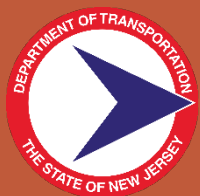




# Road Safety Audit:

Memorial Drive between Routes 33 and 35  
Neptune Township, Neptune City, Bradley Beach and Avon-  
by-the-Sea Boroughs, Monmouth County



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DECEMBER 2018

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## Executive Summary

This document is the draft report of the Memorial Drive Road Safety Audit (RSA). It was conducted along Memorial Drive (CR 40A) from Route 33 to Route 35 (MP 0.61-2.11) in Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea (Avon) Boroughs, Monmouth County. An RSA is an effective way of identifying crash-causing trends and appropriate countermeasures utilizing a nontraditional approach that promotes transportation safety while maintaining mobility.

A portion of this section of Memorial Drive was identified on NJTPA's Local Safety Program Network Screening list as high priority. According to the NJDOT crash database, 129 crashes occurred during the three-year period between January 1, 2014 and December 31, 2016 along the study area of Memorial Drive with 40, 40 and 49 crashes occurring in 2014, 2015 and 2016, respectively. Additionally, 7 pedestrian crashes occurred over the five-year period between January 1, 2012 and December 31, 2016.

This one-day RSA was conducted on Thursday, April 26, 2018 from 9:00 am to 2:00 pm. The pre- and post-audit meetings were held in the Bradley Beach Borough Hall, located at 701 Main Street, Bradley Beach, NJ. Representatives from NJDOT, NJTPA, Monmouth County, Neptune Township, Neptune City, Bradley Beach and Avon Boroughs were in attendance with NJDOT serving as the facilitator.

The RSA site and crash history is described in Sections II and III of this report, respectively. Section II also identifies previous and on-going studies conducted by the agency representatives. Corridor-wide and site-specific issues and recommendations, organized by location, are discussed in Section V. The most common recommendations were to improve pedestrian safety by investigating curb extensions at intersections, repairing sidewalks and ensuring ADA compliance. Additionally, many suggestions were made to upgrade traffic signals, improve and simplify signage, and increase parking enforcement efforts.

The recommendations contained herein were developed collaboratively with the roadway owner and local stakeholders from the RSA Team (members listed in Appendix A). The study partners have expressed interest in implementing many of the recommendations as time and funds allow. Many of the maintenance items, which are typically low cost, can be addressed without additional engineering.

Please note this RSA report does not constitute an engineering report. The agency responsible for design and construction should consult a licensed professional engineer in preparing the design and construction documents, to implement any of the safety countermeasures mentioned in this report.



# I. Introduction

## A. Site Selection

A portion of this section of Memorial Drive (CR 40A), from Route 33 to Route 35 (MP 0.61-2.11), was identified on NJTPA’s Local Safety Program Network Screening list as high priority, as shown in the below FY 2017-2018 ranking. Of note, these rankings are based on 2011-2013 vehicular and 2009-2013 pedestrian crash data.

**Table 1 – Memorial Drive NJTPA FY 2017-18 LSP Ranking (Corridor)**

Location	Ped Corridor	Regional Corridor
Memorial Drive	#14 County (MP 0.31-1.31)	Not Ranked

**Table 2 – Memorial Drive NJTPA FY 2017-18 LSP Ranking (Intersection)**

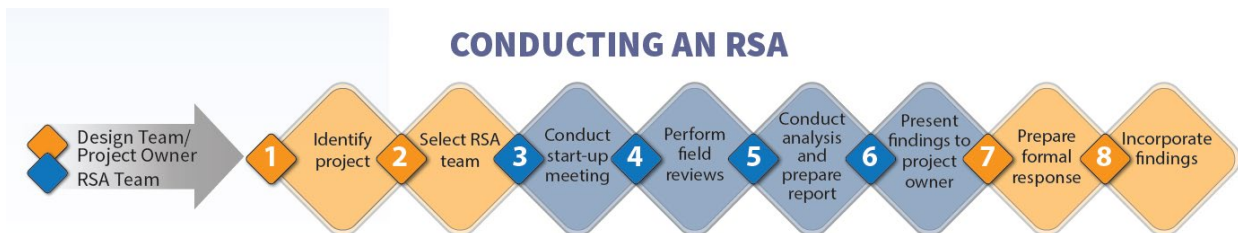
Location	Intersections	Pedestrian Intersections
7th Avenue/Lareine Avenue (MP 1.05)	#9 County	Not Ranked

## B. What is a Road Safety Audit?

A Road Safety Audit (RSA) is a formal safety performance examination of an existing or future road or intersection by a multi-disciplinary audit team. It qualitatively estimates and reports on existing and potential road safety issues, as well as identifies opportunities for improvements in safety for all road users. RSAs can be used on any size project, from minor maintenance to mega-projects, and can be conducted on facilities with a history of crashes, or during the design phase of a new roadway or planned upgrade. RSAs consider all road users, account for human factors and road user capabilities, are documented in a formal report, and require a formal response from the road owner.

The RSA program is conducted to generate improvement recommendations and countermeasures for roadway segments demonstrating a history of, or potential for, a high frequency of crashes, or an identifiable pattern of crash types. Recommendations range from low-cost, quick-turnaround safety improvements to more complex strategies. Implementation of improvement strategies identified through this process may be eligible for Local Federal Aid Safety Funds. Because the RSA process is adaptable to local needs and conditions, recommendations can be implemented incrementally as time and resources permit.

The RSA process, one of FHWA’s proven safety countermeasures, is shown in the figure below.



## C. The Memorial Drive RSA Event

This one-day RSA was conducted on Thursday, April 26, 2018 from 9:00 am to 2:00 pm. The pre- and post-audit meetings were held in the Bradley Beach Borough Hall, located at 701 Main Street,

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Bradley Beach, NJ. Representatives from NJDOT, NJTPA, Monmouth County, Neptune Township, Neptune City, Bradley Beach and Avon Boroughs were in attendance with NJDOT serving as the facilitator. Of note, the field visit was conducted between Route 33 and Evergreen Avenue (MP 0.61-1.42) due to the lack of sidewalk and intersections south of Evergreen Avenue. Memorial Drive from Evergreen Avenue to Route 35 (MP 1.42-2.11) was viewed via aerial images during the post-audit meeting. A list of team members can be found in Appendix A.

## II. Corridor Description and Analysis

### A. Study Location

The study area consists of approximately 1.5 miles of Memorial Drive between Routes 33 and 35. The area spans four municipalities in Monmouth County. This stretch of Memorial Drive is a mix of commercial and residential properties. Commercial sites consist of mainly light industrial uses. Residential units, generally along the side streets, are primarily detached single family homes. A multi-story residential complex is located along the east side of Memorial Drive near 7th Avenue and the Bradley Beach train station. Of note, the northern segment of Memorial Drive is expected to have additional development and roadway access, with 5th through 9th Avenues designated as a Transit Village. Memorial Drive runs parallel to and west of NJ Transit's North Jersey Coast line and Route 71 (Main Street) which is the primary "downtown" thoroughfare in this area. The Garden State Parkway can be accessed via Route 33 while both Routes 33 and 35 provide access to Route 18. Neptune Township, Bradley Beach and Avon Boroughs have beach access and experience increased traffic during the during the summer months. While Neptune City does not have direct access to the beach, its close proximity to the same also results in an influx to the seasonal population.

### B. Roadway and Intersection Characteristics

Memorial Drive is classified as an urban major collector. The corridor study section is 4-lanes, undivided, with a posted speed limit ranging from 30 to 45 mph and no shoulders. The roadway's horizontal alignment is straight, except for the northern limits, where consecutive 'S' curves are present. Overall, there are 3 signalized intersections, 9 unsignalized intersections, and some driveways within the project limits.

### C. Existing Bicycle/Pedestrian Accommodations

Sidewalks are currently available along Memorial Drive southbound between Route 33 and Evergreen Avenue. Sidewalk conditions vary from newly installed to needing maintenance. Continental style crosswalks are provided at 7th, 6th, 4th and Evergreen Avenues. Standard crosswalks are provided along Memorial Drive at all intersections where continental crosswalks are not provided. No sidewalk is present south of Evergreen Avenue.

There are no bicycle lanes or other bicycling infrastructure identified along the corridor. Sharrows are provided along the adjacent and parallel Main Street. Therefore, the few bicyclists observed in the field were traveling either across Memorial Drive to Main Street or on the sidewalk.

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## D. Traffic Volumes

Based on available data from July 2017, the ADT along Memorial Drive ranges from approximately 15,600 to 16,448 within the study area. A copy of the available data can be found in Appendix C.

## E. Transit Service

The Bradley Beach train station provides service on NJ Transit’s North Jersey Coast line with train headways of around 15 to 30 minutes during weekday peak hours. This line provides transportation to key intermodal hubs, such as Newark Penn, Secaucus Junction, and Penn Station-New York.

NJ Transit bus service is provided along Main Street, east of Memorial Drive via routes 317 and 830. No bus stops are located along Memorial Drive and neither route traverses Memorial Drive.

## F. Community Profile

Population and income characteristics from the 2010 Census (U.S. Census Bureau) were used to identify minority populations and low-income populations. Updates to the 2010 Census were performed by the Census Bureau through the American Community Survey (ACS) estimate. The latest ACS for this study area is a five-year estimate from 2012 through 2016. A summary of the demographics is listed below.

**Table 3 – Memorial Drive Area Demographics**

Characteristic		Memorial Dr Area	County Average
<b>Poverty</b>		10.8%	7.6%
<b>Race/ Ethnicity</b>	Black or African American	13.4%	6.7%
	Hispanic/Latino	10.2%	10.4%
	White	72.2%	75.5%
	Asian	1.8%	5.3%
	American Indian/Alaskan	0.1%	0.1%
	Other <sup>1</sup>	2.4%	1.8%
<b>Limited English Proficiency (LEP)</b>		5.4%	6.6%

In addition, approximately 3% of the population uses public transportation compared to the Monmouth County average of 8%. Roughly 4% of the area population walk or bike to work, which is higher than the county average of 2%.

## G. Redevelopment

The northern segment of Memorial Drive is expected to have additional development and roadway access, with 5th through 9th Avenues designated as a Transit Village. The 2010 Monmouth County Coastal Monmouth Plan identified redevelopment plans or projects primarily in Neptune Township and Neptune City Borough. The report noted that other revitalization efforts occurred in the Coastal Monmouth Region (CMR) through streetscape and boardwalk improvement projects such as in Avon and Bradley Beach Boroughs.

The property in the northwest corner of the Memorial Drive and 7th Avenue intersection is planned for redevelopment into 48 multi-family residential units. The 2011 Traffic Impact Analysis proposed

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<sup>1</sup> Percentages may not equal 100% due to rounding. Other includes individuals who identified themselves as ‘Native Hawaiian or Pacific Islander’, ‘Some Other Race Alone’ or ‘Two or More Races’

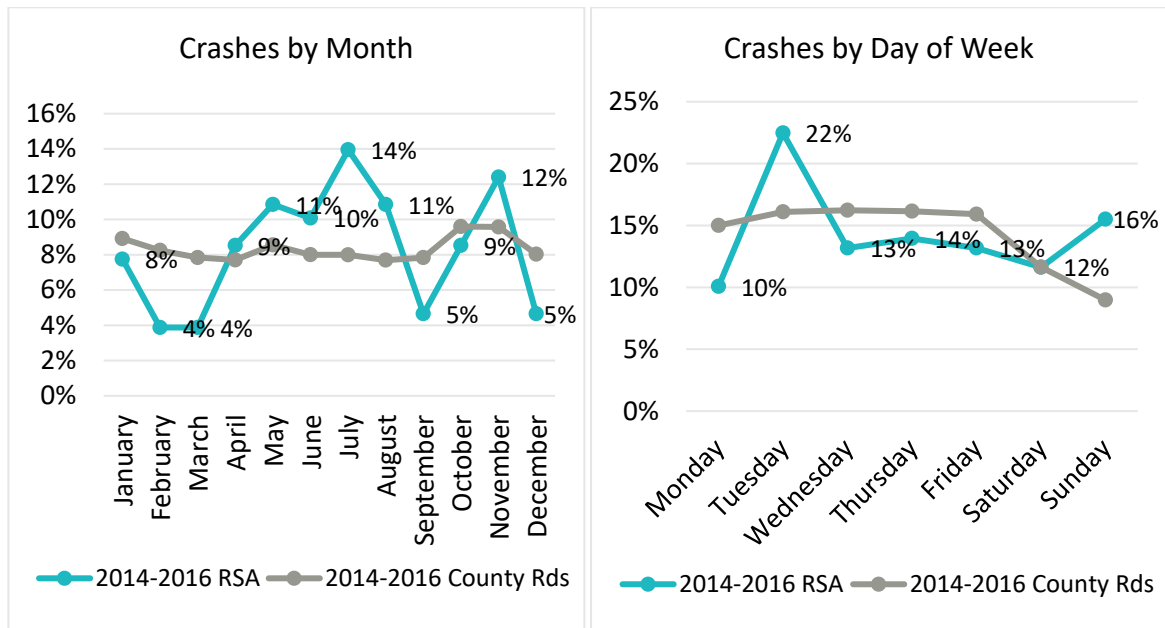
full access along 7th Avenue and a one-way entrance only on Memorial Drive within Neptune Township. As noted in their 2011 Master Plan, the Township also has redevelopment plans along the north channel of the Shark River, east of Memorial Drive near its interchange with Route 35. Bradley Beach does not have any redevelopment plans as noted in the 2014 Master Plan Re-Examination Report. Information on redevelopment in Avon was not available on their website. Excerpts from the County and Township reports, as well as other municipal reports, can be found in Appendix I and J, respectively.

### III. Crash Findings

The analysis used in the RSA was based on reportable crashes that resulted in a fatality, injury and/or property damage as found in the NJDOT crash database. Corridor-wide crash characteristics and overrepresentations were compared to the 2016 statewide average for the county road system as further detailed below. All crashes were plotted onto collision diagrams, which can be found in Appendix D and E.

#### A. Temporal Trends

According to the NJDOT crash database, there were 129 crashes occurred during the three-year period between January 1, 2014, and December 31, 2016, along the study area of Memorial Drive with 40, 40 and 49 crashes occurring in 2014, 2015 and 2016, respectively. Total crashes were highest in July and November and lowest in February compared to the county average. The day with the most of crashes is Tuesday and the day with the fewest is Monday.

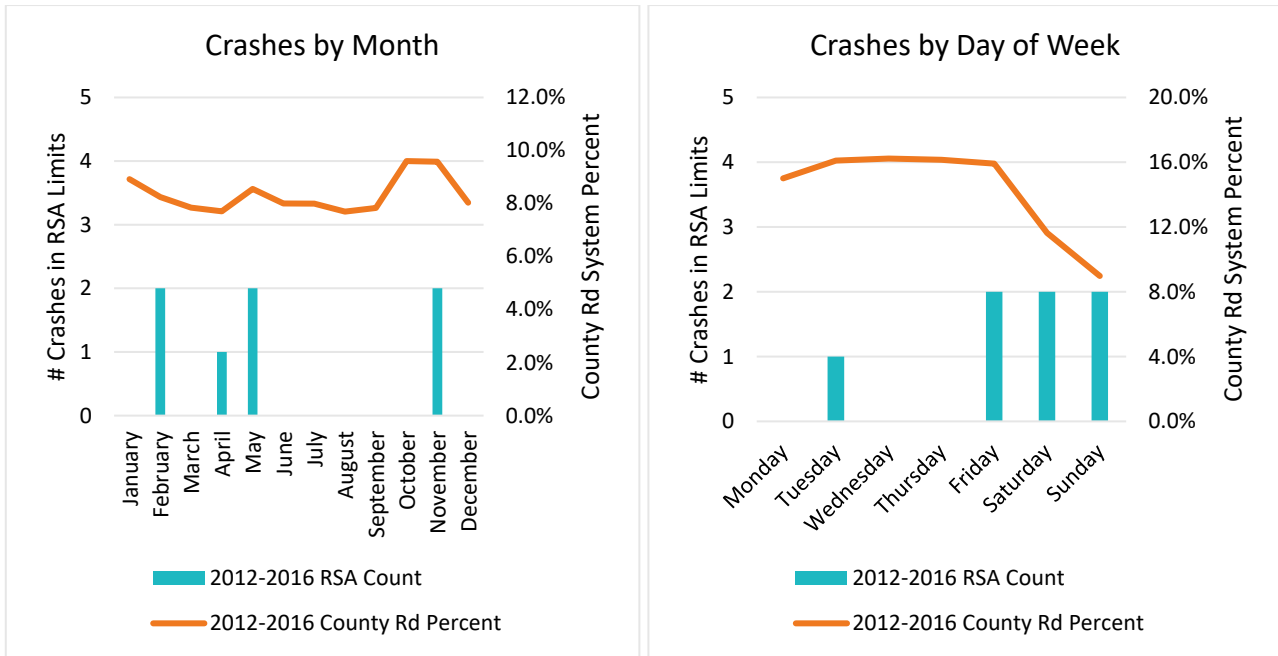


**Figure 1 – Total Crashes by Month and Day of Week**

Additionally, 7 pedestrian crashes occurred over the five-year period from 2012 to 2016. Most of these crashes included minor to moderate injury. More crashes occurred at dawn or dusk than the county average. Collisions with pedestrians were most common Fridays through Sundays and in February, May, and November. It should be noted that the low number of crashes compared to the county road system may be statistically insignificant since they could not be correlated with an



identified event. For example, while the monthly chart indicates 2 pedestrian crashes occurred in November, or 29% of the total, the county average is approximately 100 pedestrian crashes (10%) for the same month.



**Figure 2 – Pedestrian/Bicyclist Crashes by Month and Day of Week**

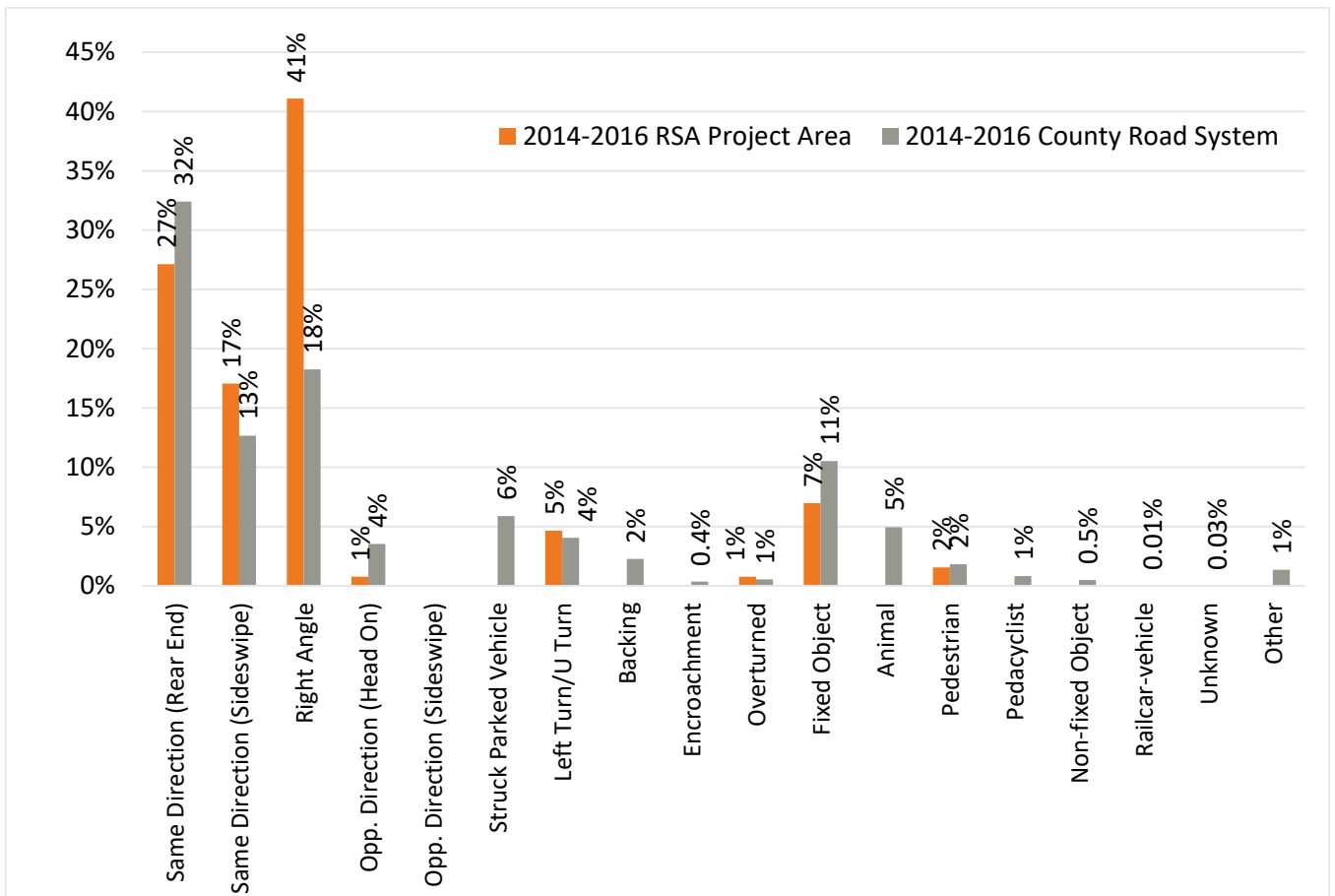
## B. Collision Types

Overrepresented crash types over the three-year period from 2014 to 2016 included sideswipe, right angle, left turn, and overturned. Of the 7 pedestrian/cyclist crashes over the five-year period from 2012 to 2016, two were pedalcyclists (scooter, skateboard, or bicycle) traveling alongside traffic, within the roadway. Angle and left turn crashes occurred both at signalized and unsignalized intersections. The proximity of the rail line to each intersection, which typically only allows one vehicle between Memorial Drive and the tracks, may contribute to these crashes, as motorists may perform rushed/abrupt turning maneuvers to leave the track area.

**Table 4 – Overrepresented Crash Types (2014-2016)**

Collision Type	Count	% of Total	2016 County Road System Average
Same Direction (Side Swipe)	22	18.93%	12.67%
Right Angle	53	19.64%	5.89%
Left Turn	6	8.57%	2.28%
Overturned	1	10.71%	2.64%

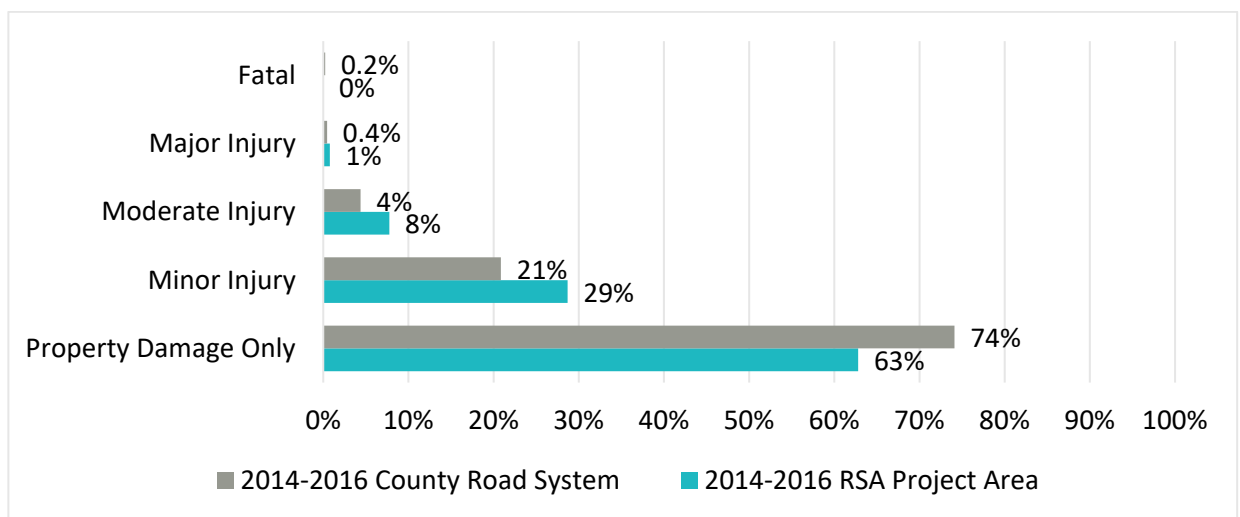
The one overturned crash compared to the county road system may be statistically insignificant.



**Figure 3 – Crash Type Breakdown**

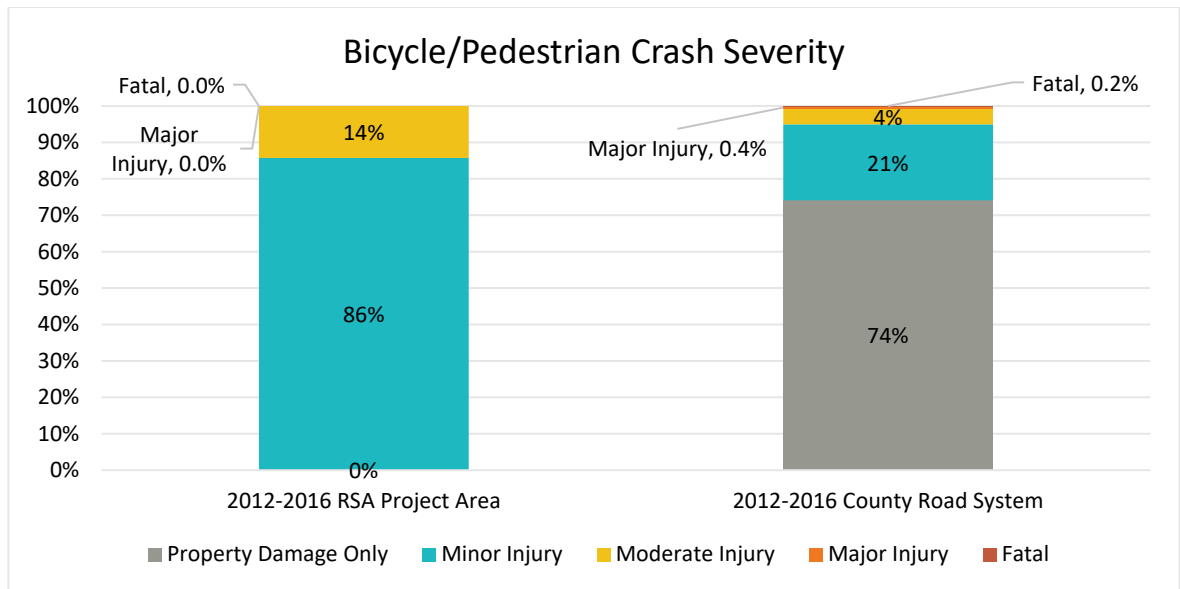
### C. Severity

Crashes resulting in injury were overrepresented compared to the county road system. This is likely due to the right angle and left turn crashes, which tend to result in more injuries. In addition, one left turn crash in 2015 resulted in a major injury. No fatal crashes occurred during the study period.



**Figure 4 – Severity (All Crashes)**

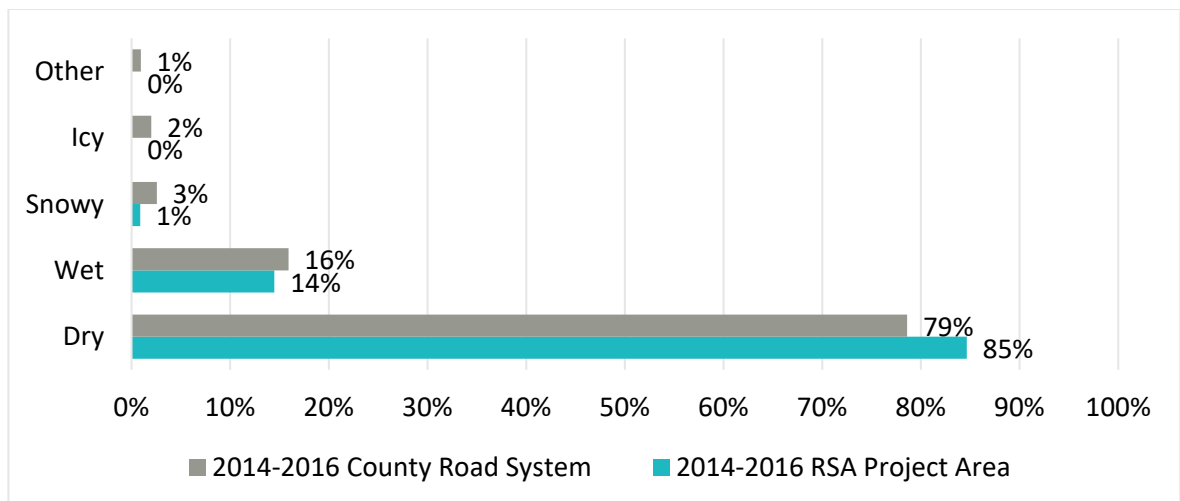
Pedestrian crashes resulting in minor and moderate injury were significantly overrepresented compared to the county road system from 2012 to 2016. No fatal crashes occurred during the study period.



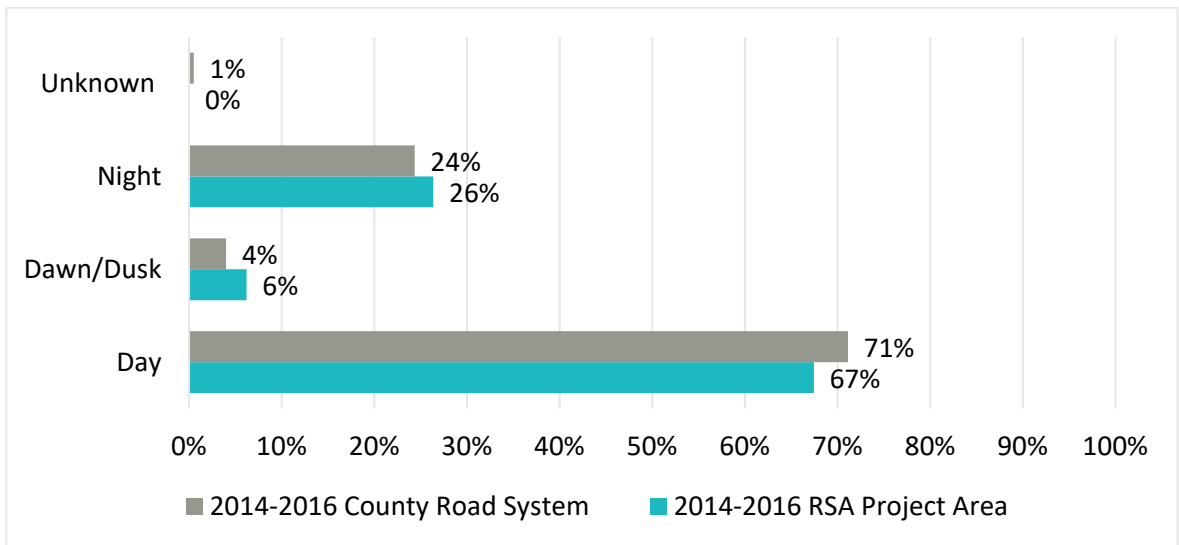
**Figure 5 – Severity (Pedestrian/Bicycle Crashes)**

#### D. Roadway Surface & Light Condition

Overrepresented crash types included dry surface and non-daylight hours. Dry surface conditions accounted for approximately 85% of total crashes, suggesting that road surface was not a significant contributing factor in the majority of crashes. While 67% of crashes occurred during daylight, approximately 32% occurred at dawn, dusk, or at night, which is slightly higher than the county road statewide average of 28%.

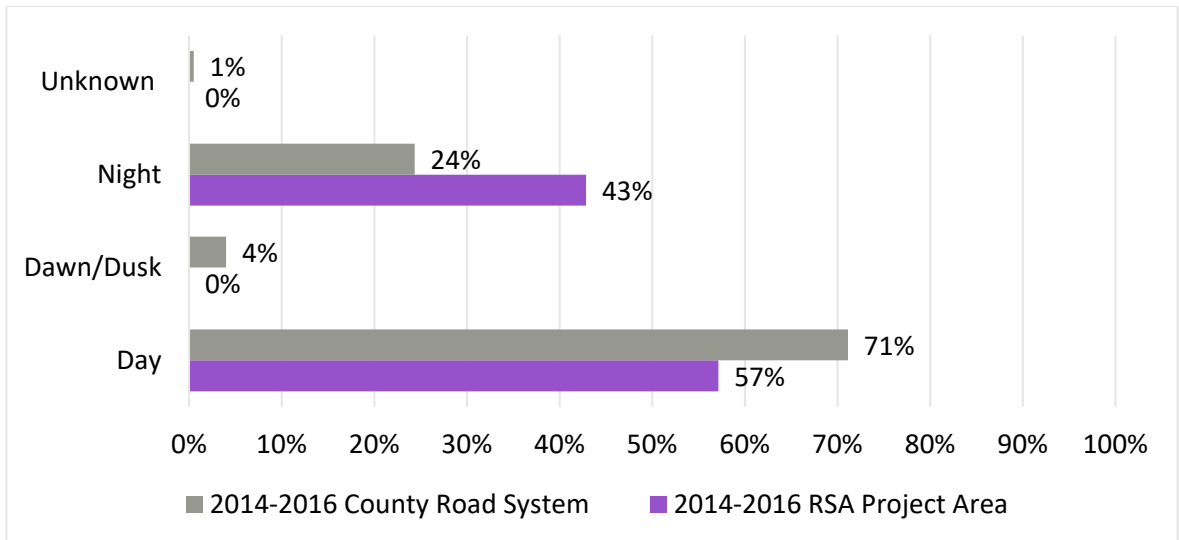


**Figure 6 – Surface Conditions (All Crashes)**



**Figure 7 – Light Conditions (All Crashes)**

In addition, three (3) or approximately 43% of pedestrian crashes occurred at night, which is almost double the county road statewide average of 24%. Of note, the low number of crashes compared to the county road system may be statistically insignificant.



**Figure 8 – Light Conditions (Pedestrian/Bicycle Crashes)**

## E. Location

Crashes at signalized intersections and between intersections were overrepresented compared to the county road system average. Nineteen percent (19%) of crashes occurred at signalized intersections compared to 14% on all county roads. Additionally, 65% of all crashes occurred between intersections compared to 64% of all crashes. More crashes occurred at or near Route 33 (which is not part of the RSA recommendations), 7th, 4th, and Evergreen Avenues. Of note, the signal at Evergreen Avenue was operational near the end of 2014 and crashes at this location noticeably decreased in 2015 and 2016. Crash frequency in 0.1-mile increments, as shown in the following figures, shows the highest concentration of vehicular and pedestrian crashes.



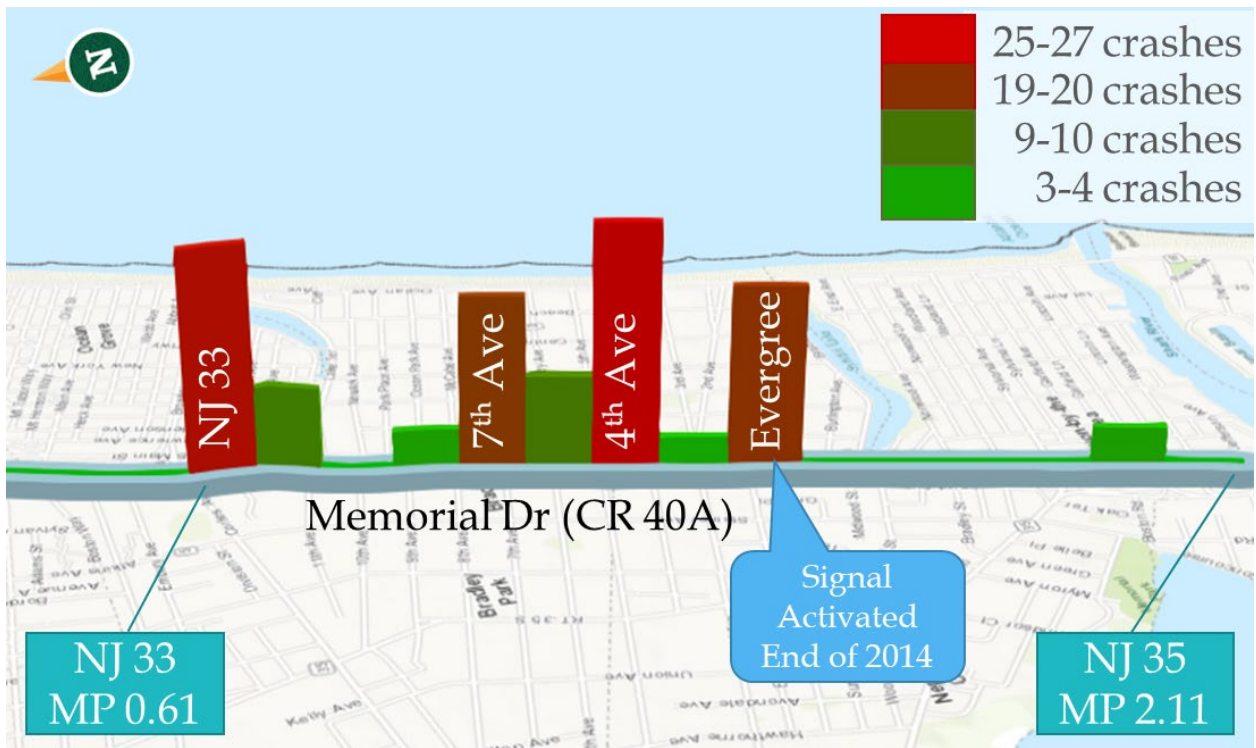


Figure 9 – Total Crash Locations (2014-2016)

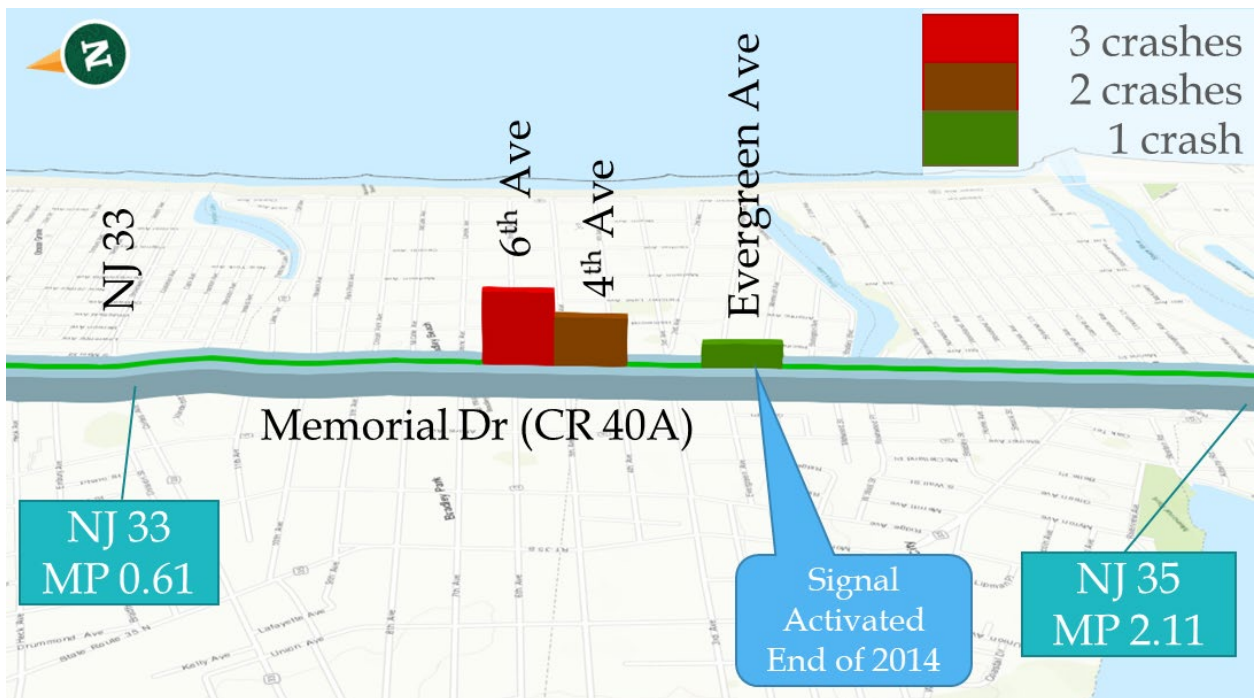


Figure 10 – Pedestrian Crash Locations (2012-2016)



## IV. Identified Issues & Observations

This section summarizes the site-specific and corridor-wide safety issues identified during the RSA. They are categorized into operations (including visibility), pedestrian, bicyclist, and maintenance. Additional issues and photographs can be found in Appendix F.

