1281	1241	1349	1086	1,242		7.6%
4:00 PM	1317	1367	1352	1287	1269	1005	1,266		7.8%
5:00 PM	1250	1326	1400	1357	1475	995	1,301		8.0%
6:00 PM	822	976	1078	1166	1131	853	1,004		6.2%
7:00 PM	619	726	832	877	813	719	764		4.7%
8:00 PM	472	586	618	740	757	694	645		4.0%
9:00 PM	406	439	537	548	665	586	530		3.3%
10:00 PM	240	296	289	357	498	457	356		2.2%
11:00 PM	192	199	226	271	412	356	276		1.7%
Total	**15088**	**15766**	**16687**	**16960**	**17801**	**15393**	**Avg**		
AM Pk Hr	11:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	10:00 AM			
AM Peak	965	952	1021	1031	1093	1118	1030		
PM Pk Hr	4:00 PM	4:00 PM	5:00 PM	5:00 PM	5:00 PM	12:00 PM			
PM Peak	1317	1367	1400	1357	1475	1148	1344		
Peak %	8.73%	8.67%	8.39%	8.00%	8.29%	7.46%	8.26%		

Count Start:	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
Start	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019
End	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019	5/19/2019
24h Total	15088	15766	16687	16960	17801	15393

State of Rhode Island Department of Transportation

Volume By Hour By Week for 5/13/2019 - 5/18/2019
Criteria: Location ID = 350082

District :

Location ID : 350082_SB

County : Kent

Factor Group : OU

Located On : US- 1 Post Rd

Functional Class : Other Principal Arterial

Area Type : Urban

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AADT																			14209	13687

Start Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Avg	Avg Volume Graph	Pct. of Total
	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019			
12:00 AM	70	63	71	100	106	160	95		0.6%
1:00 AM	70	61	58	88	84	107	78		0.5%
2:00 AM	25	44	44	49	50	75	48		0.3%
3:00 AM	60	64	54	64	62	60	61		0.4%
4:00 AM	151	139	152	155	160	96	142		0.9%
5:00 AM	337	369	357	326	335	177	317		2.1%
6:00 AM	632	702	655	674	635	313	602		3.9%
7:00 AM	1023	1091	1027	1033	1014	567	959		6.3%
8:00 AM	1037	1059	1089	1066	1142	761	1,026		6.7%
9:00 AM	844	812	867	918	939	925	884		5.8%
10:00 AM	829	801	796	877	913	1038	876		5.7%
11:00 AM	868	928	952	983	936	1170	973		6.4%
12:00 PM	996	1035	1121	865	1183	1163	1,061		6.9%
1:00 PM	1035	958	1091	1039	1110	1073	1,051		6.9%
2:00 PM	1007	960	1031	1034	1032	1014	1,013		6.6%
3:00 PM	1129	1070	1153	1068	1248	988	1,109		7.3%
4:00 PM	1027	1239	1124	1125	1206	914	1,106		7.2%
5:00 PM	963	1130	1107	1160	1071	850	1,047		6.9%
6:00 PM	675	822	868	893	950	771	830		5.4%
7:00 PM	540	587	714	774	707	693	669		4.4%
8:00 PM	350	429	519	596	600	515	502		3.3%
9:00 PM	279	313	322	469	479	427	382		2.5%
10:00 PM	204	217	230	238	358	367	269		1.8%
11:00 PM	109	144	162	182	240	260	183		1.2%
Total	**14260**	**15037**	**15564**	**15776**	**16560**	**14484**	**Avg**		
AM Pk Hr	8:00 AM	7:00 AM	8:00 AM	8:00 AM	8:00 AM	11:00 AM			
AM Peak	1037	1091	1089	1066	1142	1170	1099		
PM Pk Hr	3:00 PM	4:00 PM	3:00 PM	5:00 PM	3:00 PM	12:00 PM			
PM Peak	1129	1239	1153	1160	1248	1163	1182		
Peak %	7.92%	8.24%	7.41%	7.35%	7.54%	8.08%	7.76%		

Count Start:	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
Start	5/13/2019	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019
End	5/14/2019	5/15/2019	5/16/2019	5/17/2019	5/18/2019	5/19/2019
24h Total	14260	15037	15564	15776	16560	14484

Post Road (Route 1)

(Source; *Warwick Station Redevelopment District* Traffic Study Report, dated May 2002, by *BETA Group, Inc.*)

Town :Warwick
Location : Post Rd NB north of Connector
Weather : clear
Project : 2260 - Warwick Train Station

JAMAR Technologies, Inc.
TAS for Windows
Copyright 1999

Site Code : 226000000003
Start Date: 01/21/2002
File I.D. : POST_NB_NORT
Page : 1

North

Begin Time	Mon. 01/21	Tues. 01/22	Wed. 01/23	Thur. 01/24	Fri. 01/25	Weekday Avg.	Sat. 01/26	Sun. 01/27	Week Avg.	Each * Equals 25 Vehicles
12:00 am	*	*	*	*	*	*	240	192	216	*********
01:00	*	*	*	*	*	*	141	151	146	******
02:00	*	*	*	*	*	*	83	100	92	****
03:00	*	*	*	*	*	*	43	57	50	**
04:00	*	*	*	*	*	*	84	56	70	***
05:00	*	*	*	*	*	*	114	73	94	****
06:00	*	*	*	*	*	*	204	103	154	******
07:00	*	*	*	*	*	*	387	180	284	**********
08:00	*	*	*	*	*	*	550	322	436	*****************
09:00	*	*	*	*	*	*	691	467	579	**********************
10:00	*	*	*	*	*	*	787	579	683	***************************
11:00	*	*	*	*	*	*	987	708	848	********************************;
12:00 pm	*	*	*	*	1097	1097	1012	830	980	********************************;
01:00	*	*	*	*	1095	1095	961	622	893	********************************;
02:00	*	*	*	*	1096	1096	919	640	885	********************************;
03:00	*	*	*	*	1138	1138	912	660	903	********************************;
04:00	*	*	*	*	1219	1219	880	705	935	********************************;
05:00	*	*	*	*	1130	1130	752	757	880	********************************;
06:00	*	*	*	*	925	925	813	631	790	********************************;
07:00	*	*	*	*	831	831	601	478	637	************************
08:00	*	*	*	*	638	638	528	399	522	********************
09:00	*	*	*	*	588	588	516	315	473	******************
10:00	*	*	*	*	481	481	411	213	368	**************
11:00	*	*	*	*	388	388	312	167	289	**********
Totals	0	0	0	0	10626	10626	12928	9405	12207	
% Avg. WkDa	.0%	.0%	.0%	.0%	100.0%					
% Avg. Day	.0%	.0%	.0%	.0%	87.0%		105.9%	77.0%		
AM Peak							11:00	11:00	11:00	
Volume							987	708	848	
PM Peak					04:00	04:00	12:00	12:00	12:00	
Volume					1219	1219	1012	830	980	

ADTs

NB only

Town :Warwick
Location : Post Rd NB north of Connector
Weather : clear
Project : 2260 - Warwick Train Station

JAMAR Technologies, Inc.
TAS for Windows
Copyright 1999

Site Code : 226000000003
Start Date: 01/21/2002
File I.D. : POST_NB_NORT
Page : 2

North

Begin Time	Mon. 01/28	Tues. 01/29	Wed. 01/30	Thur. 01/31	Fri. 02/01	Weekday Avg.	Sat. 02/02	Sun. 02/03	Week Avg.	Each * Equals 25 Vehicles
12:00 am	125	91	94	132	*	110	*	*	110	****
01:00	43	59	57	59	*	54	*	*	54	**
02:00	35	34	27	48	*	36	*	*	36	*
03:00	40	49	39	46	*	44	*	*	44	**
04:00	83	75	72	72	*	76	*	*	76	***
05:00	213	192	185	211	*	200	*	*	200	********
06:00	434	459	467	483	*	461	*	*	461	******************
07:00	870	919	911	942	*	910	*	*	910	************************************
08:00	952	965	1130	1002	*	1012	*	*	1012	************************************
09:00	817	840	733	812	*	800	*	*	800	********************************
10:00	833	790	769	821	*	803	*	*	803	********************************
11:00	902	887	907	880	*	894	*	*	894	************************************
12:00 pm	1022	1051	996	834	*	976	*	*	976	************************************
01:00	944	955	937	1	*	709	*	*	709	****************************
02:00	1058	1115	1017	2	*	798	*	*	798	********************************
03:00	1103	1167	1066	*	*	1112	*	*	1112	**********************************
04:00	1209	1140	1163	*	*	1171	*	*	1171	**********************************
05:00	1126	1224	1147	*	*	1166	*	*	1166	**********************************
06:00	897	928	881	*	*	902	*	*	902	**********************************
07:00	648	670	715	*	*	678	*	*	678	**************************
08:00	506	657	564	*	*	576	*	*	576	**********************
09:00	403	439	461	*	*	434	*	*	434	*****************
10:00	216	242	284	*	*	247	*	*	247	**********
11:00	162	172	215	*	*	183	*	*	183	*******
Totals	14641	15120	14837	6345	0	14352	0	0	14352	
% Avg. WkDa	102.0%	105.3%	103.3%	44.2%	.0%					
% Avg. Day	102.0%	105.3%	103.3%	44.2%	.0%		.0%	.0%		
AM Peak	08:00	08:00	08:00	08:00		08:00			08:00	
Volume	952	965	1130	1002		1012			1012	
PM Peak	04:00	05:00	04:00	12:00		04:00			04:00	
Volume	1209	1224	1163	834		1171			1171	

ADTs

Town :
Location :
Weather :
Project :

JAMAR Technologies, Inc.
TAS for Windows
Copyright 1999

Site Code : 226000000002
Start Date: 01/21/2002
File I.D. : POST_N_OF_CO
Page : 1

Begin Time	Mon. 01/21	Tues. 01/22	Wed. 01/23	Thur. 01/24	Fri. 01/25	Weekday Avg.	Sat. 01/26	Sun. 01/27	Week Avg.	Each * Equals 25 Vehicles
12:00 am	*	*	*	*	*	*	217	197	207	********
01:00	*	*	*	*	*	*	175	149	162	******
02:00	*	*	*	*	*	*	117	109	113	*****
03:00	*	*	*	*	*	*	79	94	86	***
04:00	*	*	*	*	*	*	152	123	138	******
05:00	*	*	*	*	*	*	242	138	190	********
06:00	*	*	*	*	*	*	273	172	222	*********
07:00	*	*	*	*	*	*	390	271	330	*************
08:00	*	*	*	*	*	*	583	347	465	*******************
09:00	*	*	*	*	*	*	712	542	627	*************************
10:00	*	*	*	*	*	*	857	640	748	******************************
11:00	*	*	*	*	1063	1063	970	823	952	******************************
12:00 pm	*	*	*	*	1133	1133	1018	908	1020	******************************
01:00	*	*	*	*	1091	1091	1030	676	932	******************************
02:00	*	*	*	*	1144	1144	998	723	955	******************************
03:00	*	*	*	*	1221	1221	953	644	939	******************************
04:00	*	*	*	*	1186	1186	949	803	979	******************************
05:00	*	*	*	*	1349	1349	852	797	999	******************************
06:00	*	*	*	*	1074	1074	826	631	844	******************************
07:00	*	*	*	*	820	820	608	525	651	*************************
08:00	*	*	*	*	702	702	466	442	537	*********************
09:00	*	*	*	*	601	601	457	385	481	*******************
10:00	*	*	*	*	550	550	456	330	445	******************
11:00	*	*	*	*	374	374	354	262	330	*************
Totals	0	0	0	0	12308	12308	13734	10731	13352	
% Avg. WkDa	.0%	.0%	.0%	.0%	100.0%					
% Avg. Day	.0%	.0%	.0%	.0%	92.1%		102.8%	80.3%		
AM Peak					11:00	11:00	11:00	11:00	11:00	
Volume					1063	1063	970	823	952	
PM Peak					05:00	05:00	01:00	12:00	12:00	
Volume					1349	1349	1030	908	1020	

ADTs

SB only

Town :
Location :
Weather :
Project :

