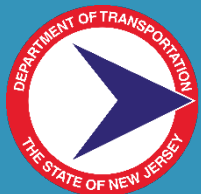




Road Safety Audit:

CR 549 (Hooper Ave/Brick Boulevard),
Toms River and Brick Townships, Ocean County



October 2020

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Executive Summary

This document is the final report of the Road Safety Audit (RSA) conducted along CR 549 (Hooper Avenue/Brick Boulevard) from Silver Bay Road to Molly Lane in Toms River and Brick Townships, Ocean 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.

Portions of the aforementioned roadway sections were identified on NJTPA's Local Safety Program Network Screening list as high priority. According to the NJDOT crash database, 338 crashes occurred during the three-year period between January 1, 2016 and December 31, 2018 (excluding pedestrians/pedalcyclists) along the study area. Additionally, 4 pedestrian/bicycle crashes occurred over the five-year period between January 1, 2014 and December 31, 2018.

This one-day RSA was conducted on Thursday, December 12, 2019 from 9:30 am to 3:30 pm. The pre- and post-audit meetings were held at the Silverton Creek Fire Company #1, located at 15 Kettle Creek Road, Toms River, NJ. Representatives from NJDOT, NJTPA, NJ Transit, Ocean County, Brick Township and Toms River Township were in attendance with NJDOT serving as the facilitator.

The RSA site and crash history are 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. These recommendations addressed 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 improved lighting.

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

This section of CR 549 was identified on NJTPA’s Local Safety Program (LSP) Network Screening list as a high priority location, as shown in the below rankings. Of note, these rankings are based on 2014-2016 vehicular and 2012-2016 pedestrian crash data.

Table 1 – NJTPA LSP Ranking (Corridor)

Location	Ped Corridor	Regional Corridor
CR 549 (Hooper Avenue/ Brick Boulevard)	#21 County (MP 4.34-5.34)	#1 County (MP 5.25-6.25)

Table 2 – NJTPA LSP Ranking (Intersection)

Location	Intersections	Pedestrian Intersections
Silver Bay Road	#91 County	N/A
Molly Lane ¹	N/A	#3 County

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 below.



¹ Rank due to one pedestrian fatality at this location.

C. The Hooper Avenue/Brick Boulevard RSA Event

This one-day RSA was conducted on Thursday, December 12, 2019 from 9:30 am to 3:30 pm. The pre- and post-audit meetings were held at the Silverton Creek Fire Company #1, located at 15 Kettle Creek Road, Toms River, NJ. Representatives from NJDOT, NJTPA, NJ Transit, Ocean County, Brick Township and Toms River Township were in attendance with NJDOT serving as the facilitator. 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 one mile of CR 549 (Hooper Avenue and Brick Boulevard). The adjacent land use along the corridor is primary commercial retail, professional and service establishments. Residential properties are located along or off the seven intersecting roadways within the project limits.

B. Roadway and Intersection Characteristics

Hooper Avenue is a divided urban principal arterial and is posted at 35 mph and 50 mph north and south of Hooper Avenue (CR 631). Two lanes are provided in each direction along with auxiliary lanes. Left turns from Hooper Avenue are provided via jughandles.

C. Existing Bicycle/Pedestrian Accommodations

Sidewalk is provided along both sides between Silver Bay Road and Church Road and along the southbound direction from Church Road to Molly Lane. Continental style crosswalks are provided throughout the corridor. Sidewalk and crosswalk conditions vary from newly installed to needing maintenance. There are no bicycle lanes or other bicycling infrastructure identified along the corridor.

D. Traffic Volumes

Based on available data, the 2016 Annual Daily Traffic (ADT) along CR 549 is approximately 38,750 vehicles per day. This was calculated from 2016 count data at each end of the corridor. A copy of the available data can be found in Appendix C.

E. Transit Service

NJ Transit bus service is provided along CR 549 via routes 67 and 137. Route 67 connects Toms River to Jersey City. Route 137 connects Toms River to the NYC Port Authority Bus Terminal.

F. Community Profile

The American Community Survey (ACS) estimate, which updates the 2010 Census population and income characteristics, was used to identify minority and low-income populations surrounding the project limits. The latest ACS for this study area is a five-year estimate from 2015 through 2017. A summary of the demographics is listed below.

Table 3 – Hooper Ave/Brick Blvd Area Demographics

Characteristic		Project Area	County Average
Poverty		4%	2%
Limited English Proficiency (LEP)		5%	8%
Race/	White	88%	85%

	Characteristic	Project Area	County Average
Ethnicity	Hispanic/Latino	5%	9%
	Asian American	2%	2%
	Black or African American	4%	3%
	American Indian/Alaskan	0%	0%
	Other ²	2%	1%

In addition, approximately 1% of the population uses public transportation and another 1% walk to work. Both are lower than the Ocean County average of 2%.

G. Redevelopment

Recent redevelopment includes construction of a strip mall between Church Road and Yorktowne Boulevard on the western side of CR 549. The site is not fully occupied yet, but will consist of commercial retail, professional and service establishments.

III. Crash Findings

The analysis used in the RSA was based on reportable crashes found in the NJDOT crash database resulting in a fatality, injury and/or property damage. Corridor-wide crash characteristics and overrepresentations were compared to the 2018 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, 338 crashes occurred during the three-year period between January 1, 2016 and December 31, 2018 (excluding pedestrians/pedalcyclists) along the study area of CR 549. Total crashes varied from the county average in February and May and on Thursday.

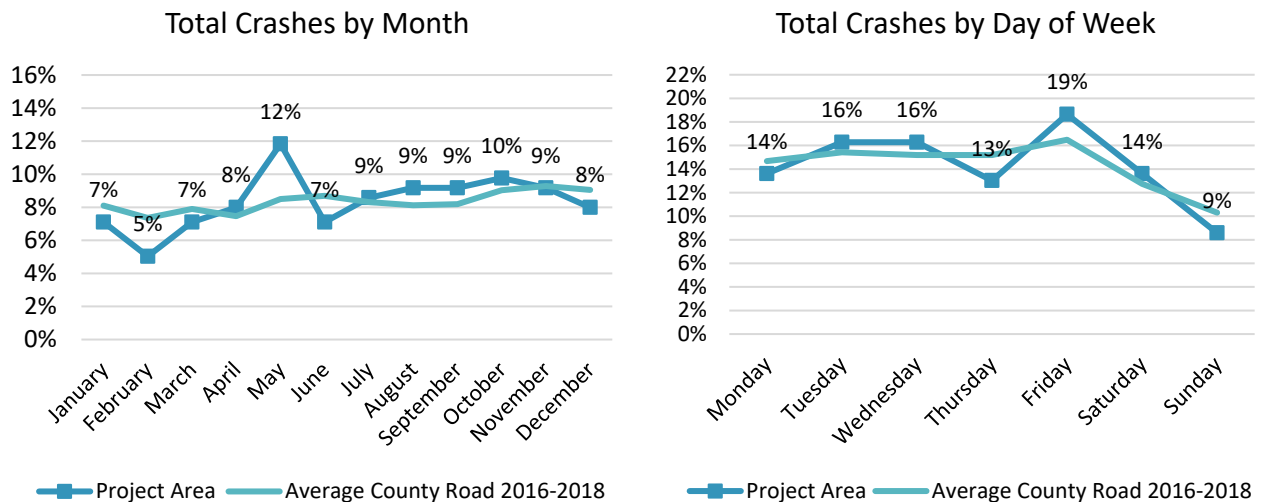


Figure 1 – Total Crashes by Month and Day of Week on All Roadways

² 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'

Additionally, 4 pedestrian crashes occurred over the 5-year period from 2014 to 2018 and were split evenly between pedestrians and bicyclists. Collisions with pedestrians trended similar to county road monthly and daily averages except when there were no reported crashes.

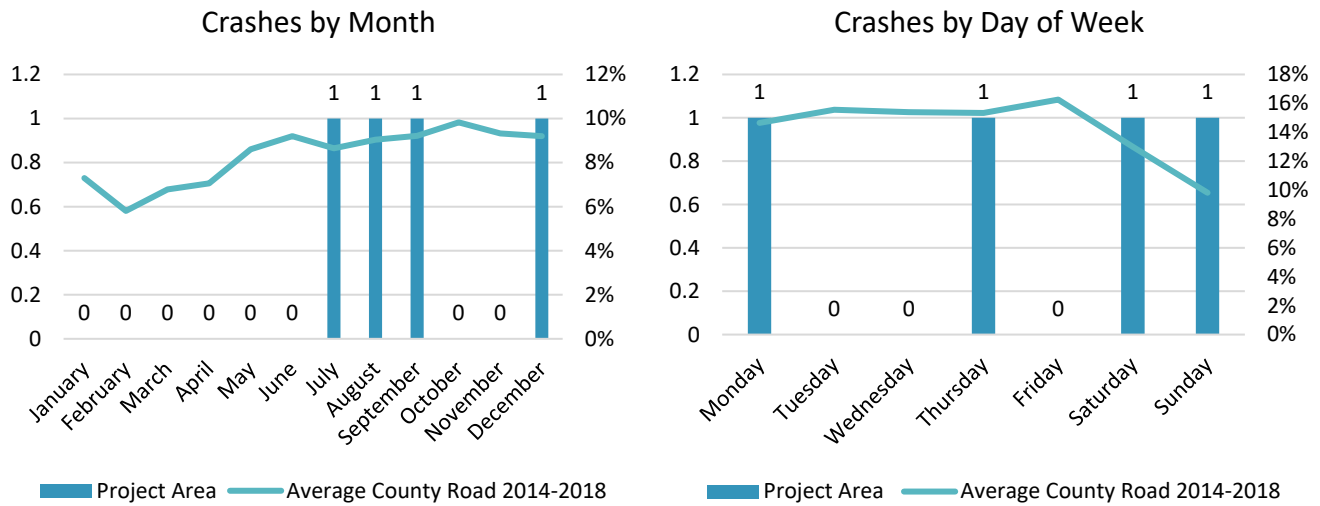


Figure 2 – Pedestrian/Bicyclist Crashes by Month and Day of Week

B. Collision Types

Overrepresented crash types over the three-year period from 2016 to 2018 included rear end and sideswipe. The majority of pedestrian/bicycle crashes, which are excluded from Figure 3 below, included injury, occurred at night and at signalized intersections.

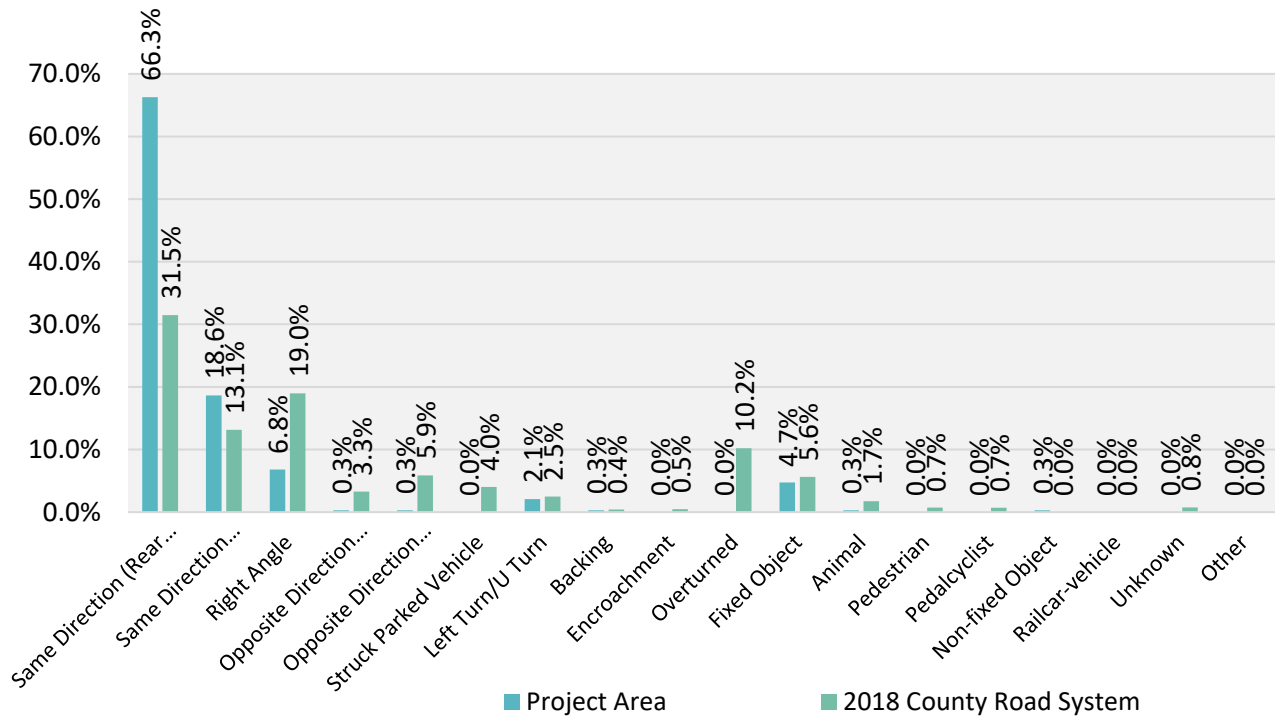


Figure 3 – Vehicular Crash Type Breakdown

C. Severity

Pedestrian crashes resulting in minor and moderate injury were significantly overrepresented compared to the county road system from 2014 to 2018.

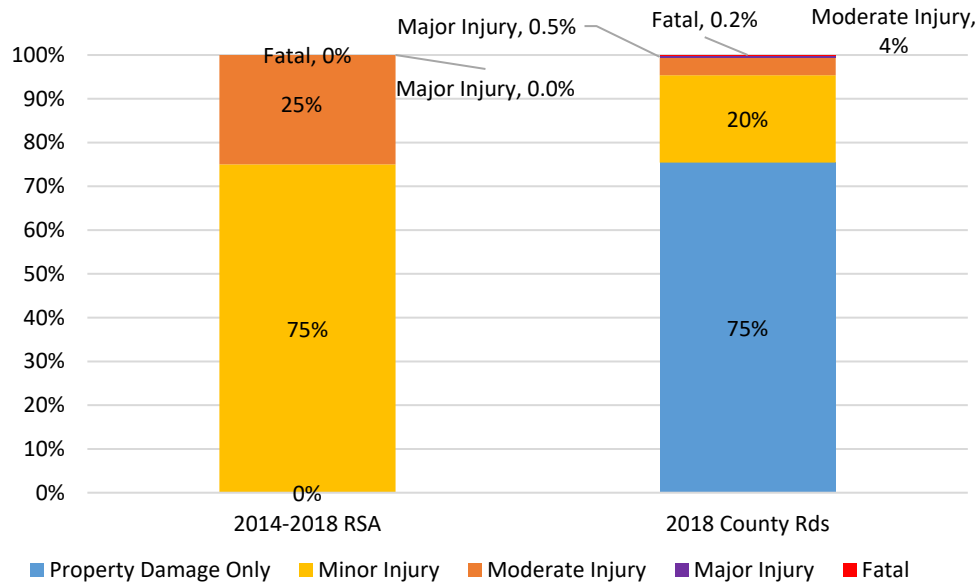


Figure 4 – Severity (Pedestrian/Bicycle Crashes)

D. Roadway Surface & Light Condition

Overrepresented crash types included dry surface and day light conditions. Dry surface conditions accounted for approximately 79% of total crashes. In addition, 74% of crashes occurred during the day.

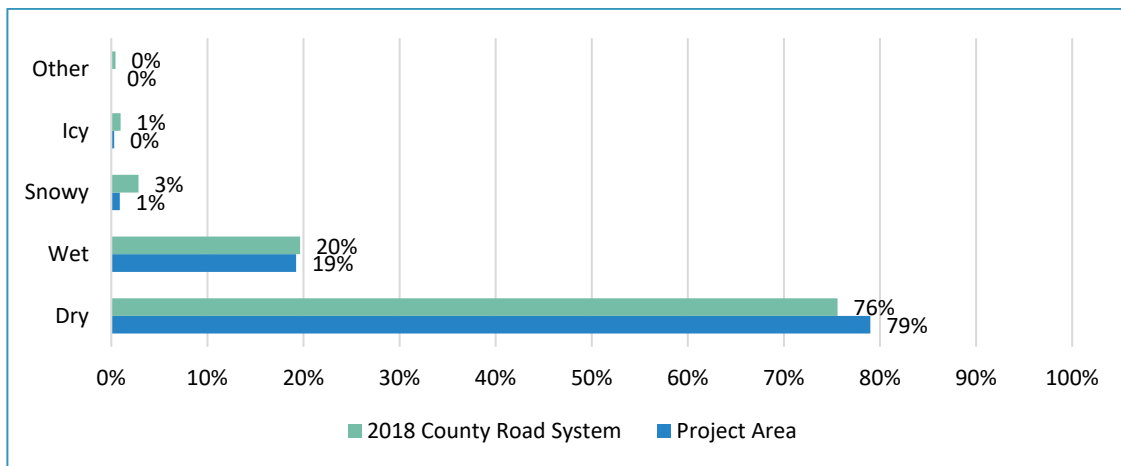


Figure 5 – Surface Conditions (Vehicular Crashes)

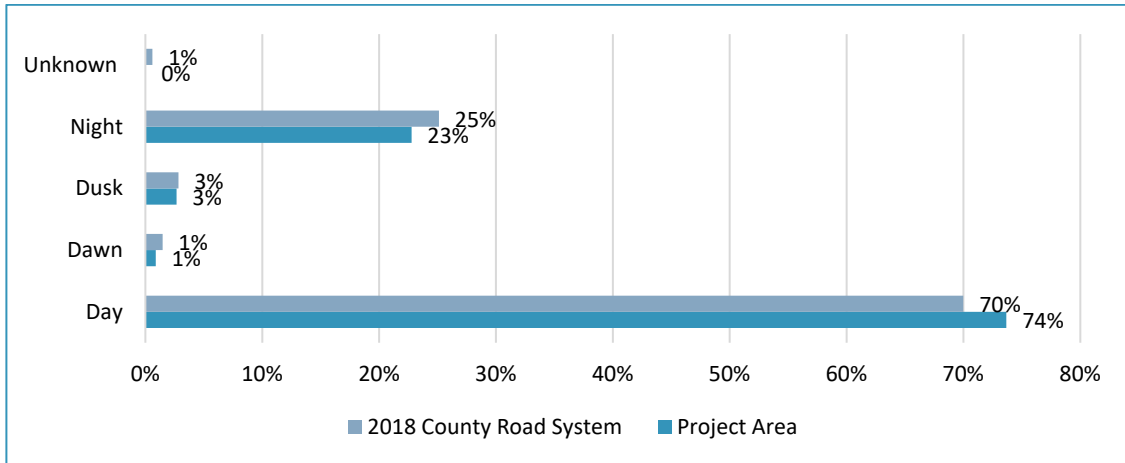


Figure 6 – Light Conditions (Vehicular Crashes)

Dry surface crashes involving pedestrians and bicyclists accounted for all of the crashes. In addition, 75% of pedestrian crashes occurred at night, which is higher than the county road statewide average of 25%.

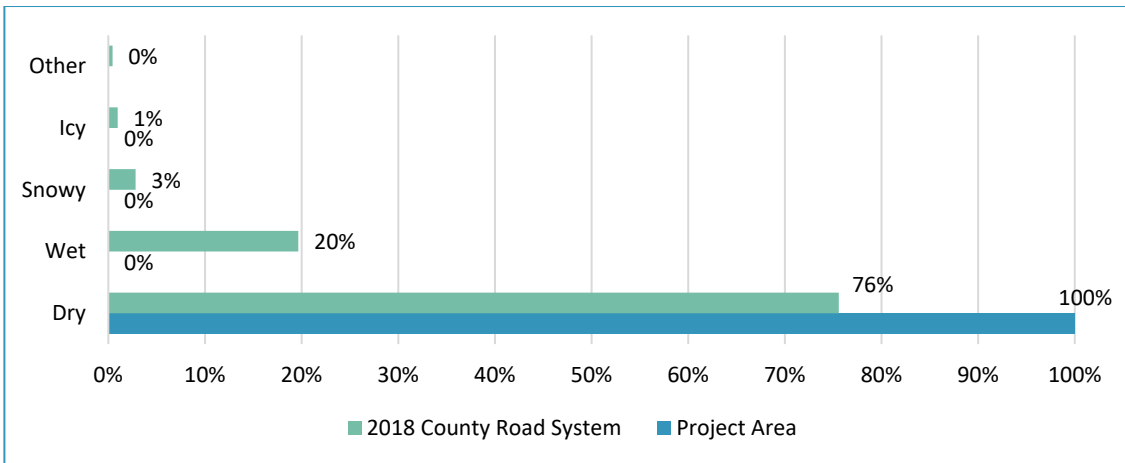


Figure 7 – Surface Conditions (Pedestrian/Bicycle Crashes)

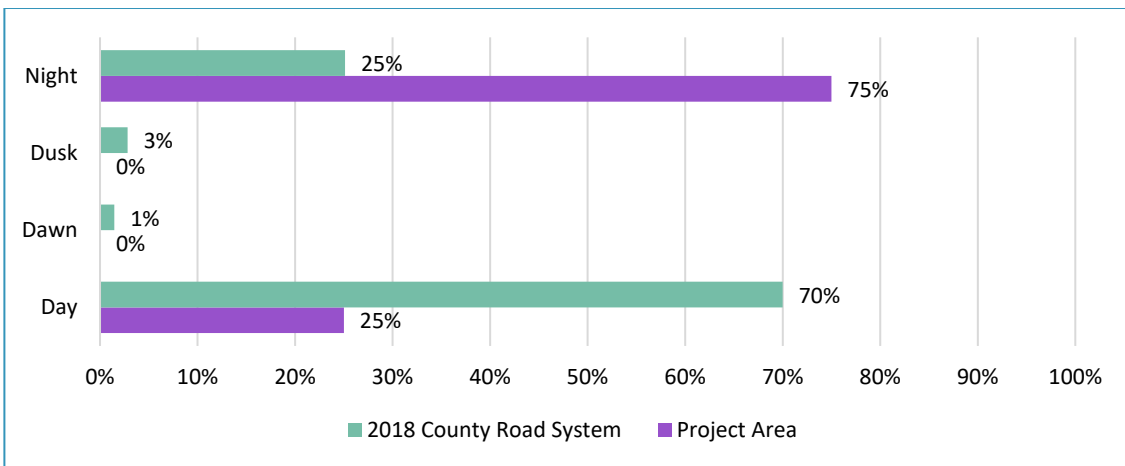


Figure 8 – Light Conditions (Pedestrian/Bicycle Crashes)

E. Location

Crashes occurring between intersections were overrepresented compared to the county road system average. Eighty-seven percent (87%) of crashes occurred between intersections compared to 64% on all county roads. In addition, three of the four pedestrian/bicyclist crashes occurred at signalized intersections. Crash frequency, as shown in the following figures, shows the highest concentration of vehicular and pedestrian crashes. The histogram view is grouped by 0.1-mile segments.



