
TRAFFIC ENGINEERING EVALUATION

EXECUTIVE DRIVE REDEVELOPMENT TOWNSHIP OF WEST ORANGE ESSEX COUNTY, NEW JERSEY

PREPARED FOR:

GREEN ESSEX PARTNERS URBAN RENEWAL ENTITY, LLC
C/O BNE REAL ESTATE GROUP, LLC
16 Microlab Road, Suite A
Livingston, New Jersey 07039

March 19, 2020
BCG File No. 081109-01-001

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CONSULTING



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A handwritten signature in black ink, appearing to read 'Eric L. Keller', is positioned above a horizontal line.

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Professional Engineer License No. 32054

**TRAFFIC ENGINEERING EVALUATION
EXECUTIVE DRIVE REDEVELOPMENT
TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY**

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**TRAFFIC ENGINEERING EVALUATION
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TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY**

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INTRODUCTION

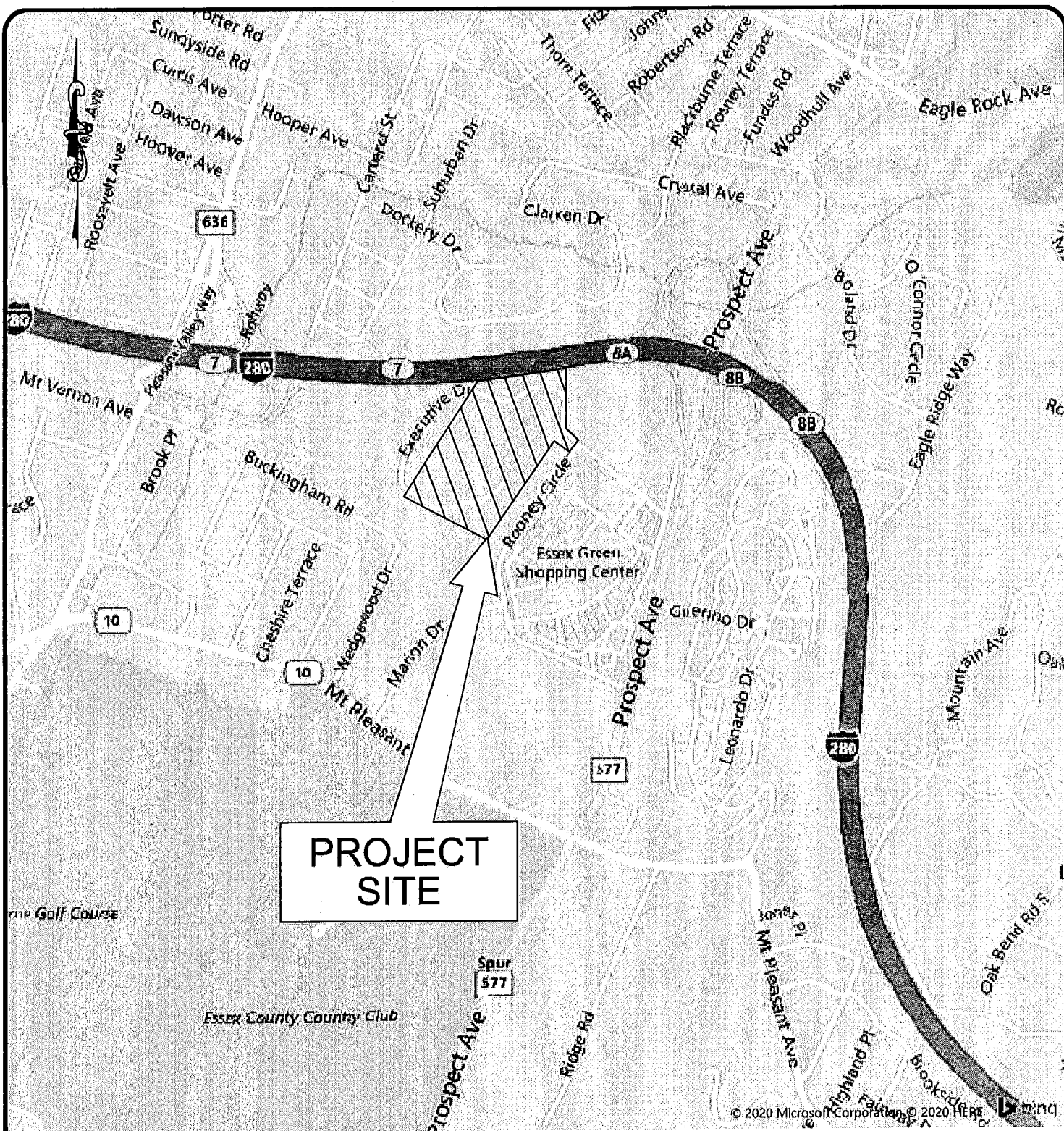
This Traffic Engineering Evaluation was prepared to assess any traffic impacts that may occur from the proposed redevelopment of the subject site located on the south side of Interstate 280, west of the Essex Green Shopping Center, in the Township of West Orange, Essex County. The project is proposed to contain a total of 425 multi-family residential units in three buildings with a total of 820 parking spaces of which 570 spaces are provided in a multi-level parking structure, 42 spaces in individual garages, 42 spaces in driveways and the remaining 166 spaces are provided in surface parking lots. The location of the site is illustrated in Figure 1.

The subject property is known on the Township of West Orange tax maps as Block 155, Lots 40.02 and 42.02. The subject property contains approximately 18.31 acres with approximately 135 feet of frontage along the north side of Rooney Circle. The site currently contains two multi-story office buildings containing a total of 203,171 square feet, of which approximately 25 percent is currently occupied. Access to the site is provided via Executive Drive and Rooney Circle. Executive Drive also provides access to 300 Executive Drive, a 129,300 square foot office building (52.7 percent occupied) and 10 Rooney Circle, a 70,900 square foot office building (41.4 percent occupied). We note that the 10 Rooney Circle office building also has another driveway to Rooney Circle located between the Courtyard Marriott and Cambria Suites hotels. Access to the proposed redevelopment project will continue to be provided via Executive Drive and Rooney Circle and shared access will remain with the two office buildings to remain.

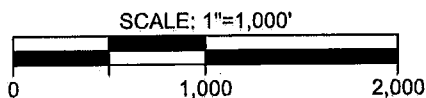
Primary aspects of this study include the investigation of existing conditions adjacent to the site, the establishment of background traffic volumes for the surrounding streets, estimation of the development related trip generation utilizing known published sources, assignment of the development related volumes to the key intersections serving the proposed development site, and the assessment of intersection performance using established traffic engineering methodologies. The base year for anticipated build-out of the redevelopment is 2023.

The ensuing report will detail the existing and proposed conditions, summarize the traffic operations at key locations, and include our findings as to the effects of the proposed redevelopment on the existing street network.

P:\081109 - Executive Drive West Orange\081109-01-001 (ENG)\Engineering\Engineering Files\TRAFFIC VOLUMES.dwg, BQ: ROAD LOCATION MAP, 3/16/2020 2:38:13 PM, mpietrangeli, 1:1



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CENTER OF PROJECT SITE:
x: 559,725 (E)
y: 714,097 (N)
N.J. STATE PLANE
COORDINATE SYSTEM

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FIGURE 1 BNE-EXECUTIVE DRIVE LOCATION MAP

TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, N.J.

EXISTING CONDITIONS

The subject property currently contains two office buildings and associated surface parking lots, as well as Executive Drive which provides access to these two office buildings and two other office buildings on adjacent parcels. The two office buildings on the subject site contain a total of 203,171 square feet of office space, of which approximately 46.3 percent is currently occupied. Access is currently provided via Executive Drive, which intersects with Rooney circle at the eastern portion of the tract. Adjacent land uses include the Essex Green Shopping Center; office buildings located at 300 Executive Drive and 10 Rooney Circle; the Cambria Suites and Courtyard Marriott hotels; LA Fitness; and townhouses and single family homes to the southwest.

Our assessment of traffic conditions in this area included a study of the signalized intersection of Prospect Avenue (CR 577) with Guerino Drive/Essex Green Driveway; and the unsignalized intersections of Executive Drive with Rooney Circle; Rooney Circle with Marion Drive and Mt. Pleasant Avenue (Route 10) with Marion Drive. Field observations were made of the existing traffic control devices at the studied intersections. The signal timing for the Prospect Avenue intersection was obtained for Essex County and is contained in Appendix IV.

The following subsections include a brief description of key routes in the adjacent roadway system:

Study Roadways

Prospect Avenue (CR 577)

Prospect Avenue (CR 577) serves as an urban principal arterial extending in a north-south direction. It begins to the south at Northfield Avenue in West Orange and terminates at Bloomfield Avenue (CR 506) to the north in Verona. Just north of the subject redevelopment area, it provides a full movement interchange with Interstate 280; and to the south it intersects with Mt. Pleasant Avenue (State Route 10/CR 577).

Prospect Avenue provides three travel lanes in each direction in the vicinity of the Essex Green Shopping Center. The posted speed limit in this segment is 40 MPH. No parking is permitted along either side of the street. There is a sidewalk along the Essex Green Shopping Center from Rooney Circle to the shopping center driveway and at the Care Station property on the east side of the roadway.

Mt. Pleasant Avenue (State Route 10)

Mt. Pleasant Avenue (State Route 10) serves as an urban principal arterial extending in an east-west direction. Mt. Pleasant Avenue extends from U.S. Route 46 in Roxbury Township to the west, terminating at Prospect Avenue in West Orange. Mt. Pleasant Avenue extends in an easterly direction to Main Street in West Orange. Mt. Pleasant Avenue conveys local traffic oriented to and from the adjacent land uses as well as

regional traffic seeking accessibility to the highway network. The posted speed limit is 40 MPH in the vicinity of its intersection with Marion Drive.

In the vicinity of Marion Drive, the cartway is striped for two travel lanes in each direction. There is a sidewalk along the north side of the roadway from Marion Drive to Prospect Avenue. No parking is permitted along either side of the roadway.

Rooney Circle

Rooney Circle serves as an urban municipal street extending around the Essex Green Shopping Center. It intersects with the shopping center driveway on the north end which provides access to Prospect Avenue, Executive Drive, Marion Drive and various parking aisles and driveways along its length. Rooney Circle's primary function is to provide access to the various uses located along its length. It is generally provided with one travel lane in each direction, except for its southern leg between Marion Drive and Prospect Avenue which is provided with two travel lanes in each direction. There is no posted speed limit and by statute it would be 25 MPH. There are no sidewalks along its length except for a small segment near the Cambria Suites hotel. No parking is permitted along its length.

Marion Drive

Marion Drive serves as an urban municipal street extending from Rooney Circle to Mt. Pleasant Avenue (State Route 10). Marion Drive provides access to the Essex Green Villas and the medical office building at 375 Mt. Pleasant Avenue. At its intersection with State Route 10, only right turns are permitted onto Route 10. It contains one travel lane in each direction with no sidewalks and no parking is permitted along either side. There is no posted speed limit and by statute it would be 25 MPH.

Studied Intersections

The intersection of Prospect Avenue with Guerino Drive/Essex Green Driveway is controlled by a four-phase, semi-actuated traffic signal operating on a variable cycle length between 78 and 115 seconds. Both the northbound and southbound Prospect Avenue approaches are provided with four (4) travel lanes, an exclusive left turn lane, two exclusive through lanes and a shared thru/right lane. The westbound Guerino Drive approach is provided with an exclusive left turn lane and a shared left/thru lane. The right turn movement from Guerino Drive is channelized and operates under Yield controlled conditions. The eastbound Essex Green driveway approach is provided with an exclusive left turn lane and a shared left/thru/right lane.

The intersection of Rooney Circle with Executive Drive operates under Stop-controlled conditions on Executive Drive. The northbound Rooney Circle approach provides an exclusive left turn lane and a through lane; while the westbound Rooney Circle approach provides a shared thru/right turn lane. The eastbound Executive Drive approach provide a shared left/right turn lane.

The intersection of Rooney Circle with Marion Drive operates under Stop-controlled conditions on Marion Drive. The northbound Rooney Circle approach provides a shared left turn/thru lane and an exclusive through lane; while the southbound Rooney Circle approach provides a shared thru/right turn lane. The eastbound Marion Drive approach provides a shared left/right turn lane.

Traffic Volumes

Manual intersection traffic turning movement counts were performed at the following intersections on Thursday, January 23, 2020:

1. Prospect Avenue (CR 577) with Essex Green Driveway/Guerino Drive
2. Rooney Circle with Executive Drive
3. Rooney Circle with Marion Drive
4. Mt. Pleasant Avenue (State Route 10) with Marion Drive

These counts were performed during the morning peak period from 7:00 AM to 9:00 AM and during the evening peak period from 4:00 PM to 6:00 PM.

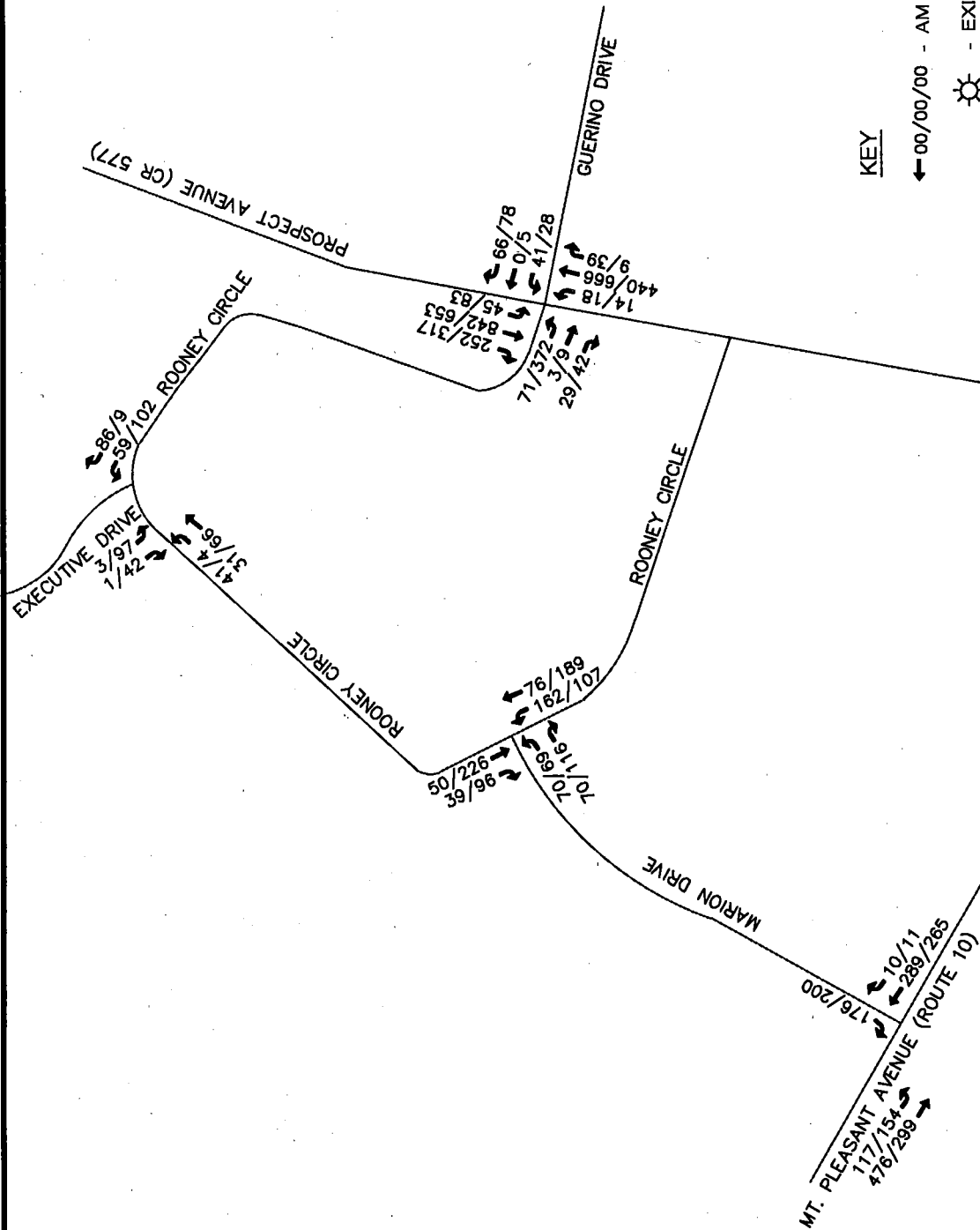
Based on the manual traffic turning movement counts, the AM weekday peak hour established for analysis purposes was determined to generally be between 8:00 AM and 9:00 AM; except at Mt. Pleasant Avenue with Marion Drive, which was between 7:45 AM and 8:45 AM. The PM weekday peak hour was somewhat more variable with two intersections have their peak hour 5:00 PM and 6:00 PM; the Prospect Avenue intersection from 4:45 PM to 5:45 PM; and the Rooney Circle/Marion Drive intersection from 4:00 PM to 5:00 PM. The use of the peak hours, regardless of the specific times, provides a more conservative analysis as we are analyzing the highest observed volumes during both peak periods.