Pedestrian/Bicyclist	
 <p>1. Sidewalk in poor condition and lacks ADA compliant curb ramps at street crossing</p>	 <p>2. Bicyclists use parallel routes and cross Memorial Drive at intersections</p>
 <p>3. Sidewalk not continuous across wide driveway; pedestrian path striped for clarity</p>	 <p>4. Lack of on-street bicycle facilities</p>
 <p>5. Long crossing distances for pedestrians</p>	 <p>6. Worn path (5th Ave) across tracks</p>



Operations & Visibility	Maintenance
	
7. Insufficient storage between Memorial Dr/tracks	8. Pavement in poor condition (Vanderbilt Rd)
	
9. Poor decisions made attempting to turn	10. Damaged guide rail protecting rail crossing signal
	
11. Vehicles parked on sidewalk, blocking pedestrian paths and visibility	12. Areas of sidewalk are damaged, have overgrown vegetation and/or settled over time

Additional issues, observations and details identified during the RSA include the following, listed from south to north:

- No sidewalk or intersections are present along Memorial Drive south of Evergreen Avenue
- A worn pedestrian path is present at 5th Avenue crossing Memorial Drive and the railroad tracks to access the other side of 5th Avenue, which dead ends at the tracks.

- Crosswalk markings on side streets are faded and intersections have very wide turning radiuses, which increases crossing distance for pedestrians and enables vehicles to make faster turns.
- A near miss collision was observed at the intersection of Memorial Drive and 5th Avenue. A tractor trailer signaled to turn right onto 5th Avenue from the southbound left lane due to the tight radius at the corner. A passenger vehicle attempted to pass in the right lane but stopped once the tractor trailer turning behavior was apparent.

## V. Findings and Recommendations

This section summarizes the site-specific and corridor-wide safety issues, potential strategies, and recommendations to improve the same, safety benefit, time frame, cost, and jurisdiction. Ratings used in the recommendation tables are described as follows:

Symbol	Meaning	Definition
✓	Low safety benefit potential	May reduce total crashes by 1-25% <sup>2</sup>
✓✓	Low to moderate safety benefit potential	May reduce total crashes by 26-49% <sup>2</sup>
✓✓✓	Moderate safety benefit potential	May reduce total crashes by 50-74% <sup>2</sup>
✓✓✓✓	High safety benefit potential	May reduce total crashes by 75+% <sup>2</sup>
\$	Low cost	Could be accomplished through maintenance
\$\$	Medium cost	May require some engineering or design and funding may be readily available
\$\$\$	High cost	Longer term; may require full engineering, ROW acquisition and new funding
🕒	Short term	Could be accomplished within 1 year
🕒	Medium term	Could be accomplished in 1 to 3 years; may require some engineering
🕒	Long term	Could be accomplished in 3 years or more; may require full engineering

### A. Recommendations

The following represents the specific findings and recommendations made by the RSA team. All recommendations and designs should be thoroughly evaluated with due diligence and designed as appropriate by the roadway owner and/or a professional engineer for conformance to all applicable codes, standards, and best practices.

**Table 5 – Corridor-Wide Recommendations**

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
<b>Operations</b>					
1	Investigate converting to a 3-lane section (2 travel lanes, TWLTL and shoulders or bike lanes; i.e. road diet)	✓✓	\$\$	🕒	County

<sup>2</sup> Based on existing Crash Modification Factors (CMFs), the Highway Safety Manual (HSM), FHWA Proven Safety Countermeasures and current research, where applicable. All safety benefits are approximate.



No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
2	Consider upgrading all ramps for ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
3	Consider development of an access management plan within the project limits (for vehicles and pedestrians)	✓	\$\$	○	County
4	Consider corridor-wide signal upgrades (replace 8" traffic signal heads with 12", install backplates with retroreflected border, evaluate clearance intervals, update to countdown pedestrian signal heads, replace push buttons in compliance with ADA, etc.)	✓✓	\$\$\$	●	County
5	Study roadway and pedestrian scale lighting	✓✓✓	\$\$	○	County
6	Investigate the location of trees, poles, and posts to minimize their interference on sight distances	✓✓	\$\$	○	Towns/ County
7	Consider incorporating green infrastructure solutions for sustainable stormwater management	✓ <sup>3</sup>	\$\$	○	County
8	Examine existing cross slope for proper drainage	✓ <sup>3</sup>	\$\$	○	County
9	Consider implementing a uniform speed limit within the study area	✓	\$\$	○	County
<b>Bicycle/Pedestrian</b>					
10	Inspect, repair and construct sidewalks in compliance with ADA as needed.	✓✓✓	\$\$	○	County
11	Examine inlets and install bicycle-safe grates	✓ <sup>3</sup>	\$\$	○	County
12	Study corridor-wide implementation of curb extensions (bump outs) based on the site-specific recommendations to maintain consistency	✓✓ <sup>3</sup>	\$\$	●	County
13	Examine crosswalks status: change to continental style, check placement and alignment	✓✓ <sup>3</sup>	\$	○	County
14	Consider leading pedestrian intervals (LPI) at signalized intersections with high pedestrian activity	✓✓✓	\$	○	County
15	Consider installing a bicycle lane and/or sharrow striping per NJ Complete Streets Design Guide	✓ <sup>3</sup>	\$	○	County
<b>Maintenance</b>					
16	Inspect existing striping for wear and restripe accordingly	✓✓	\$	○	County
17	Inspect and replace faded, damaged or incorrect/ outdated signage as needed (i.e. signs mounted below 7', on non-breakaway posts or back-to-back signs that obscure shapes [e.g. Do Not Enter behind Stop sign])	✓	\$	○	County
18	Consider resurfacing and add inlets as needed	✓	\$\$	○	County

<sup>3</sup> CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
19	Inspect drainage facilities; ensure they are free of debris; install bicycle safe grates	✓ <sup>3</sup>	\$\$	●	County
20	Explore relocation of trees planted in the berm area and consider replacing grass berm with stamped concrete or pavers	✓ <sup>3</sup>	\$\$	●	County
<b>Education</b>					
21	Consider sidewalk, crosswalk, multimodal education campaign and code enforcement	✓ <sup>3</sup>	\$	●	Towns/ County
22	Explore ways to deter vehicles from speeding along Memorial Drive	✓	\$	●	Towns/ County

**Table 6 – Site-Specific Recommendations**

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
<b>South of Evergreen Avenue to Route 35</b>					
23	Investigate installation of centerline rumble stripes	✓✓✓	\$	●	County
24	Consider corridor-wide recommendation 1 for a road diet	✓✓	\$\$	●	County
25	Consider corridor-wide recommendations 16 and 17 regarding faded markings, lines and signs	✓✓ <sup>3</sup>	\$\$	●	County
<b>Evergreen Avenue</b>					
26	Consider corridor-wide recommendation 5 regarding signal improvements (backplates)	✓✓✓	\$\$	●	County
27	Consider striping a crosswalk across Evergreen Ave WB and adding detectable warning surfaces on each side of the railroad tracks	✓✓	\$\$	●	County
28	Investigate corridor-wide recommendation 15 regarding the installation of a bicycle lane and/or sharrow striping	✓	\$	●	County
29	Explore connecting the sidewalk at the intersection and east of the tracks to delineate pedestrian path and driveway apron	✓✓✓	\$\$	●	County
30	Consider corridor-wide recommendation 12 regarding bump outs with cutouts for bikes	✓✓ <sup>3</sup>	\$\$	●	County
<b>3rd Avenue</b>					
31	Examine the need for the existing guide rail in front of the property between 3rd and 4th Aves	✓ <sup>3</sup>	\$\$	●	County
32	Investigate replacing the striped driveway area between Evergreen and 3rd Aves with sidewalk to delineate the pedestrian path	✓✓✓	\$\$	●	County

<sup>3</sup> CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
33	Consider corridor-wide recommendations 2 and 10 regarding sidewalk, ramps, and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
34	Investigate corridor-wide recommendations 11 and 18 regarding inlets and drainage	✓✓ <sup>3</sup>	\$\$	●	County
35	Consider corridor-wide recommendation 17 regarding missing, damaged, and/or faded signage	✓	\$	○	County
<b>4th Avenue</b>					
36	Consider performing a MUTCD signal warrant analysis	✓✓	\$\$	○	County
37	Explore installation of a Rectangular Rapid Flashing Beacon (RRFB) if signal not warranted <sup>4</sup>	✓✓	\$\$	○	County
38	Consider a refuge island or corridor-wide recommendation 12 for curb extensions	✓✓ <sup>3</sup>	\$\$	●	County
39	Consider corridor-wide recommendations 2 and 10 regarding sidewalk and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
40	Consider corridor-wide recommendation 17 regarding missing, damaged, and/or faded signage	✓	\$	○	County
41	Consider corridor-wide recommendation 6 regarding highway and pedestrian scale lighting	✓✓✓	\$\$\$	●	County
<b>5th Avenue</b>					
42	Consider corridor-wide recommendations 2 and 10 regarding sidewalk and ADA compliance	✓✓✓ <sup>3</sup>	\$\$	○	County
43	Investigate installation of vertical retroreflective strips on sign supports for enhanced conspicuity	✓✓ <sup>3</sup>	\$\$	●	County
44	Examine curb radii and consider revising as needed	✓ <sup>3</sup>	\$\$	○	County
45	Investigate methods to prohibit or enhance crossing over tracks ( <i>see Section IV, Photo 6</i> )	✓✓ <sup>3</sup>	\$\$	○	Towns/ County
46	Consider corridor-wide recommendation 6 regarding highway and pedestrian scale lighting	✓✓✓	\$\$\$	●	County
<b>6th Avenue</b>					
47	Consider corridor-wide recommendation 2 regarding ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
48	Consider corridor-wide recommendation 4 regarding signal upgrades (backplates, lighting)	✓✓	\$\$\$	●	County
49	Consider corridor-wide recommendation 10 regarding sidewalk inspection and repair	✓✓✓	\$\$	○	County
50	Consider corridor-wide recommendation 6 regarding highway and pedestrian scale lighting	✓✓✓	\$\$\$	●	County
51	Explore implementing an LPI	✓✓✓	\$	○	County

<sup>3</sup> CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.

<sup>4</sup> [Interim Approval 21 – Rectangular Rapid-Flashing Beacons at Crosswalks](#)

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
52	Consider corridor-wide recommendation 17 regarding faded signage	✓	\$	☉	County
<b>7th / Lareine Avenue</b>					
53	Consider performing a MUTCD signal warrant analysis	✓✓	\$\$	🕒	County
54	Explore installation of a RRFB if signal is not warranted	✓✓	\$\$	🕒	County
55	Investigate turn prohibitions	✓✓✓	\$	🕒	County
56	Consider corridor-wide recommendations 2 and 10 regarding sidewalk, ramp, and ADA compliance, specifically the pedestrian approach to Memorial Drive on Lareine Ave	✓✓✓ <sup>3</sup>	\$\$\$	🕒	County
57	Explore installing a raised intersection	✓✓ <sup>3</sup>	\$	☉	County
58	Consider corridor-wide recommendation 6 regarding highway and pedestrian scale lighting	✓✓✓	\$\$\$	🕒	County
<b>8th Avenue</b>					
59	Consider corridor-wide recommendation 3 regarding access management for the existing bus depot driveways	✓	\$\$	🕒	County
60	Consider corridor-wide recommendations 2 and 10 regarding sidewalk and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	🕒	County
61	Consider corridor-wide recommendation 17 regarding signage (non-breakaway posts)	✓	\$	☉	County
<b>9th Avenue</b>					
62	Consider corridor-wide recommendations 2 and 10 regarding sidewalk, ramps, and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	🕒	County
63	Consider corridor-wide recommendation 6 regarding pedestrian and highway lighting	✓✓✓	\$\$\$	🕒	County
64	Consider corridor-wide recommendation 17 regarding signage (missing 2-direction large arrow warning sign)	✓	\$	☉	County
65	Consider corridor-wide recommendation 7 regarding green infrastructure	✓ <sup>3</sup>	\$\$	🕒	City/ County
<b>11th Avenue (including area near 10th Avenue)</b>					
66	Explore High Friction Surface Treatment (HFST) along the horizontal curve	✓	\$\$	🕒	County
67	Investigate curve delineation along the horizontal curve (chevrons, advanced warning signs)	✓	\$	☉	County
68	Consider removing the railroad crossing pavement markings for the now removed crossing	✓	\$	☉	County

<sup>3</sup> CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
69	Consider corridor-wide recommendation 6 regarding highway and pedestrian scale lighting	✓✓✓	\$\$\$	●	County
70	Consider corridor-wide recommendations 2 and 10 regarding sidewalk, ramps, and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
71	Investigate additional signage, such as street name and two-direction arrow signs (W1-7)	✓	\$	○	County
72	Explore a pedestrian crossing with appropriate safety review	✓	\$	○	County
<b>Vanderbilt Place</b>					
73	Investigate improving the poor pavement condition	✓ <sup>3</sup>	\$\$	○	County
74	Consider corridor-wide recommendations 2 and 10 regarding sidewalk and ADA compliance	✓✓✓ <sup>3</sup>	\$\$\$	●	County
75	Explore improving the curb radii and consider revising as needed	✓ <sup>3</sup>	\$\$	○	County

## B. Road Owner Response

An important part of the RSA process is the road owner’s response: an acknowledgment of the audit’s findings and recommendations, and their planned follow-up. In responding to the RSA’s findings, the road owner must bear in mind all the competing objectives involved when implementing the recommendations, and foremost among them is available resources. Because the audit process generated a long and wide-ranging list of improvements, the road owner is expected to implement these recommended improvements as time and funds allow in coordination with other projects and priorities.

Monmouth County delivered their response following the finalization of the findings and recommendations table, a copy of which can be found in Appendix K.

## A. Recommendation Visualizations

Examples of some of the site-specific and corridor-wide safety recommendations identified in Tables 5 and 6 are shown below and are based on current practices and standards. Descriptions and images of each treatment are from the *2017 NJ Complete Street Design Guide* (CSDG) and NACTO’s *Urban Street Design Guide* (NACTO-US) and *Urban Bikeway Design Guide* (NACTO-UB), including sources contained therein.

### 1. Pedestrian Facilities

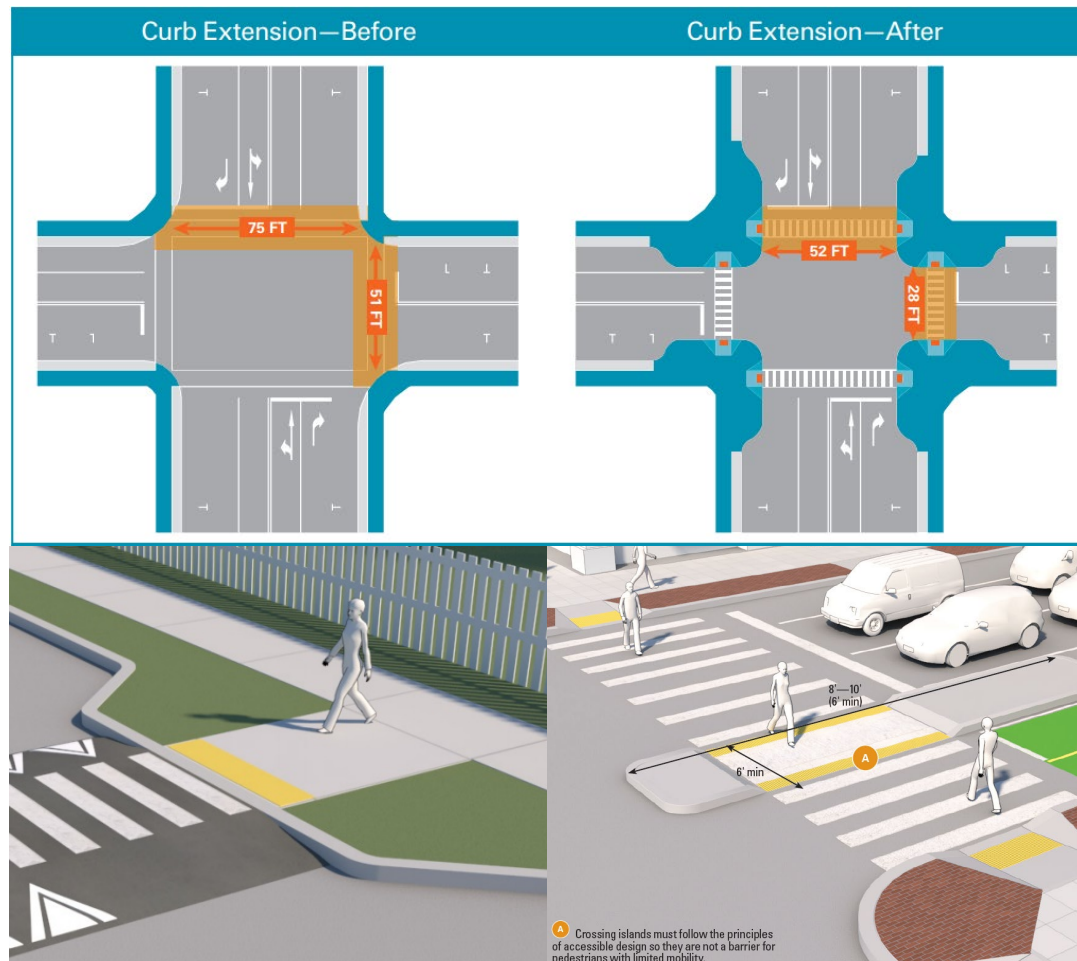
Curb extensions visually and physically narrow the roadway at intersections and midblock locations, creating safer and shorter pedestrian crossings, while increasing the available space for streetscape. They increase the overall visibility of pedestrians by aligning them with the shoulder or parking lane and help prohibit vehicles from parking in violation of Title 39. Crossing islands, or pedestrian refuge islands, reduce the exposure time of pedestrians to vehicular traffic. They enable pedestrians to make a crossing in two stages — crossing one direction of vehicular

<sup>3</sup> CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.



travel lanes, pausing at the island, and then completing the crossing. They are recommended where a pedestrian must cross three lanes of traffic in one or both directions but may be implemented on smaller cross sections where space permits.

Specifically for Memorial Drive, curb extensions, in conjunction with roadway reconfiguration as described on page 19, create an added benefit of increasing the storage space along the side streets between the eastern curb line and the railroad tracks. One vehicle could comfortably wait to complete a through or turning movement without feeling rushed. Further, reducing the side street width would prohibit side-by-side vehicles and improve sight distance (see Section IV, Photo 7 and Figure 16 on page 21).



**Figure 11 – Pedestrian Facility Examples**

Top: Curb Extension. Left: Midblock Curb Extension. Right: Crossing Island (Source: CSDG)

## 2. Bicycle Facilities

Bicycle lanes provide an exclusive space for bicyclists using pavement markings and signage. Intended for one-way travel, they are typically located on both sides of a two-way street. Bicycle lanes enable bicyclists to ride at their preferred speed, free from interference from motorists. Where it is not feasible or appropriate to provide dedicated bicycle facilities, shared-lane markings (e.g. “sharrows”) may be used to indicate a shared environment for bicycles and vehicles, such as the ones currently implemented along Hamilton Street in New Brunswick.

Bicycle lanes and shared-lane markings should be extended through intersections and major driveways to enhance continuity, guide bicyclists through the intersection, and improve driver awareness of bicycle activity and movement.



**Figure 12 – Bicycle Facility Examples**

*Left: Bicycle Lane Adjacent to Parking or Curb (Source: NACTO-UB). Right: Sharrow Markings along Route 71/Main Street in Bradley Beach (Source: Jusel Claro Alvarez, Google Maps Photos)*

### 3. Roadway Reconfiguration

This treatment allows reallocation of existing street space (i.e. roadway cross section) to accommodate multi-modal users. Lane configuration and width for travel, turning movements, parking, and bicycle lanes can be adjusted to optimize use for vehicles, pedestrians, bicyclists, and transit. The most common roadway reconfiguration, known as a road diet, involves converting an existing four-lane undivided segment into a three-lane segment with two through lanes and a center two-way left turn lane (TWLTL).

The main goal of a road diet is to improve safety by eliminating conflict points between turning, crossing and through traffic and reducing the speed differential which reduces crash severity when crashes do occur. Road diets also benefit pedestrian and bicyclist safety by reducing the number of lanes to cross at an intersection and reallocating space from the travel lane to non-motorized use, such as bicycle lanes.

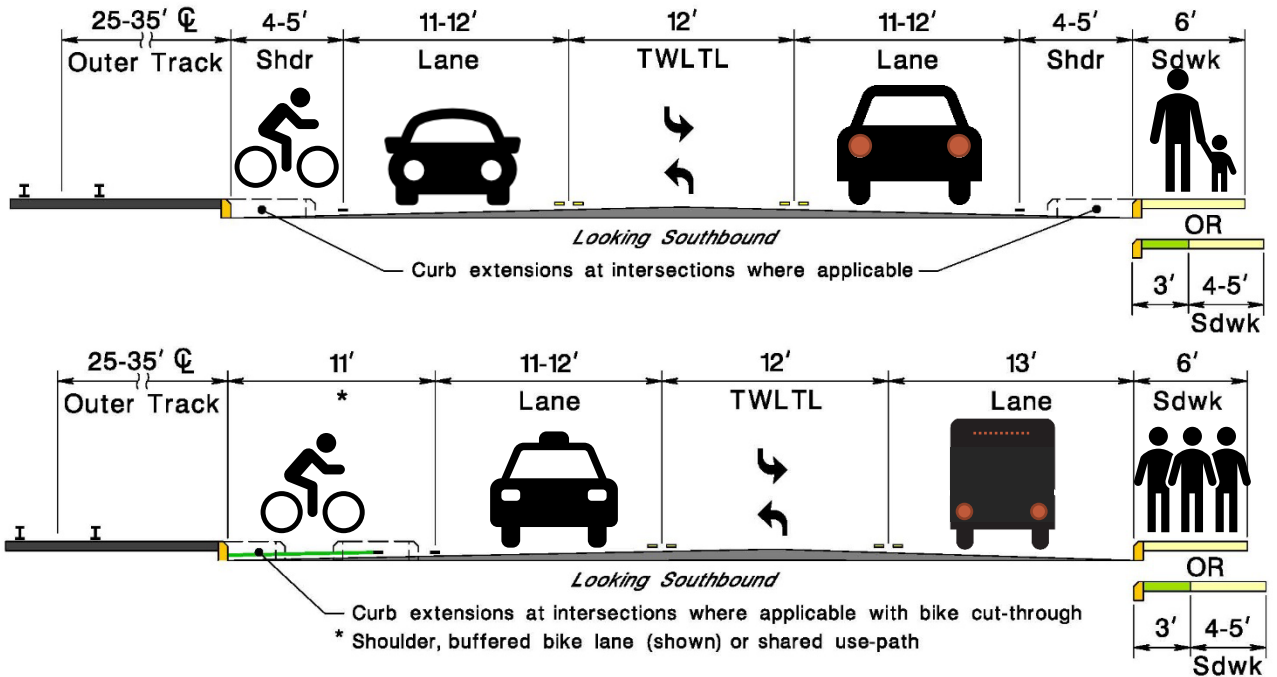
FHWA's *Road Diet Informational Guide* advises that roadways with an ADT of 20,000 vehicles per day (vpd) or less may be good candidates for a road diet. If the ADT of the roadway is near the upper limit, further analysis should be conducted, such as review of peak hour volumes by direction, turning volumes at intersections and driveways, and signal spacing. Of note, Memorial Drive north of Route 33 was converted from a four-lane section to a three-lane section. Additionally, the ADT within the RSA limits is between 15,000 to 17,000 vpd, and may be a good candidate for this treatment.

Based on the recommendations listed in Section V-A, one option for Memorial Drive cross sections is shown in Figures 14 and 15, assuming an approximate existing width of 46 feet curb-to-curb. For example, by providing edge lines as recommended, part of the pavement can be reallocated as a shoulder that can be used by bicyclists. Alternatively, this reclaimed area can be used for wider sidewalks or shifting the side street intersections away from the tracks.

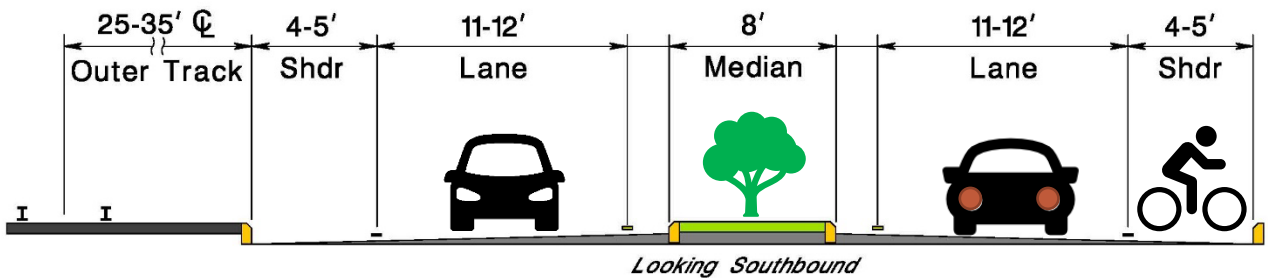


**Figure 13 – Existing Road Diet along Memorial Drive north of Route 33**

Of note, the configuration shown in Figure 15 can also be applied with the TWLTL in areas where there is not a need for one or more opposing left turns, such as at ‘T’ intersections with no driveways on the other side of the street.

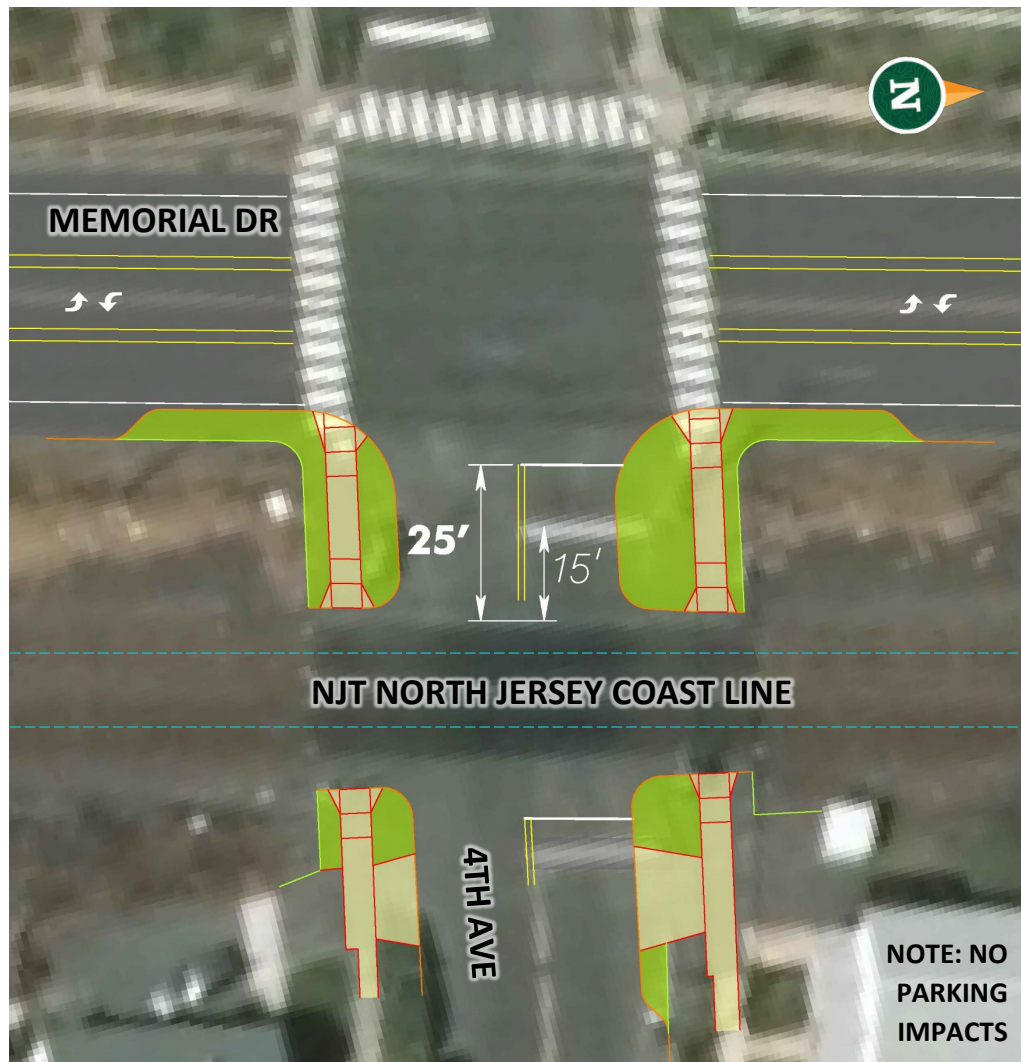


**Figure 14 – Conceptual Cross Sections based on Recommendations (north of Evergreen Avenue)**



**Figure 15 – Conceptual Cross Sections based on Recommendations (south of Evergreen Avenue)**





**Figure 16 – Conceptual Curb Extension Example based on Recommendations (N.T.S.)**

## VI. Conclusions

The Memorial Drive RSA was conducted to identify safety issues and corresponding countermeasures that compromise multimodal use of the roadway. The team identified a long list of issues from the field visit, as well as many practical short-, mid-, and long-term improvements during the post-audit.

The recommendations documented in this report are designed to improve safety for all users of Memorial Drive. Some of the strategies identified can be implemented through routine maintenance; all will be constrained by available time and budgetary priorities. The audit process and the resulting final document highlight the safety issues and present the needed improvements by location organized for systematic implementation by the roadway owner.

It is important to note that when it comes to improving safety, engineering strategies alone only go so far, especially in areas undergoing redevelopment. Education, with support from a targeted enforcement campaign, is an effective approach for addressing driver and pedestrian behaviors that lead to crashes. Employing a multipronged approach is an effective course of action to advance the goal of improved safety on the corridor.

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## Appendix A - RSA Team

## Audit Team

Name	Agency
Daria Jakimowska	Monmouth County Engineering
Renu Chhonkar	Monmouth County Engineering
David Schmetterer	Monmouth County Planning
James Bonanno	Monmouth County Planning
Denise Brooker	Monmouth County
Tim McGrath	Avon Police Department
Steve Kegelman	Avon Office of Emergency Management
Jerry Freda	Bradley Beach Engineering
Chief Len Guida	Bradley Beach Police Department
Lt. Edward Scott	Bradley Beach Police Department
Leanne Hoffmann	Neptune Township Engineering
Ed Kirschenbaum	Neptune City, Police Department, Public Safety
D/Sgt. Keith Mitchell	Neptune City Police Department
Mark Tozzi	NJDOT - Bureau of Transportation Data and Safety
Amon Boucher	NJDOT - Bureau of Transportation Data and Safety
Christine Mittman	NJTPA
Aimee Jefferson	NJTPA
Bernie Boerchers	Greenman-Pedersen, Inc. (NJDOT Consultant)
Andrew Halloran	Greenman-Pedersen, Inc.
Julia Steponanko	Greenman-Pedersen, Inc.
Alicia Ulmes	Greenman-Pedersen, Inc.




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## Appendix B - Area Map

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<p><b>NJDOT HSIP ROAD SAFETY AUDIT MEMORIAL DRIVE</b></p> <p>NEPTUNE, BRADLEY BEACH, NEPTUNE CITY, AVON-BY-TH-SEA MONMOUTH COUNTY</p>	
<p><b>PROJECT LOCATION</b></p>	
	<p><b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services</p>
<p><b>N.T.S.</b></p>	



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## Appendix C - Traffic Data

TRAFFIC ENUMERATOR  
WORK REPORT

CODE \_\_\_\_\_ TOWN Bradley Beach Borough DATE 7/13/2017  
LOCATION CR 40A (Moms in Drive), 156' South of Fourth Avenue  
DIRECTION OF ROAD TUBE NO. 1 Northbound

PRIORITY 1  2  3

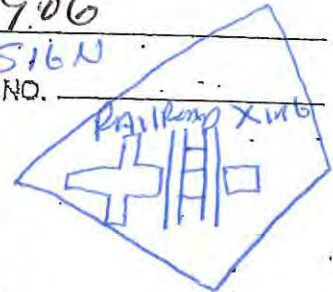
AUTOMATIC TRAFFIC RECORDER COUNT

TYPE OF COUNT: VOLUME  CLASSIFICATION  SPEED

INSTALLED: DATE 7/13/2017 TIME 9:47 AM

PICK UP: DATE 7/20/17 TIME 9:06

SER. NO. 30517 MODEL APOLLO POLE NO. SIGN



MANUAL INTERSECTION MOVEMENT COUNT

HOURS OF COUNT: 7 AM to 9 AM, 11 AM to 2 PM, 4 PM to 7 PM

OTHER \_\_\_\_\_

REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_

REMARKS: 7/14/17 counter & tubes are ok. 7/17/17 counter & tubes ok.  
7/18/17 the counter & tubes are ok.

REPAIR REQUEST \_\_\_\_\_

SIGNATURE Patricia Bennett

**7-Day (24 Hour) Automated Traffic Recorder Count  
Monmouth County Traffic Safety Engineering  
1 E. Main Street, Hall Of Records Annex  
Freehold, N.J. 07728**

Location: CR 40A (Memorial Drive)  
156' South Of Fourth Avenue.  
Municipality: Bradley Beach Borough  
Counted By: Patrick T Barrett

Site Code:

Date Start: 07/13/17  
Date End: 07/20/17  
(V) 2 CR 40A (Memorial Drive) South Of Fourth Avenue

Start Time	07/10/17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd
12:00 AM	*	*	*	*	*	*	*	*	70	105	151	266	228	383	150	251
01:00	*	*	*	*	*	*	*	*	49	66	114	206	177	307	113	193
02:00	*	*	*	*	*	*	*	*	27	42	78	154	118	237	74	144
03:00	*	*	*	*	*	*	*	*	20	21	42	71	61	87	41	60
04:00	*	*	*	*	*	*	*	*	22	27	31	33	31	65	25	42
05:00	*	*	*	*	*	*	*	*	51	84	31	56	41	53	41	64
06:00	*	*	*	*	*	*	*	*	193	205	146	134	101	104	147	148
07:00	*	*	*	*	*	*	*	*	423	398	232	259	196	201	284	286
08:00	*	*	*	*	*	*	*	*	449	436	325	333	269	269	369	346
09:00	*	*	*	*	*	*	*	*	458	398	435	430	531	406	475	411
10:00	*	*	*	*	*	*	*	473	429	421	422	437	518	449	492	434
11:00	*	*	*	*	*	*	*	460	400	402	457	465	606	507	503	457
12:00 PM	*	*	*	*	*	*	*	460	484	505	459	466	576	539	522	487
01:00	*	*	*	*	*	*	*	443	466	450	483	489	539	511	492	487
02:00	*	*	*	*	*	*	*	462	564	522	508	500	476	474	488	512
03:00	*	*	*	*	*	*	*	542	581	598	575	511	551	527	568	548
04:00	*	*	*	*	*	*	*	571	662	590	639	596	514	569	560	616
05:00	*	*	*	*	*	*	*	628	663	683	590	551	560	576	637	595
06:00	*	*	*	*	*	*	*	538	490	598	504	565	556	494	597	513
07:00	*	*	*	*	*	*	*	408	359	484	442	517	446	484	486	450
08:00	*	*	*	*	*	*	*	307	296	399	357	433	351	420	392	376
09:00	*	*	*	*	*	*	*	212	294	305	377	445	299	410	315	390
10:00	*	*	*	*	*	*	*	202	291	311	443	439	243	298	299	422
11:00	*	*	*	*	*	*	*	111	181	264	363	345	147	191	217	309
Lane	0	0	0	0	0	0	0	5817	6160	8294	8401	9106	8200	8561	8287	8541
Day	0	0	0	0	0	0	0	11977	18213	16695	16995	18213	16761	16828	16828	16828
AM Peak	-	-	-	-	-	-	-	10:00	10:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	-	-	-	-	-	-	473	429	458	457	465	606	507	503	457
PM Peak	-	-	-	-	-	-	-	17:00	17:00	17:00	16:00	22:00	12:00	17:00	17:00	16:00
Vol.	-	-	-	-	-	-	-	628	663	683	639	657	576	637	616	616





3

TRAFFIC ENUMERATOR  
WORK REPORT

CODE: \_\_\_\_\_ TOWN Neplona City Borough DATE 7/13/2017

LOCATION CR 40A (Main rd) 177 North Hob Fourth Avenue

DIRECTION OF ROAD TUBE NO. 1 South Bound

PRIORITY 1  2  3

AUTOMATIC TRAFFIC RECORDER COUNT

TYPE OF COUNT: VOLUME  CLASSIFICATION  SPEED

INSTALLED: DATE 7/13/2017 TIME 10:06 AM

PICK UP: DATE 7/20/17 TIME 9:17 AM

SER. NO. 26786 MODEL APOLON POLE NO. 40205 NC

MANUAL INTERSECTION MOVEMENT COUNT

HOURS OF COUNT: 7 AM to 9 AM, 11 AM to 2 PM, 4 PM to 7 PM.

OTHER \_\_\_\_\_

REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_

REMARKS: 7/14/17 counter & tubes are ok. 7/17/17 counter & tubes are ok. (Put Down tape)  
7/18/17 counter & tubes are ok.