Figure 9 – Total Crash Locations (2016-2018)

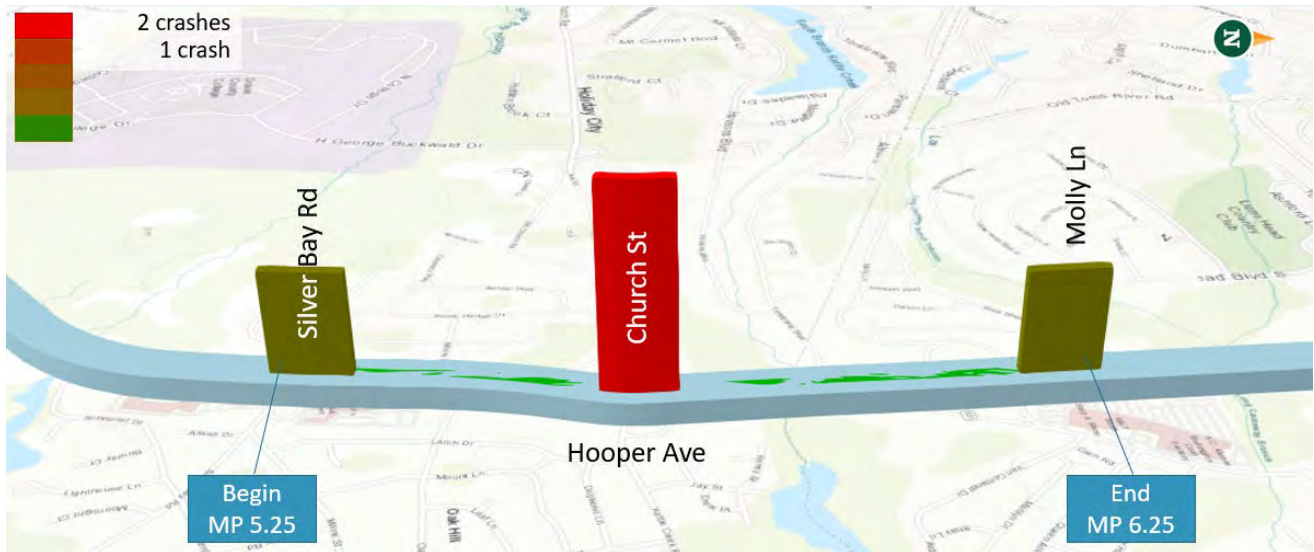


Figure 10 – Pedestrian Crash Locations (2014-2018)

IV. Identified Issues & Observations

This section summarizes the 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. No defined bicycle facilities</p>	 <p>2. Ponding/icing observed in pedestrian path</p>
 <p>3. Sidewalks are uneven and in poor condition</p>	 <p>4. Pedestrian crossing missing at driveway islands</p>
 <p>5. No detectable warning surface</p>	 <p>6. Section missing sidewalk</p>

Operations & Visibility	Maintenance
	
<p>7. Number of signs and placement blocks adjacent signs</p>	<p>8. Detectable warning surface worn, faded, and partially missing</p>
	
<p>9. Backplates could improve signal head visibility</p>	<p>10. Inlet appears blocked needs cleaning</p>

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. N/A indicates safety benefit not determined.

Symbol	Meaning	Definition
✓	Low safety benefit potential	May reduce total crashes by 1-25% ³
✓✓	Low to moderate safety benefit potential	May reduce total crashes by 26-49% ³
✓✓✓	Moderate safety benefit potential	May reduce total crashes by 50-74% ³
✓✓✓✓	High safety benefit potential	May reduce total crashes by 75+% ³
\$	Low cost	Could be accomplished through maintenance

³ 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.

Symbol	Meaning	Definition
\$\$	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 4 – Corridor-Wide Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
Operations					
1	Consider upgrading all ramps for ADA compliance	✓✓✓ ⁴	\$\$\$	●	Twps/ County
2	Consider corridor-wide signal upgrades (install backplates with retroreflected border, evaluate clearance intervals, update to countdown pedestrian signal heads, replace push buttons for ADA compliance, etc.)	✓✓	\$\$\$	●	County
3	Consider adding a speed limit step down from 50 mph to 40 mph to 35 mph in both directions, as well as advanced signage for the speed change (W3-5); consider optical speed bars to enhance the same	✓	\$\$	●	County
4	Consider conducting a lighting analysis for the corridor	✓✓✓	\$\$	⦿	Twps
5	Consider conducting a USLIMITS2 analysis	N/A	\$	☉	County
6	Consider adding diagonal striping in wide shoulders to prevent use as a travel lane	✓ ⁴	\$	☉	County
Bicycle/Pedestrian					
7	Inspect, repair and construct sidewalks in compliance with ADA as needed (i.e. 5-ft wide or 4-ft min. with 5-ft x 5-ft turnarounds), including driveway aprons, and where gaps are present if warranted	✓✓✓	\$\$	☉	Twps/ County
8	Examine inlets and install bicycle-safe grates	✓ ⁴	\$\$	☉	County

⁴ 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
9	Examine crosswalks status: check placement and alignment	✓✓	\$	☉	County
Maintenance					
10	Inspect existing striping for wear and restripe accordingly; add raised pavement markers (RPMs) where appropriate	✓✓	\$	☉	County
11	Inspect and replace missing, faded, damaged or incorrect/ outdated signage as needed (i.e. signs mounted below 7-ft, on non-breakaway posts or back-to-back signs that obscure shapes)	✓	\$	☉	County
12	Inspect drainage facilities; ensure they are free of debris	✓ ⁴	\$\$	☉	County
Education					
13	Consider sidewalk, crosswalk, multimodal education campaign and code enforcement	✓ ⁴	\$	☉	Twps/ County

The following site-specific recommendations are in addition to the corridor-wide improvements, except where noted otherwise.

Table 5 – Site-Specific Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
Silver Bay Rd/Polhemus Rd					
14	Review access management and consider driveway revisions	✓	\$\$	☉	Twps/ County
15	Consider crosswalk on the north side to reduce conflicts with the dual left (either in addition to or to relocate the south side crosswalk) and implement No Turn On Red for the side street approaches	✓ ⁴	\$	☉	Twps/ County
16	Consider corridor-wide recommendation 1, 7 and 9 regarding crosswalks, sidewalk and ADA compliance	✓✓✓	\$\$\$	☉	Twps/ County
17	Investigate moving the Silver Bay Road stop bar closer to the intersection	✓	\$	☉	County
18	Consider adding striping to west side of intersection to indicate merge from 2 lanes to 1 lane	✓	\$	☉	County
19	Investigate adding a Leading Pedestrian Interval (LPI) for all crossings (or only to cross Hooper Ave)	✓✓✓	\$	☉	County
20	Consider corridor-wide recommendation 2 regarding signal upgrades	✓✓	\$\$\$	☉	County
Oak Hill Dr/Moore Rd					
21	Consider corridor-wide recommendation 1, 7 and 9 regarding crosswalks, sidewalk and ADA compliance	✓✓✓ ⁴	\$\$\$	☉	Twps/ County

⁴ 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
Church Rd/Kettle Creek Rd					
22	Consider corridor-wide recommendation 1, 7 and 9 regarding crosswalks, sidewalk and ADA compliance	✓✓✓ ⁴	\$\$\$	●	Twps/ County
23	Consider revising lane use to L/LT/R on Kettle Creek and L/LT/T/R on Church and changing to split phase operation	✓ ⁴	\$	☉	County
24	Consider adding preemption for firehouse on Kettle Creek Rd	N/A	\$	☉	Twps/ County
25	Consider reconstructing island at Walgreens driveway on Church Road to restrict it to Right In-Right out	✓✓	\$\$	●	Twps/ County
26	Consider installing a traffic signal at Hinds Road (coordinated with the Hooper Avenue signal)	✓✓	\$\$\$	●	County
27	Consider converting Adirondack Place to a cul-de-sac to prevent cut-through traffic on residential streets	N/A	\$\$	●	Town
Yorktowne Blvd					
28	Consider reducing sign clutter, adding signage for right lane drop and adding lane drop pavement markings	✓ ⁴	\$	☉	County
29	Consider corridor-wide recommendation 6 regarding striping in shoulders	✓ ⁴	\$	☉	County
30	Consider corridor-wide recommendation 3 regarding speed reduction signage	✓	\$\$	●	County
31	Consider corridor-wide recommendation 2 regarding signal upgrades	✓✓	\$\$\$	●	County
32	Consider adding W1-7 (large double arrow) sign for T-intersection	✓ ⁴	\$	☉	County
Molly Ln					
33	Consider extending the speed reduction zone north of Molly Lane to provide a 50 to 40 mph step down before the 35-mph zone; consider optical speed bars to enhance the same	✓	\$\$	●	County
34	Consider corridor-wide recommendation 1, 7 and 9 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓ ⁴	\$\$\$	●	Twps/ County
35	Consider adding crosswalk on south side and implementing No Turn On Red for Molly Ln	✓ ⁴	\$	☉	Twps/ County
36	Investigate reducing curb radii on western side to slow vehicles and decrease pedestrian crossing time	✓	\$\$\$	●	County
37	Investigate relocating the bus stop to the south side and installing appropriate pedestrian accommodations	✓ ⁴	\$	●	County

⁴ 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
38	Consider corridor-wide recommendation 2 regarding signal upgrades	✓✓	\$\$\$	●	County
39	Investigate adding a Leading Pedestrian Interval (LPI)	✓✓✓	\$	🕒	County
Left/U-turn at Bay Harbor Plaza					
40	Investigate converting to a signalized left turn	✓✓	\$\$\$	●	County
41	Consider adding flashing warning sign alerting NB traffic to turning vehicles	✓✓	\$	🕒	County
42	Consider adding a crosswalk to traverse the plaza entrance				

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

C. Recommendation Visualizations

Examples of some of the site-specific and corridor-wide safety recommendations identified in Tables 4 and 5 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. USLIMITS2

This is a free, web-based tool⁵ designed to help practitioners assess and establish safe, reasonable, and consistent speed limits for specific segments of roadway. It is applicable to all types of facilities, from rural and local roads and residential streets to urban freeways. USLIMITS2 supports customary engineering studies used to determine appropriate speed limits. These studies typically include evaluating criteria such as 85th percentile speed, traffic volumes, roadway type, roadway setting, number of access points, crash history, pedestrian/bicyclist activity, etc. Similarly, it produces an unbiased and objective suggested speed limit value based on 50th and 85th percentile speeds, traffic volume, roadway characteristics, and crash data. It also augments the credibility of engineering speed studies, helping to address concerns when speed limits are adjusted.

2. Pedestrian Facilities

ADA standards specify a minimum 5-foot clear path width to accommodate two wheelchairs passing each other. In addition to providing a more accessible facility, this minimum width also creates a more comfortable environment for pedestrians to walk side-by-side and pass each other.

⁵ USLIMITS2 is available free online at <https://safety.fhwa.dot.gov/uslimits/>.

Sidewalk width should support the surrounding street context, land uses, and current and future pedestrian demand. The design of driveways should provide a continuous and level pedestrian zone across the vehicular path, encouraging drivers to stop for pedestrians on the sidewalk. Driveways should not be designed where the sidewalk is interrupted by the driveway.

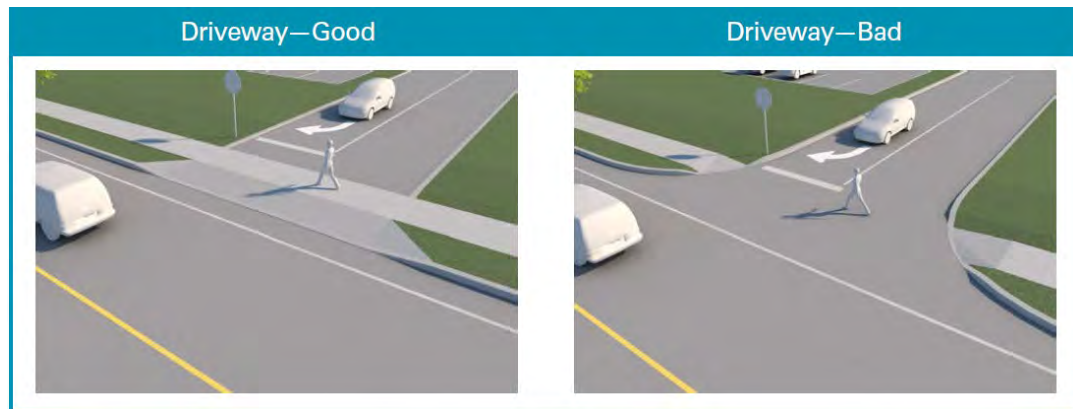


Figure 11 – Sidewalk and Driveways (Source: CSDG)

3. Bicycle Facilities

Bicycle lanes provide an exclusive space for bicyclists using pavement markings and signage. These 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. 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)

4. 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). One reconfiguration option is shown in Figure 13.

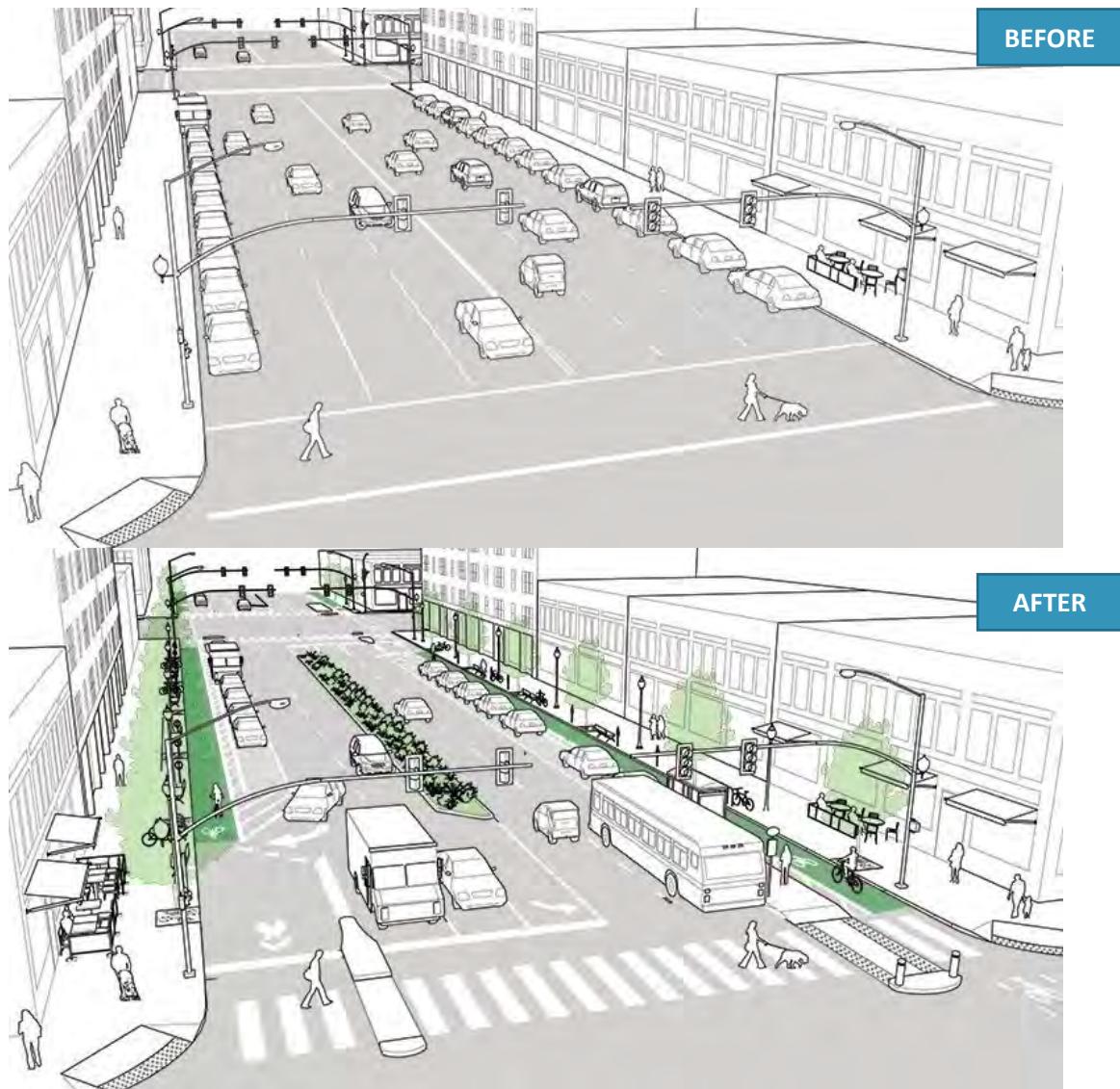


Figure 13 – Example of a Downtown Thoroughfare Typology (Source: NACTO-US)

Top: Left turns are a frequent source of conflict between motorists and pedestrians and the crossing distance for pedestrians is substantial. Buses experience frequent delay due to the encroachment of parked cars, loading freight vehicles, and through traffic. Bicyclists lack any accommodation on the street, forcing many to utilize the sidewalk.

Bottom: Assess left-turn volumes and evaluate the overall traffic network to determine whether left turns can be restricted or removed at a particular intersection. A parking-buffered 1-way bike lane can be applied on each side of the street. This lane can be combined with an offset bus-boarding island and other amenities. Alternatively, a center 6-foot pedestrian safety island can be implemented at the intersection by tapering the bike lane buffer and shifting the through lanes to the right. Land use changes and access management should be coordinated with the overall vision and redesign of the street.

5. Green Infrastructure

Bioswales are vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. They are the most effective type of green infrastructure facility in slowing runoff velocity and cleansing water while recharging the underlying groundwater table. They have flexible siting requirements, allowing them to be integrated with medians, curb extensions, and other public space or traffic calming strategies.

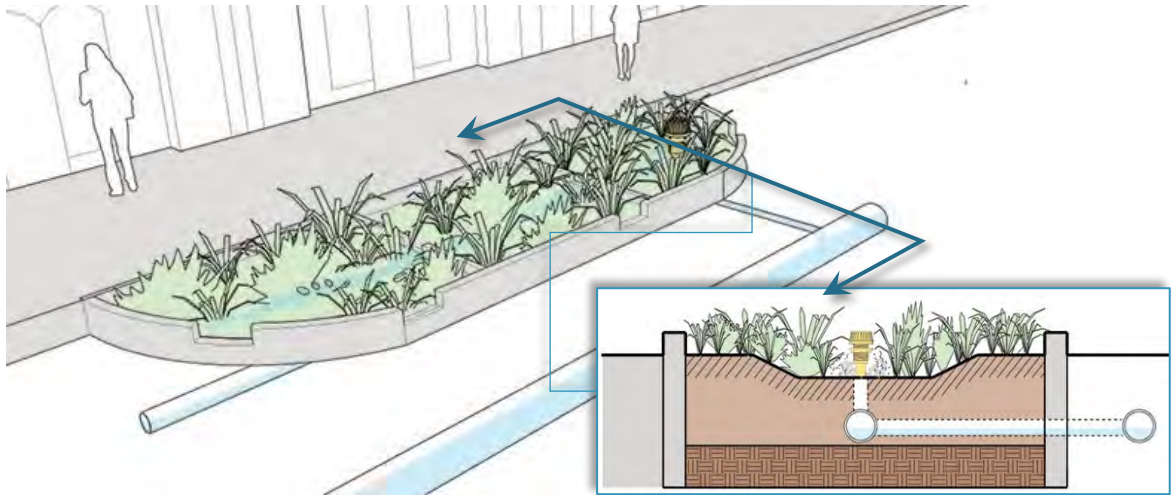


Figure 14 – Bioswale Example (Source: NACTO-US)

VI. Conclusions

The Hooper Avenue/Brick Boulevard 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 CR 549. 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.

APPENDIX A

RSA TEAM

Audit Team

Name	Agency
Mark Jehnke	Ocean County Engineering
Sean Areia	Ocean County Engineering
Michael J. Brown	Ocean County Engineering
Elissa Commins	Brick Township Engineering
Ptl. David Thergesen	Brick Township Police Department
Bob Chankalian	Toms River Engineering
Wendy Birkhead	Toms River Engineering
S/O Steve Schwartz	Toms River Police Department
Elmira Buongiorno	NJ Transit, Bus Operations
William Riviere	NJDOT – BSBPP
Virgilio Tan	NJDOT – BSBPP
Aimee Jefferson	NJTPA
Bernie Boerchers	Greenman-Pedersen, Inc. (NJDOT Consultant)
Andrew Halloran	Greenman-Pedersen, Inc.
Aidan Sheehan	Greenman-Pedersen, Inc.
Julia Steponanko	Greenman-Pedersen, Inc.



APPENDIX B

AREA MAP



MATCH LINE A



MATCH LINE A

MATCH LINE B



MATCH LINE B

LEGEND

SIGNALIZED INTERSECTION

<p>NJDOT HSIP - ROAD SAFETY AUDIT CR 549 (HOOPER AVE/BRICK BLVD)</p> <p>TOMS RIVER & BRICK TOWNSHIPS OCEAN COUNTY</p>	
<p>PROJECT LOCATION</p>	
	<p>Engineering Design Planning Construction Management</p>
<p>N.T.S.</p>	

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APPENDIX C

TRAFFIC DATA

New Jersey Department of Transportation

Daily Volume from 09/07/2016 through 09/09/2016

Site Names: 091517, , Brick Boulevard-6.61, 00000549__, Brick Twp
 County: OCEAN
 Funct. Class: Urban Principal Arterial - Other
 Location: BET MOLLY LN CO 66 BEAVERSON BLVD

Seasonal Factor Group: RG4_FC14
 Daily Factor Group: RG4_FC14
 Axle Factor Group: RG4_FC14
 Growth Factor Group: RG4_FC14

	Sun 09/04/2016			Mon 09/05/2016			Tue 09/06/2016			Wed 09/07/2016			Thu 09/08/2016			Fri 09/09/2016			Sat 09/10/2016		
	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N
00:00													234	166	68	250	152	98			
01:00													142	101	41	126	89	37			
02:00													89	49	40	119	73	46			
03:00													112	51	61	115	43	72			
04:00													240	67	173	246	60	186			
05:00													659	139	520	683	153	530			
06:00													1,488	421	1,067	1,458	426	1,032			
07:00													2,663	1,125	1,538	2,538	1,076	1,462			
08:00													2,847	1,248	1,599	2,754	1,226	1,528			
09:00													2,455	1,354	1,101	2,433	1,381	1,052			
10:00													2,335	1,367	968	2,406	1,493	913			
11:00									2,799	1,358	1,441	2,470	1,492	978							
12:00									2,868	1,491	1,377	2,481	1,461	1,020							
13:00									2,972	1,537	1,435	2,637	1,604	1,033							
14:00									3,003	1,650	1,353	2,713	1,644	1,069							
15:00									3,396	1,983	1,413	3,020	1,914	1,106							
16:00									3,448	2,163	1,285	3,201	2,183	1,018							
17:00									3,438	2,116	1,322	3,244	2,100	1,144							
18:00									2,959	1,658	1,301	2,829	1,780	1,049							
19:00									2,278	1,296	982	2,306	1,288	1,018							
20:00									1,865	1,100	765	1,744	1,011	733							
21:00									1,189	680	509	1,153	644	509							
22:00									667	416	251	760	466	294							
23:00									392	260	132	420	281	139							
Volume									31,274	17,708	13,566	42,242	23,956	18,286	13,128	6,172	6,956				
AM Peak Vol												2,896	1,492	1,627							
AM Peak Fct												0.89	0.86	0.95							
AM Peak Hr												7:30	11:00	7:30							
PM Peak Vol									3,524	2,207	1,458	3,400	2,234	1,166							
PM Peak Fct									0.94	0.94	0.93	0.93	0.94	0.93							
PM Peak Hr									16:30	16:45	13:30	16:30	16:30	16:30							
Seasonal Fct									0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933			
Daily Fct									0.990	0.990	0.990	0.963	0.963	0.963	0.884	0.884	0.884				
Axle Fct									0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487			
Pulse Fct									2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000				

New Jersey Department of Transportation

Daily Volume from 08/18/2016 through 08/24/2016

Site Names: 091546, , Hooper Avenue-5.15, 00000549__, Toms River Twp
 County: OCEAN
 Funct. Class: Urban Principal Arterial - Other
 Location: Bet S Shore Dr and CO 28 Polhemus Ave Silver Bay Ave

Seasonal Factor Group: RG4_FC14
 Daily Factor Group: RG4_FC14
 Axle Factor Group: RG4_FC14
 Growth Factor Group: RG4_FC14