Existing volumes at the studied locations for the weekday AM peak hour and PM peak hour are illustrated in Figure 2. These existing traffic volume data were used as the basis for this traffic engineering evaluation. Appendix III contains the AM and PM peak period traffic turning movement counts.

Capacity Analyses

The existing AM and PM peak hour intersection traffic volumes were analyzed to evaluate the quality of operation at the studied intersections. The methodology presented in 2010 Highway Capacity Manual, Chapter 18 entitled "Signalized Intersections" and Chapter 19 entitled "Unsignalized Intersections". Intersection capacity calculations were completed using the Highway Capacity Software, version 7.7. Definitions of Levels of Service for stop- and signal-controlled intersections are provided in Appendix I.

The methodology addresses two measurements of an intersection's effectiveness in accommodating conflicting traffic movements; capacity and level of service (LOS).



KEY

← 00/00/00 - AM PEAK/PM PEAK HOUR VOLUMES

☀ - EXISTING TRAFFIC SIGNAL

FIGURE 2 BNE - EXECUTIVE DRIVE EXISTING (2020) TRAFFIC VOLUMES

TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY

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Capacity is defined for each approach as a maximum number of vehicles that may pass through the intersection given the prevailing roadway and traffic control conditions. The capacity is evaluated in terms of the ratio of actual traffic flow to capacity (v/c ratio). The second measure of effectiveness is average stopped delay per vehicle (seconds/vehicle), which determines the Level of Service.

Table 1 presents the levels of service for the AM and PM peak hours at the studied intersections. As shown in Table 1, under 2020 Existing Conditions, all movements at the studied signalized intersection operate at acceptable LOS D or better during both peak hours, except for the Prospect Avenue left turn movements which operate at LOS E during the AM peak hour and LOS E (NB)/LOS F (SB) during the PM peak hour. All of the unsignalized intersections operate at LOS C or better on all approaches during both peak hours.

**TABLE 1 - LEVEL OF SERVICE / AVERAGE VEHICLE DELAY COMPARISON - EXISTING & NO BUILD CONDITIONS
EXECUTIVE DRIVE REDEVELOPMENT, WEST ORANGE, NJ**

Intersection	2020 Existing Condition							2023 No Build Condition						
	LANE GROUP	AM PEAK			PM PEAK			LANE GROUP	AM PEAK			PM PEAK		
		V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service		V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service
Prospect Avenue & Essex Green Dwy/ Guerino Dr. (Signalized)	EB-L	0.14	39.5	D	0.68	53.5	D	EB-L	0.17	39.9	D	0.77	59.0	E
	EB-LTR	0.21	40.7	D	0.62	51.0	D	EB-LTR	0.23	41.0	D	0.74	57.0	E
	WB-L	0.17	49.8	D	0.10	48.7	D	WB-L	0.17	49.8	D	0.10	48.7	D
	WB-LT	0.00	0.00	A	0.10	48.6	D	WB-LT	0.00	0.00	A	0.10	48.6	D
	NB-L	0.34	56.6	E	0.38	56.7	E	NB-L	0.42	56.8	E	0.44	56.8	E
	NB-T	0.20	17.7	B	0.29	19.7	B	NB-T	0.20	17.7	B	0.30	19.8	B
	NB-TR	0.20	17.9	B	0.29	20.2	C	NB-TR	0.20	18.0	B	0.30	20.3	C
	SB-L	0.63	56.8	E	0.79	82.8	F	SB-L	0.63	56.8	E	0.79	82.8	F
	SB-T	0.48	20.0	B	0.37	18.6	B	SB-T	0.52	21.0	C	0.39	19.0	B
	SB-TR	0.48	21.2	C	0.43	20.3	C	SB-TR	0.52	23.3	C	0.48	21.5	C
	OVERALL		22.5	C		28.8	C	OVERALL		23.3	C		30.7	C
Rooney Circle & Executive Drive (Unsignalized)	EB-LR	0.01	10.0	A	0.17	10.2	B	EB-L	0.03	10.4	B	0.26	10.9	B
	NB-L	0.04	7.7	A	0.00	7.4	A	EB-T	0.07	7.9	A	0.01	7.5	A
Rooney Circle & Marion Drive (Unsignalized)	EB-LR	0.25	12.7	B	0.44	18.0	C	EB-L	0.28	13.4	B	0.53	21.5	C
	NB-L	0.12	7.7	A	0.11	8.4	A	EB-T	0.12	7.7	A	0.12	8.6	A
Mt. Pleasant Avenue & Marion Drive (Unsignalized)	EB-L	0.10	8.2	A	0.15	8.4	A	EB-L	0.11	8.2	A	0.16	8.5	A
	SB-R	0.21	10.3	B	0.27	10.8	B	EB-T	0.22	10.3	B	0.31	11.1	B

PROPOSED CONDITIONS

The proposed development program will contain 425 multi-family residential units in three buildings, all of which provide four residential levels, though Building A is stepped to work with the site topography. A total of 820 parking spaces are provided of which 570 spaces are provided in a multi-level parking structure, 42 spaces in individual garages, 42 spaces in driveways and the remaining 166 spaces are provided in surface parking lots. There are an additional 57 parking spaces proposed at the dog run facilities to be located along Executive Drive, near Rooney Circle. This meets the parking requirement of 819 spaces as set forth in the Residential Site Improvement Standards (RSIS) based upon the mix of bedrooms.

The Year 2023 has been selected as the future analysis year for full occupancy of the proposed development. We have analyzed conditions for the Year 2023 without the project (No-Build) and with the project (Build).

Year 2023 No-Build Conditions

The proposed development is planned for construction and full occupancy in 2023. This year will be used as a basis for estimating background traffic growth on the surrounding street system. The annual growth rate published by the NJDOT in the April 2017 – April 2019 NJDOT Access Permit Table on Annual Background Growth Rates for urban principal arterials in Essex County is one percent (1%).

Based upon information obtained from the West Orange Township planning office and our knowledge of the area, we have calculated site generated traffic for the proposed expansion of the Essex Green Shopping Center. This additional traffic is based upon a report prepared by Langan Engineering dated November 2, 2018 as contained in Table 1 of the report. There are also two existing office buildings, 300 Executive Drive and 10 Rooney Circle, that utilize Executive Drive for access, in whole or in part. These two office buildings are only partially occupied (52.7% and 41.4% respectively), and we have calculated the additional traffic that would be generated by their full occupancy. These traffic volumes were assigned to the roadway system based upon the observed traffic volumes at studied intersections. The office building trip generation calculations for these two buildings are presented in Table 2.

We also note that the existing office building at 200 Executive Drive is also only partially occupied (46.3%); while the office building at 100 Executive Drive is currently vacant. We have not added the traffic that would be generated by the full occupancy of these buildings into our No Build network to provide a conservative analysis of the proposed redevelopment project. We have provided the trip generation calculation for 100 and 200 Executive Drive in Table 2 solely as a comparison to the traffic to be generated by the proposed multi-family housing development.

Year 2023 No-Build traffic volumes are presented in Figure 3 for the AM and PM peak hours. These traffic volumes were used to evaluate future operations without the addition of the proposed development at the studied intersections.

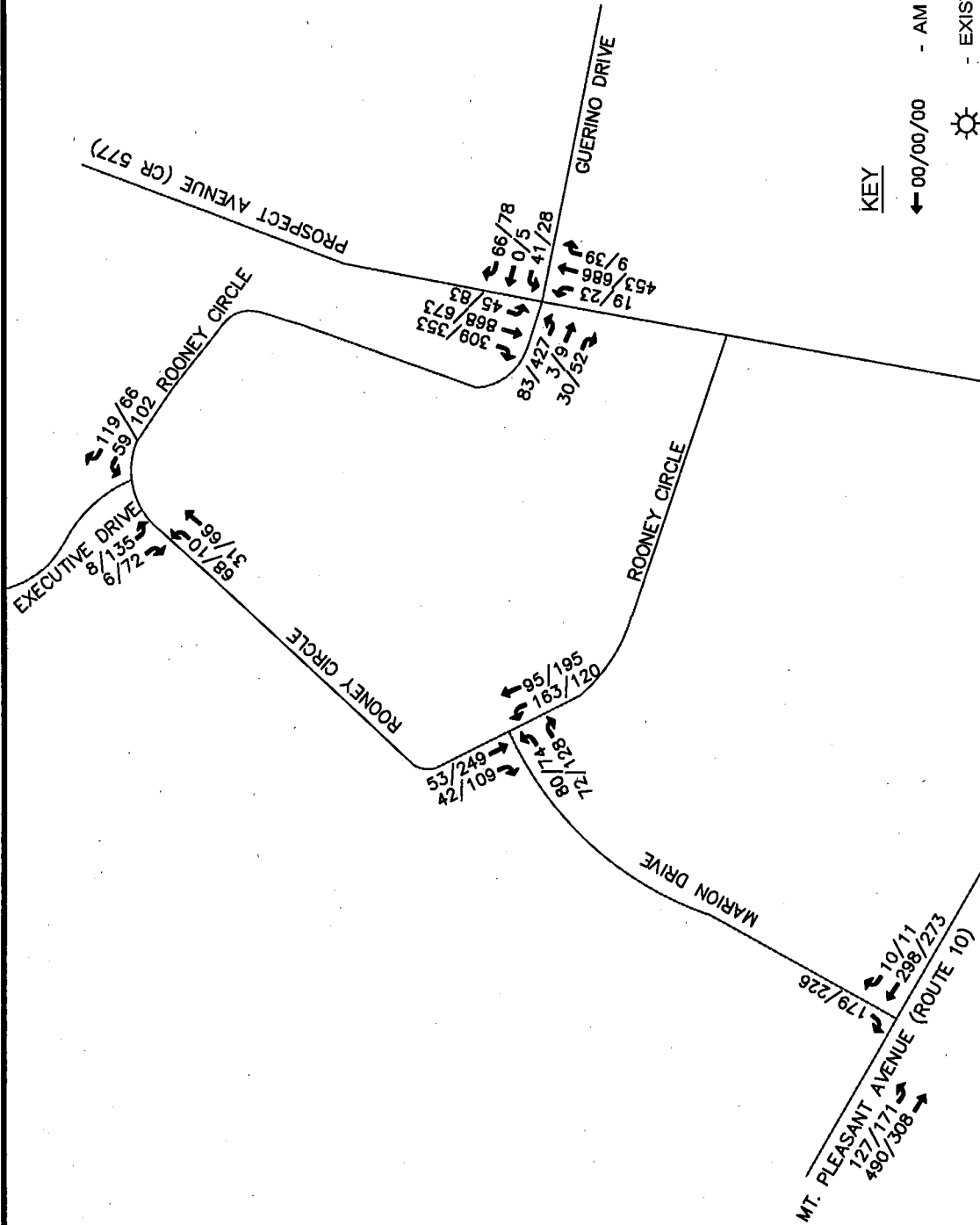


FIGURE 3

BNE - EXECUTIVE DRIVE
PROPOSED 2023 FUTURE
NO BUILD TRAFFIC VOLUMES
 TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY

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The resulting levels of service for 2023 No-Build conditions at the studied intersections are summarized in Table 1. The results of the capacity analyses indicate that under future Year 2023 No-Build conditions, the levels of service for the studied intersections would remain generally the same as the Existing 2019 levels of service during the AM and PM peak hours on each approach with nominal increases in the average delay of generally less than two (2) seconds. The levels of service on these approaches will remain at acceptable LOS D or better for both peak hours. The left turn movements along Prospect Avenue remain as LOS E and LOS F as occurs under existing conditions.

The eastbound movements from the Essex Green Shopping Center driveway at Prospect Avenue degrade to LOS E during the PM peak hour as a result of the additional office traffic from the occupancy of 10 Rooney Circle and 300 Executive Drive; and the expansion of the shopping center. There is only about a 5 to 6 second increase in average delay but since this approach currently operates at the upper range of LOS D under existing conditions, the additional traffic results in LOS E operations on this approach. These conditions are somewhat speculative as they are dependent upon the office buildings reaching full occupancy. These operating conditions are reflective of background growth on the network and other development in the area. These are exclusive of traffic from the proposed development.

Site Trip Generation and Distribution

The trip generation for the proposed 425 multi-family, mid-rise residential apartments is based upon data compiled in the Trip Generation Manual, 10th Edition published by the Institute of Transportation Engineers (ITE) using Land Use Code (LUC) 221 for multi-family mid-rise residential. We have used the average rates instead of the equation as it yields higher trip generation values. Table 2 illustrates the trip generation estimate for the proposed redevelopment. Also, one can see that the residential trip generation is 20 to 35 percent than the trip generation of these two office buildings at full occupancy. We do note that the trip distribution is reversed between the residential and office traffic.

The peak hour trips from the proposed multi-family apartments are likely to coincide temporally with the peak hour commuter trips on the surrounding roadway system. The trip assignment for the proposed development is based on observed traffic patterns of the predominant traffic flows along Prospect Avenue and Route 10, and also take into consideration the travel patterns at Guerino Drive which serves the Villas at Eagle Ridge community. These travel patterns have been considered to be representative of the traffic distribution associated with the proposed redevelopment. The distribution also takes into consideration the accessibility to the regional highway network including Interstate 280 and State Route 10.