JAMAR Technologies, Inc.
TAS for Windows

Site Code : 226000000002
Start Date: 01/21/2002
File I.D. : POST_N_OF_CO

Begin Time	Mon. 01/28	Tues. 01/29	Wed. 01/30	Thur. 01/31	Fri. 02/01	Weekday Avg.	Sat. 02/02	Sun. 02/03	Week Avg.	Each * Equals 25 Vehicles
12:00 am	138	108	113	123	*	120	*	*	120	*****
01:00	87	69	74	133	*	91	*	*	91	****
02:00	73	33	30	65	*	50	*	*	50	**
03:00	59	61	54	76	*	62	*	*	62	**
04:00	176	154	162	177	*	167	*	*	167	*******
05:00	276	278	287	331	*	293	*	*	293	************
06:00	557	544	554	580	*	559	*	*	559	**********************
07:00	906	921	900	1005	*	933	*	*	933	**************************
08:00	998	944	951	1064	*	989	*	*	989	**************************
09:00	876	828	802	897	*	851	*	*	851	**************************
10:00	833	817	836	853	*	835	*	*	835	**************************
11:00	998	985	960	1010	*	988	*	*	988	**************************
12:00 pm	1038	1025	1042	894	*	1000	*	*	1000	**************************
01:00	1056	978	975	1	*	752	*	*	752	**************************
02:00	1090	1128	1129	2	*	837	*	*	837	**************************
03:00	1051	1100	1081	*	*	1077	*	*	1077	**************************
04:00	1114	1171	1156	*	*	1147	*	*	1147	**************************
05:00	1230	1237	1270	*	*	1246	*	*	1246	**************************
06:00	852	913	1027	*	*	931	*	*	931	**************************
07:00	675	694	716	*	*	695	*	*	695	**************************
08:00	569	633	644	*	*	615	*	*	615	************************
09:00	462	513	610	*	*	528	*	*	528	**********************
10:00	327	334	359	*	*	340	*	*	340	**************
11:00	214	252	266	*	*	244	*	*	244	**********
Totals	15655	15720	15998	7211	0	15350	0	0	15350	
% Avg. WkDa	101.9%	102.4%	104.2%	46.9%	.0%					
% Avg. Day	101.9%	102.4%	104.2%	46.9%	.0%		.0%	.0%		
AM Peak	08:00	11:00	11:00	08:00		08:00			08:00	
Volume	998	985	960	1064		989			989	
PM Peak	05:00	05:00	05:00	12:00		05:00			05:00	
Volume	1230	1237	1270	894		1246			1246	

ADTs

A

Intersection Turning Movement Count

Post Road (Route 1) at Airport Road

Post Road (Route 1) at Airport Road

(Source; RIDOT December 2019)

Turning Movement Volume Report

Report Date: 4/21/2021 6:28:51 AM

From 12/4/2019 to 12/4/2019

Airport Rd at Post Rd

Intersection: 7011

	N				S				E				W				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int Total
12/04/19 07:00-07:15	0	81	57	138	98	77	0	175	0	0	0	0	142	0	255	397	710
12/04/19 07:15-07:30	0	79	59	138	83	68	0	151	0	0	0	0	154	0	275	429	718
12/04/19 07:30-07:45	0	83	71	154	117	120	0	237	0	0	0	0	177	0	259	436	827
12/04/19 07:45-08:00	0	115	76	191	142	122	0	264	0	0	0	0	135	0	209	344	799
12/04/19 08:00-08:15	0	124	77	201	89	115	0	204	0	0	0	0	135	0	234	369	774
12/04/19 08:15-08:30	0	72	70	142	96	136	0	232	0	0	0	0	139	0	244	383	757
12/04/19 08:30-08:45	0	71	94	165	98	101	0	199	0	0	0	0	133	0	211	344	708
12/04/19 08:45-09:00	0	80	90	170	95	126	0	221	0	0	0	0	159	0	210	369	760
Summary	0	705	594	1299	818	865	0	1683	0	0	0	0	1174	0	1897	3071	6053

Turning Movement Volume Report

Report Date: 4/21/2021 6:30:27 AM

From 12/4/2019 to 12/4/2019

Airport Rd at Post Rd

Intersection: 7011

	N				S				E				W				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int Total
12/04/19 15:00-15:15	0	98	110	208	169	113	0	282	0	0	0	0	105	0	199	304	794
12/04/19 15:15-15:30	0	109	120	229	132	123	0	255	0	0	0	0	113	0	183	296	780
12/04/19 15:30-15:45	0	109	127	236	168	149	0	317	0	0	0	0	125	0	202	327	880
12/04/19 15:45-16:00	0	122	125	247	150	157	0	307	0	0	0	0	129	0	164	293	847
12/04/19 16:00-16:15	0	127	110	237	173	137	0	310	0	0	0	0	110	0	174	284	831
12/04/19 16:15-16:30	0	133	121	254	148	155	0	303	0	0	0	0	97	0	154	251	808
12/04/19 16:30-16:45	0	125	131	256	180	139	0	319	0	0	0	0	109	0	203	312	887
12/04/19 16:45-17:00	0	117	104	221	163	145	0	308	0	0	0	0	103	0	160	263	792
12/04/19 17:00-17:15	0	163	125	288	160	159	0	319	0	0	0	0	126	0	139	265	872
12/04/19 17:15-17:30	0	137	120	257	182	126	0	308	0	0	0	0	113	0	153	266	831
12/04/19 17:30-17:45	0	146	128	274	173	136	0	309	0	0	0	0	93	0	128	221	804
12/04/19 17:45-18:00	0	139	109	248	172	105	0	277	0	0	0	0	93	0	99	192	717
Summary	0	1525	1430	2955	1970	1644	0	3614	0	0	0	0	1316	0	1958	3274	9843

APPENDIX B – Traffic Crash Data

January 2017 through December 2019

Post Road (Route 1)

Crash Data Summary

	2017	2018	2019	Total	Average per Year
Intersections					
Post Road (Route 1) at Airport Road	20	13	8	41	14
Post Road (Route 1) at Guilford Avenue	0	0	0	0	0
Total	**20**	**13**	**8**	**41**	**14**

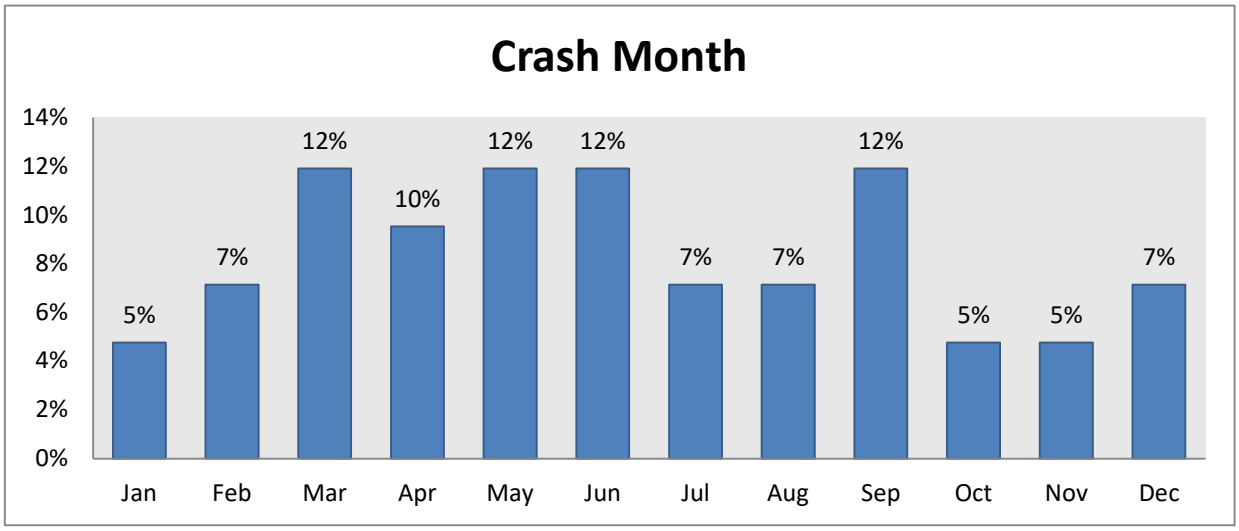
Post Road (Route 1) at Airport Road

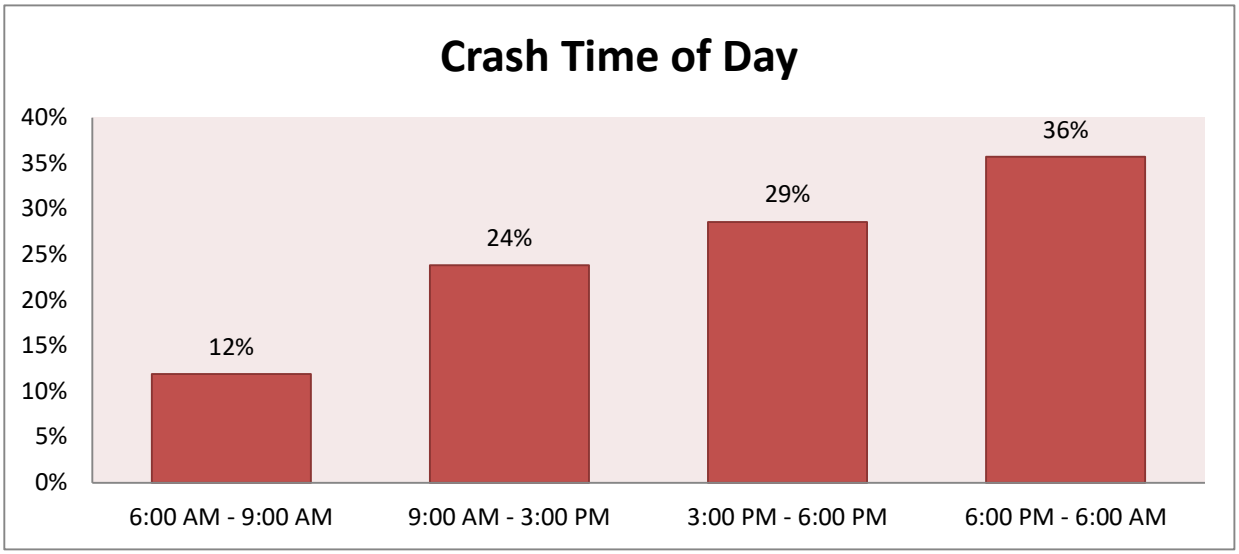
		2017	2018	2019	Total	Percent
Collision Type						
	Rear End	12	11	7	**30**	73%
	Angle	4	0	0	**4**	10%
	Head-On	0	0	0	**0**	0%
	Sideswipe, Same Direction	2	2	1	**5**	12%
	Sideswipe, Opposite Direction	1	0	0	**1**	2%
	Rear-to-Side	0	0	0	**0**	0%
	Rear-to-Rear	0	0	0	**0**	0%
	Collision with Object	1	0	0	**1**	2%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Accident Severity						
	Property	17	11	7	**35**	85%
	Injury	3	2	1	**6**	15%
	Fatal	0	0	0	**0**	0%
Light Condition						
	Daylight	13	9	6	**28**	68%
	Dawn	0	0	0	**0**	0%
	Dusk	1	1	0	**2**	5%
	Dark - Lighted	6	3	2	**11**	27%
	Dark - Not Lighted	0	0	0	**0**	0%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Road Condition						
	Dry	17	10	7	**34**	83%
	Wet	3	3	1	**7**	17%
	Snow	0	0	0	**0**	0%
	Ice/Frost	0	0	0	**0**	0%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Hour of Day						
	6:00 AM - 9:00 AM	2	3	0	**5**	12%
	9:00 AM - 3:00 PM	4	2	4	**10**	24%
	3:00 PM - 6:00 PM	7	3	2	**12**	29%
	6:00 PM - 6:00 AM	7	5	2	**14**	34%
	Total Accidents:	**20**	**13**	**8**	**41**	