	Sun 08/14/2016			Mon 08/15/2016			Tue 08/16/2016			Wed 08/17/2016			Thu 08/18/2016			Fri 08/19/2016			Sat 08/20/2016		
	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N
00:00													353	195	158	410	234	176	595	323	272
01:00													210	125	85	226	119	107	335	185	150
02:00													135	67	68	160	80	80	221	104	117
03:00													132	64	68	142	71	71	176	81	95
04:00													237	81	156	236	90	146	184	72	112
05:00													558	174	384	555	192	363	303	127	176
06:00													1,252	535	717	1,226	495	731	673	323	350
07:00													2,240	993	1,247	2,260	1,032	1,228	1,328	621	707
08:00													2,891	1,466	1,425	2,917	1,439	1,478	2,080	1,048	1,032
09:00													2,778	1,423	1,355	2,855	1,492	1,363	2,531	1,354	1,177
10:00													2,932	1,467	1,465	3,102	1,687	1,415	3,208	1,779	1,429
11:00													3,122	1,604	1,518	3,403	1,837	1,566	3,454	1,798	1,656
12:00													3,399	1,775	1,624	3,541	1,907	1,634	3,525	1,919	1,606
13:00													3,497	1,837	1,660	3,577	1,913	1,664	3,505	1,872	1,633
14:00													3,394	1,758	1,636	3,598	1,960	1,638	3,308	1,812	1,496
15:00													3,608	1,906	1,702	3,681	1,980	1,701	3,231	1,772	1,459
16:00													3,847	1,998	1,849	3,870	2,116	1,754	3,338	1,836	1,502
17:00													3,911	2,087	1,824	3,739	1,994	1,745	3,067	1,608	1,459
18:00													3,314	1,901	1,413	3,443	1,971	1,472	2,793	1,410	1,383
19:00													2,680	1,446	1,234	2,743	1,529	1,214	2,466	1,282	1,184
20:00													2,242	1,218	1,024	2,454	1,376	1,078	2,242	1,163	1,079
21:00													1,659	912	747	1,863	997	866	1,794	931	863
22:00													1,244	701	543	1,356	726	630	1,293	700	593
23:00													718	409	309	929	514	415	900	480	420
Volume													50,353	26,142	24,211	52,286	27,751	24,535	46,550	24,600	21,950
AM Peak Vol													3,122	1,604	1,518	3,403	1,837	1,566	3,460	1,817	1,656
AM Peak Fct													0.91	0.91	0.90	0.98	0.97	0.98	0.95	0.97	0.93
AM Peak Hr													11:00	11:00	11:00	11:00	11:00	11:00	10:45	10:45	11:00
PM Peak Vol													4,019	2,114	1,918	3,894	2,116	1,830	3,624	1,975	1,649
PM Peak Fct													0.96	0.97	0.95	0.97	0.98	0.97	0.97	0.96	0.98
PM Peak Hr													16:30	16:30	16:15	16:15	16:00	16:15	12:15	12:15	12:15
Seasonal Fct													0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858
Daily Fct													1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Axle Fct													0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487
Pulse Fct													2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000

New Jersey Department of Transportation

Daily Volume from 08/18/2016 through 08/24/2016

Site Names: 091546, , Hooper Avenue-5.15, 00000549__, Toms River Twp
 County: OCEAN
 Funct. Class: Urban Principal Arterial - Other
 Location: Bet S Shore Dr and CO 28 Polhemus AveSilver Bay Ave

Seasonal Factor Group: RG4_FC14
 Daily Factor Group: RG4_FC14
 Axle Factor Group: RG4_FC14
 Growth Factor Group: RG4_FC14

	Sun 08/21/2016			Mon 08/22/2016			Tue 08/23/2016			Wed 08/24/2016			Thu 08/25/2016			Fri 08/26/2016			Sat 08/27/2016		
	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N
00:00	715	395	320	225	112	113	306	168	138	332	196	136									
01:00	398	224	174	145	79	66	178	94	84	186	120	66									
02:00	344	180	164	117	69	48	111	60	51	157	88	69									
03:00	212	99	113	122	57	65	132	57	75	126	48	78									
04:00	127	60	67	257	87	170	250	87	163	266	95	171									
05:00	194	83	111	574	181	393	575	200	375	611	228	383									
06:00	438	203	235	1,312	562	750	1,280	534	746	1,300	577	723									
07:00	867	442	425	2,217	996	1,221	2,433	1,124	1,309	2,310	1,030	1,280									
08:00	1,363	676	687	2,922	1,463	1,459	2,997	1,482	1,515	3,029	1,543	1,486									
09:00	1,845	933	912	2,735	1,389	1,346	2,770	1,456	1,314	2,899	1,494	1,405									
10:00	2,455	1,308	1,147	2,930	1,501	1,429	2,908	1,519	1,389	2,933	1,535	1,398									
11:00	2,915	1,517	1,398	3,142	1,705	1,437	3,146	1,650	1,496	3,162	1,637	1,525									
12:00	3,127	1,592	1,535	3,400	1,775	1,625	3,277	1,722	1,555	3,213	1,752	1,461									
13:00	3,098	1,615	1,483	3,303	1,733	1,570	3,240	1,707	1,533	3,241	1,687	1,554									
14:00	2,938	1,382	1,556	3,363	1,710	1,653	3,369	1,801	1,568	3,327	1,800	1,527									
15:00	2,877	1,459	1,418	3,471	1,825	1,646	3,488	1,785	1,703	3,419	1,806	1,613									
16:00	2,818	1,371	1,447	3,605	1,953	1,652	3,671	1,940	1,731	3,610	1,874	1,736									
17:00	2,692	1,214	1,478	3,690	1,963	1,727	3,756	2,012	1,744	3,849	2,124	1,725									
18:00	2,270	1,009	1,261	3,177	1,782	1,395	3,116	1,708	1,408	3,093	1,720	1,373									
19:00	1,783	864	919	2,504	1,371	1,133	2,556	1,395	1,161	2,551	1,427	1,124									
20:00	1,350	673	677	1,990	1,059	931	2,048	1,092	956	2,212	1,165	1,047									
21:00	1,049	570	479	1,442	752	690	1,550	818	732	1,569	827	742									
22:00	743	401	342	925	495	430	1,011	563	448	1,053	584	469									
23:00	474	262	212	567	307	260	616	362	254	606	353	253									
Volume	37,092	18,532	18,560	48,135	24,926	23,209	48,784	25,336	23,448	49,054	25,710	23,344									
AM Peak Vol	2,915	1,517	1,398	3,142	1,705	1,468	3,146	1,650	1,515	3,165	1,637	1,543									
AM Peak Fct	0.96	0.99	0.91	0.95	0.97	0.93	0.95	0.89	0.89	0.91	0.91	0.92									
AM Peak Hr	11:00	10:45	11:00	11:00	11:00	7:45	11:00	11:00	8:00	10:45	11:00	10:45									
PM Peak Vol	3,139	1,630	1,593	3,753	2,010	1,782	3,812	2,034	1,794	3,873	2,124	1,869									
PM Peak Fct	0.96	0.96	0.94	0.96	0.94	0.95	0.93	0.97	0.90	0.97	0.98	0.92									
PM Peak Hr	12:15	12:15	13:45	16:45	17:15	16:30	16:45	16:45	16:15	16:30	17:00	16:30									
Seasonal Fct	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858	0.858									
Daily Fct	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000									
Axle Fct	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487	0.487									
Pulse Fct	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000									

APPENDIX D

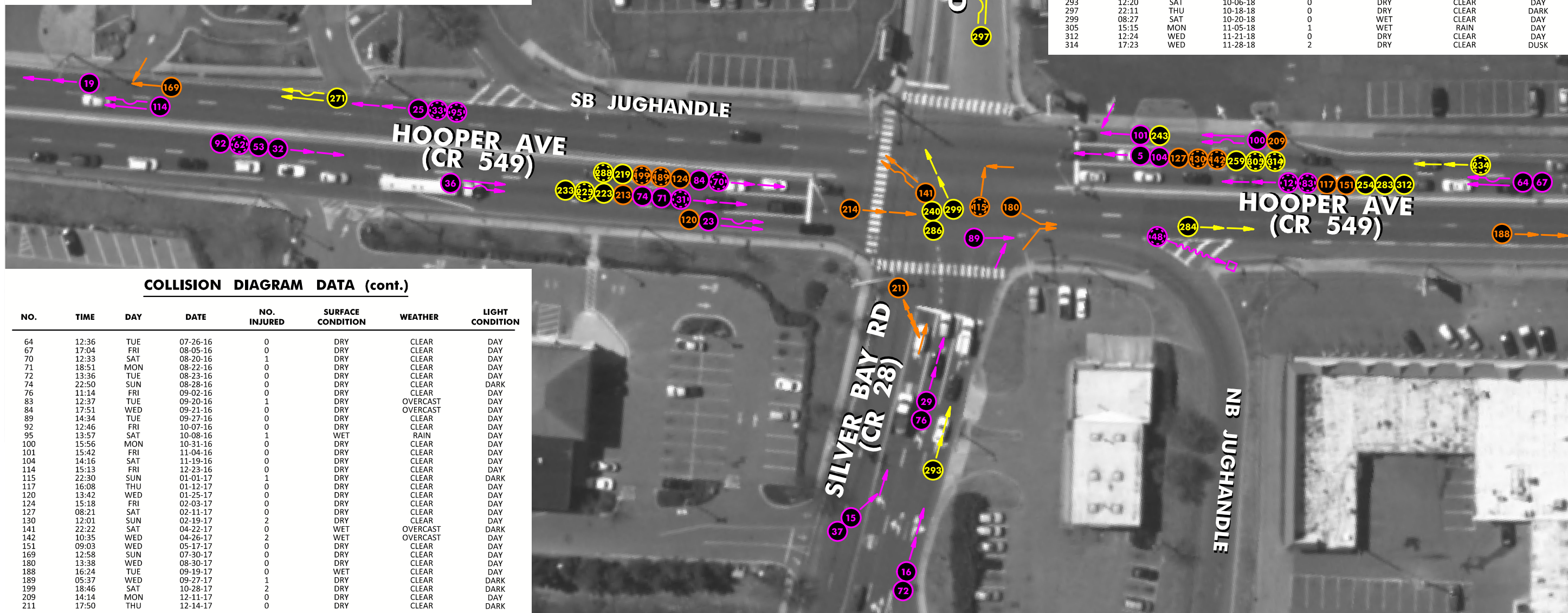
VEHICULAR CRASH DIAGRAMS

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
5	11:45	FRI	01-15-16	0	DRY	CLEAR	DAY
12	12:43	WED	02-10-16	3	DRY	OVERCAST	DAY
15	13:19	THU	03-03-16	0	DRY	CLEAR	DAY
16	14:06	THU	03-03-16	0	DRY	CLEAR	DAY
19	14:26	TUE	03-08-16	0	DRY	CLEAR	DAY
23	20:58	THU	04-07-16	0	DRY	CLEAR	DARK
25	13:40	TUE	04-12-16	0	WET	CLEAR	DAY
29	15:16	WED	04-20-16	0	DRY	CLEAR	DAY
31	15:23	TUE	04-26-16	1	DRY	OVERCAST	DAY
32	13:30	FRI	04-29-16	0	DRY	CLEAR	DAY
33	07:59	TUE	05-03-16	1	WET	RAIN	DAY
36	15:23	FRI	05-06-16	0	DRY	CLEAR	DAY
37	12:51	SAT	05-07-16	0	DRY	OVERCAST	DAY
48	12:35	MON	06-06-16	1	DRY	CLEAR	DAY
53	13:32	FRI	07-01-16	0	DRY	CLEAR	DAY
62	13:47	SUN	07-24-16	1	DRY	CLEAR	DAY

COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
213	19:46	SUN	12-24-17	0	DRY	CLEAR	DARK
214	22:58	MON	12-25-17	0	DRY	CLEAR	DARK
219	14:27	TUE	01-23-18	0	DRY	CLEAR	DAY
223	19:23	THU	02-01-18	0	DRY	CLEAR	DARK
225	21:52	SAT	02-17-18	1	SNOWY	RAIN	DARK
233	09:26	THU	03-22-18	0	SLUSH	OVERCAST	DAY
234	09:46	FRI	03-23-18	1	DRY	CLEAR	DAY
240	13:09	TUE	04-17-18	0	DRY	CLEAR	DAY
243	20:39	SAT	04-21-18	0	DRY	CLEAR	DARK
254	19:39	WED	05-16-18	0	WET	RAIN	DAY
259	19:26	SUN	06-17-18	0	DRY	CLEAR	DAY
271	09:42	THU	07-19-18	0	DRY	CLEAR	DAY
283	15:58	THU	08-23-18	0	DRY	CLEAR	DAY
284	12:19	FRI	09-07-18	0	DRY	CLEAR	DAY
286	07:23	THU	09-13-18	0	WET	OVERCAST	DAY
288	16:01	FRI	09-21-18	1	DRY	CLEAR	DAY
293	12:20	SAT	10-06-18	0	DRY	CLEAR	DAY
297	22:11	THU	10-18-18	0	DRY	CLEAR	DARK
299	08:27	SAT	10-20-18	0	WET	CLEAR	DAY
305	15:15	MON	11-05-18	1	WET	RAIN	DAY
312	12:24	WED	11-21-18	0	DRY	CLEAR	DAY
314	17:23	WED	11-28-18	2	DRY	CLEAR	DUSK



COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
64	12:36	TUE	07-26-16	0	DRY	CLEAR	DAY
67	17:04	FRI	08-05-16	0	DRY	CLEAR	DAY
70	12:33	SAT	08-20-16	1	DRY	CLEAR	DAY
71	18:51	MON	08-22-16	0	DRY	CLEAR	DAY
72	13:36	TUE	08-23-16	0	DRY	CLEAR	DAY
74	22:50	SUN	08-28-16	0	DRY	CLEAR	DARK
76	11:14	FRI	09-02-16	0	DRY	CLEAR	DAY
83	12:37	TUE	09-20-16	1	DRY	OVERCAST	DAY
84	17:51	WED	09-21-16	0	DRY	OVERCAST	DAY
89	14:34	TUE	09-27-16	0	DRY	CLEAR	DAY
92	12:46	FRI	10-07-16	0	DRY	CLEAR	DAY
95	13:57	SAT	10-08-16	1	WET	RAIN	DAY
100	15:56	MON	10-31-16	0	DRY	CLEAR	DAY
101	15:42	FRI	11-04-16	0	DRY	CLEAR	DAY
104	14:16	SAT	11-19-16	0	DRY	CLEAR	DAY
114	15:13	FRI	12-23-16	0	DRY	CLEAR	DAY
115	22:30	SUN	01-01-17	1	DRY	CLEAR	DARK
117	16:08	THU	01-12-17	0	DRY	CLEAR	DAY
120	13:42	WED	01-25-17	0	DRY	CLEAR	DAY
124	15:18	FRI	02-03-17	0	DRY	CLEAR	DAY
127	08:21	SAT	02-11-17	0	DRY	CLEAR	DAY
130	12:01	SUN	02-19-17	2	DRY	CLEAR	DAY
141	22:22	SAT	04-22-17	0	WET	OVERCAST	DARK
142	10:35	WED	04-26-17	2	WET	OVERCAST	DAY
151	09:03	WED	05-17-17	0	DRY	CLEAR	DAY
169	12:58	SUN	07-30-17	0	DRY	CLEAR	DAY
180	13:38	WED	08-30-17	0	DRY	CLEAR	DAY
188	16:24	TUE	09-19-17	0	WET	CLEAR	DAY
189	05:37	WED	09-27-17	1	DRY	CLEAR	DARK
199	18:46	SAT	10-28-17	2	DRY	CLEAR	DARK
209	14:14	MON	12-11-17	0	DRY	CLEAR	DAY
211	17:50	THU	12-14-17	0	DRY	CLEAR	DARK

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	<u>52</u>
INJURIES	<u>18</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>70</u>

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

- 2016 CRASHES
- 2017 CRASHES
- 2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

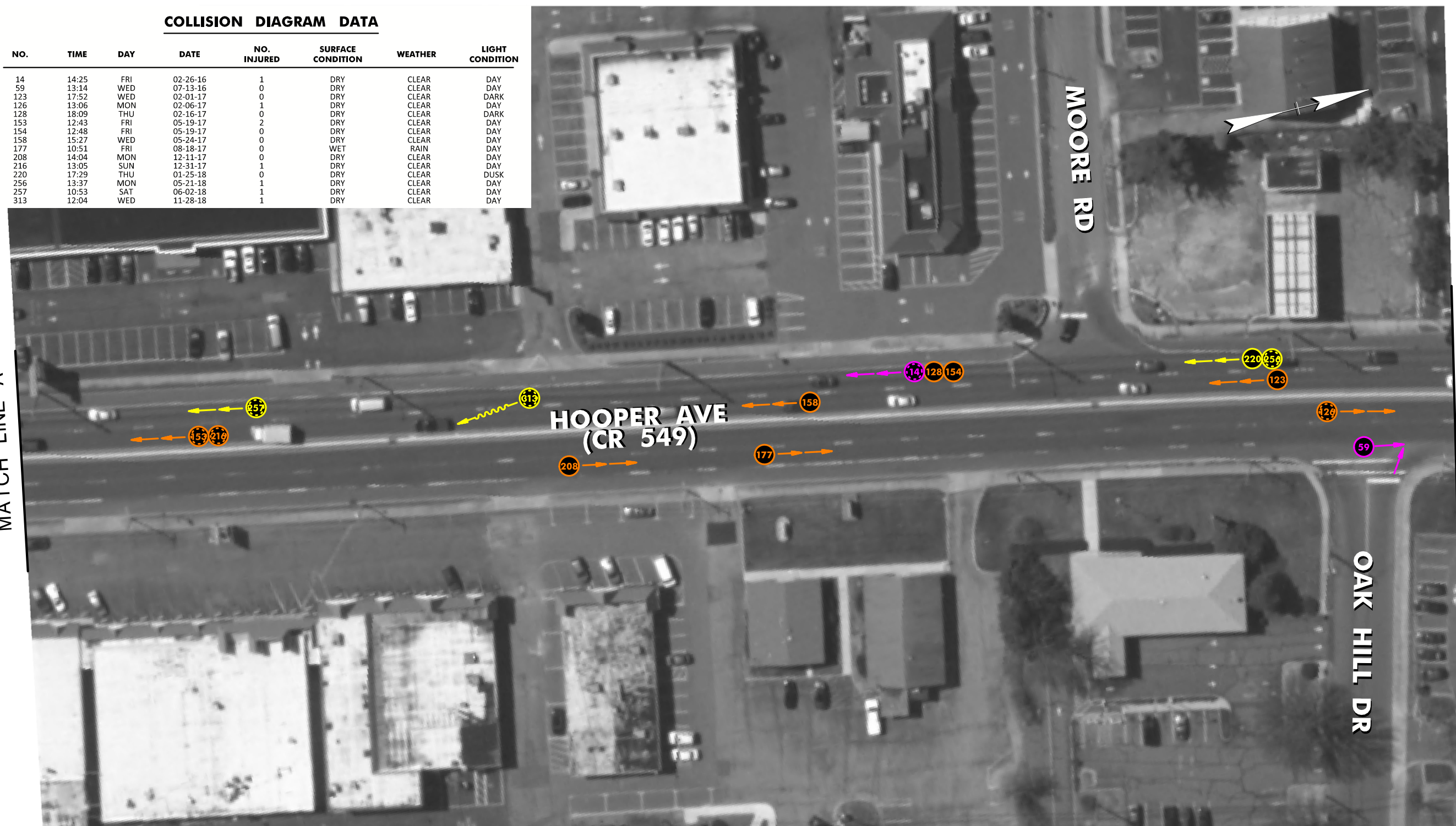
GPI Engineering
Design
Planning
Construction Management

NOT TO SCALE

MATCH LINE A
SEE SHEET NO. 2 OF 9

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
14	14:25	FRI	02-26-16	1	DRY	CLEAR	DAY
59	13:14	WED	07-13-16	0	DRY	CLEAR	DAY
123	17:52	WED	02-01-17	0	DRY	CLEAR	DARK
126	13:06	MON	02-06-17	1	DRY	CLEAR	DAY
128	18:09	THU	02-16-17	0	DRY	CLEAR	DARK
153	12:43	FRI	05-19-17	2	DRY	CLEAR	DAY
154	12:48	FRI	05-19-17	0	DRY	CLEAR	DAY
158	15:27	WED	05-24-17	0	DRY	CLEAR	DAY
177	10:51	FRI	08-18-17	0	WET	RAIN	DAY
208	14:04	MON	12-11-17	0	DRY	CLEAR	DAY
216	13:05	SUN	12-31-17	1	DRY	CLEAR	DAY
220	17:29	THU	01-25-18	0	DRY	CLEAR	DUSK
256	13:37	MON	05-21-18	1	DRY	CLEAR	DAY
257	10:53	SAT	06-02-18	1	DRY	CLEAR	DAY
313	12:04	WED	11-28-18	1	DRY	CLEAR	DAY



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	8
INJURIES	7
FATALITIES*	0
TOTAL NO. OF CRASHES	15

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	
⊙ (Purple)	2016 CRASHES
⊙ (Orange)	2017 CRASHES
⊙ (Yellow)	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: L:\2017659_HSP_Program_and_Project_Development\Support\NJDOT_HSP_Year_2_CrashData\Ocean\Collision_Diagram_Sheets\Vehicle\Sheet_02.dgn
DATE: 12/29/2019
TIME: 12:16:52 PM
GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
9	19:39	SAT	01-30-16	0	DRY	CLEAR	DARK
39	12:30	SAT	05-14-16	0	DRY	CLEAR	DAY
81	17:37	FRI	09-16-16	0	DRY	CLEAR	DAY
109	18:05	FRI	12-02-16	0	DRY	CLEAR	DARK
116	11:56	MON	01-09-17	0	DRY	OVERCAST	DAY
132	15:29	SAT	03-11-17	0	DRY	CLEAR	DAY
161	13:19	THU	06-15-17	0	DRY	CLEAR	DAY
197	11:18	TUE	10-24-17	0	WET	OVERCAST	DAY
224	15:11	WED	02-07-18	0	WET	RAIN	DAY
248	12:15	MON	05-07-18	0	DRY	CLEAR	DAY
315	16:36	FRI	11-30-18	0	DRY	CLEAR	DARK
316	16:47	FRI	11-30-18	0	DRY	CLEAR	DARK



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	12
INJURIES	0
FATALITIES*	0
TOTAL NO. OF CRASHES	12

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	
	2016 CRASHES
	2017 CRASHES
	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

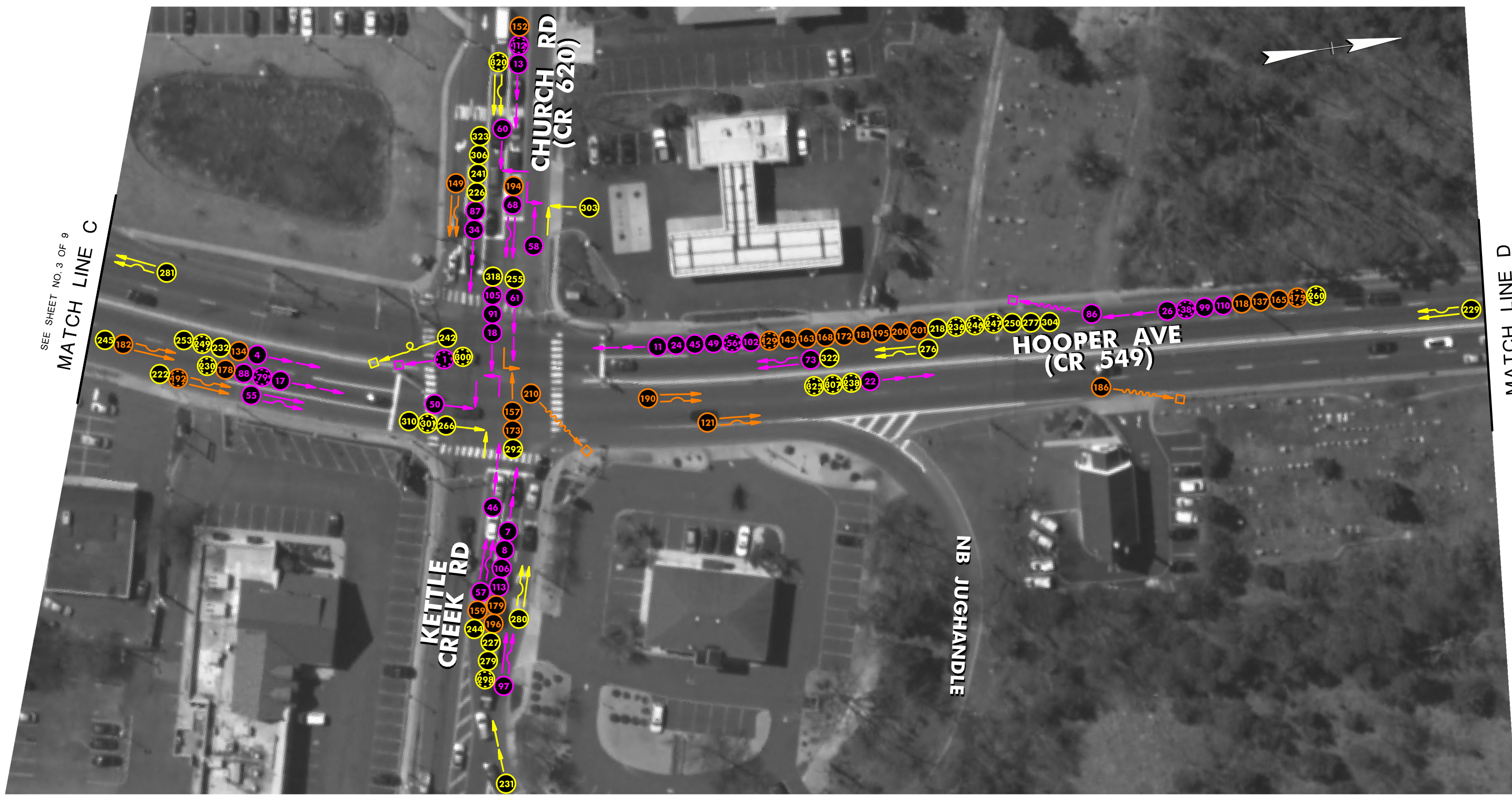
CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: L:\2017659_HSP_Program_and_Project_Development_Support\NJDOT_HSP_Year_2_CatchWay\04_Crash_Collisions_Diagram_Sheets\Vehicle\Sheet_04.dgn
 DATE: 12/29/2019
 TIME: 12:16:01 PM
 GREENMAN-PEDERSEN, INC.



