Road Safety Audit:

Water/Dock Street between Garden State Parkway and Washington Street
Toms River Township, Ocean County

DEPARTMENT OF TRANSPORTATION
THE STATE OF NEW JERSEY

APRIL 2019

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Executive Summary

This document is the final report of the Water/Dock Street Road Safety Audit (RSA). It was conducted along Water/Dock Street from the Garden State Parkway (GSP) to Washington Street in Toms River Township, 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.

This section of Water/Dock Street was identified on NJTPA's Local Safety Program Network Screening list as a high priority location. According to the NJDOT crash database, 149 crashes occurred during the three-year period between January 1, 2014 and December 31, 2016 along the study area of Water/Dock Street with 41, 51 and 57 crashes occurring in 2014, 2015 and 2016, respectively. Additionally, 8 pedestrian crashes occurred over the five-year period between January 1, 2012 and December 31, 2016.

This one-day RSA was conducted on Thursday, June 28, 2018 from 9:30 am to 3:30 pm. The pre- and post-audit meetings were held in the Ocean County Complex, located at 129 Hooper Avenue, Toms River, NJ. Representatives from NJDOT, NJTPA, Ocean County and Toms River Township were in attendance with NJDOT serving as the facilitator.

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

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

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

I. Introduction

A. Site Selection

This section of Water/Dock Street, from the GSP to Washington Street, was identified on NJTPA's Local Safety Program Network Screening list as a high priority location, as shown in the below FY 2017-2018 ranking. Of note, these rankings are based on 2011-2013 vehicular and 2009-2013 pedestrian crash data.

Table 1 – Water/Dock Street NJTPA FY 2017-18 LSP Ranking (Corridor)

Location	Ped Corridor	Regional Corridor
Water/Dock Street	#42 County (527 MP 0.11-1.11)	Not Ranked

Table 2 – Water/Dock Street NJTPA FY 2017-18 LSP Ranking (Intersection)

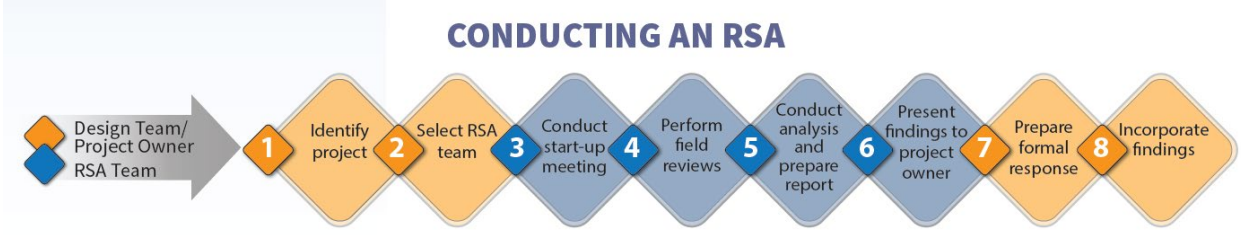
Location	Intersections	Pedestrian Intersections
Irons Street (527 MP 0.11)	#26 County	Not Ranked
Lakehurst Road (527 MP 0.30)	#78 County	Not Ranked

B. What is a Road Safety Audit?

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

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

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



C. The Water/Dock Street RSA Event

This one-day RSA was conducted on Thursday, June 28, 2018 from 9:30 am to 3:00 pm. The pre- and post-audit meetings were held in the Ocean County Complex, located at 129 Hooper Avenue, Toms River, NJ. Representatives from NJDOT, NJTPA, Ocean County 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 1.2 miles of Water/Dock Street within Toms River Township. This stretch of Water Street is a mix of commercial and retail properties. The eastern portion of Dock Street is more residential. Commercial sites consist of one- and two-story retail, professional and service establishments. The study area encompasses the Downtown Waterfront Redevelopment Area, Phase 1, and the Downtown Toms River Business Improvement District (BID).

B. Roadway and Intersection Characteristics

Water Street west of Hooper Avenue, including Lakehurst Road, is classified as an urban minor arterial with a 30 mph speed limit. Water/Dock Street east of Hooper Avenue is an urban local roadway with no posted speed limit and full shoulders. Therefore, a statutory speed limit of 25 mph is assumed based on the urban setting. The corridor study section is 2- to 4-lanes, undivided, with no parking. There are 6 signalized and 9 unsignalized intersections, including the portion of Water Street that begins at the GSP and ends near Lien Street.

C. Existing Bicycle/Pedestrian Accommodations

Sidewalks are currently available along both sides and range from 4-6 feet wide. Sidewalk conditions vary from newly installed to needing maintenance. Ladder and continental style crosswalks are provided throughout the corridor. There are no bicycle lanes or other bicycling infrastructure identified along the corridor.

D. Traffic Volumes

Based on available data, the 2016 ADT along Water/Dock Street is approximately 16,500 and 22,000 vehicles per day in November 2016 and August 2014, respectively. A copy of the available data can be found in Appendix C.

E. Transit Service

NJ Transit bus service is provided along Water/Dock Street via routes 67 and 137. A park and ride facility is located along Highland Parkway south of Water/Dock Street with service to NYC, Cape May, Atlantic City, Lakewood and points in between.

F. Community Profile

Population and income characteristics from the 2010 Census (U.S. Census Bureau) were used to identify minority populations and low-income populations. Updates to the 2010 Census were performed by the Census Bureau through the American Community Survey (ACS) estimate. The latest ACS for this study area is a five-year estimate from 2012 through 2016, except for LEP, which was from the 2011-2015 ACS. A summary of the demographics is listed below.

Table 3 – Water/Dock Street Area Demographics

Characteristic		Water/Dock St Area	County Average
Poverty		6.6%	11.2%
Race/ Ethnicity	White	82.9%	85.1%
	Hispanic/Latino	8.5%	8.9%
	Asian American	3.6%	1.9%
	Black or African American	2.9%	2.9%
	American Indian/Alaskan	0.1%	0.0%
	Other[1]	2.1%	1.2%
Limited English Proficiency (LEP)		2.1%	2.3%

In addition, approximately 2.7% of the population uses public transportation compared to the Ocean County average of 2.0%. Roughly 3% of the area population walk or bike to work, which is slightly higher than the county average.

G. Redevelopment

The Township proposes redevelopment of the area between the Garden State Parkway and Main Street south of Water Street and the two parking lots along the west side of Irons Street. As noted in the *Downtown Waterfront Redevelopment Plan,* the goal is to revitalize Downtown Toms River into a sustainable neighborhood and provides the policy for mixed use development of higher density residential dwelling unit types above street level retail. It is envisioned that the retail will front Water Street and wrap the corners of the side streets of Irons Street, Adafre Street, and a new road as they form a grid between Water Street and Herflicker Boulevard. The *Downtown Circulation Neighborhood Plan* identifies a preferred roadway network scenario that creates a one-way loop between Highland Parkway and Route 166 (Main Street). Herflicker Boulevard would be extended to Highland Parkway and provide the one-way eastbound connection, while Water Street would provide the one-way westbound connection. Excerpts from these reports can be found in Appendix I and J, respectively.

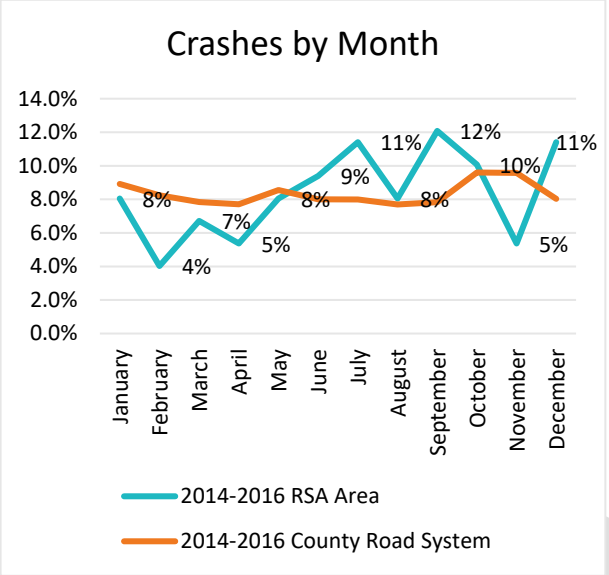
III. Crash Findings

The analysis used in the RSA was based on reportable crashes that resulted in a fatality, injury and/or property damage as found in the NJDOT crash database. Corridor-wide crash characteristics and overrepresentations were compared to the 2016 statewide average for the county road system as further detailed below. All crashes were plotted onto collision diagrams, which can be found in Appendix D and E. Of note, crashes during 2016 may be skewed due to the reconstruction of the Water/Dock Street bridge over the Garden State Parkway (GSP) and its associated construction staging.

A. Temporal Trends

According to the NJDOT crash database, there were 149 crashes occurred during the three-year period between January 1, 2014, and December 31, 2016, along the study area of Water/Dock Street with 41, 51 and 57 crashes occurring in 2014, 2015 and 2016, respectively. Total crashes were highest in June and September and lowest in February compared to the county average. The day with the most of crashes is Wednesday and the day with the fewest is Saturday.

[1] 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'



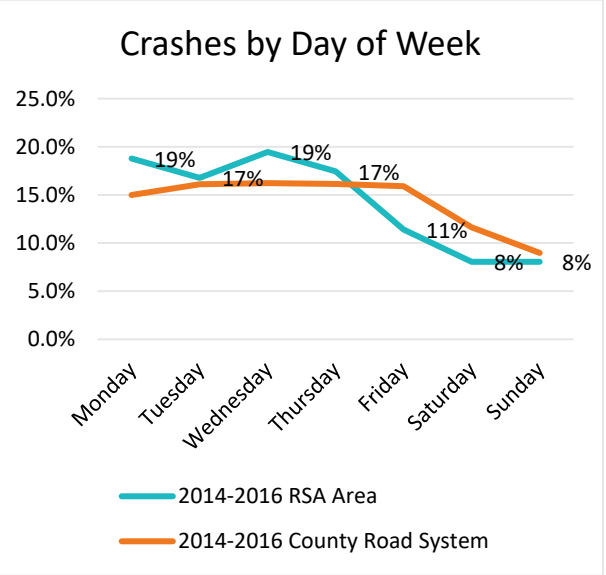
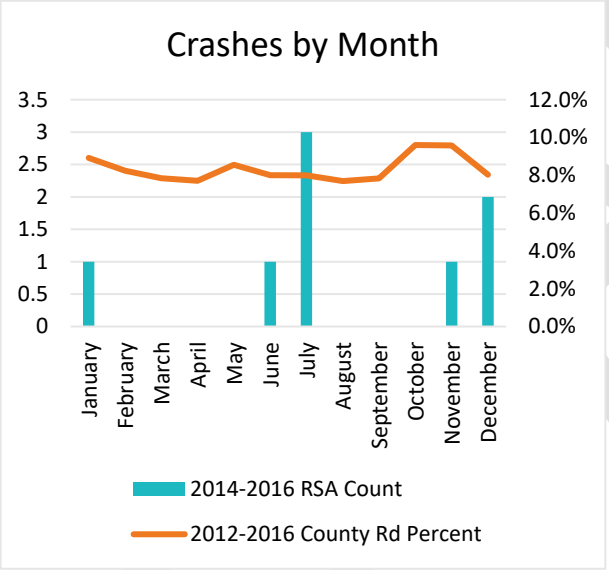


Figure 1 – Total Crashes by Month and Day of Week



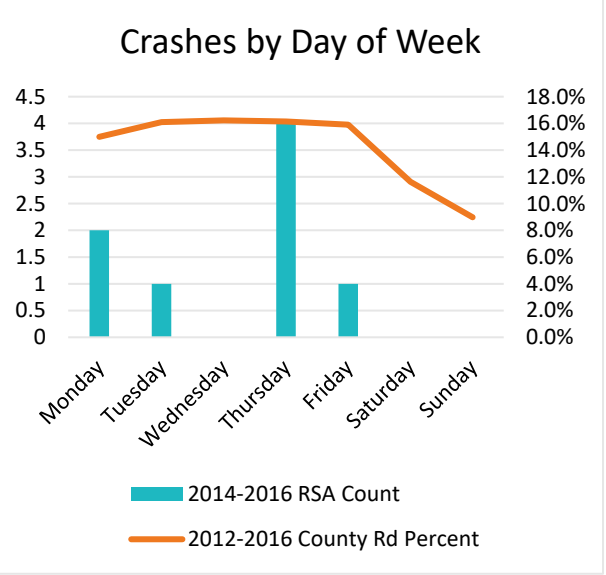


Figure 2 – Pedestrian/Bicyclist Crashes by Month and Day of Week

Additionally, 5 bicyclist and 3 pedestrian crashes (8 total) occurred over the five-year period from 2012 to 2016. Most of these crashes included minor to moderate injury. More crashes occurred at non-daylight hours than the county average. Collisions with pedestrians were most common Thursdays and in July. It should be noted that the low number of crashes compared to the county road system may be statistically insignificant since they could not be correlated with an identified event. For example, while the monthly chart indicates 3 pedestrian crashes occurred in June, this equates to 38% of total pedestrian crashes versus the county average of approximately 452 pedestrian crashes (10%) for the same month in 2016.

Ocean County also indicated that two fatal pedestrian crashes occurred in the project vicinity: one at Highland Parkway and Herflicker crash (outside the project limits) was on December 25, 2016 and one at Water Street and Robbins Parkway on December 29, 2017.

B. Collision Types

Overrepresented crash types over the three-year period from 2014 to 2016 included sideswipe, parked vehicle, backing, and pedestrian. Of the 8 pedestrian/cyclist crashes over the five-year period from 2012 to 2016, four were pedalcyclists (scooter, skateboard, or bicycle).

Table 4 – Overrepresented Crash Types (2014-2016)

Collision Type	Count	% of Total	2016 County Road System Average
Same Direction (Side Swipe)	32	21.48%	13.13%
Right Angle	40	26.85%	5.73%
Left Turn	12	8.05%	2.28%
Fixed Object	17	11.41%	9.67%
Pedacyclist	4	2.68%	0.44%

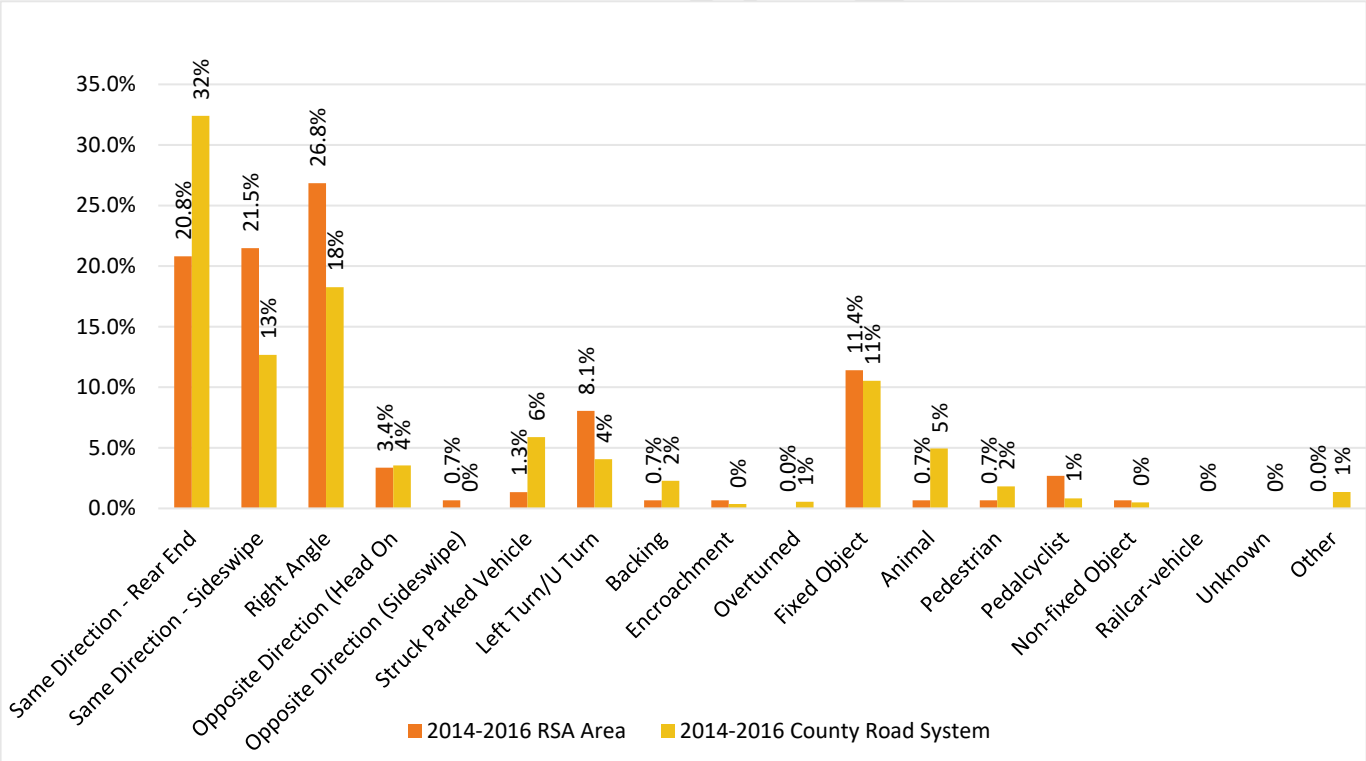


Figure 3 – Crash Type Breakdown

C. Severity

Crashes resulting in minor injury were overrepresented compared to the county road system. This is likely due to overrepresentation of right angle and left/U-turn crashes. No fatal crashes occurred during the study period.