REPAIR REQUEST \_\_\_\_\_

SIGNATURE Patrick Bennett



**7-Day (24 Hour) Automated Traffic Recorder Count  
Monmouth County Traffic Safety Engineering  
1 E. Main Street, Hall Of Records Annex  
Freehold, N.J. 07728**

Location: CR 40A (Memorial Drive)  
177 North Of Fourth Avenue.  
Municipality: Neptune City Borough  
Counted By: Patrick T Barrett

Site Code:

(N) 2 CR 40A (Memorial Drive) North Of Fourth Avenue  
Date Start: 07/13/17  
Date End: 07/20/17

Start Time	07/10/17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd
12:00 AM	*	*	*	*	*	*	*	*	108	73	264	149	389	225	254	149
01:00	*	*	*	*	*	*	*	*	73	50	206	117	310	169	196	112
02:00	*	*	*	*	*	*	*	*	41	26	157	77	233	119	144	74
03:00	*	*	*	*	*	*	*	*	23	22	65	41	87	61	58	41
04:00	*	*	*	*	*	*	*	*	29	21	31	31	61	30	40	24
05:00	*	*	*	*	*	*	*	*	79	49	52	33	52	42	61	41
06:00	*	*	*	*	*	*	*	*	185	201	125	145	97	100	136	149
07:00	*	*	*	*	*	*	*	*	370	425	252	232	190	184	271	280
08:00	*	*	*	*	*	*	*	*	427	472	325	325	286	343	380	380
09:00	*	*	*	*	*	*	*	*	410	443	411	432	431	516	417	464
10:00	*	*	*	*	*	*	*	*	422	437	438	565	477	502	446	501
11:00	*	*	*	*	*	*	*	*	450	426	462	537	514	585	460	500
12:00 PM	*	*	*	*	*	*	*	*	491	514	492	549	561	568	504	532
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04:00	*	*	*	*	*	*	*	*	677	592	574	557	542	558	615	566
05:00	*	*	*	*	*	*	*	*	656	690	534	712	560	582	582	655
06:00	*	*	*	*	*	*	*	*	516	622	559	718	488	586	524	616
07:00	*	*	*	*	*	*	*	*	362	493	509	601	473	455	450	486
08:00	*	*	*	*	*	*	*	*	292	395	445	507	432	369	384	395
09:00	*	*	*	*	*	*	*	*	310	327	464	463	390	308	386	331
10:00	*	*	*	*	*	*	*	*	288	313	648	450	313	246	424	302
11:00	*	*	*	*	*	*	*	*	185	259	500	336	197	149	309	213
Lane	0	0	0	0	0	0	0	0	8470	8445	9012	9170	8553	8307	8546	8381
Day	0	0	0	11164	16915	18182	16860	16927								
AM Peak	-	-	-	11:00	11:00	11:00	10:00	11:00	11:00	08:00	11:00	10:00	11:00	11:00	11:00	10:00
Vol.	-	-	-	414	450	462	565	514	585	472	462	565	514	585	460	501
PM Peak	-	-	-	16:00	16:00	22:00	18:00	12:00	18:00	17:00	22:00	18:00	12:00	18:00	16:00	17:00
Vol.	-	-	-	677	666	648	718	561	586	690	648	718	561	586	615	655



Location: CR 40A (Memorial Drive)  
 177' North Of Fourth Avenue.  
 Municipality: Neptune City Borough  
 Counted By: Patrick T Barrett

**7-Day (24 Hour) Automated Traffic Recorder Count**  
**Monmouth County Traffic Safety Engineering**  
**1 E. Main Street, Hall Of Records Annex**  
**Freehold, N.J. 07728**

Site Code:

Date Start: 07/13/17  
 Date End: 07/20/17

(V) 2 CR 40A (Memorial Drive) North Of Fourth Avenue

Start Time	07/17/17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd	Southbhd	Northbhd
12:00 AM	150	101	76	44	107	73	95	57	*	*	*	*	*	*	107	69
01:00	58	40	49	36	67	42	64	39	*	*	*	*	*	*	60	39
02:00	55	28	39	19	30	39	40	24	*	*	*	*	*	*	41	28
03:00	17	25	20	10	26	20	14	19	*	*	*	*	*	*	19	18
04:00	42	24	38	25	31	33	44	22	*	*	*	*	*	*	39	26
05:00	90	69	81	61	85	70	77	84	*	*	*	*	*	*	83	71
06:00	197	211	219	236	222	203	216	213	*	*	*	*	*	*	214	216
07:00	431	439	407	438	412	438	444	427	*	*	*	*	*	*	424	436
08:00	475	514	465	563	480	553	466	546	*	*	*	*	*	*	472	544
09:00	401	535	403	482	421	523	136	166	*	*	*	*	*	*	340	426
10:00	398	516	401	483	400	451	*	*	*	*	*	*	*	*	400	483
11:00	426	510	429	421	443	445	*	*	*	*	*	*	*	*	433	459
12:00 PM	468	452	450	445	490	455	*	*	*	*	*	*	*	*	469	451
01:00	466	410	450	439	457	463	*	*	*	*	*	*	*	*	458	437
02:00	457	449	487	456	455	499	*	*	*	*	*	*	*	*	466	468
03:00	538	498	569	477	563	515	*	*	*	*	*	*	*	*	553	497
04:00	603	556	638	536	635	535	*	*	*	*	*	*	*	*	625	542
05:00	656	588	678	588	679	594	*	*	*	*	*	*	*	*	671	590
06:00	465	571	489	602	489	588	*	*	*	*	*	*	*	*	481	587
07:00	397	426	418	444	450	472	*	*	*	*	*	*	*	*	420	447
08:00	387	339	418	369	412	367	*	*	*	*	*	*	*	*	406	358
09:00	331	242	370	271	389	295	*	*	*	*	*	*	*	*	363	269
10:00	257	177	284	225	294	223	*	*	*	*	*	*	*	*	278	208
11:00	153	121	228	150	171	129	*	*	*	*	*	*	*	*	184	133
Lane	7918	7841	8091	7820	8208	8025	1596	1597	0	0	0	0	0	0	8006	7802
Day	15759	15911	15911	16233	16233	3193	3193	0	0	0	0	0	0	0	15808	15808
AM Peak	08:00	09:00	08:00	08:00	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	475	535	465	563	480	553	466	546	-	-	-	-	-	-	472	544
PM Peak	17:00	17:00	17:00	18:00	17:00	17:00	-	-	-	-	-	-	-	-	17:00	17:00
Vol.	656	588	678	602	679	594	-	-	-	-	-	-	-	-	671	590
Comb. Total	15759	15911	15911	16233	16233	14357	16915	18182	16860	32735						
ADT	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448	ADT 16,448						

4

TRAFFIC ENUMERATOR  
WORK REPORT

CODE \_\_\_\_\_ TOWN Neptune Township DATE 7/13/2017

LOCATION CR 40A Memorial Drive / 409' South of Eleventh Avenue

DIRECTION OF ROAD TUBE NO. 1 Northbound

PRIORITY 1  2  3

AUTOMATIC TRAFFIC RECORDER COUNT

TYPE OF COUNT: VOLUME  CLASSIFICATION  SPEED

INSTALLED: DATE 7/13/2017 TIME 10:33 AM

PICK UP: DATE 7/20/17 TIME 9:04 AM

SER. NO. 28875 MODEL APOLCym POLE NO. JL 3011 N + 25 HR5

MANUAL INTERSECTION MOVEMENT COUNT

HOURS OF COUNT: 7 AM to 9 AM, 11 AM to 2 PM, 4 PM to 7 PM

OTHER \_\_\_\_\_

REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_

REMARKS: 7/14/17 counter & tubes are ok. 7/17/17 counter & tubes are ok.  
7/18/17 the counter & tubes are ok.

REPAIR REQUEST \_\_\_\_\_

SIGNATURE Patrick Barrett



Location: CR 40A (Memorial Drive)  
 409 South Of Eleventh Avenue.  
 Municipality: Neptune Township  
 Counted By: Patrick T Barrett

**7-Day (24 Hour) Automated Traffic Recorder Count**  
**Monmouth County Traffic Safety Engineering**  
**1 E. Main Street, Hall Of Records Annex**  
**Freehold, N.J. 07728**

Site Code:

Date Start: 07/13/17  
 Date End: 07/20/17

(V) 2 CR 40A (Memorial Drive) South Of Eleventh Avenue

Start Time	07/10/17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day	0	0	0	0	0	0	10893	5153	8272	16592	17204	8587	7477	7980	7897	16096
AM Peak	-	-	-	-	-	-	11:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	-	-	-	-	-	442	407	446	432	437	432	542	432	474	427
PM Peak	-	-	-	-	-	-	17:00	17:00	18:00	16:00	22:00	17:00	17:00	17:00	17:00	16:00
Vol.	-	-	-	-	-	-	582	675	666	645	648	535	550	606	597	





TRAFFIC ENUMERATOR  
WORK REPORT

CODE \_\_\_\_\_ TOWN NEAPKNE CITY BOROUGH DATE 7/13/2017

LOCATION CR 40A (Memorial Drive) 1/2 MI SOUTH OF EUGENIE AVENUE

DIRECTION OF ROAD TUBE NO. 1 NORTHBOUND

PRIORITY 1  2  3

AUTOMATIC TRAFFIC RECORDER COUNT

TYPE OF COUNT: VOLUME  CLASSIFICATION  SPEED

INSTALLED: DATE 7/13/2017 TIME 9:23 AM

PICK UP: DATE 7/12/2017 TIME 8:59 AM

SER. NO. 31441 MODEL ADU-1000 POLE NO. SPEED  
LIMIT  
45  
11 SIGN

MANUAL INTERSECTION MOVEMENT COUNT

HOURS OF COUNT: 7 AM to 9 AM, 11 AM to 2 PM, 4 PM to 7 PM

OTHER \_\_\_\_\_

REQUESTED BY \_\_\_\_\_ DATE \_\_\_\_\_

REMARKS: 7/14/17 counter & tubes are ok. 7/18/17 tube counter

*& tubes are ok*

REPAIR REQUEST: 7/17/17 replaced B tube continued count  
(Pot Down tube) 12:50 PM

SIGNATURE Patrukk + Banett



**7-Day (24 Hour) Automated Traffic Recorder Count  
Monmouth County Traffic Safety Engineering  
1 E. Main Street, Hall Of Records Annex  
Freehold, N.J. 07728**

Location: CR 40A (Memorial Drive)  
1527 South Of Evergreen Avenue.  
Municipality: Neptune City Borough  
Counted By: Patrick T Barrett

Site Code:

Date Start: 07/13/17  
Date End: 07/20/17  
(V) 2 CR 40A (Memorial Drive) South Of Evergreen Avenue

Start Time	07/10/17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd	Northbd	Southbd
12:00 AM	*	*	*	*	*	*	*	*	70	100	158	262	232	382	153	248
01:00	*	*	*	*	*	*	*	*	55	64	114	196	176	317	115	192
02:00	*	*	*	*	*	*	*	*	27	37	81	158	119	233	76	143
03:00	*	*	*	*	*	*	*	*	18	21	40	66	58	82	39	56
04:00	*	*	*	*	*	*	*	*	26	30	37	32	32	60	26	42
05:00	*	*	*	*	*	*	*	*	56	81	35	55	39	54	43	63
06:00	*	*	*	*	*	*	*	*	203	201	154	129	107	106	155	145
07:00	*	*	*	*	*	*	*	*	448	402	233	270	232	198	304	290
08:00	*	*	*	*	*	*	*	*	485	469	357	342	386	259	409	357
09:00	*	*	*	*	*	*	*	*	450	391	460	401	606	347	505	380
10:00	*	*	*	*	*	*	*	709	408	594	419	562	378	574	348	348
11:00	*	*	*	*	*	*	*	761	442	547	437	722	353	613	328	328
12:00 PM	*	*	*	*	*	*	*	849	437	825	144	895	98	770	181	181
01:00	*	*	*	*	*	*	*	799	444	871	62	924	62	768	156	156
02:00	*	*	*	*	*	*	*	872	547	841	69	848	51	777	171	171
03:00	*	*	*	*	*	*	*	914	584	953	87	922	71	857	206	206
04:00	*	*	*	*	*	*	*	1038	622	711	458	922	84	826	320	320
05:00	*	*	*	*	*	*	*	882	587	738	520	842	269	796	444	444
06:00	*	*	*	*	*	*	*	555	462	751	556	557	538	624	512	512
07:00	*	*	*	*	*	*	*	412	439	607	474	428	492	485	442	442
08:00	*	*	*	*	*	*	*	319	353	523	367	367	405	404	375	375
09:00	*	*	*	*	*	*	*	228	366	449	490	311	399	326	388	388
10:00	*	*	*	*	*	*	*	215	435	448	656	231	298	303	419	419
11:00	*	*	*	*	*	*	*	119	350	343	498	150	194	219	304	304
Lane	0	0	0	0	0	0	0	8672	8245	10853	7238	10668	5730	10167	6510	6510
Day	0	0	0	0	0	0	0	11579	16893	18091	16398	16677	16677	16677	16677	16677
AM Peak	-	-	-	-	-	-	-	11:00	08:00	10:00	11:00	11:00	00:00	11:00	11:00	09:00
Vol.	-	-	-	-	-	-	-	761	469	594	437	722	382	613	380	380
PM Peak	-	-	-	-	-	-	-	16:00	16:00	15:00	22:00	13:00	18:00	15:00	18:00	18:00
Vol.	-	-	-	-	-	-	-	1038	622	953	656	924	538	857	512	512



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## Appendix D - Vehicular Crash Diagrams

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**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
8	19:53	Mon	05-12-14	0	DRY	CLEAR	DAWN
18	01:44	Sun	08-03-14	3	DRY	CLEAR	DARK
24	02:26	Thu	08-28-14	1	DRY	CLEAR	DARK
27	10:42	Sat	09-13-14	0	DRY	OVERCAST	DAY
31	02:43	Sun	10-12-14	0	DRY	CLEAR	DARK
44	19:23	Thu	08-14-14	0	DRY	CLEAR	DAY
45	13:27	Wed	02-18-15	0	DRY	CLEAR	DAY
47	07:19	Thu	03-26-15	0	WET	FOG	DAY
52	19:37	Thu	04-09-15	0	DRY	CLEAR	DARK
55	20:25	Tue	05-05-15	1	DRY	CLEAR	DARK
60	19:39	Thu	06-11-15	0	DRY	CLEAR	DAY
66	22:28	Thu	07-16-15	0	DRY	CLEAR	DARK
71	16:02	Mon	10-05-15	0	DRY	CLEAR	DAY
74	13:36	Wed	11-04-15	2	DRY	CLEAR	DAY
81	17:17	Thu	01-28-16	0	WET	CLEAR	DARK
83	14:49	Tue	02-23-16	0	WET	RAIN	DAY
84	19:03	Wed	02-24-16	0	WET	RAIN	DARK
85	17:24	Tue	03-22-16	0	DRY	CLEAR	DAY
87	17:14	Mon	04-04-16	0	WET	RAIN	DAY
91	10:36	Sat	05-07-16	0	WET	OVERCAST	DAY
97	16:06	Thu	06-16-16	0	DRY	CLEAR	DAY
98	22:26	Fri	06-17-16	0	DRY	CLEAR	DARK
104	15:35	Thu	07-07-16	0	WET	RAIN	DAY
108	15:38	Mon	07-25-16	0	DRY	RAIN	DAY
114	19:30	Tue	09-06-16	1	WET	OVERCAST	DARK
116	07:41	Sat	10-08-16	0	DRY	CLEAR	DAY



MATCH LINE A  
SEE SHEET NO. 2 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	21
INJURIES	5
FATALITIES	0
TOTAL NO. OF CRASHES	26

SYMBOLS	
←	MOVING VEHICLE
←→	BACKING VEHICLE
---	NON-INVOLVED VEHICLE
x-----	PEDESTRIAN
o-----	BICYCLIST
○	PROPERTY DAMAGE ONLY CRASH
⊙	INJURY IN CRASH
⊕	FATAL CRASH
□	FIXED OBJECT
△	ANIMAL
⊗	POTHOLE
⊘	NON-FIXED OBJECT

TYPES OF CRASHES	
←←	REAR END
→→	HEAD ON
←→	SIDE SWIPE
←~	OUT OF CONTROL
←o	OVERTURNED
→	LEFT TURN
→	RIGHT ANGLE
→	STRUCK PARKED VEHICLE

COLORS	
○	2014 CRASHES
○	2015 CRASHES
○	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION  
 Memorial Drive (CR 40A) between Routes 33 and 35  
 Neptune Township, Neptune City, Bradley Beach  
 and Avon-by-the-Sea Boroughs, Monmouth County  
**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
 Engineering and Construction Services

NOT TO SCALE

1  
9

FILE: L:\2017\1699\_HSRP\_Program\_and\_Project\_Development\_Support\VDOT\_HSRP\_year\_1\Cadd\Draw\06\_Monmouth\Crash\_Sheets\Crash\_Sheet\_1.dgn  
 TIME: 10:27:06 AM  
 DATE: 4/26/2018



FILE: L:\2017\1699\_HSP\_Program\_and\_Project\_Development\_Support\VDOT\_HSP\_year\1\Cadd\1699\_Monmouth\Crash\_Sheets\Crash\_Sheet\_2.dgn

TIME: 10:28:02 AM

DATE: 4/26/2018

GREENMAN-PEDERSEN, INC.



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
1	09:03	Tue	01-14-14	0	WET	RAIN	DAY
23	22:39	Tue	08-26-14	0	DRY	CLEAR	DARK
37	20:27	Tue	12-02-14	0	WET	RAIN	DARK
46	19:37	Mon	03-09-15	0	DRY	CLEAR	DUSK
53	15:14	Wed	04-15-15	0	DRY	CLEAR	DAY
58	20:23	Sat	06-06-15	1	DRY	CLEAR	DUSK
109	14:57	Fri	08-05-16	0	DRY	CLEAR	DAY
118	18:10	Mon	10-31-16	1	DRY	CLEAR	DARK
119	16:57	Tue	11-08-16	0	DRY	CLEAR	DUSK

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>7</u>
INJURIES	<u>2</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>9</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach  
and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

---

<b>GPI</b> Greenman-Pedersen, Inc. <small>Engineering and Construction Services</small>	NOT TO SCALE
--	--------------

SEE SHEET NO. 1 OF 9  
MATCH LINE A

MATCH LINE B  
SEE SHEET NO. 3 OF 9

2  
9



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
4	19:10	Thu	04-03-14	1	DRY	CLEAR	DUSK
100	15:07	Sat	06-25-16	0	DRY	CLEAR	DAY
127	13:26	Fri	12-30-16	1	DRY	CLEAR	DAY



SEE SHEET NO. 2 OF 9  
MATCH LINE B

MATCH LINE C  
SEE SHEET NO. 4 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>1</u>
INJURIES	<u>2</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>3</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
Engineering and Construction Services

NOT TO SCALE

3/9

FILE: L:\2017\1698 RSP Program and Project Development Support\VDOT RSP Year 1\Cadd\wy08 Monmouth\Crash Sheets\Crash Sheet 3.dgn  
DATE: 4/26/18  
TIME: 3:40:37 PM  
GREENMAN-PEDERSEN, INC.

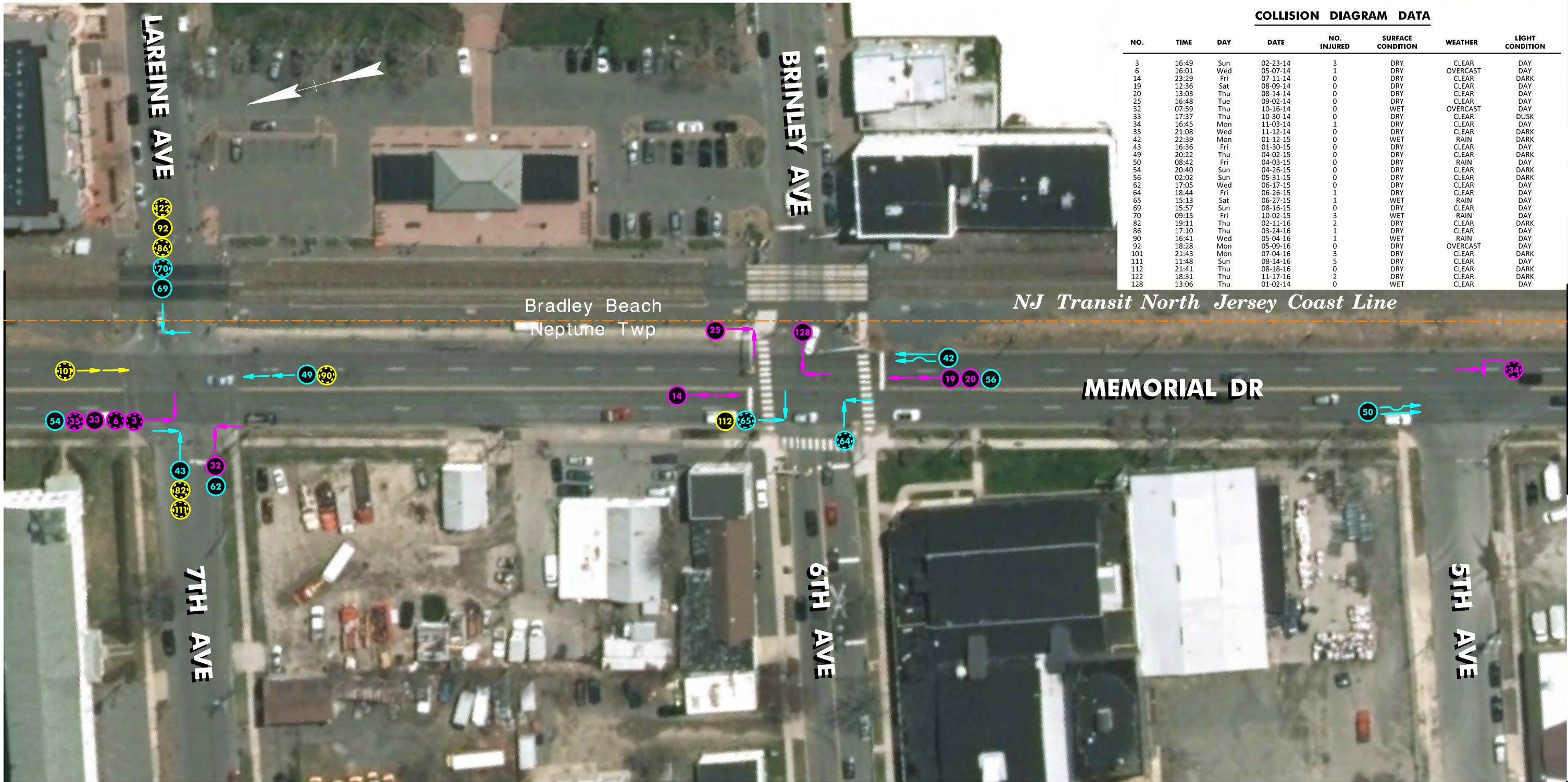


FILE: L:\2017\1698 RSP Program and Project Development Support\VDOT\_RSP\_year\_1\Cadd\dwg\06 Monmouth\Crash Streets\Crash\_Sheet\_4.dwg

TIME: 3/1/2016 10:56 PM

DATE: 4/20/2016

GREENMAN-PEDERSEN, INC.



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
3	16:49	Sun	02-23-14	3	DRY	CLEAR	DAY
6	16:01	Wed	05-07-14	1	DRY	OVERCAST	DAY
14	23:29	Fri	07-11-14	0	DRY	CLEAR	DARK
19	12:36	Sat	08-09-14	0	DRY	CLEAR	DAY
20	13:03	Thu	08-14-14	0	DRY	CLEAR	DAY
25	16:48	Tue	09-02-14	0	DRY	CLEAR	DAY
32	07:59	Thu	10-16-14	0	WET	OVERCAST	DAY
33	17:37	Thu	10-30-14	0	DRY	CLEAR	DUSK
34	16:45	Mon	11-03-14	1	DRY	CLEAR	DAY
35	21:08	Wed	11-12-14	0	DRY	CLEAR	DARK
42	22:39	Mon	01-12-15	0	WET	RAIN	DARK
43	16:36	Fri	01-30-15	0	DRY	CLEAR	DAY
49	20:22	Thu	04-02-15	0	DRY	CLEAR	DARK
50	08:42	Fri	04-03-15	0	DRY	RAIN	DAY
54	20:40	Sun	04-26-15	0	DRY	CLEAR	DARK
56	02:02	Sun	05-31-15	0	DRY	CLEAR	DARK
62	17:05	Wed	06-17-15	0	DRY	CLEAR	DAY
64	18:44	Fri	06-26-15	1	DRY	CLEAR	DAY
65	15:13	Sat	06-27-15	1	WET	RAIN	DAY
69	15:57	Sun	08-16-15	0	DRY	CLEAR	DAY
70	09:15	Fri	10-02-15	3	WET	RAIN	DAY
82	19:11	Thu	02-11-16	2	DRY	CLEAR	DARK
86	17:10	Thu	03-24-16	1	DRY	CLEAR	DAY
90	16:41	Wed	05-04-16	1	WET	RAIN	DAY
92	18:28	Mon	05-09-16	0	DRY	OVERCAST	DAY
101	21:43	Mon	07-04-16	3	DRY	CLEAR	DARK
111	11:48	Sun	08-14-16	5	DRY	CLEAR	DAY
112	21:41	Thu	08-18-16	2	DRY	CLEAR	DARK
122	18:31	Thu	11-17-16	2	DRY	CLEAR	DARK
128	13:06	Thu	01-02-14	0	WET	CLEAR	DAY

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	17
INJURIES	12
FATALITIES	0
<b>TOTAL NO. OF CRASHES</b>	<b>29</b>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FIXED OBJECT
	NON-FIXED OBJECT
	FATAL CRASH
	ANIMAL
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
Engineering and Construction Services

NOT TO SCALE



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
5	21:00	Wed	04-23-14	0	DRY	CLEAR	DARK
7	18:13	Fri	05-09-14	2	WET	RAIN	DUSK
10	15:00	Sat	05-31-14	1	DRY	CLEAR	DAY
13	15:17	Mon	07-07-14	0	DRY	CLEAR	DAY
15	17:10	Sat	07-12-14	0	DRY	CLEAR	DAY
17	12:07	Sun	07-27-14	1	DRY	OVERCAST	DAY
28	16:52	Mon	09-29-14	0	DRY	CLEAR	DAY
30	17:39	Mon	10-06-14	0	DRY	CLEAR	DAY
36	15:42	Thu	11-20-14	0	DRY	CLEAR	DUSK
38	09:33	Thu	12-04-14	1	DRY	CLEAR	DAY
40	11:44	Sat	01-03-15	0	WET	RAIN	DAY
57	08:40	Mon	06-01-15	1	WET	CLEAR	DAY
59	17:21	Tue	06-09-15	2	DRY	CLEAR	DAY
61	12:54	Sat	06-13-15	1	DRY	CLEAR	DAY
63	07:37	Thu	06-18-15	1	WET	RAIN	DAY
68	09:00	Fri	07-31-15	3	DRY	CLEAR	DAY
72	18:17	Fri	10-30-15	2	DRY	CLEAR	DARK
73	16:32	Tue	11-03-15	0	DRY	CLEAR	DAY
75	08:38	Wed	11-11-15	0	WET	CLEAR	DAY
77	11:44	Wed	11-25-15	0	DRY	CLEAR	DAY
78	13:20	Sun	11-29-15	0	DRY	CLEAR	DAY
80	12:18	Wed	01-06-16	1	DRY	CLEAR	DAY
88	20:41	Sun	04-10-16	0	DRY	CLEAR	DARK
89	17:20	Mon	04-18-16	1	DRY	CLEAR	DAY
95	12:39	Fri	05-27-16	1	DRY	CLEAR	DAY
96	17:27	Sat	05-28-16	0	DRY	CLEAR	DAY
103	18:24	Wed	07-06-16	0	DRY	CLEAR	DAY
105	15:24	Sun	07-10-16	3	DRY	CLEAR	DAY
115	16:41	Sun	09-18-16	0	DRY	CLEAR	DAY
117	16:55	Thu	10-27-16	2	DRY	CLEAR	DAY
120	11:48	Thu	11-10-16	0	DRY	CLEAR	DAY
126	02:41	Wed	12-21-16	0	DRY	CLEAR	DARK



SEE SHEET NO. 4 OF 9  
MATCH LINE D

MATCH LINE E  
SEE SHEET NO. 6 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	17
INJURIES	15
FATALITIES	0
TOTAL NO. OF CRASHES	32

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION  
 Memorial Drive (CR 40A) between Routes 33 and 35  
 Neptune Township, Neptune City, Bradley Beach  
 and Avon-by-the-Sea Boroughs, Monmouth County  
**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
 Engineering and Construction Services

NOT TO SCALE

5  
9

DATE: 4/26/18  
 TIME: 10:28:33 AM  
 FILE: L:\2017\18 ISRP Program and Project Development Support\VDOT ISRP Year 1\Cadd\1\06 Monmouth\Crash Streets\Crash Sheet 5.dgn



FILE: L:\2017\1699\_HSP\_Program\_and\_Project\_Development\_Support\AUDOT\_HSP\_year\_1\Cadd\wy06\_Monmouth\Crash\_Sheets\Crash\_Sheet\_6.dgn  
 TIME: 10/29/2016 10:29:00 AM  
 DATE: 4/26/2018



SEE SHEET NO. 5 OF 9  
MATCH LINE E

MATCH LINE F  
SEE SHEET NO. 7 OF 9

**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
11	15:44	Fri	07-04-14	0	WET	OVERCAST	DAY
12	22:48	Sat	07-05-14	0	DRY	CLEAR	DARK
16	11:26	Sat	07-26-14	1	WET	RAIN	DAY
21	12:52	Thu	08-21-14	0	DRY	CLEAR	DAY
22	14:59	Sun	08-24-14	0	DRY	CLEAR	DAY
26	12:16	Fri	09-05-14	0	DRY	CLEAR	DAY
29	13:27	Sat	10-04-14	0	WET	RAIN	DAY
39	02:15	Thu	01-01-15	0	DRY	CLEAR	DARK
48	17:28	Thu	03-26-15	1	WET	RAIN	DAY
94	19:04	Wed	05-25-16	4	DRY	CLEAR	DAY
99	20:30	Thu	06-23-16	1	DRY	CLEAR	DAY
107	22:49	Wed	07-20-16	3	DRY	CLEAR	DAY
110	08:09	Sat	08-13-16	0	DRY	CLEAR	DAY
113	22:41	Fri	08-26-16	1	DRY	CLEAR	DARK
121	11:32	Sat	11-12-16	1	DRY	CLEAR	DAY
125	17:29	Tue	12-06-16	1	WET	RAIN	DARK

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	8
INJURIES	8
FATALITIES	0
TOTAL NO. OF CRASHES	16

SYMBOLS	
→	MOVING VEHICLE
←	BACKING VEHICLE
---	NON-INVOLVED VEHICLE
x---	PEDESTRIAN
o---	BICYCLIST
○	PROPERTY DAMAGE ONLY CRASH
⊙	INJURY IN CRASH
⊕	FATAL CRASH
□	FIXED OBJECT
◇	NON-FIXED OBJECT
△	ANIMAL
⊗	POTHOLE

TYPES OF CRASHES	
←←	REAR END
→→	HEAD ON
←→	SIDE SWIPE
~	OUT OF CONTROL
⊖	OVERTURNED
→↘	LEFT TURN
→↕	RIGHT ANGLE
→↔	STRUCK PARKED VEHICLE

COLORS	
○	2014 CRASHES
⊙	2015 CRASHES
⊕	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
Engineering and Construction Services

NOT TO SCALE

6  
9



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
-----	------	-----	------	-------------	-------------------	---------	-----------------



Avon-by-the-Sea *NJ Transit North Jersey Coast Line*  
Neptune City

**MEMORIAL DR**

**LAIRD AVE**

**LEGEND**

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	0
INJURIES	0
FATALITIES	0
TOTAL NO. OF CRASHES	0

**SYMBOLS**

	MOVING VEHICLE		NON-INVOLVED VEHICLE
	BACKING VEHICLE		BICYCLIST
	PEDESTRIAN		PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH		FATAL CRASH
	FIXED OBJECT		ANIMAL
	NON-FIXED OBJECT		POTHOLE

**TYPES OF CRASHES**

	REAR END		LEFT TURN
	HEAD ON		RIGHT ANGLE
	SIDE SWIPE		STRUCK PARKED VEHICLE
	OUT OF CONTROL		OVERTURNED

**COLORS**

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach  
and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
Engineering and Construction Services

NOT TO SCALE

SEE SHEET NO. 6 OF 9  
MATCH LINE F

MATCH LINE G  
SEE SHEET NO. 8 OF 9

DATE: 4/26/18  
TIME: 10:29:42 AM  
FILE: L:\2017\1898 HSP Program and Project Development Support\VDOT HSP Year 1\Cadd\Draw (06 Monmouth\Crash Sheets)\Crash Sheet 7.dgn  
GREENMAN-PEDERSEN, INC.



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
2	07:07	Wed	01-29-14	0	SNOWY	SNOW	DAY
41	09:27	Fri	01-09-15	0	ICY	SNOW	DAY
79	09:40	Sun	12-20-15	0	DRY	CLEAR	DAY
102	16:40	Mon	07-04-16	1	DRY	CLEAR	DAY
106	14:35	Mon	07-18-16	0	DRY	CLEAR	DAY



SEE SHEET NO. 7 OF 9  
MATCH LINE G

MATCH LINE H  
SEE SHEET NO. 9 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	4
INJURIES	1
FATALITIES	0
TOTAL NO. OF CRASHES	5

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County

**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
Engineering and Construction Services

NOT TO SCALE

FILE: L:\2017\69 HSP Program and Project Development Support\VDOT\_HSP Year 1\Cadd\City\06 Monmouth\Crash Sheets\Crash Sheet 8.dgn  
DATE: 4/26/18  
TIME: 11:00:28 AM  
GREENMAN-PEDERSEN, INC.



**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
9	13:36	Sun	05-25-14	0	DRY	CLEAR	DAY
51	17:39	Thu	04-09-15	0	DRY	OVERCAST	DAY
93	23:44	Wed	05-11-16	0	DRY	CLEAR	DARK
124	08:02	Wed	11-30-16	0	WET	CLEAR	DAY



SEE SHEET NO. 8 OF 9  
MATCH LINE H

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>4</u>
INJURIES	<u>0</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>4</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	2014 CRASHES
	2015 CRASHES
	2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION  
 Memorial Drive (CR 40A) between Routes 33 and 35  
 Neptune Township, Neptune City, Bradley Beach  
 and Avon-by-the-Sea Boroughs, Monmouth County  
**2014 - 2016 COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
 Engineering and Construction Services

NOT TO SCALE

FILE: L:\2017\1691 RSP Program and Project Development Support\VDOT RSP Year 1\Cadd\1691 Monmouth\Crash Sheets\Crash Sheet 9.dgn  
 TIME: 3:42:21 PM  
 DATE: 4/26/18  
 GREENMAN-PEDERSEN, INC.

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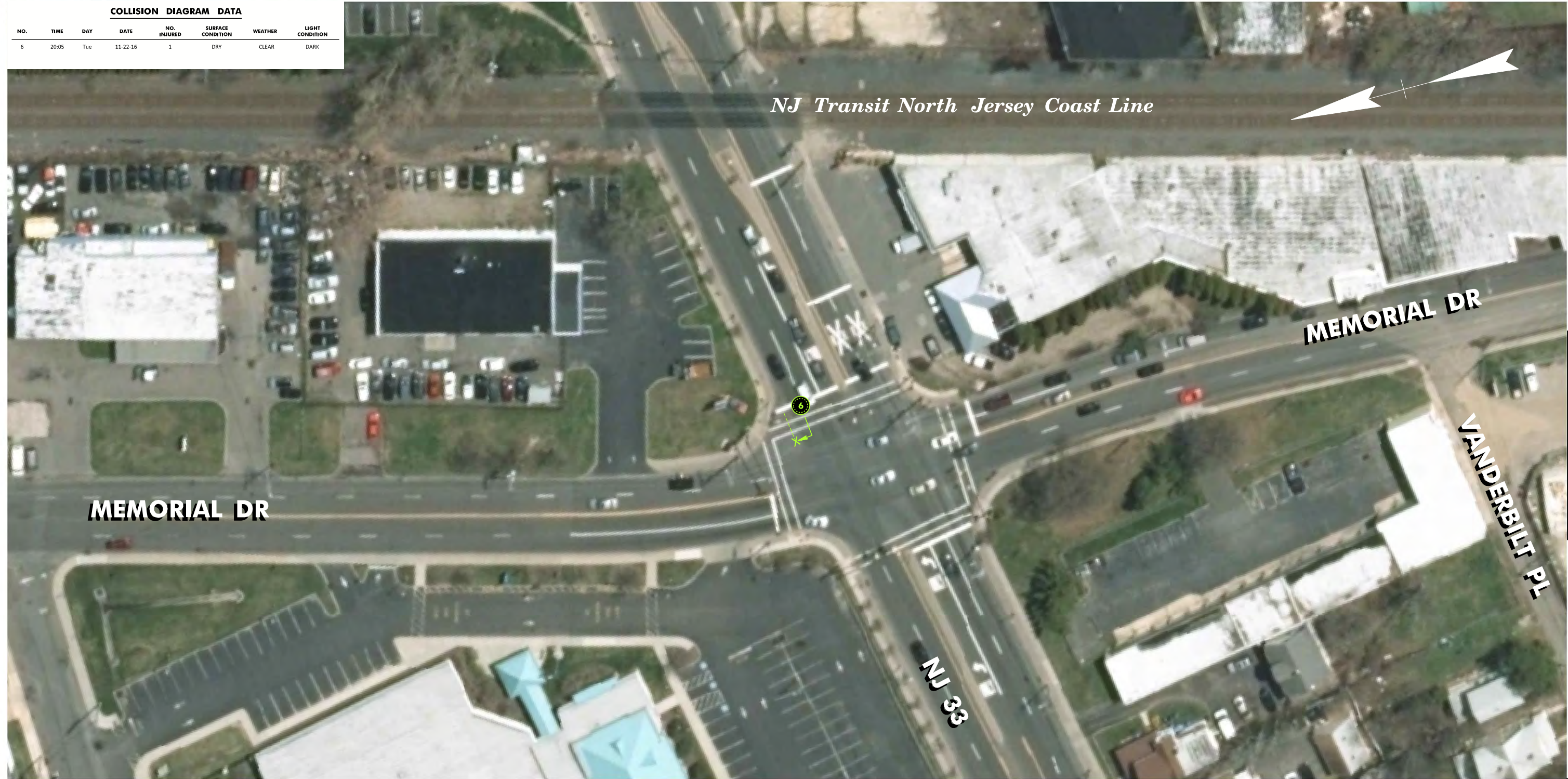
## Appendix E - Pedestrian Crash Diagrams

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**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
6	20:05	Tue	11-22-16	1	DRY	CLEAR	DARK



MATCH LINE A  
SEE SHEET NO. 2 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	0
INJURIES	1
FATALITIES	0
TOTAL NO. OF CRASHES	1

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION  
 Memoria Drive (CR 40A) between Routes 33 and 35  
 Neptune Township, Neptune City, Bradley Beach  
 and Avon-by-the-Sea Boroughs, Monmouth County  
**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
 Engineering and Construction Services

NOT TO SCALE

1  
9

DATE: 3/6/2018 TIME: 11:25:22 AM FILE: L:\2017\1698\_HSP\_Program\_and\_Project\_Development\Support\VDOT\_HSP\_Year\_1\Cadd\Draw\06\_Monmouth\Crash\_Sheets\Crash\_Sheet\_1.dwg



FILE: L:\2017\1699 RSP Program and Project Development Support\VDOT RSP Year 1\Cadd\Map\06 Monmouth\Crash Sheets\Crash Sheet 2.dgn

TIME: 11:54:07 AM

DATE: 3/6/2018

GREENMAN-PEDERSEN, INC.