SEE SHEET NO. 3 OF 9
 MATCH LINE C

MATCH LINE D
 SEE SHEET NO. 6 OF 9

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	87
INJURIES	21
FATALITIES*	0
TOTAL NO. OF CRASHES	108

SYMBOLS	
→	MOVING VEHICLE
←	BACKING VEHICLE
- - -	NON-INVOLVED VEHICLE
x - - -	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	
○ (Purple)	2016 CRASHES
○ (Orange)	2017 CRASHES
○ (Yellow)	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
 SILVER BAY ROAD (CR 28) TO MOLLY LANE
 TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
1	15:14	WED	01-06-16	1	DRY	CLEAR	DAY
4	17:12	TUE	01-12-16	0	DRY	CLEAR	DUSK
7	22:02	FRI	01-22-16	0	SNOWY	SNOW	DARK
8	14:54	THU	01-28-16	0	WET	CLEAR	DAY
11	14:22	SAT	02-06-16	0	DRY	CLEAR	DAY
13	16:05	WED	02-17-16	0	DRY	CLEAR	DAY
17	05:24	FRI	03-04-16	0	WET	SNOW	DAWN
18	09:50	MON	03-07-16	0	DRY	CLEAR	DAY
22	17:42	MON	04-04-16	0	WET	RAIN	DAY
24	20:54	SUN	04-10-16	0	DRY	CLEAR	DARK
26	13:53	SUN	04-17-16	0	DRY	CLEAR	DAY
34	14:31	TUE	05-03-16	0	WET	OVERCAST	DAY
38	09:17	FRI	05-13-16	2	DRY	OVERCAST	DAY
45	20:07	SAT	05-28-16	0	DRY	CLEAR	DAY
46	15:56	WED	06-01-16	0	DRY	CLEAR	DAY
49	12:59	MON	06-13-16	0	DRY	CLEAR	DAY
50	00:02	THU	06-23-16	0	DRY	CLEAR	DARK
55	11:01	TUE	07-05-16	0	DRY	CLEAR	DAY
56	19:03	TUE	07-05-16	1	DRY	CLEAR	DAY
57	11:26	THU	07-07-16	0	DRY	CLEAR	DAY
58	13:53	FRI	07-08-16	0	DRY	CLEAR	DAY
60	15:56	THU	07-14-16	0	DRY	CLEAR	DAY
61	16:26	SAT	07-23-16	0	DRY	CLEAR	DAY
68	10:20	THU	08-18-16	0	DRY	CLEAR	DAY
73	13:49	SAT	08-27-16	0	DRY	CLEAR	DAY
79	02:10	FRI	09-09-16	1	DRY	CLEAR	DARK
86	21:01	WED	09-21-16	0	DRY	CLEAR	DARK
87	22:37	THU	09-22-16	0	DRY	CLEAR	DARK
88	07:28	MON	09-26-16	0	DRY	CLEAR	DAY
91	19:25	SUN	10-02-16	0	DRY	CLEAR	DARK
97	13:46	FRI	10-21-16	0	WET	CLEAR	DAY
99	17:02	THU	10-27-16	0	WET	RAIN	DAY
102	07:49	MON	11-14-16	0	DRY	CLEAR	DAY
105	15:05	SAT	11-19-16	0	DRY	CLEAR	DAY
106	16:28	SAT	11-26-16	0	DRY	CLEAR	DAY
110	10:35	SAT	12-03-16	0	DRY	CLEAR	DAY
112	14:01	THU	12-15-16	1	DRY	CLEAR	DAY
113	20:02	THU	12-15-16	0	DRY	CLEAR	DARK
118	18:17	TUE	01-17-17	0	WET	RAIN	DAY
121	19:44	THU	01-26-17	0	DRY	CLEAR	DARK
129	19:17	FRI	02-17-17	1	DRY	CLEAR	DARK
134	09:13	FRI	03-17-17	0	DRY	CLEAR	DAY
137	11:59	FRI	03-31-17	0	WET	RAIN	DAY
143	17:58	SAT	04-29-17	0	DRY	CLEAR	DAY
149	11:54	FRI	05-12-17	0	DRY	CLEAR	DAY
152	14:23	WED	05-17-17	0	DRY	CLEAR	DAY
157	08:54	TUE	05-23-17	0	DRY	OVERCAST	DAY
159	10:31	THU	06-01-17	0	DRY	CLEAR	DAY
163	10:13	THU	06-22-17	0	DRY	CLEAR	DAY
165	15:29	FRI	07-07-17	0	DRY	CLEAR	DAY
168	09:49	TUE	07-18-17	0	DRY	CLEAR	DAY
172	14:41	FRI	08-04-17	0	DRY	CLEAR	DAY
173	05:56	SAT	08-05-17	0	WET	RAIN	DAWN
175	13:58	MON	08-07-17	1	WET	RAIN	DAY

COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
178	01:38	SUN	08-27-17	0	DRY	CLEAR	DARK
179	12:36	MON	08-28-17	0	DRY	CLEAR	DAY
181	19:16	WED	08-30-17	0	DRY	CLEAR	DAY
182	18:33	THU	08-31-17	0	DRY	CLEAR	DAY
186	00:19	FRI	09-15-17	0	DRY	CLEAR	DARK
190	10:06	MON	10-02-17	0	DRY	CLEAR	DAY
192	20:14	TUE	10-03-17	1	DRY	CLEAR	DARK
194	19:16	MON	10-09-17	0	DRY	CLEAR	DARK
195	10:50	SAT	10-14-17	0	WET	RAIN	DAY
196	11:20	SUN	10-22-17	0	DRY	CLEAR	DAY
200	13:33	MON	10-30-17	0	DRY	CLEAR	DAY
201	15:32	WED	11-01-17	0	DRY	CLEAR	DAY
210	10:58	TUE	12-12-17	0	DRY	CLEAR	DAY
218	13:29	SAT	01-20-18	0	DRY	CLEAR	DAY
222	13:08	THU	02-01-18	0	DRY	CLEAR	DAY
226	20:34	THU	02-22-18	0	WET	OVERCAST	DARK
227	16:44	THU	03-01-18	0	WET	RAIN	DARK
229	07:06	TUE	03-06-18	0	DRY	CLEAR	DAY
230	14:13	TUE	03-06-18	1	DRY	CLEAR	DAY
231	12:32	SUN	03-11-18	0	DRY	CLEAR	DAY
232	11:18	TUE	03-13-18	0	WET	RAIN	DAY
236	16:23	MON	03-26-18	1	DRY	CLEAR	DAY
238	14:24	TUE	04-03-18	2	WET	RAIN	DAY
241	19:26	TUE	04-17-18	0	DRY	CLEAR	DUSK
242	02:10	SAT	04-21-18	0	DRY	CLEAR	DARK
244	19:52	THU	04-26-18	0	DRY	CLEAR	DUSK
245	18:51	TUE	05-01-18	0	DRY	CLEAR	DAY
246	20:02	WED	05-02-18	1	DRY	CLEAR	DARK
247	00:47	SUN	05-06-18	1	DRY	CLEAR	DARK
249	17:26	FRI	05-11-18	1	DRY	CLEAR	DAY
250	17:59	FRI	05-11-18	0	DRY	CLEAR	DAY
253	14:16	WED	05-16-18	0	WET	RAIN	DAY
255	07:42	FRI	05-18-18	0	WET	RAIN	DAY
260	13:52	TUE	06-19-18	1	DRY	CLEAR	DAY
266	02:35	TUE	07-03-18	0	DRY	CLEAR	DARK
276	16:10	MON	08-06-18	0	DRY	CLEAR	DAY
277	14:03	TUE	08-07-18	0	DRY	CLEAR	DAY
279	12:00	SUN	08-12-18	0	DRY	CLEAR	DAY
280	10:03	WED	08-15-18	0	DRY	CLEAR	DAY
281	17:36	WED	08-15-18	0	DRY	CLEAR	DAY
292	09:35	WED	10-03-18	0	DRY	CLEAR	DAY
298	19:51	FRI	10-19-18	1	DRY	CLEAR	DARK
300	19:01	WED	10-24-18	1	DRY	CLEAR	DARK
301	19:51	SUN	10-28-18	1	DRY	CLEAR	DARK
303	06:18	WED	10-31-18	0	DRY	CLEAR	DARK
304	19:31	FRI	11-02-18	0	WET	RAIN	DARK
306	15:21	MON	11-05-18	0	WET	RAIN	DAY
307	10:59	TUE	11-06-18	1	WET	RAIN	DAY
310	12:18	MON	11-19-18	0	DRY	CLEAR	DAY
318	10:15	SAT	12-08-18	0	DRY	CLEAR	DAY
320	16:41	THU	12-13-18	1	DRY	CLEAR	DARK
322	22:14	SAT	12-15-18	0	WET	RAIN	DARK
323	03:35	SUN	12-16-18	0	WET	RAIN	DARK
325	16:24	FRI	12-28-18	1	WET	RAIN	DARK

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	87
INJURIES	21
FATALITIES*	0
TOTAL NO. OF CRASHES	108

SYMBOLS

	MOVING VEHICLE		NON-INVOLVED VEHICLE
	BACKING VEHICLE		PEDESTRIAN
	BICYCLIST		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

	2016 CRASHES
	2017 CRASHES
	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

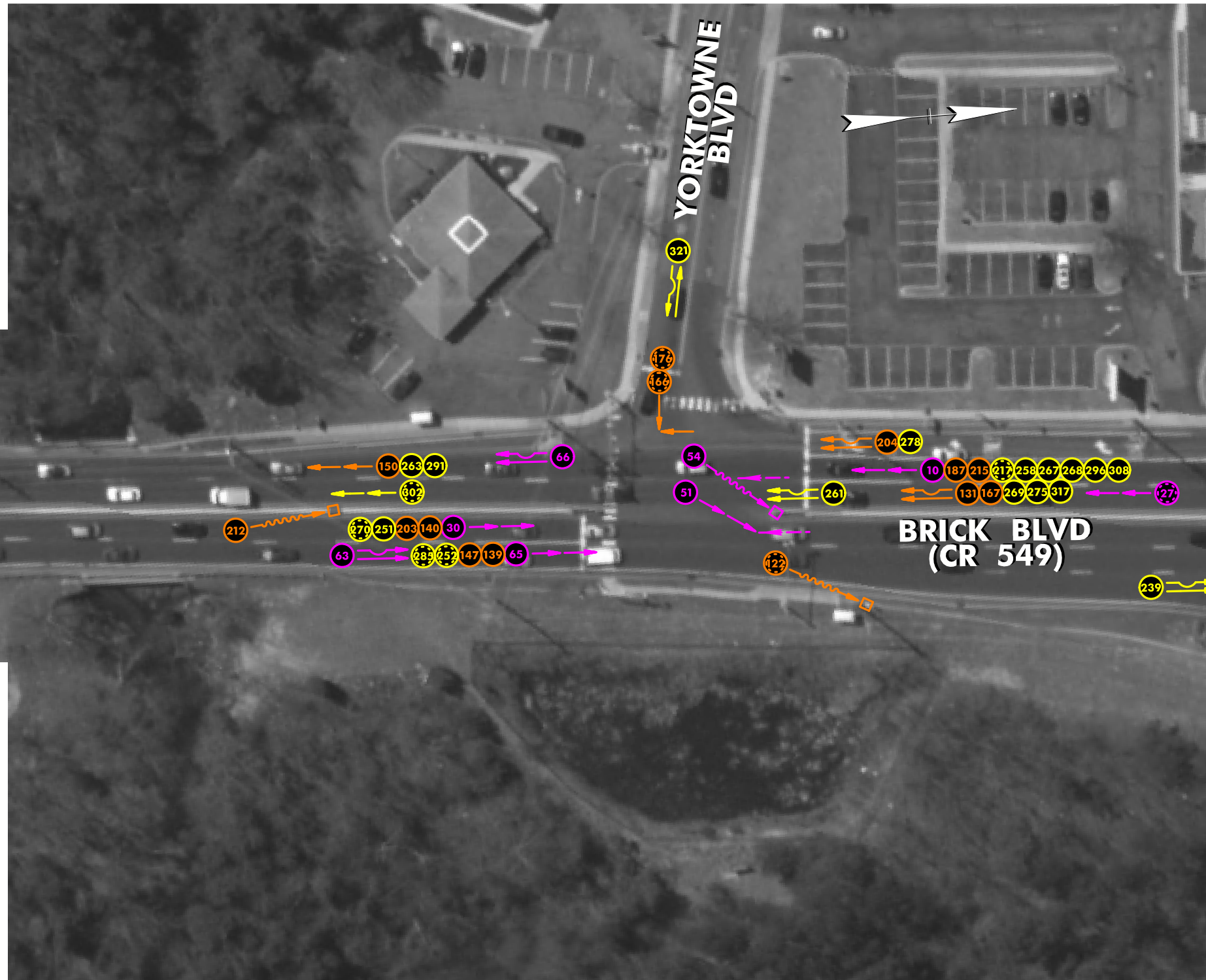
CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY
2016 - 2018 COLLISION DIAGRAMS



NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
10	15:09	SUN	01-31-16	0	DRY	CLEAR	DAY
27	16:52	MON	04-18-16	1	DRY	CLEAR	DAY
30	12:39	FRI	04-22-16	0	DRY	CLEAR	DAY
51	13:07	SAT	06-25-16	0	DRY	CLEAR	DAY
54	05:09	SAT	07-02-16	0	DRY	CLEAR	DAWN
63	15:20	MON	07-25-16	0	DRY	CLEAR	DAY
65	16:36	TUE	07-26-16	0	DRY	CLEAR	DAY
66	20:38	SAT	07-30-16	0	DRY	CLEAR	DARK
90	10:03	FRI	09-30-16	0	WET	RAIN	DAY
103	07:48	TUE	11-15-16	1	WET	RAIN	DAY
108	18:26	TUE	11-29-16	0	WET	CLEAR	DARK
122	15:15	TUE	01-31-17	1	WET	OVERCAST	DAY
125	12:28	MON	02-06-17	2	DRY	CLEAR	DAY
131	17:57	FRI	03-10-17	0	WET	SNOW	DARK
139	15:42	SUN	04-16-17	0	DRY	CLEAR	DAY
140	16:49	TUE	04-18-17	0	DRY	CLEAR	DAY
147	15:27	MON	05-08-17	0	DRY	CLEAR	DAY
150	15:52	TUE	05-16-17	0	DRY	CLEAR	DAY
162	15:13	THU	06-15-17	0	DRY	CLEAR	DAY
166	09:44	SAT	07-08-17	2	DRY	CLEAR	DAY
167	18:02	SAT	07-15-17	0	DRY	CLEAR	DAY
176	12:31	WED	08-16-17	1	DRY	CLEAR	DAY
187	14:16	TUE	09-19-17	0	WET	RAIN	DAY



COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
203	08:23	SUN	11-05-17	0	WET	OVERCAST	DAY
204	13:57	MON	11-13-17	0	WET	RAIN	DAY
212	18:58	FRI	12-15-17	0	SNOWY	SNOW	DARK
215	17:02	TUE	12-26-17	0	DRY	CLEAR	DARK
217	09:18	SAT	01-13-18	1	DRY	OVERCAST	DAY
239	09:34	TUE	04-17-18	0	DRY	CLEAR	DAY
251	06:57	TUE	05-15-18	0	DRY	CLEAR	DAY
252	07:37	WED	05-16-18	1	WET	RAIN	DAY
258	21:37	THU	06-07-18	0	DRY	CLEAR	DARK
261	09:04	SUN	06-24-18	0	DRY	CLEAR	DAY
263	14:09	WED	06-27-18	0	DRY	CLEAR	DAY
267	15:05	TUE	07-03-18	0	DRY	CLEAR	DAY
268	21:22	SAT	07-14-18	0	DRY	CLEAR	DARK
269	17:26	MON	07-16-18	0	DRY	CLEAR	DAY
270	12:06	WED	07-18-18	1	DRY	CLEAR	DAY
275	14:41	SAT	07-28-18	0	DRY	OVERCAST	DAY
278	17:59	WED	08-08-18	0	DRY	CLEAR	DAY
285	11:48	TUE	09-11-18	1	WET	RAIN	DAY
291	13:16	FRI	09-28-18	0	DRY	CLEAR	DAY
296	16:18	TUE	10-16-18	0	DRY	CLEAR	DAY
302	15:26	MON	10-29-18	1	DRY	CLEAR	DAY
308	16:18	SUN	11-18-18	0	DRY	CLEAR	DAY
317	16:24	FRI	12-07-18	0	DRY	CLEAR	DARK
321	18:07	FRI	12-14-18	0	WET	RAIN	DARK

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	36
INJURIES	11
FATALITIES*	0
TOTAL NO. OF CRASHES	47

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	
⊙ (Purple)	2016 CRASHES
⊙ (Orange)	2017 CRASHES
⊙ (Yellow)	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD): SILVER BAY ROAD (CR 28) TO MOLLY LANE TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: L:\2017\659_HSP_Program_and_Project_Development\Support\NJDOT_HSP_Year_2_Catchway\04_Ocean\Collision_Diagram_Sheets\Vehicle_Sheet_06.dgn DATE: 12/29/2019 TIME: 12:16:02 PM

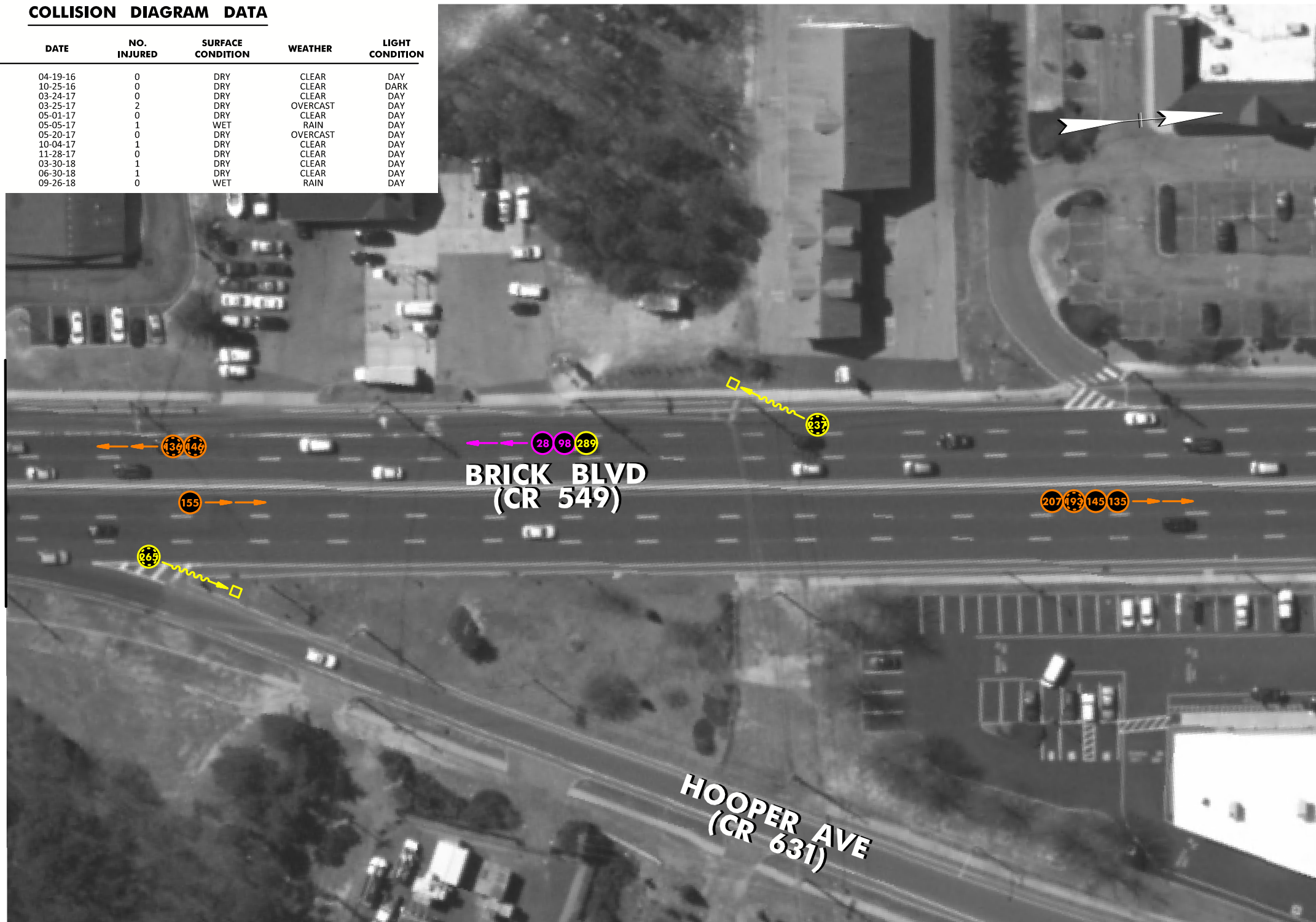
SEE SHEET NO. 4 OF 9 MATCH LINE D

MATCH LINE E SEE SHEET NO. 7 OF 9

6/9

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
28	16:18	TUE	04-19-16	0	DRY	CLEAR	DAY
98	18:24	TUE	10-25-16	0	DRY	CLEAR	DARK
135	13:08	FRI	03-24-17	0	DRY	CLEAR	DAY
136	11:14	SAT	03-25-17	2	DRY	OVERCAST	DAY
145	17:50	MON	05-01-17	0	DRY	CLEAR	DAY
146	12:13	FRI	05-05-17	1	WET	RAIN	DAY
155	14:38	SAT	05-20-17	0	DRY	OVERCAST	DAY
193	09:29	WED	10-04-17	1	DRY	CLEAR	DAY
207	11:19	TUE	11-28-17	0	DRY	CLEAR	DAY
237	10:08	FRI	03-30-18	1	DRY	CLEAR	DAY
265	17:56	SAT	06-30-18	1	DRY	CLEAR	DAY
289	07:53	WED	09-26-18	0	WET	RAIN	DAY



SEE SHEET NO. 6 OF 9
MATCH LINE E

MATCH LINE F
SEE SHEET NO. 8 OF 9

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	7
INJURIES	5
FATALITIES*	0
TOTAL NO. OF CRASHES	12

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	
	2016 CRASHES
	2017 CRASHES
	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