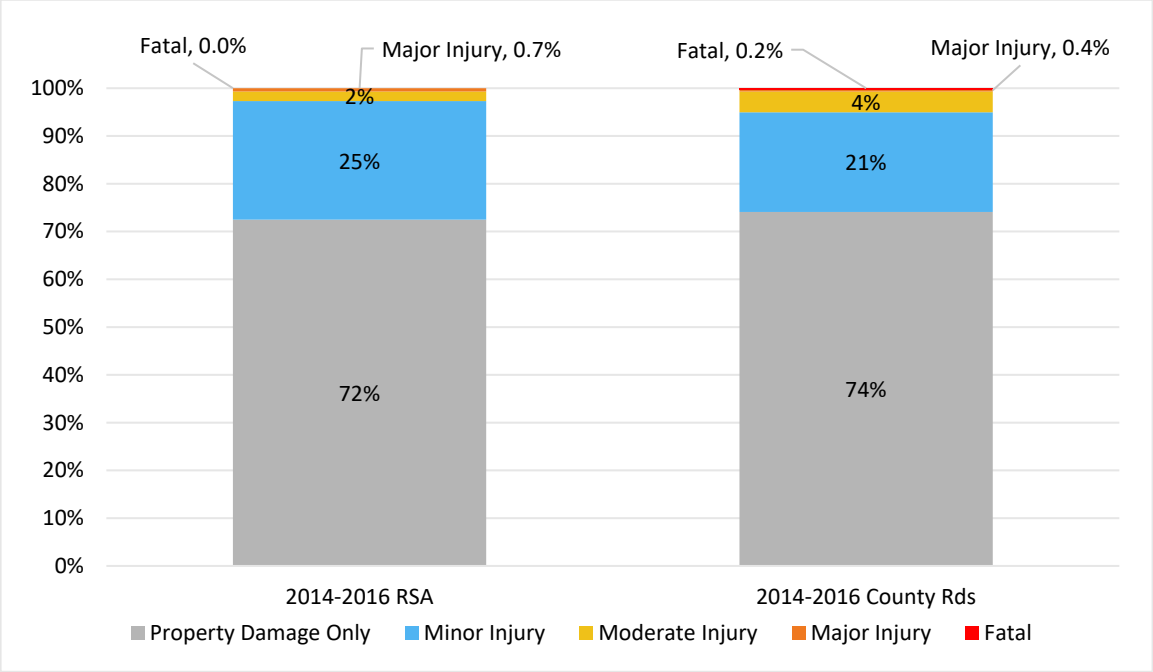


Figure 4 – Severity (All Crashes)

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

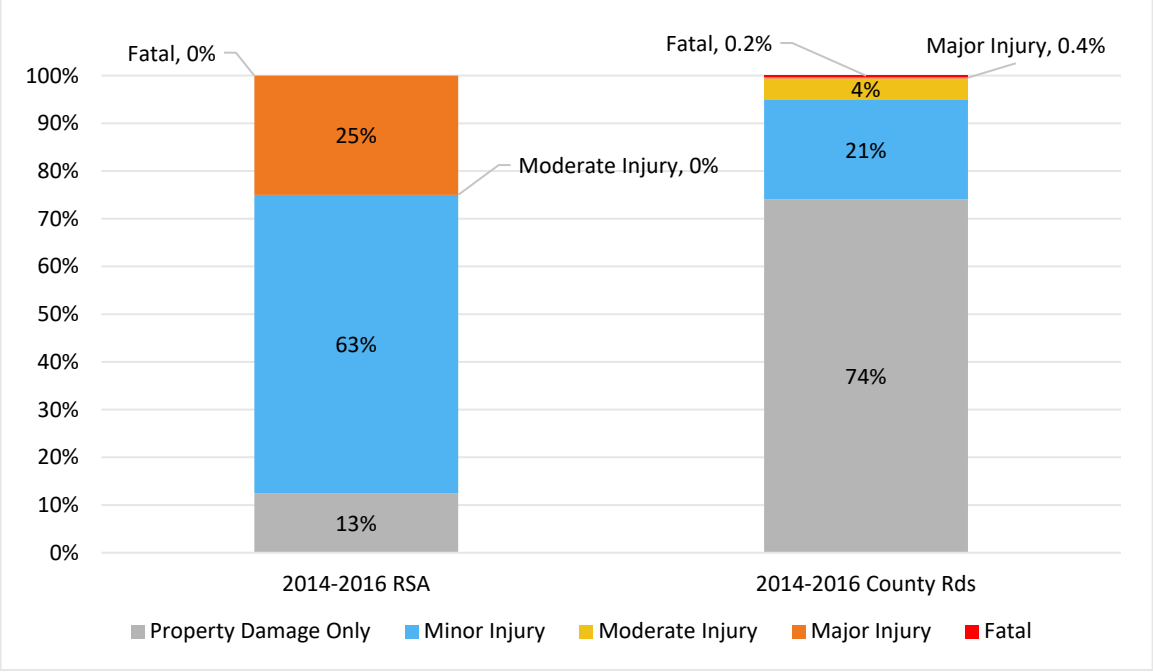


Figure 5 – Severity (Pedestrian/Bicycle Crashes)

D. Roadway Surface & Light Condition

Overrepresented crash types included dry surface, wet surface and non-daylight hours. Crashes occurring on wet surface conditions were primarily along curves. In addition, 79% of crashes occurred during the daytime.

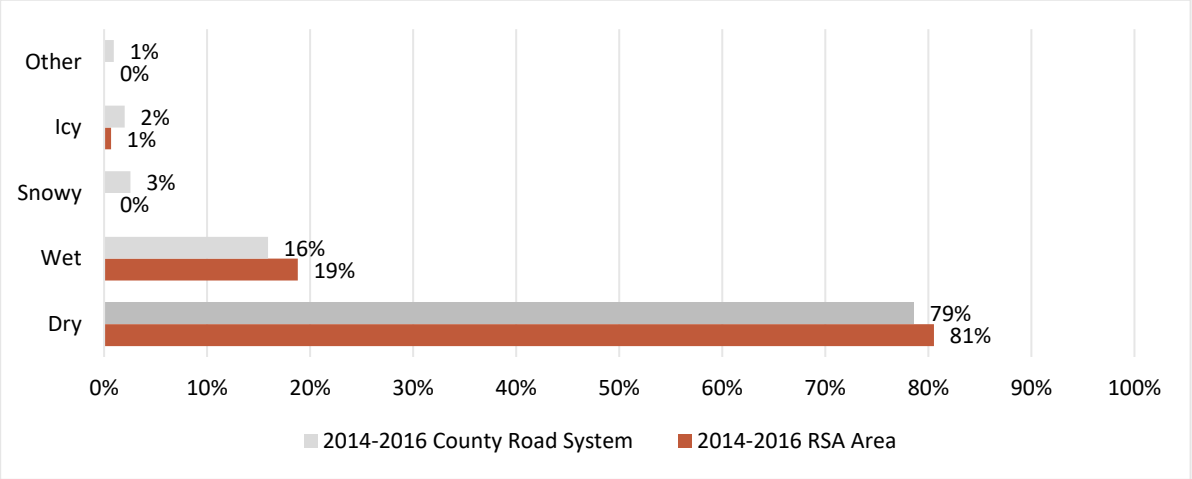


Figure 6 – Surface Conditions (All Crashes)

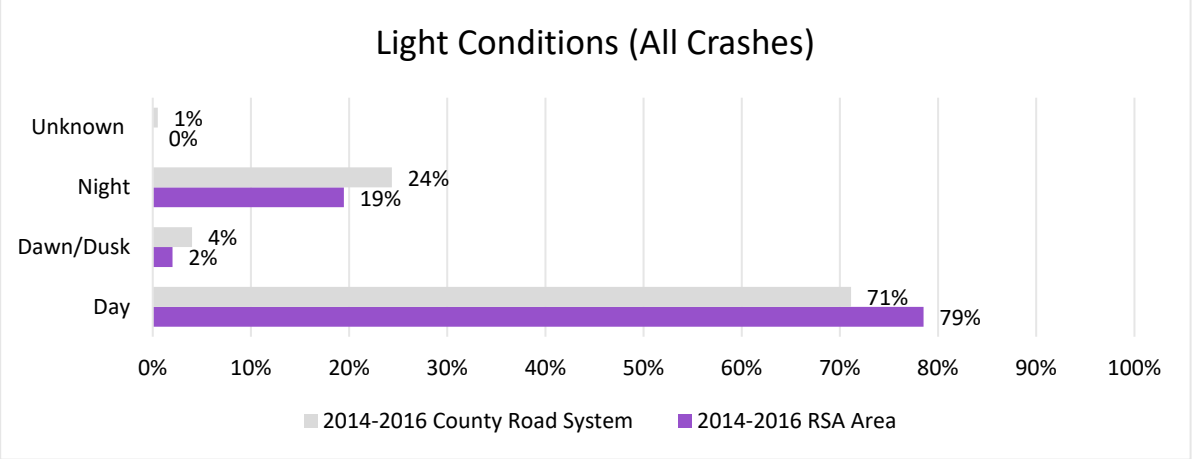


Figure 7 – Light Conditions (All Crashes)

Dry surface crashes involving pedestrians and bicyclists accounted for most of the crashes. In addition, 4 or approximately 50% of pedestrian crashes occurred during non-daylight hours (dawn, dusk and night), which is higher than the county road average of 28%. Of note, the low number of crashes compared to the county road system may be statistically insignificant.

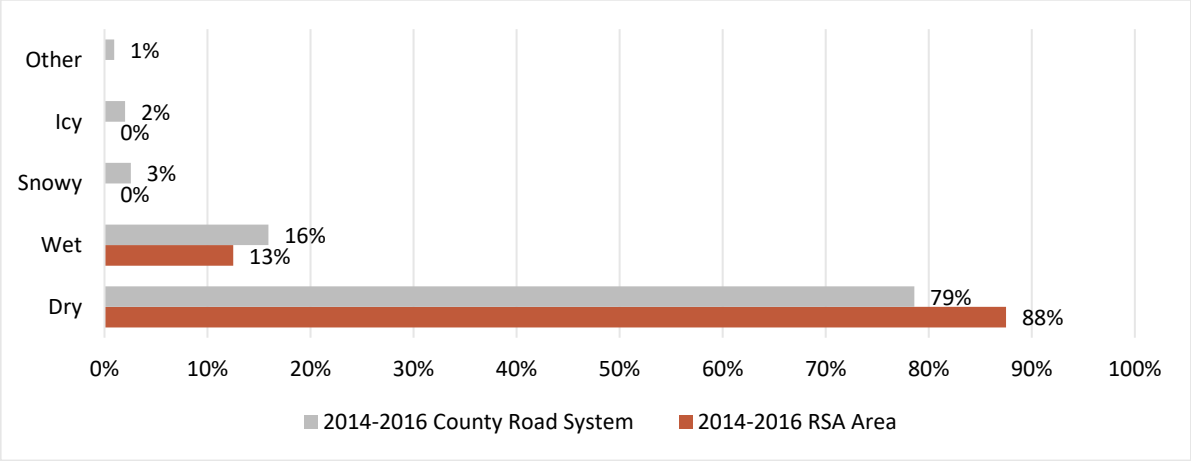


Figure 8 – Surface Conditions (Pedestrian/Bicycle Crashes)

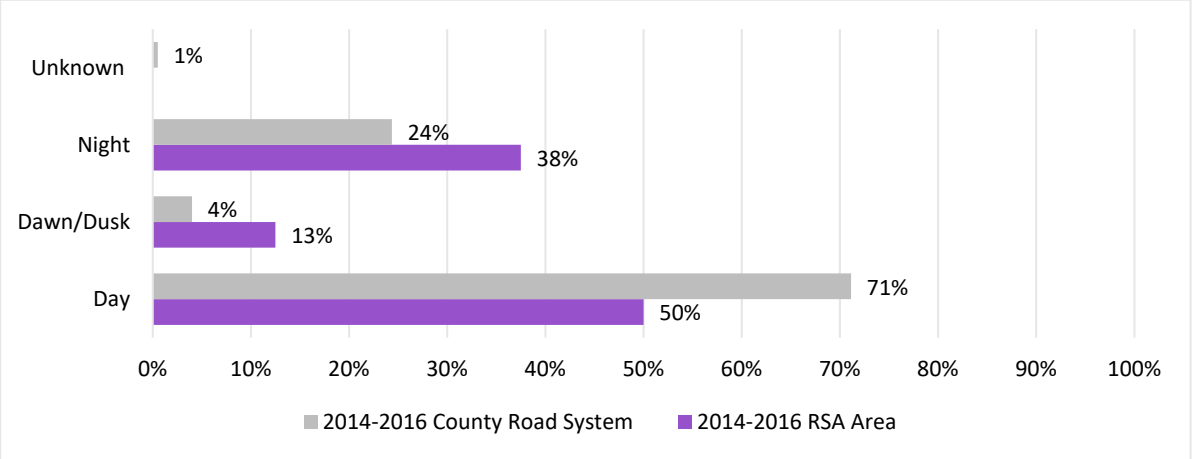


Figure 9 – Light Conditions (Pedestrian/Bicycle Crashes)

E. Location

Crashes at signalized intersections were overrepresented compared to the county road system average. Twenty-four percent (24%) of crashes occurred at signalized intersections compared to 14% on all county roads. More crashes occurred at or near 40th Street, Stuyvesant Avenue, Eastern Parkway and Ellis Avenue. Pedestrian/bicyclist crashes occurred more often at Maple Avenue than at any other study intersection. Crash frequency, as shown in the following figures, shows the highest concentration of vehicular and pedestrian crashes.

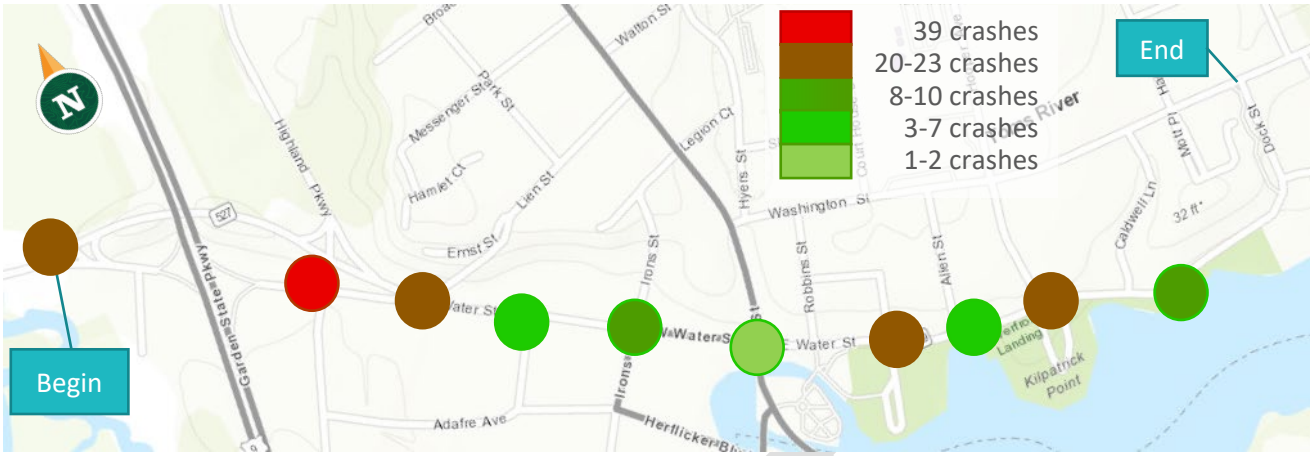


Figure 10 – Total Crash Locations (2014-2016)

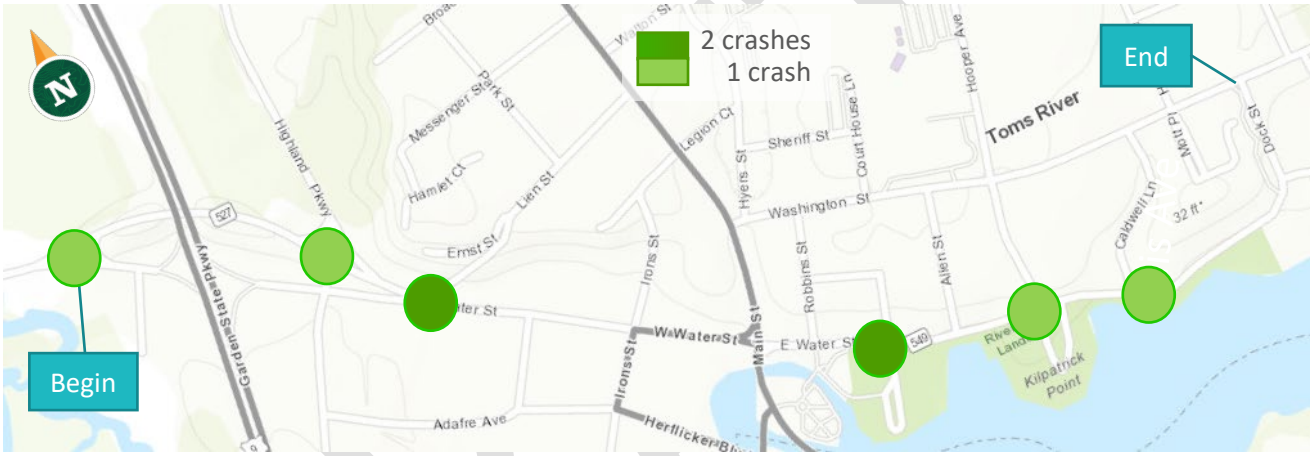


Figure 11 – Pedestrian Crash Locations (2012-2016)

IV. Identified Issues & Observations

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

Pedestrian/Bicyclist

1. Few bicyclists observed potentially due to lack of continuous shoulder

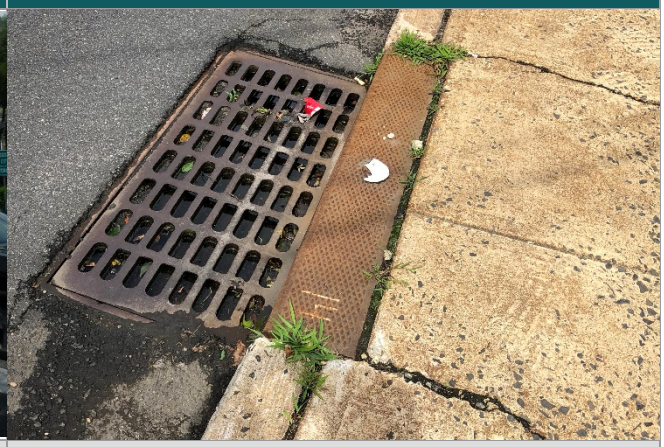
2. Lack of ADA curb ramps and DWS

3. Two curb ramps with one marked crossing

4. Overgrown vegetation restricts sidewalk and obscures signs

5. Lack of ADA curb ramp; guide rail may not be warranted

6. Improperly placed DWS and ADA ramp

Operations & Visibility	Maintenance
	
7. Poor sight distance at merge	**8.** Inlets filled with water and broken sidewalk
	
9. Limited visibility over GSP	**10.** Signs obscured by vegetation

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

- The roadway crown along Water Street in the area of the horizontal curve immediately east of Caldwell Lane appears to be centered along the eastbound lane, which could be contributing to the high number of wet weather, fixed object, and out of control crashes at this location.
- Sections of sidewalk abut the curb but are only 4 feet wide, rather than the recommended 6 feet wide per NJDOT. The lack of shoulders adjacent to sidewalk, utility poles set in the middle of sidewalk, and limited sidewalk width increases driver and pedestrian discomfort.
- Vehicles make wide left turns from Water/Dock Street westbound onto Hooper Avenue (i.e. higher speed turns).
- There is a potential perceived conflict between left turning vehicles and channelized right turn vehicles attempting to enter the GSP SB entrance ramp causes hesitation and leads to left turn crashes along Lakehurst Road.

V. Findings and Recommendations

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

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

A. Recommendations

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

Table 5 – Corridor-Wide Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
	Operations				
1	Consider upgrading all ramps for ADA compliance	✓✓✓[3]	$$$	◕	Township/ County
2	Investigate reallocating pavement space or converting to a 3-lane section (2 travel lanes, TWLTL and shoulders; i.e. road diet)	✓✓	$$	◑	County
3	Investigate on-street parking requirements where business have existing parking lots (parking study) and for conformance with Title 39.	✓[3]	$$	◑	Township
4	Consider development of an access management plan within the project limits (for vehicles and pedestrians)	✓	$$	◕	County

[2] 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.

[3] 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
5	Consider corridor-wide signal upgrades (replace 8" traffic signal heads with 12", install backplates with retroreflected border, evaluate clearance intervals, update to countdown pedestrian signal heads, replace push buttons in compliance with ADA, etc.)	✓✓	$$$	◕	County
6	Study roadway and pedestrian scale lighting	✓✓✓	$$	◑	Township
	Bicycle/Pedestrian				
7	Inspect, repair and construct sidewalks in compliance with ADA as needed	✓✓✓	$$	◔	Township/ County
8	Examine inlets and install bicycle-safe grates	✓[3]	$$	◔	County
9	Study corridor-wide implementation of curb extensions (bump outs) based on the site-specific recommendations to maintain consistency	✓✓[3]	$$	◕	County
10	Examine crosswalks status: continental style, check placement and alignment	✓✓	$	◔	County
11	Consider leading pedestrian intervals (LPI) or all pedestrian phase at signalized intersections with high pedestrian activity	✓✓✓	$	◔	County
12	Consider installing a bicycle lane and/or sharrow striping per NJ Complete Streets Design Guide	✓[3]	$	◑	Township/ County Approval
	Maintenance				
13	Inspect existing striping for wear and restripe accordingly; add RPMs	✓✓	$	◔	County
14	Inspect and replace faded, damaged or incorrect/ outdated signage as needed (i.e. signs mounted below 7', on non-breakaway posts or back-to-back signs that obscure shapes [e.g. Do Not Enter behind Stop sign])	✓	$	◔	County
15	Inspect drainage facilities; ensure they are free of debris	✓[3]	$$	◑	County
16	Inspect and trim foliage/vegetation to improve sign visibility and sidewalk paths	✓[3]	$	◔	County
	Education				
17	Consider sidewalk, crosswalk, multimodal education campaign and code enforcement	✓[3]	$	◑	Town/ County
18	Explore ways to deter vehicles from speeding along Water/Dock Street	✓	$	◔	Town/ County

The following site-specific recommendations are in addition to the corridor-wide improvements, except where noted otherwise. Of note, a recent pedestrian/bicycle study within the project limits showed at least one pedestrian crossing phase coincided with right turn signal. The issue has been addressed and has either been fixed or is in the process of being fixed. In addition, NJTPA is working on a project to systematically install High Friction Surface Treatment (HFST) to high crash areas within Ocean County.