The trip distribution is graphically presented in Figure 4. Applying the site trip distribution to the trip generation values presented in Table 2 resulted in the site trip assignment for the AM and PM peak hours shown in Figure 5.

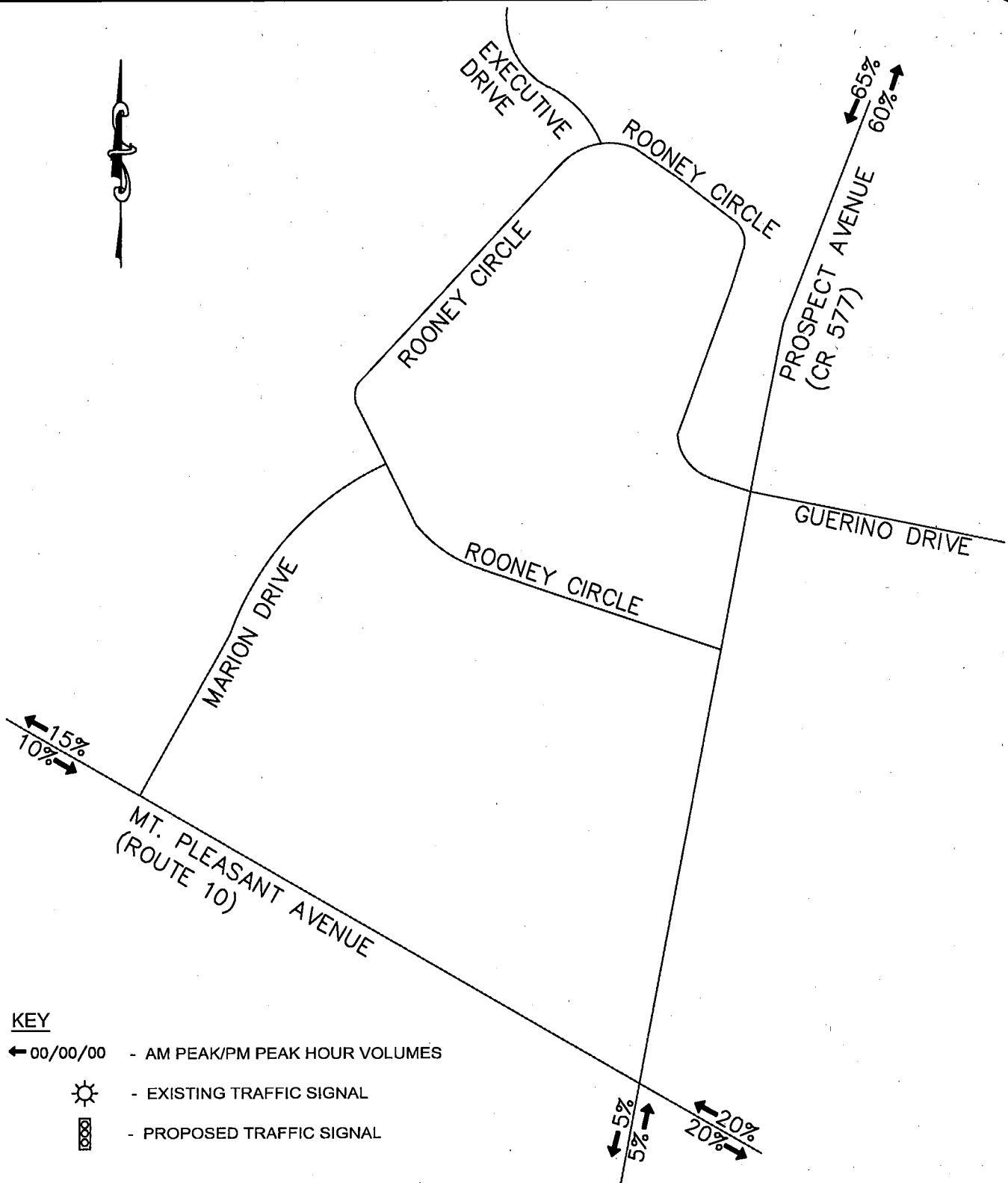
EXECUTIVE DRIVE REDEVELOPMENT

Table 2 - Trip Generation Summary

CODE	LAND USE	AMOUNT	WEEKDAY					
			AM PEAK HOUR			PM PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
221	Multifamily Housing (Mid-Rise)(Avg Rate)	425 units	37	105	141	108	69	178
TOTAL DEVELOPMENT NEW TRIPS								
710	Office (Formula) - 10 Rooney Circle (Total)	70,913 SF	80	13	93	13	69	82
710	Office (Formula) - 10 Rooney Circle (Occupied)	29,372 SF	47	8	54	6	30	36
	Net Increase		34	5	39	7	39	47
710	Office (Formula) - 300 Executive Drive (Total)	129,298 SF	127	21	148	23	122	145
710	Office (Formula) - 300 Executive Drive (Occupied)	68,083 SF	78	13	90	13	66	79
	Net Increase		49	8	58	11	56	66
	TOTAL OFFICE TRIPS - FULL OCCUPANCY		83	14	97	18	95	113
710	Office (Formula) - 100 + 200 Executive Drive (Total)	203,171 SF	187	30	217	36	188	223
710	Office (Formula) - 100 + 200 Executive Drive (Occupied)	50,825 SF	64	10	74	10	50	60
	Net Increase		123	20	143	26	137	163

Source: Trip Generation, 10th Edition, published by the Institute of Transportation Engineers (ITE)

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FIGURE 4 BNE - EXECUTIVE DRIVE SITE TRIP DISTRIBUTION

TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY



FIGURE 5 **BNE - EXECUTIVE DRIVE** **SITE GENERATED** **TRAFFIC VOLUMES**

TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY

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Year 2023 Build Conditions

The site generated traffic volumes presented in Figure 5 were added to Year 2023 No-Build traffic volumes presented in Figure 3 to yield the AM and PM peak hour Year 2023 Build conditions, which are presented in Figure 6. These traffic volumes are used to analyze future operating conditions including the traffic from the proposed redevelopment. Again, no credit was taken for the existing traffic generated by the tenants of 200 Executive Drive, which will be eliminated as a result of this redevelopment project. This presents a conservative analysis of future Build conditions.

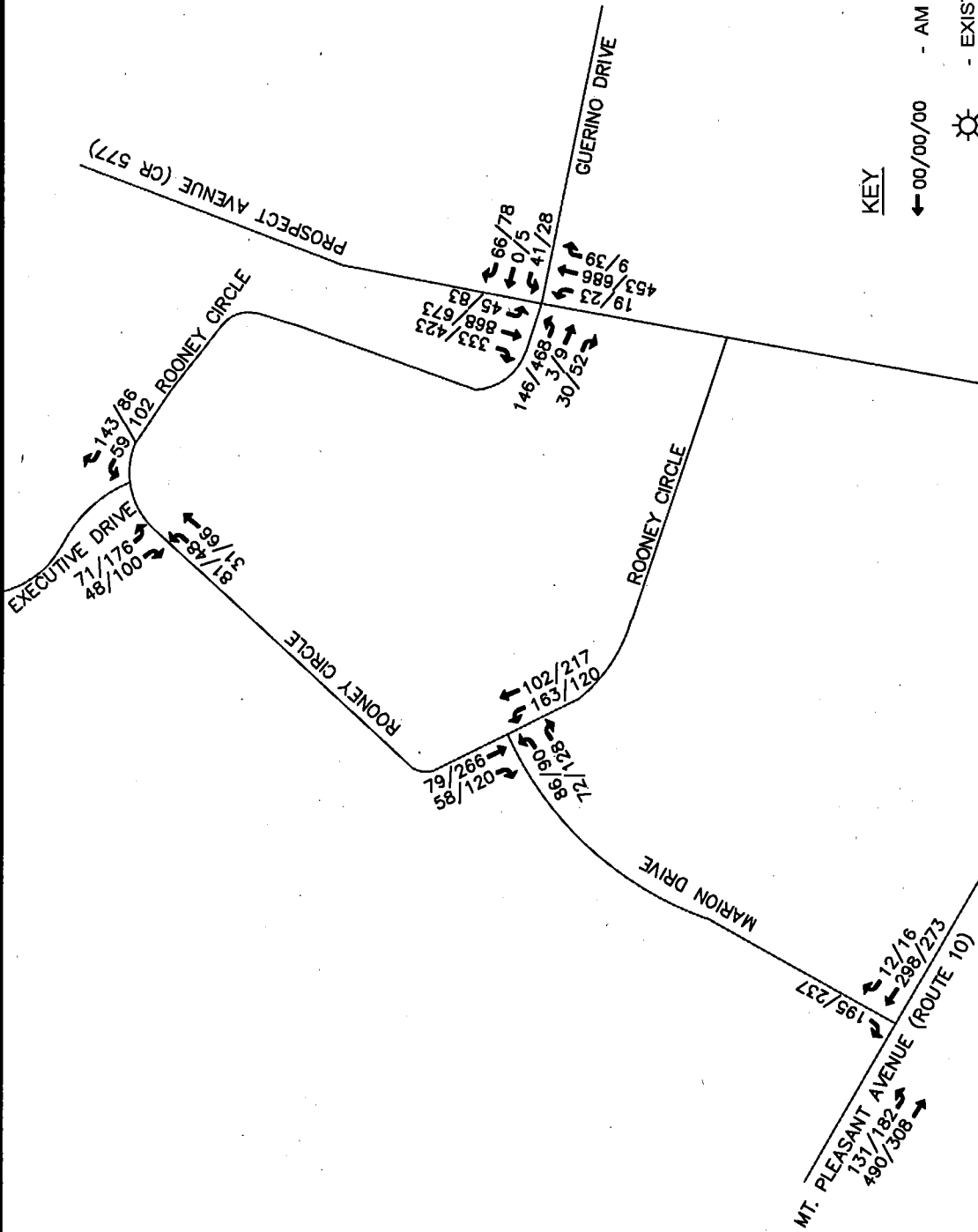
The resulting levels of service for 2023 Build conditions at the studied intersections are summarized in Table 3. The results of the analyses indicate that under future Year 2023 Build conditions, the levels of service for the traffic movements at the studied intersections would remain at LOS D or better during the AM and PM peak hours, with the exceptions noted under No Build conditions.

The eastbound approach of the Essex Green Shopping Center driveway will continue to operate at LOS E during the PM peak hour, although the increases in average delay are relatively small and would not materially impact operations as viewed by the motorist. The increases in average delay on the various approach movements at the studied intersections are generally less than 2.5 seconds, which is nominal and would not materially impact operations as viewed by the motorist.

These operating conditions, particularly at the signalized intersection of Prospect Avenue with Guerino Drive and the shopping center driveway, are somewhat speculative as they are dependent upon the office buildings reaching full occupancy. Modifications to the signal timing could be implemented by the County to improve the side street operations without impacting the mainline traffic on Prospect Avenue (which operates at LOS B and LOS C) during both peak hours. These signal timing modifications are a typical maintenance activity performed by the County and should be monitored once the project has been constructed and is occupied.

The existing intersection of Rooney Circle with Executive Drive would operate at LOS B or better during both peak hours.

In summary, the proposed redevelopment of the subject tract will reduce the intensity of traffic volumes generated by the site; and the site generated residential traffic will have a nominal impact on intersection operations at the studied locations during the weekday peak hours and other hours of the day.



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DATE: 2/5/2020
 PROJ.: 081109-01-001
 CHKD.: _____

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FIGURE 6 **BNE - EXECUTIVE DRIVE** **2023 FUTURE** **BUILD TRAFFIC VOLUMES**

TOWNSHIP OF WEST ORANGE, ESSEX COUNTY, NEW JERSEY

**TABLE 3 - LEVEL OF SERVICE / AVERAGE VEHICLE DELAY COMPARISON - NO BUILD & BUILD CONDITIONS
EXECUTIVE DRIVE REDEVELOPMENT, WEST ORANGE, NJ**

Intersection	2023 No Build Condition							2023 Build Condition						
	LANE GROUP	AM PEAK			PM PEAK			LANE GROUP	AM PEAK			PM PEAK		
		V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service		V/C Ratio	Delay (sec)	Levels of Service	V/C Ratio	Delay (sec)	Levels of Service
Prospect Avenue & Essex Green Dwy/ Guerino Dr. (Signalized)	EB-L	0.17	39.9	D	0.77	59.0	E	EB-L	0.29	42.0	D	0.83	64.3	E
	EB-LTR	0.23	41.0	D	0.74	57.0	E	EB-LTR	0.32	42.5	D	0.80	62.2	E
	WB-L	0.17	49.8	D	0.10	48.7	D	WB-L	0.17	49.8	D	0.10	48.7	D
	WB-LT	0.00	0.00	A	0.10	48.6	D	WB-LT	0.00	0.00	A	0.10	48.6	D
	NB-L	0.42	56.8	E	0.44	56.8	E	NB-L	0.42	56.8	E	0.44	56.8	E
	NB-T	0.20	17.7	B	0.30	19.8	B	NB-T	0.20	17.7	B	0.30	19.8	B
	NB-TR	0.20	18.0	B	0.30	20.3	C	NB-TR	0.20	18.0	B	0.30	20.3	C
	SB-L	0.63	56.8	E	0.79	82.8	F	SB-L	0.63	56.8	E	0.79	82.8	F
	SB-T	0.52	21.0	C	0.39	19.0	B	SB-T	0.53	21.2	C	0.39	19.0	B
	SB-TR	0.52	23.3	C	0.48	21.5	C	SB-TR	0.53	22.6	C	0.57	23.8	C
	OVERALL		23.3	C		30.7	C	OVERALL		24.1	C		32.4	C
Rooney Circle & Executive Drive (Unsignalized)	EB-LR	0.03	10.4	B	0.26	10.9	B	EB-L	0.24	12.4	B	0.40	13.3	B
	NB-L	0.07	7.9	A	0.01	7.5	A	EB-T	0.08	8.0	A	0.04	7.7	A
Rooney Circle & Marion Drive (Unsignalized)	EB-LR	0.28	13.4	B	0.53	21.5	C	EB-L	0.31	14.5	B	0.62	27.2	D
	NB-L	0.12	7.7	A	0.12	8.6	A	EB-T	0.12	7.9	A	0.13	8.7	A
Mt. Pleasant Avenue & Marion Drive (Unsignalized)	EB-L	0.11	8.2	A	0.16	8.5	A	EB-L	0.11	8.3	A	0.18	8.6	A
	SB-R	0.22	10.3	B	0.31	11.1	B	EB-T	0.24	10.5	B	0.33	11.3	B

SITE PLAN EVALUATION

The site access will be provided via the existing Executive Drive, which will continue to serve the office buildings at 10 Rooney Circle and 300 Executive Drive as well as the three proposed residential buildings. Three site driveways will intersect with Executive Drive providing access to the various buildings, surface parking areas and the parking structure. Two of the driveways are connected and provide a loop through the internal portion of the site development. This access and circulation system are compliant with the Residential Site Improvement Standards (RSIS), which only applies to the internal site driveways and parking lots from a circulation and parking perspective.