**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION



SEE SHEET NO. 1 OF 9  
MATCH LINE A

MATCH LINE B  
SEE SHEET NO. 3 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>0</u>
INJURIES	<u>0</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>0</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

2/9

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memoria Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County

**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

<b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services	NOT TO SCALE
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**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION



**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>0</u>
INJURIES	<u>0</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>0</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memoria Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach  
and Avon-by-the-Sea Boroughs, Monmouth County

**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

<b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services	NOT TO SCALE
---	--------------

3  
9

DATE: 3/26/2018 TIME: 12:11:06 PM FILE: L:\2017\1699\_HSP\_Program\_and\_Project\_Development\_Support\VDOT\_HSP\_year\_1\Cadd\dwg\06\_Monmouth\Crash\_Streets\Crash\_Sheet\_3.dwg

MATCH LINE C  
SEE SHEET NO. 4 OF 9

MATCH LINE B  
SEE SHEET NO. 2 OF 9



FILE: L:\2017\1699 HSP Program and Project Development Support\VDOT HSP Year 1\Cad\Drawings\06 Monmouth\Crash Streets\Crash Sheet 4.dgn

TIME: 12:20:02 PM

DATE: 3/26/2018

GREENMAN-PEDERSEN, INC.

SEE SHEET NO. 3 OF 9  
MATCH LINE C

MATCH LINE D  
SEE SHEET NO. 5 OF 9



COLLISION DIAGRAM DATA								
NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION	
1	16:27	Sun	02-19-12	1	DRY	CLEAR	DAY	
2	09:35	Sun	04-01-12	1	DRY	CLEAR	DAY	
4	20:37	Sat	05-04-13	1	DRY	CLEAR	DAY	

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>0</u>
INJURIES	<u>3</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>3</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memoria Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach  
and Avon-by-the-Sea Boroughs, Monmouth County

**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

<b>GPI</b> Greenman-Pedersen, Inc. <small>Engineering and Construction Services</small>	NOT TO SCALE
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**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
3	15:40	Fri	02-01-13	1	DRY	CLEAR	DAY
7	15:27	Fri	11-20-15	1	DRY	CLEAR	DAY



SEE SHEET NO. 4 OF 9  
MATCH LINE D

MATCH LINE E  
SEE SHEET NO. 6 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	0
INJURIES	2
FATALITIES	0
TOTAL NO. OF CRASHES	2

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FIXED OBJECT
	FATAL CRASH
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION  
 Memoria Drive (CR 40A) between Routes 33 and 35  
 Neptune Township, Neptune City, Bradley Beach  
 and Avon-by-the-Sea Boroughs, Monmouth County  
**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

**GPI** Greenman-Pedersen, Inc.  
 Engineering and Construction Services

NOT TO SCALE

5  
9

DATE: 3/26/2018 TIME: 11:28:25 AM FILE: L:\2017\1699 RSP Program and Project Development Support\AUDOT RSP Year 1\Cadd\1699 Monmouth\Crash Sheets\Crash Sheet 5.dgn







**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION



MATCH LINE F

MATCH LINE G

SEE SHEET NO. 6 OF 9

SEE SHEET NO. 8 OF 9

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	0
INJURIES	0
FATALITIES	0
TOTAL NO. OF CRASHES	0

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION	
Memoria Drive (CR 40A) between Routes 33 and 35	
Neptune Township, Neptune City, Bradley Beach and Avon-by-the-Sea Boroughs, Monmouth County	
2012-2016 PEDESTRIAN COLLISION DIAGRAMS	
<b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services	NOT TO SCALE

7  
9

DATE: 3/26/2018 TIME: 12:28:28 PM FILE: L:\2017\1698\_HSP\_Program\_and\_Project\_Development\_Support\VDOT\_HSP\_Year\_1\Cadd\Draw\Map\Monmouth\Crash\_Sheets\Crash\_Sheet\_7.dgn







FILE: L:\2017\1699\_HSP\_Program and Project Development Support\VDOT\_HSP\_year\_1\Cadd\wy06\_Monmouth\Crash\_Sheets\Crash\_Sheet\_9d.gpr

TIME: 12:15:25 PM

DATE: 3/6/2018

GREENMAN-PEDERSEN, INC.

**COLLISION DIAGRAM DATA**

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION



SEE SHEET NO. 8 OF 9  
MATCH LINE H

MATCH LINE I  
SEE SHEET NO. 10 OF 10

**LEGEND**

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>0</u>
INJURIES	<u>0</u>
FATALITIES	<u>0</u>
TOTAL NO. OF CRASHES	<u>0</u>

SYMBOLS	
	MOVING VEHICLE
	BACKING VEHICLE
	NON-INVOLVED VEHICLE
	PEDESTRIAN
	BICYCLIST
	PROPERTY DAMAGE ONLY CRASH
	INJURY IN CRASH
	FATAL CRASH
	FIXED OBJECT
	ANIMAL
	NON-FIXED OBJECT
	POTHOLE

TYPES OF CRASHES	
	REAR END
	HEAD ON
	SIDE SWIPE
	OUT OF CONTROL
	OVERTURNED
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Memoria Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City, Bradley Beach  
and Avon-by-the-Sea Boroughs, Monmouth County

**2012-2016 PEDESTRIAN COLLISION DIAGRAMS**

<b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services	NOT TO SCALE
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9  
9

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## Appendix F - Site Photographs

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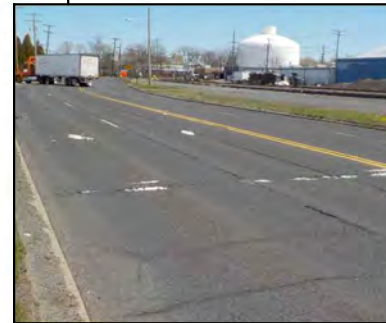




Poor pavement condition



Limited sight distance due to obstructions



Pavement markings for removed rail crossing



Pedestrian path not well defined near rail crossing/across tracks



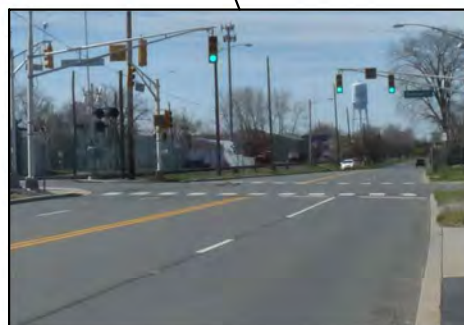
Incorrect cross slope along train station curb



Faded mast arm signs



No ADA ramps or bicycle safe grates



No east side crosswalk or backplates




Unclear pedestrian path (lack of sidewalk)



No shoulders or lighting



No shoulders or acceleration/deceleration lanes

<p><b>NJDOT HSIP ROAD SAFETY AUDIT MEMORIAL DRIVE</b></p> <p>NEPTUNE, BRADLEY BEACH, NEPTUNE CITY, AVON-BY-TH-SEA MONMOUTH COUNTY</p>	
<p><b>SITE PHOTOGRAPHS</b></p>	
	<p><b>GPI</b> Greenman-Pedersen, Inc. Engineering and Construction Services</p>
<p><b>N.T.S.</b></p>	



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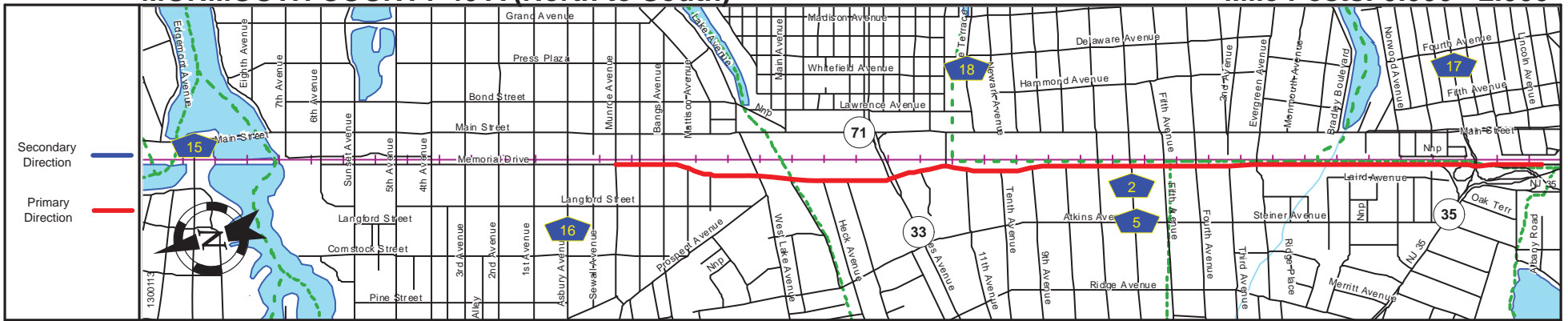
## Appendix G - Straight Line Diagrams

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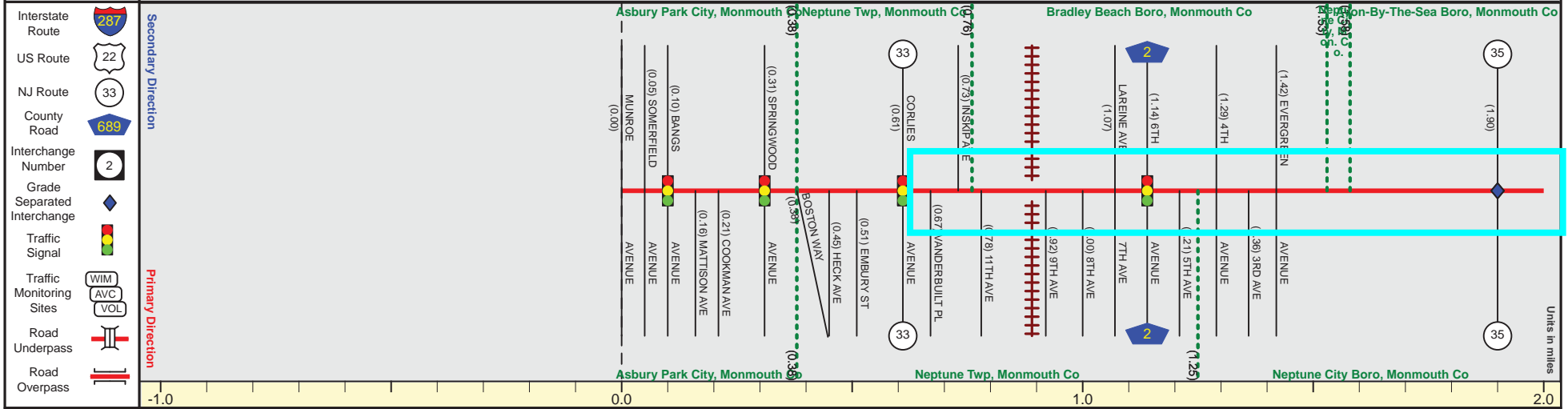


# MONMOUTH COUNTY 40 A (North to South)

Mile Posts: 0.000 - 2.000



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



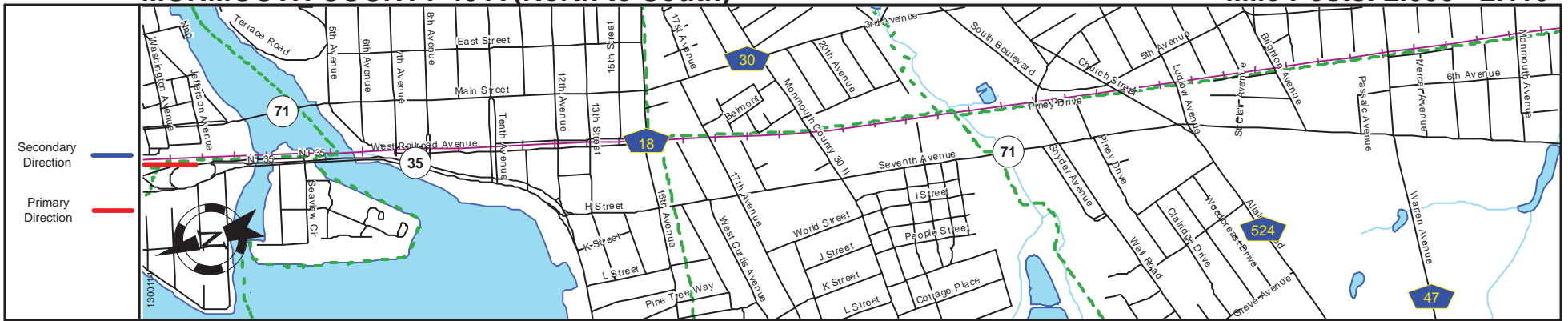
Street Name		Memorial Drive		
Jurisdiction	Municipal	County		
Functional Class		Urban Major Collector		
Federal Aid - NHS Sy		STP		
Control Section				
Speed Limit	NOT POSTED	30	40	45
Number of Lanes			4	
Med. Type			None	
Med. Width			0	
Pavement			48	
Shoulder			0	
Traffic Volume				
Traffic Sta. ID				
Structure No.				
Enlarged Views				

SRI = 13000040A\_

Date last inventoried: July 2011

# MONMOUTH COUNTY 40 A (North to South)

Mile Posts: 2.000 - 2.110



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



Street Name	Monmouth Drive
Jurisdiction	Monmouth County
Functional Class	Urban Major Collector
Federal Aid - NHS Sy	STP
Control Section	
Speed Limit	45
Number of Lanes	4
Med. Type	None
Med. Width	0
Pavement	48
Shoulder	0
Traffic Volume	
Traffic Sta. ID	
Structure No.	
Enlarged Views	

SRI = 13000040A\_

Date last inventoried: July 2011



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## Appendix H - Pre-Audit Presentation


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# Road Safety Audit:

## Memorial Drive (CR 40A) between Routes 33 and 35

Neptune Township, Neptune City,  
Bradley Beach & Avon-by-the-Sea  
Boroughs, Monmouth County

April 26, 2018



## Audit Team Introductions

- *Funded by Federal Highway Administration and NJDOT*
- NJDOT, Bureau of Transportation Data & Safety
  - Bicycle & Pedestrian Programs
- NJTPA
- Monmouth County
- Neptune Township & Neptune City Borough
- Bradley Beach & Avon-by-the-Sea Boroughs
- NJ Transit
- Greenman-Pedersen, Inc., NJDOT Consultant





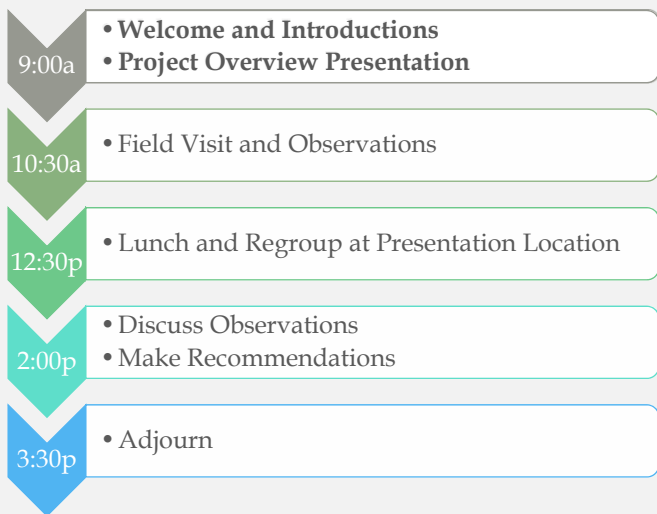





2

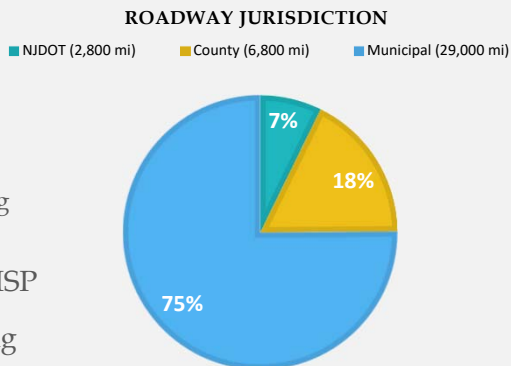


## Today's Schedule



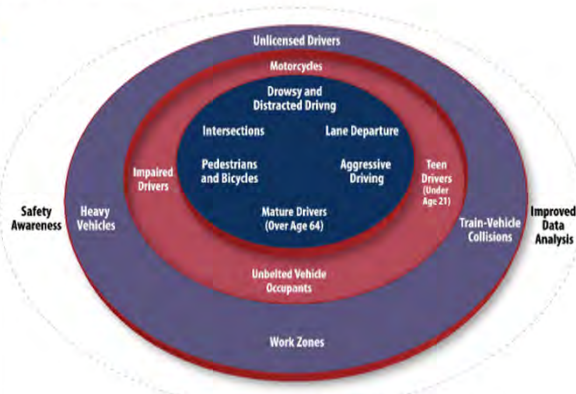
## Highway Safety Improvement Program/ Local Safety Program

- GOAL: Reduce serious injury and fatality (K+A) crashes on all of NJ's public roads
  - 40,000 centerline miles of public roads
  - 33% K+A crashes occur on state highways
  - 57% K+A crashes occur on local roads
- Achieve zero deaths on all public roads
  - Established 2.5%/year reduction in 5-year rolling average
- Performance-based goals consistent with SHSP
- Data-driven, strategic approach to improving highway safety



## Highway Safety Improvement Program (HSIP)

New Jersey Prioritization of Safety Emphasis Areas



**Legend**

- 1st Priority (>2,000 fatality and serious injury crashes)
- 2nd Priority (1,000 to 2,000 fatality and serious injury crashes)
- 3rd Priority (<1,000 fatality and serious injury crashes)

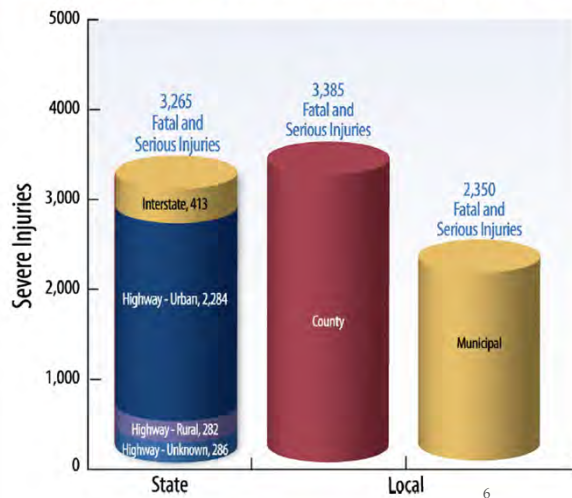
Note: Fatality and serious injury crashes are those crashes that result in one or more fatalities or serious injuries, or both. The exception to this categorization is for Mature Drivers, which are considered a first priority emphasis area due to the increasingly older population in New Jersey.

- 14 Emphasis Areas
- Pedestrian Safety and Intersection Focus State
- Top priority: lane departure, intersections, and pedestrians
- 7 sub-programs including Local Safety Program
- Core Federal Aid Program, NJ receives ~\$57M

## Local Safety Program (LSP)

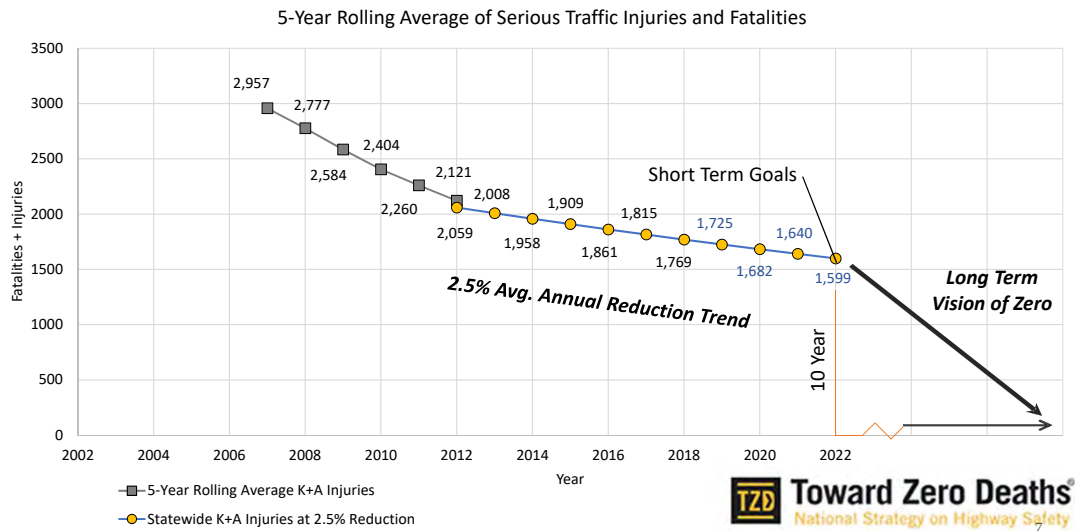
- NJDOT supports LSP:
  - Dedication of HSIP funds
  - Technical assistance
  - Screening lists for MPOs
  - **Road Safety Audits**
- MPOs support LSP:
  - Local Road Safety/High Risk Rural Roads
  - PE/FD Assistance Program
- Focus annual HSIP funding:
  - 40% on state highways
  - 60% percent on county and municipal network

Fatal and Serious Injuries by Roadway System by Roadway System, 2008 to 2012



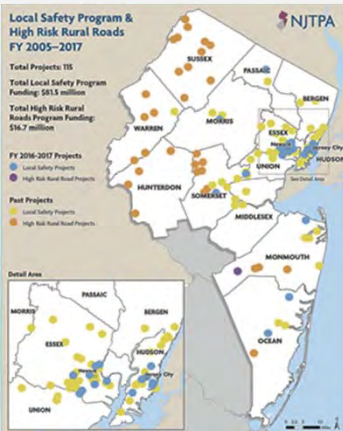


## National Strategy – Toward Zero Deaths



## Federal Transportation Funding

through the  
**North Jersey Transportation Planning Authority**  
 The Metropolitan Planning Organization for Northern New Jersey



### Local Safety and High Risk Rural Roads Programs

Over \$98 million in funding since 2005 on County and Local Roadways  
 Relatively quick-fix safety improvements

### Highway Safety Improvement Program (HSIP) funds

Emphasizes a data-driven, strategic approach to improving highway safety

### Network Screening

Identifies locations experiencing:  
 High crash frequencies  
 Severe crash injuries  
 Specific crash types such as right-angle or roadway departures

### Community Outreach

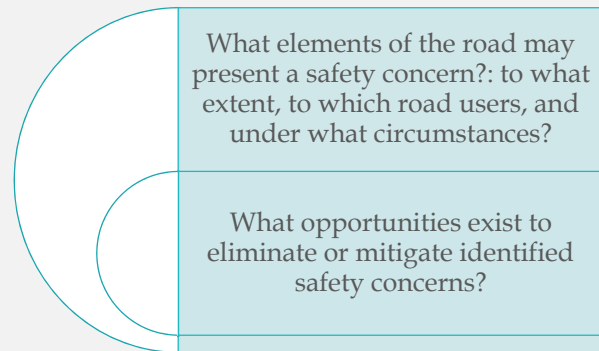
Provides the public, local stakeholders and officials with an opportunities for provide comments and ask questions



## RSA Purpose

- Formal safety performance examination
- Qualitatively estimates and reports on potential road safety issues
- Identifies safety improvement opportunities for all road users.
- Independent, multidisciplinary audit team

- Goals:



9

## RSA Benefits

- Pro-actively address safety
  - Audited designs should produce fewer, less severe crashes
  - Identify low-cost/high-value improvements
  - Enhance consistency in how safety is considered; promote "safety culture"
  - Provide continuous advancement of safety skills and knowledge
  - Contribute feedback on safety issues for future projects
  - Support optimized savings of lives, money and time
- Not a replacement for:
    - Design quality control
    - Standard compliance
    - Traffic or safety impact studies
    - Safety conscious planning
    - Road safety inventory programs
    - Traffic safety modeling efforts

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# RSA Process



Responsibilities:

- RSA Team
- Design Team/Project Owner

# FHWA Proven Safety Countermeasures

Roadside Design Improvement at Curves	Reduced Left-Turn Conflict Intersections	Systemic Application of Multiple Low Cost Countermeasures at Stop-Controlled Intersections	Leading Pedestrian Interval	Local Road Safety Plan
USLIMITS2	Enhanced Delineation and Friction for Horizontal Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Median Barrier	Safety Edges <sub>SM</sub>
Backplates with Retroreflective Borders	Corridor Access Management	Dedicated Left- and Right-Turn Lanes at Intersections	Roundabouts	Yellow Change Intervals
Medians and Pedestrian Crossing Islands in Urban and Suburban Areas	Pedestrian Hybrid Beacon	Road Diet	Walkways	Road Safety Audit

*Descriptions provided in your handouts*

# FHWA Proven Safety Countermeasures



Road Diet  
Maplewood Township, Essex County

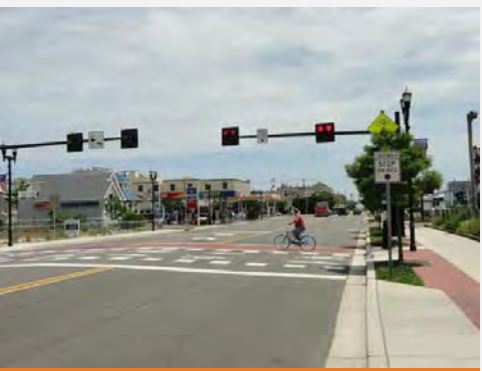


Roundabout  
Chesterfield Township, Burlington County

# FHWA Proven Safety Countermeasures



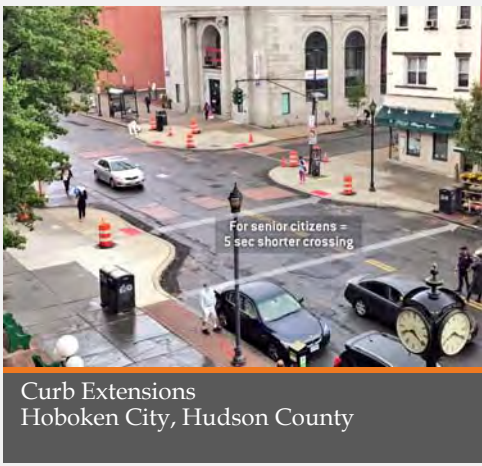
Backplates with Retroreflective Borders



Pedestrian Hybrid Beacon (HAWK)  
Ocean City, Cape May County



# Additional Considerations



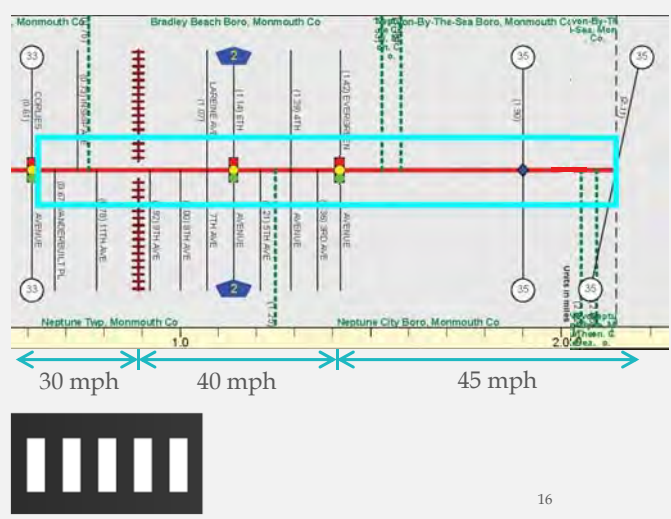
Curb Extensions  
Hoboken City, Hudson County

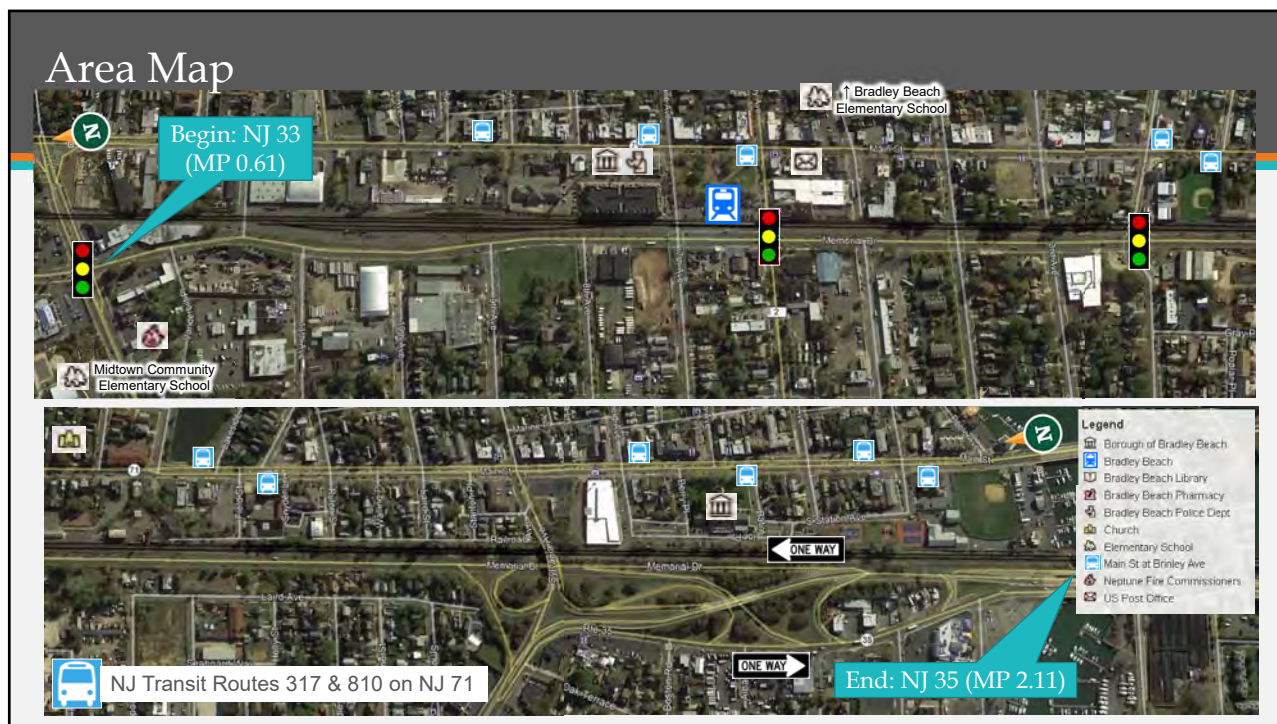


Enhanced signing / pedestrian crossings

# Project Area

- Urban Major Collector, undivided 4-lanes, no shoulders
- 30-45 mph within project limits
- Parallels NJT North Jersey Coast Line on NB side
- Sidewalk on SB side from Route 33 to Evergreen Ave
- Continental style crosswalks at 6<sup>th</sup>, 4<sup>th</sup> and Evergreen Aves





### Project Area

*Memorial Dr NB at 6<sup>th</sup> Ave (2013)*

- Traffic Data (2010)
  - ADT: 12,900-13,135
- Land Use
  - Commercial/residential
  - NB side vacant except near NJ 33
  - 48 multi-family units proposed near 7<sup>th</sup> Ave
- Demographics (near Memorial Dr)
  - 72% White
  - 13% Black/African American
  - 10% Hispanic/Latino
  - 11% below poverty level
  - 3% use public transportation
  - 4% walk or bike to work



## NJTPA's FY 2017-2018 LSP Network Screening List

Location	Ped Corridor	Regional Corridor
Memorial Dr	#14 County (MP 0.31-1.31)	Not Ranked

Location	Intersection	Ped Intersection
7 <sup>th</sup> Ave/Lareine (MP 1.05)	# 9 County	Not Ranked

*Lists use 2009-2013 crash data*

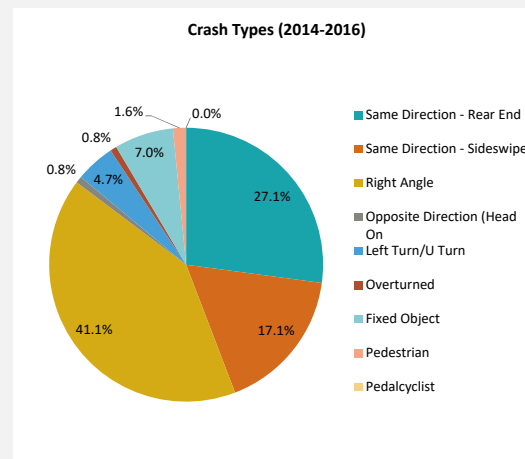
## Crash Data

### 129 Crashes (2014-2016)

- Overrepresentations:
  - Sideswipe
  - Right Angle & Left Turn
  - At Intersection
  - Wet & At Night

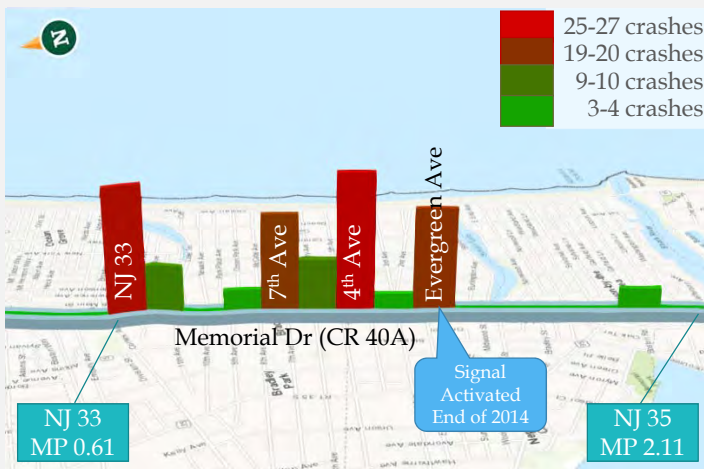
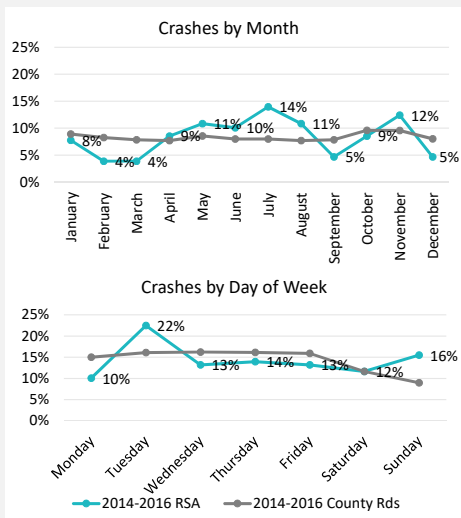
### 7 Pedestrian Crashes (2012-2016)

- Overrepresentations:
  - Min./Mod. Injury
  - At Intersection
  - At Night



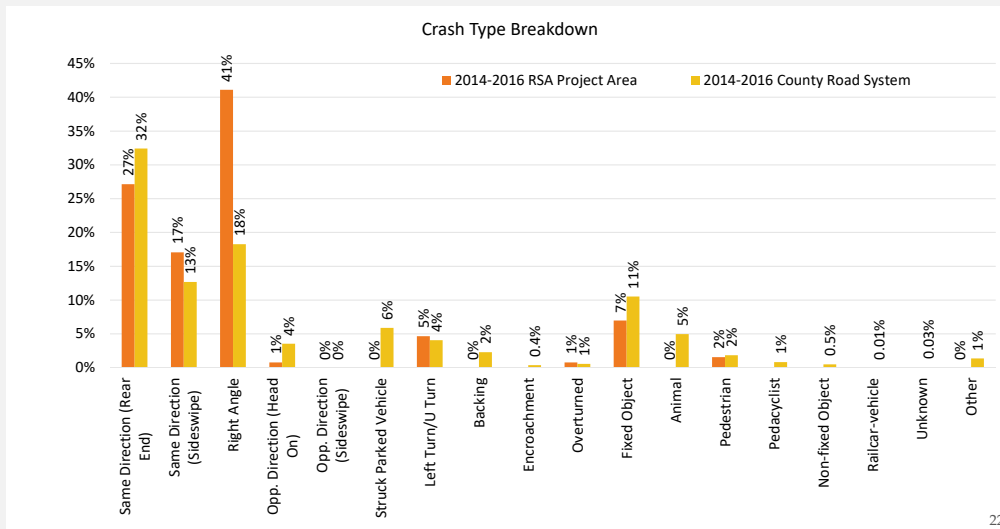
## Crash Data (2014-2016)

### Histogram View by 0.1 Mile



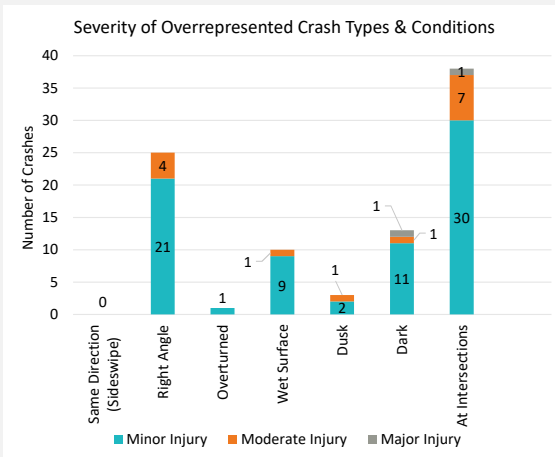
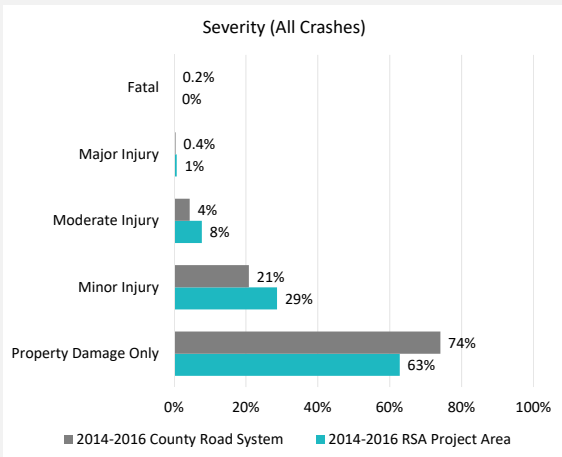
*Edited from original view*