Table 6 – Site-Specific Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
	Curve between Brooks Rd and Caldwell Ln				
19	Consider HFST (if noise is not an issue), chevrons and/or curve warning signs along the curves	✓	**$$**	◑	County
20	Consider relocating or removing the pedestrian crossing as there is very little activity at the same	✓✓[3]	**$$**	◔	County
21	Investigate reprofiling the roadway in this area	✓[3]	**$$**	◑	County
22	Explore centerline rumble strips/stripes	✓✓✓	**$$**	◑	County
23	Consider green infrastructure solutions for drainage and overflow conditions	N/A	**$$**	◕	County
	Caldwell Ln				
24	Consider corridor-wide recommendations 8 and 15 regarding inlets and drainage	✓[3]	**$$**	◑	County
25	Consider corridor-wide recommendation 1, 7 and 10 regarding crosswalks, sidewalk and ADA compliance	✓✓✓[3]	**$$$**	◕	Township/ County
26	Investigate adding 5'x5' turnarounds every 200' for ADA compliance	✓✓✓[3]	**$$**	◕	County
	Hooper Ave				
27	Consider corridor-wide recommendation 1, 7 and 10 regarding crosswalks, sidewalk and ADA compliance	✓✓✓[3]	**$$$**	◕	Township/ County
28	Consider skip/tract lines for the westbound left turn movement and/or investigate relocating the WB stop bar to reduce turn radii	✓✓[3]	**$$**	◑	County
	Allen St				
29	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	**$$$**	◕	County
	Horner St/Robbins Pkwy				
30	Consider corridor-wide recommendation 6 regarding lighting	✓✓	**$$$**	◑	County
31	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	**$$$**	◕	Township/ County
32	Investigate corridor-wide recommendation 11 regarding LPIs	✓✓✓	**$**	◔	County
33	Examine reducing the off-peak cycle length or employ free-float timing to reduce delay on the side streets and mitigate driver impatience	✓[3]	**$**	◔	County
	Robbins St				
34	Investigate a center divisional island along Water St to eliminate dangerous left turn movements (and potential for use as a mid-block pedestrian crossing)	✓✓✓	**$$**	◑	County

[3] 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
35	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	$$$	◕	Township/ County
	Route 166/Main St				
36	Consider coordinating with NJDOT on any improvements	N/A	$	◑	County
37	Investigate removal of the SB approach channelized right turn and realign the Water St WB approach so that the right lane continues to the through/right turn lane at Irons St and only the left lane continues to the left turn only lanes	✓[3]	$$	◕	Township/ County
38	Consider additional lane use signage for Water St WB in advance of Irons St	✓[3]	$$	◑	County
	Irons St				
39	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	$$$	◕	Township/ County
40	Install steel mast arm providing oversized lane usage signs along the westbound approach.	✓	$$	◑	County
41	Explore reconfiguring the WB approach to provide a shared left/through lane in the current rightmost left turn lane and to provide two receiving lanes on the westerly approach which merge to a single lane after the intersection (update signal heads as appropriate)	✓[3]	$$$	◕	County
	Adafre Ave				
42	Investigate divisional islands or bollards to enforce prohibited left turns from post office driveway	✓✓✓	$	◑	County
43	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	$$$	◕	County
	Lein St/W Water St				
44	Examine restricting left turns onto Lien St, relocating movement to Irons St. Consider installing a divisional island along Water St/Lakehurst Rd	✓✓✓	$$	◑	County
45	Investigate removal of parking along W Water St EB and provide two-lane section	✓	$	◑	Township/ County
46	Investigate removal of parking along W Water St EB and provide shoulder or bike lane	✓✓	$	◑	Township/ County
47	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	$$$	◕	Township/ County
48	Examine reducing the curb radii (specifically the NW corner) or creating a more 90° approach	✓	$$	◕	County
49	Consider corridor-wide recommendation 14 regarding signage upgrades	✓	$	◔	County

[3] 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.

[3] 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
	Highland Pkwy/W Water St				
50	Study implementation of a 2-lane roundabout	✓✓✓✓	**$$$**	◕	County
51	Investigate relocating W Water Street intersection to the west to provide a perpendicular alignment with Lakehurst Rd and improve visibility	✓✓	**$$$**	◑	County
52	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	**$$$**	◕	Township/ County
53	Consider performing a MUTCD signal warrant analysis and combine operation with existing signal	✓✓	**$$$**	◕	County
54	If warranted, investigate use of coordinated clearance interval to address storage concerns and a force-off loop to prevent queues from extending onto GSP	✓[3]	**$$**	◑	County
	Entrance to GSP SB/Lakehurst Rd				
55	Study implementation of a single lane roundabout	✓✓✓✓	**$$$**	◕	County
56	Consider corridor-wide recommendation 1, 7 and 10 regarding sidewalk, crosswalks, and ADA compliance	✓✓✓[3]	**$$$**	◕	Township/ County
57	Consider corridor-wide recommendation 5 regarding signal upgrades	✓✓	**$$$**	◕	County
58	Investigate removing the channelized right turn lane along the EB approach and provide a right turn overlap during Lakehurst Rd green time	✓✓[3]	**$$**	◕	County
59	Consider extending the WB left turn lane to provide additional storage	✓[3]	**$$**	◑	County
60	Consider a protected only WB left turn phase, lag left phase and/or modified peak hour timing	✓	**$$**	◔	County

B. Road Owner Response

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

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

A. Recommendation Visualizations

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

1. Pedestrian Facilities

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. 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.

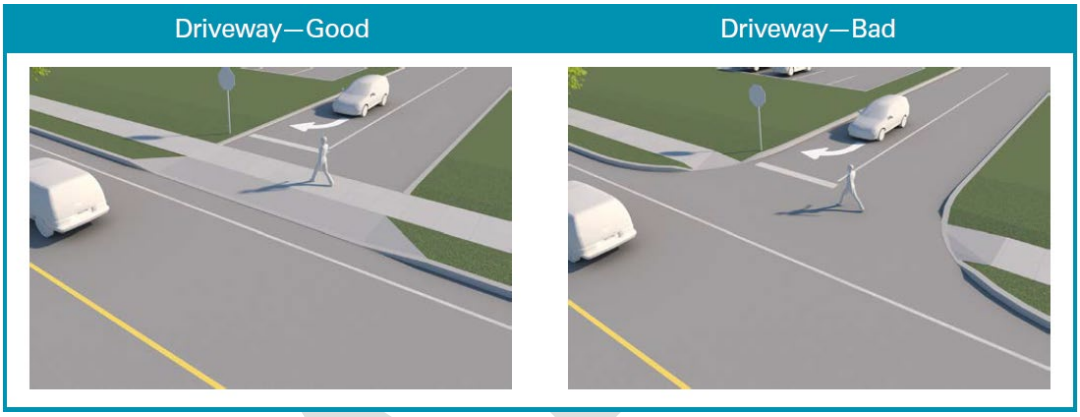


Figure 12 – Sidewalk and Driveways (Source: CSDG)

Crossing islands, or pedestrian refuge islands, reduce the exposure time of pedestrians to vehicular traffic. They enable pedestrians to make a crossing in two stages — crossing one direction of vehicular travel lanes, pausing at the island, and then completing the crossing. They are recommended where a pedestrian must cross three lanes of traffic in one or both directions but may be implemented on smaller cross sections where space permits.

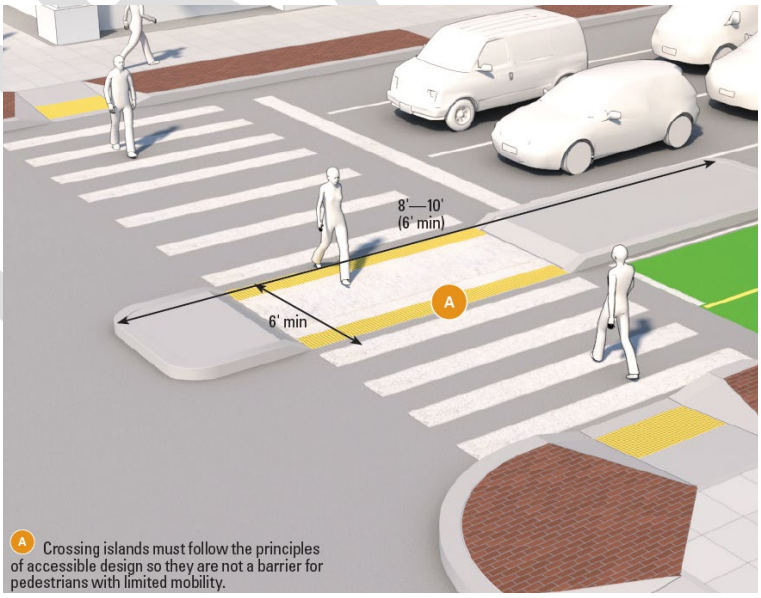


Figure 13 – Pedestrian Crossing Island (Source: CSDG)

2. Bicycle Facilities

Bicycle lanes provide an exclusive space for bicyclists using pavement markings and signage. Intended for one-way travel, they are typically located on both sides of a two-way street. Bicycle lanes enable bicyclists to ride at their preferred speed, free from interference from motorists. Where it is not feasible or appropriate to provide dedicated bicycle facilities, shared-lane markings (e.g. “sharrows”) may be used to indicate a shared environment for bicycles and vehicles. 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 14 – Bicycle Facility Examples

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

3. Roundabout

Roundabout design, which was recommended at the intersections of Water/Dock Street with Highland Parkway and the GSP ramps, should create conditions that reduce vehicle speed and provide a consistent speed into, through, and out of the roundabout. Lower speeds reduce crash frequency and severity for all roadway users, allow safer and easier merging of traffic, provide more reaction time for drivers, and make the facility more accessible for novice users.

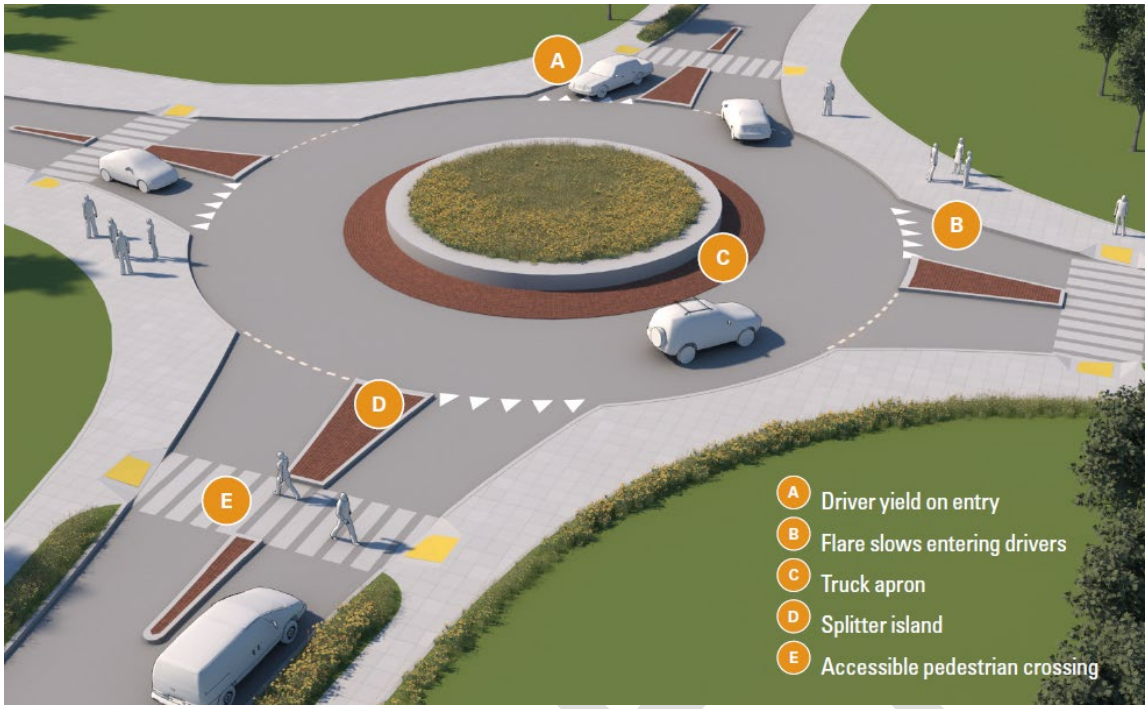


Figure 15 – Single Lane Roundabout Example (Source: CSDG)

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). Other roadway reconfiguration options are shown on the following pages.

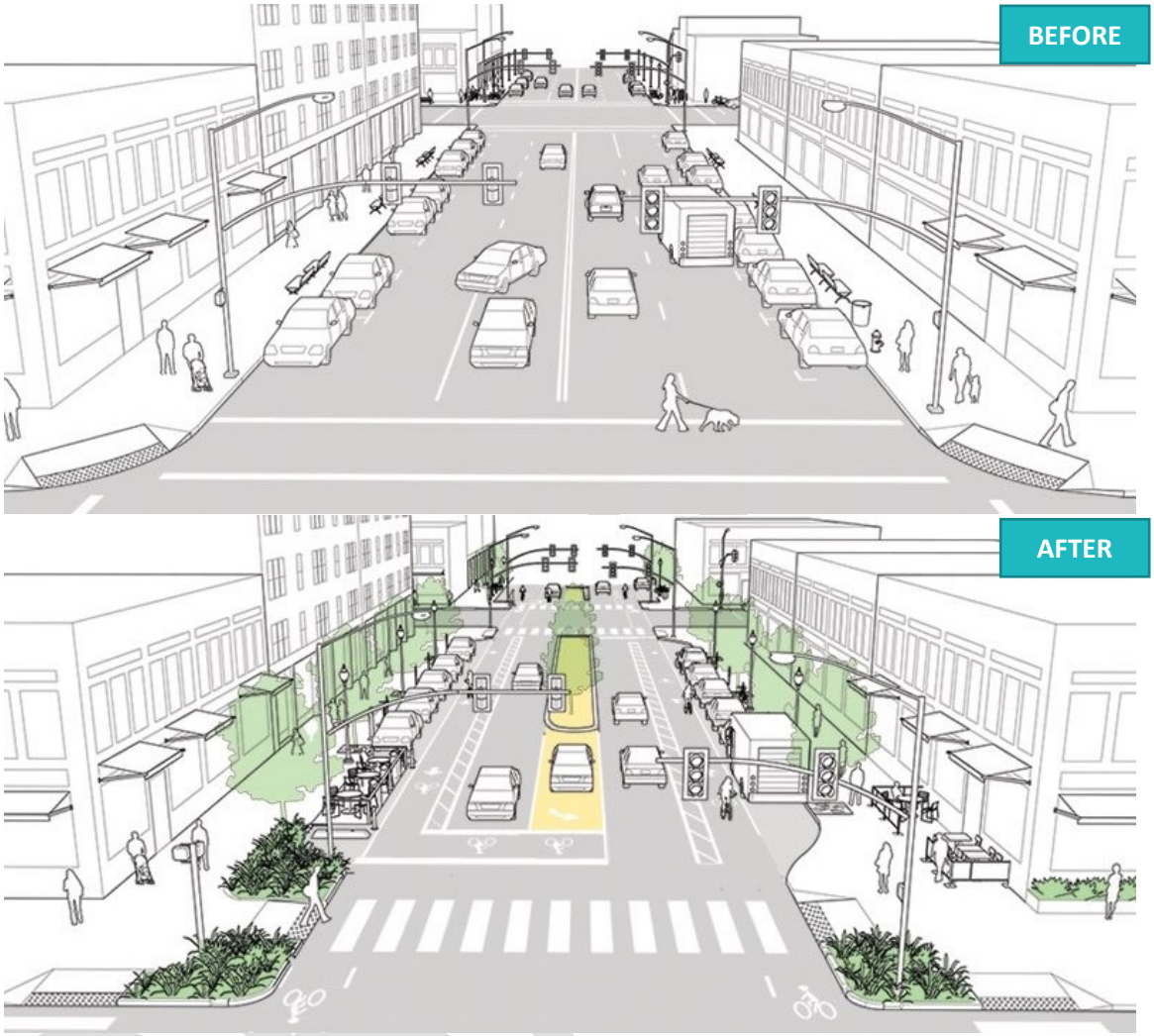


Figure 16 – Example of a Main Street Typology (Source: NACTO-US)

<u>Top:</u> With medium traffic volumes and high pedestrian activity, the street has significant potential for regeneration as a retail district, yet currently underperforms. Frequent destinations have resulted in multiple turning and weaving conflicts along the street.

<u>Bottom:</u> While road diets are not appropriate on all 4-lane cross sections, they can improve traffic flow and reduce conflicts with turning vehicles, enhancing safety. From an economic standpoint, they often rank favorably with business owners and have a positive impact on local business activity. Alternatively, a center 6-foot pedestrian safety island can be implemented in the above configuration by tapering the bike lane buffer near the intersection and shifting the through lanes to the right. Streets also benefit from dedicated loading zones near intersections. Implementation should consider availability of parallel routes, potential for mode shift, and channelization of traffic.

Figure 17 – Example of a Two-Lane Downtown Street Typology (Source: NACTO-US)

Top: The above illustration depicts a 2-way street in a central business district that is congested by buses, bikes, people, and cars. Curbside bus stops may be undermined by double-parked vehicles and heavy rush-hour traffic. Double-parking also creates conflicts and safety hazards for all modes.

Bottom: Bus bulbs serve as dedicated waiting areas for transit users while decreasing pedestrian exposure during crossings and can connect to existing sidewalk or be designed as a bus-boarding island with a bicycle cut-through. Delineation in the roadway can be created using striping, cycle tracks, and narrow travel lanes. Restricting delivery, encouraging off-peak delivery, and/or dedicated loading zones are critical to eliminating double-parking obstructions.

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.