The two smaller residential buildings are provided with garages and adjacent driveways serving a portion of the units within each building, which provide 84 total parking spaces. The large residential building (Building A) is served by a multi-level parking structure, containing 570 parking spaces, which is accessed directly from the southern end of Executive Drive. In addition, there are 166 surface parking spaces distributed throughout the site proximate to the various residential buildings.

The internal sidewalk network is proposed to link all of the residential buildings as well as extending along Executive Drive to the proposed dog parks. There is also a 57 space parking area at the dog parks, as these facilities are available for Township residents, in addition to those living in the proposed redevelopment project. The sidewalk is not extended to Rooney Circle as there are no existing sidewalks along the majority of Rooney Circle or the adjacent development parcels.

The site plan provides for safe and efficient traffic operations without affecting the quality of traffic flow along area roadways. The internal roadways are proposed at 24 feet wide with perpendicular parking proposed. The site plan proposes designated crosswalks and STOP lines and STOP signs at the two intersections of the site driveways with Executive Drive, as well as internal intersections. The proposed site plan conforms to applicable standards from a traffic engineering viewpoint. Circulation and access to and from the site, as well as within the property are adequate for residents, visitors, deliveries and emergency services.

Residential Site Improvement Standards require 1.8 parking spaces for one-bedroom units, 2.0 parking spaces for two-bedroom units and 2.1 parking spaces for three-bedroom units. The proposed bedroom mix is 162 one-bedroom units, 250 two-bedroom units and 13 three-bedroom units; a total of 425 dwelling units. The parking requirement is therefore 819 parking spaces (1.93 spaces per unit) and 820 parking spaces (including the parking structure, individual garages and driveways) are proposed, thereby meeting the RSIS requirements. There are 42 individual garages and 42 driveway spaces at the two smaller residential buildings, 570 parking spaces in the multi-level parking structure with the remaining 166 parking spaces provided in surface parking areas available for use by all residents. RSIS parking standards require that 213 parking spaces (0.5 spaces per unit times 425 units) are available for guest parking and the project exceeds the required amount of available guest parking in both the surface lots and the parking structure.

CONCLUSIONS

The proposed redevelopment of 425 multi-family residential apartments, in place of 203,171 square feet of existing office space, would have a negligible impact on traffic operations at the studied intersections during the weekday AM and PM peak commuting hours.

The incremental impact of the additional site-generated traffic results in a slight increase in the average delay on the affected approach movements at the studied intersections but would not be noticeable to motorists. Generally, these slight increases in average vehicle delay would be less than 2.5 seconds and would not materially impact the operations of the study intersections or change the level of service.

The studied intersections would continue to operate at acceptable levels of service, LOS D or better, with the exception of the northbound and southbound left turn movements on Prospect Avenue at the Guerino Drive/Essex Green driveway intersection which are calculated to operate at LOS E and LOS F under no build and build conditions. In addition, during the PM peak hour, the eastbound Essex Green driveway approach is calculated to operate at LOS E under 2023 No Build and Build conditions. These operations may not be reached depending upon the level of occupancy in the existing office buildings at 300 Executive Drive and 10 Rooney Circle.

It is our professional opinion that, based upon our traffic engineering evaluation, the proposed redevelopment will provide for safe and efficient traffic operations without affecting the quality of traffic flow along area roadways.

The proposed site plan conforms to applicable standards from a traffic engineering viewpoint. Circulation and access to and from the site, as well as within the property are adequate. Sufficient parking is provided in accordance with RSIS requirements for the multi-family residential use.

In conclusion, this redevelopment project would have a minimal impact on the traffic operations of the existing roadway system and at the studied intersections. The design of the development will adequately serve the needs of this project's residents and guests.

APPENDIX I

LEVEL OF SERVICE DEFINITIONS

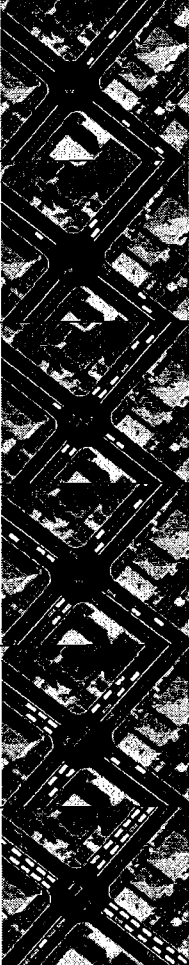
TRAFFIC OPERATIONS

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the 2010 Highway Capacity Manual (HCM) and 2010 Highway Capacity Software.

For a signalized intersection, Level of Service (LOS) A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle.

For an unsignalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle.

LEVEL OF SERVICE /AVERAGE DELAY CRITERIA*

	Level Of Service (LOS)	Signalized Delay Range (average delay, sec/veh)	Unsignalized Delay Range (average delay in sec/veh)
	A	≤ 10	≤ 10
	B	> 10 and ≤ 20	> 10 and ≤ 15
	C	> 20 and ≤ 35	> 15 and ≤ 25
	D	> 35 and ≤ 55	> 25 and ≤ 35
	E	> 55 and ≤ 80	> 35 and ≤ 50
	F	> 80	> 50

* Sources: Highway Capacity Manual (2010 Edition) & SimTraffic Version 5.0

APPENDIX II

CAPACITY ANALYSES

IIA – 2020 EXISTING CONDITIONS
IIB – 2023 NO-BUILD CONDITIONS
IIC – 2023 BUILD CONDITIONS

APPENDIX IIA
2020 EXISTING CONDITIONS

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information							
Agency		Bowman Consulting Group				Duration, h		0.25					
Analyst		ELK		Analysis Date		2/16/2020		Area Type		Other			
Jurisdiction		County		Time Period		AM Peak		PHF		0.86			
Urban Street		Prospect Ave (CR 577)		Analysis Year		2020 Existing		Analysis Period		1> 7:00			
Intersection		Prospect/Essex Gr/Guer...		File Name		EX-AM-Prospect-EG-ER.xus							
Project Description		BNE-Executive Dr											

Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				71	3	29	41	0		14	440	9	45	842	252

Signal Information						
Cycle, s	115.0	Reference Phase	2			
Offset, s	0	Reference Point	End			
Uncoordinated	No	Simult. Gap E/W	On			
Force Mode	Fixed	Simult. Gap N/S	On			
Green	3.0	2.2	54.7	22.0	11.0	0.0
Yellow	3.0	0.0	5.0	3.0	3.0	0.0
Red	2.0	0.0	2.0	2.0	2.0	0.0

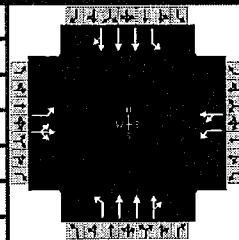
Timer Results		EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase			4		8	5	2	1	6
Case Number			10.0		10.0	2.0	4.0	2.0	4.0
Phase Duration, s			27.0		16.0	8.0	61.7	10.3	64.0
Change Period, (Y+R), s			5.0		5.0	5.0	7.0	5.0	7.0
Max Allow Headway (MAH), s			3.2		3.1	3.1	0.0	3.1	0.0
Queue Clearance Time (g_s), s			6.0		3.7	3.0		5.3	
Green Extension Time (g_e), s			0.2		0.0	0.0	0.0	0.0	0.0
Phase Call Probability			1.00		1.00	1.00		1.00	
Max Out Probability			0.00		0.00	0.15		1.00	

Movement Group Results		EB			WB			NB			SB		
Approach Movement		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		50	70		29	0		16	349	173	52	883	389
Adjusted Saturation Flow Rate (s), veh/h/ln		1810	1716		1810	1900		1795	1870	1850	1810	1870	1647
Queue Service Time (g_s), s		2.6	4.0		1.7	0.0		1.0	6.2	6.2	3.3	17.9	18.0
Cycle Queue Clearance Time (g_c), s		2.6	4.0		1.7	0.0		1.0	6.2	6.2	3.3	17.9	18.0
Green Ratio (g/C)		0.19	0.19		0.10	0.10		0.03	0.48	0.48	0.05	0.50	0.50
Capacity (c), veh/h		346	328		173	182		47	1780	880	83	1853	816
Volume-to-Capacity Ratio (X)		0.143	0.214		0.165	0.000		0.344	0.196	0.197	0.630	0.476	0.477
Back of Queue (Q), ft/ln (50 th percentile)		31	44.9		21.2	0		12.1	68.1	68.2	38.6	196.6	177.4
Back of Queue (Q), veh/ln (50 th percentile)		1.2	1.8		0.8	0.0		0.5	2.7	2.7	1.5	7.7	7.1
Queue Storage Ratio (RQ) (50 th percentile)		0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh		38.7	39.2		47.8	0.0		55.0	17.4	17.4	53.9	19.2	19.2
Incremental Delay (d_2), s/veh		0.9	1.5		2.0	0.0		1.6	0.2	0.5	2.9	0.9	2.0
Initial Queue Delay (d_3), s/veh		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh		39.5	40.7		49.8	0.0		56.6	17.7	17.9	56.8	20.0	21.2
Level of Service (LOS)		D	D		D			E	B	B	E	C	C
Approach Delay, s/veh / LOS		40.2	D		49.8	D		18.9	B		21.8	C	
Intersection Delay, s/veh / LOS		22.5						C					

Multimodal Results		EB		WB		NB		SB	
Pedestrian LOS Score / LOS		2.61	C	2.62	C	1.91	B	1.90	B
Bicycle LOS Score / LOS		0.69	A	0.57	A	0.78	A	1.22	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Bowman Consulting Group			Duration, h	0.25
Analyst	ELK	Analysis Date	2/16/2020	Area Type	Other
Jurisdiction	County	Time Period	PM Peak	PHF	0.95
Urban Street	Prospect Ave (CR 577)	Analysis Year	2020 Existing	Analysis Period	1> 5:00
Intersection	Prospect/Essex Gr/Guer...	File Name	EX-PM-Prospect-EG-ER.xus		
Project Description	BNE-Executive Dr				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	372	9	42	28	5		18	666	39	83	653	317

Signal Information												
Cycle, s	115.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	3.2	3.8	53.0	22.0	11.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	0.0	5.0	3.0	3.0	0.0		
				Red	2.0	0.0	2.0	2.0	2.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		10.0		10.0	2.0	4.0	2.0	4.0
Phase Duration, s		27.0		16.0	8.2	60.0	12.0	63.8
Change Period, (Y+R _c), s		5.0		5.0	5.0	7.0	5.0	7.0
Max Allow Headway (MAH), s		3.2		3.1	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s		15.9		3.0	3.2		7.5	
Green Extension Time (g _e), s		0.6		0.0	0.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		1.00	
Max Out Probability		0.16		0.00	0.23		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	235	210		18	17		19	498	244	87	687	334
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1770		1810	1837		1795	1870	1815	1810	1870	1585
Queue Service Time (g _s), s	13.9	12.5		1.0	1.0		1.2	9.5	9.6	5.5	13.1	15.5
Cycle Queue Clearance Time (g _c), s	13.9	12.5		1.0	1.0		1.2	9.5	9.6	5.5	13.1	15.5
Green Ratio (g/C)	0.19	0.19		0.10	0.10		0.03	0.46	0.46	0.06	0.49	0.49
Capacity (c), veh/h	346	339		173	176		50	1724	837	110	1848	783
Volume-to-Capacity Ratio (X)	0.679	0.621		0.102	0.097		0.380	0.289	0.291	0.793	0.372	0.426
Back of Queue (Q), ft/ln (50 th percentile)	178	155.1		12.9	12.4		14.1	105.6	104.3	84.3	143.2	147.1
Back of Queue (Q), veh/ln (50 th percentile)	7.1	6.2		0.5	0.5		0.6	4.2	4.2	3.4	5.6	5.9
Queue Storage Ratio (RQ) (50 th percentile)	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	43.2	42.7		47.5	47.5		54.9	19.3	19.3	53.3	18.0	18.7
Incremental Delay (d ₂), s/veh	10.3	8.3		1.2	1.1		1.8	0.4	0.9	29.5	0.6	1.7
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	53.5	51.0		48.7	48.6		56.7	19.7	20.2	82.8	18.6	20.3
Level of Service (LOS)	D	D		D	D		E	B	C	F	B	C
Approach Delay, s/veh / LOS	52.3	D		48.6	D		20.8	C		24.2	C	
Intersection Delay, s/veh / LOS	28.8						C					

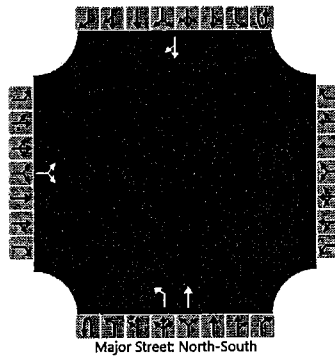
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.61	C	2.62	C	1.91	B	1.90	B
Bicycle LOS Score / LOS	1.22	A	0.54	A	0.91	A	1.10	A

HCS7 Two-Way Stop-Control Report

General Information

Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2020	North/South Street	Rooney Circle
Time Analyzed	AM Peak	Peak Hour Factor	0.76
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		3		1						41	31				59	86
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

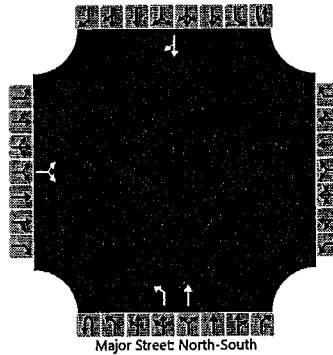
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			5							54						
Capacity, c (veh/h)			731							1395						
v/c Ratio			0.01							0.04						
95% Queue Length, Q ₉₅ (veh)			0.0							0.1						
Control Delay (s/veh)			10.0							7.7						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	10.0								4.4							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2020	North/South Street	Rooney Circle
Time Analyzed	PM Peak	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		97		42						4	66				102	9
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

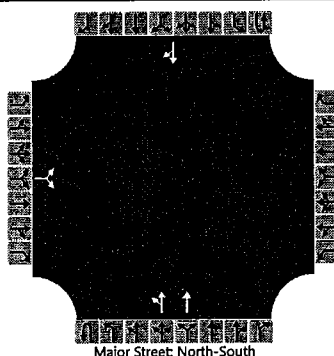
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			146							4						
Capacity, c (veh/h)			840							1484						
v/c Ratio			0.17							0.00						
95% Queue Length, Q ₉₅ (veh)			0.6							0.0						
Control Delay (s/veh)			10.2							7.4						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.2								0.4							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2020	North/South Street	Rooney Circle
Time Analyzed	AM Peak	Peak Hour Factor	0.91
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		70		70						162	76				50	39
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