## Crashes: RSA Project Area v. County Road System



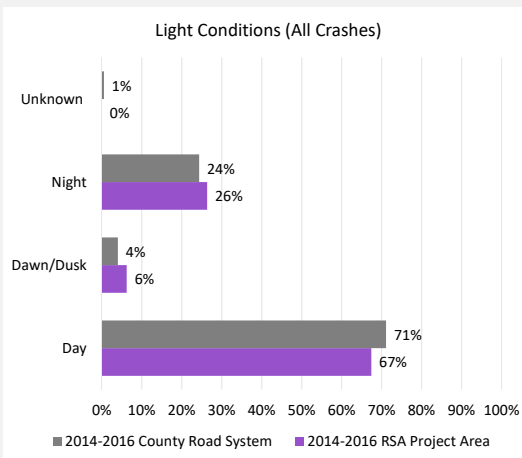
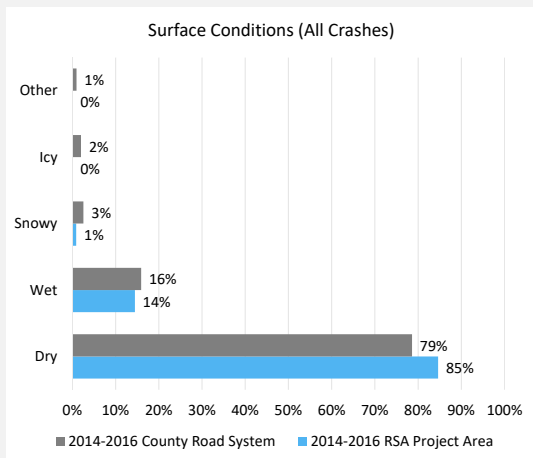


### Crashes: Severity

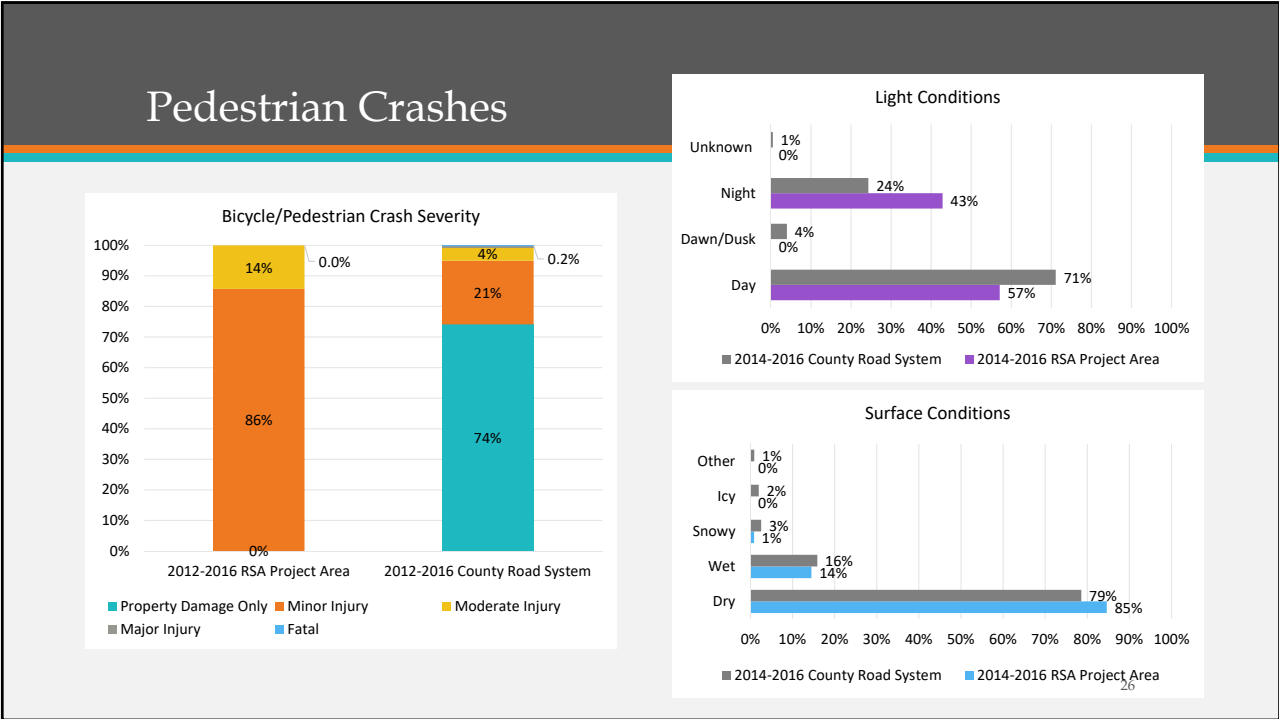
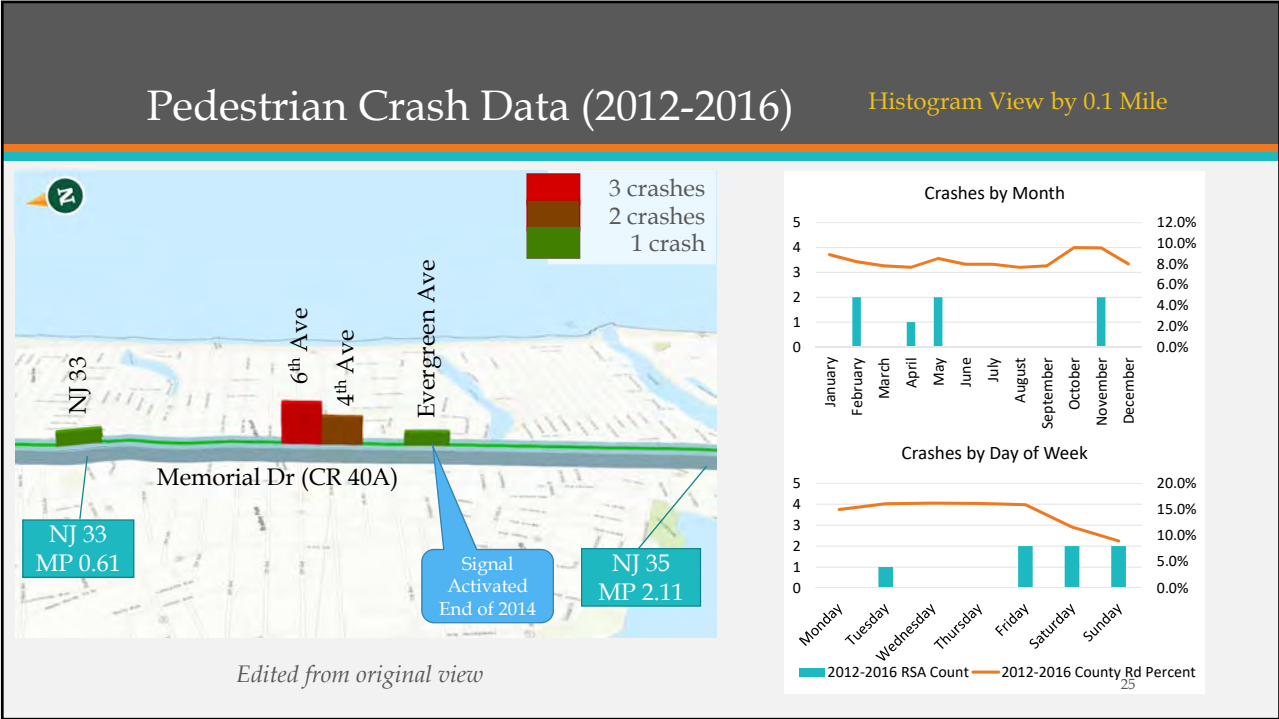


23

### Crashes: Light & Surface Conditions



24





## Crash Diagrams

Vehicle (2014-2016)

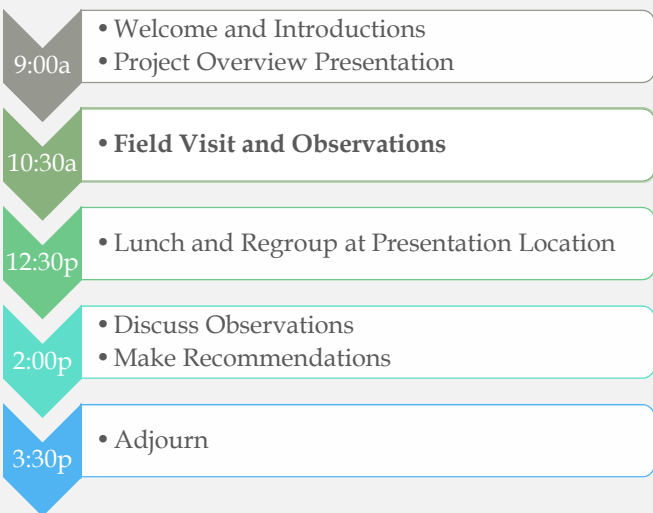


Pedestrian (2012-2016)



27

## Field Visit Itinerary



- ✓ Verify Identified Issues
- ✓ Observe Operations
- ✓ Note Other Safety Concerns
- ✓ Document Findings
  - Photographs
  - Checklist
- ✓ Safety First!
  - Use proper safety equipment
  - Stay alert to your surroundings

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Source: Best-Beaches.com

## Field Visit & Observations

(pause presentation)



## Post Audit Analysis

(resume presentation)



## RSA Schedule

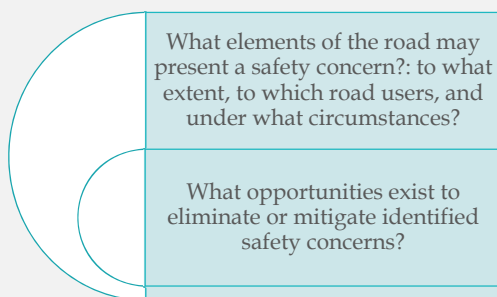
- 9:00a • Welcome and Introductions  
• Project Overview Presentation
- 10:30a • Field Visit and Observations
- 12:30p • Lunch and Regroup at Presentation Location
- 2:00p • **Discuss Observations**  
• **Make Recommendations**
- 3:30p • Adjoin



Sharrows on Route 71, Bradley Beach

## Post Audit Analysis

### Observations



### Recommendations

- What corridor safety issues did you observe?
- What localized safety issues did you observe?
- What improvements would you make?
- Are any of the FHWA countermeasures beneficial?

## Next Steps

- Preparation of RSA Report
- Review/comments from RSA Team
- Preparation of Preliminary Final Report
- NJDOT review
- Preparation of Final Report
- Approximate timeframe: 10 weeks



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Thank you!  
Questions/Comments

Source: Digital Commonwealth/Boston Public Library





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Appendix I - Excerpts from Monmouth County and  
Together North Jersey Reports

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## **THE COASTAL MONMOUTH PLAN**

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**Monmouth County Planning Board**  
Monmouth County, New Jersey

**FINAL DRAFT**

Prepared by  
**Maser Consulting, PA**  
In association with  
George Henry George Partners, LLC  
Reichman Frankle Inc.  
VIC Group

May 2010



- Redevelopment Plans.
- Balancing tax rates with services costs with as little impact on local tax payers as is possible.

**Question 6. What do you feel are the key economic issues facing your municipality?**

- Major influx of transient extended family units which are major users of City services and minor contributors to the City's economy/quality of life.
- The key economic issue facing our municipality is beach replenishment. Without the beach, income from our bathing pavilion, the largest source of revenue for the Borough after property taxes would be at risk. Loss of this revenue stream would place an undue burden on local businesses and residential property owners.
- Survival of small businesses downtown (\*2).
- Attracting new quality businesses into the downtown (\*2).
- Control of property taxes (\*2).
- Promote the retention of our diverse community and provide a viable downtown district to allow people to live in our community without the need to use a car extensively.
- Rising cost of housing.
- Closure of Fort Monmouth.
- Attracting high quality rates to the development corridors as defined in the Master Plan and Gateway Redevelopment Plan.

**Question 7. What do you feel are the key economic issues facing the Coastal Monmouth Region?**

- Growing the employment base, tax stability and housing affordability

## **12.4 REDEVELOPMENT PROJECTS**

Planned redevelopment projects will have an impact on the economy of the CMR. Red Bank has established revitalization efforts that have taken root and flourished creating a town center serving the Northern Region. The North Central Region is gaining a cultural and entertainment center through the on-going Long Branch redevelopment efforts along the oceanfront and Broadway Avenue. The South Central Region through the Asbury Park redevelopment efforts is promoting an entertainment venue and almost 4,000 new housing units. The Southern Region will focus on Belmar which is a designated Transit Village and is undergoing redevelopment to expand their Seaport Village area. Belmar is a developing entertainment and business center for this subregion.

The decommission of Fort Monmouth by 2011 will have a critical impact on the County and the CMR in terms of direct and secondary impacts on the economy. A base reuse plan was adopted in September 2008. Information on Fort Monmouth is presented at the end of this section.

Coordination of redevelopment plans between municipalities is crucial to build on and strengthen the planning efforts. This will assist in addressing the intermunicipal impacts – both positive and negative – which can result. For example, Belmar’s Seaport Village and Neptune’s Shark River Waterfront redevelopment project could coordinate to provide synergistic support and marketing. The recommendation to implement Shark River ferry service can draw visitors and support the economy of both venues.

The Transit Village is planned for Neptune Township at the boundary of the Bradley Beach train station. Coordination between all three municipalities would address conditions in a necessary broader view.

Other revitalization efforts have occurred in the CMR through streetscape and boardwalk improvement projects such as in Avon-by-the-Sea, Manasquan and Bradley Beach. A number of CMR municipalities are beginning to discuss revitalization and /or redevelopment efforts. Sea Bright has a grant to develop a redevelopment plan for their business district. Spring Lake initiated the process to evaluate redevelopment opportunities. Fair Haven is discussing streetscape improvements for their business district. These projects are highlighted in the municipal fact sheets in Volume III - Appendix.

The following summarizes ongoing redevelopment projects and related studies currently underway in the CMR. These involve eight municipalities: Allenhurst, Asbury Park, Belmar, Eatontown, Long Branch, Neptune Township, Neptune City and Wall. (See Redevelopment Map I - 17).

**ALLENHURST**

Main Street Redevelopment Plan - This Redevelopment Plan was initiated because of the imminent closure of the JCP&L facility which was the Borough’s largest taxpayer. The Redevelopment Plan provides for redevelopment of 8 acres on both sides of Main Street with about 5.6 acres planned for single and multi-family residential infill development along with a mix of retail and office use. Planned improvements to the existing Borough-owned park between Deal Lake and the railroad line are identified. The Plan encourages off-street parking behind buildings wherever possible, and provides for site plan and architectural guidelines to be aesthetically pleasing and compatible with the scale of the existing community. The Borough adopted the Redevelopment Plan in November 2006.<sup>34</sup>

**ASBURY PARK**



Asbury Park

According to the Asbury Park website, the City contains seven redevelopment areas of which four have redevelopment plans adopted. Of the other three areas, redevelopment plans are in process.<sup>35</sup>

Waterfront Redevelopment Area – on approximately 56 acres, the areas will provide 3,164 residential units and nearly 450,000 square feet of commercial space. The first phases are underway with nearly 500 units approved for construction and consist of the Boardwalk Area, Prime Renewal Area and Renovation Infill Area.

Central Business District Redevelopment Area – Located within the historic business district, the CBD Redevelopment Area is projected at build-out to contain nearly 600 residential units in mixed-use renovated buildings with a mix of retail and service businesses. Steinbach’s Department Store conversion will yield 63 apartments with 22,000 sf retail shops on the first floor.

<sup>34</sup> Main Street Redevelopment Plan, Allenhurst Borough, November 2006

<sup>35</sup> <http://www.cityofasburypark.com/redevelop.htm>



**NEPTUNE TOWNSHIP**

Gateways of Neptune Strategic Revitalization Plan (adopted October 13, 2004) A comprehensive strategy for revitalization of Neptune Midtown, Bradley Park and Shark River Waterfront neighborhoods. Plan includes the following elements.

- Northern Gateway - Includes properties on the southwestern side of Route 35 from Neptune – Ocean Township municipal border to Brockton Avenue. Goal is to promote a positive and inviting gateway to pedestrians and vehicles through landscaping, quality of design, signage and site development.
- Route 35 Commercial Corridor - Transition from Northern Gateway to the Crossroads.
  - Route 35 - Brockton Avenue to West Bangs Avenue - Improve physical appearance of buildings and roadway and maximize economic viability.
  - Route 35 - West Bangs Avenue to Milton Avenue - Commercial Revitalization techniques including tax abatements, façade programs, and available State aid to assist businesses in constructing improvements to facades, expanding or renovating existing buildings, supplementing site improvements or off-street parking where possible.
  - Route 35 - Milton Avenue to Heck Avenue - Commercial Revitalization techniques including tax abatements, façade programs, and available State aid to assist businesses in constructing improvements to facades, expanding or renovating existing buildings, supplementing site improvements or off-street parking where possible.
  - Heck Avenue – Route 35 to Taylor Avenue - Create pedestrian friendly and safe route for school children traveling to and from Neptune High School.



Shark River



Bradley Beach Train Station

- West Lake Avenue - Includes 3.5 Blocks from the east side of Route 35 to Neptune/Asbury Park municipal border. Goal is to restore commercial viability and create a new neighborhood center for the surrounding Midtown neighborhood, consisting of commercial and residential buildings with a village character, including minimal setbacks on side streets, parking in rear of building, and a pedestrian orientation.
- Township Crossroads - Intersection of Route 33 and Route 35, northward to Heck Avenue. Use traditional building concepts to reclaim this area as a traditional “main street” area or downtown for surrounding residential neighborhoods.
- Route 33 Corridor - Properties fronting on southern side of Route 33 from Route 35 to Memorial Drive and properties on northern side of Route 33 from Atkins Avenue to Route 35; includes roadway improvements with NJTPA to coordinate planned roadway improvements with a new land use vision to create a pedestrian/bicycle friendly environment.
- Eastern Gateway - Intersection of Route 35 and Route 71 and the block at southwestern corner of intersection; goal is to promote a positive and inviting gateway to pedestrians and vehicles through landscaping, quality of design, signage and site development.
- Southern Gateway - Properties fronting on both sides of Route 35 from the Neptune – Neptune City municipal boundary, north to the Crossroads Area; goal is to promote a positive and inviting gateway to pedestrians and vehicles through landscaping, quality of design, signage and site development.
- Transit Village – a four block area within Bradley Park section of Township proximate to the Bradley Beach Train Station, from Memorial Avenue to 9th Avenue to Atkins Avenue to 5th Avenue; create a transit village, compact mixed-use community within walking distance of the Bradley Beach Train Station.
- Shark River Waterfront Redevelopment - Lands on the north side of Shark River inlet and along Route 35; includes a mixed-use waterfront center including waterfront walkway and promenade, new restaurants on waterfront, specialty shops, public plaza and pedestrian mall, mix of residential uses, new commercial and office buildings.

Neptune's Waterfront Destination A Redevelopment Plan for the North Channel of the Shark River, (adopted July 2005). Mixed-use waterfront center including waterfront walkway and promenade, new restaurants on waterfront, specialty shops, public plaza and pedestrian mall, mix of residential uses, new commercial and office buildings.

West Lake Redevelopment Plan, (adopted April 2005) – new neighborhood center for the surrounding Midtown neighborhood including new commercial and residential buildings as well as mixed-use structures in this area; adjoins Springwood Avenue Redevelopment in Asbury Park.

High Tech Park Redevelopment Plan, (adopted 2000), provides for 19 office buildings on approximately 187 acres; part of comprehensive effort to bring businesses to Neptune Township.

### **NEPTUNE CITY**

City declared 20 acres in eastern portion of City as “Area in Need of Redevelopment”. Area is west of Memorial Drive, south of Evergreen Avenue and east of Steiner Avenue, north of Holly Avenue. Concept plan being prepared for mix of uses (commercial and higher density residential).

### **WALL**

West Belmar Gateway Redevelopment Area (December 2003) - The West Belmar Gateway Redevelopment Area is generally comprised of the frontage lots on either side of Route 71 between the municipal borders of Spring Lake Heights and Belmar. Plan provides for transforming underutilized and non-conforming buildings into pedestrian friendly human scale development with a colonial theme and high quality design standards. Plan also proposes to create, through lot merger or acquisition, larger development parcels.

### **FORT MONMOUTH (EATONTOWN AND OCEANPORT)**

Fort Monmouth is a major military facility located within Eatontown, Oceanport, and Tinton Falls. In the Fall 2005, Fort Monmouth was officially designated for base closure and its operations will be transferred to Aberdeen, Maryland. The Fort Monmouth Economic Revitalization Planning Authority (“FMERPA”) is a group of elected officials and citizens designated by the State and recognized by the US Secretary of Defense to develop a reuse plan for Fort Monmouth. The US Military Department, as the property disposal agent, identified the final property disposal mechanisms.<sup>40</sup> The base closure and ultimate redevelopment of Fort Monmouth will have lasting effects on the CMR and the County.

This section of the report briefly summarizes the current functions and employment on Fort Monmouth and the recommendations of Base Realignment and Closing (BRAC) Commission.

**Fort Monmouth Today** - Fort Monmouth is the central of the Army's Command and Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) systems. Much of the Army's research and development of these hi-tech systems is done at Fort Monmouth by members of Team C4ISR.<sup>41</sup> Fort Monmouth is home to a variety of other Army, Department of Defense and government activities. What follows is a description of activities that take place on Fort Monmouth, according to their web site.

CECOM - The Army's Communications Electronics Command (CECOM), although geographically dispersed at various locations throughout the U.S. and around the world, is the host and largest activity at Fort Monmouth. The Software Engineering Center (SEC); Information Systems Engineering Command (ISEC); Logistics and Readiness Center (LRC); Tobyhanna Army Depot; and CECOM Acquisition Center (AC) are all part of CECOM.

CERDEC - The Communications and Electronics Research and Development Center (CERDEC) has made many contributions in research in development, such as Night Vision goggles, counter equipment for improvised explosive devices, shortstop electronic protection systems and well sensor systems to provide soldiers with a safe method for rapidly inspecting wells and underground locations in OIF/OEF. CERDEC is part of the Research, Development and Engineering

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<sup>40</sup> <http://nj.gov/fmerpa/reuse/faq.html>

<sup>41</sup> <http://www.monmouth.army.mil/C4ISR/about.shtml>



## 15.9 LOCAL TRANSPORTATION ISSUES IDENTIFIED

Many communities identified traffic congestion as a key area of concern, specifically during the summer months when commuting shore traffic is largely responsible for increased volumes along State and County roads. Some areas use cones and additional signage along local roadways to help alleviate the effects of the increased traffic and to increase pedestrian safety. Other areas reroute traffic to deal with excessive volumes. Either way, several towns have expressed interest in exploring traffic calming techniques to slow the prevailing speed of traffic and increase pedestrian safety. Overall, most municipalities have some concern regarding their existing transportation system. The following information was collected from each municipality within the CMR to address existing or potential pedestrian, transit and vehicular traffic concerns.<sup>52</sup> Additionally, in response to a request by the County for additional information on traffic problem areas, traffic problem statements were received by a number of municipalities. These are included in Volume III – Appendix. Table I – 63 Transportation Issues identified by municipalities and Regional Collaborative and the Identified Transportation Issues Map I – 24 summarize transportation needs raised by CMR municipalities.

### ALLENHURST

Allenhurst current infrastructure is operating at capacity, and traffic congestion becomes a concern during the summer months along ocean roads. In response to the congestion, the ocean block of Allenhurst becomes a one-way street to ease traffic within the Borough. Allenhurst is also located along the New Jersey Transit North Jersey Coast Rail Line and has considered the development of a Transit Village to supplement the existing train station.

### ASBURY PARK

Asbury Park has major improvements planned to transit, pedestrian and roadway access within the CMR. The recently completed Asbury Park Transportation Improvement Study of the existing train station and connecting corridors identifies four categories of needs: Underutilization of the Transportation Center, Unmet transportation demand and service gaps, Pedestrian and bicycle facility needs and traffic circulation and parking issues. Additionally, a parking deck has been planned and is funded by developers to address the need for adequate parking. Asbury Park is also seeking improvements in pedestrian accessibility in the Central Business District, specifically with the planned improvements to the James J. Howard Transportation Center (5-10 years), redeveloping Main Street, constructing a boardwalk to connect Asbury Park to Loch Arbour and increasing bike paths to alleviate vehicular traffic.

The major roadway improvements seek to revitalize the CBD and provide improved east/west links within city limits. The Main Street Redevelopment Plan calls for improved parking and pedestrian mobility, while the Waterfront Redevelopment Project includes the removing/improving of traffic signals and the re-stripping of existing roadways to improve traffic flow.

Additionally, the NJDOT intends to open a study of two sections of highway due to an alarming number of accidents reported during 2005. According to the study, one of the most accident-prone sections of State highway was in Monmouth County on Route 35 between Asbury Avenue/Route 66 and the border of Eatontown, where 174 accidents were reported during 2005.<sup>2</sup> A study of these areas will be conducted, at which point safety improvements can be evaluated.

Transportation problem statements were provided by Asbury Park for:

- Route 71 (Main Street) Congestion
- Train Quiet Zone
- Route 35/Route 36/Asbury Avenue Circle

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<sup>52</sup> Information taken from municipal master plans, 2004 Cross Acceptance Report and CMR Questionnaires

<sup>2</sup> Asbury Park Transportation Improvement Study, Monmouth County Planning Board and STV Incorporated, September 2005

### **AVON-BY-THE-SEA**

The majority of traffic congestion occurs during the summer season, May through September. There are no other major traffic issues to report.

### **BELMAR**

Belmar is a designated Transit Village which is part of the adopted Seaport Redevelopment area. Belmar is trying to improve the existing facilities due to the seasonal increases in traffic volume and available parking.

The major traffic concerns within Belmar are congestion, specifically during the summer season, accidents and residential speeding. Other traffic issues link to implementing traffic calming techniques, mainly on Ocean Avenue, in order to improve pedestrian circulation and promote non-motorized transportation. Belmar has a fully developed infrastructure, with roadway improvements being completed on a per project basis.

Traffic problem statements were provided by Belmar for:

- Ocean Avenue in Belmar – safety, bicycle and pedestrian issues
- Main Street between 8<sup>th</sup> and 16<sup>th</sup> Avenues – pedestrian improvements
- 16<sup>th</sup> Avenue between Route 35 and Ocean Avenue (CR 18) – traffic calming

### **BRADLEY BEACH**

The main transportation issue in Bradley Beach is completing the five-year road maintenance plan and NJ Transit improvements, which include the train station along the North Jersey Coast Line and bus services along Route 71. Traffic congestion exists within the Borough during the summer months, but measures are currently used, such as providing parking cones, to calm traffic and improve pedestrian safety. The Borough is seeking additional funding opportunities from the NJDOT to help in roadway improvements.

### **BRIELLE**

Brielle does not currently have many major transportation concerns, with the primary traffic congestion existing on State and County routes only. However, Brielle was considering supplanting the existing highway-grade signage style with a village-style signage system. The Borough is also interested in the replacement of existing bridges located on Route 35 and Route 70 crossing the Manasquan River.

### **DEAL**

Major traffic congestion and/or need for calming measures were not identified by Deal. Currently, Deal is working with the NJDOT to signalize the intersection of Phillips and Route 71, while also trying to implement a bicycle-only lane on Ocean Ave. to facilitate local pedestrian/bicycle accessibility and safety.

### **EATONTOWN**

The Borough of Eatontown planning issues include development of the highway area and improving traffic circulation to relieve traffic congestion. The main improvements to the highway area include Route 35 and Route 36 highway corridors, Wyckoff Road Corridor and Route 18 North Corridor (no access to Garden State Parkway (GSP)). In 2001, the Borough of Eatontown received a grant to investigate flooding and traffic signalization synchronization along Highway 35 in Eatontown. Other improvements to Route 35 include: working with the NJDOT in planning connector roads at the Route 35 and Industrial Way to alleviate congestion, the Route 35 & Route 36 interchange redesign and the implementation of the Route 35 Master Plan. Other roadway improvements in the Borough include constructing noise barriers in local neighborhoods, heavy vehicle traffic exiting the GSP at Exit 105, State and County road congestion leading to queues on local roads (i.e. Route 18 and Hope Road). Additionally, an interchange permitting Route 18 NB to access the Garden State Parkway NB is desired.



## **LOCH ARBOUR**

The key planning issues for Loch Arbour includes regional traffic impacts and the replacement and maintenance of infrastructure. Loch Arbour seeks the County's help with regional traffic and planning issues; local traffic problems exist on Ocean Avenue, Norwood Avenue and Route 71, as well as at the intersections of Main Street and Euclid, and Euclid and Norwood. During the summer season, additional signage is used as a traffic calming technique.

## **LONG BRANCH**

Key planning issues revolve around improving existing roadways to accommodate present and future traffic volumes in the area. Long Branch is seeking improved transit accessibility through constructing a pier near the train station for ferry service.

## **MANASQUAN**

Key planning issues for Manasquan include traffic and development along the Route 71 travel corridor; specifically relieving traffic congestion along Route 71 with vehicles seeking to avoid congestion through other areas. Regional traffic volumes result in queues and congestion on local roads. Manasquan also expressed interest in the use of traffic calming techniques (variable message signs) and redesigning highway corridors to reduce congestion and accidents on these highways and local roadways.

Manasquan is interested in upgrading the existing intersections of Lakewood and South Street and North Main Street and Atlantic. A new train station was recently completed on the North Jersey Coast Line. Bike and pedestrian improvements, specifically the Capitol-Coast Bike Trail, (Edgar Felix Bike Path) is planned for extension through Manasquan to the Atlantic Ocean.

## **MONMOUTH BEACH**

Monmouth Beach has no mass transit service and would greatly benefit from a small scale feeder system with service to ferry, train and regional bus services. Traffic congestion and speeding on Route 36, specifically during summer months, and a need for better pedestrian facilities are key transportation issues for the Borough. Monmouth Beach has an annual Capital Improvement Plan aimed at addressing roadway improvements within the Borough.

Monmouth Beach provided traffic problem statements for:

- Ocean Avenue, Route 36

## **NEPTUNE TOWNSHIP**

Neptune is considering implementing a Transit Village located near the Bradley Beach station within the next 5–10 years. They are conducting a traffic impact study to investigate the existing road and circulation system. The Township is coordinating with NJ Transit to provide jitney service from midtown to the shopping center and ocean front locations. Also, Neptune is seeking assistance from the NJDOT with the completion of widening of Route 33 east of Route 35.

The Township provided traffic problem statements for:

- Route 35 (milepost 21.77 to 22.25 – Seaview Circle to Boston Road)
- Route 66 – Municipal boundary on the west to Wayside road highway improvements
- Route 66 & Neptune Boulevard intersection
- Route 66 & Wayside Road Boulevard intersection
- Route 18
- Shuttle bus service between Neptune and Asbury Park Transportation Center
- Route 33 – Garden State Parkway interchange to Route 35
- Shark River Bikeway

### **NEPTUNE CITY**

The City of Neptune's key traffic issue regards the accessibility of vehicles to traverse Route 35 and 3<sup>rd</sup> Avenue due to flooding during heavy rain falls. Main Avenue Streetscape project is planned and pedestrian corridor improvements along West Sylvania Avenue. The Township has also identified the Asbury Avenue Circle (Asbury Avenue / Route 66 / Route 35) as an area in need of mitigation.

### **OCEAN**

The key planning issue within Ocean is existing traffic circulation and is preparing traffic studies to address problems. The Planning Board encourages limiting the number of driveways accessing Highway 35 and Norwood Avenue via cross-access easements.

### **OCEANPORT**

Oceanport reports no concerns regarding traffic congestion and roadway improvements, and has a "pedestrian friendly" village center. Also, it is serviced by the North Jersey Coast Line during Monmouth Park racing season.

### **RED BANK**

Red Bank is currently working on road and infrastructure improvements, but the key planning issue revolves around additional parking facilities and improved traffic circulation. Red Bank has participated in projects including a *Wayfinding Study*, *Transit-oriented Development Study* and *NJDOT Red Bank Circulation Study*.

Red Bank has implemented traffic calming measures on Leighton Avenue, which is used to avoid traffic on Shrewsbury Avenue. The Borough is interested in the possibility of creating a Transit Village near the train station and adding pedestrian walkway on Cooper's Bridge.

### **RUMSON**

Rumson is primarily seeking improvements in transportation routes, relieving traffic congestion and implementing traffic calming measures. Currently, traffic congestion is a result of potential bridge closures detours (Sea Bright Bridge and Oceanic Bridge), summer shore and racetrack traffic and flooding resulting in limited roadway access. Rumson has identified improvements needed to the following travel corridors: Rumson Road (County Route 520), River Road (County Route 10), Ridge Road (County Route 34), Bingham Road, Oceanic Bridge and Ocean Ave (NJ State Route 36). Rumson requests assistance to develop an overall Emergency Traffic Management Plan.

The Borough provided traffic problem statements for:

- Bingham Avenue and Rumson Road (CR 520) Intersection

### **SEA BRIGHT**

Sea Bright key planning issues include roadway usability, traffic control, pedestrian safety and the addition of bike paths to complement the sidewalks and paths located along the waterfront. Traffic calming measures and bus shelters along Ocean Avenue to improve pedestrian safety were identified.

### **SHREWSBURY BOROUGH**

Shrewsbury Borough wishes to alleviate traffic congestion while increasing pedestrian access and safety. Traffic using local roads to bypass State and County roads was identified as a problem. Shrewsbury unsuccessfully requested that Shrewsbury Avenue be designated a north/south section of Route 35 to reduce congestion. The Borough currently directs traffic to Shrewsbury Avenue from Broad Street to make Broad Street a two-lane boulevard with bike paths and wider sidewalks. Bike paths and crosswalks on Broad Street were deemed unsafe without police assistance; therefore, a request to the NJDOT has been introduced to adjust signal cycle lengths to permit safe pedestrian crossing.





## **Volume II THE PLAN**

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**Monmouth County Planning Board**  
Monmouth County, New Jersey

**FINAL DRAFT**

Prepared by  
**Maser Consulting, PA**  
In association with  
George Henry George Partners, LLC  
Reichman Frankle Inc.  
VIC Group

May 2010









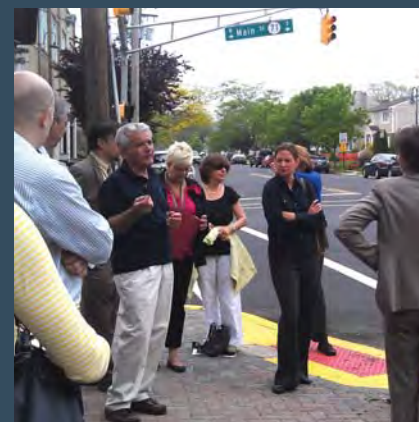
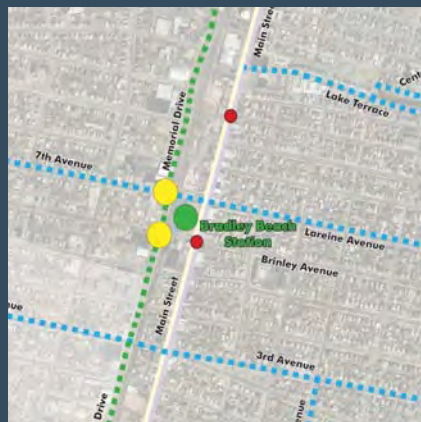
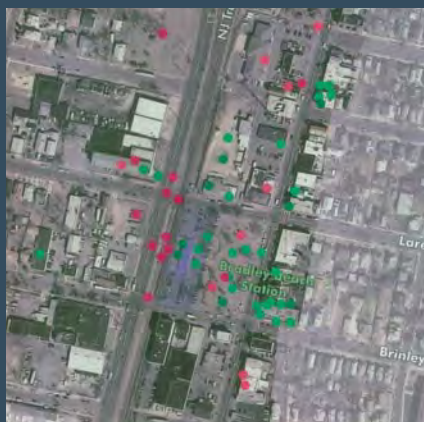
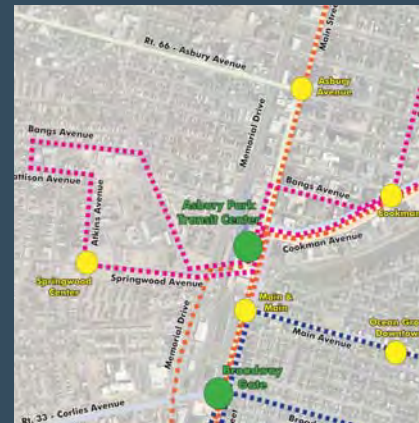






# CONNECTING COMMUNITY CORRIDORS: Monmouth County Asbury Park, Bradley Beach, Neptune Township

## A LOCAL DEMONSTRATION PROJECT





**Proposed Study Area**

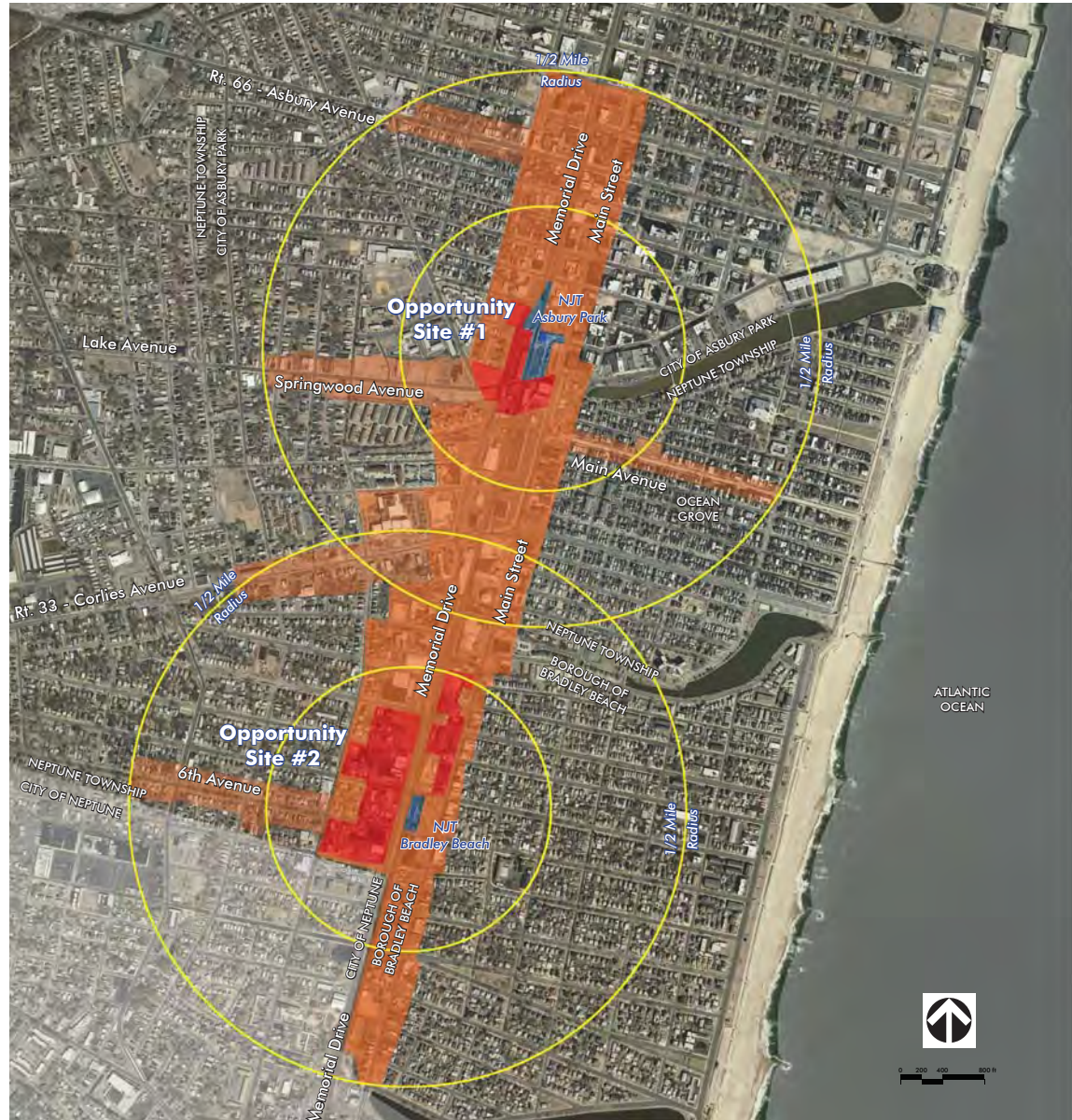
Based on the feedback from the Kickoff Meeting, and discussions on the Walk and Talk tours, the Project Team defined a physical Study Area. The Study Area encompasses more regional corridors such as the combined Main Street and Memorial Drive north-south couplets, key east-west gateway corridors into the towns, Avenue and a few small opportunity sites suitable for TOD infill, as described below. The opportunity sites are clustered in each municipality around the Main Street and Memorial Drive Corridors.