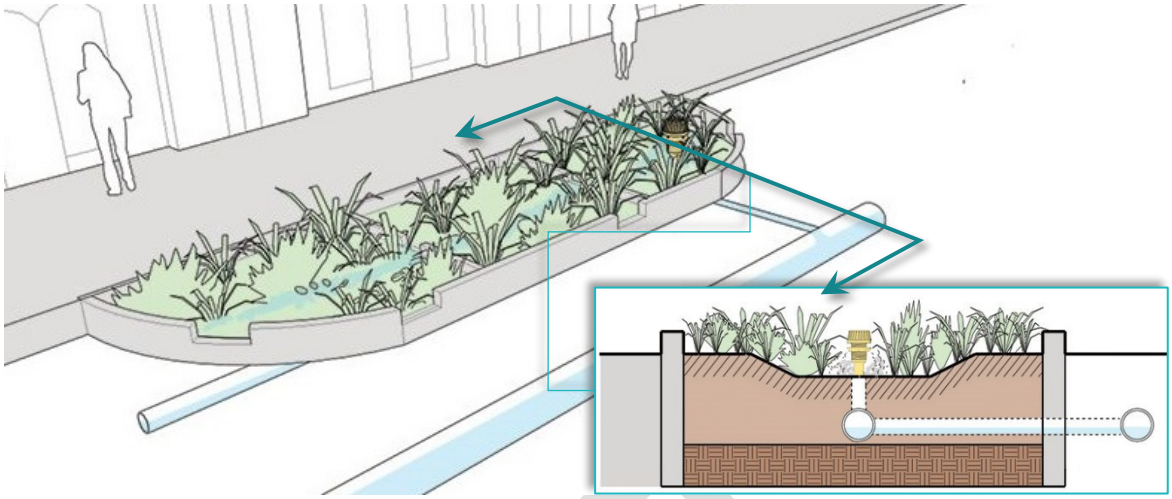


Figure 18 – Bioswale Example (Source: NACTO-US)

VI. Conclusions

The Water/Dock Street 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 Water/Dock Street. 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
John Ernst	Ocean County Engineering
Mark Jehnke	Ocean County Engineering
Lauren Schroetter	Ocean County Engineering
Angela DeBiase	Ocean County Engineering
Robert Chankalian	Toms River Township Engineer
Wendy Birkhead	Toms River Township
Dave Roberts	Toms River Township
S/O Steve Schwartz	Toms River Township Police Department
Edward O'Connor	NJOAG – Division of Highway Traffic Safety
Amon Boucher	NJDOT - Bureau of Transportation Data and Safety
Angela Quevedo	NJDOT - Bureau of Transportation Data and Safety
Grace Faughnan	NJDOT - Bureau of Transportation Data and Safety
William Riviere	NJDOT – Office of Bicycle and Pedestrian Programs
Karen Garcia	NJDOT – Bureau of Traffic Engineering
Aimee Jefferson	NJTPA
Bernie Boerchers	Greenman-Pedersen, Inc. (NJDOT Consultant)
Andrew Halloran	Greenman-Pedersen, Inc.
Christopher Marra	Greenman-Pedersen, Inc.
Aidan Sheenan	Greenman-Pedersen, Inc.
Julia Steponanko	Greenman-Pedersen, Inc.

APPENDIX B

AREA MAP

NJDOT HSIP
ROAD SAFETY AUDIT
WATER/DOCK STREET

TOMS RIVER TOWNSHIP
OCEAN COUNTY

PROJECT LOCATION

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

N.T.S.

APPENDIX C

TRAFFIC DATA

Ocean County Engineering Dept.

Traffic Division
Toms River, NJ 08754

N/S Street: Irons St.
E/W Street: CR# 2 (Water Street)
Town: Toms River Township
Counted By: AM/CS/CS

File Name : 02 & irons-16
Site Code : 07002100
Start Date : 4/19/2016
Page No : 1

Groups Printed- Cars/ Peds - Trucks/Bikes

	Irons St. From North					Water St. From East					Irons St From South					Water St. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	17	0	0	0	17	2	99	140	2	243	0	0	0	1	1	24	29	13	0	66	327
07:15 AM	8	0	0	2	10	5	107	102	4	218	0	0	0	0	0	37	32	6	0	75	303
07:30 AM	4	0	0	8	12	8	94	130	2	234	0	0	0	0	0	28	64	18	0	110	356
07:45 AM	8	0	0	16	24	7	95	119	1	222	0	0	0	1	1	35	60	21	0	116	363
Total	37	0	0	26	63	22	395	491	9	917	0	0	0	2	2	124	185	58	0	367	1349
08:00 AM	8	0	0	5	13	7	104	132	0	243	0	0	0	1	1	35	64	21	0	120	377
08:15 AM	11	0	0	0	11	13	100	119	1	233	0	0	0	0	0	32	88	23	1	144	388
08:30 AM	12	0	0	0	12	10	111	110	2	233	0	0	0	0	0	37	98	23	2	160	405
08:45 AM	7	0	0	2	9	13	122	105	5	245	0	0	0	0	0	43	88	34	0	165	419
Total	38	0	0	7	45	43	437	466	8	954	0	0	0	1	1	147	338	101	3	589	1589
09:00 AM	9	0	0	0	9	16	85	93	2	196	0	0	0	0	0	29	83	28	0	140	345
09:15 AM	12	0	0	1	13	13	122	142	0	277	0	0	0	1	1	40	60	28	1	129	420
09:30 AM	14	0	0	1	15	9	99	131	0	239	0	0	0	2	2	43	64	18	1	126	382
09:45 AM	19	0	0	1	20	15	108	106	1	230	0	0	0	0	0	42	66	25	0	133	383
Total	54	0	0	3	57	53	414	472	3	942	0	0	0	3	3	154	273	99	2	528	1530
*** BREAK ***																					
11:00 AM	17	0	0	1	18	10	108	176	0	294	0	0	0	0	0	52	61	20	1	134	446
11:15 AM	27	0	0	1	28	12	120	173	4	309	0	0	0	1	1	54	76	26	0	156	494
11:30 AM	18	0	0	0	18	13	99	174	2	288	0	0	0	0	0	43	62	18	0	123	429
11:45 AM	15	0	0	0	15	3	113	165	5	286	0	0	0	0	0	56	72	22	2	152	453
Total	77	0	0	2	79	38	440	688	11	1177	0	0	0	1	1	205	271	86	3	565	1822
12:00 PM	16	0	0	0	16	7	114	160	2	283	0	0	0	0	0	62	55	18	0	135	434
12:15 PM	20	0	0	0	20	13	123	250	1	387	0	0	0	0	0	40	78	26	3	147	554
12:30 PM	22	0	0	5	27	15	123	186	3	327	0	0	0	0	0	48	53	24	2	127	481
12:45 PM	16	0	0	1	17	12	119	217	1	349	0	0	0	1	1	47	58	31	0	136	503
Total	74	0	0	6	80	47	479	813	7	1346	0	0	0	1	1	197	244	99	5	545	1972
*** BREAK ***																					
04:00 PM	23	0	0	1	24	10	126	247	1	384	0	0	0	0	0	65	80	32	1	178	586
04:15 PM	22	0	0	1	23	6	139	320	0	465	0	0	0	0	0	93	69	27	4	193	681
04:30 PM	30	0	0	0	30	2	116	283	0	401	0	0	0	0	0	92	80	20	0	192	623
04:45 PM	60	0	0	0	60	12	192	353	2	559	0	0	0	3	3	89	62	22	0	173	795
Total	135	0	0	2	137	30	573	1203	3	1809	0	0	0	3	3	339	291	101	5	736	2685
05:00 PM	29	0	0	0	29	21	154	357	2	534	0	0	0	0	0	100	90	19	4	213	776
05:15 PM	52	0	0	1	53	9	192	378	1	580	0	0	0	2	2	91	69	13	4	177	812
05:30 PM	31	0	0	0	31	8	139	310	5	462	0	0	0	1	1	90	79	20	0	189	683
05:45 PM	19	0	0	1	20	12	123	306	0	441	0	0	0	0	0	86	51	17	0	154	615
Total	131	0	0	2	133	50	608	1351	8	2017	0	0	0	3	3	367	289	69	8	733	2886
06:00 PM	27	0	0	0	27	6	102	269	0	377	0	0	0	2	2	95	67	23	2	187	593
06:15 PM	10	0	0	0	10	4	102	225	0	331	0	0	0	0	0	67	54	13	0	134	475
06:30 PM	21	0	0	0	21	7	90	256	0	353	0	0	0	0	0	83	49	13	0	145	519
06:45 PM	7	0	0	0	7	10	97	321	0	428	0	0	0	0	0	51	48	3	0	102	537
Total	65	0	0	0	65	27	391	1071	0	1489	0	0	0	2	2	296	218	52	2	568	2124
Grand Total	611	0	0	48	659	310	3737	6555	49	10651	0	0	0	16	16	1829	2109	665	28	4631	15957
Apprch %	92.7	0	0	7.3		2.9	35.1	61.5	0.5		0	0	0	100		39.5	45.5	14.4	0.6		
Total %	3.8	0	0	0.3	4.1	1.9	23.4	41.1	0.3	66.7	0	0	0	0.1	0.1	11.5	13.2	4.2	0.2	29	
Cars/ Peds	586	0	0	44	630	305	3646	6361	44	10356	0	0	0	15	15	1763	2061	649	22	4495	15496
% Cars/ Peds	95.9	0	0	91.7	95.6	98.4	97.6	97	89.8	97.2	0	0	0	93.8	93.8	96.4	97.7	97.6	78.6	97.1	97.1
Trucks/Bikes	25	0	0	4	29	5	91	194	5	295	0	0	0	1	1	66	48	16	6	136	461
% Trucks/Bikes	4.1	0	0	8.3	4.4	1.6	2.4	3	10.2	2.8	0	0	0	6.2	6.2	3.6	2.3	2.4	21.4	2.9	2.9

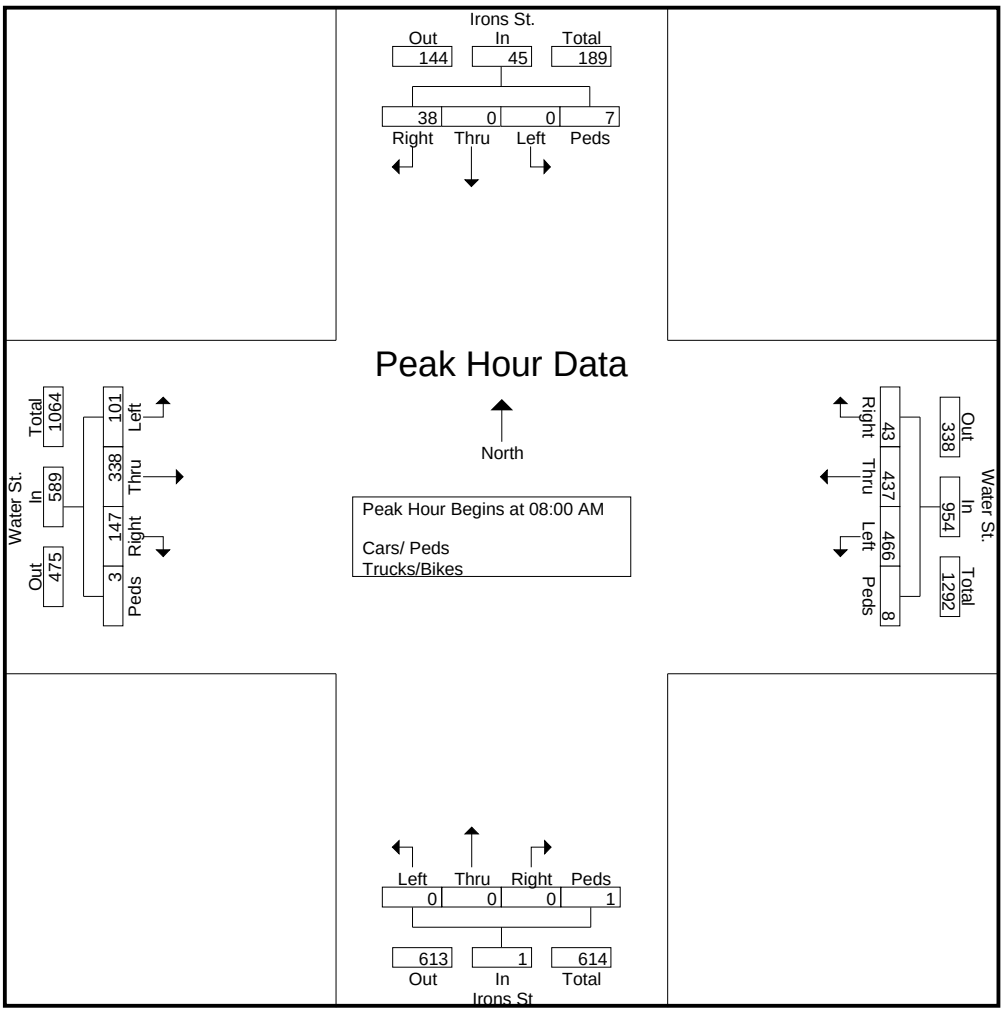
Ocean County Engineering Dept.

Traffic Division
Toms River, NJ 08754

N/S Street: Irons St.
E/W Street: CR# 2 (Water Street)
Town: Toms River Township
Counted By: AM/CS/CS

File Name : 02 & irons-16
Site Code : 07002100
Start Date : 4/19/2016
Page No : 2

	Irons St. From North					Water St. From East					Irons St From South					Water St. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	8	0	0	**5**	**13**	7	104	**132**	0	243	0	0	0	**1**	**1**	35	64	21	0	120	377
08:15 AM	11	0	0	0	11	**13**	100	119	1	233	0	0	0	0	0	32	88	23	1	144	388
08:30 AM	**12**	0	0	0	12	10	111	110	2	233	0	0	0	0	0	37	**98**	23	**2**	160	405
08:45 AM	7	0	0	2	9	13	**122**	105	**5**	**245**	0	0	0	0	0	**43**	88	**34**	0	**165**	**419**
Total Volume	38	0	0	7	45	43	437	466	8	954	0	0	0	1	1	147	338	101	3	589	1589
% App. Total	84.4	0	0	15.6		4.5	45.8	48.8	0.8		0	0	0	100		25	57.4	17.1	0.5		
PHF	.792	.000	.000	.350	.865	.827	.895	.883	.400	.973	.000	.000	.000	.250	.250	.855	.862	.743	.375	.892	.948



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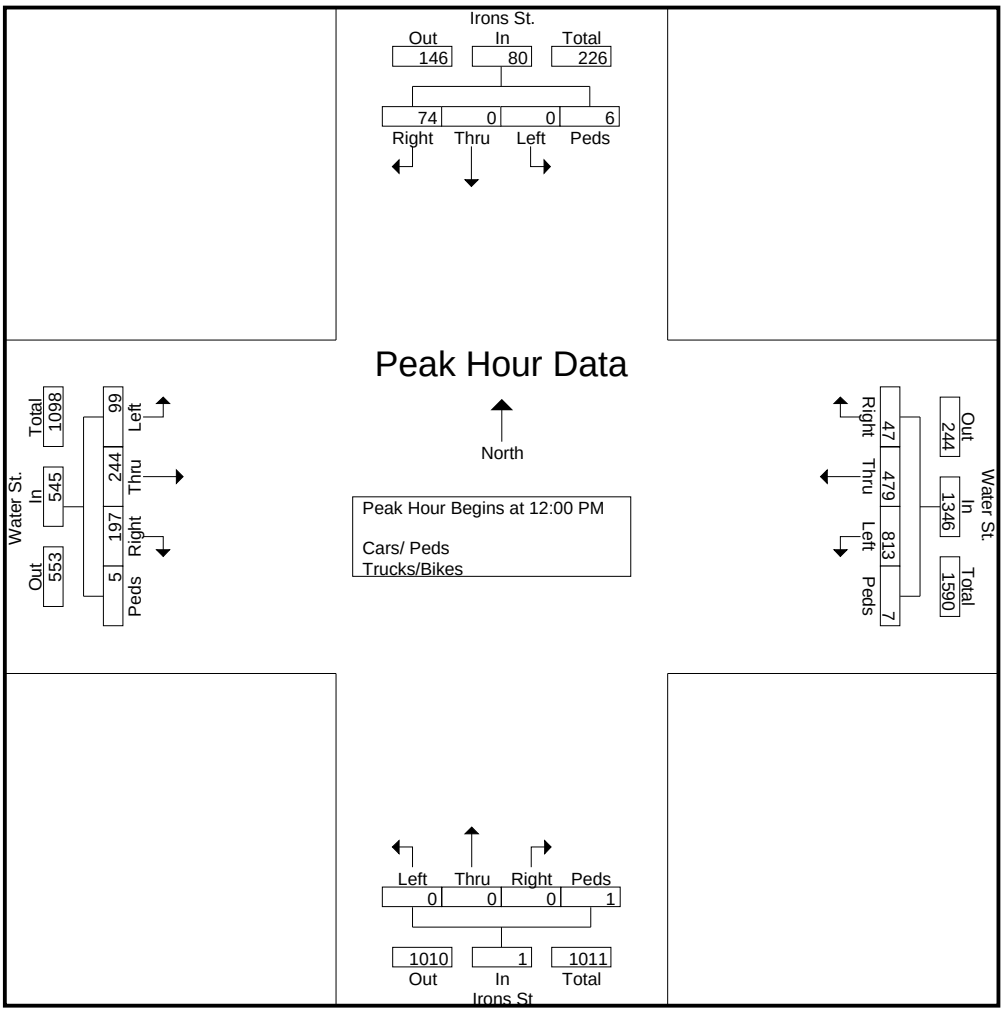
File Name : 02 & irons-16
Site Code : 07002100
Start Date : 4/19/2016
Page No : 3

	Irons St. From North					Water St. From East					Irons St From South					Water St. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	16	0	0	0	16	7	114	160	2	283	0	0	0	0	0	**62**	55	18	0	135	434
12:15 PM	20	0	0	0	20	13	**123**	**250**	1	**387**	0	0	0	0	0	40	**78**	26	**3**	**147**	**554**
12:30 PM	**22**	0	0	**5**	**27**	**15**	123	186	**3**	327	0	0	0	0	0	48	53	24	2	127	481
12:45 PM	16	0	0	1	17	12	119	217	1	349	0	0	0	**1**	**1**	47	58	**31**	0	136	503
Total Volume	74	0	0	6	80	47	479	813	7	1346	0	0	0	1	1	197	244	99	5	545	1972
% App. Total	92.5	0	0	7.5		3.5	35.6	60.4	0.5		0	0	0	100		36.1	44.8	18.2	0.9		
PHF	.841	.000	.000	.300	.741	.783	.974	.813	.583	.870	.000	.000	.000	.250	.250	.794	.782	.798	.417	.927	.890



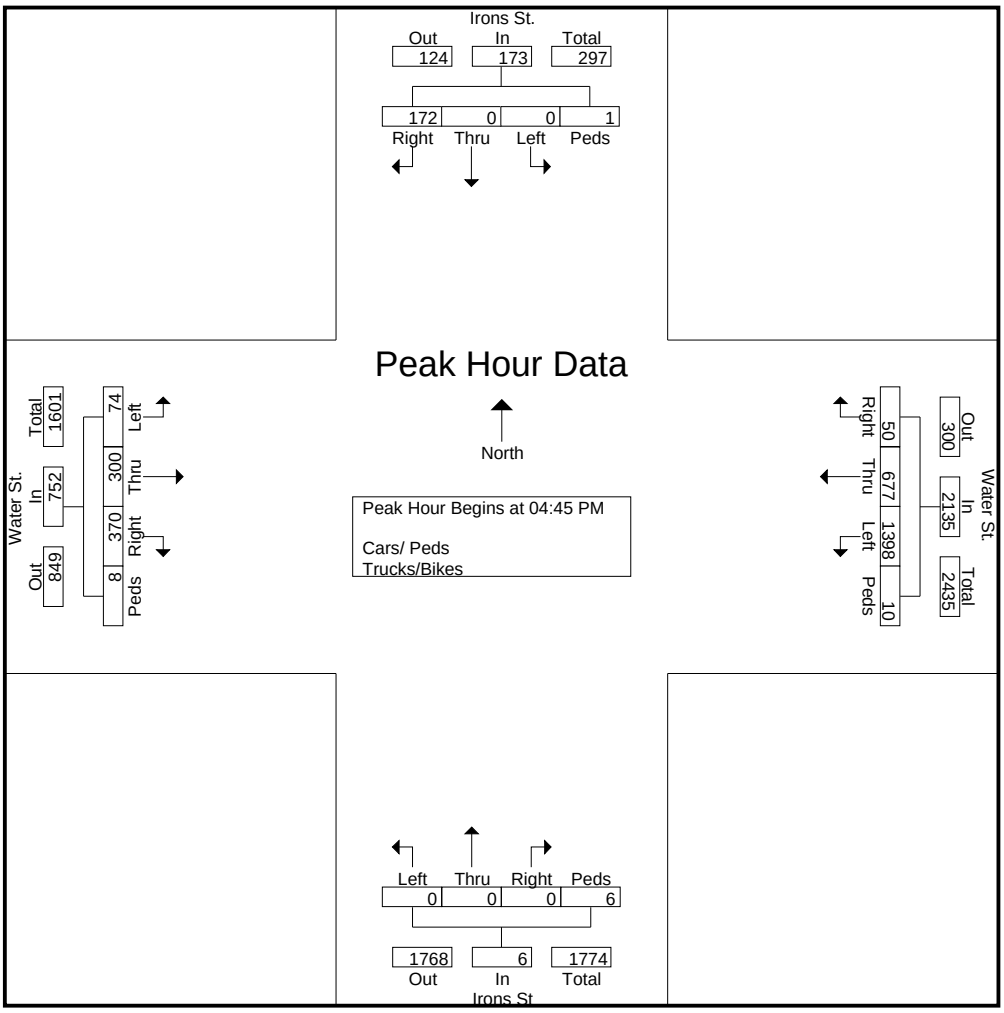
Ocean County Engineering Dept.