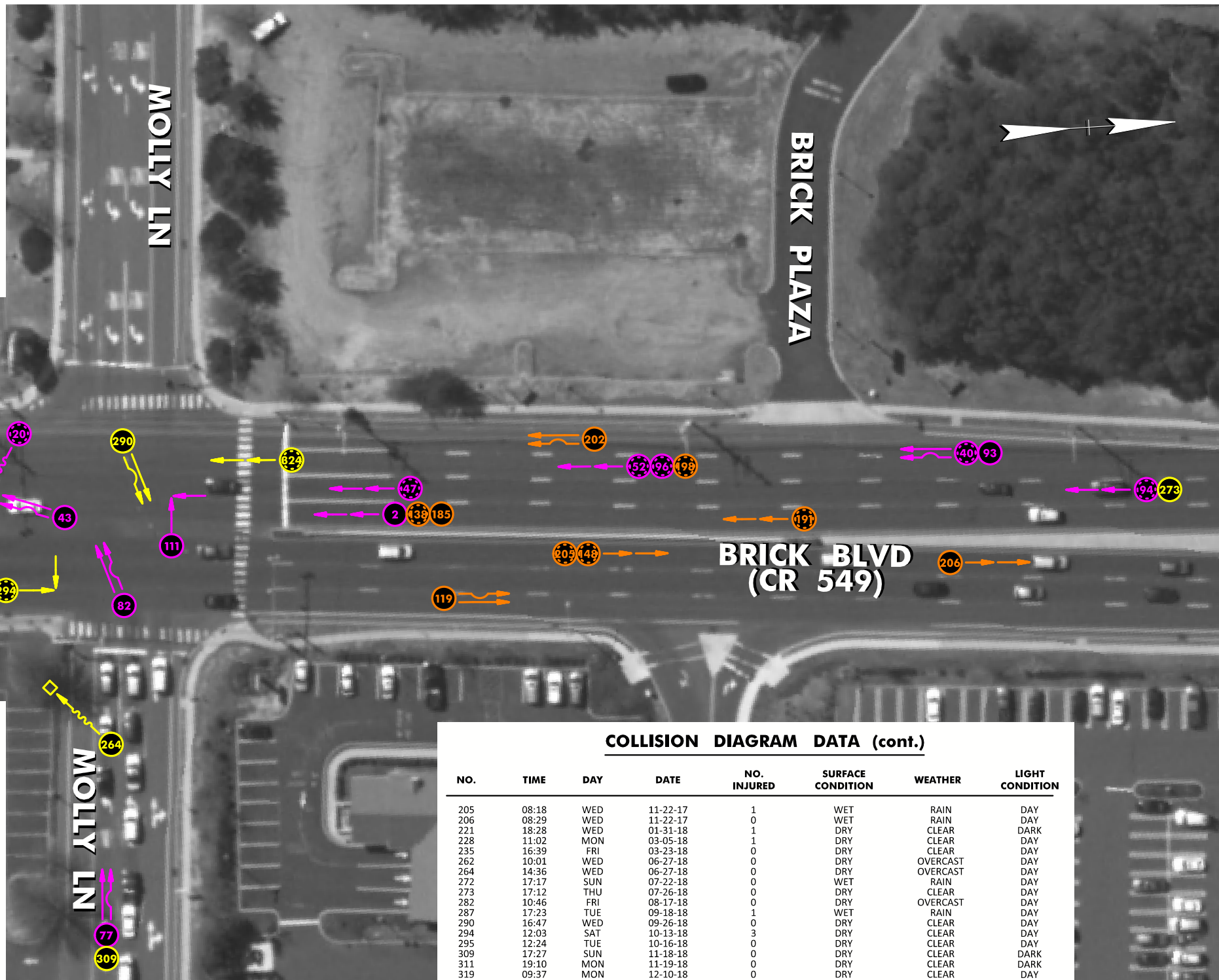
GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: L:\2017659 HSP Program and Project Development Support\NJDOT_HSP_Year 2_Catchway\04 Ocean\Collision Diagram - Sheets\Vehicle\Sheet 07.dgn
DATE: 12/29/2019
TIME: 12:16:30 PM
GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
2	18:28	WED	01-06-16	0	DRY	CLEAR	DUSK
6	11:51	THU	01-21-16	0	DRY	CLEAR	DAY
20	09:52	THU	03-24-16	1	DRY	CLEAR	DAY
21	17:17	FRI	04-01-16	0	DRY	CLEAR	DAY
35	12:54	FRI	05-06-16	0	WET	CLEAR	DAY
40	16:52	MON	05-16-16	1	DRY	CLEAR	DAY
41	18:00	WED	05-18-16	0	DRY	CLEAR	DAY
42	15:26	FRI	05-20-16	0	DRY	CLEAR	DAY
43	16:07	SAT	05-21-16	0	WET	CLEAR	DAY
47	17:58	WED	06-01-16	2	DRY	CLEAR	DAY
52	12:24	WED	06-29-16	1	DRY	CLEAR	DAY
69	17:42	THU	08-18-16	0	DRY	CLEAR	DAY
75	14:23	MON	08-29-16	1	DRY	CLEAR	DAY
77	10:50	THU	09-08-16	0	DRY	CLEAR	DAY
78	16:22	THU	09-08-16	0	DRY	CLEAR	DAY
80	16:43	WED	09-14-16	0	DRY	CLEAR	DAY
82	20:24	MON	09-19-16	0	WET	CLEAR	DARK
85	18:10	WED	09-21-16	0	DRY	CLEAR	DAY
93	19:25	FRI	10-07-16	0	DRY	CLEAR	DARK
94	20:34	FRI	10-07-16	1	DRY	CLEAR	DARK



COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
96	10:41	FRI	10-21-16	1	WET	RAIN	DAY
107	15:56	TUE	11-29-16	1	WET	RAIN	DUSK
111	20:29	TUE	12-06-16	0	WET	RAIN	DARK
119	10:54	SAT	01-21-17	0	DRY	OVERCAST	DAY
133	17:57	MON	03-13-17	0	DRY	CLEAR	DAY
138	15:05	SAT	04-15-17	1	DRY	CLEAR	DAY
144	16:39	MON	05-01-17	2	DRY	CLEAR	DAY
148	07:30	TUE	05-09-17	2	DRY	OVERCAST	DAY
156	20:19	MON	05-22-17	1	WET	RAIN	DARK
160	18:32	MON	06-05-17	0	WET	RAIN	DAY
164	12:07	FRI	06-30-17	2	DRY	CLEAR	DAY
170	17:59	WED	08-02-17	1	WET	CLEAR	DAY
171	14:01	THU	08-03-17	1	DRY	CLEAR	DAY
174	16:15	SAT	08-05-17	1	DRY	CLEAR	DAY
183	09:27	WED	09-06-17	0	WET	RAIN	DAY
184	15:49	MON	09-11-17	0	DRY	CLEAR	DAY
185	14:29	WED	09-13-17	0	DRY	CLEAR	DAY
191	19:00	TUE	10-03-17	1	DRY	RAIN	DUSK
198	14:32	FRI	10-27-17	1	DRY	CLEAR	DAY
202	16:39	WED	11-01-17	0	DRY	CLEAR	DAY

COLLISION DIAGRAM DATA (cont.)

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
205	08:18	WED	11-22-17	1	WET	RAIN	DAY
206	08:29	WED	11-22-17	0	WET	RAIN	DAY
221	18:28	WED	01-31-18	1	DRY	CLEAR	DARK
228	11:02	MON	03-05-18	1	DRY	CLEAR	DAY
235	16:39	FRI	03-23-18	0	DRY	CLEAR	DAY
262	10:01	WED	06-27-18	0	DRY	OVERCAST	DAY
264	14:36	WED	06-27-18	0	DRY	OVERCAST	DAY
272	17:17	SUN	07-22-18	0	WET	RAIN	DAY
273	17:12	THU	07-26-18	0	DRY	CLEAR	DAY
282	10:46	FRI	08-17-18	0	DRY	OVERCAST	DAY
287	17:23	TUE	09-18-18	1	WET	RAIN	DAY
290	16:47	WED	09-26-18	0	DRY	CLEAR	DAY
294	12:03	SAT	10-13-18	3	DRY	CLEAR	DAY
295	12:24	TUE	10-16-18	0	DRY	CLEAR	DAY
309	17:27	SUN	11-18-18	0	DRY	CLEAR	DARK
311	19:10	MON	11-19-18	0	DRY	CLEAR	DARK
319	09:37	MON	12-10-18	0	DRY	CLEAR	DAY
324	18:30	TUE	12-18-18	1	DRY	CLEAR	DARK
326	16:46	FRI	12-28-18	0	WET	RAIN	DUSK

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	<u>35</u>
INJURIES	<u>24</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>59</u>

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2016 CRASHES
- 2017 CRASHES
- 2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering
Design
Planning
Construction Management

NOT TO SCALE

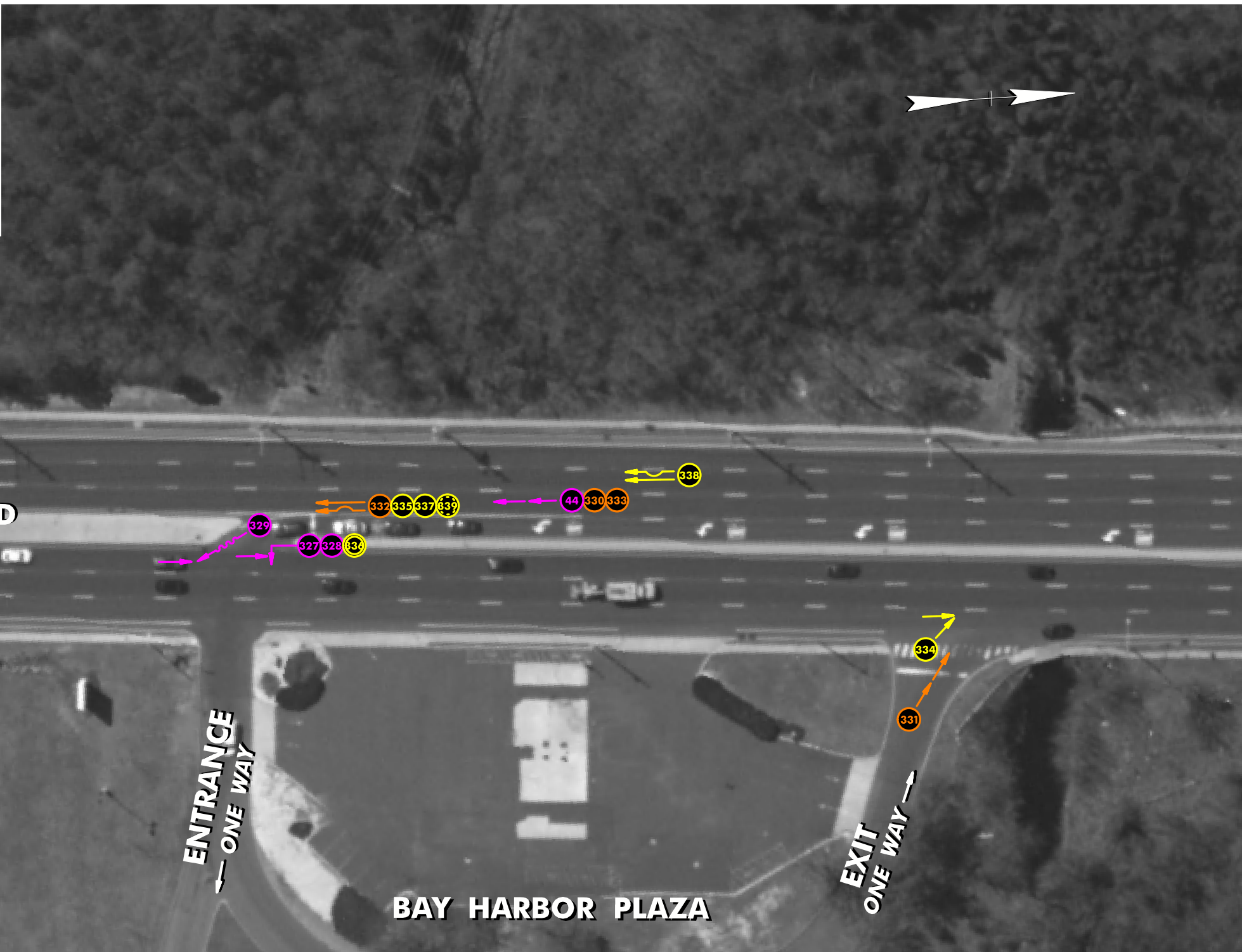
SEE SHEET NO. 7 OF 9
MATCH LINE F

SEE SHEET NO. 9 OF 9
MATCH LINE G



COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
44	15:50	FRI	05-27-16	0	DRY	CLEAR	DAY
274	23:33	THU	07-26-18	0	DRY	CLEAR	DARK
327	12:19	SUN	01-24-16	0	SLUSH	CLEAR	DAY
328	19:54	WED	01-27-16	0	ICY	CLEAR	DARK
329	04:21	THU	12-01-16	0	WET	OVERCAST	DARK
330	17:03	FRI	06-23-17	0	DRY	CLEAR	DAY
331	13:41	SUN	09-10-17	0	DRY	CLEAR	DAY
332	17:53	MON	11-06-17	0	DRY	CLEAR	DARK
333	17:32	MON	11-13-17	0	DRY	CLEAR	DARK
334	12:22	THU	04-19-18	0	DRY	CLEAR	DAY
335	21:14	SAT	04-28-18	0	DRY	CLEAR	DARK
336	08:55	SUN	06-24-18	2 (1*)	DRY	CLEAR	DAY
337	21:01	SUN	08-05-18	0	DRY	CLEAR	DARK
338	18:13	TUE	11-13-18	0	DRY	CLEAR	DARK
339	19:24	WED	12-19-18	1	DRY	CLEAR	DARK



SEE SHEET NO. 8 OF 9
MATCH LINE G

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	13
INJURIES	1
FATALITIES*	1
TOTAL NO. OF CRASHES	15

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	
	2016 CRASHES
	2017 CRASHES
	2018 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2016 - 2018 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

DATE: 12/29/2019 TIME: 12:17:26 PM FILE: L:\2017\659 HSP Program and Project Development Support\NJDOT_HSP_Year 2_Catchway\04 Ocean\Collision Diagram - Sheets\Vehicle\Sheet 09.dgn

APPENDIX E

PEDESTRIAN CRASH DIAGRAMS



COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
1	00:11	MON	08-16-14	1	DRY	CLEAR	DAY
3	17:14	SAT	12-04-17	2	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

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NOT TO SCALE

MATCH LINE A
SEE SHEET NO. 2 OF 8

1/8

FILE: L:\2017659_HSP_Program_and_Project_Development_Support\NDDOT_HSP_Year_2_CardHwy04_Ocean\Collision_Diagram_Sheets\Pedestrian\Sheet 02.dgn
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 DATE: 12/29/2019
 GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

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



SEE SHEET NO. 1 OF 8
 MATCH LINE A

MATCH LINE B
 SEE SHEET NO. 3 OF 8

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

2 / 8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
 SILVER BAY ROAD (CR 28) TO MOLLY LANE
 TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

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COLLISION DIAGRAM DATA

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



SEE SHEET NO. 2 OF 8
MATCH LINE B

SEE SHEET NO. 4 OF 8
MATCH LINE C

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

3 / 8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

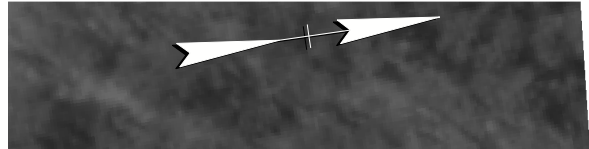
GPI Engineering Design Planning Construction Management	NOT TO SCALE
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TIME: 12:25:43 PM
GREENMAN-PEDERSEN, INC.

FILE: L:\2017\659 HSP Program and Project Development Support\NDDOT_HSP_Year 2\CatchWay\04 Ocean\Collision Diagram Sheets\Pedestrian\Sheet 04.dgn
 DATE: 12/29/2019
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 GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
2	17:14	MON	12-04-17	1	DRY	CLEAR	DARK



SEE SHEET NO. 3 OF 9
 MATCH LINE C

MATCH LINE D
 SEE SHEET NO. 5 OF 9

LEGEND

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

4
8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
 SILVER BAY ROAD (CR 28) TO MOLLY LANE
 TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

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

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

Engineering Design Planning Construction Management	NOT TO SCALE
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 DATE: 12/29/2019
 TIME: 12:26:41 PM
 GREENMAN-PEDERSEN, INC.

SEE SHEET NO. 4 OF 8
MATCH LINE D

MATCH LINE E
SEE SHEET NO. 6 OF 8

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
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SEE SHEET NO. 5 OF 8
MATCH LINE E



MATCH LINE F
SEE SHEET NO. 7 OF 8

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

PEDESTRIAN CRASH

6
8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

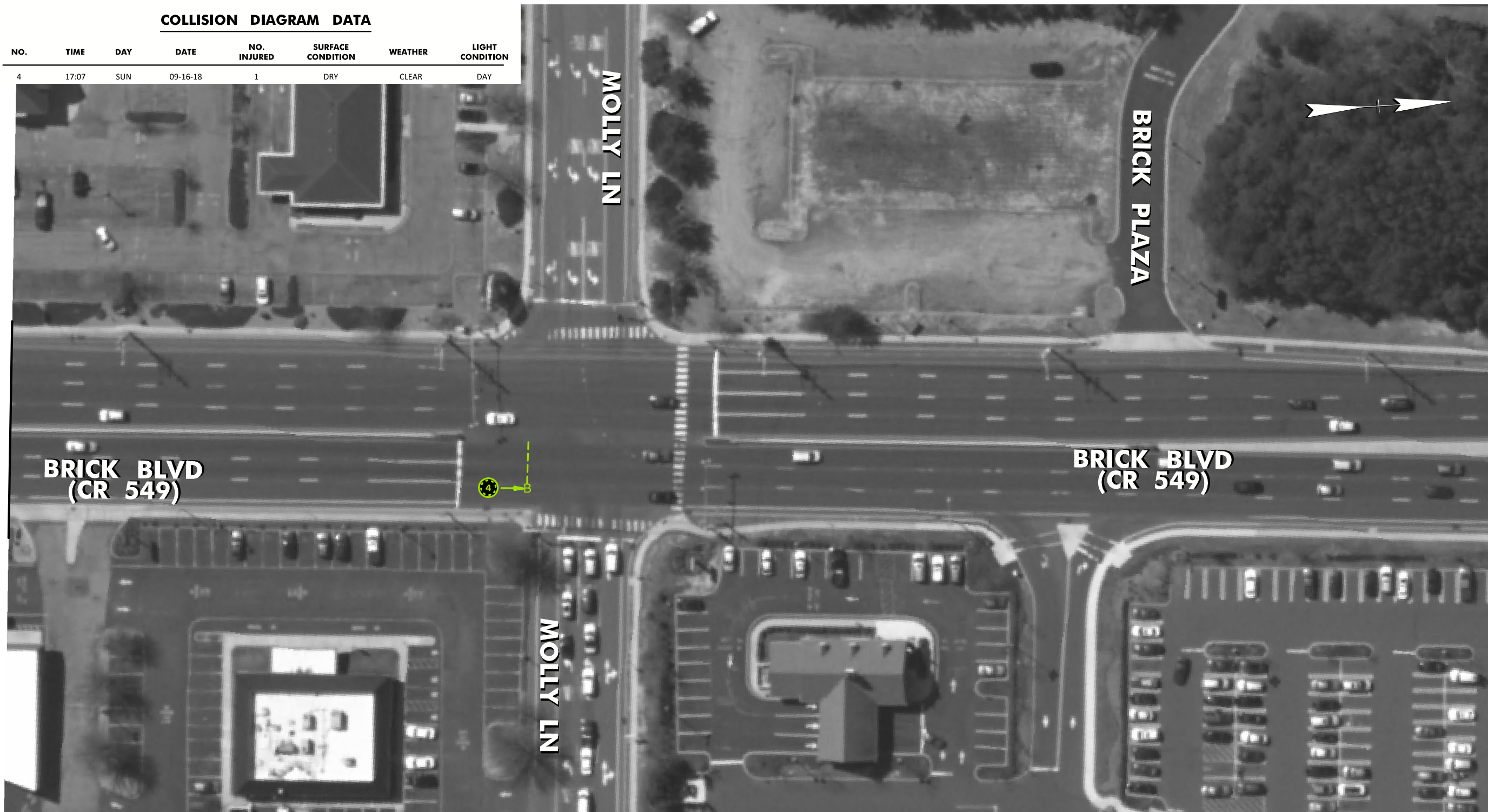
2014-2018 PEDESTRIAN COLLISION DIAGRAMS

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NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
4	17:07	SUN	09-16-18	1	DRY	CLEAR	DAY



SEE SHEET NO. 6 OF 8
MATCH LINE F

SEE SHEET NO. 8 OF 8
MATCH LINE G

LEGEND

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

7
8

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

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COLLISION DIAGRAM DATA

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



SEE SHEET NO. 7 OF 8
MATCH LINE G

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

	MOVING VEHICLE		BICYCLIST
	BACKING VEHICLE		PEDESTRIAN
	NON-INVOLVED VEHICLE		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

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

CR 549 (HOOPER AVENUE & BRICK BOULEVARD):
SILVER BAY ROAD (CR 28) TO MOLLY LANE
TOMS RIVER & BRICK TOWNSHIPS, OCEAN COUNTY

2014-2018 PEDESTRIAN COLLISION DIAGRAMS

GPI Engineering
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Planning
Construction Management

NOT TO SCALE

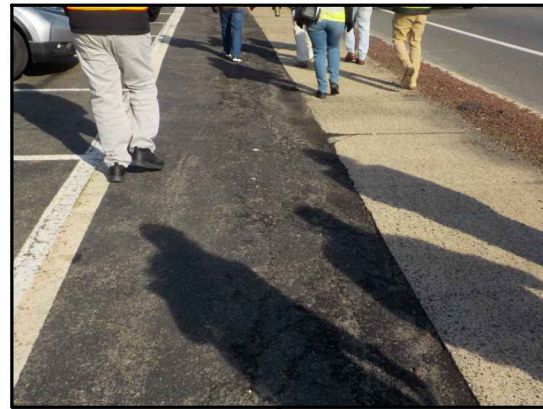
APPENDIX F

SITE PHOTOGRAPHS

Inlet filled with debris presents drainage issue



Lack of physical barrier between parking lot and sidewalk may result in vehicles encroaching onto the sidewalk



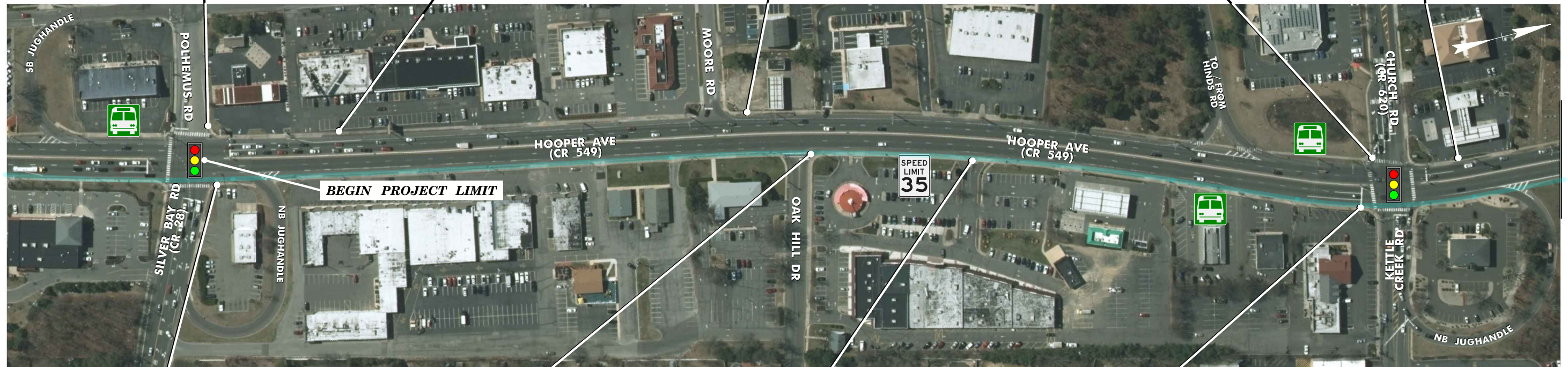
Uneven/damaged sidewalk can be a tripping hazard



Bicyclists do not have dedicated facilities



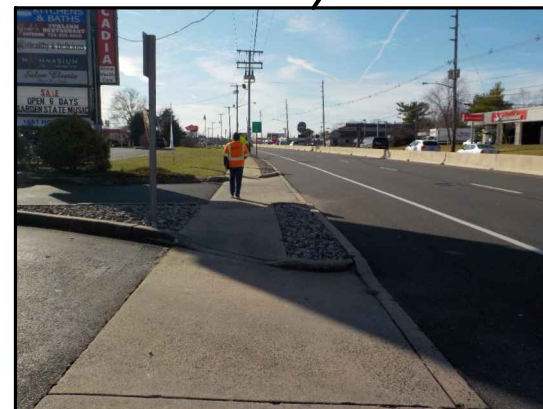
Wide driveways close to intersection creates access management issues



Protruding signal foundation in sidewalk can be a tripping hazard



Ponding at curb ramps; non-compliant ADA ramps



Lack of ADA compliant ramps at driveways



Sign clutter can cause motorist confusion

1
2

**NJDOT HSIP - ROAD SAFETY AUDIT
CR 549 (HOOPER AVE/BRICK BLVD)**

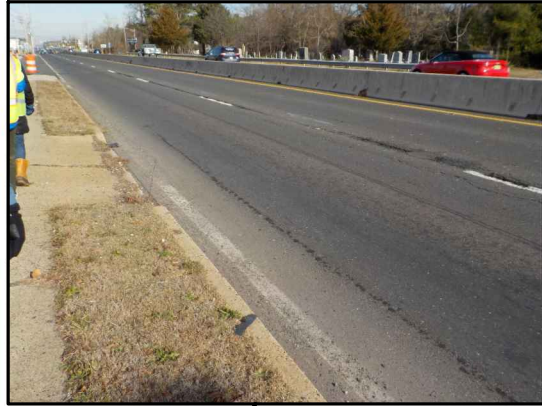
TOMS RIVER & BRICK TOWNSHIPS
OCEAN COUNTY

SITE PHOTOGRAPHS



N.T.S.