The Study Area includes:

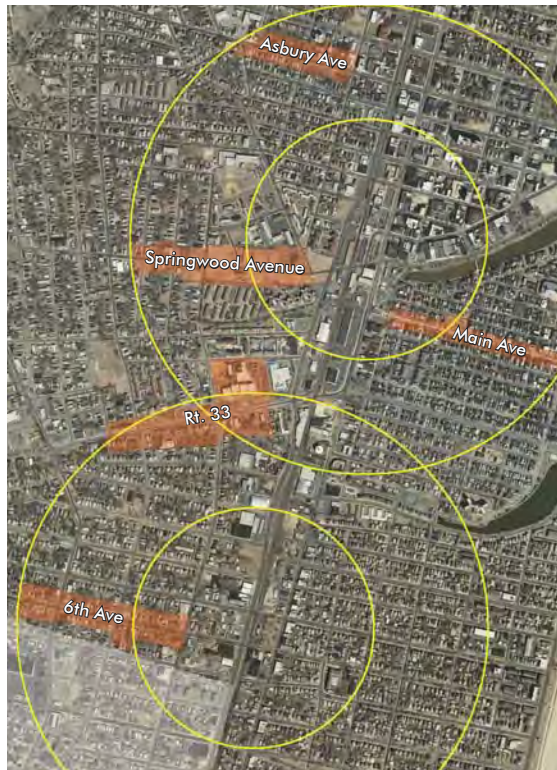
- Main Street /Memorial Drive Corridor
- East-West Gateway Corridors
- Opportunity Site #1 – Station Gateway in Asbury Park
- Opportunity Site #2 –Main Street Redevelopment sites in Bradley Beach and Neptune Township’s Transit Village area

**The Main Street /Memorial Drive Corridor.**

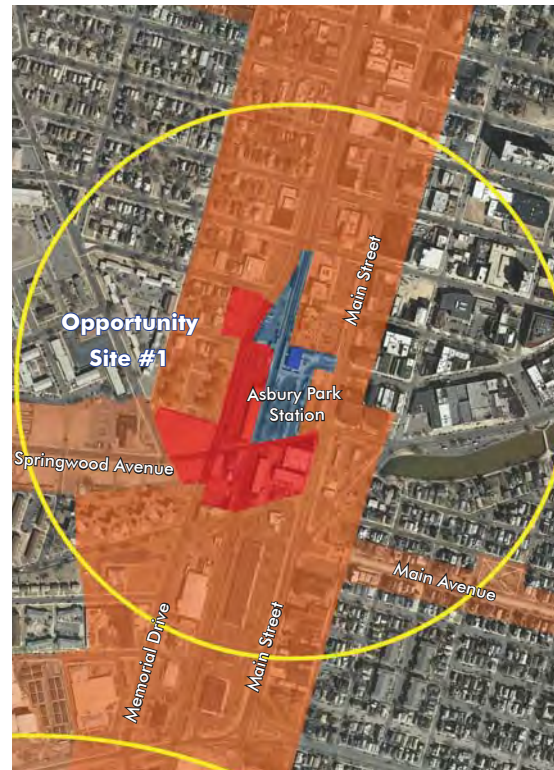
Main Street (State Route 71) and Memorial Drive flank the North Jersey Coast Railroad running as a “shared core” through all three municipalities. The two parallel roads serve as dual system; Main Street serves as the main commercial spine and Memorial Drive serves as a higher-volume, secondary route with more underutilized parcels and opportunities for infill, redevelopment, and adaptive reuse.



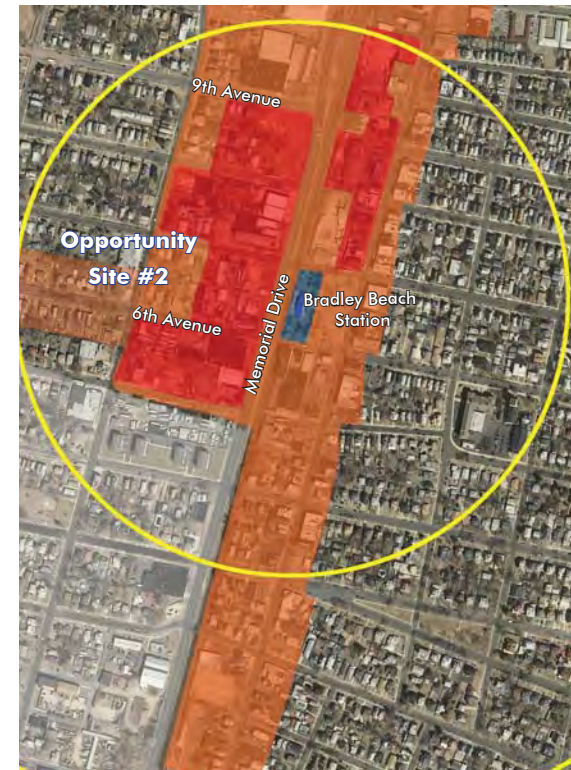




**East-West Gateway Corridors.** Roads including Rt. 33, 6th Avenue (Neptune), Main Avenue (Ocean Grove), Springwood Avenue and Asbury Avenue serve to connect the Main Street/Memorial Drive corridor to the west and rest of the region and east toward the beach communities. They represent the gateways into the “shared core” of these communities. These east-west corridors are important as access points to the greater region and have implications for equitable access to transit, combined housing and transit costs, connection to regional employment, among others.



**Opportunity Site #1 – Station Gateway in Asbury Park.** The Station Gateway site is located opposite the southern end of the Asbury Park Station. The location contains several vacant parcels and under-utilized lots, including a municipal public works facility. This location connects the emerging Springwood Redevelopment Corridor, which extends toward the west, to downtown, Cookman Avenue and the beach area/Boardwalk of Asbury Park. It is also the gateway to the community for those arriving through the Transit Center.



**Opportunity Site #2 – Main Street Redevelopment sites in Bradley Beach and Neptune Township’s Transit Village area.** There are several municipally-owned sites in Bradley Beach located between Main and Memorial and near the Bradley Beach Station. The Neptune Township Strategic Revitalization Plan identified a four-block area to the west of the Bradley Beach station as a proposed “Transit Village”.



### Traffic Calming and Pedestrian/Bicycle Circulation

Memorial Drive (Monmouth County Route 40A) is a wide roadway without adequate pedestrian amenities and bicycle accommodations. East-west pedestrian and bicycle access from neighborhoods, business areas and the beaches is limited and dangerous. Memorial Drive and the railroad tracks act as both physical and psychological barriers. There are very few pedestrian crossing signals and delineated crosswalks as well as a lack of amenities such as benches, enhanced lighting, maps, signage, bike racks and designated bicycle lanes.

Some Main Street streetscapes have been improved, but there is not much consistency and many places where improvements are still needed. There are no dedicated bicycle lanes or sharrow designations along Main Street (NJ State Route 71). Just to the south in Avon a number of recent streetscape/traffic calming improvements

were made including bumpouts, medians, brick sidewalks and bike lanes. While there is some wayfinding in Asbury Park near Main Street, there is no wayfinding signage for local destinations along Memorial or on Main Street in Bradley Beach.

Bicycle usage is very high along Main Street with many cyclists using the sidewalks in conflict with pedestrians. This was observed qualitatively in the field both in terms of cyclists on the streets/sidewalks and the numbers of bicycles parked in racks at local employment centers, transit facilities and businesses. It should also be noted that this was observed in the off-season and the rates are probably substantially higher during the summer beach season. The data is further supported by the American Community Survey 5-Year Estimates, which indicates bicycle commuting at 7% for the census tracts that intersect with the Study Area, and at almost 10% in the areas of Asbury Park west of the railroad.



Bicycle usage is high in the corridor, but without adequate designated routes and facilities.



Pedestrian crossings of Memorial Drive at the Asbury Station are particularly challenged.



Memorial Drive is an over-scaled roadway. It is not pedestrian friendly due to vehicular speed volume and lack of pedestrian crossings.

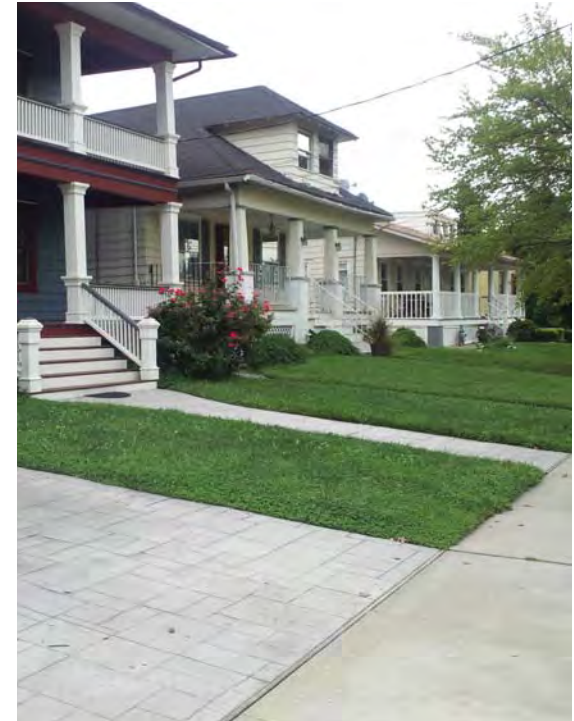




Springwood Ave. Redevelopment Area



Memorial Drive in Neptune



Bradley Park residential neighborhood



Wayfinding on Main Street in Asbury Park



Main Street in Bradley Beach



New mixed-use infill at Bradley Beach Station



## Reconnecting Bradley Beach and Bradley Park

Both Neptune Township and Bradley Beach have studied transit-oriented infill in their respective boundaries. Memorial Drive and the North Jersey Coast Line, as is the case in other parts of the Study Area, act as a significant east-west barrier. The concept plan for this area seeks to treat the station as the center of a larger mixed use, walkable district on both sides of the tracks, reconnecting Bradley Beach with Bradley Park. The concept plan includes:

- Mixed-use infill on Main Street
- Upgrade streetscapes & traffic calming on Memorial Drive
- Improve East-West connectivity
- Create hub for additional shuttle & mobility
- Transit Village respects the scale & character of neighborhood
- Relocating Municipal Complex to create Main Street anchor

### Bradley Beach

The core of Bradley Beach is an attractive, walkable, tree-lined section of Main Street centered around a community park at the Bradley Beach train station. The top priority for this district is to bring people back into downtown – through new Main Street residential living, and business and attractions for other community residents and visitors. Retail uses should include both convenience and specialty shops, and be encouraged on both sides of the street to offer a

dense core of shopping and dining opportunities. The municipal offices occupy a valuable piece of Main Street that, if relocated, could free up land for residential development with commercial ground floor uses.

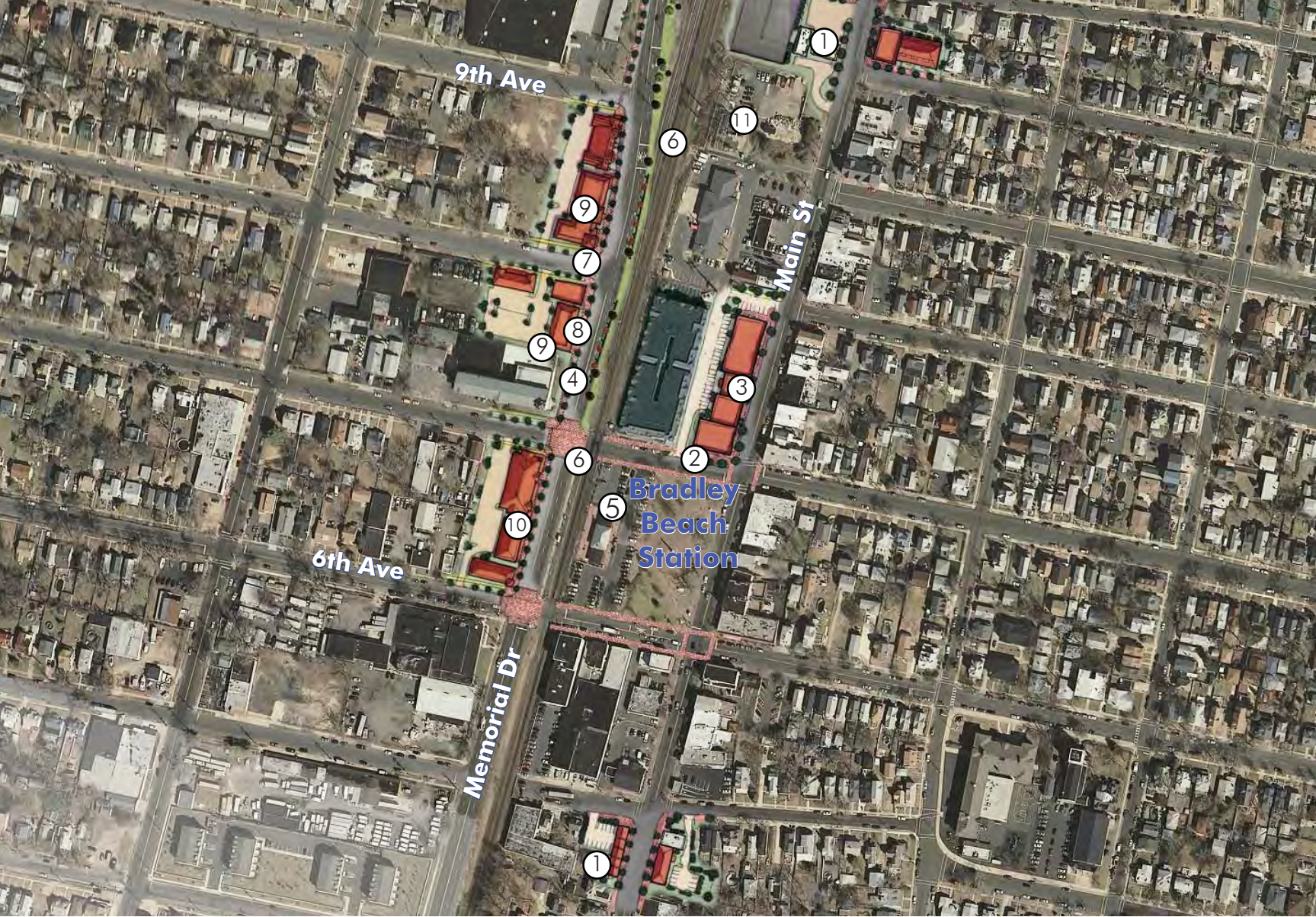
### Neptune Transit Village

Prospective future development along Memorial Drive (whether infill or redevelopment) will need to compliment/reflect the existing scale and nature of development along Memorial Drive (e.g., mix of convenience retail, personal services and low-rise residential units), so as not to undermine the viability of existing uses (for example, placing mid-rise structures next to single family homes or large format retail adjacent to small boutique stores).

As there continues to be healthy growth in the number of new household formations in the region, and increasing service employment opportunities associated with this household growth, new workforce housing (whether designed as infill units or as part of a larger scale redevelopment project) should be a main tactic pursued within the broader Memorial Drive revitalization strategy. New retail and service business investment, whether going into an existing storefront or developed as a new building, should be of a small scale reflective of small proprietor businesses. These retail and service businesses should be convenience (small coffee houses, dry cleaners, grocers) and/or specialty oriented businesses (boutique clothing, yoga studio, bakery, sit-down restaurant).

- ① Small-scale infill on Main Street to match the existing character
- ② Park serves as the center for the entire Transit Village & serves as an activity generator
- ③ Municipal complex relocated free up the prime corner for mixed-use infill development
- ④ Adaptive reuse of Monmouth Piano building will anchor to the Neptune side of Memorial
- ⑤ Station will serve as a hub for increased shuttle & node for alternate transportation options
- ⑥ Memorial Dr. improvements include a “greening” of the rail, bike lanes & traffic calming to improve east-west connections
- ⑦ Infill development to be the face of Bradley Park & will reflect its scale & character
- ⑧ Memorial Drive to have a more active streetscape with some ground-level commercial, live-work space, & residential
- ⑨ Infill on the side streets should transition back into the Bradley Park neighborhood with townhouses and smaller lot single family cottages
- ⑩ Flexible commercial uses along Memorial could include small offices & convenience retail complimentary to uses on Main St.
- ⑪ Parking structure to be located on the north side to service a new civic building & to serve as intercept parking for Main St. businesses









Relocate municipal complex to anchor Main St. infill



Add housing in mixed-use buildings to increase foot traffic & provide a stable customer base



Encourage a variety of retail uses as ground floor uses, including neighborhood convenience, restaurants and specialty shops.





Flexible commercial uses along Memorial could include small offices, cafes, & convenience retail



\*Refer to page 58 for numbered plan notes



## Community Scale and Character

The goals and objectives of the Neptune Township Transit Village Study Area Land Use Plan are to:

- Maximize the locational advantage of the neighborhood to the Bradley Beach Train Station by creating residential housing opportunities;
- Minimize land use conflicts between the industrial, commercial, and residential land uses; and,
- Build a “sense of place” with good urban design through controls on building massing, streetscape improvements roadway improvements and building design guidelines.

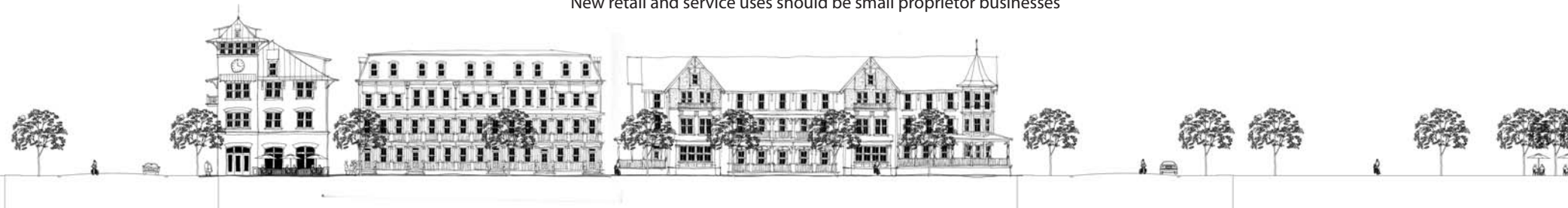
The proposed infill concept in the Neptune portion of the Study Area was designed to test the form-based bulk standards and design guidelines in the Neptune Transit Village Plan. The overall intent is to provide transit-oriented and mixed use development that is consistent with the scale and character of the Bradley Park neighborhood.



Infill on the side streets could include smaller lot single family cottages



New retail and service uses should be small proprietor businesses



## Memorial Drive Traffic Calming

The majority of Memorial Drive is under Monmouth County jurisdiction in the Study Area. There are four travel lanes – two in each direction and the pavement width is about 45 feet wide. The speed limit varies from 30 miles per hour (mph) in Asbury Park to 40 and 45 mph in Neptune and Bradley Beach. Traffic signals are located at the intersections with Bangs Avenue and Springwood Avenue in Asbury Park, at Route 33/Corlies Avenue in Neptune, and at 6th Avenue in Bradley Beach. The wide pavement, minimal traffic signals, and variable speed limits, encourage speeding.

Several measures, requiring more detailed study, could be considered to create a more pedestrian and bicycle friendly environment and slow down

traffic traveling through the Study Area including:

- Modify the speed limit to 30 mph in Neptune and Bradley Beach so that it is consistent throughout the corridor
- Change the roadway configuration so that there is one travel lane in each direction with a center turning lane and bicycle lanes on either side of the roadway
- Repair/replace cracked or missing sidewalks and consider widening the existing sidewalk
- Install pedestrian scale lighting
- At the four signalized intersections install High visibility crosswalks, ADA compliant ramps, pedestrian signal pushbutton instructions, “Stop for Pedestrian” stanchion signs
- Repaint stop bars, and other pavement markings and add new crosswalks, if needed
- Consider installing a “signal ahead is red” activated sign on Memorial Drive around 5th Avenue to advise motorists when the signal at 6th Avenue is red. When a train is at Bradley Beach Station and the gates are down, traffic approaching 6th Avenue can back up as far back as 4th Avenue.
- Consider gateway treatments in the study area at the north and south ends of Memorial Drive so that drivers recognize they are entering an area with more pedestrian and bicycle activity and that they need to slow down.





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## Appendix J - Excerpts from Municipal Reports and Master Plans

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- (5) Multi-Family Dwellings – Not permitted on the First Floor
- (6) Residential units are not permitted on the First Floor

Minimum Lot Size.

- (1) 5,000 sf

Yard and Bulk Regulations.

- (1) Lot Frontage: 50 feet minimum
- (2) Lot Width: 50 feet minimum
- (3) Lot Coverage: 80%

Principal Building.

- (1) Front Yard Setback: 0 feet minimum – 15 feet maximum
- (2) Side Yard Setback: 0 feet minimum – 15 feet maximum
- (3) Rear Yard Setback: 0 feet minimum – no maximum

Accessory Structure.

- (1) Front Yard Setback: 24 feet minimum plus principal building setback
- (2) Side Yard Setback: 0 feet minimum - no maximum
- (3) Rear Yard Setback: 3 feet minimum – no maximum

Density/Intensity Standards.

- (1) Maximum Residential Density: 20 units/acre
- (2) Principal Building Height: 4 stories/48 feet – 2 stories minimum
- (3) Accessory Building Height: 2 stories/20 feet

- C. Form B – Medium Density Residential Zone - Form B includes the following Blocks and Lots:

Block 162, Lot 73	Block 163, Lot 72	Block 164, Lot 10	Block 165, Lot 16
Lot 74	Lot 74	Lot 40	Lot 20
Lot 70	Lot 60	Lot 42	Lot 25
Lot 1		Lot 44	
Lot 2		Lot 45	
Lot 9		Lot 41	
Lot 10		Lot 47	
Lot 11		Lot 48	
		Lot 49	
		Lot 9	
		Lot 2	
		Lot 8	
		Lot 4	
		Lot 5	
		Lot 7	

Permitted Principal Uses.

- (1) Multi-Family Dwellings

Minimum Lot Size.

- (1) 5,000 sf

Yard and Bulk Regulations.

- (1) Lot Frontage: 50 feet minimum
- (2) Lot Width: 50 feet minimum
- (3) Lot Coverage: 70%

Principal Building.

- (1) Front Yard Setback: 10 feet minimum – 20 feet maximum
- (2) Side Yard Setback: 5 feet minimum – no maximum
- (3) Rear Yard Setback: 5 feet minimum – no maximum

Accessory Structure.

- (1) Front Yard Setback: 20 feet minimum plus principal building setback
- (2) Side Yard Setback: 6 feet minimum, no maximum
- (3) Rear Yard Setback: 6 feet minimum, no maximum

Density/Intensity Standards.

- (1) Maximum Residential Density: 15 units/acre
- (2) Principal Building Height: 3 stories/36 feet – 2 stories minimum
- (3) Accessory Building Height: 2 stories/20 feet

D. Form C – Lower Density Residential Zone - Form C includes the following Block and Lots:

Block 163, Lot 69	Block 164, Lot 1	Block 165, Lot 23
Lot 70	Lot 3	Lot 24.01
Lot 71	Lot 6	Lot 25

Permitted Principle Uses.

- (1) Multi-Family Dwellings

Minimum Lot Size

- (1) 5,000 sf



Yard and Bulk Regulations.

- (1) Lot Frontage: 50 feet minimum
- (2) Lot Width: 50 feet minimum
- (3) Lot Coverage: 70%

Principal Building.

- (1) Front Yard Setback: 20 feet minimum – no maximum
- (2) Side Yard Setback: 6 feet minimum – no maximum
- (3) Rear Yard Setback: 6 feet minimum – no maximum

Accessory Structure.

- (1) Front Yard Setback: 20 feet minimum plus principal building setback
- (2) Side Yard Setback: 6 feet minimum – no maximum
- (3) Rear Yard Setback: 6 feet minimum – no maximum

Density/Intensity Standards.

- (1) Maximum Residential Density: 10 units/acre
- (2) Principal Building Height: 2 stories/35 feet
- (3) Accessory Building Height: 2 stories/20 feet

All Ordinances or parts of Ordinances that are inconsistent herewith are repealed, but only to the extent of such inconsistency.

The amended Ordinance shall become effective immediately upon its passage and the publication as required by law.

APPROVED ON FIRST READING:

APPROVED, PASSED AND ADOPTED:

ATTEST:

\_\_\_\_\_  
Richard J. Cuttrell,  
Municipal Clerk

\_\_\_\_\_  
Dr. Michael Brantley,  
Mayor

***FORM-BASED CODE***  
***NEPTUNE TRANSIT VILLAGE***

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**TOWNSHIP OF NEPTUNE**  
**MONMOUTH COUNTY, NEW JERSEY**  
DECEMBER 2009

PREPARED FOR:  
**TOWNSHIP OF NEPTUNE**

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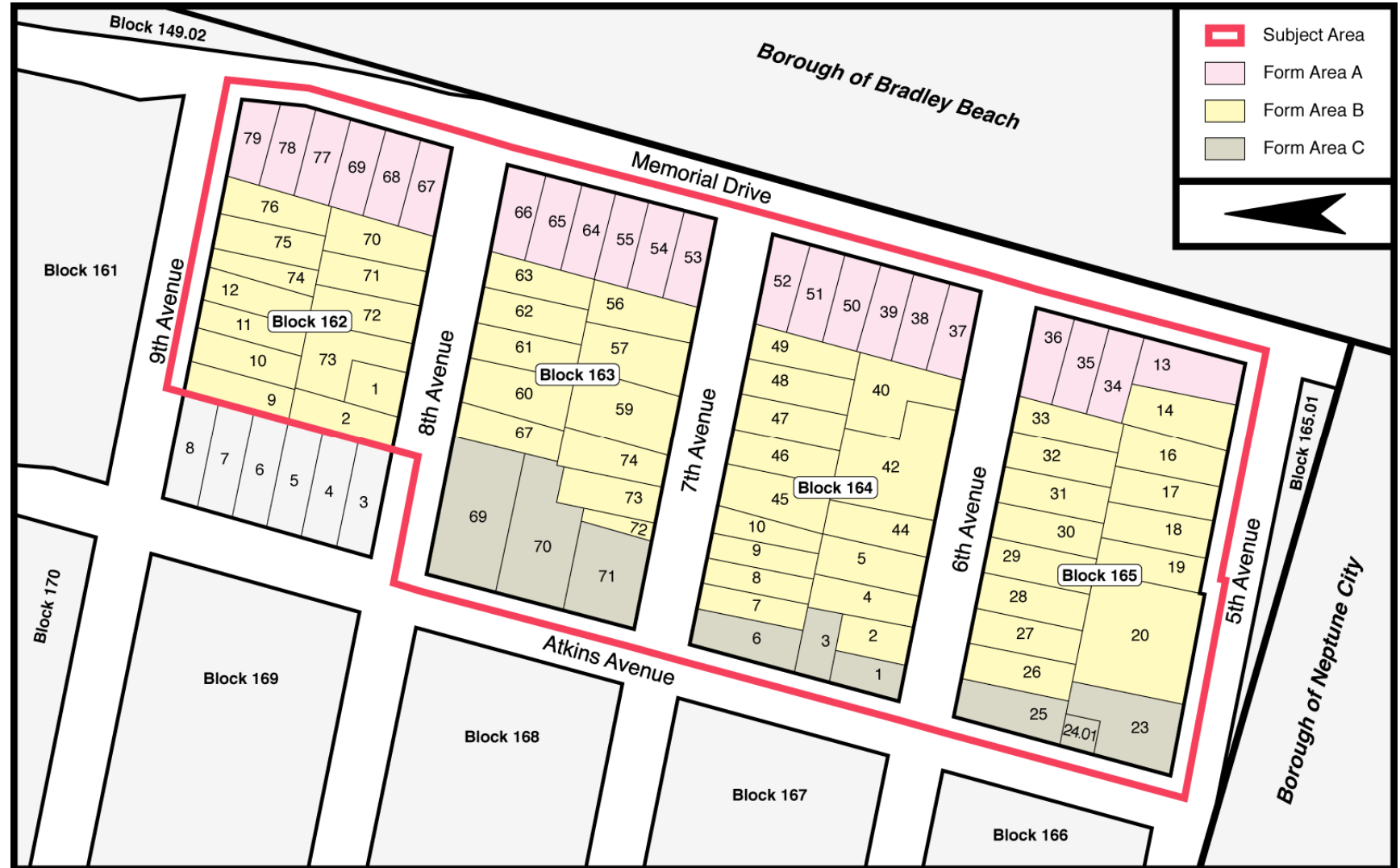
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SECTION 1: REGULATING PLAN

1. Building Form Areas



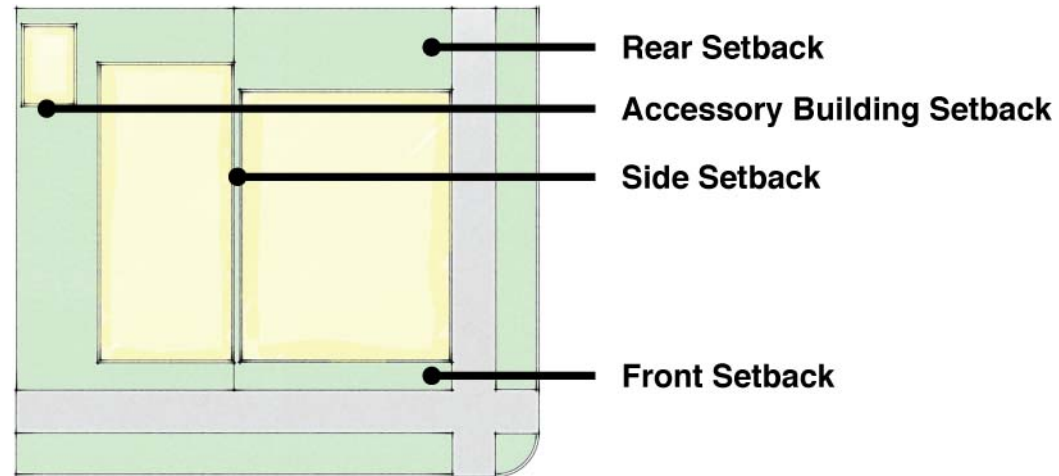
**SECTION 2: BUILDING PLACEMENT STANDARDS**

**1. Form Area A: Lots with Frontage on Memorial Drive (Including Corner Lots)**

**1.1 Building Placement Standards**

Principal Building Setbacks			Accessory Building Setbacks			Principal Building Height		Accessory Building Height		Lot Width	Lot Cover	Density/ Intensity
Front	Side	Rear	Front	Side	Rear	Feet	Stories	Feet	Stories			
5 feet min., 20 feet max.	0 feet min., 15 feet max.	0 feet min.	24 feet min., plus (+) principal building setback	0 feet min.	3 feet min.	48 feet max.	2 stories min., 4 stories max.	25 feet max.	2 stories max.	40 feet min., 80 feet max.	70 percent max.	8 dwellings per acre

**1.2 Building Placement Diagram**



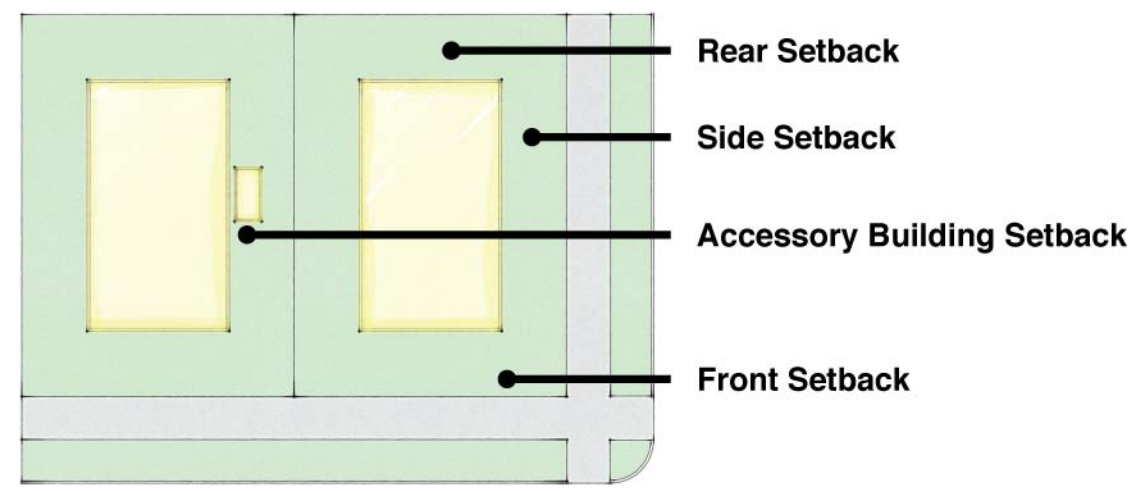


**2. Form Area B: Lots with Frontage on 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup> Avenues (Excluding Corner Lots)**

**2.1 Building Placement Standards**

Principal Building Setbacks			Accessory Building Setbacks			Principal Building Height		Accessory Building Height		Lot Width	Lot Cover	Density/ Intensity
Front	Side	Rear	Front	Side	Rear	Feet	Stories	Feet	Stories			
12 feet min., 25 feet max.	12 feet min.	12 feet min.	20 feet min., plus (+) principal building setback	6 feet min.	6 feet min.	36 feet max.	3 stories max.	25 feet max.	2 stories max.	50 feet min., 100 feet max.	60 percent max.	6 dwellings per acre

**2.2 Building Placement Diagram**

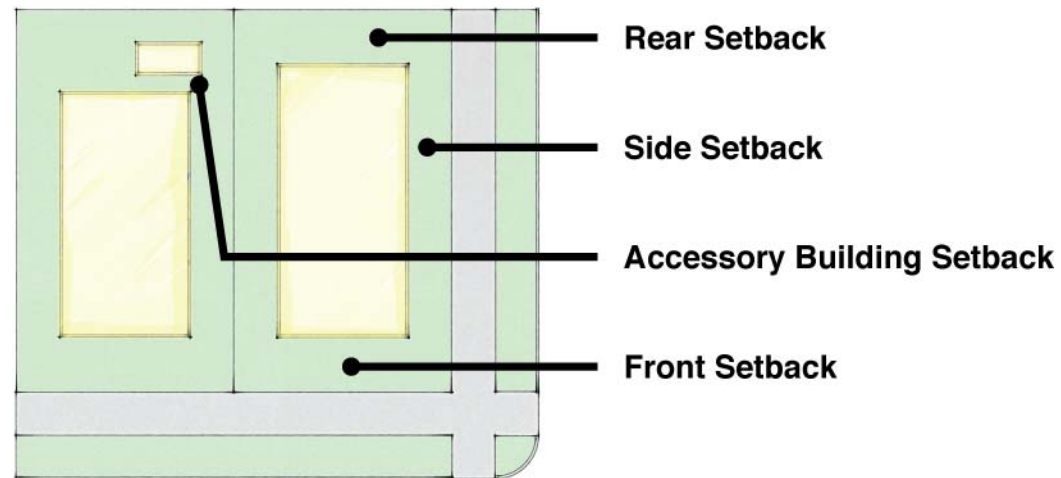


**3. Form Area C: Lots with Frontage on Atkins Avenue (Including Corner Lots)**

**3.1 Building Placement Standards**

Principal Building Setbacks			Accessory Building Setbacks			Principal Building Height		Accessory Building Height		Lot Width	Lot Cover	Density/ Intensity
Front	Side	Rear	Front	Side	Rear	Feet	Stories	Feet	Stories			
10 feet min., 20 feet max.	8 feet min.	10 feet min.	18 feet min., plus (+) principal building setback	6 feet min.	6 feet min.	36 feet max.	3 stories max.	25 feet max.	2 stories max.	40 feet min., 80 feet max.	65 percent max.	6 dwellings per acre

**3.2 Building Placement Diagram**





## **SECTION 3: BUILDING FORM STANDARDS**

### **1. General Requirements for Residential Buildings**

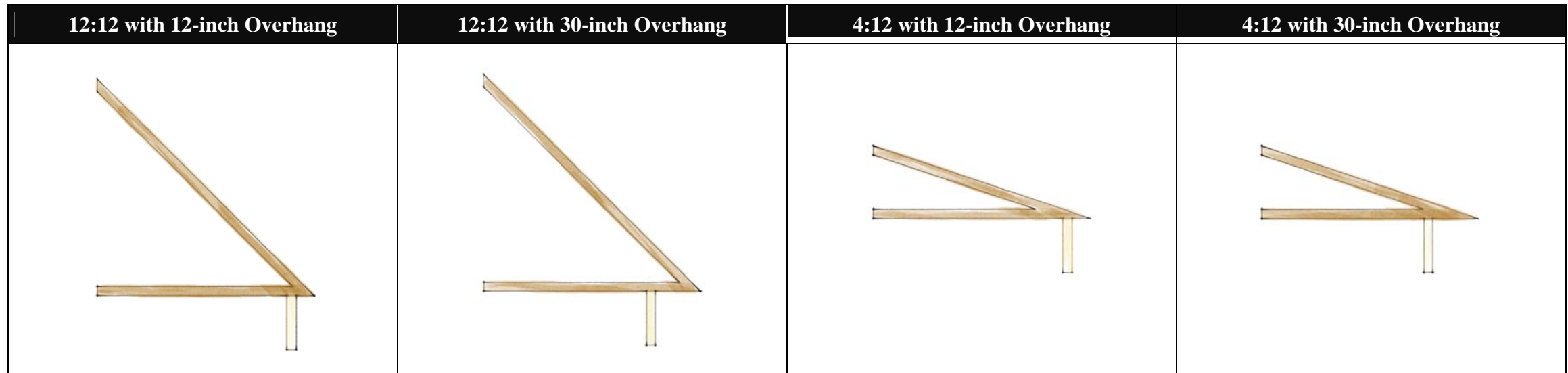
#### **1.1 Architectural Styles**

Newly constructed buildings shall be constructed in an architectural style that is representative of the existing character of the area. Residential buildings shall be constructed in one of the following architectural styles: Folk Victorian; Bungalow; or, Dutch Colonial. Alternatively, another architectural style that is deemed to be consistent with the character of the area may be used.