Traffic Division
Toms River, NJ 08754

N/S Street: Irons St.
E/W Street: CR# 2 (Water Street)
Town: Toms River Township
Counted By: AM/CS/CS

File Name : 02 & irons-16
Site Code : 07002100
Start Date : 4/19/2016
Page No : 4

	Irons St. From North					Water St. From East					Irons St From South					Water St. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**60**	0	0	0	**60**	12	**192**	353	2	559	0	0	0	**3**	**3**	89	62	**22**	0	173	795
05:00 PM	29	0	0	0	29	**21**	154	357	2	534	0	0	0	0	0	**100**	**90**	19	**4**	**213**	776
05:15 PM	52	0	0	**1**	53	9	192	**378**	1	**580**	0	0	0	2	2	91	69	13	4	177	**812**
05:30 PM	31	0	0	0	31	8	139	310	**5**	462	0	0	0	1	1	90	79	20	0	189	683
Total Volume	172	0	0	1	173	50	677	1398	10	2135	0	0	0	6	6	370	300	74	8	752	3066
% App. Total	99.4	0	0	0.6		2.3	31.7	65.5	0.5		0	0	0	100		49.2	39.9	9.8	1.1		
PHF	.717	.000	.000	.250	.721	.595	.882	.925	.500	.920	.000	.000	.000	.500	.500	.925	.833	.841	.500	.883	.944



Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Main St.- Rt. 166
E/W Street: CR#2(Water St.)
Town: Toms River Township
Counted By: CS-JH/AM-JH/CS-JH

File Name : 02 & main st.-16
Site Code : 07002100
Start Date : 4/21/2016
Page No : 1

Groups Printed- Peds - Bikes

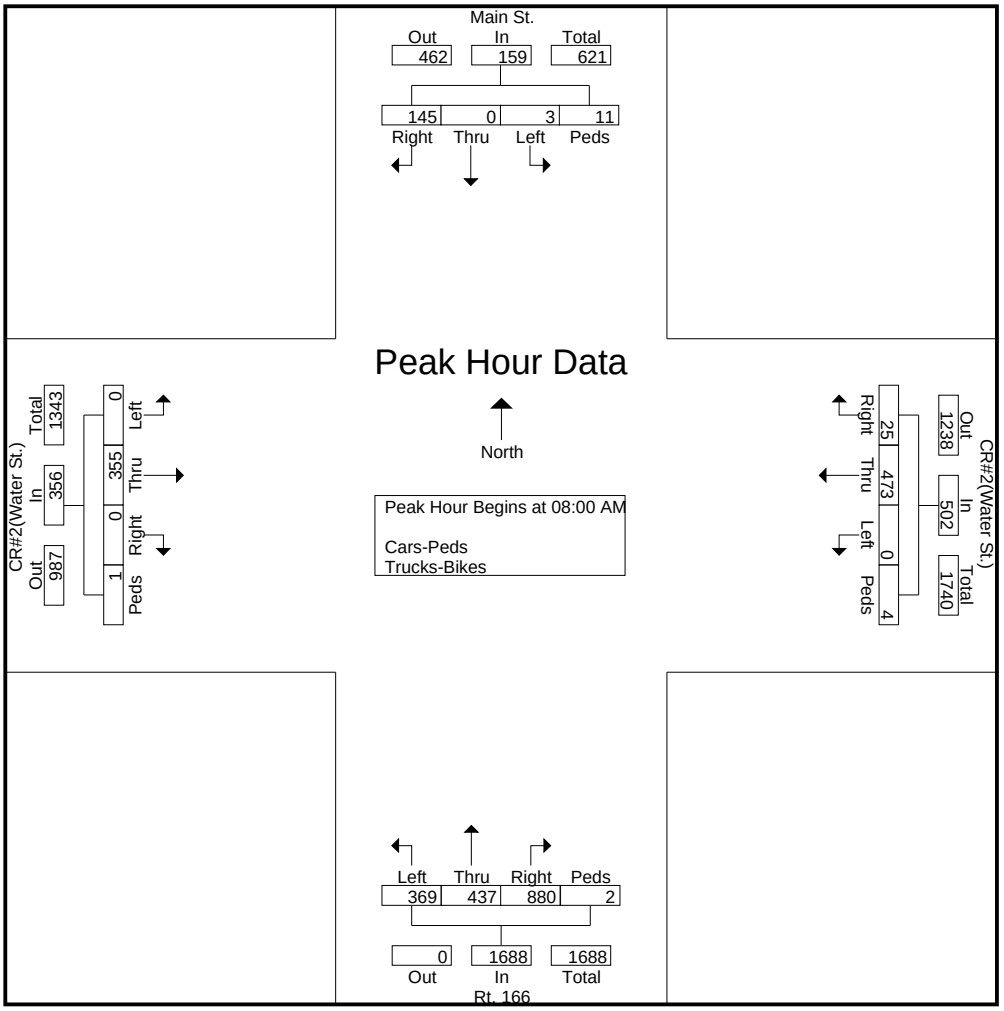
	Main St. From North					CR#2(Water St.) From East					Rt. 166 From South					CR#2(Water St.) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	38	4	42	0	57	3	1	61	66	149	191	1	407	0	17	0	0	17	527
07:15 AM	0	0	33	5	38	0	132	6	0	138	69	82	162	1	314	0	13	0	0	13	503
07:30 AM	0	0	47	4	51	0	102	2	1	105	82	106	205	0	393	0	59	0	0	59	608
07:45 AM	2	0	42	3	47	0	131	2	3	136	84	131	257	0	472	0	61	0	0	61	716
Total	2	0	160	16	178	0	422	13	5	440	301	468	815	2	1586	0	150	0	0	150	2354
08:00 AM	1	0	36	4	41	0	152	5	1	158	104	125	217	1	447	0	64	0	0	64	710
08:15 AM	0	0	31	1	32	0	136	6	2	144	88	85	200	0	373	0	118	0	1	119	668
08:30 AM	2	0	40	5	47	0	81	3	1	85	89	99	195	1	384	0	53	0	0	53	569
08:45 AM	0	0	38	1	39	0	104	11	0	115	88	128	268	0	484	0	120	0	0	120	758
Total	3	0	145	11	159	0	473	25	4	502	369	437	880	2	1688	0	355	0	1	356	2705
09:00 AM	4	0	54	1	59	0	122	12	0	134	93	96	229	0	418	0	77	0	0	77	688
09:15 AM	2	0	43	0	45	0	128	7	1	136	78	91	195	0	364	0	78	0	0	78	623
09:30 AM	1	0	35	1	37	0	115	8	0	123	63	77	184	1	325	0	65	0	1	66	551
09:45 AM	1	0	59	4	64	0	94	4	2	100	75	82	177	0	334	0	74	0	2	76	574
Total	8	0	191	6	205	0	459	31	3	493	309	346	785	1	1441	0	294	0	3	297	2436
*** BREAK ***																					
11:00 AM	7	0	62	3	72	0	120	5	1	126	43	82	140	0	265	0	45	0	1	46	509
11:15 AM	9	0	80	5	94	0	209	8	2	219	47	70	161	1	279	0	69	0	0	69	661
11:30 AM	6	0	79	0	85	0	145	14	0	159	66	64	136	0	266	0	60	0	0	60	570
11:45 AM	5	0	77	2	84	0	162	15	1	178	45	76	146	1	268	0	61	0	0	61	591
Total	27	0	298	10	335	0	636	42	4	682	201	292	583	2	1078	0	235	0	1	236	2331
12:00 PM	2	0	80	3	85	0	141	9	2	152	50	86	120	0	256	0	58	0	2	60	553
12:15 PM	4	0	72	2	78	0	176	12	3	191	44	61	131	0	236	0	59	0	0	59	564
12:30 PM	9	0	81	4	94	0	180	5	2	187	61	70	139	3	273	0	40	0	0	40	594
12:45 PM	4	0	102	3	109	0	190	14	0	204	49	81	138	0	268	0	74	0	0	74	655
Total	19	0	335	12	366	0	687	40	7	734	204	298	528	3	1033	0	231	0	2	233	2366
*** BREAK ***																					
04:00 PM	5	0	101	6	112	0	222	8	1	231	53	88	207	2	350	0	85	0	0	85	778
04:15 PM	5	0	119	3	127	0	224	12	1	237	94	100	256	4	454	0	107	0	0	107	925
04:30 PM	7	0	110	0	117	0	285	10	1	296	72	81	137	3	293	0	92	0	1	93	799
04:45 PM	6	0	99	5	110	0	247	7	2	256	62	116	214	3	395	0	60	0	0	60	821
Total	23	0	429	14	466	0	978	37	5	1020	281	385	814	12	1492	0	344	0	1	345	3323
05:00 PM	4	0	134	1	139	0	339	11	1	351	66	77	157	1	301	0	108	0	0	108	899
05:15 PM	2	0	151	4	157	0	288	12	1	301	71	90	176	2	339	0	114	0	0	114	911
05:30 PM	8	0	125	2	135	0	279	5	1	285	80	73	167	1	321	0	77	0	0	77	818
05:45 PM	3	0	109	1	113	0	270	10	2	282	46	120	191	3	360	0	78	0	2	80	835
Total	17	0	519	8	544	0	1176	38	5	1219	263	360	691	7	1321	0	377	0	2	379	3463
06:00 PM	2	0	134	4	140	0	256	5	1	262	68	90	160	3	321	0	85	0	0	85	808
06:15 PM	3	0	120	14	137	0	229	8	0	237	70	79	190	1	340	0	78	0	4	82	796
06:30 PM	6	0	57	6	69	0	201	36	1	238	47	77	185	1	310	0	93	0	0	93	710
06:45 PM	3	0	82	0	85	0	173	6	5	184	65	87	137	0	289	0	71	0	2	73	631
Total	14	0	393	24	431	0	859	55	7	921	250	333	672	5	1260	0	327	0	6	333	2945
Grand Total	113	0	2470	101	2684	0	5690	281	40	6011	2178	2919	5768	34	10899	0	2313	0	16	2329	21923
Apprch %	4.2	0	92	3.8		0	94.7	4.7	0.7		20	26.8	52.9	0.3		0	99.3	0	0.7		
Total %	0.5	0	11.3	0.5	12.2	0	26	1.3	0.2	27.4	9.9	13.3	26.3	0.2	49.7	0	10.6	0	0.1	10.6	
Cars-Peds	108	0	2376	82	2566	0	5552	277	31	5860	2155	2868	5724	20	10767	0	2286	0	14	2300	21493
% Cars-Peds	95.6	0	96.2	81.2	95.6	0	97.6	98.6	77.5	97.5	98.9	98.3	99.2	58.8	98.8	0	98.8	0	87.5	98.8	98
Trucks-Bikes	5	0	94	19	118	0	138	4	9	151	23	51	44	14	132	0	27	0	2	29	430
% Trucks-Bikes	4.4	0	3.8	18.8	4.4	0	2.4	1.4	22.5	2.5	1.1	1.7	0.8	41.2	1.2	0	1.2	0	12.5	1.2	2

Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Main St.- Rt. 166
E/W Street: CR#2(Water St.)
Town: Toms River Township
Counted By: CS-JH/AM-JH/CS-JH

File Name : 02 & main st.-16
Site Code : 07002100
Start Date : 4/21/2016
Page No : 2

	Main St. From North					CR#2(Water St.) From East					Rt. 166 From South					CR#2(Water St.) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	0	36	4	41	0	**152**	5	1	**158**	**104**	125	217	**1**	447	0	64	0	0	64	710
08:15 AM	0	0	31	1	32	0	136	6	**2**	144	88	85	200	0	373	0	118	0	**1**	119	668
08:30 AM	**2**	0	**40**	**5**	**47**	0	81	3	1	85	89	99	195	1	384	0	53	0	0	53	569
08:45 AM	0	0	38	1	39	0	104	**11**	0	115	88	**128**	**268**	0	**484**	0	**120**	0	0	**120**	**758**
Total Volume	3	0	145	11	159	0	473	25	4	502	369	437	880	2	1688	0	355	0	1	356	2705
% App. Total	1.9	0	91.2	6.9		0	94.2	5	0.8		21.9	25.9	52.1	0.1		0	99.7	0	0.3		
PHF	.375	.000	.906	.550	.846	.000	.778	.568	.500	.794	.887	.854	.821	.500	.872	.000	.740	.000	.250	.742	.892

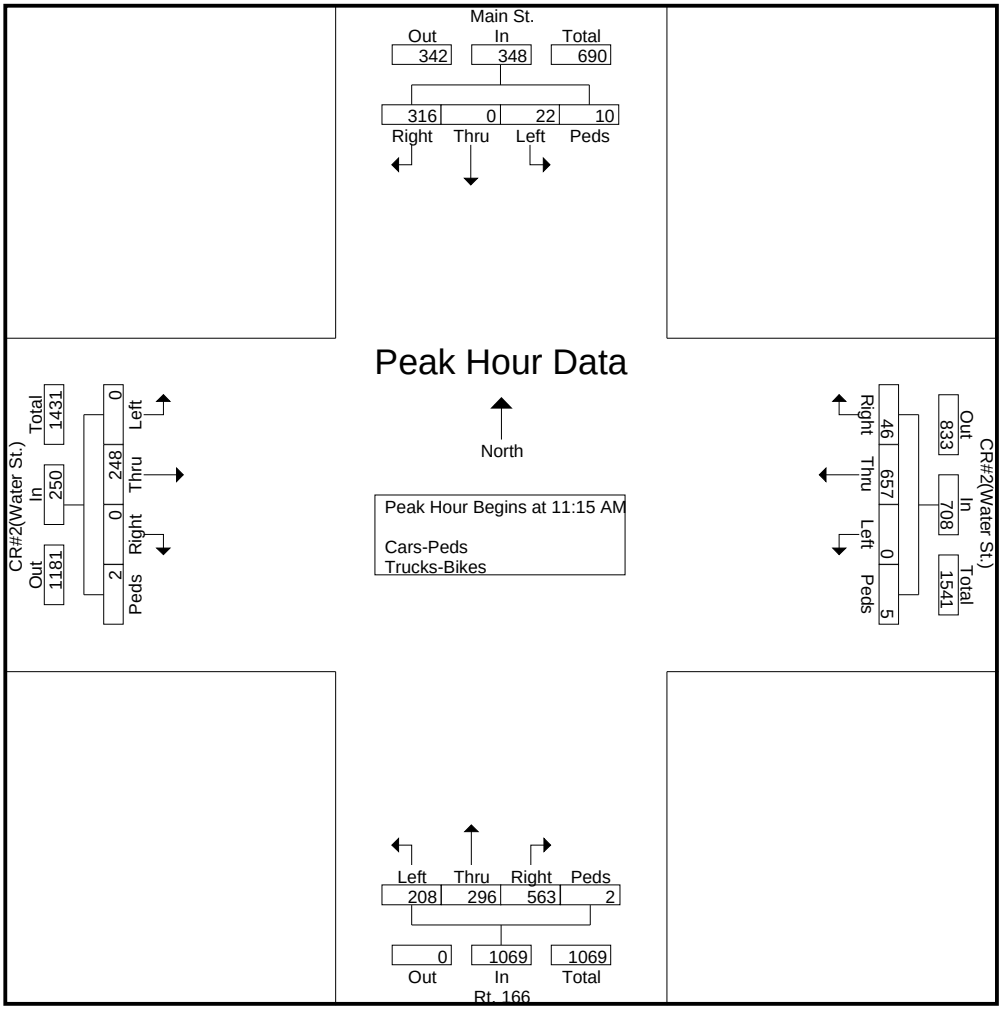


Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Main St.- Rt. 166
E/W Street: CR#2(Water St.)
Town: Toms River Township
Counted By: CS-JH/AM-JH/CS-JH

File Name : 02 & main st.-16
Site Code : 07002100
Start Date : 4/21/2016
Page No : 3

	Main St. From North					CR#2(Water St.) From East					Rt. 166 From South					CR#2(Water St.) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	**9**	0	**80**	**5**	**94**	0	**209**	8	**2**	**219**	47	70	**161**	**1**	**279**	0	**69**	0	0	**69**	**661**
11:30 AM	6	0	79	0	85	0	145	14	0	159	**66**	64	136	0	266	0	60	0	0	60	570
11:45 AM	5	0	77	2	84	0	162	**15**	1	178	45	76	146	1	268	0	61	0	0	61	591
12:00 PM	2	0	80	3	85	0	141	9	2	152	50	**86**	120	0	256	0	58	0	**2**	60	553
Total Volume	22	0	316	10	348	0	657	46	5	708	208	296	563	2	1069	0	248	0	2	250	2375
% App. Total	6.3	0	90.8	2.9		0	92.8	6.5	0.7		19.5	27.7	52.7	0.2		0	99.2	0	0.8		
PHF	.611	.000	.988	.500	.926	.000	.786	.767	.625	.808	.788	.860	.874	.500	.958	.000	.899	.000	.250	.906	.898