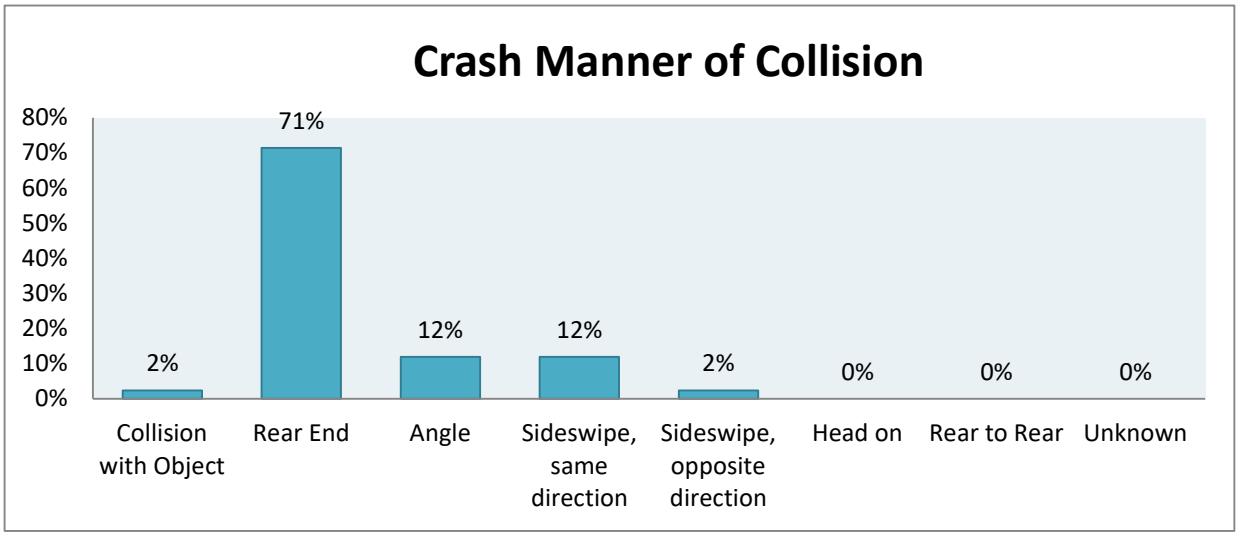
Post Road (Route 1) at Guilford Avenue

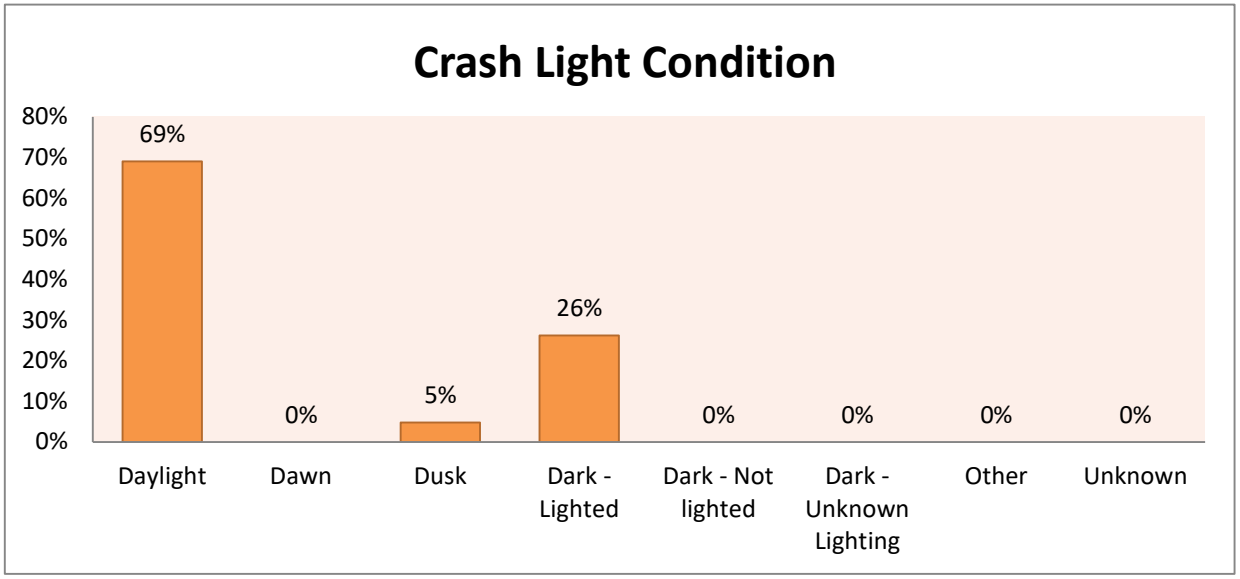
		2017	2018	2019	Total	Percent
Collision Type						
	Rear End	0	0	0	**0**	0%
	Angle	0	0	0	**0**	0%
	Head-On	0	0	0	**0**	0%
	Sideswipe, Same Direction	0	0	0	**0**	0%
	Sideswipe, Opposite Direction	0	0	0	**0**	0%
	Rear-to-Side	0	0	0	**0**	0%
	Rear-to-Rear	0	0	0	**0**	0%
	Collision with Object	0	0	0	**0**	0%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Accident Severity						
	Property	0	0	0	**0**	0%
	Injury	0	0	0	**0**	0%
	Fatal	0	0	0	**0**	0%
Light Condition						
	Daylight	0	0	0	**0**	0%
	Dawn	0	0	0	**0**	0%
	Dusk	0	0	0	**0**	0%
	Dark - Lighted	0	0	0	**0**	0%
	Dark - Not Lighted	0	0	0	**0**	0%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Road Condition						
	Dry	0	0	0	**0**	0%
	Wet	0	0	0	**0**	0%
	Snow	0	0	0	**0**	0%
	Ice/Frost	0	0	0	**0**	0%
	Other	0	0	0	**0**	0%
	Unknown	0	0	0	**0**	0%
Hour of Day						
	6:00 AM - 9:00 AM	0	0	0	**0**	0%
	9:00 AM - 3:00 PM	0	0	0	**0**	0%
	3:00 PM - 6:00 PM	0	0	0	**0**	0%
	6:00 PM - 6:00 AM	0	0	0	**0**	0%
	Total Accidents:	**0**	**0**	**0**	**0**	

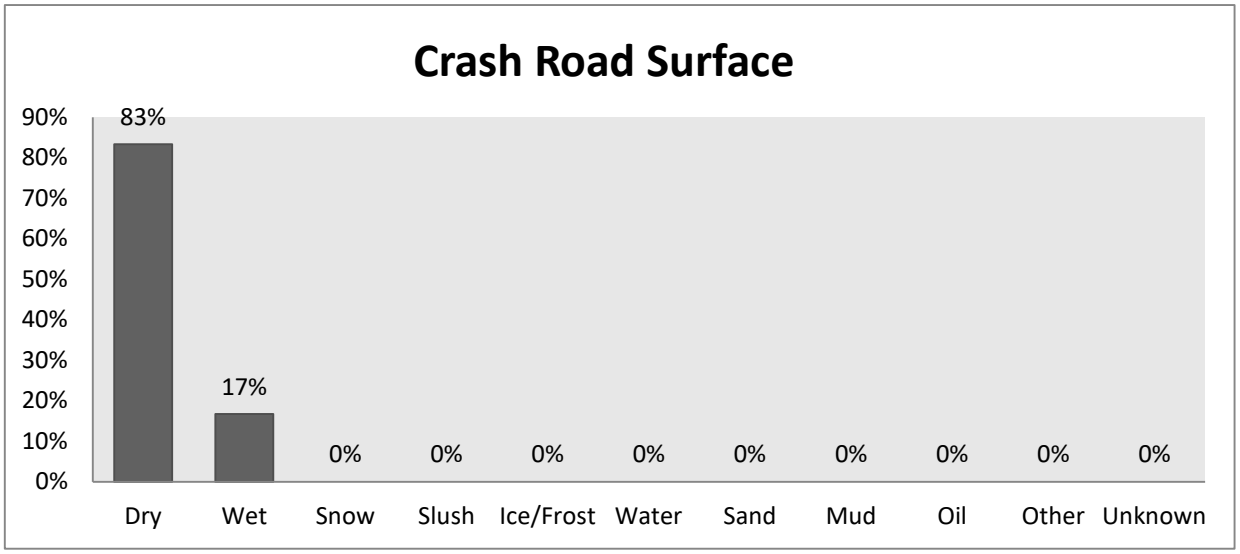
Crash Data Summary Charts








Crash Light Condition
80%
70%
60%
50%
40%
30%
20%
10%
0%
69%
0%
5%
26%
0%
0%
0%
0%
Daylight
Dawn
Dusk
Dark - Lighted
Dark - Not lighted
Dark - Unknown Lighting
Other
Unknown


Crash Road Surface
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83%
17%
0%
0%
0%
0%
0%
0%
0%
0%
0%
Dry
Wet
Snow
Slush
Ice/Frost
Water
Sand
Mud
Oil
Other
Unknown

APPENDIX C – Trip Generation

ITE Trip Generation Summary

Site Trip Distribution

ITE Land Use Code

- ITE Land Use Code 822 – Strip Retail Plaza (<40k)
- ITE Land Use Code 912 – Drive-in Bank

C

ITE Trip Generation Summary

Trip Generation Summary

Summary;

Description			Enter	Exit	Total
Weekday AM Peak Hour					
ITE Land Use Code 822	Strip Retail Plaza (<40k)		4	3	7
ITE Land Use Code 912	Drive-in Bank		14	9	23
		TOTAL	18	12	30
Weekday PM Peak Hour					
ITE Land Use Code 822	Strip Retail Plaza (<40k)		9	9	18
ITE Land Use Code 912	Drive-in Bank		23	24	47
		TOTAL	32	33	65

Calculations;

ITE Land Use Code 822 Strip Retail Plaza (<40k) (2,800 GFA)

Independent Variable (X) = Thousand Gross Floor Area (GFA) X = 2.8

AM Peak *Directional Distribution:* *60% Entering* *40% Exiting*

T =	2.36 (X)	Enter:	4
T =	2.36 2.8	Exit:	3
T =	7	Total:	7

PM Peak *Directional Distribution:* *50% Entering* *50% Exiting*

T =	6.59 (X)	Enter:	9
T =	6.59 2.8	Exit:	9
T =	18	Total:	18

ITE Land Use Code 912 Drive-in Bank (2,240 GFA)

Independent Variable (X) = Thousand Gross Floor Area (GFA) X = 2.24

AM Peak *Directional Distribution:* *58% Entering* *42% Exiting*

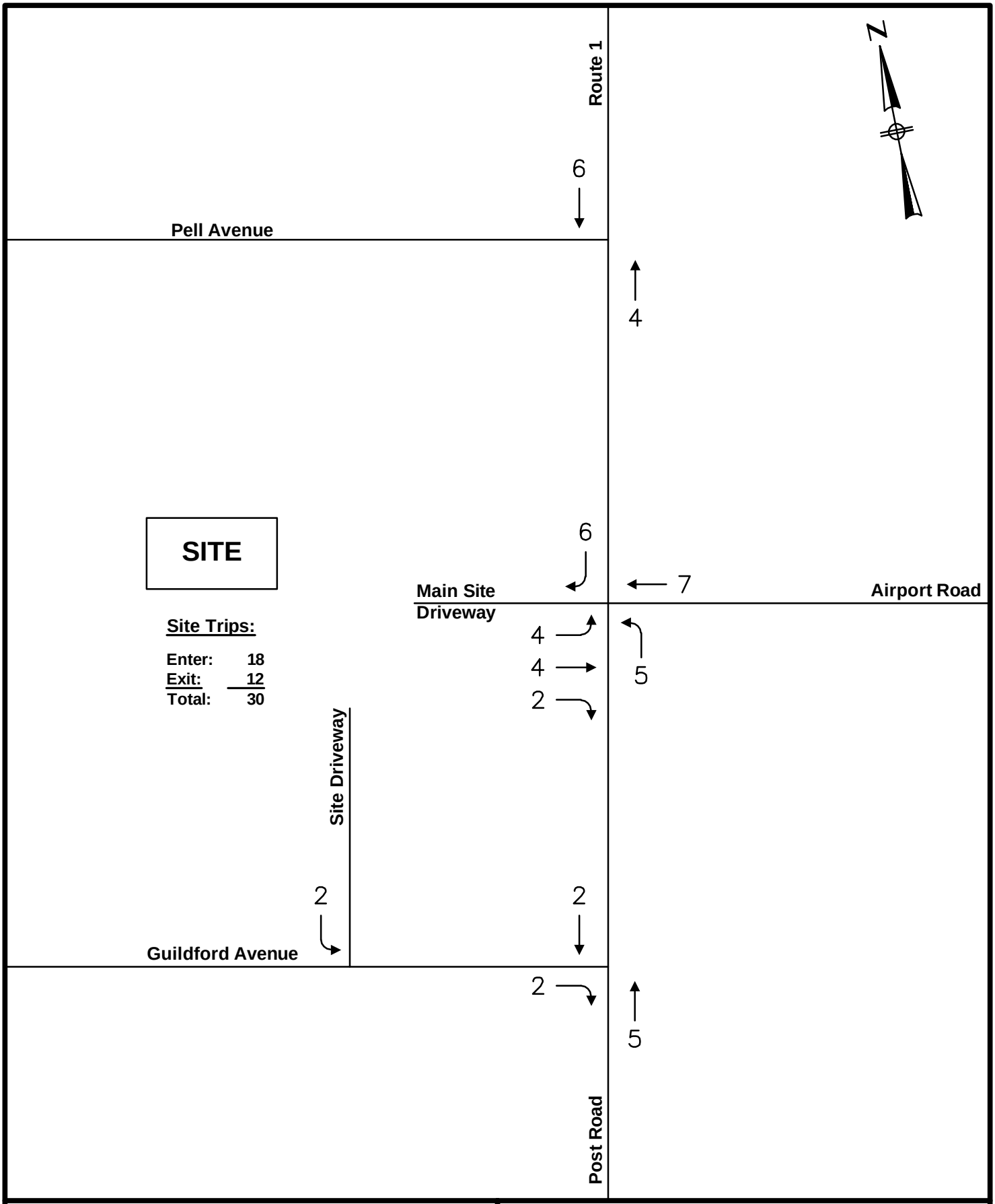
T =	9.95 (X)	Enter:	14
T =	9.95 2.24	Exit:	9
T =	23	Total:	23