## 2. Building Elements for Residential Buildings

### 2.1 Roofs

The roofs of residential buildings shall be symmetrical hips or gables with an overhang of at least twelve (12) inches and a pitch of between 4:12 and 12:12. Overhangs shall not exceed thirty (30) inches beyond the face of any façade.



### 2.2 Walls

Walls may be constructed of two different materials provided that the heavier material is placed below. When two materials are used on a front façade and terminate on the outside corner of the façade, both materials must continue for a minimum distance of three (3) feet around the corner of the side façade. At the joint between a wall and an overhanging pitched roof, the use of moldings is appropriate to indicate the transition.



### **2.3 Windows and Doors**

The use of moldings or other surrounds on windows and doors is encouraged, but not required.

### **2.4 Chimneys**

Exterior chimneys shall be finished in brick or stone.

### **2.5 Porches**

Porches are required to be incorporated into the design and construction of new residential dwellings.

### **2.6 Materials**

Residential building walls shall be made of one or more of the following materials: wood clapboard, primed board, brick, stone, approved vinyl siding, fiber cement siding, or similar approved material.

Retaining or decorative walls may be of brick or stone, and must match the main building.

Front yard fences shall be made of wood picket, split rail, or decorative metal, such as wrought iron. Side and rear yard fences may match front yard fences, or may be made of chain link fencing, board-on-board fencing, or another similar material. Front yard fences may not exceed four (4) feet in height. Side and rear yard fencing may be no less than four (4) but and not more than six (6) feet in height.

Residential roofs, including porch roofs, shall be clad in wood shingles, standing seam metal, slate, asphalt shingles or other approved material. Overhanging eaves may expose rafters

## **2.7 Private Frontages**

The following private frontage types are permitted for new residential structures:

- Common Yards
- Fences (materials must conform to the above requirements)
- Terraces or Dooryards
- Forecourts
- Stoops

## **3. General Requirements for Non-Residential and Mixed-Use Buildings**

### **3.1 Architectural Styles**

Newly constructed non-residential and mixed-use buildings shall emulate the architectural elements of a turn-of-the-century factory building. Alternatively, planned non-residential and mixed-use buildings shall be designed to emulate the architecture of an iconic “Main Street” environment.

## **4. Building Elements for Non-Residential and Mixed-Use Buildings**

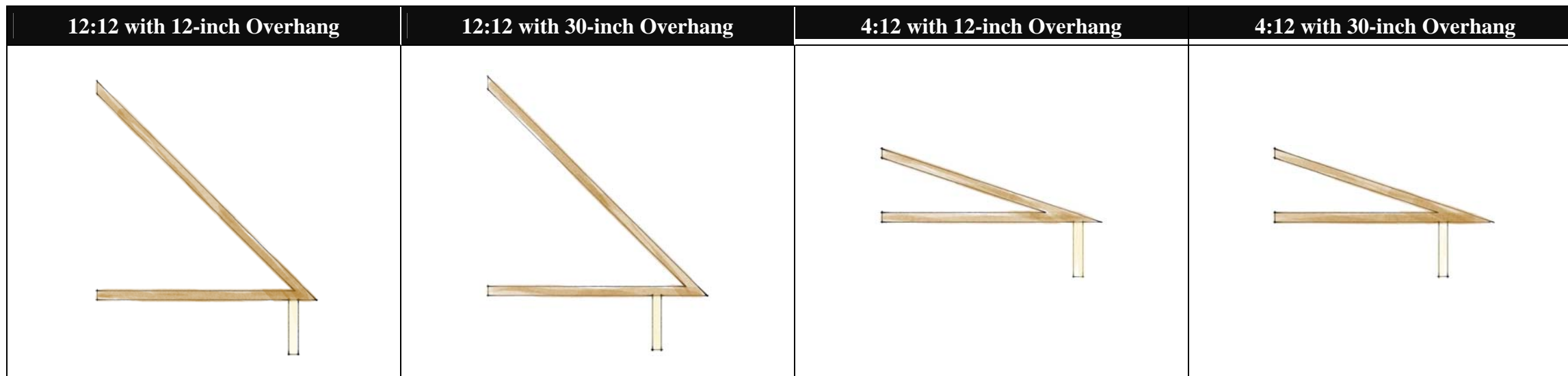
### **4.1 Materials**

Non-residential and mixed-use buildings shall be constructed of brick, cast concrete, or some other masonry material that is similar in appearance and durability. All ancillary structures shall be constructed of materials similar in appearance to the primary structure. Commercial and mixed-use buildings are encouraged to incorporate some element of ornamentation on building facades that front public streets.



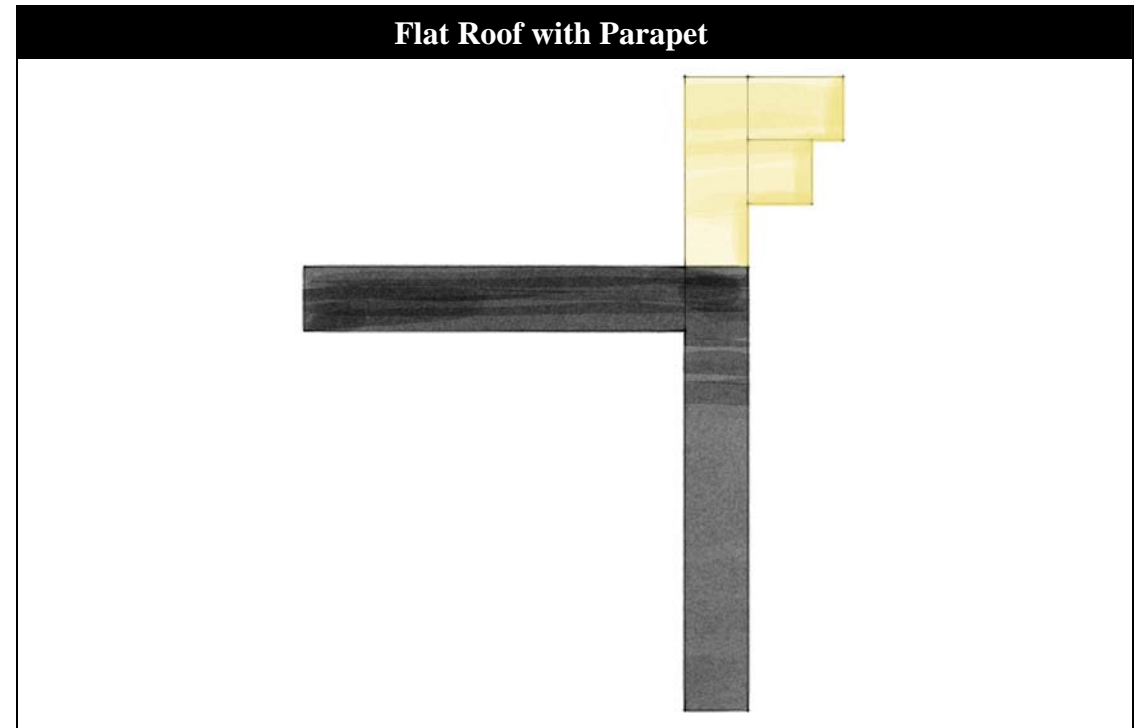
## 4.2 Roofs

Main roofs on commercial and mixed-use buildings shall be constructed as symmetrical hips or gables, wherever possible. Roofs shall be designed to incorporate an overhang of at least twelve (12) inches and a pitch of between 4:12 and 12:12. Overhangs shall not exceed thirty (30) inches beyond the face of any façade.



Flat roofs are permissible on non-residential and mixed-use buildings. Flat roofs must be raked at the minimum slope necessary to shed water and meet other standard construction requirements.

Buildings with flat roofs must include a parapet surround on the primary (front) façade, as well as on both side façades. The top of the parapets shall be no lower than eighteen (18) inches higher than the adjacent roof surface.



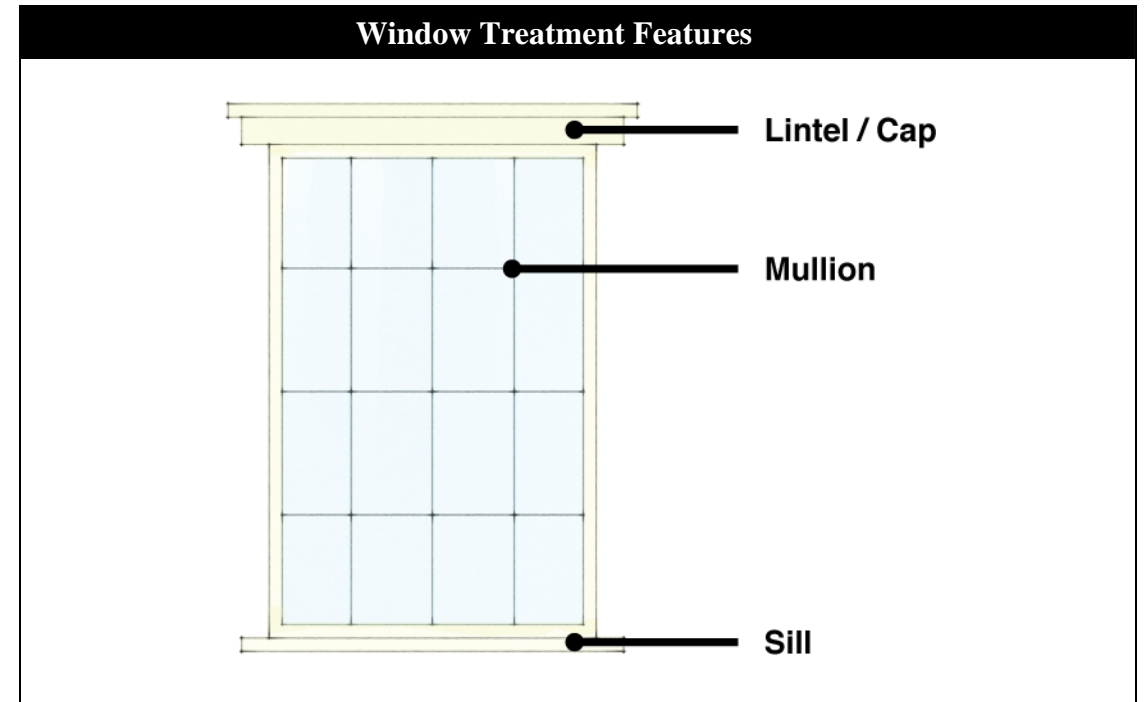


#### 4.3 Windows and Doors

Window types shall include bay, dormer, and double hung windows. Single-pane and tilt windows are permitted provided that the glass panes have mullions within. The minimum vertical proportion of a window shall be 1.5 times its width. Bands of windows (a horizontal series of three windows or more, separated only by mullions that form a horizontal band across the façade of a building) are permitted.

Glass types for windows shall be clear. Window treatments shall include caps, lintels, and sills.

Permitted door types include entry doors and French doors for public entrances into non-residential (e.g. commercial) uses. For entrances to private residences that may be located within mixed-use buildings, only entry doors shall be permitted. French doors and patio doors may be permitted to provide access to any patios that may be located at the rear of any non-residential or mixed-use building.



#### 4.4 Chimneys

Exterior chimneys shall be finished in brick or stone. Chimney hoods and caps shall be finished with brick. Chimney shafts shall be integrated into the design of the building.

#### 4.5 Porches and Awnings

All structures built along Memorial Drive are required to include physical extensions that extend into the intermediate space between the required minimum setback and the public right-of-way. These physical extensions are intended to provide a transition between public and private space, to provide pedestrians with protection from the sun and rain, and to enhance the experience of pedestrians who walk along Memorial Drive. These physical extensions may be in the form of porches or awnings.

At minimum, awnings shall be constructed of a rigid metal frame with a stretched canvas cover. However, awnings may be designed to incorporate ornate architectural details that are consistent with the overall character of the subject building, as well as the surrounding buildings.

Porches shall be constructed of elements that are consistent with the overall architectural character of the subject building. Porches shall include vertical supports as well as horizontal extensions from the building façade in order to create an effective outdoor space that includes a roof, a floor, and three open sides. Porches may be constructed to allow additional usable space above the ground floor (e.g. balconies). In these cases, a traditional porch roof may be replaced with a usable floor to provide accessible outdoor space for residents or tenants of the second story of the building. This technique may also be replicated on the third and fourth stories of a building fronting Memorial Drive.

All buildings that front Memorial Drive are required to provide either a porch or awnings that shall extend from the primary façade of the building. At a minimum, porches and awnings are required to be no less than one-third (1/3) of the length of the front façade of the building to which they are attached, and shall provide protection for all the entryways of the building. It is strongly encouraged, though not required, that additional protection be provided for all building openings, including windows.

Awnings shall extend no less than six (6) feet from the front façade of a building, and porches shall extend no less than seven (7) feet from the front façade of a building.

#### **4.6 Private Frontages**

The following private frontage types are permitted for new structures:

- Terraces or Dooryards (at the rear of the building only)
- Stoops



## **SECTION 4: PUBLIC SPACE STANDARDS**

### **1. Memorial Drive**

#### ***1.1 Assembly***

The assembly width for Memorial Drive shall be no less than fourteen (14) and no more than twenty (20) feet.

#### ***1.2 Curb Type and Radius***

Raised curbs shall be required along Memorial Drive. Curb Radii along Memorial Drive shall be no less than five (5) feet, and no more than twenty (20) feet in length.

#### ***1.3 Sidewalk Width***

Sidewalks shall be provided along Memorial Drive. Sidewalks shall be no less than eight (8) feet and no more than twelve (12) feet in width.


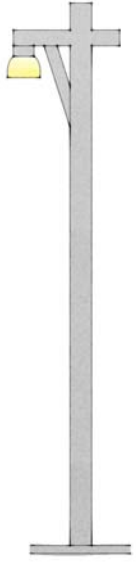


#### ***1.4 Planting Strips***

Planting strips shall be provided along Memorial Drive to beautify the corridor and buffer pedestrians from vehicular and bicycle traffic. Planting strips shall be no less than five (5) feet and no more than twelve (12) feet in width and shall be continuous, breaking only for driveways and ADA-accessible curb ramps provided for pedestrian crossing.

Planting strips shall incorporate shade trees to provide pedestrians with protection from the sun and to enhance the aesthetics of the Memorial Drive Corridor. Shade trees shall be planted on center within the planting strip with twenty-five (25) feet between plantings. Shade trees planted along the Memorial Drive Corridor shall be all the same species. Suggested species include: October Glory Maple; Autumn Blaze Red Maple; and, Crimson King.

**1.5 Lighting**

Light fixtures along Memorial Drive shall be pipe, post, column, or double column fixtures and shall not exceed fourteen (14) feet in height. Fixtures shall be placed on the sidewalk in close proximity to the planting strip. Fixtures shall be placed evenly and occur at intervals of fifty (50) feet on the west side of Memorial Drive, and at 100-foot intervals along the east side of Memorial Drive. Special considerations may be given to the presence of outdoor seating areas for restaurants, the presence of traffic signals, and/or utility poles when placing light fixtures. Light fixtures shall be decorated with hanging planters along both sides of the roadway.

Pipe	Post	Column	Double Column
			

**1.6 Street Furniture**

Street furniture shall be provided along the Memorial Drive Corridor. Street furniture shall be coordinated in color and style, and shall include benches, trash receptacles, and newspaper vending machines at a minimum. Street furniture shall be placed opportunistically between lighting fixtures, or on small concrete pads that may be located on the planting strip. Benches



shall be placed in close proximity to street trees wherever possible. Trash receptacles shall be placed on or near street corners. Newspaper vending machines may be placed opportunistically.

## **2. 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> Avenues**

### ***2.1 Assembly***

The assembly widths for 5th, 6th, 7th, and 8th Avenues shall be no less than ten (10) and no more than sixteen (16) feet.

### ***2.2 Curb Type and Radius***

Raised curbs shall be required along 5th, 6th, 7th, and 8th Avenues. Curb Radii along these thoroughfares shall be no less than five (5) feet, and no more than twenty (20) feet in length.

### ***2.3 Sidewalk Width***

Sidewalks shall be provided on both sides of 5th, 6th, 7th, and 8th Avenues. Sidewalks shall be no less than four (4) feet and no more than eight (8) feet in width.

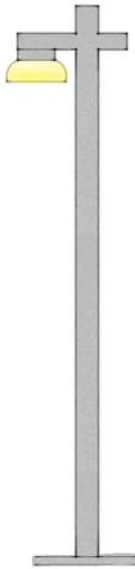
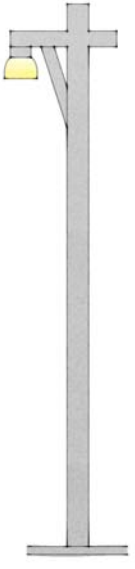

### ***2.4 Planting Strips***

Planting strips shall be provided along both sides of 5th, 6th, 7th, and 8th Avenues to beautify the streets and buffer pedestrians from vehicular traffic. Planting strips shall be no less than five (5) feet and no more than twelve (12) feet in width and shall be continuous, breaking only for driveways and ADA-accessible curb ramps provided for pedestrian crossing.

Planting strips shall incorporate shade trees to provide protection pedestrians with protection from the sun, and to enhance the aesthetics of the residential streets. Shade trees shall be planted on center within the planting strip at intervals of with thirty (30) feet between plantings. Shade trees planted along 5th, 6th, 7th, and 8th Avenues shall be alternating species. Suggested species include: Norway Maple; Red Maple; Red Oak; and, Green Ash.

**2.5 Lighting**

Light fixtures along 5th, 6th, 7th, and 8th Avenues shall be pipe, post, or column fixtures and shall not exceed fourteen (14) feet in height. Fixtures shall be placed on concrete pads within the planting strip and shall be placed evenly at intervals of one hundred (100) feet on alternating sides of the roadway. Special considerations may be given to the presence of traffic signals, and/or utility poles when placing light fixtures.

Pipe	Post	Column
		



### **3. Atkins Avenue**

#### ***3.1 Assembly***

The assembly width for Atkins Avenue shall be no less than ten (10) and no more than sixteen (16) feet.

#### ***3.2 Curb Type and Radius***

Raised curbs shall be required along Atkins Avenue. Curb Radii along Atkins Avenue shall be no less than five (5) feet, and no more than twenty (20) feet in length.

#### ***3.3 Sidewalk Width***

Sidewalks shall be provided along Atkins. Sidewalks shall be no less than six (6) feet and no more than ten (10) feet in width.

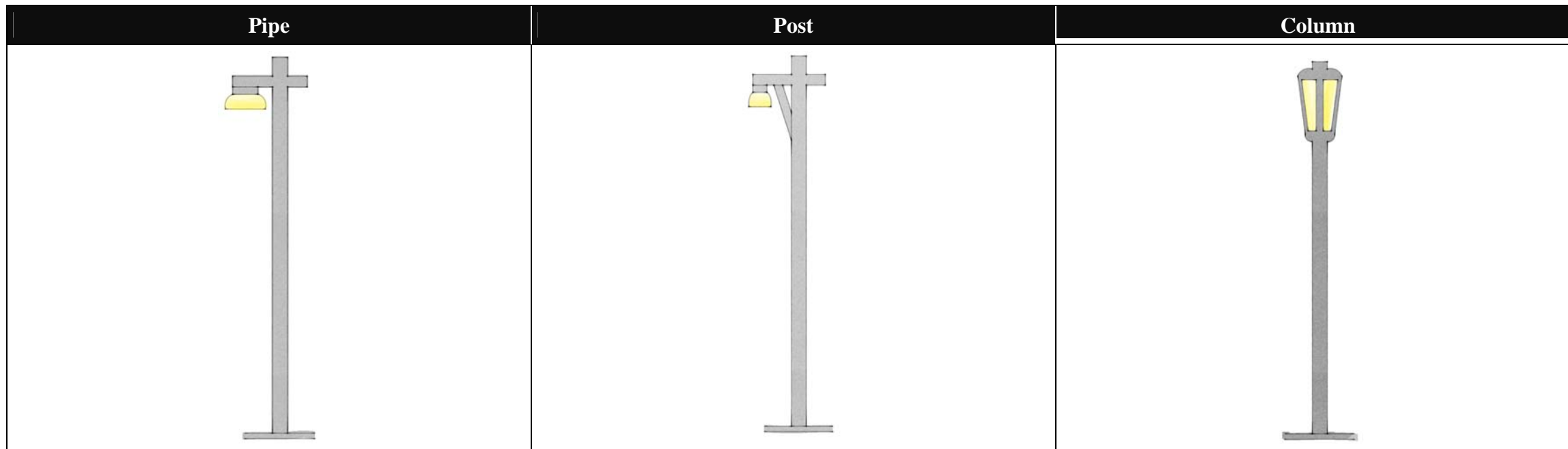
#### ***3.4 Planting Strips***

Planting strips shall be provided along both sides of Atkins Avenue to beautify the Avenue and buffer pedestrians from vehicular traffic. Planting strips shall be no less than five (5) feet and no more than twelve (12) feet in width and shall be continuous, breaking only for driveways and ADA-accessible curb ramps provided for pedestrian crossing.

Planting strips shall incorporate shade trees to provide pedestrians with protection from the sun, and to enhance the aesthetics of the Avenue. Shade trees shall be planted on center with thirty (30) feet between plantings. Shade trees planted along Atkins Avenue shall be alternating species. Suggested species include: Norway Maple; Red Maple; Red Oak; and, Green Ash.

### 3.5 Lighting

Light fixtures along Atkins Avenue shall be pipe, post, or column fixtures and shall not exceed fourteen (14) feet in height. Fixtures shall be placed on concrete pads within the planting strip and shall be placed at intervals of seventy-five (75) feet on both sides of the roadway. Special considerations may be given to the presence of traffic signals, and/or utility poles when placing light fixtures.



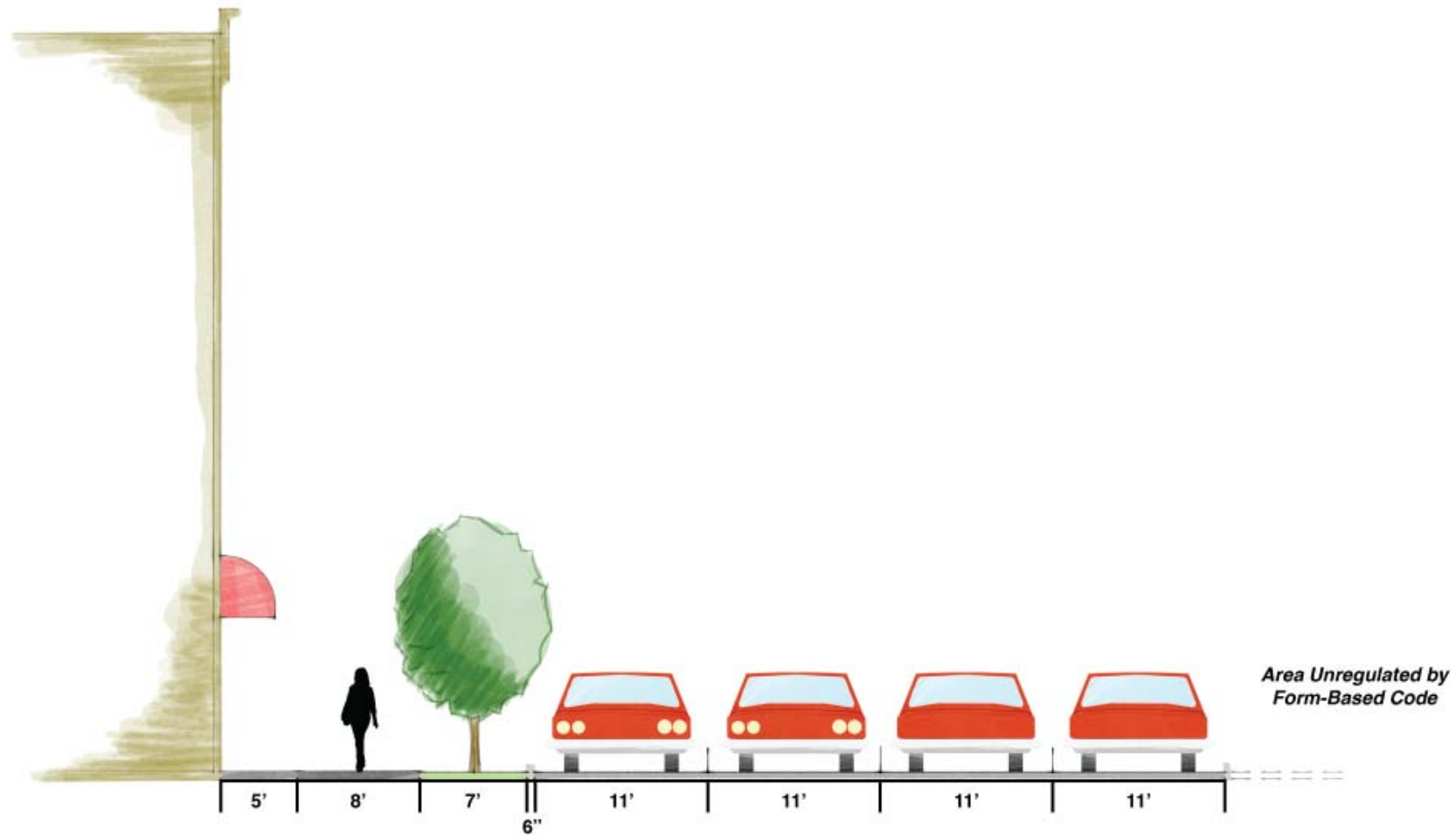
### 3.6 Street Furniture

Street furniture is not required along the Atkins Avenue Corridor. However, the provision of benches and trash receptacles are encouraged. Street furniture shall be coordinated in color and style, and shall be placed opportunistically on small concrete pads that may be located on the planting strip. Benches shall be placed in close proximity to street trees wherever possible and trash receptacles shall be placed on or near street corners.

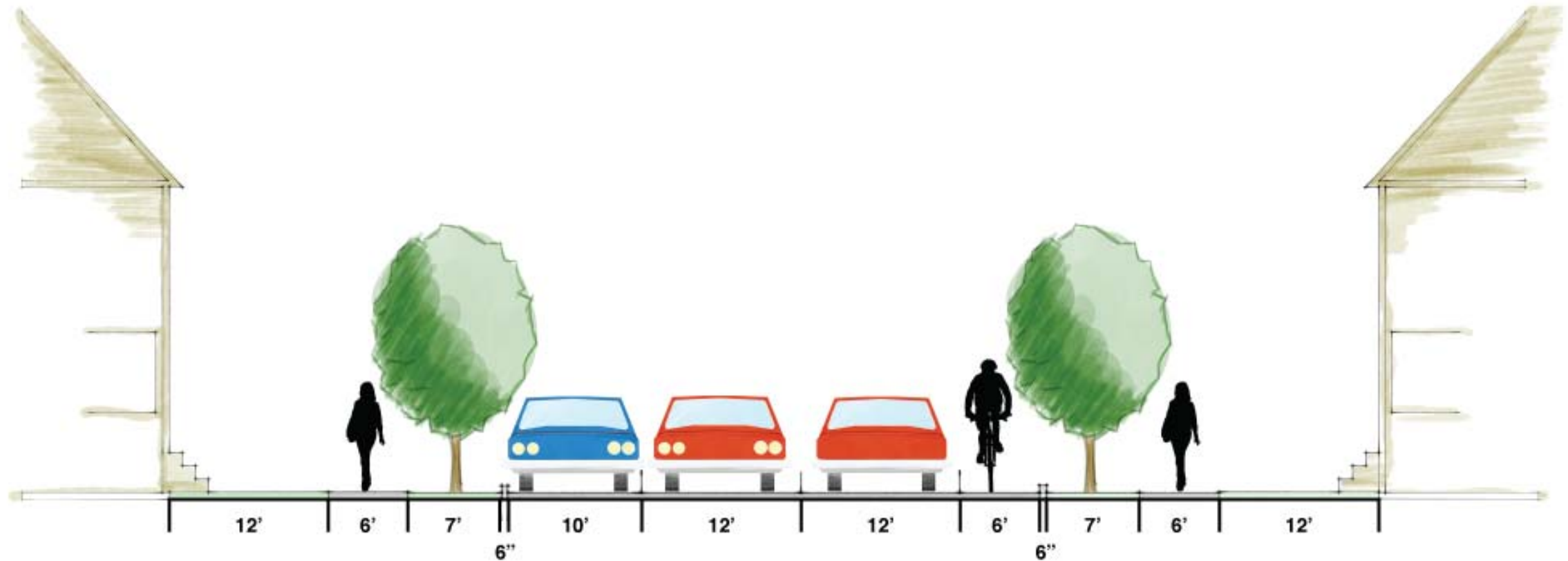


SECTION 5: THOROUGHFARE ASSEMBLIES

1. Memorial Drive

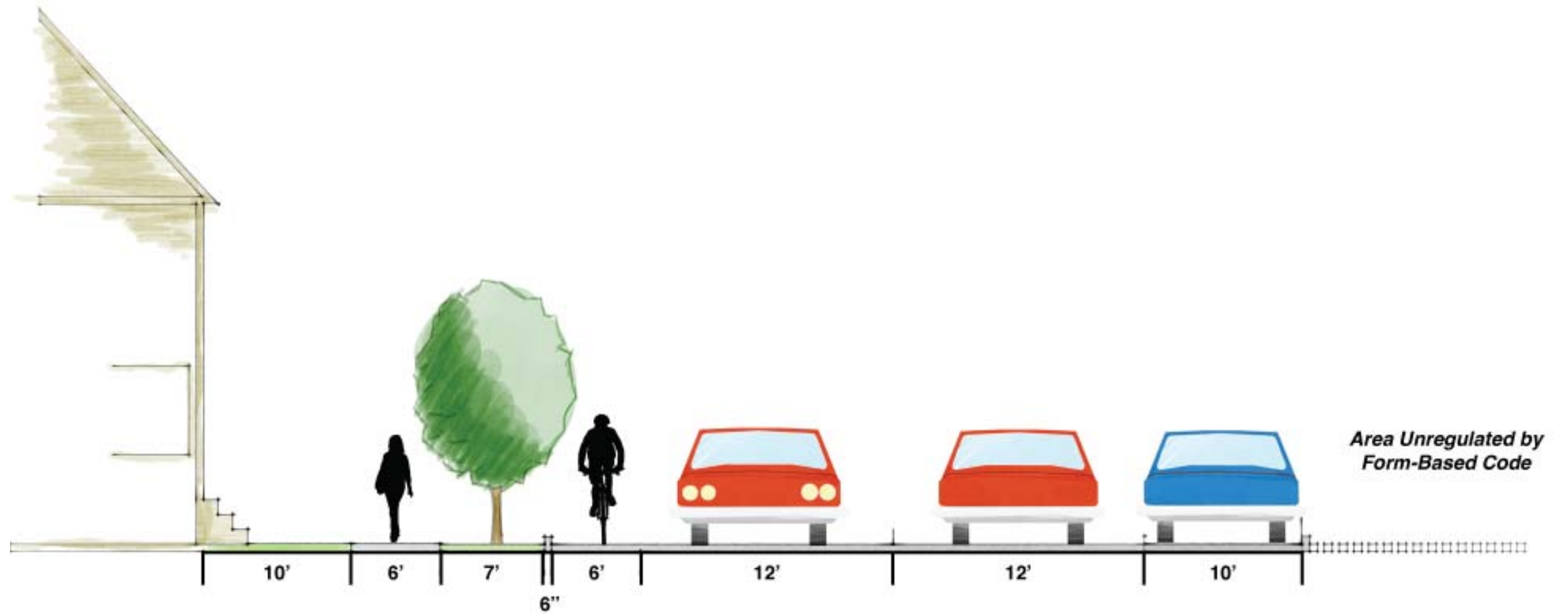


2. 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> Avenues





3. Atkins Avenue



## **SECTION 6: TRAFFIC CALMING**

According to the Institute of Transportation Engineers (ITE), “traffic calming is the combination of mainly physical measures to reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users” (I.M. Lockwood, “ITE Traffic Calming Definition,” ITE Journal, Vol. 67, July 1997, page 22-24).

Implementing traffic calming measures is an essential action in creating safe streets for pedestrians, and limiting potentially dangerous conflicts between vehicles, bicyclists, and pedestrians. The subsections that follow discuss traffic calming mechanisms that may be implemented to achieve these goals.

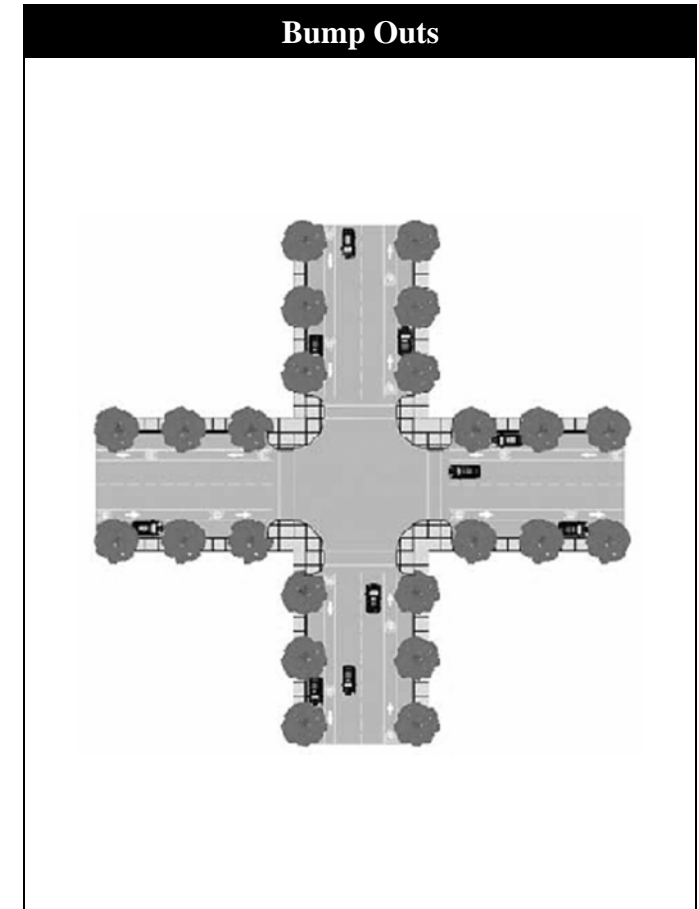


## 1. Bump Outs

Bump outs, also known as neckdowns, involve the extension of the curb line to narrow the street width and shorten the length of the crosswalk. Bump outs reduce the curb-to-curb roadway width, making the intersection more pedestrian friendly by shortening the crossing distance and improving the visibility of the crosswalk and the intersection via raised peninsulas. Bump outs can also tighten curb radii, thereby reducing the speed of turning vehicles.

Generally, the curb is extended eight (8) feet from the existing curb line, thereby creating a protected area for parked vehicles. This measure also provides greater visibility at intersections, since vehicle travel away from the curb line and closer to the centerline of the traveled way. Bump outs reduce the length of the crosswalk for pedestrians, while creating a narrowing effect to the motorist traveling through the bump out. Bump outs may also be used at mid-block locations to provide areas for benches and plantings. Vertical elements such as flagpoles, trash cans, and street trees can also be used to draw attention to the constriction of the road and provide a visual cue to the motorist.

Bump outs may be most effective if they are provided along the Memorial Drive Corridor. Citizen feedback suggests that cars traveling along the Memorial Drive Corridor do so at excessive speeds, making it difficult for pedestrians to safely cross the roadway. Bump outs should also be considered along the Atkins Avenue Corridor, where a wide cartway width and a straight roadway allow motorists to travel at excessive speeds.

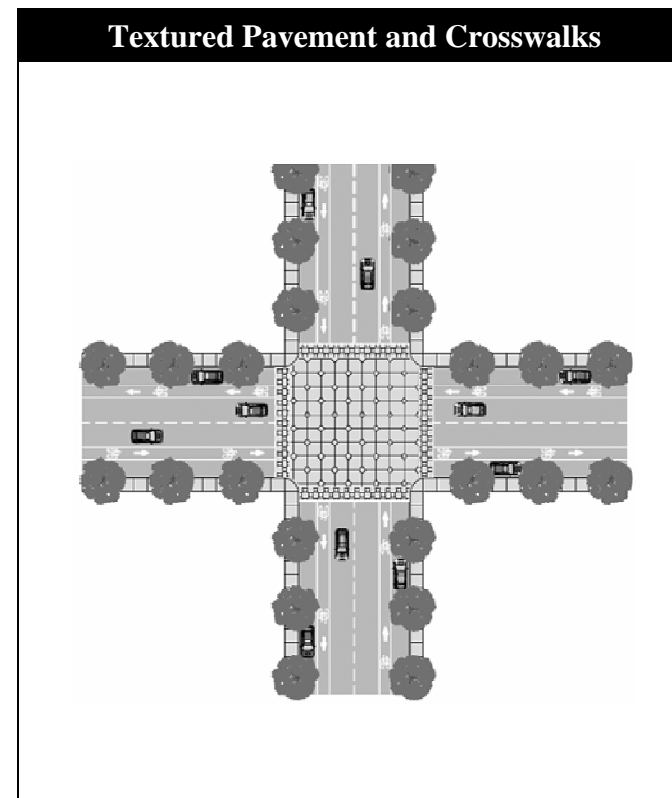


## 2. Textured Pavement and Crosswalks

Concrete pavers, stamped concrete and/or decorative pavement can be placed at intersections to warn motorists that they are approaching a pedestrian crossing. This traffic calming measure by itself has a minimal effect on reducing traffic speeds or volume. However, it is particularly effective when used in combination with other traffic calming measures.

Textured pavement and crosswalks may present traction problems for bicyclists and wheelchairs if a heavily-textured surface is utilized. Care should be taken to design an appropriate pavement texture that meets the requirements of the Americans with Disabilities Act (ADA). Consideration should also be given to bicyclists when developing a textured pavement treatment. Another issue with implementing textured pavement at crosswalks is associated with roadway maintenance, particularly as it relates to utility work and road opening permits. When a road opening is required in areas having textured or decorative pavement, the roadway will only be patched with hot mix asphalt. Therefore, this traffic calming strategy should be implemented concurrently with a road opening permit ordinance that requires a contractor to restore the road surface using a matching decorative pavement.

Textured pavement and crosswalks should be implemented in intersections along the Memorial Drive Corridor.