Worn edge line striping and degrading roadway



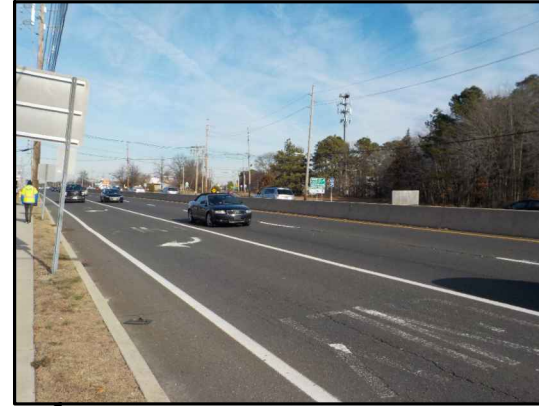
Pavement markings to indicate right turn only are missing



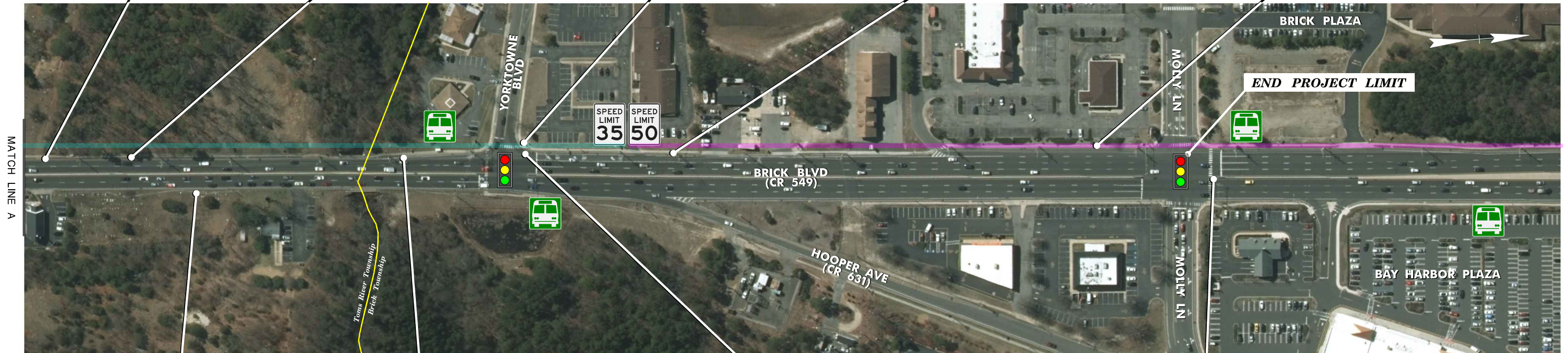
Detectable warning surfaces not contrasting color and are in poor condition



Worn striping indicating right turn only



Overgrown shrub needs trimming; reduces usable width of sidewalk



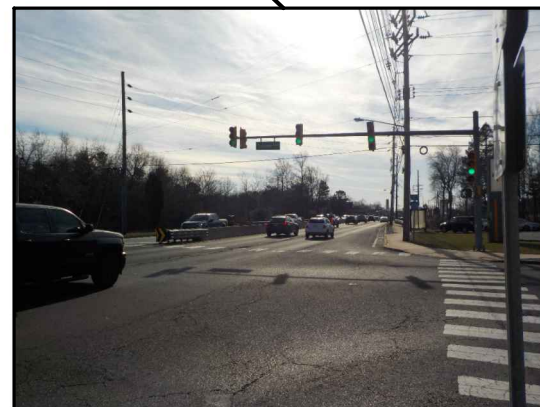
MATCH LINE A



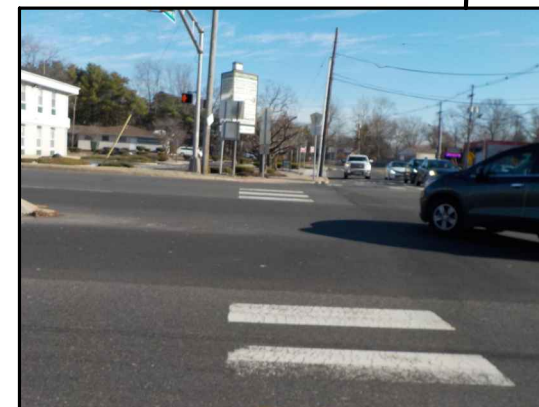
No sidewalk northbound between Kettle Creek/Church Rd and Yorktowne Blvd (note proximity of cemetery/graves in some areas)



Wide shoulder and bus stop area can be restriped to indicate bus stop



Signal heads without backplates are difficult to see



Crosswalk striping missing

2
2

**NJDOT HSIP - ROAD SAFETY AUDIT
CR 549 (HOOPER AVE/BRICK BLVD)**

TOMS RIVER & BRICK TOWNSHIPS
OCEAN COUNTY

SITE PHOTOGRAPHS



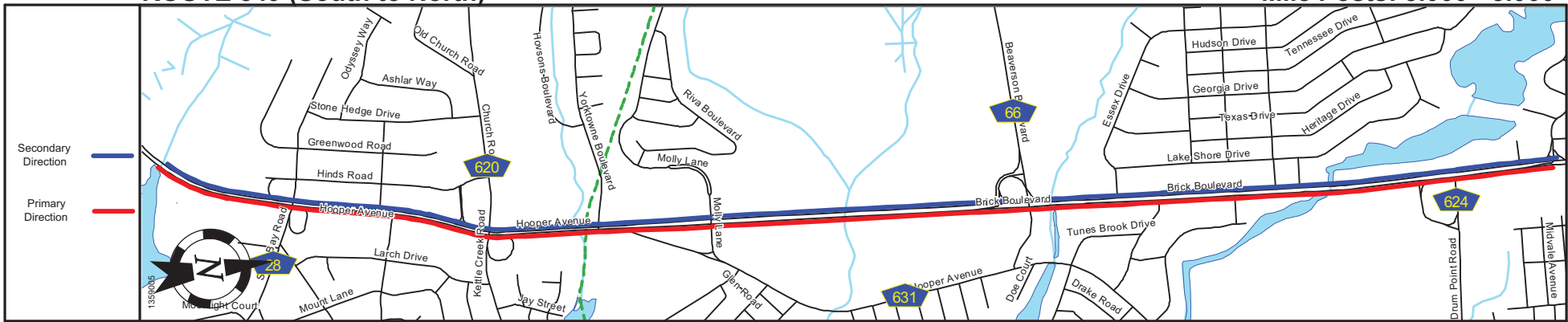
N.T.S.

APPENDIX G

STRAIGHT LINE DIAGRAMS

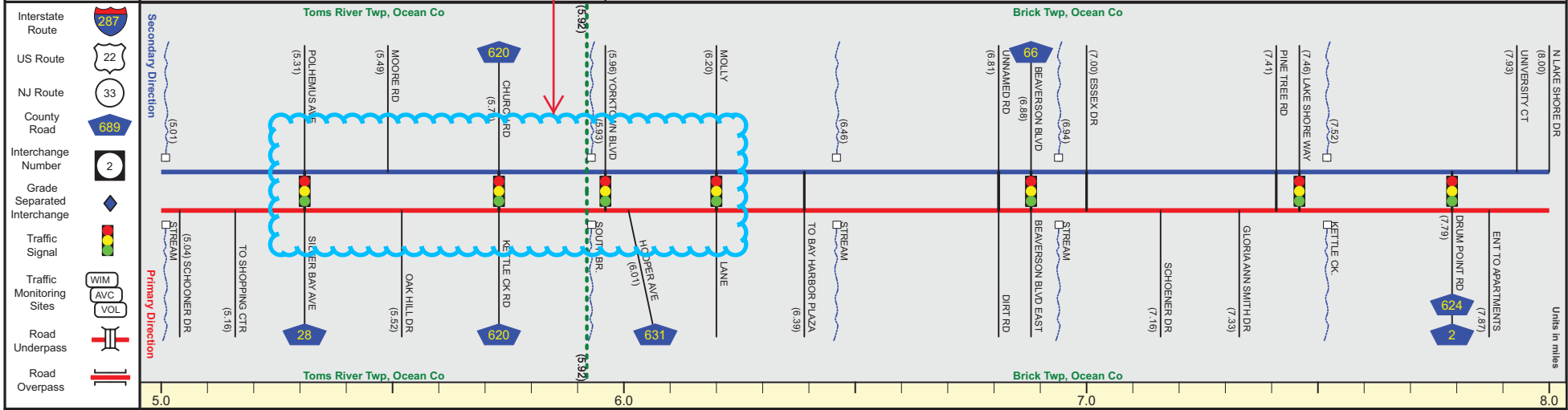
ROUTE 549 (South to North)

Mile Posts: 5.000 - 8.000



Pavement	24	36	30	
Shoulder	4	10	2	
Number of Lanes	2	3	2	
Speed Limit	50	35	50	40
Street Name	Hooper Avenue		Brick Boulevard	

RSA Limits



Street Name	Hooper Avenue		Brick Boulevard	
Jurisdiction	County			
Functional Class	Urban Principal Arterial			
Federal Aid - NHS Sy	NHS			
Control Section				
Speed Limit	50	35	50	40
Number of Lanes	2		3	2
Med. Type	Curbed	Positive		Curbed
Med. Width	10	4		VAR
Pavement	24		36	
Shoulder	4	10	2	10
Traffic Volume	39,666 (2016)		37,825 (2016)	
Traffic Sta. ID	91546		91517	
Structure No.	1506008		1506010	
Enlarged Views				

SRI = 0000549__

Date last inventoried: October 2012

APPENDIX H

PRE-AUDIT PRESENTATION

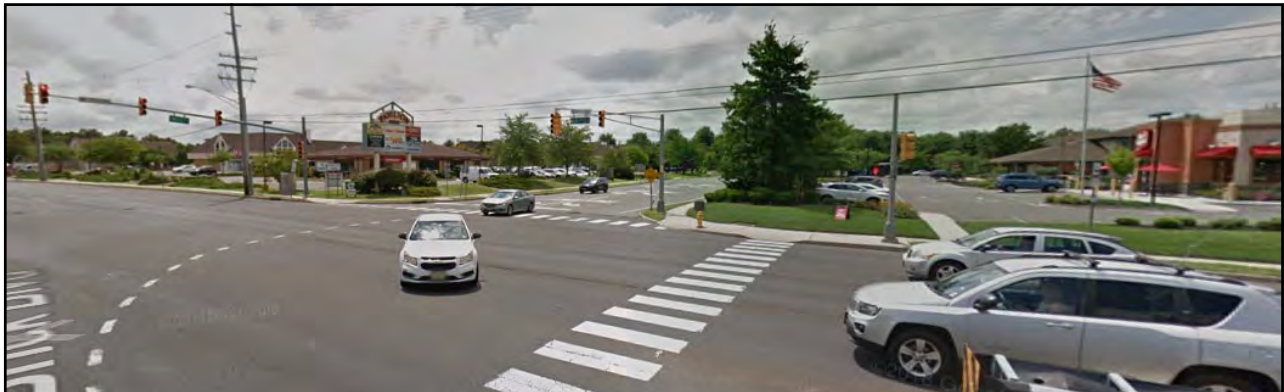
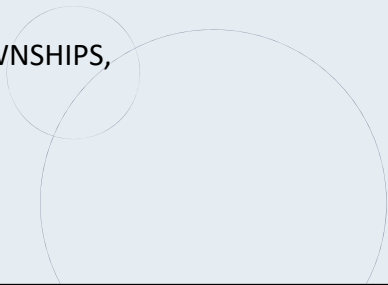


ROAD SAFETY AUDIT

CR 549 (HOOPER AVENUE/BRICK BOULEVARD)
SILVER BAY ROAD (CR 28) TO MOLLY LANE

TOMS RIVER AND BRICK TOWNSHIPS,
OCEAN COUNTY

DECEMBER 12, 2019



AUDIT TEAM



NJDOT



NJTPA



Ocean County



Toms River Township



Brick Township



FUNDED BY FEDERAL HIGHWAY ADMINISTRATION AND NJDOT

PRESENTED BY GREENMAN-PEDERSEN, INC., NJDOT CONSULTANT

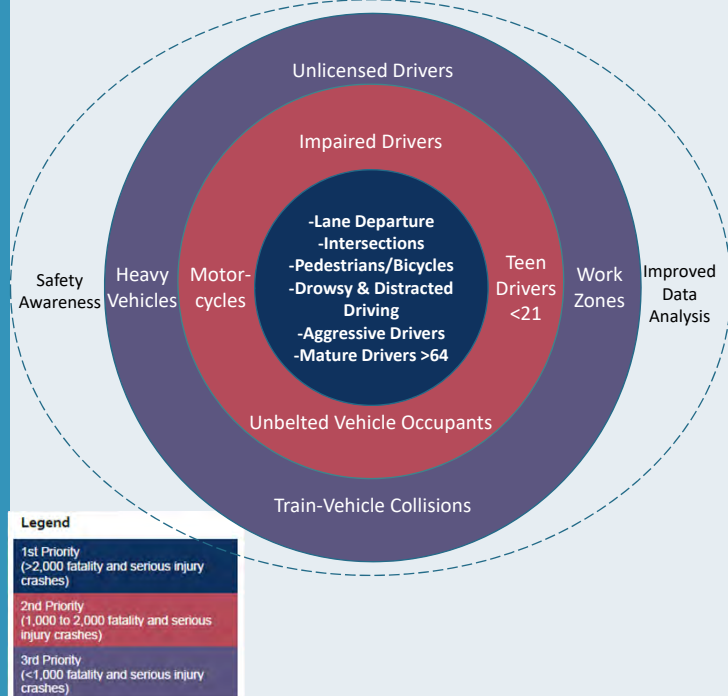


Today's Schedule

- 9:30a
 - 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
 - Adjourn

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

- 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 about \$57M





HSIP/LOCAL SAFETY PROGRAM

MAIN GOAL: Reduce serious injury and fatality (K+A) crashes on all of NJ's public roads



Program Goals

- Toward zero deaths on all public roads
- Performance-based goals consistent with SHSP
- Data-driven, strategic approach to improving highway safety

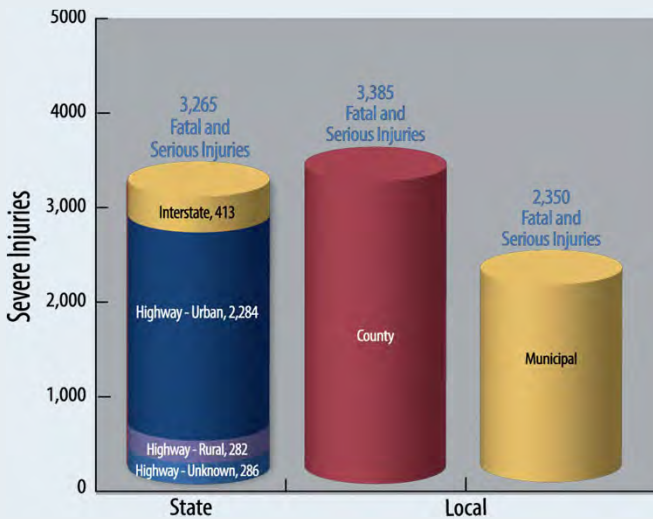


Local Safety Program (LSP)

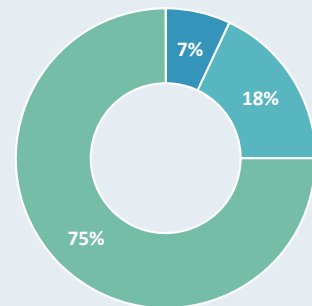
- NJDOT support
 - Dedication of HSIP funds
 - Technical assistance
 - Screening lists for MPOs
 - **Road Safety Audits**
- MPOs support
 - Local Road Safety
 - High Risk Rural Roads
 - CD/PE/FD Assistance Program



FATAL & SERIOUS INJURIES BY ROADWAY SYSTEM (2008-2012)

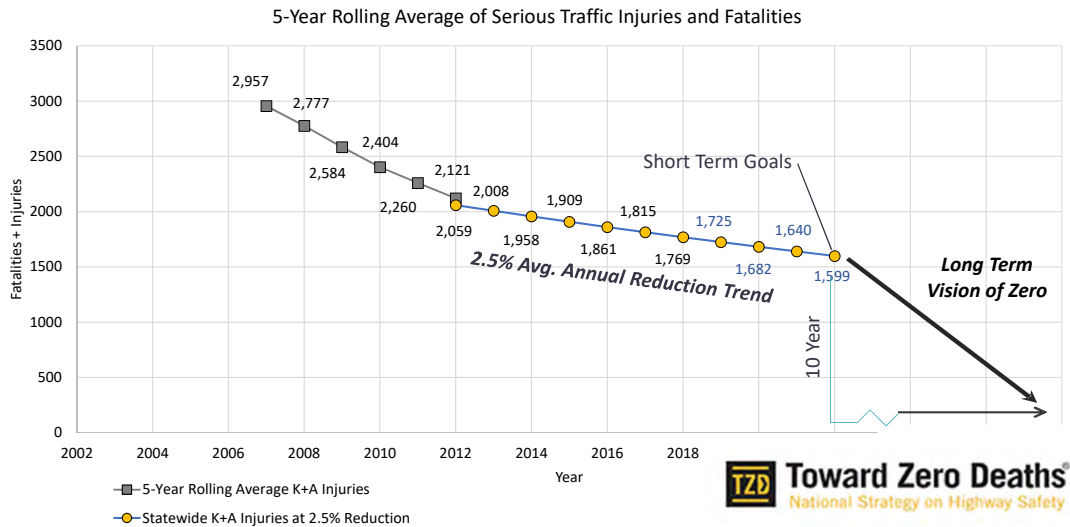


Roadway Jurisdiction



- NJDOT (2,800 mi)
- County (6,800 mi)
- Municipal (29,000 mi)

NATIONAL STRATEGY – TOWARD ZERO DEATHS



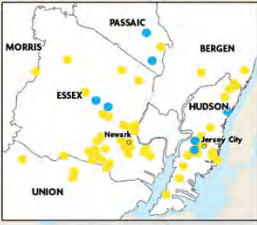
Local Safety Program & High Risk Rural Roads FY 2005–2018

Total Projects: 131
 Total Local Safety Program Funding: \$144.6 million
 Total High Risk Rural Roads Program Funding: \$19.6 million

FY 2017-2018 Projects
 ● Local Safety Projects
 ● High Risk Rural Road Projects

Past Projects
 ● Local Safety Projects
 ● High Risk Rural Road Projects

Detail Area



FEDERAL TRANSPORTATION FUNDING

- Local Safety and High Risk Rural Roads Programs
 - \$145+ million in funding 2005-18 on County / Local Roadways
 - Relatively quick-fix safety improvements
- HSIP funds – emphasizes 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 officials and stakeholders with opportunities to comment and ask questions



RSA PURPOSE

Formal safety performance examination by an independent, multidisciplinary audit team that identifies safety improvement opportunities for all road users.