PM Peak *Directional Distribution:* *50% Entering* *50% Exiting*

T =	21.01 (X)	Enter:	23
T =	21.01 2.24	Exit:	24
T =	47	Total:	47

C

Site Trip Distribution



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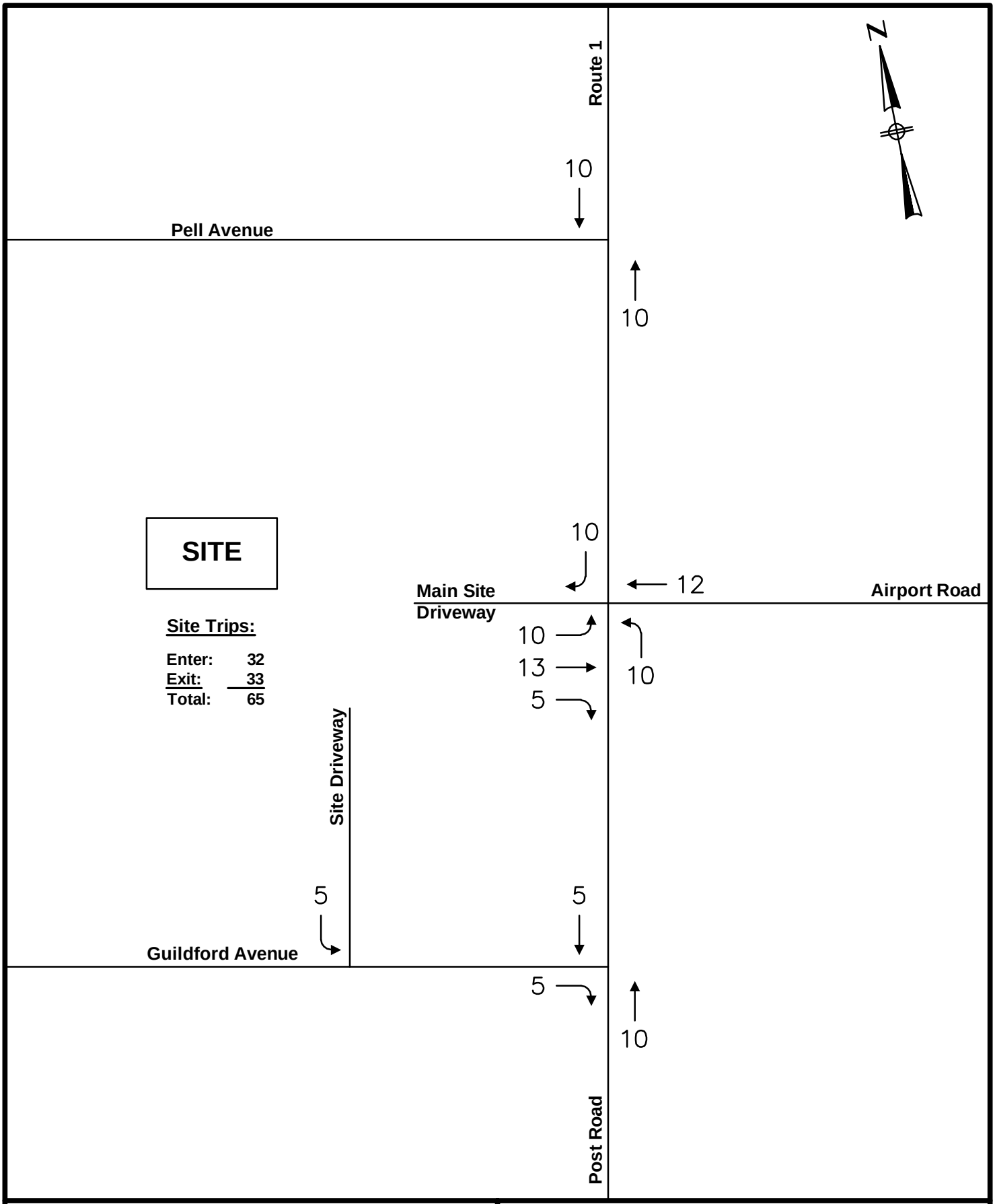
SITE TRIP DISTRIBUTION
WEEKDAY AM PEAK HOUR BUILD

PROPOSED COMMERCIAL REDEVELOPMENT
WARWICK, RHODE ISLAND



BETA
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SITE TRIP DISTRIBUTION
WEEKDAY PM PEAK HOUR BUILD

PROPOSED COMMERCIAL REDEVELOPMENT
WARWICK, RHODE ISLAND

C

ITE Land Use Code

ITE Land Use Code 822 – Strip Retail Plaza (<40k)

ITE Land Use Code 912 – Drive-in Bank

ITE Land Use Code 822 – Strip Retail Plaza (<40k)

Land Use: 822
Strip Retail Plaza (<40k)

Description

A strip retail plaza is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Each study site in this land use has less than 40,000 square feet of gross leasable area (GLA). Because a strip retail plaza is open-air, the GLA is the same as the gross floor area of the building.

The 40,000 square feet GFA threshold between strip retail plaza and shopping plaza (Land Use 821) was selected based on an examination of the overall shopping center/plaza database. No shopping plaza with a supermarket as its anchor is smaller than 40,000 square feet GLA.

Shopping center (>150k) (Land use 820), shopping plaza (40-150k) (Land Use 821), and factory outlet center (Land Use 823) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Delaware, Florida, New Jersey, Ontario (CAN), South Dakota, Vermont, Washington, and Wisconsin.

Source Numbers

304, 358, 423, 428, 437, 507, 715, 728, 936, 960, 961, 974, 1009

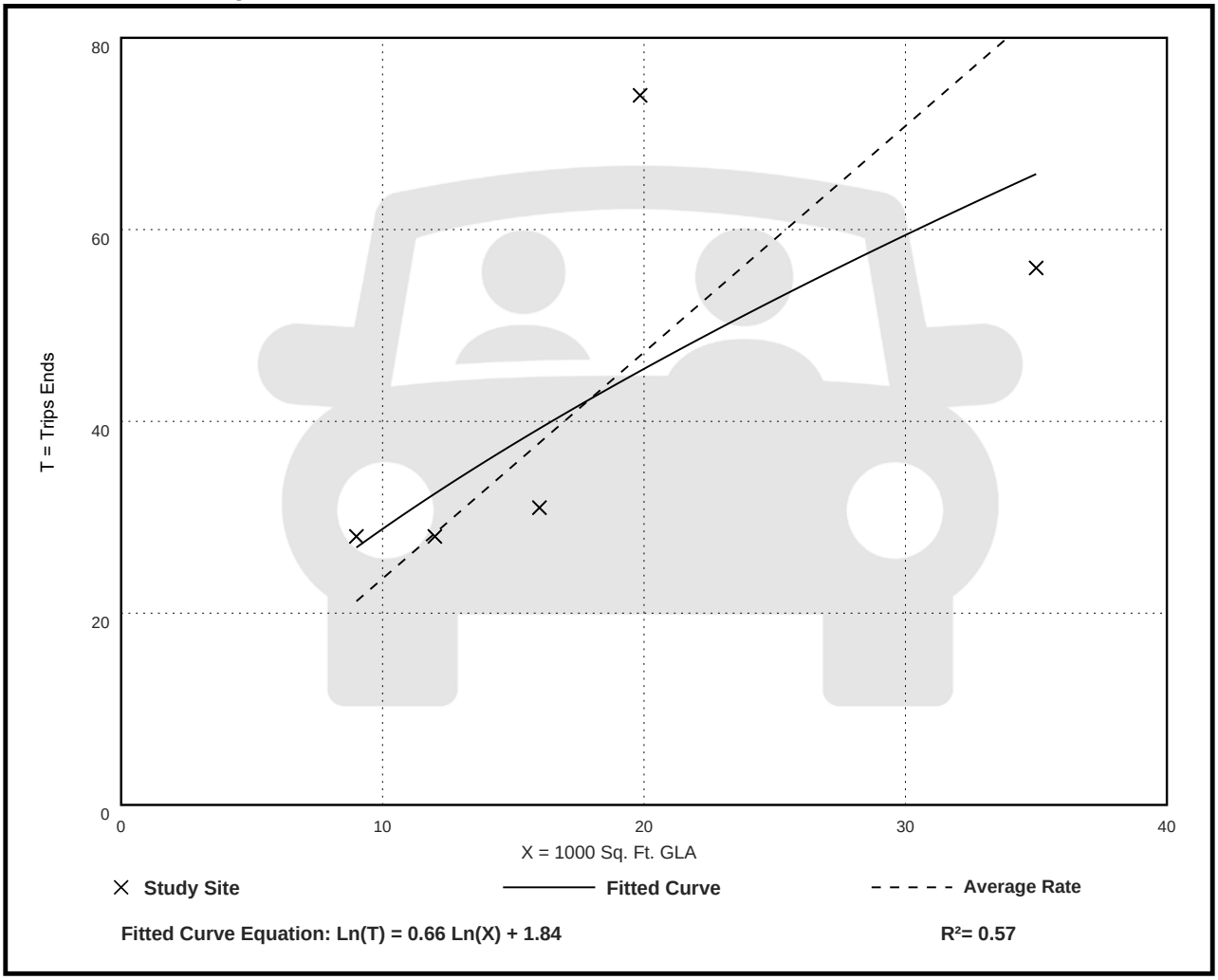
Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. 1000 Sq. Ft. GLA: 18
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.66 Ln(X) + 1.84