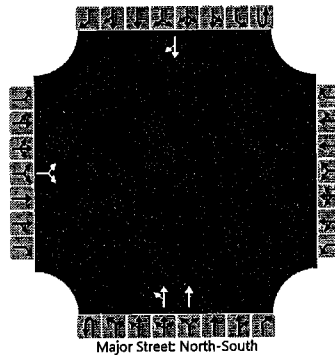
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			154							178						
Capacity, c (veh/h)			622							1501						
v/c Ratio			0.25							0.12						
95% Queue Length, Q ₉₅ (veh)			1.0							0.4						
Control Delay (s/veh)			12.7							7.7						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	12.7								5.3							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2020	North/South Street	Rooney Circle
Time Analyzed	PM Peak	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		69		116						107	189				226	96
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

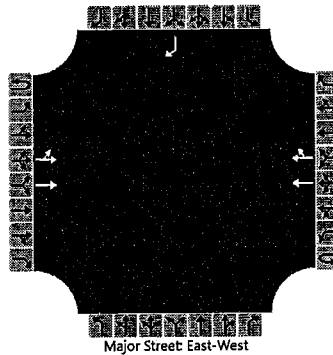
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			218							126						
Capacity, c (veh/h)			492							1183						
v/c Ratio			0.44							0.11						
95% Queue Length, Q ₉₅ (veh)			2.2							0.4						
Control Delay (s/veh)			18.0							8.4						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	18.0								3.2							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2020	North/South Street	Marion Drive
Time Analyzed	AM Peak	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		117	476				289	10								176
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

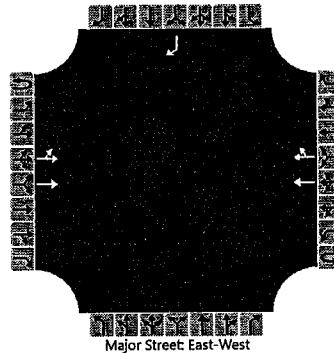
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		122														183
Capacity, c (veh/h)		1253														865
v/c Ratio		0.10														0.21
95% Queue Length, Q ₉₅ (veh)		0.3														0.8
Control Delay (s/veh)		8.2														10.3
Level of Service (LOS)		A														B
Approach Delay (s/veh)	1.9												10.3			
Approach LOS													B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2020	North/South Street	Marion Drive
Time Analyzed	PM Peak	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		154	299				265	11								200
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

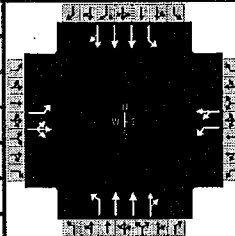
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		181														235
Capacity, c (veh/h)		1239														857
v/c Ratio		0.15														0.27
95% Queue Length, Q ₉₅ (veh)		0.5														1.1
Control Delay (s/veh)		8.4														10.8
Level of Service (LOS)		A														B
Approach Delay (s/veh)	3.1												10.8			
Approach LOS													B			

APPENDIX IIB
2023 NO-BUILD CONDITIONS

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information							
Agency		Bowman Consulting Group				Duration, h		0.25					
Analyst		ELK		Analysis Date		2/16/2020		Area Type		Other			
Jurisdiction		County		Time Period		AM Peak		PHF		0.86			
Urban Street		Prospect Ave (CR 577)		Analysis Year		2023 No Build		Analysis Period		1> 7:00			
Intersection		Prospect/Essex Gr/Guer...		File Name		NB-AM-Prospect-EG-ER.xus							
Project Description		BNE-Executive Dr											



Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				83	3	30	41	0		19	453	9	45	868	309

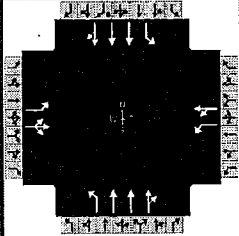
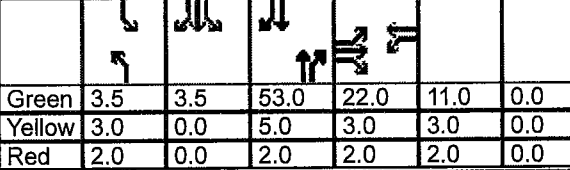
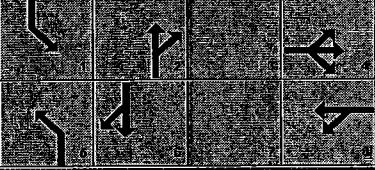
Signal Information														
Cycle, s	115.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	3.4	1.9	54.7	22.0	11.0	0.0				
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.0	0.0	5.0	3.0	3.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	2.0	0.0				

Timer Results		EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase			4		8	5	2	1	6
Case Number			10.0		10.0	2.0	4.0	2.0	4.0
Phase Duration, s			27.0		16.0	8.4	61.7	10.3	63.6
Change Period, (Y+R _c), s			5.0		5.0	5.0	7.0	5.0	7.0
Max Allow Headway (MAH), s			3.2		3.1	3.1	0.0	3.1	0.0
Queue Clearance Time (g _s), s			6.4		3.7	3.4		5.3	
Green Extension Time (g _e), s			0.2		0.0	0.0	0.0	0.0	0.0
Phase Call Probability			1.00		1.00	1.00		1.00	
Max Out Probability			0.00		0.00	0.36		1.00	

Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				58	77		29	0		22	359	178	52	955	413
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1721		1810	1900		1795	1870	1851	1810	1870	1617
Queue Service Time (g _s), s				3.1	4.4		1.7	0.0		1.4	6.4	6.4	3.3	20.0	20.0
Cycle Queue Clearance Time (g _c), s				3.1	4.4		1.7	0.0		1.4	6.4	6.4	3.3	20.0	20.0
Green Ratio (g/C)				0.19	0.19		0.10	0.10		0.03	0.48	0.48	0.05	0.49	0.49
Capacity (c), veh/h				346	329		173	182		53	1780	881	83	1841	796
Volume-to-Capacity Ratio (X)				0.167	0.234		0.165	0.000		0.417	0.202	0.202	0.630	0.519	0.519
Back of Queue (Q), ft/ln (50 th percentile)				36.5	49.6		21.2	0		16.4	70.4	70.4	38.6	220.2	195.3
Back of Queue (Q), veh/ln (50 th percentile)				1.5	2.0		0.8	0.0		0.7	2.8	2.8	1.5	8.7	7.8
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh				38.8	39.4		47.8	0.0		54.8	17.5	17.5	53.9	19.9	19.9
Incremental Delay (d ₂), s/veh				1.0	1.7		2.0	0.0		1.9	0.3	0.5	2.9	1.0	2.4
Initial Queue Delay (d ₃), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				39.9	41.0		49.8	0.0		56.8	17.7	18.0	56.8	21.0	22.3
Level of Service (LOS)				D	D		D			E	B	B	E	C	C
Approach Delay, s/veh / LOS				40.5	D		49.8	D		19.4	B		22.7	C	
Intersection Delay, s/veh / LOS				23.3						C					

Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.61	C		2.62	C		1.91	B		1.90	B	
Bicycle LOS Score / LOS				0.71	A		0.57	A		0.80	A		1.27	A	

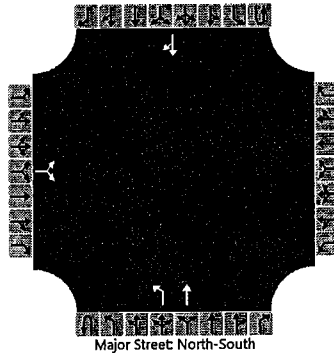
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information												
Agency		Bowman Consulting Group				Duration, h		0.25										
Analyst		ELK		Analysis Date		2/16/2020		Area Type		Other								
Jurisdiction		County		Time Period		PM Peak		PHF		0.95								
Urban Street		Prospect Ave (CR 577)		Analysis Year		2023 No Build		Analysis Period		1> 5:00								
Intersection		Prospect/Essex Gr/Guer...		File Name		NB-PM-Prospect-EG-ER.xus												
Project Description		BNE-Executive Dr																
Demand Information				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Demand (v), veh/h				427	9	52	28	5		23	686	39	83	673	353			
Signal Information																		
Cycle, s		115.0	Reference Phase			2												
Offset, s		0	Reference Point			End												
Uncoordinated		No	Simult. Gap E/W			On		Green	3.5	3.5	53.0	22.0	11.0	0.0				
Force Mode		Fixed	Simult. Gap N/S			On		Yellow	3.0	0.0	5.0	3.0	3.0	0.0				
							Red	2.0	0.0	2.0	2.0	2.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT							
Assigned Phase					4		8	5	2	1	6							
Case Number					10.0		10.0	2.0	4.0	2.0	4.0							
Phase Duration, s					27.0		16.0	8.5	60.0	12.0	63.5							
Change Period, (Y+R c), s					5.0		5.0	5.0	7.0	5.0	7.0							
Max Allow Headway (MAH), s					3.2		3.1	3.1	0.0	3.1	0.0							
Queue Clearance Time (g s), s					18.0		3.0	3.5		7.5								
Green Extension Time (g e), s					0.5		0.0	0.0	0.0	0.0	0.0							
Phase Call Probability					1.00		1.00	1.00		1.00								
Max Out Probability					0.63		0.00	0.49		1.00								
Movement Group Results				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Assigned Movement				7	4	14	3	8		5	2	12	1	6	16			
Adjusted Flow Rate (v), veh/h				265	248		18	17		24	513	251	87	708	372			
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1768		1810	1837		1795	1870	1817	1810	1870	1585			
Queue Service Time (g s), s				16.0	15.2		1.0	1.0		1.5	9.8	9.9	5.5	13.7	17.9			
Cycle Queue Clearance Time (g c), s				16.0	15.2		1.0	1.0		1.5	9.8	9.9	5.5	13.7	17.9			
Green Ratio (g/C)				0.19	0.19		0.10	0.10		0.03	0.46	0.46	0.06	0.49	0.49			
Capacity (c), veh/h				346	338		173	176		55	1724	837	110	1837	778			
Volume-to-Capacity Ratio (X)				0.766	0.735		0.102	0.097		0.440	0.297	0.299	0.793	0.386	0.477			
Back of Queue (Q), ft/ln (50 th percentile)				212.3	195.3		12.9	12.4		18	109	107.8	84.3	149.9	171			
Back of Queue (Q), veh/ln (50 th percentile)				8.5	7.8		0.5	0.5		0.7	4.3	4.3	3.4	5.9	6.8			
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Uniform Delay (d 1), s/veh				44.1	43.8		47.5	47.5		54.8	19.4	19.4	53.3	18.4	19.5			
Incremental Delay (d 2), s/veh				14.9	13.3		1.2	1.1		2.0	0.4	0.9	29.5	0.6	2.1			
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0			
Control Delay (d), s/veh				59.0	57.0		48.7	48.6		56.8	19.8	20.3	82.8	19.0	21.5			
Level of Service (LOS)				E	E		D	D		E	B	C	F	B	C			
Approach Delay, s/veh / LOS				58.0	E		48.6	D		21.1	C		24.6	C				
Intersection Delay, s/veh / LOS				30.7						C								
Multimodal Results				EB			WB			NB			SB					
Pedestrian LOS Score / LOS				2.61	C		2.62	C		2.27	B		1.90	B				
Bicycle LOS Score / LOS				1.34	A		0.54	A		0.92	A		1.13	A				

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	AM Peak - No Build	Peak Hour Factor	0.76
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		8		6						68	31				59	119
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

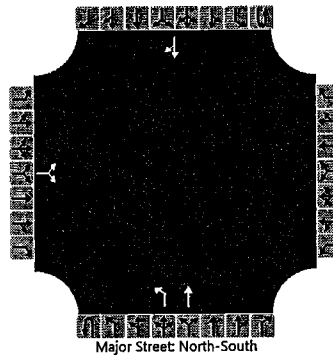
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			18							89						
Capacity, c (veh/h)			689							1345						
v/c Ratio			0.03							0.07						
95% Queue Length, Q ₉₅ (veh)			0.1							0.2						
Control Delay (s/veh)			10.4							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.4								5.4							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	PM Peak - No Build	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		135		72						10	66				102	16
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

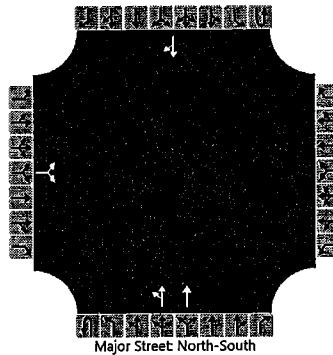
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			218							11						
Capacity, c (veh/h)			830							1475						
v/c Ratio			0.26							0.01						
95% Queue Length, Q ₉₅ (veh)			1.1							0.0						
Control Delay (s/veh)			10.9							7.5						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.9								1.0							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	AM Peak - No Build	Peak Hour Factor	0.91
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		80		72						163	95				53	42
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

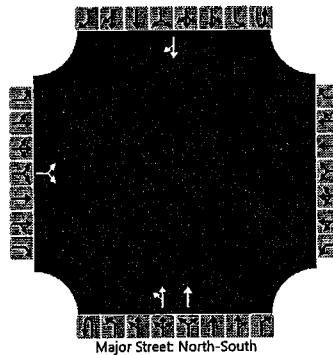
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			167							179						
Capacity, c (veh/h)			596							1492						
v/c Ratio			0.28							0.12						
95% Queue Length, Q ₉₅ (veh)			1.1							0.4						
Control Delay (s/veh)			13.4							7.7						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.4								4.9							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	PM Peak - No Build	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		74		128						120	195				249	109
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

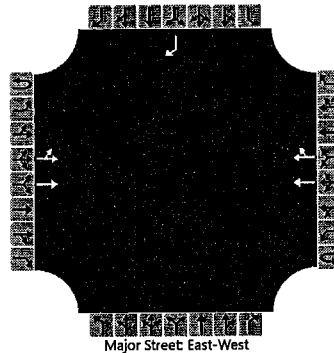
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			238							141						
Capacity, c (veh/h)			451							1142						
v/c Ratio			0.53							0.12						
95% Queue Length, Q ₉₅ (veh)			3.0							0.4						
Control Delay (s/veh)			21.5							8.6						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	21.5								3.4							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2023	North/South Street	Marion Drive
Time Analyzed	AM Peak - No Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		127	490				298	10								179
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

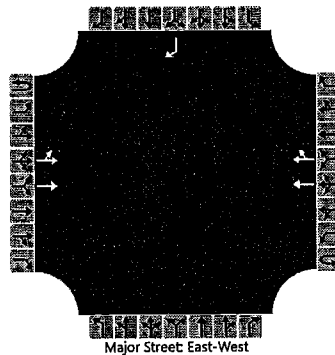
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		132														186
Capacity, c (veh/h)		1243														859
v/c Ratio		0.11														0.22
95% Queue Length, Q ₉₅ (veh)		0.4														0.8
Control Delay (s/veh)		8.2														10.3
Level of Service (LOS)		A														B
Approach Delay (s/veh)	2.0												10.3			
Approach LOS													B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2023	North/South Street	Marion Drive
Time Analyzed	PM Peak - No Build	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		171	308				273	11								226
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