Benefits

- Pro-actively address safety; reduce crashes
- Identify low-cost/high-value improvements
- 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 meant to replace

- Design quality control
- Standard compliance
- Traffic or safety impact studies
- Safety conscious planning
- Road safety inventory programs
- Traffic safety modeling efforts



RSA PROCESS



Responsibilities:

Steps 1-2 & 7-8: Design Team/Road Owner

Steps 3-6: RSA Team

FHWA PROVEN SAFETY COUNTERMEASURES

20 countermeasures

Descriptions provided in handouts



FHWA PROVEN SAFETY COUNTERMEASURES

- Clockwise from top:
 - Roundabout, Chesterfield Township, Burlington County
 - Backplates with Retroreflective Borders, Statewide
 - Road diet, Maplewood Township, Essex County
 - Pedestrian Hybrid Beacon (HAWK), Ocean City, Cape May County



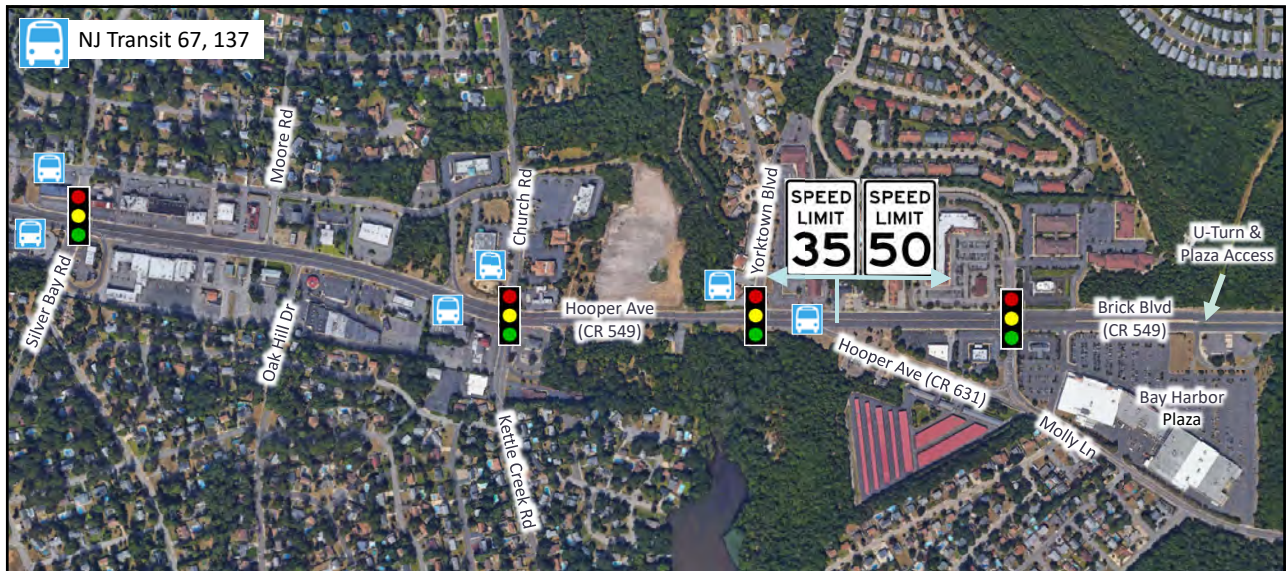


ADDITIONAL CONSIDERATIONS

Curb Extensions
Hoboken City, Hudson County



Enhanced signing / pedestrian crossings
Bellevue City, WA



CR 549
• Urban Principal Arterial
• Divided, 4- to 6-lanes

 **PROJECT AREA**

- Sidewalk both sides*
- Continental crosswalks





NETWORK SCREENING

NJTPA County Ranking – 2012-2016 Data



Top 100 Corridors

Route	Regional	Pedestrian/Bicycle
CR 549	#1: MP 5.25-6.25	#19: MP 4.33-5.33



Top 100 Intersections

Location	All Crashes	Pedestrian	Bike/Ped
Molly Ln	-	#3	#4
Silver Bay Rd	#91	-	-



CRASH DATA

2014-2018 Pedestrian/Bicyclist

- 4 crashes (2 Ped/2 Bike)
- Minor to Moderate Injuries

2016-2018 Vehicular

- 338 crashes
- Primarily property damage only
- 1 Fatality

Overrepresentations

Vehicular

- Rear End
- Sideswipe
- Between Intersections
- Dry Surface
- Day

Ped/Bike

- Injury
- At Signalized Intersection
- Dry Surface
- Night

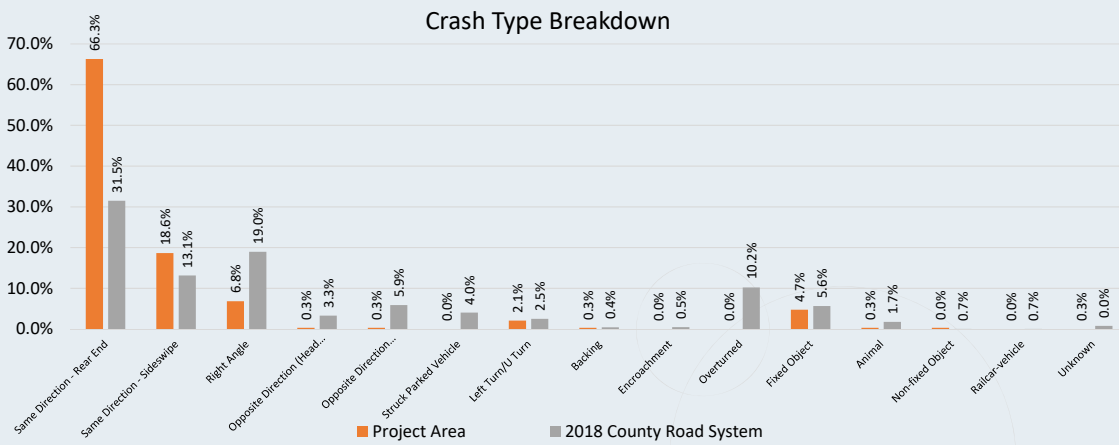


CRASHES: LOCATION IN RSA (CR 549)

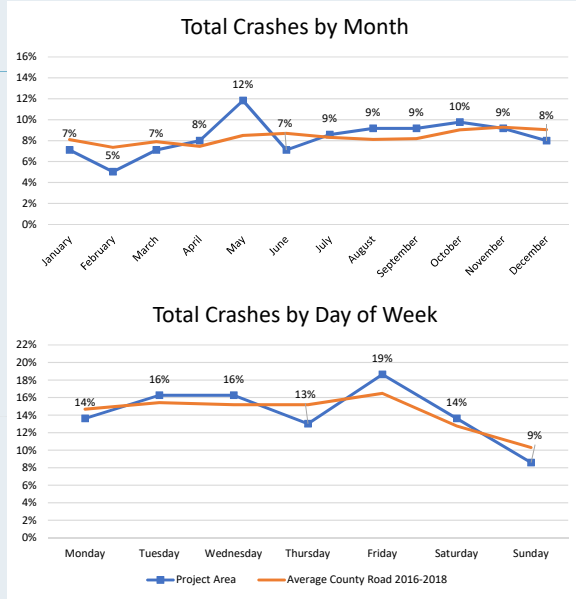
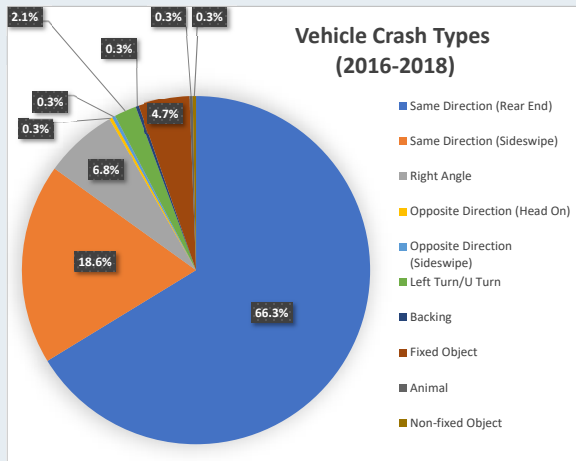
Modified Histogram View by 0.1 Mile
Geocoded Crashes Only (2016-2018)



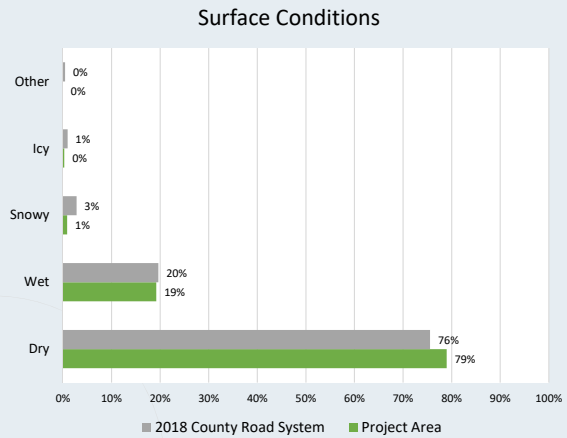
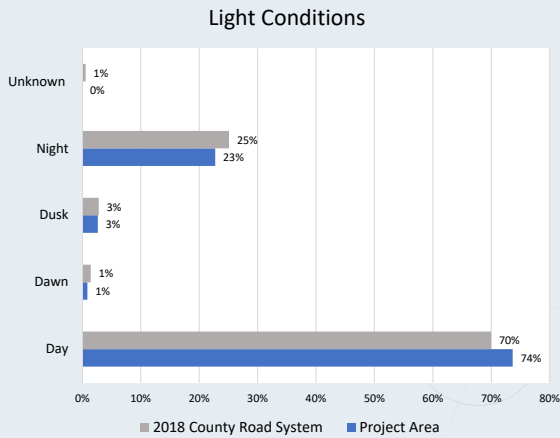
CRASHES: RSA AREA v. COUNTY ROAD SYSTEM



CRASHES: TYPE & TIMES

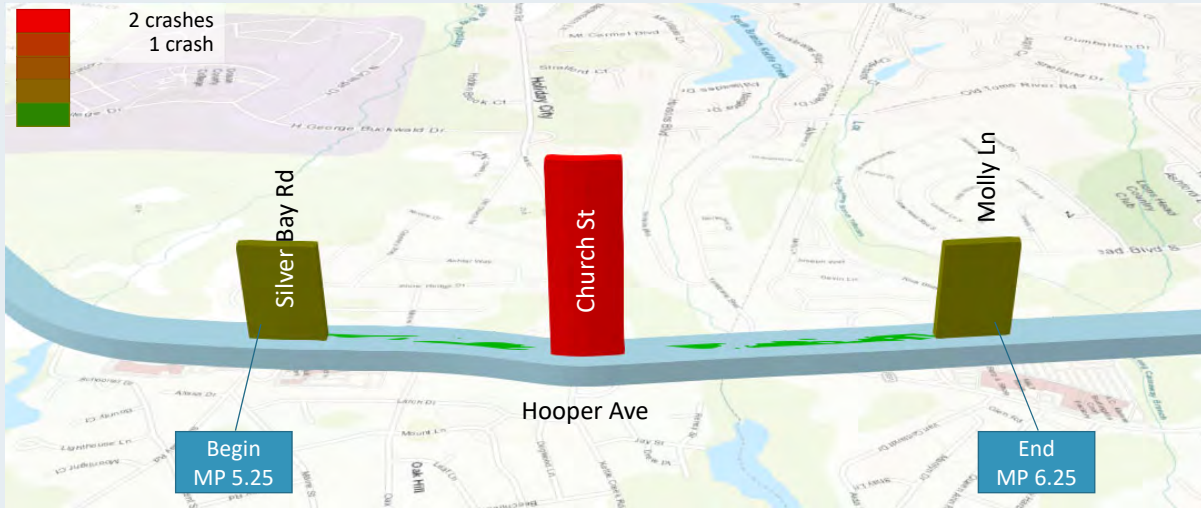


CRASHES: LIGHT & SURFACE CONDITIONS

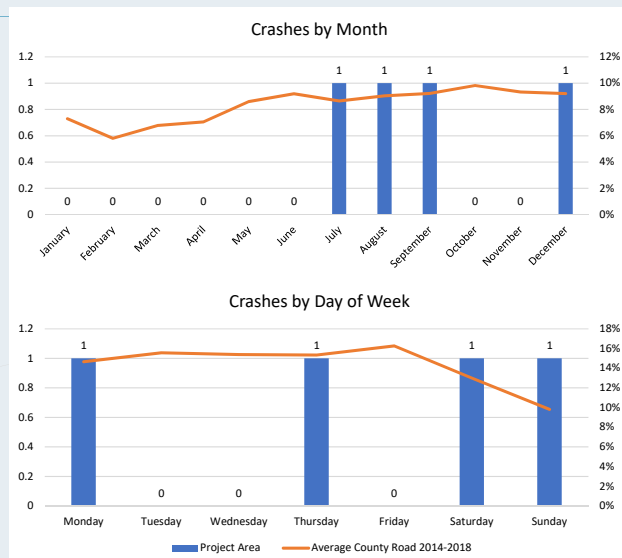
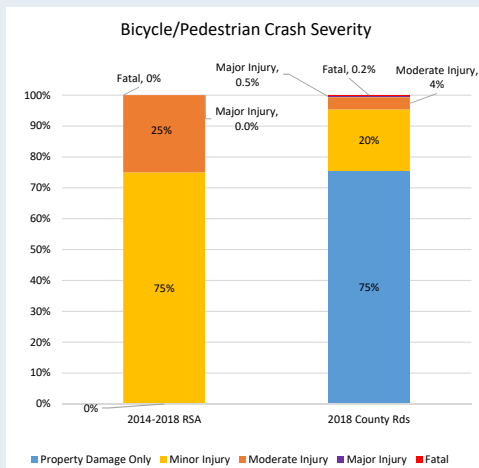


PED/BIKE CRASHES: LOCATION IN RSA

Modified Histogram View by 0.1 Mile
Geocoded Crashes Only (2014-2018)

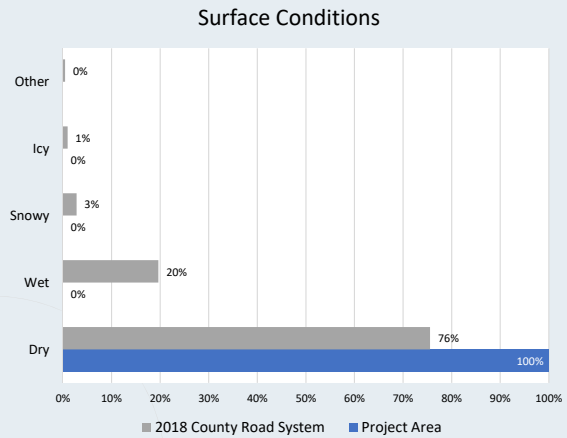
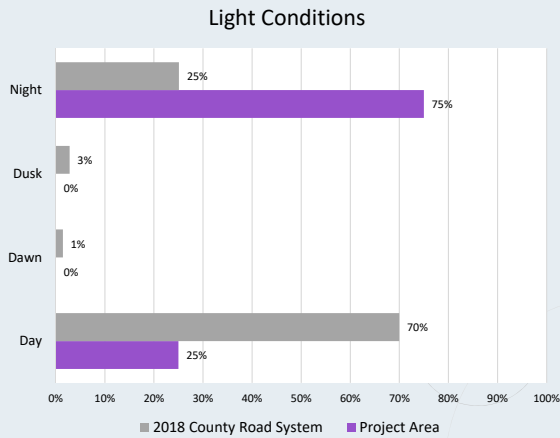


PED/BIKE CRASHES: SEVERITY & TIMES





PED/BIKE CRASHES: LIGHT & SURFACE CONDITIONS

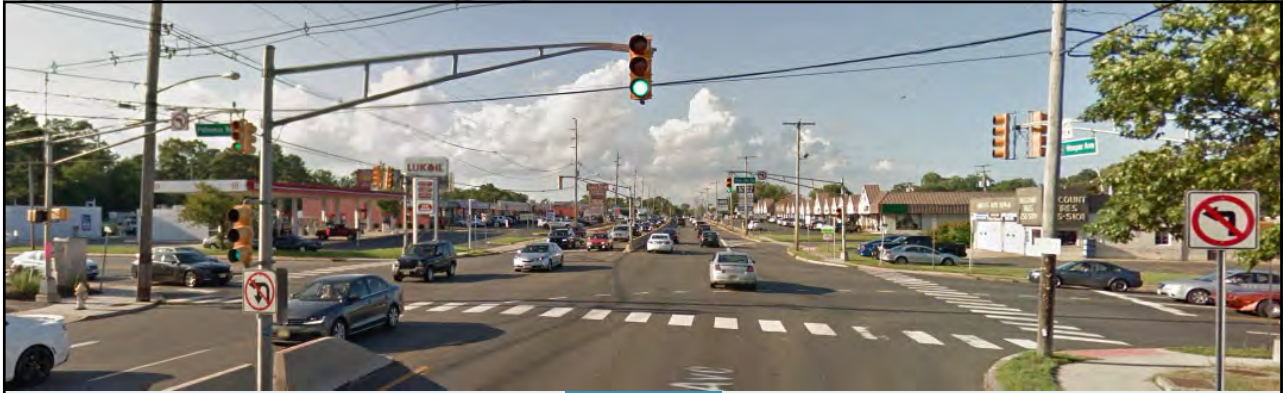


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- 12:30p
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- 2:00p
 - Discuss Observations
 - Make Recommendations
- 3:30p
 - Adjourn

- ✓ Verify Identified Issues
- ✓ Observe Operations
- ✓ Note Other Safety Concerns
- ✓ Document Findings
- ✓ Safety First!





FIELD VISIT | POST AUDIT



Pause | Resume

Presentation



Today's Schedule

9:30a

- 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

- Adjourn

✓ Welcome back!



POST AUDIT

Discussion of Field Visit



Observations

- What elements of the road may present a safety concern?
- To what extent, to which road users, and under what circumstances?
- What corridor safety issues did you observe?
- What localized safety issues did you observe?



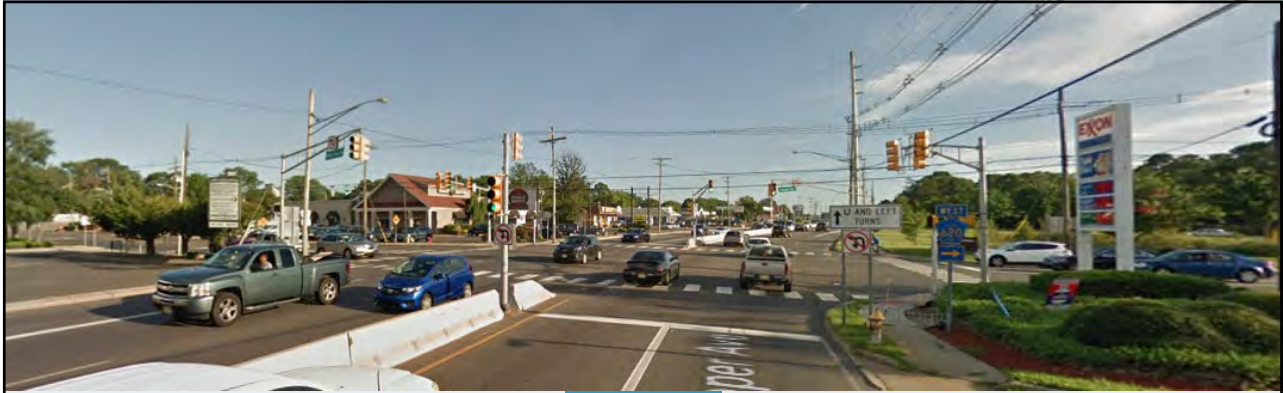
Recommendations

- What opportunities exist to eliminate or mitigate identified safety concerns?
- 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
- Road Owner Response
- Preparation of Final Report
- Approximate timeframe: 12 weeks





THANK YOU



<http://www.gpiprojects.com/HSIP/Ocean>

APPENDIX I

EXCERPTS FROM COUNTY & MUNICIPAL PLANS/REPORTS



Ocean County Planning Board Comprehensive Master Plan



Ocean County, New Jersey

Ocean County, New Jersey 2011 Comprehensive Master Plan

December 2011



**Ocean County Planning Board
129 Hooper Avenue
Toms River, NJ 08754
(732) 929-2054
www.planning.co.ocean.nj.us**



Figure 10-6: List of Natural Lands Properties

<u>Town</u>	<u>Name</u>	<u>Acres</u>	<u>Street Reference</u>	<u>Closing Date</u>
Barnegat	Cloverdale Farm Ext.	2.19	Cloverdale Road	6/6/06
	Cloverdale Road Farm	80.01	Cloverdale Road	11/15/04
	Rose Hill Estates Extension	147.00	Hamilton Road, Rose Hill Road	4/25/02
	Schmidt Property	3.30	Catherine St., Cloverdale Rd	9/11
	Talamas	7.00	Tuckerton RR, Barnegat Blvd	6/08
Barnegat / Berkeley / Ocean	Barnegat Branch Rail Trail	52.00	Rail R-O-W	10/30/02
Beachwood	Pinewald Road	20.00	Pinewald Road, Spruce Street	3/4/09
	Pinewald Road (Tyson)	0.18	Seaman Avenue	7/27/11
Berkeley	Berkeley Island West	18.16	Brennan Concourse	8/23/00
	Good Luck Point	363.00	Veeder Lane, Bayview Ave, Allen Rd, Sloop Creek Rd	12/29/98
	Good Luck Point TPL Extension	209.71	Bayview Avenue	2/25/05
	Haines	400.00	Route 530	7/13/07
	Hopkins	33.62	Route 530	12/28/10
	Lifetime Homes, Inc.	126.07	Veeder Lane	6/01/00
	Lifetime Homes-Myers	0.14	Anglesea Ave, Louis Ave	12/31/09
	Lifetime Homes-Smith	3.00	Sloop Creek Rd, Joseph St	11/19/10
	Lumley	284.34	Route 530	9/08
	Potters Creek	118.00	Eugene Fury Boulevard	11/30/06
	Roberts Avenue Marsh	7.07	Roberts & Bay View Aves	12/17/99
	Sloop Creek Donation	5.70	Sloop Creek Road	12/30/04
	Trust for Public Land Toms River Divide	126.50	Garden State Parkway, Magnolia Lane	3/29/00
Berkeley/ Lacey	KGE	100.00	Pinewald-Keswick Road	12/20/01
Brick	Beaton Pointe	9.64	Beverly Beach Road	7/6/2011
	Brick Airport Tract	166.88	Drum Point Rd, Cherry Quay Rd, Kettle Creek Rd	12/08/98
	Drum Point Road	17.80	Drum Point Road	8/02/00
	Havens Cove	35.00	Havens Cove Road, Atlantic Drive	3/31/09
	Kettle Creek	25.10	Hooper Avenue	2/01
	Metedeconk North Branch	13.00	Green Grove Road, Lanes Mill Road	1/15/10
Eagleswood	Westecunk Creek	126.00	Cox's Lane and Dock Ave	10/1/07
Jackson	Bismark Road	74.55	Bismark Road	8/28/02
	Bowman Road River Corridor	239.00	Between Bowman and Grawtown Roads	5/23/05
	Bowmans Bridge	142.00	Bowman's Bridge Road	12/1/00
	Cassville Toms River Corridor	27.68	West Veterans Highway	9/26/08
	Clayton-Ridgeway	16.10	Ogden Road, Route 571	8/23/10
	Commodore Pointe	35.00	W. Commodore Blvd	12/08
	Jackson Land LLC	163.02	Route 571	6/10/09



<u>Town</u>	<u>Name</u>	<u>Acres</u>	<u>Street Reference</u>	<u>Closing Date</u>
Ocean / Lacey	Frazer Forked River Mtns.	218.45	Route 532	5/16/05
	Johnson-Forked River Mt. Area	715.90	Route 532	7/31/03
Plumsted	Coastal Divide I	22.88	Plum Ridge Drive	12/22/99
	Coastal Divide III	30.29	Tower Road, Oak Leaf Road	4/30/02
	Downs	20.39	Brynmere Road	7/18/08
	Goldman	22.46	Route 539	1/2008
	Jantorno	21.12	Route 539	8/31/10
	Jumping Brook	99.00	Long Swamp Road	6/23/10
	Kavas	30.38	Route 539	11/9/09
	Long Swamp	121.00	Long Swamp Road	1/26/10
	Nash	57.46	Long Swamp Road	2/29/08
	Pinehurst Preservation Area	55.45	Routes 539 and 528	4/30/02
Stafford	Campbell Property	369.04	Route 72	4/25/07
	Labin	5.76	Route 72	7/20/07
	Manahawkin Marsh	93.17	Route 72	11/14/05
	Manahawkin Marsh Ext II	3.24	Pennsylvania Ave, Mill Creek Road	9/26/11
	Manahawkin Marsh Ext.	27.67	Bay Avenue	12/13/05
	Manahawkin Marsh Inholding	2.55	Marsha Drive	9/26/07
	Mary Bell Road	18.40	Mary Bell Road	12/31/09
	Mary Bell Road West	25.60	Ranch Boulevard, Mary Bell Road	9/30/09
	Oak Road Partnership	53.58	Oak Road, Katydid Drive, Doc Kramer Blvd	4/1/04
	Route 72 West Associates	58.49	Route 72	11/28/06
	Route 9 Stafford	7.11	Hwy 9 North	1/4/06
	Route 9 Stafford II	11.40	Route 9	9/29/08
	Route 9 Stafford III	8.40	Route 9, Hilliard Road	12/29/05
Toms River	Green Island	13.00	West Green Island Road	4/18/01
	Green Island II	8.19	Kettle Creek Road	10/8/04
	JAMM	65.00	Fischer Blvd, Hooper Ave.	9/15/05
	Route 571	15.37	Indian Head Road (Route 571)	2/16/01
	Silver Bay Watershed	140.19	Fischer Blvd, Hooper Ave.	3/9/06
	Sixth Avenue Nomination	1.14	Sixth Avenue, Fishcer Blvd	2/6/02
	Tilton Point Inholding	1.00	Pickwick Drive	11/9/04
	Trust for Public Land Tilton Point	61.90	Cattus Island Blvd, Pickwick Drive	11/05/99
	Weiner Homes	115.00	Bay Ave , Church Road	8/19/02
Tuckerton	Tuckerton Lake	28.66	Nugentown Road, First Ave	6/14/07
TOTAL PRESERVED ACRES: 10,567.35				

Source: Ocean County Department of Planning, 2011.