R^2= 0.57

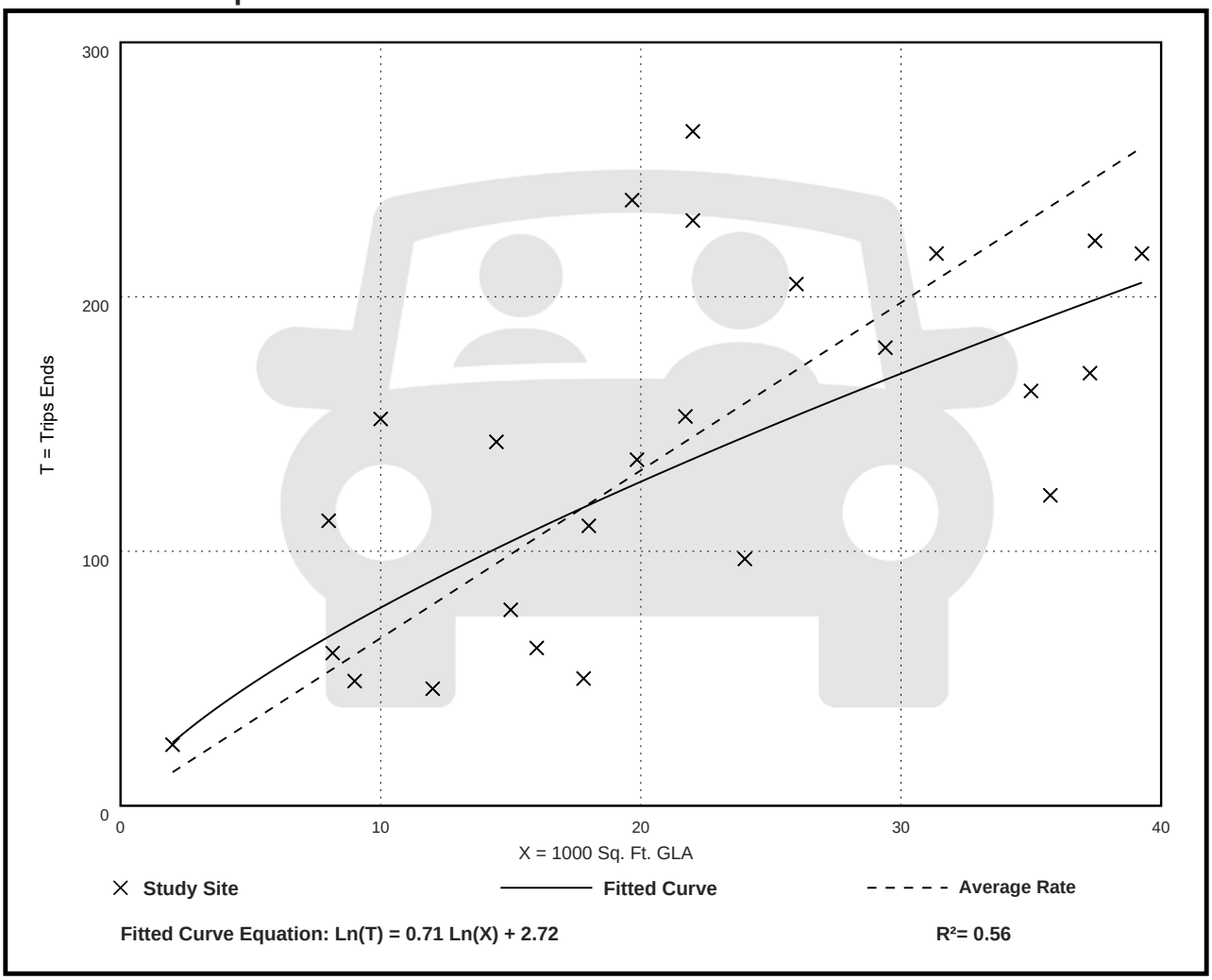
Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 25
Avg. 1000 Sq. Ft. GLA: 21
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.71 Ln(X) + 2.72

R^2= 0.56

ITE Land Use Code 912 – Drive-in Bank

Land Use: 912
Drive-in Bank

Description

A bank is a financial institution that can offer a wide variety of financial services. A drive-in bank provides banking services for a motorist through a teller station. A drive-in bank may also serve patrons who walk into the building. The drive-in lanes may or may not provide an automatic teller machine (ATM). Walk-in bank (Land Use 911) is a related use.

Additional Data

The independent variable—drive-in lanes—refers to all lanes at a banking facility used for financial transactions, including ATM-only lanes.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 2000s and the 2010s in Colorado, Kentucky, Minnesota, Nebraska, New Jersey, New York, Oregon, Pennsylvania, Texas, Vermont, Virginia, Washington, and Wisconsin.

To assist in the future analysis of this land use, it is important that Friday data be collected and reported separately from weekday data. It is also important to specify the date and month of the data collection period and the number of drive-through lanes that are open at the time of the study.

Source Numbers

535, 539, 553, 555, 573, 577, 600, 624, 626, 629, 630, 637, 656, 657, 710, 724, 728, 866, 869, 883, 884, 927, 935, 961, 1047

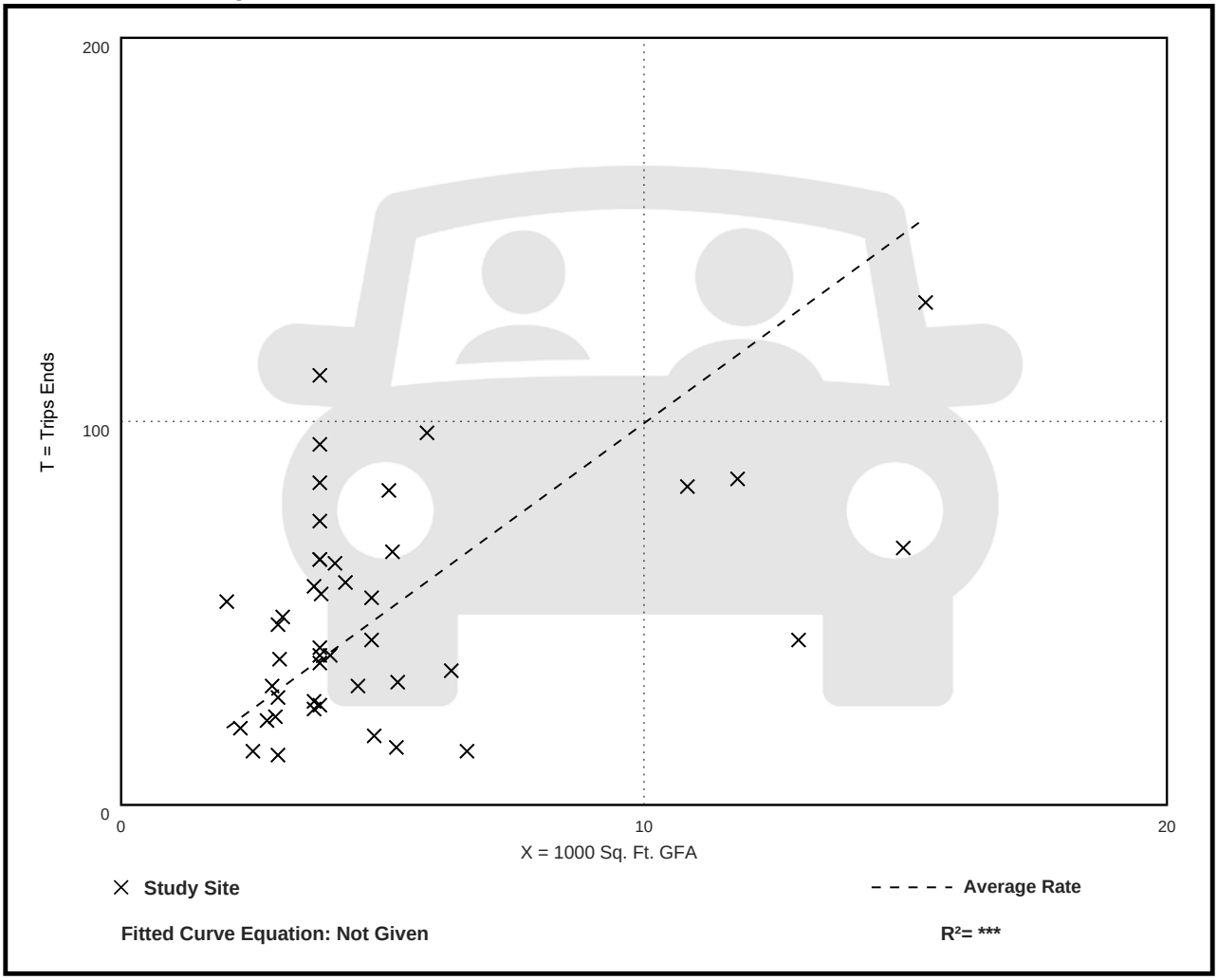
Drive-in Bank
(912)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 44
Avg. 1000 Sq. Ft. GFA: 5
Directional Distribution: 58% entering, 42% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.95	2.12 - 29.47	6.00

Data Plot and Equation



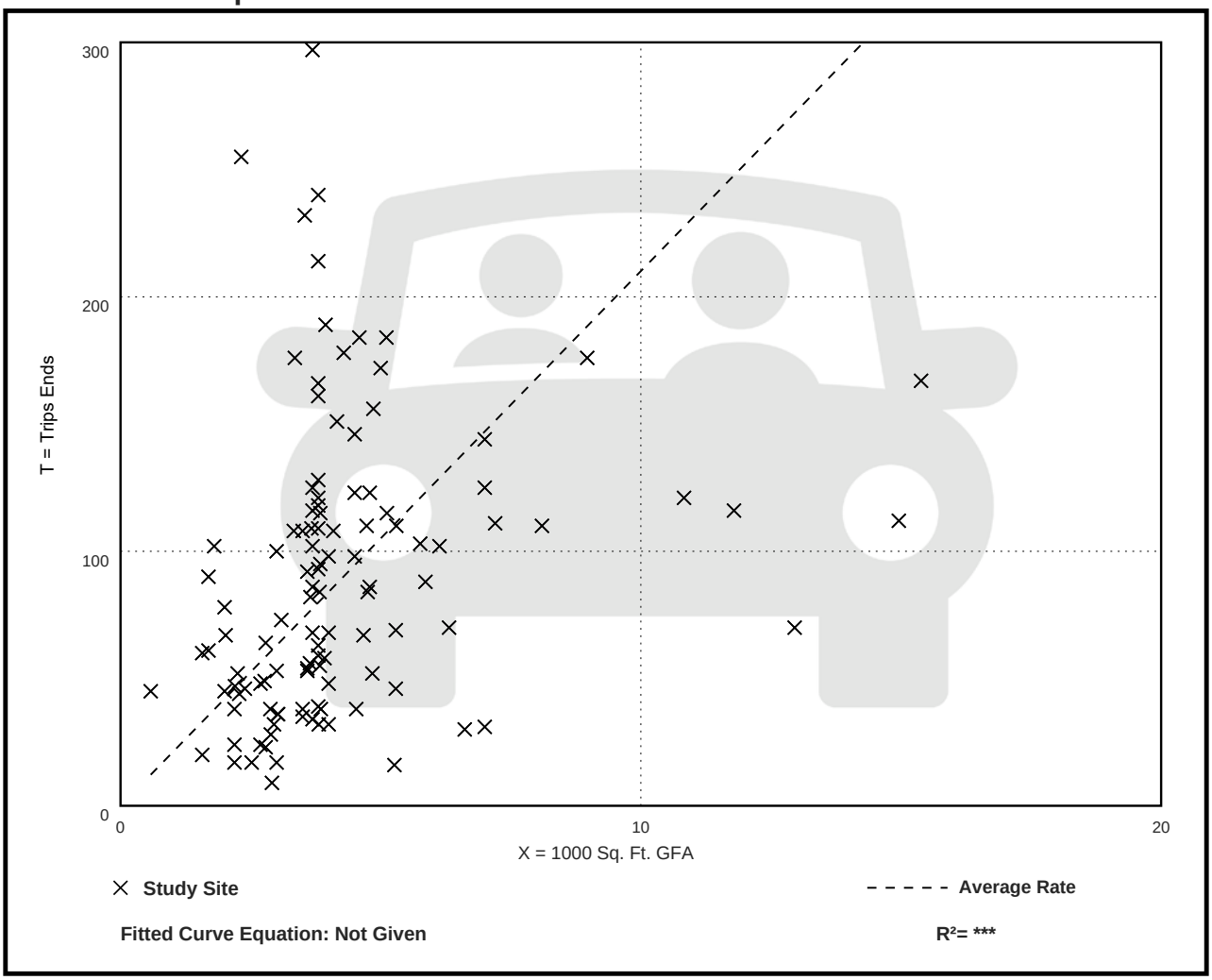
Drive-in Bank
(912)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 114
Avg. 1000 Sq. Ft. GFA: 4
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
21.01	3.04 - 109.91	15.13