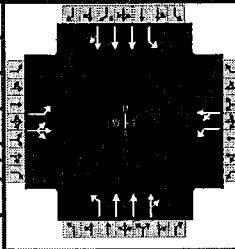
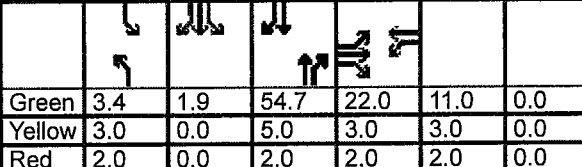
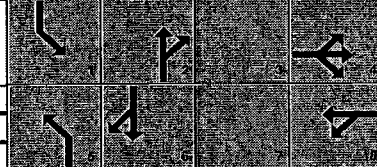
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		201														266
Capacity, c (veh/h)		1229														851
v/c Ratio		0.16														0.31
95% Queue Length, Q ₉₅ (veh)		0.6														1.3
Control Delay (s/veh)		8.5														11.1
Level of Service (LOS)		A														B
Approach Delay (s/veh)	3.3												11.1			
Approach LOS													B			

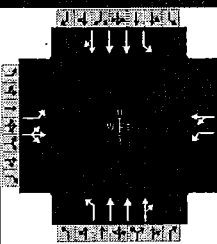
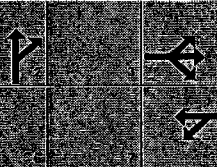
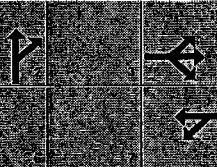
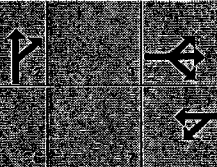
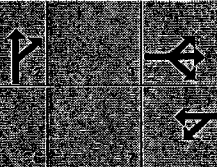
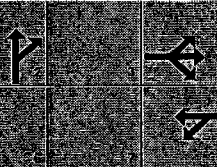
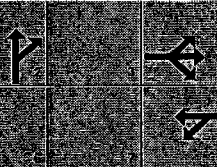
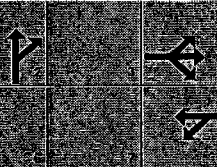
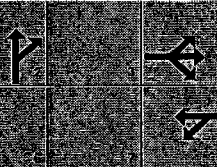
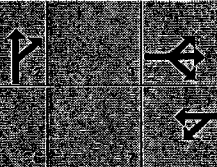
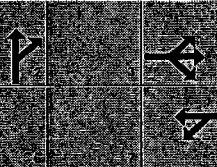
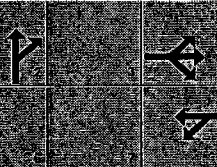
APPENDIX IIC

2023 BUILD CONDITIONS

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Bowman Consulting Group				Duration, h		0.25											
Analyst		ELK		Analysis Date		2/16/2020		Area Type					Other						
Jurisdiction		County		Time Period		AM Peak		PHF					0.86						
Urban Street		Prospect Ave (CR 577)		Analysis Year		2023 Build		Analysis Period					1> 7:00						
Intersection		Prospect/Essex Gr/Guer...		File Name		B-AM-Prospect-EG-ER.xus													
Project Description		BNE-Executive Dr																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				146	3	30	41	0		19	453	9	45	868	333				
Signal Information																			
Cycle, s		115.0	Reference Phase													2			
Offset, s		0	Reference Point													End			
Uncoordinated		No	Simult. Gap E/W													On			
Force Mode		Fixed	Simult. Gap N/S													On			
Green				3.4	1.9	54.7	22.0	11.0	0.0										
Yellow				3.0	0.0	5.0	3.0	3.0	0.0										
Red				2.0	0.0	2.0	2.0	2.0	0.0										
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						10.0				10.0		2.0		4.0		2.0		4.0	
Phase Duration, s						27.0				16.0		8.4		61.7		10.3		63.6	
Change Period, (Y+R), s						5.0				5.0		5.0		7.0		5.0		7.0	
Max Allow Headway (MAH), s						3.2				3.1		3.1		0.0		3.1		0.0	
Queue Clearance Time (g_s), s						8.0				3.7		3.4				5.3			
Green Extension Time (g_e), s						0.3				0.0		0.0		0.0		0.0		0.0	
Phase Call Probability						1.00				1.00		1.00				1.00			
Max Out Probability						0.00				0.00		0.36				1.00			
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8		5	2	12	1	6	16				
Adjusted Flow Rate (v), veh/h				102	106		29	0		22	359	178	52	977	419				
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1746		1810	1900		1795	1870	1851	1810	1870	1604				
Queue Service Time (g_s), s				5.5	6.0		1.7	0.0		1.4	6.4	6.4	3.3	20.7	20.7				
Cycle Queue Clearance Time (g_c), s				5.5	6.0		1.7	0.0		1.4	6.4	6.4	3.3	20.7	20.7				
Green Ratio (g/C)				0.19	0.19		0.10	0.10		0.03	0.48	0.48	0.05	0.49	0.49				
Capacity (c), veh/h				346	334		173	182		53	1780	881	83	1841	789				
Volume-to-Capacity Ratio (X)				0.294	0.318		0.165	0.000		0.417	0.202	0.202	0.630	0.531	0.531				
Back of Queue (Q), ft/ln (50 th percentile)				66.4	70.1		21.2	0		16.4	70.4	70.4	38.6	227.1	200				
Back of Queue (Q), veh/ln (50 th percentile)				2.7	2.8		0.8	0.0		0.7	2.8	2.8	1.5	8.9	8.0				
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00				
Uniform Delay (d_1), s/veh				39.8	40.0		47.8	0.0		54.8	17.5	17.5	53.9	20.1	20.1				
Incremental Delay (d_2), s/veh				2.2	2.5		2.0	0.0		1.9	0.3	0.5	2.9	1.1	2.6				
Initial Queue Delay (d_3), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh				42.0	42.5		49.8	0.0		56.8	17.7	18.0	56.8	21.2	22.6				
Level of Service (LOS)				D	D		D			E	B	B	E	C	C				
Approach Delay, s/veh / LOS				42.3	D		49.8	D		19.4	B		22.9	C					
Intersection Delay, s/veh / LOS				24.1						C									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.61	C		2.62	C		1.91	B		1.90	B					
Bicycle LOS Score / LOS				0.83	A		0.57	A		0.80	A		1.28	A					

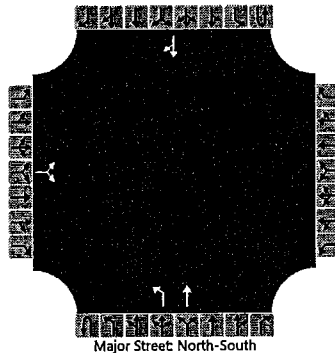
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency		Bowman Consulting Group				Duration, h		0.25									
Analyst		ELK		Analysis Date		2/16/2020		Area Type		Other							
Jurisdiction		County		Time Period		PM Peak		PHF		0.95							
Urban Street		Prospect Ave (CR 577)		Analysis Year		2023 Build		Analysis Period		1> 5:00							
Intersection		Prospect/Essex Gr/Guer...		File Name		B-PM-Prospect-EG-ER.xus											
Project Description		BNE-Executive Dr															
Demand Information				EB			WB			NB			SB				
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R		
Demand (v), veh/h				468	9	52	28	5		23	686	39	83	673	423		
Signal Information																	
Cycle, s		115.0	Reference Phase												2		
Offset, s		0	Reference Point												End		
Uncoordinated		No	Simult. Gap E/W												On		
Force Mode		Fixed	Simult. Gap N/S												On		
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT						
Assigned Phase					4		8	5	2	1	6						
Case Number					10.0		10.0	2.0	4.0	2.0	4.0						
Phase Duration, s					27.0		16.0	8.5	60.0	12.0	63.5						
Change Period, (Y+R _c), s					5.0		5.0	5.0	7.0	5.0	7.0						
Max Allow Headway (MAH), s					3.2		3.1	3.1	0.0	3.1	0.0						
Queue Clearance Time (g _s), s					19.4		3.0	3.5		7.5							
Green Extension Time (g _e), s					0.4		0.0	0.0	0.0	0.0	0.0						
Phase Call Probability					1.00		1.00	1.00		1.00							
Max Out Probability					1.00		0.00	0.49		1.00							
Movement Group Results				EB			WB			NB			SB				
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R		
Assigned Movement				7	4	14	3	8		5	2	12	1	6	16		
Adjusted Flow Rate (v), veh/h				286	271		18	17		24	513	251	87	708	445		
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1771		1810	1837		1795	1870	1817	1810	1870	1585		
Queue Service Time (g _s), s				17.4	16.8		1.0	1.0		1.5	9.8	9.9	5.5	13.7	22.9		
Cycle Queue Clearance Time (g _c), s				17.4	16.8		1.0	1.0		1.5	9.8	9.9	5.5	13.7	22.9		
Green Ratio (g/C)				0.19	0.19		0.10	0.10		0.03	0.46	0.46	0.06	0.49	0.49		
Capacity (c), veh/h				346	339		173	176		55	1724	837	110	1837	778		
Volume-to-Capacity Ratio (X)				0.825	0.800		0.102	0.097		0.440	0.297	0.299	0.793	0.386	0.572		
Back of Queue (Q), ft/ln (50 th percentile)				239.9	223.5		12.9	12.4		18	109	107.8	84.3	149.9	220.2		
Back of Queue (Q), veh/ln (50 th percentile)				9.6	8.9		0.5	0.5		0.7	4.3	4.3	3.4	5.9	8.8		
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00		
Uniform Delay (d ₁), s/veh				44.7	44.4		47.5	47.5		54.8	19.4	19.4	53.3	18.4	20.7		
Incremental Delay (d ₂), s/veh				19.7	17.8		1.2	1.1		2.0	0.4	0.9	29.5	0.6	3.0		
Initial Queue Delay (d ₃), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Control Delay (d), s/veh				64.3	62.2		48.7	48.6		56.8	19.8	20.3	82.8	19.0	23.8		
Level of Service (LOS)				E	E		D	D		E	B	C	F	B	C		
Approach Delay, s/veh / LOS				63.3	E		48.6	D		21.1	C		25.2	C			
Intersection Delay, s/veh / LOS				32.4					C								
Multimodal Results				EB			WB			NB			SB				
Pedestrian LOS Score / LOS				2.61	C		2.62	C		2.27	B		1.90	B			
Bicycle LOS Score / LOS				1.41	A		0.54	A		0.92	A		1.17	A			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	AM Peak - Build	Peak Hour Factor	0.76
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		71		48						81	31				59	143
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

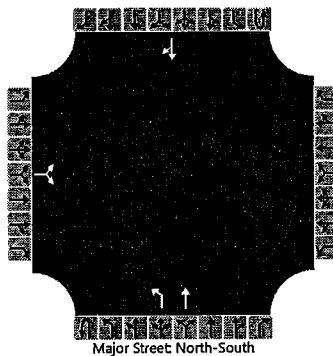
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			157							107						
Capacity, c (veh/h)			640							1310						
v/c Ratio			0.24							0.08						
95% Queue Length, Q ₉₅ (veh)			1.0							0.3						
Control Delay (s/veh)			12.4							8.0						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	12.4								5.8							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Executive Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Executive Dr
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	PM Peak - Build	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		176		100						48	66				102	86
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

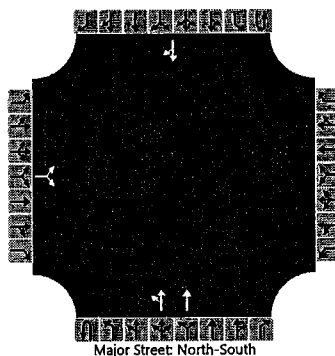
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			291							51						
Capacity, c (veh/h)			723							1387						
v/c Ratio			0.40							0.04						
95% Queue Length, Q ₉₅ (veh)			1.9							0.1						
Control Delay (s/veh)			13.3							7.7						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.3								3.2							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	AM Peak - Build	Peak Hour Factor	0.91
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		86		72						163	102				79	58
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

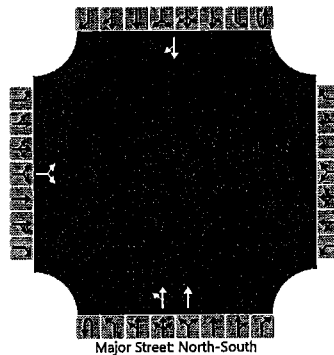
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			174							179						
Capacity, c (veh/h)			553							1435						
v/c Ratio			0.31							0.12						
95% Queue Length, Q ₉₅ (veh)			1.3							0.4						
Control Delay (s/veh)			14.5							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	14.5								4.9							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Rooney Cir/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	Municipal
Date Performed	2/16/2020	East/West Street	Marion Drive
Analysis Year	2023	North/South Street	Rooney Circle
Time Analyzed	PM Peak - Build	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	BNE Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	1	0
Configuration			LR							LT	T					TR
Volume (veh/h)		90		128						120	217				266	120
Percent Heavy Vehicles (%)		1		1						1						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.82		6.92						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.31						2.21						

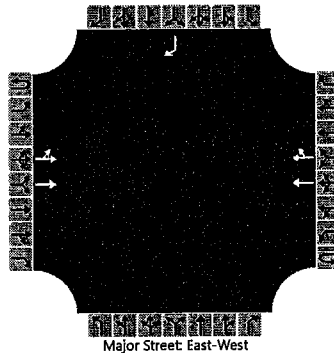
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			256							141						
Capacity, c (veh/h)			411							1110						
v/c Ratio			0.62							0.13						
95% Queue Length, Q ₉₅ (veh)			4.1							0.4						
Control Delay (s/veh)			27.2							8.7						
Level of Service (LOS)			D							A						
Approach Delay (s/veh)	27.2								3.3							
Approach LOS	D															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2023	North/South Street	Marion Drive
Time Analyzed	AM Peak - Build	Peak Hour Factor	0.96
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		131	490				298	12								195
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

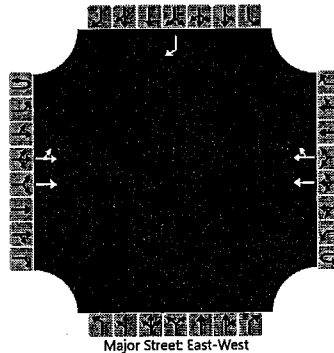
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		136														203
Capacity, c (veh/h)		1241														858
v/c Ratio		0.11														0.24
95% Queue Length, Q ₉₅ (veh)		0.4														0.9
Control Delay (s/veh)		8.3														10.5
Level of Service (LOS)		A														B
Approach Delay (s/veh)	2.1												10.5			
Approach LOS													B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	ELK	Intersection	Route 10/Marion Dr
Agency/Co.	Bowman Consulting Group	Jurisdiction	NJDOT
Date Performed	2/16/2020	East/West Street	Mt. Pleasant Ave (Rte 10)
Analysis Year	2023	North/South Street	Marion Drive
Time Analyzed	PM Peak - Build	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	BNE-Executive Dr BCG 081109-01-001		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	2	0	0	0	2	0		0	0	0		0	0	1
Configuration		LT	T				T	TR								R
Volume (veh/h)		182	308				273	16								237
Percent Heavy Vehicles (%)		1														1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized													No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1														6.9
Critical Headway (sec)		4.12														6.92
Base Follow-Up Headway (sec)		2.2														3.3
Follow-Up Headway (sec)		2.21														3.31