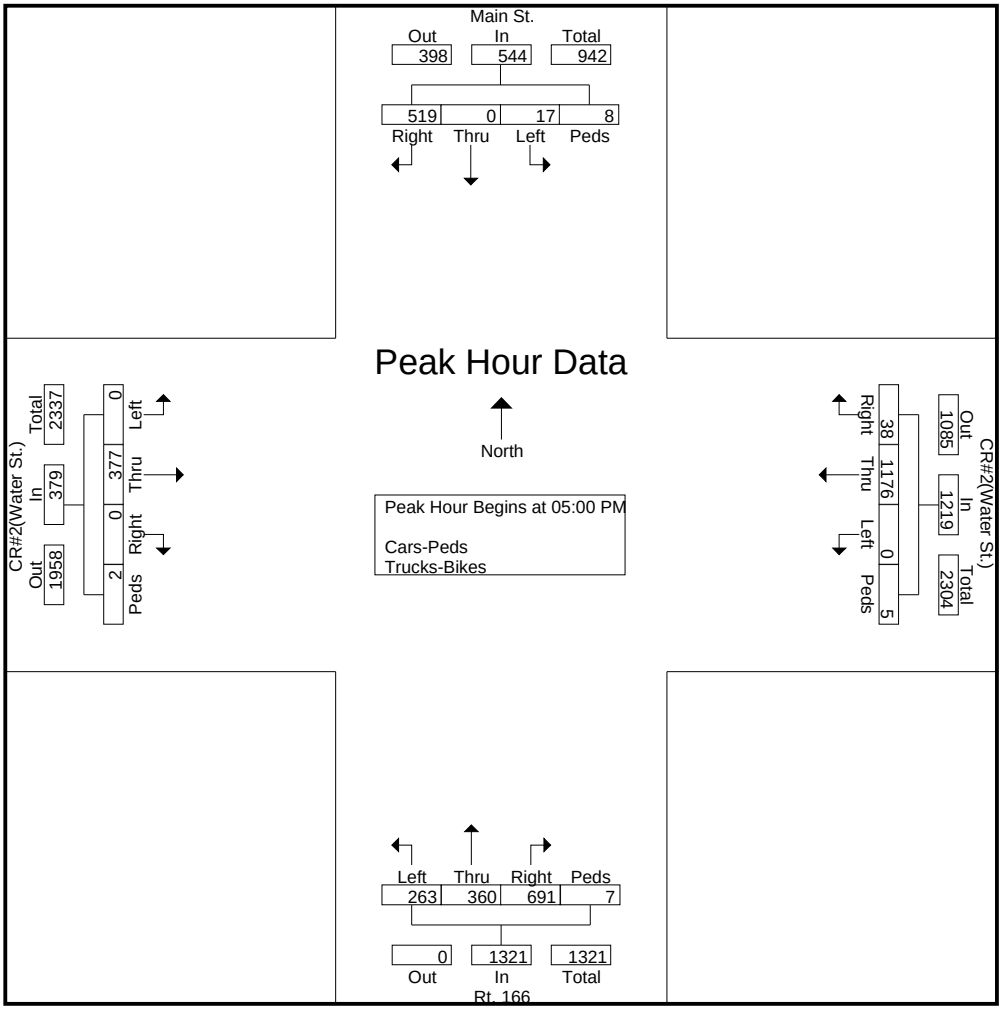


Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Main St.- Rt. 166
E/W Street: CR#2(Water St.)
Town: Toms River Township
Counted By: CS-JH/AM-JH/CS-JH

File Name : 02 & main st.-16
Site Code : 07002100
Start Date : 4/21/2016
Page No : 4

	Main St. From North					CR#2(Water St.) From East					Rt. 166 From South					CR#2(Water St.) From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	4	0	134	1	139	0	**339**	11	1	**351**	66	77	157	1	301	0	108	0	0	108	899
05:15 PM	2	0	**151**	**4**	**157**	0	288	**12**	1	301	71	90	176	2	339	0	**114**	0	0	**114**	**911**
05:30 PM	**8**	0	125	2	135	0	279	5	1	285	**80**	73	167	1	321	0	77	0	0	77	818
05:45 PM	3	0	109	1	113	0	270	10	**2**	282	46	**120**	**191**	**3**	**360**	0	78	0	**2**	80	835
Total Volume	17	0	519	8	544	0	1176	38	5	1219	263	360	691	7	1321	0	377	0	2	379	3463
% App. Total	3.1	0	95.4	1.5		0	96.5	3.1	0.4		19.9	27.3	52.3	0.5		0	99.5	0	0.5		
PHF	.531	.000	.859	.500	.866	.000	.867	.792	.625	.868	.822	.750	.904	.583	.917	.000	.827	.000	.250	.831	.950



Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Robbins Pkwy-Horner St.
E/W Street: CR#2 (Water St)
Town: Toms River
Counted By: CS/AM/JH

File Name : 02 & Robbins Pkwy. & Horner-16
Site Code : 07002100
Start Date : 5/2/2016
Page No : 1

Groups Printed- Peds - Bikes

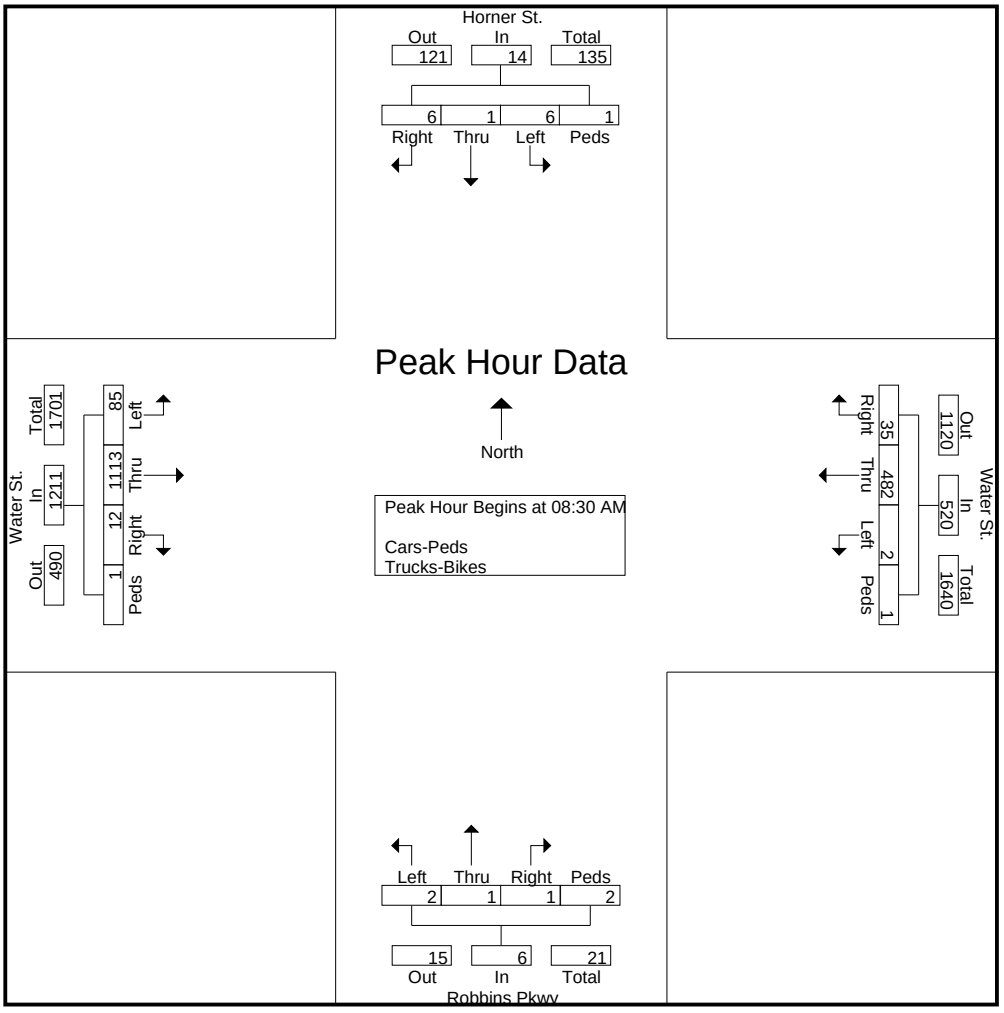
	Horner St. From North					Water St. From East					Robbins Pkwy From South					Water St. From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	59	3	1	63	1	0	0	0	1	3	195	0	0	198	262
07:15 AM	0	1	1	0	2	0	114	6	0	120	0	0	0	0	0	1	202	0	0	203	325
07:30 AM	0	0	0	0	0	0	100	1	0	101	1	0	0	0	1	3	196	1	0	200	302
07:45 AM	2	0	1	0	3	0	113	2	0	115	0	0	0	0	0	12	265	0	0	277	395
Total	2	1	2	0	5	0	386	12	1	399	2	0	0	0	2	19	858	1	0	878	1284
08:00 AM	0	0	0	0	0	2	130	10	1	143	1	0	0	0	1	6	288	2	0	296	440
08:15 AM	0	0	2	0	2	0	122	9	1	132	0	0	0	0	0	9	237	0	0	246	380
08:30 AM	1	0	0	0	1	0	109	15	0	124	0	0	0	0	0	19	291	10	0	320	445
08:45 AM	2	1	3	0	6	0	113	8	0	121	0	1	0	1	2	13	271	1	0	285	414
Total	3	1	5	0	9	2	474	42	2	520	1	1	0	1	3	47	1087	13	0	1147	1679
09:00 AM	2	0	1	1	4	2	120	9	1	132	2	0	1	1	4	29	277	1	0	307	447
09:15 AM	1	0	2	0	3	0	140	3	0	143	0	0	0	0	0	24	274	0	1	299	445
09:30 AM	0	0	6	0	6	0	120	9	1	130	0	0	1	0	1	10	196	1	0	207	344
09:45 AM	0	0	4	0	4	2	143	10	0	155	2	0	1	0	3	28	216	2	0	246	408
Total	3	0	13	1	17	4	523	31	2	560	4	0	3	1	8	91	963	4	1	1059	1644
*** BREAK ***																					
11:00 AM	2	1	15	0	18	3	110	6	2	121	2	0	1	0	3	9	125	2	0	136	278
11:15 AM	3	0	8	0	11	1	136	5	1	143	1	0	1	0	2	19	200	2	0	221	377
11:30 AM	2	0	8	4	14	1	138	8	0	147	1	0	0	0	1	13	154	0	0	167	329
11:45 AM	3	1	8	0	12	1	137	7	0	145	2	0	1	0	3	13	188	1	2	204	364
Total	10	2	39	4	55	6	521	26	3	556	6	0	3	0	9	54	667	5	2	728	1348
12:00 PM	4	2	14	0	20	3	159	4	1	167	1	0	1	1	3	10	178	0	0	188	378
12:15 PM	0	0	10	0	10	1	169	3	2	175	1	0	0	0	1	16	184	0	1	201	387
12:30 PM	3	1	11	1	16	2	155	5	1	163	1	0	0	0	1	12	182	6	0	200	380
12:45 PM	3	0	8	5	16	1	157	10	1	169	0	1	3	1	5	19	176	2	0	197	387
Total	10	3	43	6	62	7	640	22	5	674	3	1	4	2	10	57	720	8	1	786	1532
*** BREAK ***																					
04:00 PM	2	0	13	1	16	3	223	5	2	233	0	0	0	0	0	9	174	21	1	205	454
04:15 PM	2	0	10	0	12	2	220	4	0	226	3	0	1	0	4	9	240	1	1	251	493
04:30 PM	1	1	31	1	34	3	219	2	0	224	2	0	0	0	2	4	208	2	0	214	474
04:45 PM	0	0	15	1	16	1	191	0	0	192	5	0	1	0	6	11	212	5	0	228	442
Total	5	1	69	3	78	9	853	11	2	875	10	0	2	0	12	33	834	29	2	898	1863
05:00 PM	2	1	28	2	33	5	200	0	0	205	0	1	0	0	1	12	194	4	3	213	452
05:15 PM	1	0	12	0	13	5	254	4	1	264	2	3	0	2	7	7	197	0	1	205	489
05:30 PM	2	0	11	2	15	2	242	1	0	245	2	0	0	2	4	11	203	2	3	219	483
05:45 PM	3	0	5	0	8	2	226	2	0	230	4	0	0	0	4	17	217	1	0	235	477
Total	8	1	56	4	69	14	922	7	1	944	8	4	0	4	16	47	811	7	7	872	1901
06:00 PM	2	2	6	0	10	3	210	1	1	215	4	1	0	3	8	7	181	0	0	188	421
06:15 PM	3	0	5	0	8	6	187	1	0	194	6	1	4	0	11	7	175	1	0	183	396
06:30 PM	0	0	6	0	6	1	139	1	0	141	4	2	3	0	9	5	166	0	1	172	328
06:45 PM	2	0	4	0	6	7	180	1	0	188	8	1	1	1	11	1	189	2	0	192	397
Total	7	2	21	0	30	17	716	4	1	738	22	5	8	4	39	20	711	3	1	735	1542
Grand Total	48	11	248	18	325	59	5035	155	17	5266	56	11	20	12	99	368	6651	70	14	7103	12793
Apprch %	14.8	3.4	76.3	5.5		1.1	95.6	2.9	0.3		56.6	11.1	20.2	12.1		5.2	93.6	1	0.2		
Total %	0.4	0.1	1.9	0.1	2.5	0.5	39.4	1.2	0.1	41.2	0.4	0.1	0.2	0.1	0.8	2.9	52	0.5	0.1	55.5	
Cars-Peds	48	11	245	16	320	58	4913	155	12	5138	56	11	19	11	97	366	6475	69	8	6918	12473
% Cars-Peds	100	100	98.8	88.9	98.5	98.3	97.6	100	70.6	97.6	100	100	95	91.7	98	99.5	97.4	98.6	57.1	97.4	97.5
Trucks-Bikes	0	0	3	2	5	1	122	0	5	128	0	0	1	1	2	2	176	1	6	185	320
% Trucks-Bikes	0	0	1.2	11.1	1.5	1.7	2.4	0	29.4	2.4	0	0	5	8.3	2	0.5	2.6	1.4	42.9	2.6	2.5

Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Robbins Pkwy-Horner St.
E/W Street: CR#2 (Water St)
Town: Toms River
Counted By: CS/AM/JH

File Name : 02 & Robbins Pkwy. & Horner-16
Site Code : 07002100
Start Date : 5/2/2016
Page No : 2

	Horner St. From North					Water St. From East					Robbins Pkwy From South					Water St. From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:30 AM																					
08:30 AM	1	0	0	0	1	0	109	**15**	0	124	0	0	0	0	0	19	**291**	**10**	0	**320**	445
08:45 AM	**2**	**1**	**3**	0	**6**	0	113	8	0	121	0	**1**	0	**1**	2	13	271	1	0	285	414
09:00 AM	2	0	1	**1**	4	**2**	120	9	**1**	132	**2**	0	**1**	1	**4**	**29**	277	1	0	307	**447**
09:15 AM	1	0	2	0	3	0	**140**	3	0	**143**	0	0	0	0	0	24	274	0	**1**	299	445
Total Volume	6	1	6	1	14	2	482	35	1	520	2	1	1	2	6	85	1113	12	1	1211	1751
% App. Total	42.9	7.1	42.9	7.1		0.4	92.7	6.7	0.2		33.3	16.7	16.7	33.3		7	91.9	1	0.1		
PHF	.750	.250	.500	.250	.583	.250	.861	.583	.250	.909	.250	.250	.250	.500	.375	.733	.956	.300	.250	.946	.979

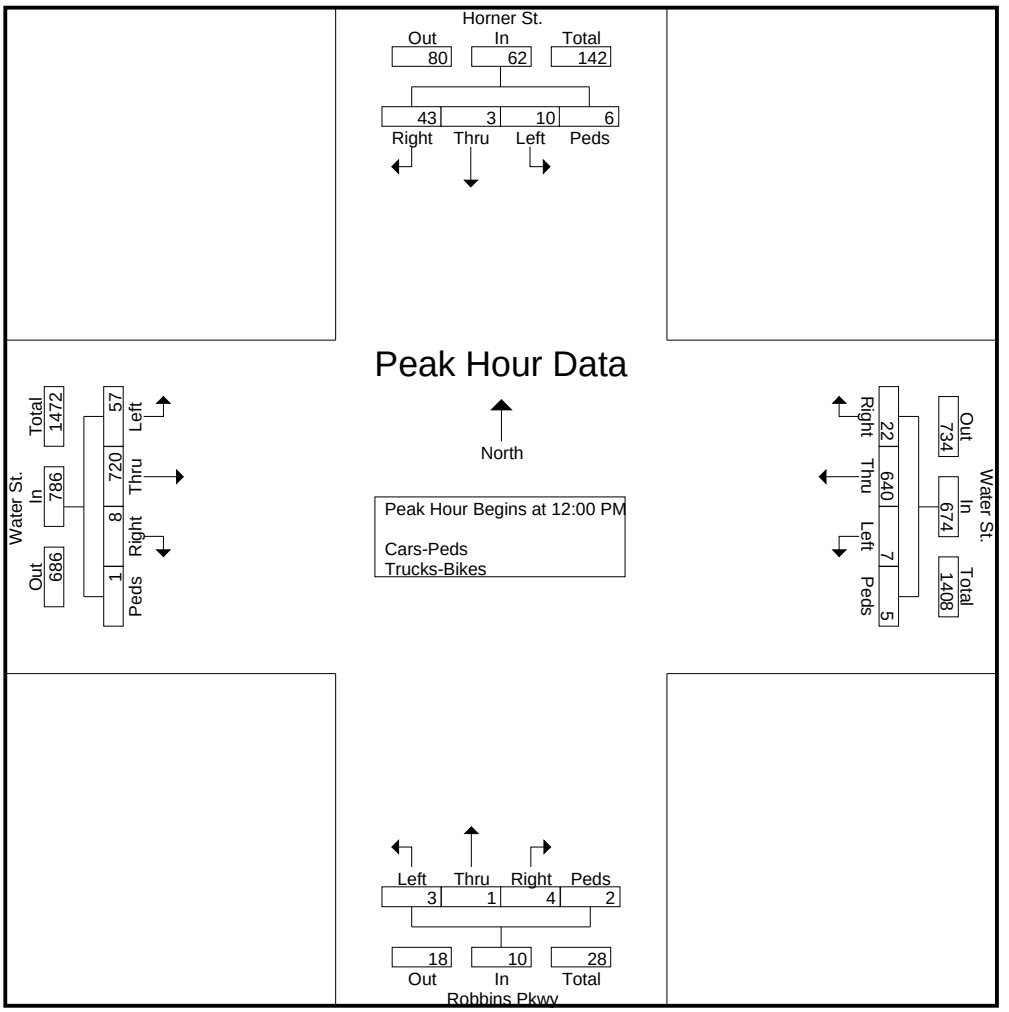


Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Robbins Pkwy-Horner St.
E/W Street: CR#2 (Water St)
Town: Toms River
Counted By: CS/AM/JH

File Name : 02 & Robbins Pkwy. & Horner-16
Site Code : 07002100
Start Date : 5/2/2016
Page No : 3

	Horner St. From North					Water St. From East					Robbins Pkwy From South					Water St. From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**4**	**2**	**14**	0	**20**	**3**	159	4	1	167	**1**	0	1	**1**	3	10	178	0	0	188	378
12:15 PM	0	0	10	0	10	1	**169**	3	**2**	**175**	1	0	0	0	1	16	**184**	0	**1**	**201**	**387**
12:30 PM	3	1	11	1	16	2	155	5	1	163	1	0	0	0	1	12	182	**6**	0	200	380
12:45 PM	3	0	8	**5**	16	1	157	**10**	1	169	0	**1**	**3**	1	**5**	**19**	176	2	0	197	387
Total Volume	10	3	43	6	62	7	640	22	5	674	3	1	4	2	10	57	720	8	1	786	1532
% App. Total	16.1	4.8	69.4	9.7		1	95	3.3	0.7		30	10	40	20		7.3	91.6	1	0.1		
PHF	.625	.375	.768	.300	.775	.583	.947	.550	.625	.963	.750	.250	.333	.500	.500	.750	.978	.333	.250	.978	.990