Data Plot and Equation



APPENDIX D – Operational Analysis

Existing Conditions

Post Road (Route 1) at Airport Road

Future No-Build Conditions

Post Road (Route 1) at Airport Road/Site Driveway

Future Build Conditions

Post Road (Route 1) at Airport Road/Site Driveway

D

Existing Weekday AM / PM Peak Hour

Post Road (Route 1) at Airport Road

Post Road (Route 1) at Airport Road

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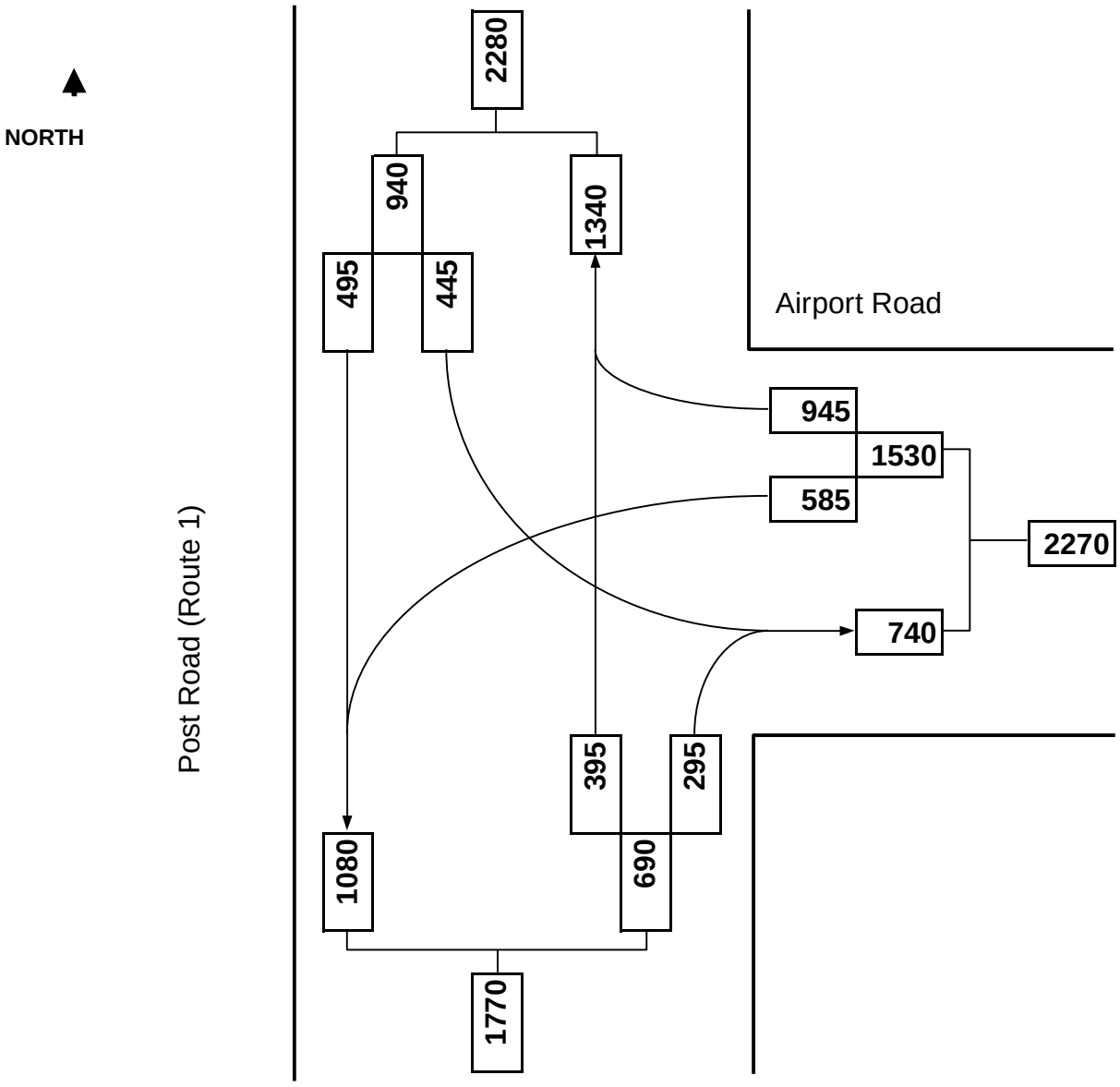
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	7:30 AM - 8:30 AM
Existing:	AM Peak Hour	**Future**:	n/a



Proposed Commercial Redevelopment — Warwick, RI
Post Road (Route 1) at Airport Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	585	945	395	295	445	495
Future Volume (vph)	585	945	395	295	445	495
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Satd. Flow (RTOR)		167				
Lane Group Flow (vph)	636	1027	429	321	484	538
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Total Split (s)	38.0	34.0	38.0	38.0	34.0	72.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	21.9	56.3	15.2	42.2	29.4	49.6
Actuated g/C Ratio	0.27	0.69	0.19	0.52	0.36	0.61
v/c Ratio	0.69	0.90	0.65	0.39	0.39	0.25
Control Delay	31.2	21.8	36.3	13.1	22.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	21.8	36.3	13.1	22.4	8.4
LOS	C	C	D	B	C	A
Approach Delay	25.4		26.4			15.0
Approach LOS	C		C			B
Queue Length 50th (ft)	148	306	106	92	92	59
Queue Length 95th (ft)	220	#796	172	145	168	109
Internal Link Dist (ft)	1376		748			726
Turn Bay Length (ft)		200		350	300	
Base Capacity (vph)	1403	1143	1446	1040	1233	2937
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.90	0.30	0.31	0.39	0.18

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 81.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 22.5 — Intersection LOS: C
Intersection Capacity Utilization 77.8% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1:

Existing Conditions
Timing Plan: AM Peak Hour

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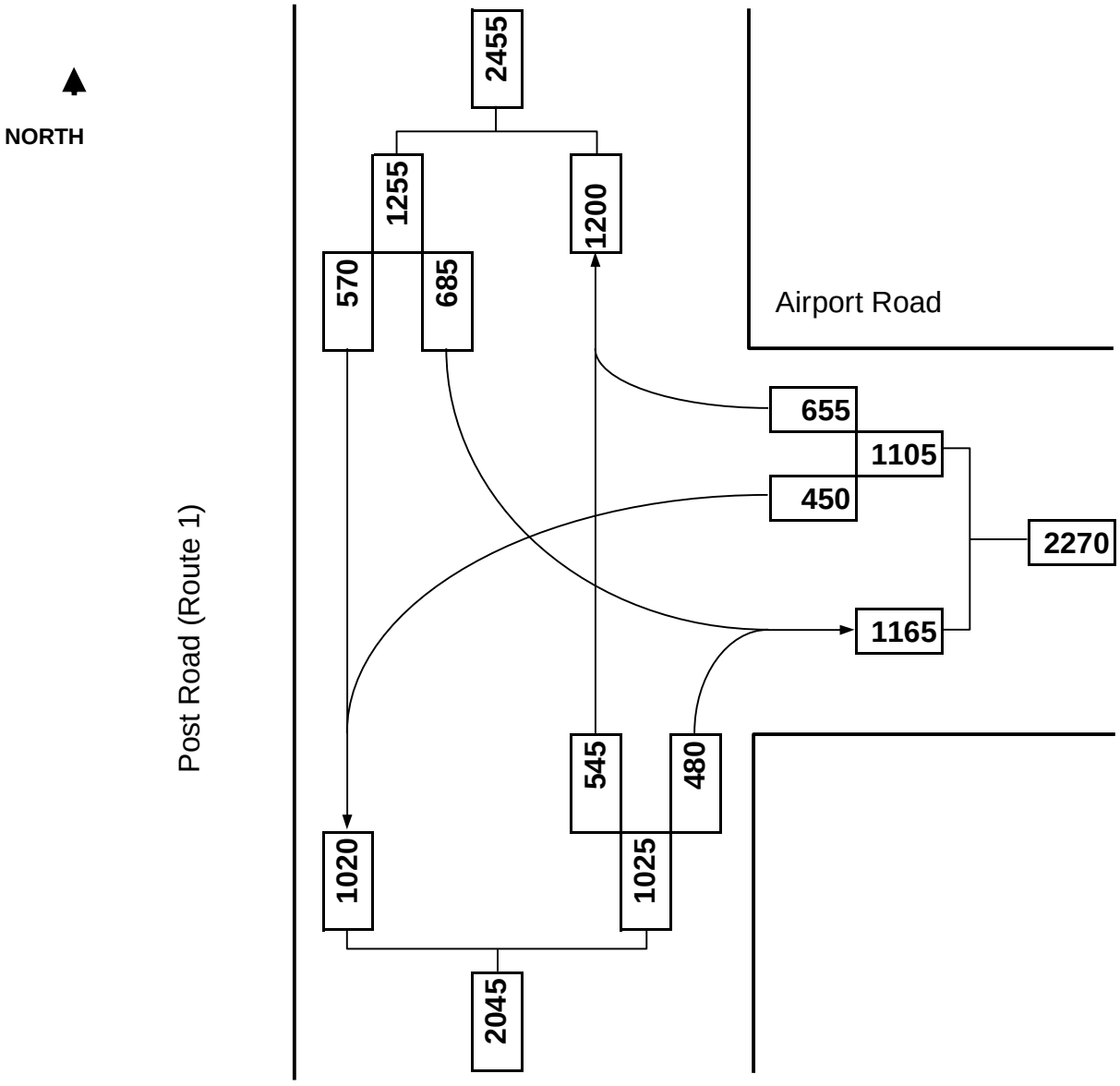
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	5:00 PM - 6:00 PM
Existing:	PM Peak Hour	**Future**:	n/a

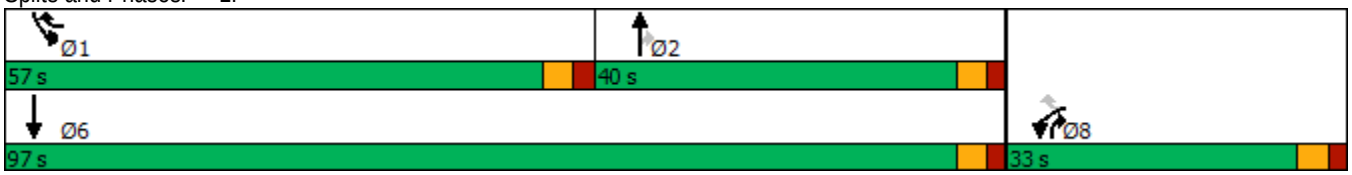


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	450	655	545	480	685	570
Future Volume (vph)	450	655	545	480	685	570
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Satd. Flow (RTOR)		57				
Lane Group Flow (vph)	489	712	592	522	745	620
Turn Type	Prot	pm+ov	NA	pm+ov	Prot	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Total Split (s)	33.0	57.0	40.0	33.0	57.0	97.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	20.1	55.1	21.4	46.8	29.7	56.4
Actuated g/C Ratio	0.23	0.63	0.25	0.54	0.34	0.65
v/c Ratio	0.62	0.70	0.68	0.61	0.64	0.27
Control Delay	35.5	14.2	35.6	18.6	27.7	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	14.2	35.6	18.6	27.7	7.0
LOS	D	B	D	B	C	A
Approach Delay	22.8		27.6			18.3
Approach LOS	C		C			B
Queue Length 50th (ft)	118	199	148	176	168	65
Queue Length 95th (ft)	230	425	275	379	295	113
Internal Link Dist (ft)	1376		748			726
Turn Bay Length (ft)		200		350	300	
Base Capacity (vph)	1159	1420	1493	1019	2152	3351
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.50	0.40	0.51	0.35	0.19

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 87
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 64.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1:



D

Future 2024 No Build Weekday AM / PM Peak Hour

Post Road (Route 1) at Airport Road

Post Road (Route 1) at Airport Road

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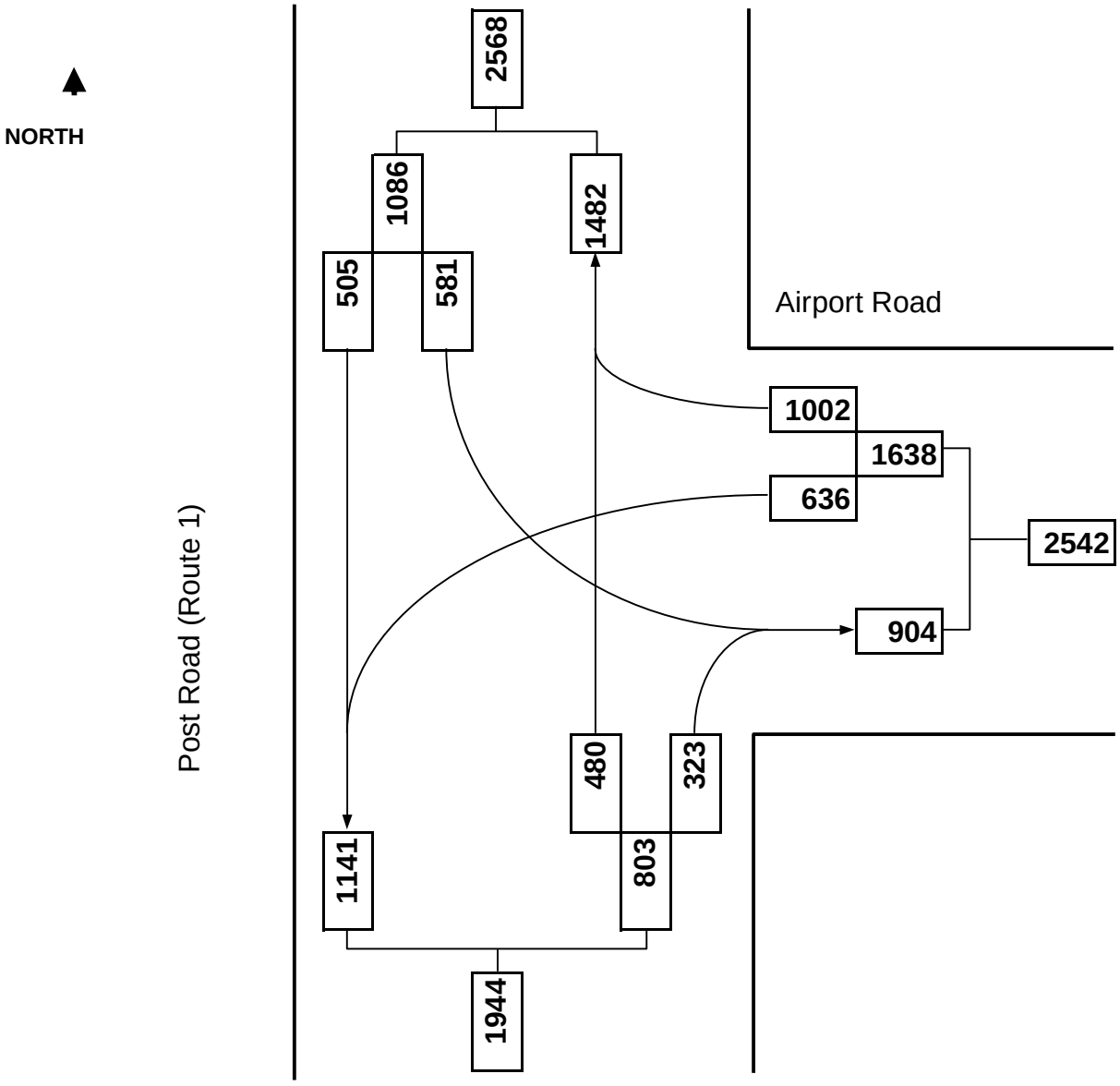
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	AM Peak Hour
Existing:	n/a	**Future**:	2024 No Build



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	636	1002	480	323	581	505
Future Volume (vph)	636	1002	480	323	581	505
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Satd. Flow (RTOR)		109				
Lane Group Flow (vph)	691	1089	522	351	632	549
Turn Type	Prot	pt+ov	NA	custom	Prot	NA
Protected Phases	8	1 8	2	2 8	1	6
Permitted Phases		8		2		
Total Split (s)	38.0		38.0		34.0	72.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Act Effct Green (s)	33.1	67.1	20.3	58.3	29.1	54.3
Actuated g/C Ratio	0.34	0.69	0.21	0.60	0.30	0.56
v/c Ratio	0.59	0.97	0.71	0.37	0.62	0.28
Control Delay	29.9	35.7	41.4	11.3	33.2	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	35.7	41.4	11.3	33.2	11.6
LOS	C	D	D	B	C	B
Approach Delay	33.4		29.3			23.2
Approach LOS	C		C			C
Queue Length 50th (ft)	179	509	158	104	171	87
Queue Length 95th (ft)	264	#1009	214	158	254	117
Internal Link Dist (ft)	1376		748			726
Turn Bay Length (ft)		200		350	300	
Base Capacity (vph)	1165	1124	1201	947	1024	2438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.97	0.43	0.37	0.62	0.23

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 97.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 29.3 Intersection LOS: C
Intersection Capacity Utilization 83.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1:

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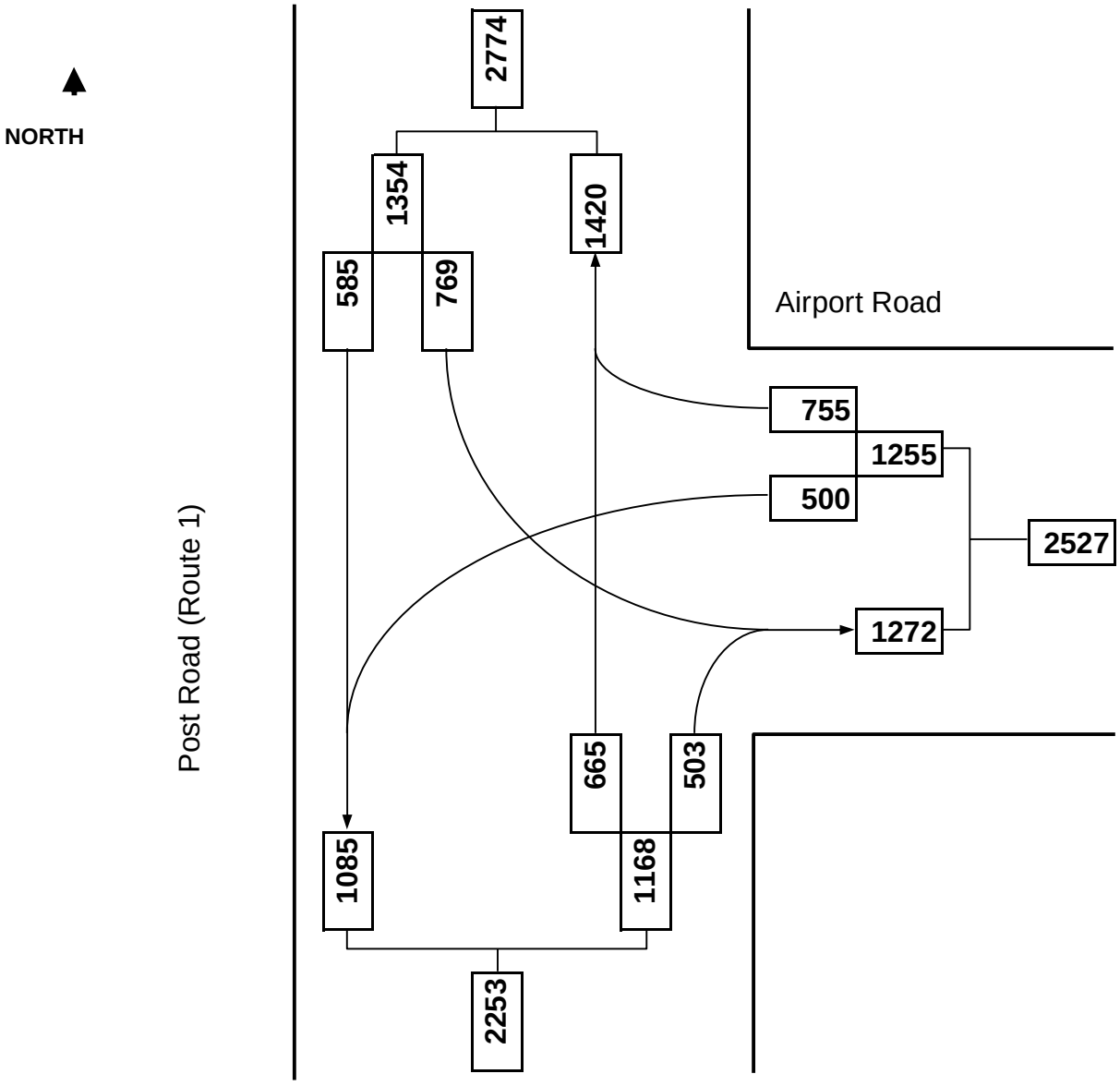
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	PM Peak Hour
Existing:	n/a	**Future**:	2024 No Build

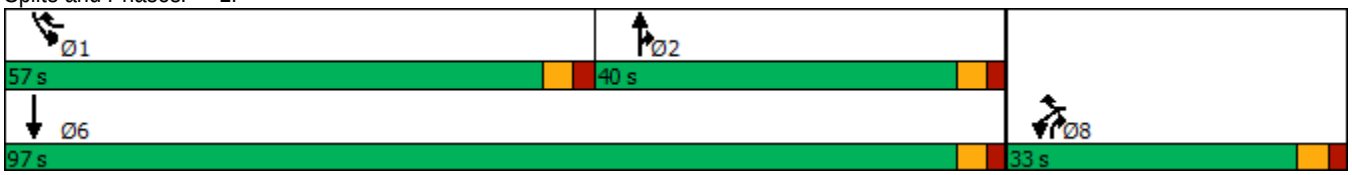


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	500	755	665	503	769	585
Future Volume (vph)	500	755	665	503	769	585
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Satd. Flow (RTOR)		29				
Lane Group Flow (vph)	543	821	723	547	836	636
Turn Type	Prot	pt+ov	NA	custom	Prot	NA
Protected Phases	8	1 8	2	2 8	1	6
Permitted Phases		8		2		
Total Split (s)	33.0		40.0		57.0	97.0
Total Lost Time (s)	5.0		5.0		5.0	5.0
Act Effct Green (s)	28.7	71.6	28.9	62.8	37.8	71.8
Actuated g/C Ratio	0.26	0.65	0.26	0.57	0.34	0.65
v/c Ratio	0.61	0.79	0.78	0.61	0.71	0.28
Control Delay	42.7	21.5	45.6	21.5	35.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	21.5	45.6	21.5	35.4	8.2
LOS	D	C	D	C	D	A
Approach Delay	29.9		35.3			23.6
Approach LOS	C		D			C
Queue Length 50th (ft)	177	411	241	229	274	90
Queue Length 95th (ft)	286	642	369	457	352	115
Internal Link Dist (ft)	1376		748			726
Turn Bay Length (ft)		200		350	300	
Base Capacity (vph)	889	1251	1146	890	1652	2966
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.66	0.63	0.61	0.51	0.21

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 110.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 29.3 — Intersection LOS: C
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1:



D

Future 2024 Weekday AM / PM Peak Hour

Post Road (Route 1) at Airport Road/Site Driveway

Post Road (Route 1) at Airport Road/Site Driveway

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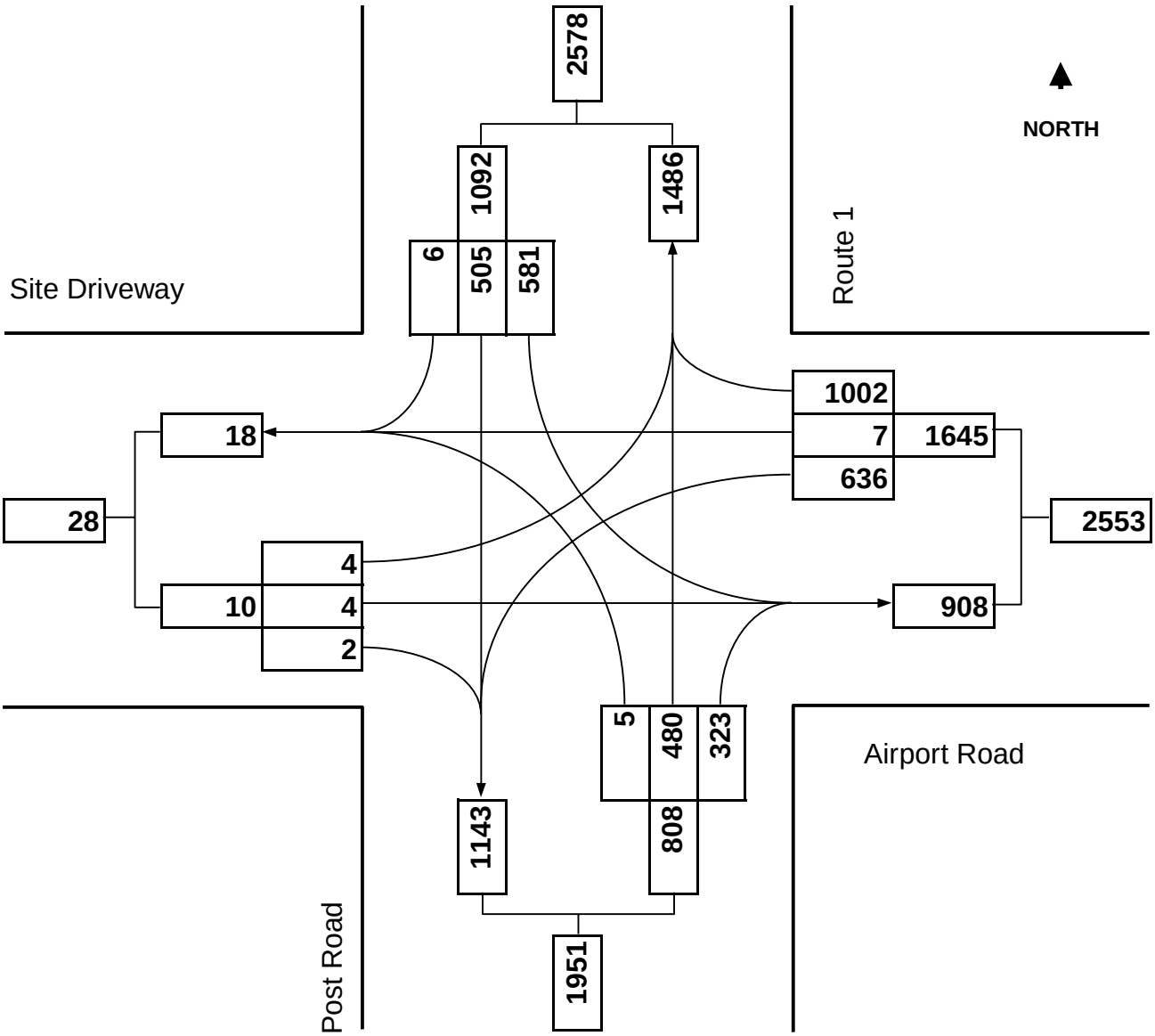
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road/Site Driveway
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	AM Peak Hour
Existing:	n/a	**Future**:	2024 Build