TOWNSHIP OF TOMS RIVER

PERIODIC REEXAMINATION REPORT UPDATE & LAND USE PLAN ELEMENT UPDATE
PART 2
LAND USE ELEMENT

Township of Toms River
Ocean County, NJ
March 6, 2017

ADOPTED: APRIL 19, 2017

Prepared by:

David G. Roberts, AICP/PP, LLA, LEED AP ND
Township Planner
NJ Professional Planner License No. 3081

The Municipal Land Use Law calls for regular reviews and updates of the master plan and land use regulations, as set forth in the following section of the statute:

40:55D-89. Periodic examination

The governing body shall, at least every 10 years, provide for a general reexamination of its master plan and development regulations by the planning board, which shall prepare and adopt by resolution a report on the findings of such reexamination, a copy of which report and resolution shall be sent to the county planning board. A notice that the report and resolution have been prepared shall be sent to the municipal clerk of each adjoining municipality, who may, on behalf of the governing body of the municipality, request a copy of the report and resolution. A reexamination shall be completed at least once every 10 years from the previous reexamination.

The Toms River Planning Board adopted a Periodic Reexamination Report on August 3, 2016. The Reexamination Report addresses two significant planning and regulatory issues that had emerged since the last comprehensive Master Plan update in 2006: 1) the evolving and uncertain status of determining the fair share obligation of municipalities for providing affordable housing under the New Jersey Supreme Court cases of Mount Laurel I and II; and 2) the recovery from Superstorm Sandy after the devastation caused on October 29, 2012 and the related Plan Endorsement process intended to identify and reinstate centers after the expiration of the CAFRA Center previously referenced in the Master Plan.

and it adjoins a mobile home park to the south. A reasonable approach to providing development opportunities at this location would be to identify it as an Area in Need of Redevelopment, allowing for comprehensive development of the site through vacating streets and consolidating ownership. This site provides potential access to both Route 9 and Route 70, and with proper improvements of North Maple Avenue it can provide access to Massachusetts Avenue as well, which should be a distinct advantage for commercial development. Specific development controls would be spelled out in an adopted Redevelopment Plan ordinance.

Best course of action is to declare a redevelopment area. Recommend HB zone use and possibly expand HB zone to existing Stop & Shop property.

5. Route 9 adjoining Nobility Crest: This approximately 10 acre site has been filed with the Planning Board as an application for mixed use development. The property owner has also expressed an interest in the past in having the Township acquire it for open space. The application to the Planning Board has progressed, but will require relief from both the minimum tract area and height.

Recommend changing PUD to a Conditional Use in RHB and changing smaller parcels fronting Route 9 to HB.

6. Church Road adjoining HB Zone, Block 192.05, Lots 47-48: These two lots adjoin the entrance to a recently approved commercial development on Hooper Avenue that also has access from Church Road. The lots lie in the RR one acre residential zone and are about 4.5 acres in size. The property is over 600 feet deep and 300 feet wide. Consideration is requested for expansion of the HB zone or some other business zone.

Change from RR to HB and extend depth of HB zone.

7. Ciba-Geigy/ BASF: At a land area of 1,200 acres, this is the largest site in single ownership in Toms River. It has a well-documented history of environmental issues, many of which have been addressed. The site has been declared an Area in Need of Redevelopment, but a redevelopment plan has not been adopted by the Township or proposed by the property owner. There is an ongoing property tax appeal.

Show as a redevelopment area and prepare a redevelopment plan.

8. Cardinal Drive, Block 508.03, Lot 4: This lot is zoned R-90 and adjoins an HB Zone. The request is to expand the HB to include this lot in order to provide a more suitable development site for a proposed commercial use, with Lot 4 used primarily to accommodate a proposed extension of Wren Place to Cardinal Drive.

Change from R 90 to HB

9. R-90 to Hospital Zone between Lakehurst Road and Route 37: There are two clusters of houses included in this request that has been filed through the offices of Harvey York, Esq. The operating premise of this request appears to be that the two neighborhoods do not have sufficient critical mass to remain viable as residential neighborhoods long-term. Based on citizen participation at work sessions on the Master Plan and on comments related to development applications in this area, it is anticipated that there will be significant opposition

to encourage future development in the downtown consistent with these recommendations, including allowing mid-rise residential and mixed-use buildings at a maximum of 10 stories.

11. Permit mid-rise residential buildings downtown, including in the VO Zone on Hooper: This is more of a general request to increase housing in the downtown area as a means of providing convenient access to employment opportunities and to strengthen the commercial aspect of downtown. The specific request is for six to eight story buildings on sites that are at least one-half acre in size.
12. Adopt a Redevelopment Plan for the Water Street Redevelopment Area: This proposal has been under consideration since before the last comprehensive Master Plan update in 2006. There has been a declaration that the area is an Area in Need of Redevelopment, and there has been a proposed redevelopment plan prepared at the request of TR BID, but to date the plan has not been adopted. There are a number of complicating factors that are part of the planning process, including the ongoing coal tar cleanup, flood elevations, traffic flows, communication towers and others.
13. Hooper Avenue O-15 inclusion of commercial options: Request is to expand commercial options in this zone, which now permits full-service restaurants. Specific mention was made of retail as a permitted use.

No change recommended.

14. Hooper Avenue O-10 to RC: This is a request not only for a map change but for a change in the minimum floor area for a business. This parcel immediately adjoins a shopping center and is about 2.6 acres in size.

Recommended changing from O-10 to RC and also change some adjacent lots to RC. Other lots in the immediate vicinity should be examined to potentially include in RC zone from O-10.

15. South of Caudina and South of Seacourt Pavilion: This is another area with paper streets and small lots that are mostly owned by one entity. The paper street system includes two zoning districts – O-15 and R-120. In order for this area to effectively develop it would be appropriate to treat it as a redevelopment area so lot consolidation could occur and the obsolete street system changed. As part of the preparation of a redevelopment plan, proper consideration could be given to compatibility with nearby uses, including a fire house and bank, and zoning for both multifamily and single family homes.

Recommend a redevelopment area.

16. O-10 on Oak Avenue adjoining Penny Layne condos: This parcel was the subject of a separate request to rezone the property to O-15. While there is no pending request for rezoning to any particular zoning district, it is included because of its recent history before both the Planning Board and Township Council.

Undeveloped and currently located in the O-10 zone. It is recommended that the best way to encourage the appropriate development would be to change zone to RC if it would support the Ocean County Mall. However, an alternative that would permit multi-family would increase the residential

Hooper Avenue

Hooper Avenue runs north and south through the center of the Township. It is largely developed with commercial uses under O-10, O-15 and HB zoning. However, the greatest concentration of commercial development in the Township is found in the RC, Regional Commercial zone in the vicinity of Bay Avenue. This is the home of the Ocean County Mall and a number of other commercial centers whose vitality is directly linked to the draw provided by the regional mall.

In the decade since the 2006 Master Plan, the Hooper Avenue corridor has experienced economic challenges that have led to a decline in property value at the Ocean County Mall property, which had been the anchor of the corridor with a regional draw. Over time the strength of the retail market, competition from other retail locations and the emergence of internet commerce has hurt the mall economically, as well as several of the linear shopping centers along Hooper that had benefited from their proximity to the mall, such as Seacourt Pavilion and the Target-Lowes shopping centers.

Simultaneously, the office market in Ocean County, as in New Jersey as a whole, has suffered through an extended period of excess supply and increasing vacancies, which prompted rezoning requests for both the Office-10 (O-10) at the north end of the Mall at Oak street, as well as the Office-15 (O-15) Zone to the south of Seacourt Pavilion. In the case of the O-10 area the proposal was for rezoning to permit a hotel, while the request for the O-15 was for more retail uses. The O-15 Zone was amended to allow freestanding restaurants to locate in an Office Park, but allowing any other retail uses was rejected out of concern for adversely affecting the Mall.

Given the above, this Land Use Element recommends that the Hooper Avenue corridor from Oak Street south to include the O-15 Zone be evaluated as a whole with the goal of proactively working with key property owners to develop a combination of land uses, including the possibility of higher density residential and/or mixed use buildings in appropriate locations, that would serve to revitalize both the mall property and the O-15 and O-10 Office Park Zones. The area between the O-15 and Seacourt Pavilion is largely vacant land and has been identified as a potential redevelopment area due to the property assemblage challenges presented by numerous subscription lots and paper streets. If the area is designated as a redevelopment area, the associated redevelopment plan may be an opportunity to provide connectivity between the Seacourt Pavilion and adjacent higher density residential development (rezoned from Regional Commercial to Multifamily – 8 du/acre) on one side and the O-15 Zone on the other.



Figure 3: Google Earth graphic marked to illustrate proximity of the office, residential and retail development with the potential redevelopment area in the center.

* * *



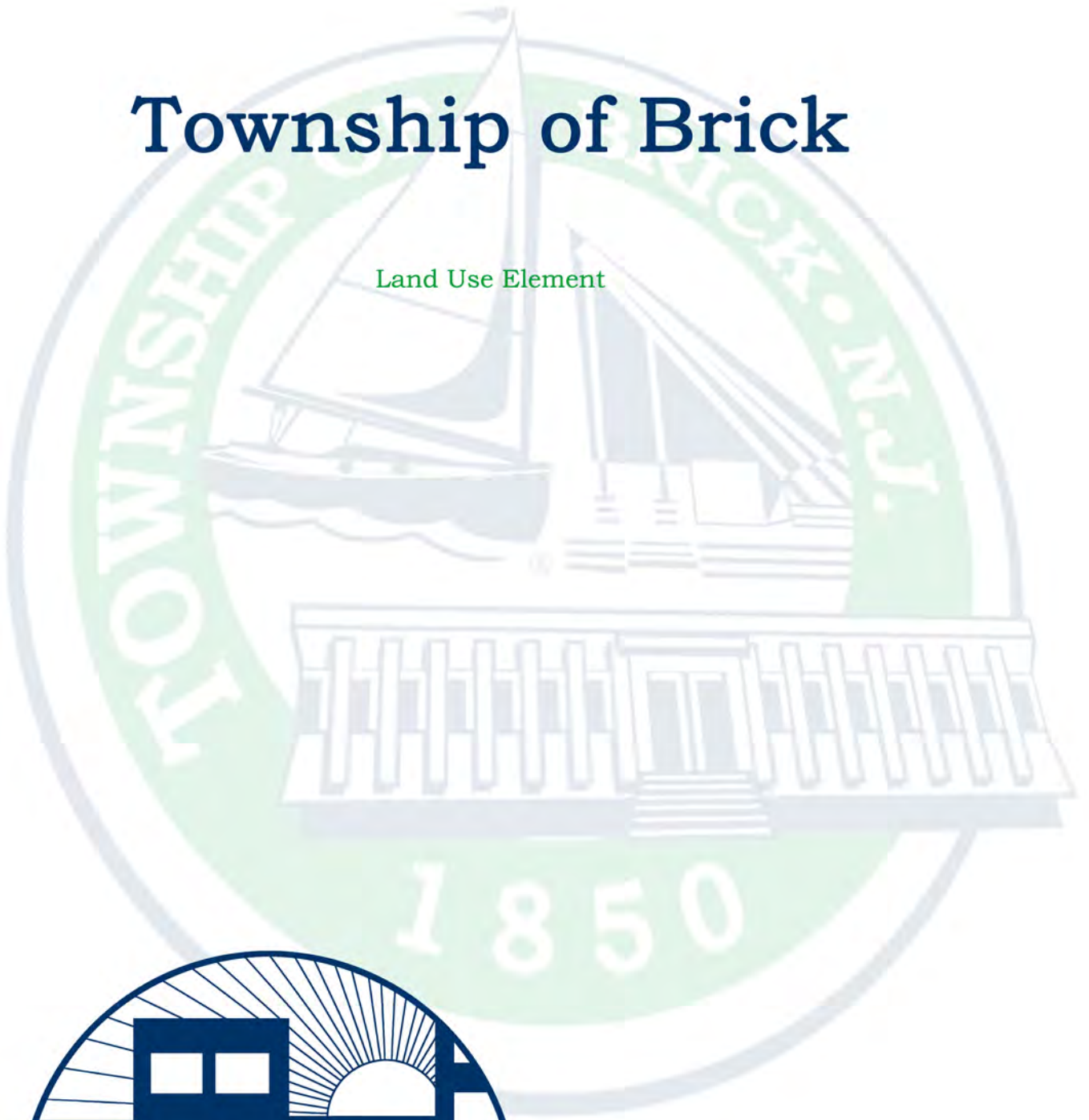
MASTER PLAN

June 6, 2007

Township of Brick
Division of Land Use and Planning
401 Chambers Bridge Road
Brick, NJ 08723

Township of Brick

Land Use Element



Township of Brick
Division of Land Use and Planning
401 Chambers Bridge Road
Brick, NJ 08723

1. Low Density Residential

The low density designation corresponds to the Rural Residential zoning category, including the RR-1, RR-2 and RR-3 Zones. Gross densities in the Rural Residential Zones approximate one (1) dwelling unit per acre. Planned Residential Retirement Communities, Planned Residential Communities and Clustering are permitted within the RR-2 and RR-3 Residential Zones on smaller lots provided certain development standards are satisfied. Adult Community Multi-family/Townhouse units are also permitted at a three (3) dwelling unit per acre maximum. In addition, a cluster option is available in the RR-2 and RR-3 Zones which approximates a gross density of 1.5 dwelling units per acre. The majority of the property that is zoned RR-1 is not suitable for the more dense development options due to the presence of high water tables.

The Rural Residential zoned properties that have not been developed for senior housing are predominantly vacant or underdeveloped and are likely lands being considered for preservation by the Township, County, State or Federal Governments. The majority of the remaining, large, vacant, privately owned parcels contains freshwater or coastal wetland areas and is located within or in close proximity to the Edwin B Forsythe Wildlife Refuge. Efforts to preserve these properties are ongoing.

2. Medium Density Residential

The medium density residential classification corresponds to the R-10, R-15 and R-20 zones which generally yield a gross density of 1.6 to 3 dwelling units per acre. The majority of the medium density development and zoning occurs north of State Highway Route 70. Few privately held vacant properties remain in the Medium Density Residential areas. There are no changes proposed in the Medium Density category.

3. High Density Residential

This classification corresponds to the R-5 and R-7.5 zones, permitting 7 and 4.5 units per acre, respectively. This category includes those existing developments built to high density parameters with little developable land remaining with the exception of sporadic infill parcels. The majority of the High Density Residential development and zoning occurs on the south side of State Highway Route 70.

However, the Timber Ridge project was constructed at the intersection of Van Zile and Burnt Tavern Roads north of Route 70 in 1994. It was an Affordable Housing project of one hundred twenty single family detached dwellings on lots of 5,000, 6,000 and 7,000 square feet. No additions are proposed to the High Density Residential Category.

4. Multi-family Residential

The multi-family designation corresponds to the R-M Multi-Family Zone, permitting six units per acre. The Township has accommodated such a zone to permit a wider range of housing options within its boundaries. This plan is proposing no additions of vacant land to this designation with the exception of those parcels included in the Township's Fair Share/Affordable Housing Plan and in the Mixed Use Overlay Zone within the Brick Town Center. These areas are described in the Housing Element and also described Brick Town Center section of the Land Use Plan and in the Initial Plan Endorsement submission appended to this Master Plan.

5. Planned Residential Retirement Communities

Planned Residential Retirement Communities (PRRC's) are permitted within the (RR-2&3) Rural Residential Zones. These communities are age restricted, generally fifty-five and older, and contain a club house, outdoor recreational facilities, open space and common areas. PRRC's within the Township are of condominium or fee simple forms or ownership. The following parcels have been approved and developed under the PRRC designation since the adoption of the 1997 Master Plan:

- a. The Cedar Village site at the northeast corner of the Burnt Tavern Road/N.J. State Highway Route 70 intersection.
- b. The Wedgewood Place site at the northeast corner of the Burnt Tavern Road/Lanes Mill Road intersection.

6. Planned Residential Communities (PRC's)

Planned Residential Communities were created by Ordinance in 1995 as a permitted use within the (RR-2&3) Rural Residential Zones. PRC's allow for a mix of attached and detached housing at controlled percentages and densities on tracts of land in excess of 100 acres. The Sailors Quay/Grande Quay development between Hooper Avenue and Cherry Quay Road is the Township's only Planning Residential Community.

7. Planned Multi-family Residential Retirement Community (PMRRC)

The PMRRC Zone was created in 2005 to address the apparent need for senior housing opportunities within the Township in a form other than the traditional single family detached dwelling. The PMRRC allows for multi-family condominium type dwellings in four story buildings at a density of twenty units per acre. The only identified PMRRC location is a twenty acre site located within the Brick Town Center adjacent to the Shop-rite/ Kohls Shopping Center and the Post Office. The Planning Board granted site plan approval for approximately three hundred age-restricted units in 2006. To date, development of the site has not been initiated. The Land Use Plan designation for this parcel has been changed from Highway Commercial to PMRRC and allows for the Mixed Use Overlay Zone as a developer option.

In addition, the Zoning Board of Adjustment approved a senior condominium project in 2005 on a twelve acre tract in the B-3 Highway Development Zone. The site fronts on Brick Boulevard and Hooper Avenue at the southern end of the Township. It was approved for one hundred ten age restricted units. The site is presently vacant. The Land Use Plan designation has been changed from Highway Commercial to PMRRC.

8. Affordable Housing

As a result of the Supreme Court decisions commonly known as Mount Laurel I & II, the Township of Brick, along with every other community within the State of New Jersey, is required to provide for its fair share of affordable housing opportunities.

The affordable housing sites approved by the Council on Affordable Housing are designated on the Land Use Plan. The affordable housing sites are described in detail in the Housing Element of this Master Plan and the COAH approved Fair Share Plan and amendments thereto.

Since the adoption of 1997 Master Plan three affordable housing sites have been developed. Dottie's House, at an undisclosed location, the Bancroft Facility on Route 70 West adjacent to the Industrial Park and the Pier Avenue Project at the northern end of Pier Avenue. The Bancroft and Pier Avenue sites have been designated Affordable Housing on the Land Use, changing the current Industrial and Residential designations, respectively.

The Township's proposed Affordable Housing Plan is currently under review. However, midway through the review process, the Court determined that the 3rd Round COAH Rules, upon which municipalities based their Affordable Housing Plans, was invalid. COAH was given six months to rewrite their rules and address the Court's concerns. Once the new rules are adopted, the Township will have to amend its Housing Plan. The Township will continue to seek suitable locations and innovative methods to provide for its fair share obligation.

9. The Barrier Island

The Barrier Island of Brick Township has been developed largely for high density residential land use. However, hurricanes, storms, and flooding pose major hazards to life and property on the island. Maintaining and enhancing the island beach-dune system is vital to the safety of residents and the protection of property. Where allowed to achieve sufficient breadth and height, the beach-dune system is a barrier against destructive storm surges. Accordingly, the Township zoning and development regulations should be coordinated with the State rules on Coastal Zone Management (N.J.A.C. 7:7E-1.1 et. Seq.) in an effort to protect the Township's beach-dune area from inappropriate development. State policy is to prohibit development on land that has no prudent or feasible alternative use other than a dune. Moreover, development must not cause significant long-term adverse impacts on the natural functioning of the beach-dune system.

In recognition of the special attraction and scenic value to residential uses of a barrier island location and the over-water views it provides, the intensity of development and the height of future buildings should be managed to maintain a desirable scale and relationship among existing dwellings. Land disturbance and the construction or expansion of principal and accessory buildings and structures should be permitted only west of the beach-dune area. Consistent with State policy, development seaward of the line will be limited to defined access ways and approved shore protection efforts.

B. Commercial Development



The established commercial development pattern in Brick Township consists of a loosely defined central core area, bound by Route 70, Brick Boulevard, Chambers Bridge Road & Cedar Bridge Avenue (which contains Brick Plaza), and linear development along such commercial corridors as Brick Boulevard, Route 70, Route 88 & Chambers Bridge Road. The Brick Town Center consists of the central core area and the linear development in proximity to it and the Hospital Support Zone.

Neighborhood commercial areas exist along portions of Herbertsville Road, Hooper Avenue, Mantoloking Road and Drum Point Road. This plan recognizes that Brick’s existing commercial development pattern is well established and attempts to encourage new commercial development and redevelopment in the most appropriate locations within that pattern, while at the same time controlling the site specific intensity of commercial development.

Specific objectives of the plan are to:

- Encourage commercial establishments at appropriate locations as infill developments as opposed to creating new commercial areas.
- Where feasible require that commercial establishments are setback sufficiently from adjacent road rights of way to allow road widening without major disruptions.
- Require existing and proposed commercial tracts to meet improved standards with increased buffer areas and landscaped areas.
- Reduce the planned commercial areas along certain County corridors such as Mantoloking and Herbertsville Roads where there exists adequate commercial space to service the existing neighborhoods but the roads are not equipped to receive higher volumes of traffic and/or the vacant lands are environmentally sensitive.
- Create a restoration plan for the Herbertsville Road and Mantoloking Road neighborhood commercial areas which encourages improvements to existing commercial sites that are consistent with the character of the areas, such as historic preservation for Herbertsville Road, and a prescribed restoration motif, such as a nautical theme, for the Mantoloking Road area.
- Maintain existing residential uses along the Township’s arterial roadways, such as but not limited to, Van Zile Road, Burrsville Road, and Hooper Avenue (south) by discouraging nonconforming commercial conversions of residential structures and new Commercial Development in such areas.
- Create mixed use development areas within the Brick Town Center that encourage integrated retail, office and residential development.
- Continue to require vehicular and pedestrian connections between existing and proposed adjoining commercial sites.

There are five commercial designations within the Township:

1. Highway Commercial

Highway Commercial refers to large-scale commercial development which serves major regional population centers. The Brick Plaza area at the junction of Route 70, Cedar Bridge Road and Brick Boulevard is presently the most intensely developed commercial area in Brick Township.

In zoning terms, the B-3 and B-4 Highway Development categories correspond with the Highway Commercial land use designation which permits a broad variety of commercial uses along the major transportation corridors traversing the Township. Recent approvals and redevelopment projects have been concentrated along the Route 70 corridor between Chambers Bridge Road and the Lakewood border.

There are no additions proposed to the Highway Commercial designation.

2. General Commercial

General Commercial uses consist of a broad variety of small retail and service facilities that are easily accessible by major residential sections of the community. The uses may rely on pedestrian and vehicular access. The scope of services and size of the commercial facilities will depend largely upon per capita income and density of the supporting population. In terms of zoning, general commercial corresponds to the B-2 General Business Zone. General commercial shopping areas are located along most major arterial roads in the Township.

APPENDIX J

ROAD OWNER RESPONSE

John N. Ernst, P.E., P.P.
Ocean County Engineer

Mark F. Jehnke, P.E.
Assistant County Engineer

Thomas E. Hartman, Jr., P.E.
Supervising Engineer
Highway & Bridges

Lukasz Praski, P.E.
Supervising Engineer, Bridges

Gary Leemann, P.E.
Principal Engineer, Highways



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Traffic (732) 349-8165

OFFICE OF THE OCEAN COUNTY ENGINEER

129 Hooper Avenue • P.O. Box 2191
Toms River, New Jersey 08754-2191

October 7, 2020

Ms. Julia Steponanko, P.E.
Greenman-Pederson, Inc.
100 Corporate Drive
Lebanon, NJ 08833

Re: Road Safety Audit, CR 549 (Hooper Ave/Brick Blvd), Toms River and Brick Townships

Dear Ms. Steponanko:

We would like to take the opportunity to thank the Road Safety Audit (RSA) Team for the time and effort to evaluate traffic safety along Hooper Avenue and Brick Boulevard in Toms River and Brick Townships. The Team identified many opportunities for improvements along the corridor that will be useful in our future evaluations.

Since the Road Safety Audit, Ocean County initiated a study to evaluate potential improvements at the signalized intersection of Church Road/Kettle Creek and Hooper Avenue. The findings from this study are being advanced to Preliminary and Final Engineering by the end of this year and will incorporate many of the recommendations of the RSA into the project.

Thank you for the opportunity and we look forward to continue to work with the RSA Team to evaluate opportunities to improve safety along County roadways.

Sincerely,

Mark F. Jehnke, P.E.
Assistant County Engineer

MFJ/kk

cc: John N. Ernst, Ocean County Engineer
Lynn LaMunyon, Traffic Engineer
Amy Jefferson, NJTPA



SPECIAL ASSISTANCE/ACCOMMODATIONS available, please call (732) 929-2130.