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		214														279
Capacity, c (veh/h)		1223														847
v/c Ratio		0.18														0.33
95% Queue Length, Q ₉₅ (veh)		0.6														1.4
Control Delay (s/veh)		8.6														11.3
Level of Service (LOS)		A														B
Approach Delay (s/veh)	3.5												11.3			
Approach LOS													B			

APPENDIX III

TRAFFIC COUNTS

Turning Movement Count Report

Study Information

Study Summary		Notes	
Count Name	AM - MTMC (206021)		
Location	Prospect Ave & Rooney Circle/Guerino Drive, West Orange, New Jersey		
Performed By			
AT			
Date			
Thursday, January 23, 2020			

Peak Hour Volume		1812
% Bank 1	% Bank 2	
100.0%	0.0%	
% Bank 3	% Bank 4	
0.0%	0.0%	
Pedestrians Volume		
		0

U = U Turn L = Left Turn T = Thru R = Right Turn

P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2

Veh = Total Vehicles for Approach

Peak Hour Data

[illegible]

Vehicle Movement Summary

Movement/ Details	EB - Rooney Circle						WB - Guetino Drive						NB - Prospect Avenue						SB - Prospect Avenue						Entire Intersection				
							U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh		
Movement Volume	0	71	3	29	0	0	103	0	41	0	66	0	0	107	0	14	440	9	0	0	463	0	842	252	0	0	1139	1812	0
PHF	-	0.85	0.75	0.56	-	-	0.83	-	0.85	-	0.79	-	-	0.86	-	0.70	0.74	0.56	-	-	0.75	-	0.80	0.93	0.82	-	-	0.86	-
% Bank 1	0.0%	100.0%	100.0%	100.0%				0.0%	100.0%	0.0%	100.0%	0.0%			0.0%	100.0%	100.0%					0.0%	100.0%	100.0%					
% Bank 2	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%					0.0%	0.0%	0.0%					
% Bank 3	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%					0.0%	0.0%	0.0%					
% Bank 4	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%					0.0%	0.0%	0.0%					

Turning Movement Count Report

Study Information

Count Name		Peak Hour Volume	
PM - MTMC (205021)		% Bank 1	2310
Location		% Bank 2	
Prospect Ave & Rooney Circle/Guerino Drive, West Orange, New Jersey		100.0%	0.0%
Performed By		% Bank 3	
DF		0.0%	0.0%
Date		Pedestrian Volume	
Thursday, January 23, 2020		0	

U = U Turn L = Left Turn T = Thru R = Right Turn
 P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
 Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Rooney Circle				WB - Guerino Drive				NB - Prospect Avenue				SB - Prospect Avenue				Total Vehicles	Total Pedestrians												
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh																
4:45 PM	0	74	4	13	0	0	91	0	5	2	19	0	0	26	0	3	154	15	0	0	172	0	26	176	83	0	0	285	574	0
5:00 PM	0	97	1	9	0	0	107	0	7	1	24	0	0	32	0	5	156	5	0	0	166	0	15	174	93	0	0	282	587	0
5:15 PM	0	93	2	7	0	0	102	0	9	1	21	0	0	31	0	6	171	11	0	0	188	0	23	122	74	0	0	219	540	0
5:30 PM	0	108	2	13	0	0	123	0	7	1	14	0	0	22	0	4	185	8	0	0	197	0	19	181	67	0	0	267	609	0

Vehicle Movement Summary

Movement/ Details	EB - Rooney Circle				WB - Guerino Drive				NB - Prospect Avenue				SB - Prospect Avenue				Entire Intersection										
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh						
Movement Volume	0	372	9	42	0	0	423	0	28	5	78	0	18	666	39	0	0	723	0	83	653	317	0	0	1053	2310	0
PHF	-	0.86	0.56	0.81	-	-	0.86	-	0.78	0.63	0.81	-	0.75	0.90	0.65	-	-	0.92	-	0.80	0.90	0.85	-	-	0.92	0.95	-
% Bank 1	0.0%	100.0%	100.0%	100.0%				0.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%				0.0%	100.0%	100.0%	100.0%					
% Bank 2	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%					
% Bank 3	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%					
% Bank 4	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%					

Turning Movement Count Report

Study Information

Study Summary		Count Name		Peak Hour Volume	
AM - MTMC (205021)		AM - MTMC (205021)		221	
Executive Drive & Rooney Circle, West Orange, New Jersey		Location		% Bank 1	
Performed By		KT		100.0%	
Date		Thursday, January 23, 2020		% Bank 2	
				0.0%	
				% Bank 3	
				0.0%	
				% Bank 4	
				0.0%	
				Pedestrians Volume	
				0	

U = U Turn L = Left Turn T = Thru R = Right Turn
 P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
 Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Executive Drive				WB - Rooney Circle							NB - Rooney Circle							SB					Total Vehicles	Total Pedestrians																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Vehicle Movement Summary

Movement/ Details	EB - Executive Drive				WB - Rooney Circle				NB - Rooney Circle				SB				Entire Intersection			
					U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh		
Movement Volume	0	0	3	1	0	0	4	0	59	86	0	0	0	0	0	0	0	0	221	0
PHF	-	-	0.38	0.25	-	-	0.50	-	0.67	0.90	-	-	-	-	-	-	-	-	0.76	-
% Bank 1	0.0%	0.0%	100.0%	100.0%					0.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
% Bank 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
% Bank 3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
% Bank 4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		

Turning Movement Count Report

Study Information

Study Summary		Notes	
Count Name	PM - MTMC (205021)		
Location	Executive Drive & Rooney Circle, West Orange Twp, New Jersey		
Performed By			
DF			
Date			
Thursday, January 23, 2020			

Peak	Hour	Day	Temp (°C)	Humidity (%)	Wind Speed (m/s)	Wind Dir (°)	Pressure (hPa)	Clouds (%)	Vis (km)	Soil Temp (°C)	Plant Temp (°C)	Leaf Temp (°C)	Soil Moisture (%)	Plant Moisture (%)	Leaf Moisture (%)	Soil pH	Plant pH	Leaf pH	Soil EC (µS/cm)	Plant EC (µS/cm)	Leaf EC (µS/cm)	Soil N (mg/kg)	Plant N (mg/kg)	Leaf N (mg/kg)	Soil P (mg/kg)	Plant P (mg/kg)	Leaf P (mg/kg)	Soil K (mg/kg)	Plant K (mg/kg)	Leaf K (mg/kg)	Soil Ca (mg/kg)	Plant Ca (mg/kg)	Leaf Ca (mg/kg)	Soil Mg (mg/kg)	Plant Mg (mg/kg)	Leaf Mg (mg/kg)	Soil Fe (mg/kg)	Plant Fe (mg/kg)	Leaf Fe (mg/kg)	Soil Zn (mg/kg)	Plant Zn (mg/kg)	Leaf Zn (mg/kg)	Soil Cu (mg/kg)	Plant Cu (mg/kg)	Leaf Cu (mg/kg)	Soil Mn (mg/kg)	Plant Mn (mg/kg)	Leaf Mn (mg/kg)	Soil B (mg/kg)	Plant B (mg/kg)	Leaf B (mg/kg)	Soil S (mg/kg)	Plant S (mg/kg)	Leaf S (mg/kg)	Soil Cl (mg/kg)	Plant Cl (mg/kg)	Leaf Cl (mg/kg)	Soil I (mg/kg)	Plant I (mg/kg)	Leaf I (mg/kg)	Soil Br (mg/kg)	Plant Br (mg/kg)	Leaf Br (mg/kg)	Soil Li (mg/kg)	Plant Li (mg/kg)	Leaf Li (mg/kg)	Soil Na (mg/kg)	Plant Na (mg/kg)	Leaf Na (mg/kg)	Soil Al (mg/kg)	Plant Al (mg/kg)	Leaf Al (mg/kg)	Soil Si (mg/kg)	Plant Si (mg/kg)	Leaf Si (mg/kg)	Soil Ti (mg/kg)	Plant Ti (mg/kg)	Leaf Ti (mg/kg)	Soil V (mg/kg)	Plant V (mg/kg)	Leaf V (mg/kg)	Soil Cr (mg/kg)	Plant Cr (mg/kg)	Leaf Cr (mg/kg)	Soil Co (mg/kg)	Plant Co (mg/kg)	Leaf Co (mg/kg)	Soil Ni (mg/kg)	Plant Ni (mg/kg)	Leaf Ni (mg/kg)	Soil Pb (mg/kg)	Plant Pb (mg/kg)	Leaf Pb (mg/kg)	Soil Cd (mg/kg)	Plant Cd (mg/kg)	Leaf Cd (mg/kg)	Soil Hg (mg/kg)	Plant Hg (mg/kg)	Leaf Hg (mg/kg)	Soil As (mg/kg)	Plant As (mg/kg)	Leaf As (mg/kg)	Soil Se (mg/kg)	Plant Se (mg/kg)	Leaf Se (mg/kg)	Soil Mo (mg/kg)	Plant Mo (mg/kg)	Leaf Mo (mg/kg)	Soil Sb (mg/kg)	Plant Sb (mg/kg)	Leaf Sb (mg/kg)	Soil Sn (mg/kg)	Plant Sn (mg/kg)	Leaf Sn (mg/kg)	Soil Ba (mg/kg)	Plant Ba (mg/kg)	Leaf Ba (mg/kg)	Soil Sr (mg/kg)	Plant Sr (mg/kg)	Leaf Sr (mg/kg)	Soil Y (mg/kg)	Plant Y (mg/kg)	Leaf Y (mg/kg)	Soil Zr (mg/kg)	Plant Zr (mg/kg)	Leaf Zr (mg/kg)	Soil Nb (mg/kg)	Plant Nb (mg/kg)	Leaf Nb (mg/kg)	Soil Ta (mg/kg)	Plant Ta (mg/kg)	Leaf Ta (mg/kg)	Soil W (mg/kg)	Plant W (mg/kg)	Leaf W (mg/kg)	Soil Bi (mg/kg)	Plant Bi (mg/kg)	Leaf Bi (mg/kg)	Soil Po (mg/kg)	Plant Po (mg/kg)	Leaf Po (mg/kg)	Soil At (mg/kg)	Plant At (mg/kg)	Leaf At (mg/kg)	Soil Rn (mg/kg)	Plant Rn (mg/kg)	Leaf Rn (mg/kg)	Soil Fr (mg/kg)	Plant Fr (mg/kg)	Leaf Fr (mg/kg)	Soil Ac (mg/kg)	Plant Ac (mg/kg)	Leaf Ac (mg/kg)	Soil Th (mg/kg)	Plant Th (mg/kg)	Leaf Th (mg/kg)	Soil Pa (mg/kg)	Plant Pa (mg/kg)	Leaf Pa (mg/kg)	Soil U (mg/kg)	Plant U (mg/kg)	Leaf U (mg/kg)	Soil Np (mg/kg)	Plant Np (mg/kg)	Leaf Np (mg/kg)	Soil Pu (mg/kg)	Plant Pu (mg/kg)	Leaf Pu (mg/kg)	Soil Am (mg/kg)	Plant Am (mg/kg)	Leaf Am (mg/kg)	Soil Cm (mg/kg)	Plant Cm (mg/kg)	Leaf Cm (mg/kg)	Soil Bk (mg/kg)	Plant Bk (mg/kg)	Leaf Bk (mg/kg)	Soil Cf (mg/kg)	Plant Cf (mg/kg)	Leaf Cf (mg/kg)	Soil Es (mg/kg)	Plant Es (mg/kg)	Leaf Es (mg/kg)	Soil Fm (mg/kg)	Plant Fm (mg/kg)	Leaf Fm (mg/kg)	Soil Md (mg/kg)	Plant Md (mg/kg)	Leaf Md (mg/kg)	Soil No (mg/kg)	Plant No (mg/kg)	Leaf No (mg/kg)	Soil Pm (mg/kg)	Plant Pm (mg/kg)	Leaf Pm (mg/kg)	Soil Sm (mg/kg)	Plant Sm (mg/kg)	Leaf Sm (mg/kg)	Soil Eu (mg/kg)	Plant Eu (mg/kg)	Leaf Eu (mg/kg)	Soil Gd (mg/kg)	Plant Gd (mg/kg)	Leaf Gd (mg/kg)	Soil Tb (mg/kg)	Plant Tb (mg/kg)	Leaf Tb (mg/kg)	Soil Dy (mg/kg)	Plant Dy (mg/kg)	Leaf Dy (mg/kg)	Soil Ho (mg/kg)	Plant Ho (mg/kg)	Leaf Ho (mg/kg)	Soil Er (mg/kg)	Plant Er (mg/kg)	Leaf Er (mg/kg)	Soil Tm (mg/kg)	Plant Tm (mg/kg)	Leaf Tm (mg/kg)	Soil Yb (mg/kg)	Plant Yb (mg/kg)	Leaf Yb (mg/kg)	Soil Lu (mg/kg)	Plant Lu (mg/kg)	Leaf Lu (mg/kg)	Soil Hf (mg/kg)	Plant Hf (mg/kg)	Leaf Hf (mg/kg)	Soil Ta (mg/kg)	Plant Ta (mg/kg)	Leaf Ta (mg/kg)	Soil W (mg/kg)	Plant W (mg/kg)	Leaf W (mg/kg)	Soil Re (mg/kg)	Plant Re (mg/kg)	Leaf Re (mg/kg)	Soil Os (mg/kg)	Plant Os (mg/kg)	Leaf Os (mg/kg)	Soil Ir (mg/kg)	Plant Ir (mg/kg)	Leaf Ir (mg/kg)	Soil Pt (mg/kg)	Plant Pt (mg/kg)	Leaf Pt (mg/kg)	Soil Au (mg/kg)	Plant Au (mg/kg)	Leaf Au (mg/kg)	Soil Hg (mg/kg)	Plant Hg (mg/kg)	Leaf Hg (mg/kg)	Soil Tl (mg/kg)	Plant Tl (mg/kg)	Leaf Tl (mg/kg)	Soil Pb (mg/kg)	Plant Pb (mg/kg)	Leaf Pb (mg/kg)	Soil Bi (mg/kg)	Plant Bi (mg/kg)	Leaf Bi (mg/kg)	Soil Po (mg/kg)	Plant Po (mg/kg)	Leaf Po (mg/kg)	Soil At (mg/kg)	Plant At (mg/kg)	Leaf At (mg/kg)	Soil Rn (mg/kg)	Plant Rn (mg/kg)	Leaf Rn (mg/kg)	Soil Fr (mg/kg)	Plant Fr (mg/kg)	Leaf Fr (mg/kg)	Soil Ac (mg/kg)	Plant Ac (mg/kg)	Leaf Ac (mg/kg)	Soil Th (mg/kg)	Plant Th (mg/kg)	Leaf Th (mg/kg)	Soil Pa (mg/kg)	Plant Pa (mg/kg)	Leaf Pa (mg/kg)	Soil U (mg/kg)	Plant U (mg/kg)	Leaf U (mg/kg)	Soil Np (mg/kg)	Plant Np (mg/kg)	Leaf Np (mg/kg)	Soil Pu (mg/kg)	Plant Pu (mg/kg)	Leaf Pu (mg/kg)	Soil Am (mg/kg)	Plant Am (mg/kg)	Leaf Am (mg/kg)	Soil Cm (mg/kg)	Plant Cm (mg/kg)	Leaf Cm (mg/kg)	Soil Bk (mg/kg)	Plant Bk (mg/kg)	Leaf Bk (mg/kg)	Soil Cf (mg/kg)	Plant Cf (mg/kg)	Leaf Cf (mg/kg)	Soil Es (mg/kg)	Plant Es (mg/kg)	Leaf Es (mg/kg)	Soil Fm (mg/kg)	Plant Fm (mg/kg)	Leaf Fm (mg/kg)	Soil Md (mg/kg)	Plant Md (mg/kg)	Leaf Md (mg/kg)	Soil No (mg/kg)	Plant No (mg/kg)	Leaf No (mg/kg)	Soil Pm (mg/kg)	Plant Pm (mg/kg)	Leaf Pm (mg/kg)	Soil Sm (mg/kg)	Plant Sm (mg/kg)	Leaf Sm (mg/kg)	Soil Eu (mg/kg)	Plant Eu (mg/kg)	Leaf Eu (mg/kg)	Soil Gd (mg/kg)	Plant Gd (mg/kg)	Leaf Gd (mg/kg)	Soil Tb (mg/kg)	Plant Tb (mg/kg)	Leaf Tb (mg/kg)	Soil Dy (mg/kg)	Plant Dy (mg/kg)	Leaf Dy (mg/kg)	Soil Ho (mg/kg)	Plant Ho (mg/kg)	Leaf Ho (mg/kg)	Soil Er (mg/kg)	Plant Er (mg/kg)	Leaf Er (mg/kg)	Soil Tm (mg/kg)	Plant Tm (mg/kg)	Leaf Tm (mg/kg)	Soil Yb (mg/kg)	Plant Yb (mg/kg)	Leaf Yb (mg/kg)	Soil Lu (mg/kg)	Plant Lu (mg/kg)	Leaf Lu (mg/kg)	Soil Hf (mg/kg)	Plant Hf (mg/kg)	Leaf Hf (mg/kg)	Soil Ta (mg/kg)	Plant Ta (mg/kg)	Leaf Ta (mg/kg)	Soil W (mg/kg)	Plant W (mg/kg)	Leaf W (
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Time Period	EB - Executive Drive				WB - Rooney Circle				NB - Rooney Circle				SB - Rooney Circle				Total Vehicles	Total Pedestrians											
	EB - Executive Drive				WB - Rooney Circle				NB - Rooney Circle				SB - Rooney Circle																
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L			T	R	P1	P2	Veh						
5:00 PM	0	0	21	14	0	0	35	0	25	3	0	0	0	0	28	0	1	0	19	0	0	20	0	0	0	0	0	83	0
5:15 PM	0	0	31	11	0	0	42	0	24	1	0	0	0	0	25	0	2	0	15	0	0	17	0	0	0	0	0	84	0
5:30 PM	0	0	28	9	0	0	37	0	23	4	0	0	0	0	27	0	1	0	18	0	0	19	0	0	0	0	0	83	0
5:45 PM	0	0	17	8	0	0	25	0	30	1	0	0	0	0	31	0	0	0	14	0	0	14	0	0	0	0	0	70	0