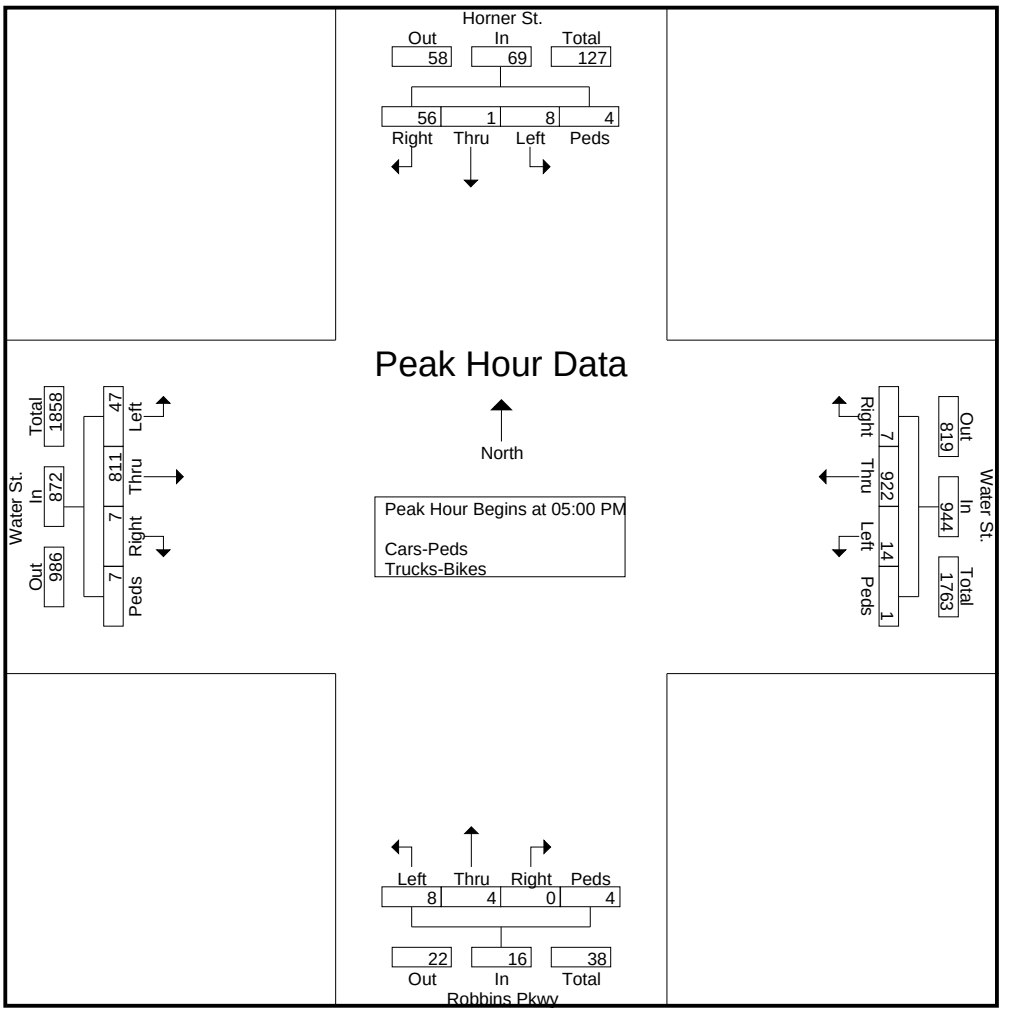


Ocean County Engineering Dept.
Traffic Division
Toms River, NJ 08754

N/S Street: Robbins Pkwy-Horner St.
E/W Street: CR#2 (Water St)
Town: Toms River
Counted By: CS/AM/JH

File Name : 02 & Robbins Pkwy. & Horner-16
Site Code : 07002100
Start Date : 5/2/2016
Page No : 4

	Horner St. From North					Water St. From East					Robbins Pkwy From South					Water St. From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	2	**1**	**28**	**2**	**33**	**5**	200	0	0	205	0	1	0	0	1	12	194	**4**	**3**	213	452
05:15 PM	1	0	12	0	13	5	**254**	**4**	**1**	**264**	2	**3**	0	**2**	**7**	7	197	0	1	205	**489**
05:30 PM	2	0	11	2	15	2	242	1	0	245	2	0	0	2	4	11	203	2	3	219	483
05:45 PM	**3**	0	5	0	8	2	226	2	0	230	**4**	0	0	0	4	**17**	**217**	1	0	**235**	477
Total Volume	8	1	56	4	69	14	922	7	1	944	8	4	0	4	16	47	811	7	7	872	1901
% App. Total	11.6	1.4	81.2	5.8		1.5	97.7	0.7	0.1		50	25	0	25		5.4	93	0.8	0.8		
PHF	.667	.250	.500	.500	.523	.700	.907	.438	.250	.894	.500	.333	.000	.500	.571	.691	.934	.438	.583	.928	.972



New Jersey Department of Transportation

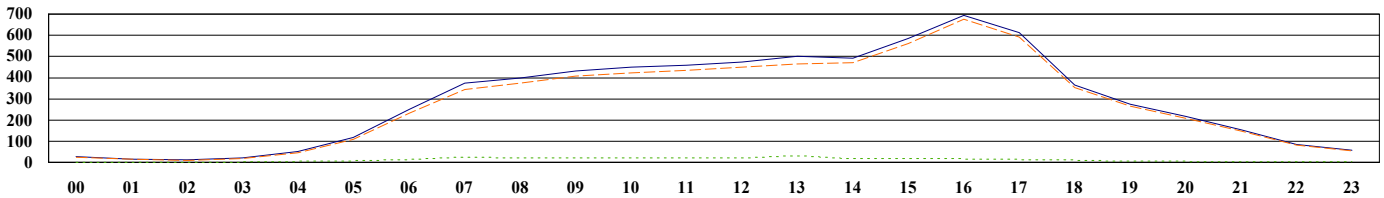
24 Hour Directional Summary, North Bound for Nov 28, 2016

6-5-601, , Water Street-.24, 00000527__, Toms River Twp
FC16 **OCEAN County**

Bet Adafree Ave and Lien St

	Total	Total	Peak	Peak
Private:	6,773.9	94.9	675.3	97.3
Single:	264.2	3.7	14.5	2.1
Combo:	12.8	0.2	0.8	0.1
Trucks:	277.0	3.9	15.3	2.2
Total:	7,138.2		694.0	

Peak Hour: 16
Axle Factor: 1.00



	VOL	MC	CAR	PU	BUS	2D	SU 3	SU 4+	ST 4-	ST 5	ST 6+	MT 5-	MT 6	MT 7+
0	27.5	0	19.0	6.5	1.0	1.0	0	0	0	0	0	0	0	0
1	18.0	0.3	11.3	3.8	1.0	1.3	0.3	0	0	0.3	0	0	0	0
2	12.5	0	7.3	2.3	2.0	0.5	0.3	0	0	0.3	0	0	0	0
3	23.5	0.5	13.0	4.8	2.3	2.3	0.3	0	0.5	0	0	0	0	0
4	51.8	0	35.0	11.0	2.3	2.3	1.3	0	0	0	0	0	0	0
5	120.0	0.5	82.5	26.3	2.3	7.0	1.3	0	0	0.3	0	0	0	0
6	251.3	0.3	165.5	66.8	6.5	11.3	0.5	0	0.5	0	0	0	0	0
7	375.5	0.8	231.5	112.5	5.8	23.0	2.0	0	0	0	0	0	0	0
8	400.3	0	258.7	115.7	5.3	19.7	0.3	0	0	0.7	0	0	0	0
9	432.7	0.3	277.0	131.0	4.0	18.0	0.7	0	0.3	1.3	0	0	0	0
10	448.7	0.3	281.7	141.0	5.7	18.7	0	0	0.7	0.7	0	0	0	0
11	460.0	1.0	308.7	125.7	6.0	17.7	1.0	0	0	0	0	0	0	0
12	473.3	0	301.0	148.3	5.0	17.0	0.7	0	0.3	1.0	0	0	0	0
13	501.7	0.3	325.0	139.7	6.0	29.0	0.3	0	1.0	0.3	0	0	0	0
14	493.0	0.3	330.3	140.7	4.0	16.0	0.7	0	1.0	0	0	0	0	0
15	586.5	0.5	397.8	164.8	2.8	19.3	0.5	0	0.5	0.3	0.3	0	0	0
16	694.0	0.3	481.0	194.0	3.5	14.5	0	0	0.5	0.3	0	0	0	0
17	611.5	0.5	443.0	148.8	5.3	12.5	0	0	0.8	0.8	0	0	0	0
18	366.8	0.8	265.5	87.3	3.5	9.3	0	0	0.5	0	0	0	0	0
19	275.8	0	196.5	69.5	4.5	5.3	0	0	0	0	0	0	0	0
20	217.3	0.3	157.8	51.3	3.5	4.5	0	0	0	0	0	0	0	0
21	153.8	0.3	116.3	33.0	2.0	2.3	0	0	0	0	0	0	0	0
22	85.0	0	62.5	19.5	1.3	1.8	0	0	0	0	0	0	0	0
23	58.0	0	39.0	16.5	2.0	0.5	0	0	0	0	0	0	0	0
Total	**7,138.2**	**7.1**	**4,806.6**	**1,960.3**	**87.3**	**254.3**	**9.9**	**0**	**6.6**	**6.0**	**0.3**	**0**	**0**	**0**
%	**100.0**	**0.1**	**67.3**	**27.5**	**1.2**	**3.6**	**0.1**	**0**	**0.1**	**0.1**	**0**	**0**	**0**	**0**

New Jersey Department of Transportation

Daily Volume from 11/28/2016 through 12/02/2016

Site Names: 6-5-601, , Water Street-.24, 00000527__, Toms River Twp
County: OCEAN
Funct. Class: Urban Minor Arterial
Location: Bet Adafree Ave and Lien St

Seasonal Factor Group: RG4_FC16
Daily Factor Group: RG4_FC16
Axle Factor Group: RG4_FC16
Growth Factor Group: RG4_FC16

	Sun 11/27/2016			Mon 11/28/2016			Tue 11/29/2016			Wed 11/30/2016			Thu 12/01/2016			Fri 12/02/2016			Sat 12/03/2016		
	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N
00:00							57	24	33	64	38	26	59	33	26	81	56	25			
01:00							48	26	22	38	19	19	38	26	12	45	26	19			
02:00							36	24	12	29	17	12	29	16	13	32	19	13			
03:00							45	19	26	38	14	24	45	20	25	36	17	19			
04:00							82	30	52	85	34	51	93	36	57	81	33	48			
05:00							193	64	129	185	67	118	176	51	125	162	54	108			
06:00							440	190	250	430	180	250	450	184	266	431	192	239			
07:00							796	419	377	797	419	378	809	433	376	788	416	372			
08:00							1,059	651	408	1,059	668	391	1,019	615	404						
09:00							918	513	405	980	562	418	977	502	475						
10:00							930	484	446	949	494	455	994	549	445						
11:00							993	526	467	951	503	448	1,032	566	466						
12:00							981	536	445	964	522	442	1,106	572	534						
13:00							993	527	466	1,065	555	510	1,067	537	530						
14:00							1,030	540	490	1,016	543	473	1,124	608	516						
15:00				1,338	669	669	1,180	638	542	1,137	584	553	1,263	681	582						
16:00				1,447	705	742	1,328	680	648	1,357	654	703	1,392	708	684						
17:00				1,340	670	670	1,243	670	573	1,221	637	584	1,318	699	619						
18:00				817	429	388	702	361	341	750	397	353	830	445	385						
19:00				616	302	314	568	345	223	609	334	275	633	342	291						
20:00				419	206	213	842	617	225	414	213	201	457	227	230						
21:00				327	149	178	267	129	138	284	135	149	335	185	150						
22:00				164	95	69	196	110	86	197	100	97	205	117	88						
23:00				134	69	65	118	65	53	132	76	56	144	86	58						
Volume				6,602	3,294	3,308	15,045	8,188	6,857	14,751	7,765	6,986	15,595	8,238	7,357	1,656	813	843			
AM Peak Vol							1,059	651	467	1,059	668	455	1,032	615	475						
AM Peak Fct							1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
AM Peak Hr							8:00	8:00	11:00	8:00	8:00	10:00	11:00	8:00	9:00						
PM Peak Vol							1,328	680	648	1,357	654	703	1,392	708	684						
PM Peak Fct							1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
PM Peak Hr							16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00						
Seasonal Fct				1.144	1.144	1.144	1.144	1.144	1.144	1.144	1.144	1.144	1.173	1.173	1.173	1.173	1.173	1.173			
Daily Fct				0.984	0.984	0.984	0.951	0.951	0.951	0.930	0.930	0.930	0.932	0.932	0.932	0.975	0.975	0.975			
Axle Fct				0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500			
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	2.000	2.000	2.000			

Collected by: NJDOT
Created 04/05/2017 1:41:21PM

ROAD AADT 16,521 **S AADT 8,747** **N AADT 7,775**

DV03:

New Jersey Department of Transportation

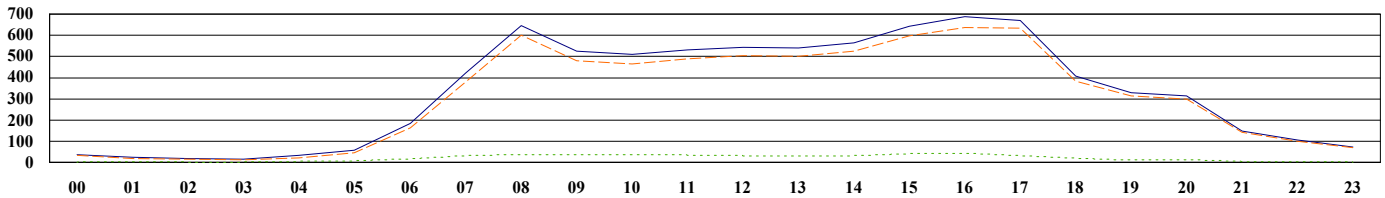
24 Hour Directional Summary, South Bound for Nov 28, 2016

6-5-601, , Water Street-.24, 00000527__, Toms River Twp
FC16 **OCEAN County**

Bet Adafree Ave and Lien St

	Total	Total	Peak	Peak
Private:	7,443.9	92.6	638.3	92.9
Single:	467.2	5.8	42.0	6.1
Combo:	17.5	0.2	1.8	0.3
Trucks:	484.7	6.0	43.8	6.4
Total:	8,038.0		686.8	

Peak Hour: 16
Axle Factor: 1.00



	VOL	MC	CAR	PU	BUS	2D	SU 3	SU 4+	ST 4-	ST 5	ST 6+	MT 5-	MT 6	MT 7+
0	37.8	0	21.8	12.8	0.8	2.0	0	0	0	0.5	0	0	0	0
1	24.3	0	10.0	9.3	1.3	3.5	0	0	0.3	0	0	0	0	0
2	19.0	0	9.0	6.8	2.0	0.8	0.3	0	0	0.3	0	0	0	0
3	17.5	0.3	7.3	6.0	2.3	0.8	0.3	0	0.8	0	0	0	0	0
4	33.3	0.5	12.5	10.0	5.5	3.0	1.3	0	0.5	0	0	0	0	0
5	59.0	0	25.0	20.3	7.0	4.8	1.8	0	0	0.3	0	0	0	0
6	186.5	0	76.8	86.3	6.8	15.0	0.3	0	1.3	0.3	0	0	0	0
7	421.8	0.3	183.3	198.8	8.5	28.5	1.0	0.3	1.0	0.3	0	0	0	0
8	644.7	1.0	322.0	278.7	6.0	34.0	2.0	0	0.7	0.3	0	0	0	0
9	525.7	1.0	250.3	227.7	9.0	36.3	1.0	0	0.3	0	0	0	0	0
10	509.0	1.0	231.0	234.3	5.7	34.3	0.7	0.7	0.7	0.7	0	0	0	0
11	531.7	0.7	224.3	263.0	7.7	33.0	1.0	0.7	0.3	1.0	0	0	0	0
12	543.0	1.0	263.0	241.3	6.0	30.3	0.3	0.7	0.3	0	0	0	0	0
13	539.7	0	260.7	240.0	6.7	30.3	0.3	0	1.3	0.3	0	0	0	0
14	563.3	0.7	268.3	257.7	5.7	29.7	0.3	0	0.7	0.3	0	0	0	0
15	643.0	0.8	312.0	284.5	5.5	37.8	1.0	0.3	0.5	0.8	0	0	0	0
16	686.8	0.5	314.0	323.8	4.8	41.3	0.8	0	0.8	1.0	0	0	0	0
17	669.0	0.8	350.8	281.3	4.5	30.3	0	0	1.3	0.3	0	0	0	0
18	408.0	0.3	197.8	186.5	3.3	20.0	0	0	0.3	0	0	0	0	0
19	330.5	0.5	164.8	150.8	3.3	11.0	0.3	0	0	0	0	0	0	0
20	315.8	0	153.5	144.8	3.8	13.5	0	0	0	0.3	0	0	0	0
21	149.5	0	76.5	65.8	1.5	5.5	0.3	0	0	0	0	0	0	0
22	105.5	0.3	54.5	45.8	1.0	3.8	0	0	0	0.3	0	0	0	0
23	74.0	0	43.0	27.0	1.3	2.8	0	0	0	0	0	0	0	0
Total	**8,038.0**	**9.3**	**3,831.9**	**3,602.7**	**109.4**	**452.0**	**12.7**	**2.5**	**10.8**	**6.7**	**0**	**0**	**0**	**0**
%	**100.0**	**0.1**	**47.7**	**44.8**	**1.4**	**5.6**	**0.2**	**0**	**0.1**	**0.1**	**0**	**0**	**0**	**0**

New Jersey Department of Transportation

Daily Volume from 08/06/2014 through 08/08/2014

Site Names: 101502, , WATER ST-.06, 00000166Z_, Toms River Twp
County: OCEAN
Funct. Class: Urban Minor Arterial
Location: BET MAIN ST AND IRONS ST

Seasonal Factor Group: RG4_FC16
Daily Factor Group: RG4_FC16
Axle Factor Group: RG4_FC16
Growth Factor Group:

	Sun 08/03/2014			Mon 08/04/2014			Tue 08/05/2014			Wed 08/06/2014			Thu 08/07/2014			Fri 08/08/2014			Sat 08/09/2014		
	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N	ROAD	S	N
00:00													202	184	18	225	208	17			
01:00													109	99	10	109	101	8			
02:00													59	57	2	56	50	6			
03:00													51	46	5	63	53	10			
04:00													83	76	7	88	79	9			
05:00													241	214	27	221	193	28			
06:00													554	461	93	569	492	77			
07:00													900	708	192	894	706	188			
08:00													1,220	898	322	1,285	951	334			
09:00													1,237	946	291	1,252	993	259			
10:00													1,323	1,056	267	1,440	1,148	292			
11:00													1,374	1,074	300	1,581	1,318	263			
12:00										1,612	1,342	270	1,586	1,265	321						
13:00										1,660	1,380	280	1,527	1,207	320						
14:00										1,705	1,473	232	1,487	1,241	246						
15:00										1,752	1,502	250	1,860	1,581	279						
16:00										2,019	1,748	271	2,146	1,855	291						
17:00										1,949	1,677	272	2,067	1,766	301						
18:00										1,421	1,184	237	1,525	1,292	233						
19:00										1,205	1,035	170	1,199	1,034	165						
20:00										1,132	1,029	103	1,146	1,022	124						
21:00										949	855	94	918	841	77						
22:00										620	573	47	688	625	63						
23:00										364	334	30	460	417	43						
Volume										16,388	14,132	2,256	23,962	19,965	3,997	7,783	6,292	1,491			
AM Peak Vol													1,374	1,074	331	1,581	1,318	342			
AM Peak Fct													0.91	0.86	0.93	0.95	0.95	0.93			
AM Peak Hr													11:00	11:00	8:15	11:00	11:00	8:15			
PM Peak Vol										2,119	1,839	282	2,236	1,942	326						
PM Peak Fct										0.98	0.98	0.88	0.98	0.96	0.92						
PM Peak Hr										16:30	16:30	12:30	16:30	16:30	12:15						
Seasonal Fct										0.862	0.862	0.862	0.862	0.862	0.862	0.862	0.862	0.862			
Daily Fct										1.145	1.145	1.145	1.086	1.086	1.086	0.902	0.902	0.902			
Axle Fct										0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492			
Pulse Fct										2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000			