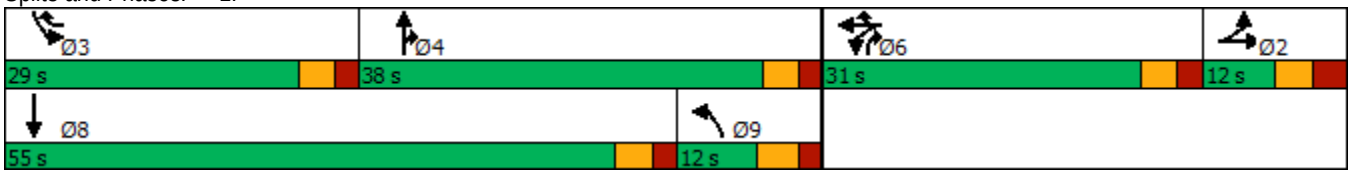


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	2	636	7	1002	5	480	323	581	505	6
Future Volume (vph)	4	4	2	636	7	1002	5	480	323	581	505	6
Satd. Flow (prot)	0	1812	0	1681	1687	1583	1805	3539	1583	3433	3533	0
Flt Permitted		0.980		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1812	0	1681	1687	1583	1805	3539	1583	3433	3533	0
Satd. Flow (RTOR)						267					1	
Lane Group Flow (vph)	0	10	0	352	347	1089	5	522	351	632	556	0
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	2	2		6	6	3 6	9	4	4 6	3	8	
Permitted Phases												
Total Split (s)	12.0	12.0		31.0	31.0		12.0	38.0		29.0	55.0	
Total Lost Time (s)		6.0		5.0	5.0		5.5	5.0		5.0	5.0	
Act Effct Green (s)		5.6		26.3	26.3	54.8	8.7	19.1	50.4	24.3	43.6	
Actuated g/C Ratio		0.06		0.30	0.30	0.63	0.10	0.22	0.58	0.28	0.50	
v/c Ratio		0.09		0.69	0.68	0.99	0.03	0.67	0.38	0.66	0.31	
Control Delay		44.3		37.3	36.8	39.6	34.6	35.6	11.6	33.2	16.6	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		44.3		37.3	36.8	39.6	34.6	35.6	11.6	33.2	16.6	
LOS		D		D	D	D	C	D	B	C	B	
Approach Delay		44.3			38.6			26.0			25.4	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		5		166	163	368	3	132	88	147	72	
Queue Length 95th (ft)		24		#407	#396	#1143	12	213	190	#281	228	
Internal Link Dist (ft)		29			332			748			459	
Turn Bay Length (ft)						165	75		250	225		
Base Capacity (vph)		126		509	511	1098	195	1360	917	960	2058	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.08		0.69	0.68	0.99	0.03	0.38	0.38	0.66	0.27	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 86.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 31.7 Intersection LOS: C
Intersection Capacity Utilization 92.8% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1:



Timing Plan:
2024 Build Optz Airport AM

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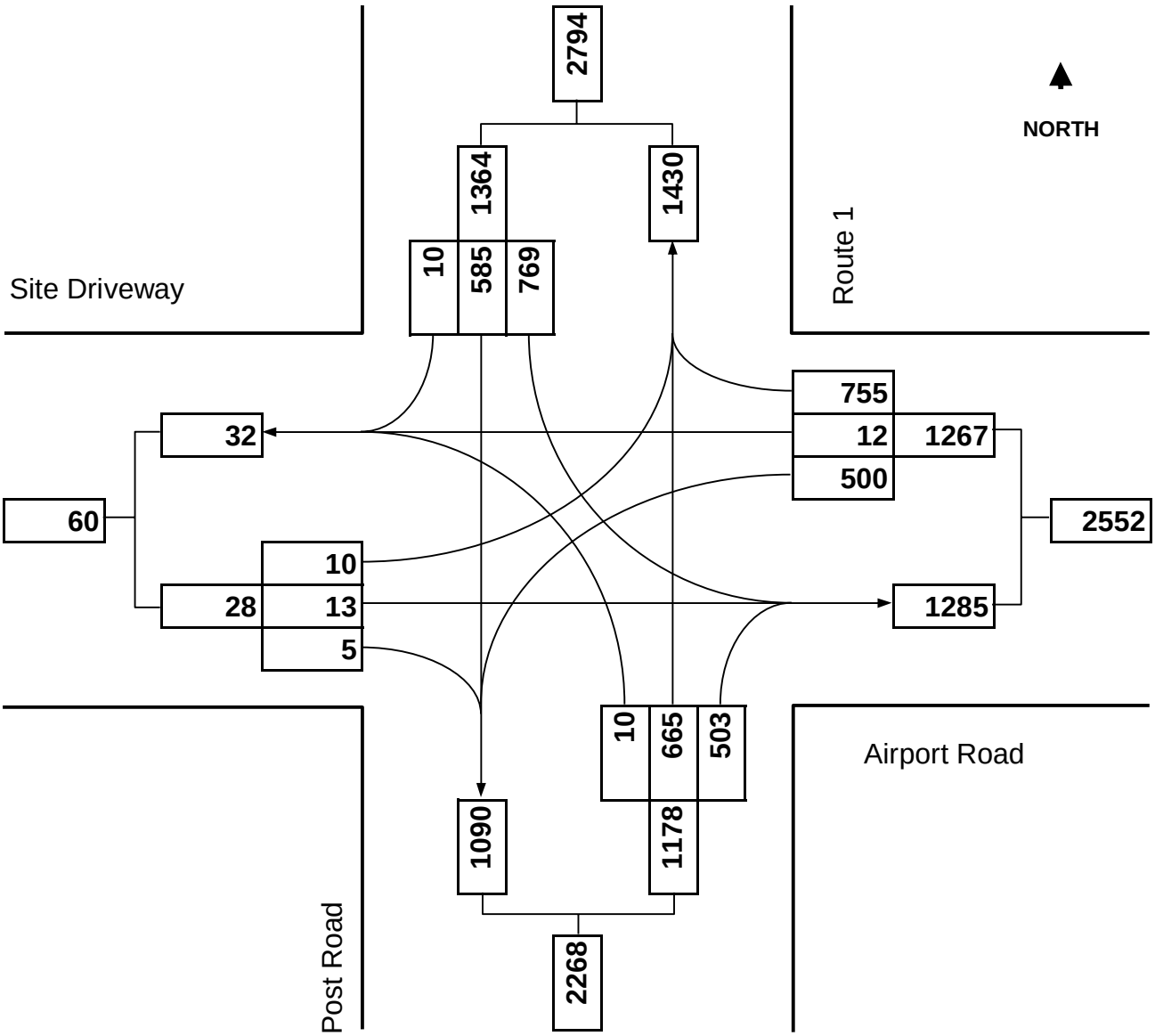
Turning Movement Diagram

Major Street:	Post Road (Route 1)	**Minor Street**:	Airport Road/Site Driveway
City/Town:	Warwick, RI	**Day of Week**:	Weekday
Reference No.:	7593	**Peak Period**:	PM Peak Hour
Existing:	n/a	**Future**:	2024 Build



Proposed Commercial Redevelopment — Warwick, RI

Post Road (Route 1) at Airport Road/Site Driveway

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	13	5	500	12	755	10	665	503	769	585	10
Future Volume (vph)	10	13	5	500	12	755	10	665	503	769	585	10
Satd. Flow (prot)	0	1823	0	1681	1690	1583	1805	3539	1583	3433	3530	0
Flt Permitted		0.982		0.950	0.954		0.950			0.950		
Satd. Flow (perm)	0	1823	0	1681	1690	1583	1805	3539	1583	3433	3530	0
Satd. Flow (RTOR)						170					2	
Lane Group Flow (vph)	0	30	0	277	279	821	11	723	547	836	647	0
Turn Type	Split	NA		Split	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	2	2		6	6	3 6	9	4	4 6	3	8	
Permitted Phases												
Total Split (s)	12.0	12.0		33.0	33.0		12.0	35.0		50.0	73.0	
Total Lost Time (s)		6.0		5.0	5.0		5.5	5.5		5.0	5.0	
Act Effct Green (s)		6.0		27.9	27.9	66.9	11.1	27.2	60.2	36.6	62.1	
Actuated g/C Ratio		0.05		0.24	0.24	0.59	0.10	0.24	0.53	0.32	0.54	
v/c Ratio		0.32		0.67	0.68	0.82	0.06	0.86	0.65	0.76	0.34	
Control Delay		67.6		51.9	51.9	20.9	46.9	54.5	26.9	40.4	19.0	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		67.6		51.9	51.9	20.9	46.9	54.5	26.9	40.4	19.0	
LOS		E		D	D	C	D	D	C	D	B	
Approach Delay		67.6			33.5			42.7			31.1	
Approach LOS		E			C			D			C	
Queue Length 50th (ft)		24		220	221	305	9	296	325	312	126	
Queue Length 95th (ft)		59		#365	#368	460	22	#422	502	386	312	
Internal Link Dist (ft)		29			332			748			459	
Turn Bay Length (ft)						165	75		250	225		
Base Capacity (vph)		98		425	427	1115	188	943	840	1396	2272	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.31		0.65	0.65	0.74	0.06	0.77	0.65	0.60	0.28	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 114

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 35.7 — Intersection LOS: D

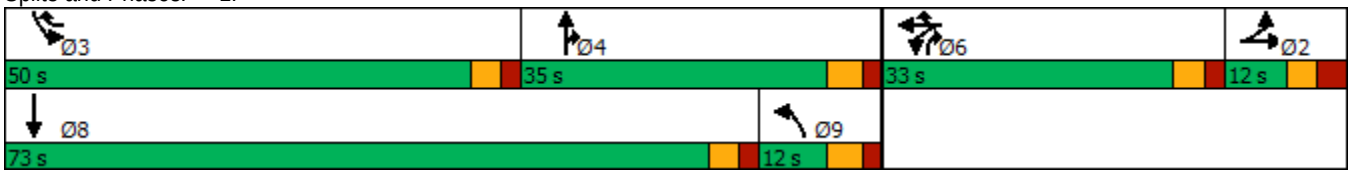
Intersection Capacity Utilization 83.0% — ICU Level of Service E

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1:



Timing Plan: PM Peak Hour

2024 Build Conditions

APPENDIX E – Off-Site Improvement Concept Plan

Post Road (Route 1) at Airport Road/Site Access Driveway

Proposed Commercial Redevelopment

WARWICK, RHODE ISLAND

Off-Site Improvement Concept Plan