Vehicle Movement Summary

Movement/ Details	EB - Executive Drive						WB - Rooney Circle						NB - Rooney Circle						Engine Intersection							
	Movement Details						WB - Rooney Circle						NB - Rooney Circle						Engine Intersection							
							U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh						
Movement Volume	0	0	97	42	0	0	139	0	102	9	0	0	0	111	0	4	0	66	0	0	70	0	0	0	320	0
PHF	-	-	0.78	0.75	-	-	0.83	-	0.85	0.56	-	-	-	0.90	-	0.50	-	0.87	-	-	0.88	-	-	-	0.95	-
% Bank 1	0.0%	0.0%	100.0%	100.0%				0.0%	100.0%	100.0%	0.0%				0.0%	100.0%	0.0%	100.0%				0.0%	0.0%			
% Bank 2	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%			
% Bank 3	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%			
% Bank 4	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%			

Turning Movement Count Report

Study Information

Count Name		Peak Hour Volume	
AM - MTMC (205021)		% Bank 1	467
Location		% Bank 2	
Marion Drive & Rooney Circle, West Orange, New Jersey		100.0%	0.0%
Performed By		% Bank 3	
TR		0.0%	0.0%
Date		Pedestrian Volume	
Thursday, January 23, 2020			0

U = U Turn L = Left Turn T = Thru R = Right Turn
P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Marion Drive				WB				NB - Rooney Circle				SB - Rooney Circle				Total Vehicles	Total Pedestrians					
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L			T	R	P1	P2	Veh
8:00 AM	0	13	0	11	0	0	24	0	0	0	0	0	0	0	0	0	8	10	0	0	0	18	0
8:15 AM	0	18	0	21	0	0	39	0	0	0	0	0	0	0	0	0	14	11	0	0	0	25	0
8:30 AM	0	18	0	12	0	0	30	0	0	0	0	0	0	0	0	0	13	8	0	0	0	21	0
8:45 AM	0	21	0	26	0	0	47	0	0	0	0	0	0	0	0	0	15	10	0	0	0	25	0

Vehicle Movement Summary

Movement/ Details	EB - Marion Drive				WB				NB - Rooney Circle				SB - Rooney Circle				Entire Intersection					
Movement Volume	0	70	0	0	140	0	0	0	0	0	0	0	238	0	0	50	39	0	0	89	467	0
PHF	-	0.83	-	0.67	-	-	-	-	-	-	-	-	0.90	-	-	0.83	0.89	-	-	0.89	0.91	-
% Bank 1	0.0%	100.0%	0.0%	100.0%										0.0%	0.0%	100.0%	100.0%					
% Bank 2	0.0%	0.0%	0.0%	0.0%										0.0%	0.0%	0.0%	0.0%					
% Bank 3	0.0%	0.0%	0.0%	0.0%										0.0%	0.0%	0.0%	0.0%					
% Bank 4	0.0%	0.0%	0.0%	0.0%										0.0%	0.0%	0.0%	0.0%					

Turning Movement Count Report

Study Information

Count Name		Peak Hour Volume	
PM - MTMC (205021)		% Bank 1	803
Location		% Bank 2	
Marion Drive & Rooney Circle, West Orange Twp, New Jersey		100.0%	0.0%
Performed By		% Bank 3	
TR		0.0%	0.0%
Date		Pedestrian Volume	
Thursday, January 23, 2020		0	

U = U Turn L = Left Turn T = Thru R = Right Turn
 P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
 Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Marion Drive				WB				NB - Rooney Circle				SB - Rooney Circle				Total Vehicles	Total Pedestrians					
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L			T	R	P1	P2	Veh
4:00 PM	0	19	0	39	0	0	58	0	0	0	0	0	0	0	0	35	57	0	0	0	0	87	0
4:15 PM	0	12	0	30	0	0	42	0	0	0	0	0	0	0	0	23	48	0	0	0	0	87	0
4:30 PM	0	14	0	32	0	0	46	0	0	0	0	0	0	0	0	20	44	0	0	0	0	84	0
4:45 PM	0	24	0	15	0	0	39	0	0	0	0	0	0	0	0	29	40	0	0	0	0	64	0

Vehicle Movement Summary

Movement / Details	EB - Marion Drive				WB				NB - Rooney Circle				SB - Rooney Circle				Entire Intersection				
Movement Volume	0	69	0	116	0	0	185	0	0	0	0	0	0	0	226	96	0	0	322	803	0
PHF	-	0.72	-	0.74	-	-	0.80	-	-	-	-	-	-	-	0.90	0.83	-	-	0.93	0.85	-
% Bank 1	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%
% Bank 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Bank 3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Bank 4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Turning Movement Count Report

Study Information

Study Summary		Count Name		Peak Hour Volume	
AM - MTWC (205021)		AM - MTWC (205021)		1058	
Location		Mt Pleasant Avenue & Marion Drive, West Orange, New Jersey		% Bank 1	
Performed By		KT		100.0%	
Date		Thursday, January 23, 2020		% Bank 2	
				0.0%	
				% Bank 3	
				0.0%	
				% Bank 4	
				0.0%	
				Pedestrians Volume	
				0	

U = U Turn L = Left Turn T = Thru R = Right Turn
 P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
 Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Mt Pleasant Avenue				WB - Mt Pleasant Avenue				NB				SB - Marion Drive				Total Vehicles	Total Pedestrians										
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh														
7:45 AM	0	29	110	0	0	0	139	0	0	77	4	0	0	81	0	0	0	0	0	0	57	0	0	57	0	0	277	0
8:00 AM	0	28	134	0	0	0	162	0	0	72	2	0	0	74	0	0	0	0	0	0	40	0	0	40	0	0	276	0
8:15 AM	0	32	132	0	0	0	164	0	0	62	3	0	0	65	0	0	0	0	0	0	46	0	0	46	0	0	275	0
8:30 AM	0	28	100	0	0	0	128	0	0	78	1	0	0	79	0	0	0	0	0	0	33	0	0	33	0	0	240	0

Vehicle Movement Summary

Movement/ Details	EB - Mt Pleasant Avenue				WB - Mt Pleasant Avenue							NB				SB - Marion Drive							Entire Intersection					
Movement Volume	0	117	476	0	0	0	593	0	0	289	10	0	0	0	0	0	0	0	0	0	0	176	0	0	176	0	1068	0
PHF	-	0.91	0.89	-	-	-	0.90	-	-	0.93	0.63	-	-	0.92	-	-	-	-	-	-	-	0.77	-	-	0.77	-	0.96	-
% Bank 1	0.0%	100.0%	100.0%	0.0%				0.0%	0.0%	100.0%	100.0%				0.0%	0.0%	0.0%				0.0%	0.0%						
% Bank 2	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%				0.0%	0.0%						
% Bank 3	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%				0.0%	0.0%						
% Bank 4	0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%				0.0%	0.0%						

Turning Movement Count Report

Study Information

Count Name		Peak Hour Volume	
PM - MTWC (205021)		% Bank 1	929
Location		% Bank 2	
Mt Pleasant Avenue & Marion Drive, West Orange, New Jersey		100.0%	0.0%
Performed By		% Bank 3	
DF		0.0%	0.0%
Date		Pedestrian Volume	
Thursday, January 23, 2020		0	

U = U Turn L = Left Turn T = Thru R = Right Turn
P1 = Pedestrian Direction 1 P2 = Pedestrian Direction 2
Veh = Total Vehicles for Approach

Peak Hour Data

Time Period	EB - Mt Pleasant Avenue				WB - Mt Pleasant Avenue				NB				SB - Marion Drive				Total Vehicles	Total Pedestrians						
	U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh	U	L			T	R	P1	P2	Veh	
5:00 PM	0	32	83	0	0	0	115	0	0	67	0	0	0	0	0	0	0	0	48	0	0	48	230	0
5:15 PM	0	32	58	0	0	0	90	0	0	53	2	0	0	0	0	0	0	0	39	0	0	39	184	0
5:30 PM	0	46	88	0	0	0	134	0	0	76	6	0	0	0	0	0	0	0	57	0	0	57	273	0
5:45 PM	0	44	70	0	0	0	114	0	0	69	3	0	0	0	0	0	0	0	56	0	0	56	242	0

Vehicle Movement Summary

Movement/ Details	EB - Mt Pleasant Avenue				WB - Mt Pleasant Avenue				NB				SB - Marion Drive				Entire Intersection						
					U	L	T	R	P1	P2	Veh	U	L	T	R	P1	P2	Veh					
Movement Volume	0	154	299	0	0	453	0	0	265	11	0	0	0	0	0	0	0	200	0	0	200	929	0
PHF	-	0.84	0.85	-	-	0.85	-	-	0.87	0.46	-	-	-	-	-	-	-	0.88	-	-	0.88	0.85	-
% Bank 1	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0
% Bank 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
% Bank 3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
% Bank 4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0

APPENDIX IV

SIGNAL TIMING

New Jersey Department of Transportation

TRAFFIC ENGINEERING - ELECTRICAL PROJECTNumber 66-94

Job No.	0729103 -4701
Memo to	Mr. I. B. Senyk
Attention	Mr. Harry Romaine

Route No.	280, Prospect Avenue and Essex Green Shopping Center
Location	Eagle Ridge Drive West Orange Essex County
Date	AUG 19 1993

PRIORITY

This directive confirms a verbal authorization given to Mr. Harry Romaine on July 21, 1993.

Should you have any questions regarding this matter, please contact Mr. S. Maurice Rached at (609) 530-4692.

Reference:

SMR:JAR:mf: WEA

Date Completed	8/26/93
By	Charles Vitale

Copies: Blue
Pink
Green
White

ORIGINAL SIGNED
GERARD J. KERWIN

TITLE: Gerard J. Kerwin, Manager
Bureau of Electrical Engineering

Rt. 280, Prospect Ave. &
Essex Green Shopping Ctr.-
Eagle Ridge Drv.
West Orange, Essex County

Directive No. 66-9478-115 Second Variable CycleSignal Face

<u>PHASE</u>	<u>1,6,7,16</u>	<u>2-5</u>	<u>8,9</u>	<u>17,18</u>	<u>10,11</u>	<u>12-15</u>	<u>Time (Sec.)</u>
<u>Without Pedestrian Actuation</u>							
1 Prospect Ave. ROW	R	G	R	R	DW	W	20
Pedestrian Clearance	R	G	R	R	DW	FDW	18
Change	R	Y	R	R	DW	DW	5
Clearance	R	R	R	R	DW	DW	2
2 Essex Green ROW	R	R	G	R	DW	DW	7-27
Change	R	R	Y	R	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
3 Eagle Ridge ROW	R	R	R	G	DW	DW	7-16
Change	R	R	R	Y	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
4 Prospect Ave. Left Turn	G	R	R	R	DW	DW	4-12
Change	Y	R	R	R	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
<u>With Pedestrian Actuation</u>							
1 Prospect Ave. ROW	R	G	R	R	DW	W	20
Pedestrian Clearance	R	G	R	R	DW	FDW	18
Change	R	Y	R	R	DW	DW	5
Clearance	R	R	R	R	DW	DW	2
2 Essex Green ROW	R	R	G	R	W	DW	7
Pedestrian Clearance	R	R	G	R	FDW	DW	20
Change	R	R	Y	R	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
3 Eagle Ridge ROW	R	R	R	G	DW	DW	7-16
Change	R	R	R	Y	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
4 Prospect Ave. Left Turn	G	R	R	R	DW	DW	4-12
Change	Y	R	R	R	DW	DW	3
Clearance	R	R	R	R	DW	DW	2
Emergency Flash	R	Y	R	R	DARK	DARK	-

- 1 - Memory is to be off (Presence Mode).
- 2 - Vehicle extension intervals are to be 2 seconds.
- 3 - During Phase 4, the controller shall have the ability to service adjacent through traffic when the opposing left does not register calls.