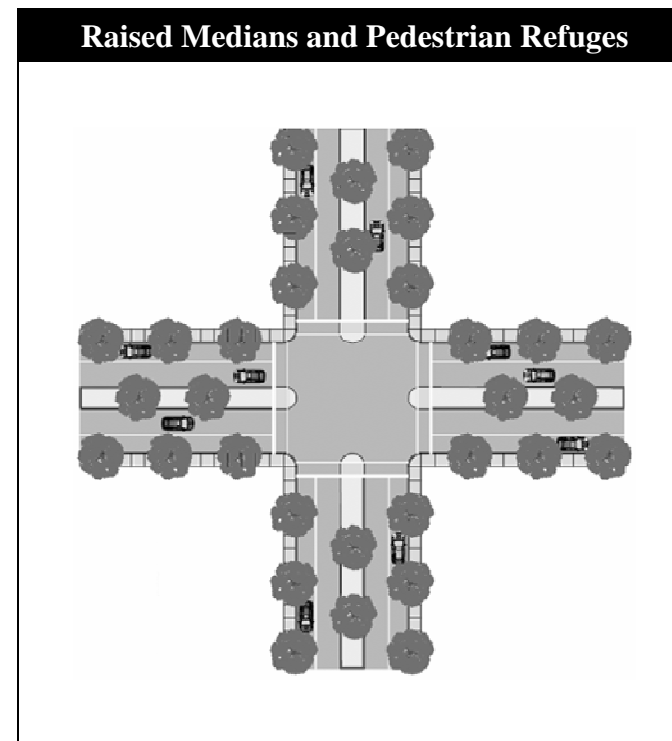


### 3. Raised Medians and Pedestrian Refuges

A raised median includes the installation of a curbed island within the center of a street. This island narrows the travel lanes at that location and provides pedestrians with a refuge area at the center of the street. This reduces crossing distance for pedestrians by allowing them to cross half of the street at one time. They can be provided at approaches to intersections or along an entire block.

Median islands should be six (6) feet to eight (8) feet wide and should be at least twelve (12) to twenty (20) feet in length. Access across the raised median should be provided in the design to accommodate pedestrians and bicyclists. Raised medians will restrict access to driveways to/from one direction of travel.

Raised medians and pedestrian refuges would be most appropriate along the Memorial Drive Corridor. Implementing these traffic calming measures would reduce the overall speed of automobiles traveling along the roadway, and would also provide an added element of beautification. Any raised medians should be appropriately landscaped, but should not interfere with the intended function of the traffic calming measure.



## **SECTION 7: PARKING**

### **1. Parking**

#### **1.1 Standards**

Parking areas shall be located at the rear of buildings wherever possible in order to preserve an attractive, walkable public realm. If locating parking areas at the rear of buildings is not possible, parking areas may be provided beside structures, provided that the parking area does not occupy a distance of more than one-third (1/3) of the entire lot or block frontage, whichever is smaller.

No parking areas shall front on Memorial Drive.

All off-street parking provided for multifamily residential uses shall be located at the rear of the structure. Parking areas provided for single-family structures may be provided by a driveway located on the subject lot.

Required dimensions for parking areas, associated driveways, and the number of required parking stalls shall be governed by §412.17 of the Neptune Township Land Development Ordinance, except in the case of residential development, which shall be governed by the parking requirements contained in the most recent edition of Residential Site Improvement Standards (RSIS) at NJAC 5:21.

#### **1.2 Permitted Reductions**

The parking standards contained in the Township's Land Development Ordinance and RSIS may be reduced pursuant to site plan approval of a development in accordance with the provisions that follow.



Reductions in parking would apply where the applicant demonstrates that there are either:

- Variations in the accumulation of vehicles by hour, by day, or by season; or
- Relationships that exist among the land uses that result in visiting multiple land uses on the same auto trip; or
- Another shared parking approach.

Parking may be reduced at the discretion of the Planning Board or Zoning Board of Adjustment to the following requirements:

- Retail: One (1) space for each 500 square feet of gross floor area
- Apartments: 1.3 spaces for each one-bedroom unit; 1.8 spaces per each two-bedroom unit
- Offices: One (1) space for each 300 square feet of gross floor area
- Restaurants, bars, and taverns: no parking is required

### **1.3 Buffering**

All parking lots visible from public rights-of-way shall be screened by plantings, berms, and/or walls. These walls shall be no less than three (3) feet high and no more than four (4) feet high.

## **SECTION 8: SIGNAGE**

### **1. Signage**

#### **1.1 Requirements**

Signage shall be governed by the regulations contained in §416 of the Neptune Township Land Development Ordinance.

RECEIVED

JUL 26 2013

MONMOUTH COUNTY  
PLANNING BOARD

NSP9262

August 26, 2011

Neptune Township Zoning Board of Adjustment  
POB 1125  
Neptune, New Jersey 07753

Re: 509 Memorial Drive Partners, LLC  
Lots 53, 54, 55, 56, 57 and 59 in Block 163  
Neptune Township, Monmouth County  
MRA File No. 10-140

Dear Board Members:

McDonough & Rea Associates (MRA) has prepared this *Traffic Impact Analysis* in connection with plans to redevelop the noted property into 48 multi-family residential units configured as follows:

- 21 one-bedroom units
- 27 two-bedroom units.

The subject property is located on the northwest corner of the intersection of Memorial Drive and 7<sup>th</sup> Avenue. A variance sketch prepared by Crest Engineering Associates (CEA) shows full access to 7<sup>th</sup> Avenue and a 1-way entrance only from Memorial Drive. The plan also shows a total parking supply of 72 spaces in order to support tenant and visitor demand. *Figure 1, Site Location Map*, appended to this letter, illustrates the approximate location of the property.

#### EXISTING CONDITIONS

The subject property is located on the northwest corner of Memorial Drive and 7<sup>th</sup> Avenue. Memorial Drive is a north/south Monmouth County roadway providing 2 travel lanes in each direction with a relatively level and straight alignment. Seventh Avenue is an east/west municipal roadway providing 1 travel lane in each direction with parking permitted on both sides of the roadway. The subject property is located in close proximity to the Bradley Beach NJ Transit railway station on the east side of Memorial Drive. Railroad crossings are provided at 7<sup>th</sup> Avenue and 6<sup>th</sup> Avenue/Brinley Avenue to the south.



### EXISTING TRAFFIC VOLUMES

MRA collected traffic volume data by conducting manual peak hour turning movement counts at the following intersections:

- Memorial Drive and 7<sup>th</sup> Avenue
- Atkins Avenue and 7<sup>th</sup> Avenue

The traffic counts were conducted during the summer recreational season and AM and PM peak street hour traffic volumes utilizing the adjacent roadway network are shown in *Figure 2*, appended to this letter.

### TRIP GENERATION AND DISTRIBUTION

Estimates of traffic to be generated by the 48 residential units were made based on data published by the Institute of Transportation Engineers (ITE) in the 8<sup>th</sup> Edition of the *Trip Generation* manual. *Table I* illustrates the anticipated AM and PM peak street hour traffic that will be generated from the 48 units:

TABLE I  
TRIP GENERATION

	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
AM Peak Street Hour	5	22	27
PM Peak Street Hour	29	15	44

Traffic was distributed along Memorial Drive and 7<sup>th</sup> Avenue in accordance with existing traffic patterns in the area and access to higher order roadways, such as Route 33, Route 35, Route 18, and the Garden State Parkway. *Figure 3*, appended to this letter, illustrates site generated and distributed traffic volumes during peak hours.

### ANALYSIS OF FUTURE TRAFFIC VOLUMES

A design year of 2014 was selected for analysis. In accordance with the New Jersey Department of Transportation (NJDOT) *Annual Background Growth Table*, a background traffic growth rate of 2.0 percent per year was added to existing traffic volumes. *Figure 4*, appended to this letter, illustrates design year 2014 AM and PM peak street hour *pre-development* traffic volumes and *Figure 5* illustrates year 2014 AM and PM peak street hour *post-development* traffic volumes.

Traffic engineers calculate levels of service of unsignalized intersections which relate to the quality of traffic flow. Level of service is a measure of average control delay. Average control delay is the time lost due to deceleration and the amount of time from when a vehicle is stopped for a traffic control device (or at the end of the queue) to when the vehicle departs the intersection. Delay is a relative quantity of driver discomfort, frustration, fuel consumption, and loss in travel time. Levels of service range from "A" to "F" with "A" being the highest or best attainable level of service. Level of service "E" with average control delays of not more than 50 seconds per vehicle at an unsignalized intersection indicates near to or at capacity conditions and is generally considered the limit of acceptable level of service and delay. Full definitions of levels of service for unsignalized intersections and level of service summaries are included in the *Appendix*. The intersections studied by this report were analyzed according to the procedures set forth in the *Highway Capacity Manual 2000*, using the *Highway Capacity Software (HCS+)*, release 5.4.

Memorial Drive intersects 7<sup>th</sup> Avenue as an unsignalized intersection with stop control to 7<sup>th</sup> Avenue. The eastbound 7<sup>th</sup> Avenue approach to Memorial Drive will operate at level of service "C" during the AM peak street hour and at level of service "D" during the PM peak street hour for the 2014 post-development condition. Westbound 7<sup>th</sup> Avenue will operate at level of service "C" during the AM peak street hour and at level of service "D" during the PM peak street hour. Left-turns from Memorial Drive onto 7<sup>th</sup> Avenue from both the northbound and southbound directions will operate at level of service "A" during the AM and PM peak street hours.

Seventh Avenue intersects Atkins Avenue as an unsignalized intersection with stop control to 7<sup>th</sup> Avenue. Eastbound 7<sup>th</sup> Avenue will operate at level of service "B" during the AM peak street hour and at level of service "B" during the PM peak street hour. Westbound 7<sup>th</sup> Avenue will operate at level of service "B" during the AM peak street hour and at level of service "B" during the PM peak street hour. Left-turns from northbound and southbound Atkins Avenue onto 7<sup>th</sup> Avenue will operate at level of service "A" during the AM and PM peak street hours.

*SITE PLAN AND PARKING*

A variance sketch, prepared by CEA, shows a total of 72 parking spaces supporting the 48 residential units. Twenty-one of the parking spaces are angled spaces along the northern boundary of 7<sup>th</sup> Avenue in front of the building.

New Jersey *Residential Site Improvement Standards (RSIS)* require 92 parking spaces for the 21 one-bedroom units and 27 two-bedroom units. Therefore, *RSIS* requirements are technically not met. However, provisions in the *RSIS* allow for alternate parking standards in certain situations.

Due to the fact that the subject property is located within a future transit village zone and is adjacent to the Bradley Beach train station, this factor needs to be taken into consideration in determining the overall parking that will be required for the 48 units. In addition, MRA conducted parking accumulation counts at the *Bradley Village* multi-family project directly across Memorial Drive and the railway tracks in Bradley Beach. The *Bradley Village* development contains 42 residential units; however, all units are 2-bedrooms and therefore parking ratios would be expected to be slightly higher at this complex as compared to the proposed complex in Neptune Township.

The following parking observations were made at *Bradley Village*:

DAY/DATE	TIME	NO. OF PARKED VEHICLES	RATIO PER UNIT
Sunday August 8, 2010	6:00 AM	71	1.7
Monday August 9, 2010		40	1.0
Sunday, September 19, 2010	9:00 AM	56	1.3
Sunday, October 10, 2010		50	1.2
Saturday, August 20, 2011	8:00 AM	65	1.5
Sunday, August 21, 2011			



As can be seen from the foregoing, peak parking accumulation at *Bradley Village* occurred on a Sunday morning in the summer with 71 parked vehicles. At other times, parking accumulation was lower.

It is our anticipation that the 72 parking spaces provided for the 48 residential units will be adequate to serve tenant and visitor demand for the overwhelming amount of time during the year. During peak summer weekends, we anticipate that there may be need for a small amount of vehicles generated by the complex to legally park along other sections of 7<sup>th</sup> Avenue proximate to the site. However, we anticipate this activity to be relatively light (approximately 5 vehicles) and there is adequate capacity along 7<sup>th</sup> Avenue on both the north and south sides of the street to accommodate this activity.

In summary, the variance sketch prepared for *509 Memorial Drive Partners, LLC*, showing 48 multi-family residential units to be constructed at the northwest corner of Memorial Drive and 7<sup>th</sup> Avenue can be approved and operate compatibly with existing traffic flow in the area. Levels of service at the Memorial Drive and 7<sup>th</sup> Avenue and the 7<sup>th</sup> Avenue and Atkins Avenue intersections will operate well within accepted traffic engineering parameters as will the site driveways to Memorial Drive and 7<sup>th</sup> Avenue.

The 72 parking spaces provided will be adequate for tenant and visitor demand for all time periods with the possible exception of several peak summer weekends during which a small number of vehicles may need to legally parking along roadways in the area. However, this activity is consistent with on-street parking that occurs at other multi-family complexes in the area.

A representative from MRA will attend a Neptune Township Zoning Board of adjustment meeting to provide testimony and answer any questions you or the public may have with regard to traffic issues pertaining to this application.

Very truly yours,

John H. Rea, PE  
Principal

Scott T. Kennel  
Associate



# TOWNSHIP OF NEPTUNE COMPREHENSIVE MASTER PLAN



**Neptune Township  
Monmouth County, New Jersey**

**September, 2011**

**Prepared by:**

A handwritten signature in blue ink, reading "Jennifer C. Beahm", is written over a horizontal line.

**Jennifer C. Beahm, PP, AICP  
New Jersey License No. 05625  
Original is Signed & Sealed**

## **Redevelopment Areas**

The Township of Neptune maintains several areas within its jurisdiction that have been designated by the governing body as areas in need of redevelopment pursuant to the LRHL, N.J.S.A. 40A:12A-1 et seq., and has adopted Redevelopment Plans for the same. These Redevelopment Plans have been prepared in order to transform vacant and underutilized land to contain productive and economically supportive uses.

### ***High Pointe - Route 18 Redevelopment Plan***

This is an area bound by State Highways 66 and 18; Neptune Boulevard, West Bangs Avenue and Wayside Road. The larger parcel, located to the west of State Highway 18 and containing 122 acres, is designated as the west parcel, while the smaller parcel, located to the east of State Highway 18 and containing about 44 acres, is designated as the east parcel. The area is identified as Blocks 345-390 and including all the lots therein; Block 1000, Lots 1,2,6,10.01, 11.02, 12.01; Block 1006, Lots 4, 14.01, 17, 18; and Block 1008, Lots 10, 11, 12, 13, 14, 14.02 and 24.

The High Pointe – Route 18 Redevelopment Plan was adopted on December 26, 2001 and subsequently a Redevelopment Agreement was approved by and between the Township of Neptune and Garden State Hi-Tech Park, L.L.C. on July 30, 2001. This Plan was subsequently amended in November 2005 and February 2008 to reflect the changes in market demand since the adoption of the original Plan.

This Redevelopment Area is proposed as Planned Commercial Development (PCD) that will serve both local and regional patrons and is intended to be developed to encourage high quality uses such as planned retail centers, including regional retail, restaurants, hotels, research and development facilities. Additionally, the area is proposed to contain Planned Residential and Commercial development, which would allow residential, retail and service uses in accordance with the C-1 Commercial Zoning. Overall the Planned Residential and Commercial development option permits residential development within high-rise structures of 12 stories and 150 feet in



height, office buildings to be developed to a height of eight (8) stories and 96 feet with garages to be a maximum of six (6) stories and 65 feet.

### ***West Lake Avenue Redevelopment Plan***

The West Lake Avenue Redevelopment Plan was adopted in 2005 and subsequently the Township entered into a Redevelopment Agreement with CityWorks West Lake, LLC. The area governed by the West Lake Avenue Redevelopment Plan includes all properties fronting along West Lake Avenue between State Highway 35 and the Township's boundary with Asbury Park. The area is identified as Block 178, Lots 4, 4.01, 5 and 6; Block 179, Lots 4, 5, and 6; Block 194, Lots 1, 2, 3 and 173-178; Block 195, Lots 1, 1.01, 2, 3 and 167-172; Block 217, Lots 56-61 and 482, 484 and 487; Block 218.02, Lots 612-618, 627-637, 642, 643 and 646; Block 219, Lots 50, 55 and 488-493; and Block 225, Lots 564-568 and 589-611.

West Lake Avenue was the Township's premier commercial corridors but has declined since the 1960s and at the present state consists of primarily underutilized and vacant properties. Some of the commercial establishments show signs of disinvestment and many buildings in the corridor are substandard. The overall goal of the Redevelopment Plan is the creation of walkable, attractive and inviting neighborhood center to serve the needs of the surrounding residential neighborhoods and the Neptune Township community. Additionally, the Plan was put in place with the objective of improving business opportunities and expansion through promotion of new and diverse economic activities and a variety of businesses in the said area. To that end the land uses proposed within the area consist of senior residential, commercial, restaurant, office and mixed use option, residential and office use overlay and mixed uses consisting of commercial on the first floor and residential on the second and third floor, if applicable. The Plan is currently in the process of being implemented, with Phase I of the project being completed.

### ***Redevelopment Plan for the North Channel of the Shark River***

The North Channel of the Shark River is one of the numerous waterfront areas in Neptune. The Redevelopment Plan for the North Channel of the Shark River was revised on November 27, 2006. In order to further enhance its role as a "Gateway" to the Jersey shore, Neptune Township

has identified the North Channel of the Shark River as a critical community and regional resource and proposed its redevelopment as a new waterfront destination for Neptune and the surrounding region. To that end the Redevelopment Plan proposes the creation of a mixed-use waterfront center supporting the recreational, commercial and residential needs of the Township. To that end the area is slated to be developed to contain a variety of residential, commercial and office buildings. If planned and implemented appropriately, the redevelopment of the North Channel can help initiate and support further economic growth and redevelopment in Neptune and provide a wide variety of commercial, recreational and cultural activities that will benefit the residents of the Township. Additionally, it will also promote public access to the waterfront by providing improved circulation, a new public plaza and pedestrian mall and a waterfront walkway and promenade. It is the intent of the Plan to avail of the scenic vistas and waterways in order to attract residents and visitors into the area to shop, dine and recreate in an attractive setting, consequently support economic activity and job creation in the Township as well as an appreciation of the natural resources of the Township.

#### ***Route 35 and West Bangs Avenue Redevelopment Plan***

The Route 35 and West Bangs Avenue Redevelopment Plan was adopted in 2008. This area, identified as Block 249, Lots 1,4,5,6 and 10.1 and Block 250, Lots 1.01 and 3 and containing an area of approximately 1.34 acres, has frontage along State Highway 35, Monroe Avenue and Bangs Avenue. The area contains a mix of vacant commercial and residential buildings. The overall goal of the Redevelopment Plan is the commercial redevelopment of the 1.34 acre tract in a manner that will enhance the Township's overall economic base.

#### ***Ocean Grove North End Redevelopment Plan***

The Ocean Grove North End Redevelopment Plan, adopted in 2008, provides a planning framework for the redevelopment and revitalization of the former North End Hotel site situated at the north end of the Ocean Grove oceanfront and boardwalk. The subject area containing approximately 5.60 acres is identified as Block 1, Lots 1 and 2, Block 1.01, Lots 3 and part of Lot 1, Block 146.03 and Portions of Lots 1 and 2. The Plan proposes to redevelop the site into a new mixed-use community with a hotel and combination of single-family residential and

commercial uses including public spaces and amenities. The purpose of the Plan is to reclaim the North End site as the northern anchor to Ocean Grove, while providing for new opportunities for employment and housing within the Township, as well as enhanced public access to the Wesley Lake waterfront and the oceanfront and beach areas of the Township.



*f. Establish Conditional Use Standards for Specific Commercial Uses.*

It is recommended that the Township establish Conditional Use Criteria for some commercial and/or industrial uses within the Township, to provide a uniform development pattern in within the commercial and industrial areas of the Township. Said criteria would establish specific criteria as well as appropriate zones and/or areas for the following uses: Assisted living facilities, New and Use Car Dealerships, Check Cashing Establishments Tow Service Establishments as well as any other uses that the Township feels would be appropriate.

*g. Convenience Store With Fueling Station*

The traditional gas station-repair facility has been transitioning away the combination of those uses and has trended toward a convenience store that provides gas filling capabilities. The repair and service component of these types of facilities are becoming less and less prevalent. Must zoning requirements, however still regulates gas stations as if the repair and maintenance activities are still taking place. Currently the Township Zoning Ordinance does not have provisions for these types of uses as such Use Variance approval would be required. It is recommended that the Township investigate existing commercially zoned areas of the Township, which are appropriate for such a use. It is further recommended that the township adopt standards where appropriate to permit convenience stores with gasoline fueling stations as conditional uses within these identified areas.

*h. Evaluate parking and loading requirements for commercial uses*

It is recommended that the existing parking and loading requirements for commercial uses within the Township be evaluated. Provisions that encourage shared parking should be investigated and where appropriate implemented.

## 2. Industrial Areas

There are three (3) industrially zoned areas in the Township that present opportunities for development/redevelopment and or zoning changes. As identified within the Land Use Element it is recommended that the properties currently zoned for light industrial uses be evaluated and alternative zoning be proposed, where appropriate.

*a. High Pointe – Route 18 Redevelopment Area*

The large tract of vacant property zoned LI in the northern portion of the Township is bisected by Route 18 is known locally as the High Pointe Redevelopment Area. This is the single largest contiguous tract available for redevelopment within the Township. The Township over the past several years has adopted several Redevelopment Plans for this area. At this time it is recommended that the zoning designation as well as Redevelopment Plans be reevaluated and new zoning standards be established for this area.

*b. Memorial Drive*

It is recommended that the light industrially zoned properties located along Memorial Drive should be evaluated given the proximity to the Transit Village area and new zoning criteria including a provision for mixed-use development should be explored.

*c. Ridge and 5<sup>th</sup> Avenues*

As identified within the Land Use Element, the land use pattern within this light industrial zone has transitioned away from traditional industrial zoning. It is recommended that alternative zoning criteria be established for this area.

3. Redevelopment Areas

The Township of Neptune maintains five (5) existing redevelopment zones throughout the Township. As discussed above, these Redevelopment Areas are comprised of the following: the Hi Point Park Redevelopment Area, West Lake Avenue Redevelopment Area, North Channel of the Shark River Redevelopment Area, Route 35 and West Bangs Avenue Redevelopment Area, and the Ocean Grove North End Redevelopment Area. The Township is also maintains a Transit Village Designation in the eastern portion of the Township. It is recommended that the Township incorporate these Redevelopment Plan, Transit Village Criteria along with the associated requirements into the Township Land Development Ordinance, as well as include a depiction of these areas on the Township Zoning Map.








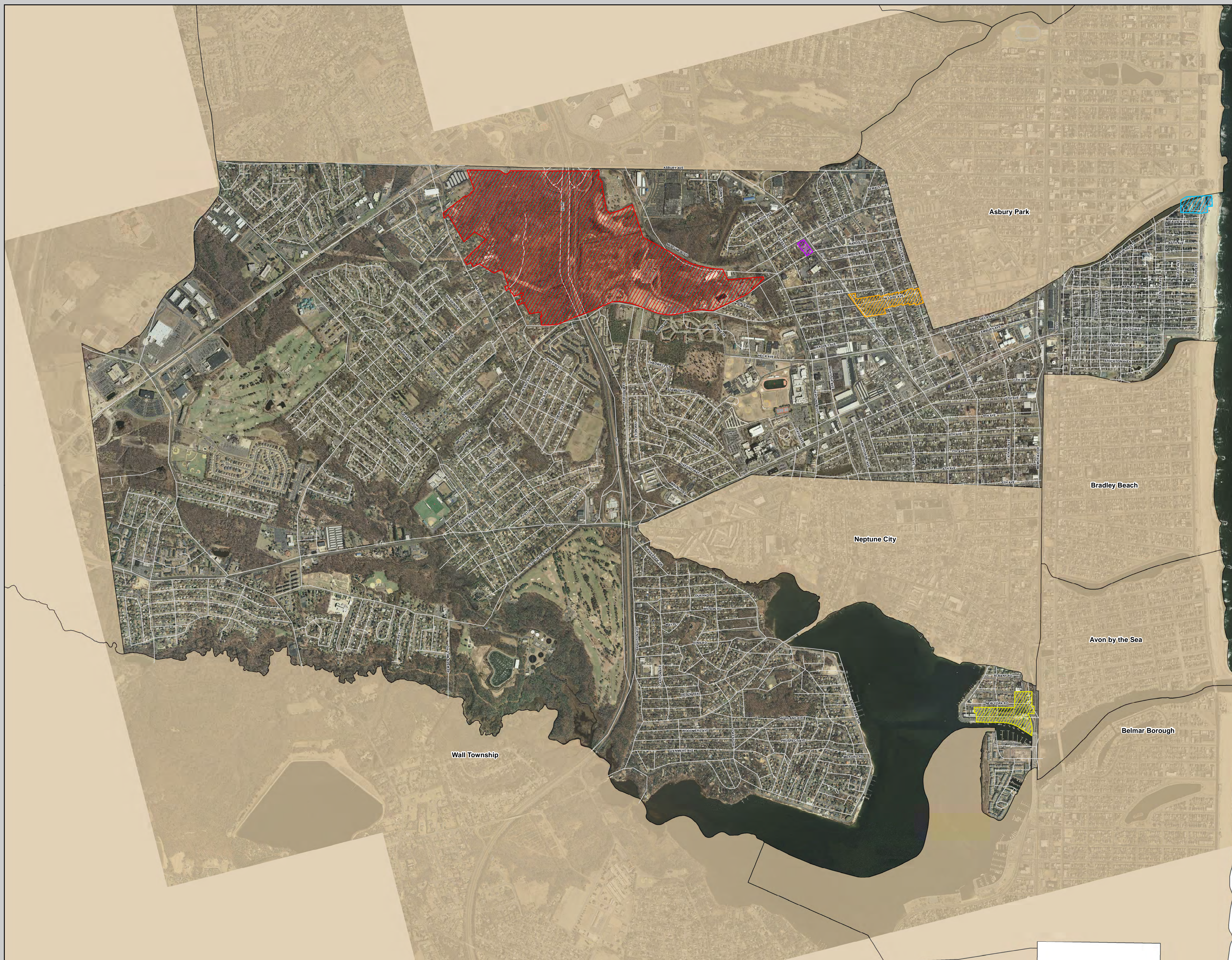
**FIGURE 6  
REDEVELOPMENT AREAS MAP**

**TOWNSHIP OF NEPTUNE  
MONMOUTH COUNTY  
NEW JERSEY**



**Legend**

-  High Pointe Park - Route 18 Redevelopment Area
-  West Lake Avenue Redevelopment Area  
(Phase I Completed)
-  North Channel Redevelopment Area  
(Completed)
-  Ocean Grove North End Redevelopment Area
-  Route 35 & West Bangs Avenue Redevelopment Area



**CONSULTING & MUNICIPAL ENGINEERS**

3141 BORDENTOWN AVENUE, PARLIN, N.J. 08859  
1460 ROUTE 9 SOUTH HOWELL, N.J. 07731  
3759 ROUTE 1 SOUTH SUITE 100, MONMOUTH JUNCTION, NJ 08852  
1 GREENTREE CENTER SUITE 201, MARLTON, NJ 08053

WWW.CMEUSA1.COM

DATE 08/17/2011	SCALE 1" = 1000'	CREATED BY JEC
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**Neptune's Waterfront Destination:  
A Redevelopment Plan for the North Channel of the Shark River**

*Prepared for:*

*The Township of Neptune,  
Monmouth County, New Jersey*






Revised: November 27, 2006



Figure 2: Aerial Photo  
 North Channel Redevelopment Area  
 Neptune Township  
 Monmouth County, New Jersey

Block	Lots	Owner	Address
558	1, 03	Township of Neptune	PO Box 1125 Neptune, NJ 07753
558	1, 12 to 14, 12	Zekaria Family Limited Partnership	302 Bradley Boulevard Bradley Beach, NJ 07720
558	15, 14	Polo Club Holding Corp.	1215 Rensen Mill Road Neptune, NJ 07753
558	16, 13	Ziegler, Joseph, Kalek & Steve	43L Cambridge Court Lakewood, NJ 08701
558	17, 13	Hoffman, Michael & Sheila	502 Prospect Avenue Neptune, NJ 07753
558	18, 13 to 22, 13	Bry, M. Edwin, Jr. & Lucille K.	6 Pullman Avenue Elberon, NJ 07740
559	2 and 3	MFCCO, Inc.	1400 Route 35 South Neptune, NJ 07753
559.01	4 to 8	Pilot, Eugene R.	1300 Route 35 South Neptune, NJ 07753
563	1 and 2	New Jersey Department of Transportation	1035 Parkway Avenue Trenton, NJ 08625
550	8 to 12, and 18 to 22	Bry, M. Edwin, Jr.	6 Pullman Avenue Elberon, NJ 07740
550	13 to 15, and 17	Hoffman, Michael & Sheila	502 Prospect Avenue Neptune, NJ 07753
550	16	Ziegler, Joseph, Kalek & Steve	43L Cambridge Court Lakewood, NJ 08701
554	13	New York Concourse, LLC	PO Box 242 Avon, NJ 07717
554	21 to 29	Halari, Bhaskar	3 Neha Court Manalapan, NJ 07726
554	1 to 12	Zekaria Family Limited Partnership	302 Bradley Boulevard Bradley Beach, NJ 07720
555	7 to 14, and 16	JACAR, LLC	1311 Route 35 South Neptune, NJ 07753
555	15	Boyce, Monroe and Susan	304 Adams Street Wall, NJ 07719

**Legend**

-  North Channel Redevelopment Area
-  Tax Parcels
-  Multiple parcels owned by a single owner
-  Municipal Boundary
-  Block Numbers

Local path: H:\Nept\00010\GIS\Projects\northchannel\_studyareaaerial.mxd





**MASTER PLAN RE-EXAMINATION**

**Borough of Bradley Beach,  
Monmouth County, New Jersey**

**February 2014**



Prepared By:



1460 Route 9 South  
Howell, New Jersey 07731  
(732) 462-7400

---

Jennifer C. Beahm, PP, AICP  
License No. 5625



**vi. RECOMMENDATIONS OF THE PLANNING BOARD CONCERNING THE INCORPORATION OF REDEVELOPMENT PLANS INTO THE LAND USE ELEMENT AND LOCAL DEVELOPMENT REGULATIONS**

Currently, there are no Redevelopment Areas in the Borough, but it should be recognized that this is still a viable tool to stimulate private investment, economic development and reconstitute otherwise stagnant buildings, structures, properties and or areas of the Borough. As such, it is recommended that the Borough consider utilization of this tool in the future, in appropriate areas of the Borough.



**MASTER PLAN  
REEXAMINATION REPORT**

**BOROUGH OF NEPTUNE CITY**

**PREPARED FOR:**

**BOROUGH OF NEPTUNE CITY PLANNING BOARD**

**December 16, 2005**

## **6.0 RECOMMENDATIONS CONCERNING REDEVELOPMENT**

In 1992, the Local Redevelopment and Housing Law (LRHL) was enacted into law. The LRHL replaced a number of former redevelopment statutes, including the Redevelopment Agencies Law, Local Housing and Redevelopment Corporation Law, Blighted Area Act, and Local Housing Authorities Law, with a single comprehensive statute. At the same time, the MLUL was also amended to require, as part of a master plan reexamination, that the issues raised in the LRHL be addressed.

The LRHL provides the statutory authority for municipalities to designate areas in need of "redevelopment," prepare and adopt redevelopment plans, and implement redevelopment projects. Specifically, the governing body has the power to initially cause a preliminary investigation to determine if an area is in need of redevelopment, determine that an area is in need of redevelopment, adopt a redevelopment plan, and/or, determine that an area is in need of rehabilitation.

A planning board has the power to conduct, when authorized by the governing body, a preliminary investigation and hearing and make a recommendation as to whether an area is in need of redevelopment. The planning board is also authorized to make recommendations concerning a redevelopment plan, and prepare a plan as determined to be appropriate. The board may also make recommendations concerning a determination if an area is in need of rehabilitation.

The statute provides that "a delineated area may be determined to be in need of redevelopment if "after investigation, notice and hearing...the governing body of the municipality by resolution concludes that within the delineated area "any of the following conditions are found:

- a. The generality of buildings are substandard, unsafe, unsanitary, dilapidated, or obsolescent, or possess any of such characteristics, or are so lacking in light, air, or space, as to be conducive to unwholesome living or working conditions;
- b. The discontinuance of the use of buildings previously used for commercial, manufacturing, or industrial purposes; the abandonment of such buildings; or the same



- being allowed to fall into so great a state of disrepair as to be untenable;
- c. Land that is owned by the municipality, the county, a local housing authority, redevelopment agency or redevelopment entity, or unimproved vacant land that has remained so for a period of ten years prior to adoption of the resolution, and that by reason of its location, remoteness, lack of means of access to developed sections or portions of the municipality, or topography or nature of the soil, is not likely to be developed through the instrumentality of private capital;
  - d. Areas with buildings or improvements which, by reason of dilapidation, obsolescence, overcrowding, faulty arrangement or design, lack of ventilation, light and sanitary facilities, excessive land coverage, deleterious land use or obsolete layout, or any combination of these or other factors, are detrimental to the safety, health, morals, or welfare of the community;
  - e. A growing lack or total lack of proper utilization of areas caused by the condition of the title, diverse ownership of the real property therein or other conditions, resulting in a stagnant or not fully productive condition of land potentially useful and valuable for contributing to and serving the public health, safety and welfare;
  - f. Areas in excess of five contiguous acres, whereon buildings or improvements have been destroyed, consumed by fire, demolished or altered by the action of storm, fire, cyclone, tornado, earthquake or other casualty in such a way that the aggregate assessed value of the area has been materially depreciated.
  - g. In any municipality in which an enterprise zone has been designated pursuant to the "New Jersey Urban Enterprise Zones Act," P.L.1983, c.303 (C.52:27H-60 et seq.) the execution of the actions prescribed in that act for the adoption by the municipality and approval by the New Jersey Urban Enterprise Zone Authority of the zone development plan for the area of the enterprise zone shall be considered sufficient for the determination that the area is in need of redevelopment pursuant to sections 5 and 6 of P.L.1992, c.79 (C.40A:12A-5 and 40A:12A-6) for the purpose of granting tax exemptions within the enterprise zone district pursuant to the provisions of P.L.1991, c.431 (C.40A:20-1 et seq.) or the adoption of a tax abatement and exemption ordinance pursuant to the provisions of P.L.1991, c.441 (C.40A:21-1 et seq.). The municipality shall not utilize any other redevelopment powers within the urban enterprise zone unless the municipal governing body and planning board have also taken the actions and fulfilled the requirements prescribed in P.L.1992, c.79 (C.40A:12A-1 et al.) for determining that the area is in need of redevelopment or an area in need of rehabilitation and the municipal governing body has adopted a redevelopment plan ordinance including the area of the enterprise zone.
  - h. The designation of the delineated area is consistent with smart growth planning

principles adopted pursuant to law and regulation.

The statute defines redevelopment to include "clearance, replanning, development and redevelopment; the conservation and rehabilitation of any structure or improvement, the construction and provision for construction of residential, commercial, industrial, public or other structures and the grant or dedication of spaces as may be appropriate or necessary in the interest of the general welfare for streets, parks, playgrounds, or other public purposes, including recreational and other facilities incidental or appurtenant thereto, in accordance with a redevelopment plan". It is noteworthy that the statute specifically states that a redevelopment area may include lands which of themselves are not detrimental to the public health, safety or welfare, but the inclusion of which is necessary for the effective redevelopment of an area.

In August 2005, the Borough designated the largely industrial area generally located between Steiner Avenue and Memorial Drive as an area in need of redevelopment. Most of the affected properties are privately-owned. A plan has yet to be prepared for the redevelopment area.

The Borough should investigate the possibility of delineating certain properties along Route 35 and Third Avenue for the purpose of creating a mixed use central business district that would essentially function as the Borough's "Main Street."

The former Shop 'N Bag property is largely vacant, and represents a potentially blighting influence at a major gateway to the community. The Borough should investigate designating this property as an "area in need of redevelopment" for the purpose of redevelopment and/or rehabilitation.

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## Appendix K - Road Owner Response

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# The Board of Chosen Freeholders of the County of Monmouth

## DEPARTMENT OF PUBLIC WORKS & ENGINEERING

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### DIVISION OF ENGINEERING & TRAFFIC SAFETY

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December 3, 2018

Julia Steponanko, PE, Project Manager,  
Greenman-Pederson Inc. (GPI)  
100 Corporate Drive  
Lebanon, NJ 08833

Re: Monmouth County response to Road Safety Audit  
Recommendations for Memorial Drive (CR 40A),  
between State Routes 33 and 35, Township of Neptune,  
and the Boroughs of Neptune City, Bradley Beach and  
Avon-by-the-Sea, Monmouth County

Dear Ms. Steponanko:

Monmouth County is committed to improving safety and implementing appropriate elements of our Complete Streets policy along all county roadways to better serve the traveling public.

We would like to take this opportunity to thank the Road Safety Audit Team for their participation in this significant effort to evaluate traffic safety along the Memorial Drive (CR 40A) Corridor between State Route 33 and State Route 35 in the Township of Neptune, and the Boroughs of Neptune City, Bradley Beach and Avon-by-the-Sea, and assist the County to better accommodate all road users within the corridor.

The County has reviewed the recommendations outlined in the report of Road Safety Audit (RSA), dated Nov 2018, and endorses the short term and long term improvements identified by the RSA Team to enhance roadway safety along the above referenced portion of Memorial Drive corridor. However, as you are aware, implementation of specific improvements will require further design, municipal support and funding.

In general, the identified improvements primarily include corridor-wide and site-specific recommendations, as follows:

- Conversion of 3-lane section (Road Diet) with appropriate signage and striping
- Corridor-wide upgrade of all ramps for ADA compliance
- Implementation of corridor wide curb extensions (bump-outs)
- Development of access management plan for vehicles and pedestrians within project limits

- Roadway and pedestrian lighting
- Green infrastructure solutions to sustainable stormwater management systems
- Striping of bike lanes and/or sharrows and bicycle safe grates,
- Installation of centerline rumble strips
- Construction and/or maintenance of sidewalks
- Construction of raised intersection at CR 40A and 7<sup>th</sup> Ave/Lorraine Ave
- Improvement to curb radii at various locations
- Corridor-wide signal upgrades
- Evaluation of cross slopes for proper drainage
- Landscape

As you may be aware, Monmouth County implemented a road diet along a 0.6 mile long segment of Memorial Drive between SH 33 and Sewall Avenue in Asbury Park in 2016 as part of federally funded Local Safety Project. The portion of Memorial Drive corridor investigated under the current Road Safety Audit has similar road characteristics and land uses to the portion of Memorial Drive improved under the 2016 improvement project. Therefore, the County desires to extend the road diet concept to the portion of Memorial Drive evaluated under the current RSA. Continuation of the 2016 road diet project, south of State Route 33, would create a uniform Memorial Drive corridor with improvements that address identified operational and safety concerns. The proposed road diet project would also incorporate municipal improvements such as lighting, sidewalks, and landscaping.

Based on recommendations of the RSA Team, as a next step, the County would explore funding alternatives for the design and construction of these improvements. In the meantime, the County does plan to implement certain short term spot improvements, including signing and striping along the corridor as part of its regular maintenance efforts along County routes.

Should you have any questions or concerns regarding the above, please do not hesitate to contact this office at (732) 431-7760.

Sincerely



Joseph Ettore, P.E.  
County Engineer

cc: Christine Mittman, NJTPA

Mark Tozzi, NJDOT- Bureau of Transportation Data and Safety

John Tobia, Director, Department of Public Works and Engineering, Monmouth County

David Schmetterer, Monmouth County Planning Board

Ming Kao, Assistant County Engineer

Daria Jakimowska, Chief Engineer, Traffic Design

Debra Compton, Traffic Engineer

Renu Chhonkar, Principal Engineer, Traffic Design