Collected by: NJDOT
Created 02/11/2015 2:33:57PM

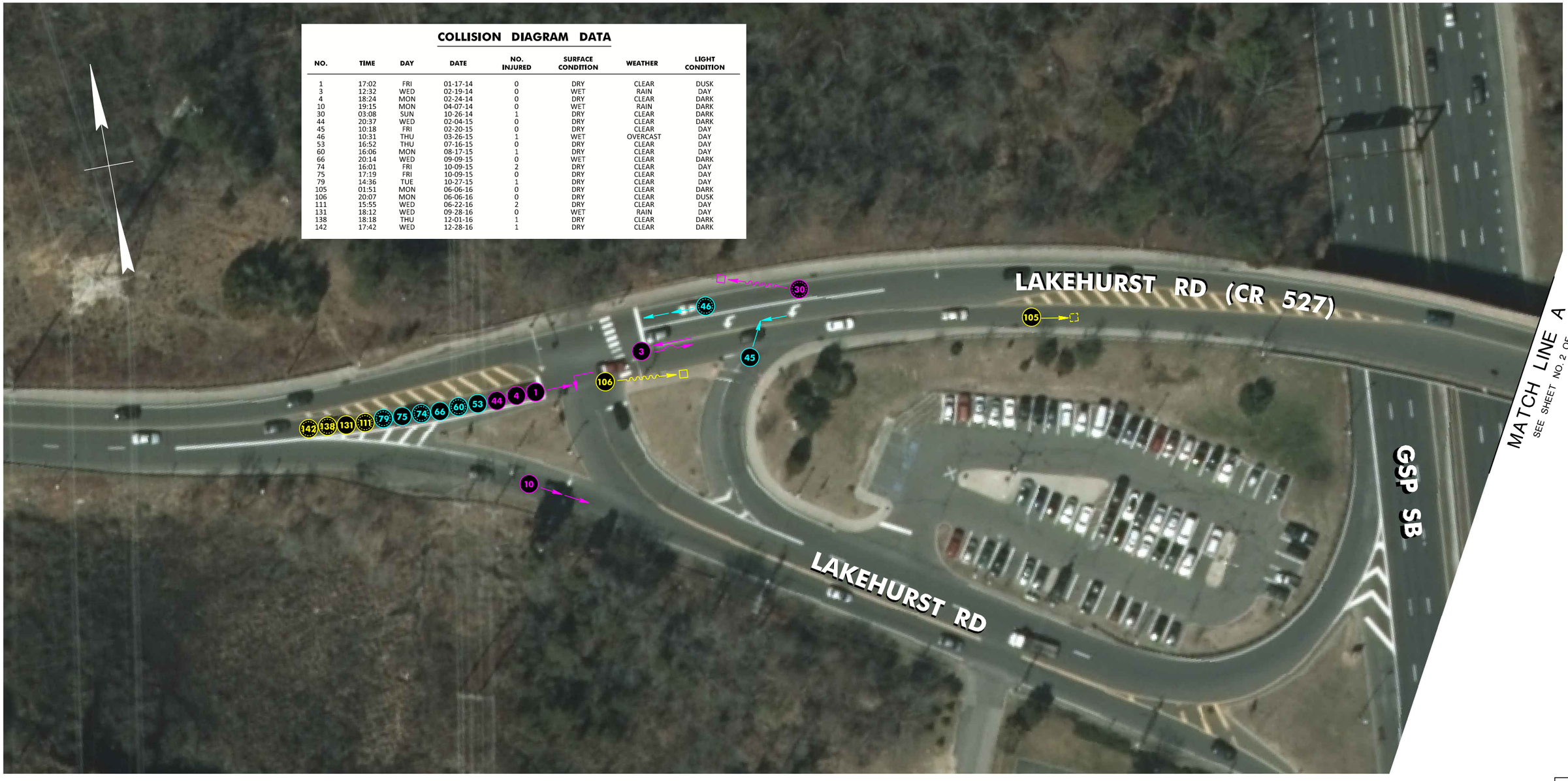
ROAD AADT 21,972 **S AADT 18,465** **N AADT 3,507**

APPENDIX D

VEHICULAR CRASH DIAGRAMS

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
1	17:02	FRI	01-17-14	0	DRY	CLEAR	DUSK
3	12:32	WED	02-19-14	0	WET	RAIN	DAY
4	18:24	MON	02-24-14	0	DRY	CLEAR	DARK
10	19:15	MON	04-07-14	0	WET	RAIN	DARK
30	03:08	SUN	10-26-14	1	DRY	CLEAR	DARK
44	20:37	WED	02-04-15	0	DRY	CLEAR	DARK
45	10:18	FRI	02-20-15	0	DRY	CLEAR	DAY
46	10:31	THU	03-26-15	1	WET	OVERCAST	DAY
53	16:52	THU	07-16-15	0	DRY	CLEAR	DAY
60	16:06	MON	08-17-15	1	DRY	CLEAR	DAY
66	20:14	WED	09-09-15	0	WET	CLEAR	DARK
74	16:01	FRI	10-09-15	2	DRY	CLEAR	DAY
75	17:19	FRI	10-09-15	0	DRY	CLEAR	DAY
79	14:36	TUE	10-27-15	1	DRY	CLEAR	DAY
105	01:51	MON	06-06-16	0	DRY	CLEAR	DARK
106	20:07	MON	06-06-16	0	DRY	CLEAR	DUSK
111	15:55	WED	06-22-16	2	DRY	CLEAR	DAY
131	18:12	WED	09-28-16	0	WET	RAIN	DAY
138	18:18	THU	12-01-16	1	DRY	CLEAR	DARK
142	17:42	WED	12-28-16	1	DRY	CLEAR	DARK



LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	12
INJURIES	8
FATALITIES	0
TOTAL NO. OF CRASHES	20

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

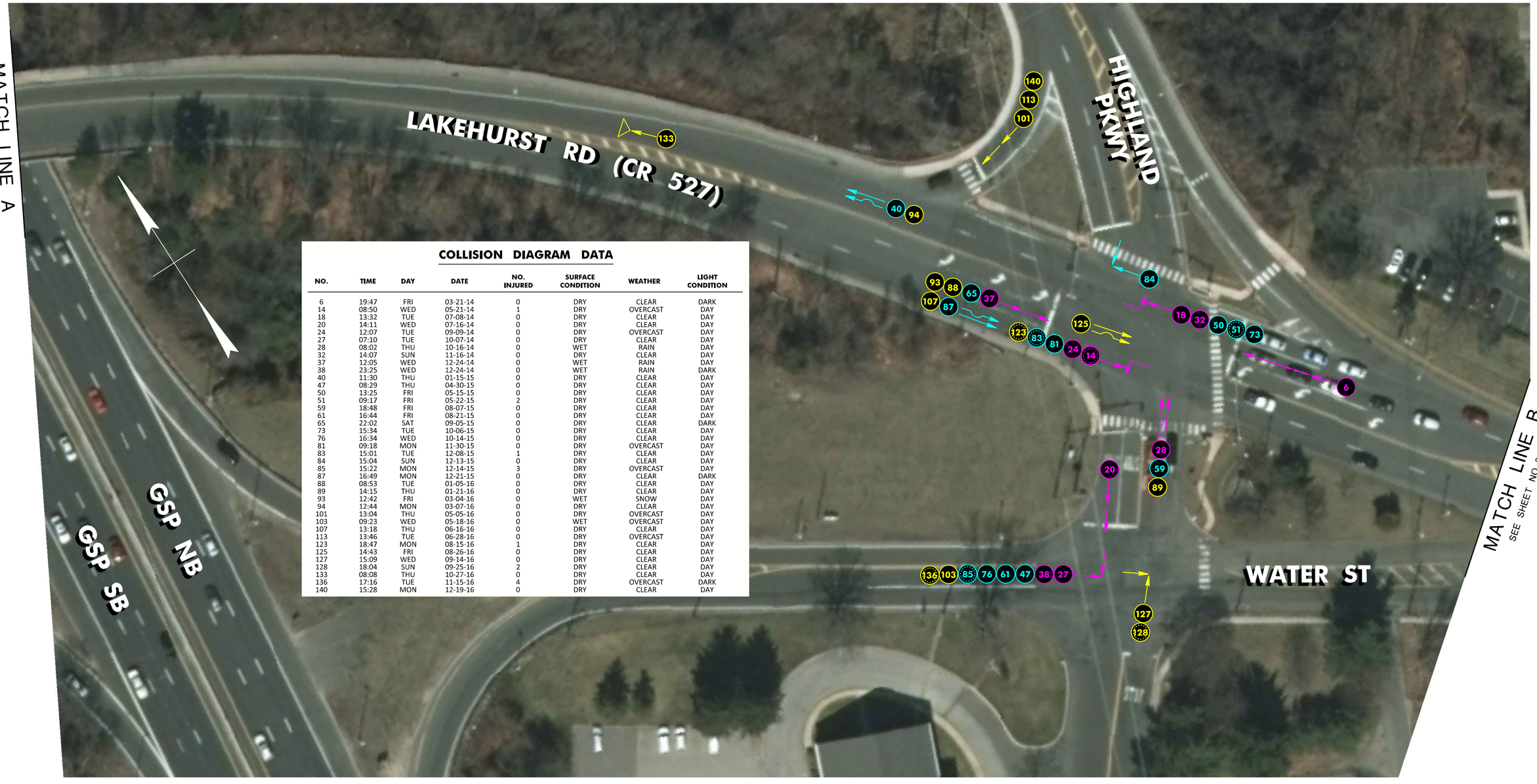
NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE



COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
6	19:47	FRI	03-21-14	0	DRY	CLEAR	DARK
14	08:50	WED	05-21-14	1	DRY	OVERCAST	DAY
18	13:32	TUE	07-08-14	0	DRY	CLEAR	DAY
20	14:11	WED	07-16-14	0	DRY	CLEAR	DAY
24	12:07	TUE	09-09-14	0	DRY	OVERCAST	DAY
27	07:10	TUE	10-07-14	0	DRY	CLEAR	DAY
28	08:02	THU	10-16-14	0	WET	RAIN	DAY
32	14:07	SUN	11-16-14	0	DRY	CLEAR	DAY
37	12:05	WED	12-24-14	0	WET	RAIN	DAY
38	23:25	WED	12-24-14	0	WET	RAIN	DARK
40	11:30	THU	01-15-15	0	DRY	CLEAR	DAY
47	08:29	THU	04-30-15	0	DRY	CLEAR	DAY
50	13:25	FRI	05-15-15	0	DRY	CLEAR	DAY
51	09:17	FRI	05-22-15	2	DRY	CLEAR	DAY
59	18:48	FRI	08-07-15	0	DRY	CLEAR	DAY
61	16:44	FRI	08-21-15	0	DRY	CLEAR	DAY
65	22:02	SAT	09-05-15	0	DRY	CLEAR	DARK
73	15:34	TUE	10-06-15	0	DRY	CLEAR	DAY
76	16:34	WED	10-14-15	0	DRY	CLEAR	DAY
81	09:18	MON	11-30-15	0	DRY	OVERCAST	DAY
83	15:01	TUE	12-08-15	1	DRY	CLEAR	DAY
84	15:04	SUN	12-13-15	0	DRY	CLEAR	DAY
85	15:22	MON	12-14-15	3	DRY	OVERCAST	DAY
87	16:49	MON	12-21-15	0	DRY	CLEAR	DARK
88	08:53	TUE	01-05-16	0	DRY	CLEAR	DAY
89	14:15	THU	01-21-16	0	DRY	CLEAR	DAY
93	12:42	FRI	03-04-16	0	WET	SNOW	DAY
94	12:44	MON	03-07-16	0	DRY	CLEAR	DAY
101	13:04	THU	05-05-16	0	DRY	OVERCAST	DAY
103	09:23	WED	05-18-16	0	WET	OVERCAST	DAY
107	13:18	THU	06-16-16	0	DRY	CLEAR	DAY
113	13:46	TUE	06-28-16	0	DRY	OVERCAST	DAY
123	18:47	MON	08-15-16	1	DRY	CLEAR	DAY
125	14:43	FRI	08-26-16	0	DRY	CLEAR	DAY
127	15:09	WED	09-14-16	0	DRY	CLEAR	DAY
128	18:04	SUN	09-25-16	2	DRY	CLEAR	DAY
133	08:08	THU	10-27-16	0	DRY	CLEAR	DAY
136	17:16	TUE	11-15-16	4	DRY	OVERCAST	DARK
140	15:28	MON	12-19-16	0	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	32
INJURIES	7
FATALITIES	0
TOTAL NO. OF CRASHES	39

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

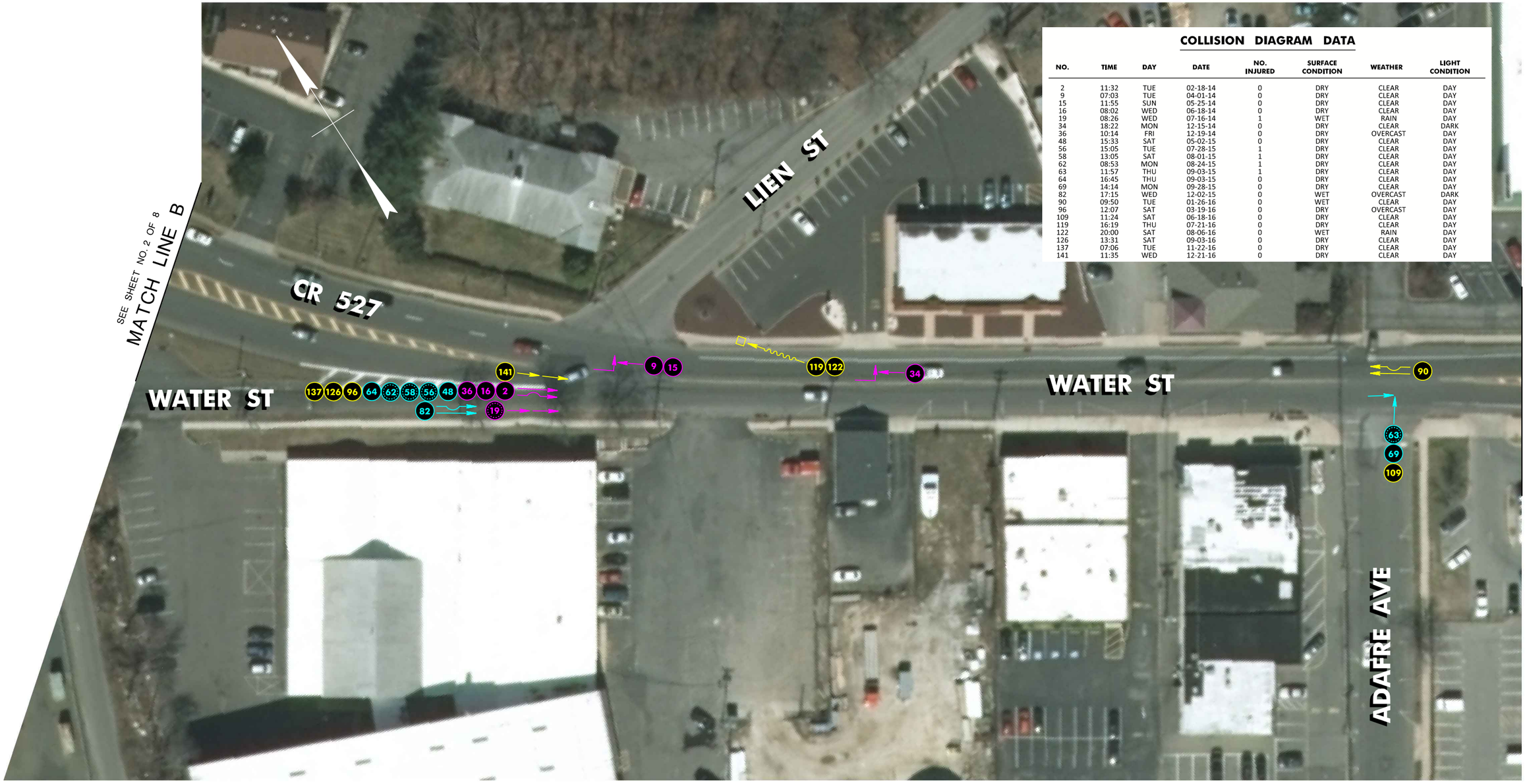
Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

GREENMAN-PEDERSEN, INC. DATE: 5/23/2018 TIME: 10:29:52 AM FILE: L:\2017659 HSIP Program and Project Development Support\NJDOT HSIP Year 1\Cadd\Hwy\07 Ocean\Crash Sheets\Crash Sheet 2.dgn



COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
2	11:32	TUE	02-18-14	0	DRY	CLEAR	DAY
9	07:03	TUE	04-01-14	0	DRY	CLEAR	DAY
15	11:55	SUN	05-25-14	0	DRY	CLEAR	DAY
16	08:02	WED	06-18-14	0	DRY	CLEAR	DAY
19	08:26	WED	07-16-14	1	WET	RAIN	DAY
34	18:22	MON	12-15-14	0	DRY	CLEAR	DARK
36	10:14	FRI	12-19-14	0	DRY	OVERCAST	DAY
48	15:33	SAT	05-02-15	0	DRY	CLEAR	DAY
56	15:05	TUE	07-28-15	1	DRY	CLEAR	DAY
58	13:05	SAT	08-01-15	1	DRY	CLEAR	DAY
62	08:53	MON	08-24-15	1	DRY	CLEAR	DAY
63	11:57	THU	09-03-15	1	DRY	CLEAR	DAY
64	16:45	THU	09-03-15	0	DRY	CLEAR	DAY
69	14:14	MON	09-28-15	0	DRY	CLEAR	DAY
82	17:15	WED	12-02-15	0	WET	OVERCAST	DARK
90	09:50	TUE	01-26-16	0	WET	CLEAR	DAY
96	12:07	SAT	03-19-16	0	DRY	OVERCAST	DAY
109	11:24	SAT	06-18-16	0	DRY	CLEAR	DAY
119	16:19	THU	07-21-16	0	DRY	CLEAR	DAY
122	20:00	SAT	08-06-16	0	WET	RAIN	DAY
126	13:31	SAT	09-03-16	0	DRY	CLEAR	DAY
137	07:06	TUE	11-22-16	0	DRY	CLEAR	DAY
141	11:35	WED	12-21-16	0	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	18
INJURIES	5
FATALITIES	0
TOTAL NO. OF CRASHES	23

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

SEE SHEET NO. 3 OF 8
MATCH LINE C

MATCH LINE D
SEE SHEET NO. 5 OF 8

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
98	16:27	WED	04-13-16	0	DRY	CLEAR	DAY
99	21:54	THU	04-21-16	0	DRY	CLEAR	DARK
108	13:55	FRI	06-17-16	1	DRY	CLEAR	DAY
112	19:49	SAT	06-25-16	0	DRY	CLEAR	DAY
114	16:51	TUE	06-28-16	0	DRY	CLEAR	DAY
117	20:49	SAT	07-09-16	0	DRY	CLEAR	DARK
120	13:48	MON	07-25-16	0	DRY	CLEAR	DAY
124	14:49	THU	08-25-16	0	DRY	CLEAR	DAY
129	18:04	TUE	09-27-16	0	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	8
INJURIES	1
FATALITIES	0
TOTAL NO. OF CRASHES	9

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

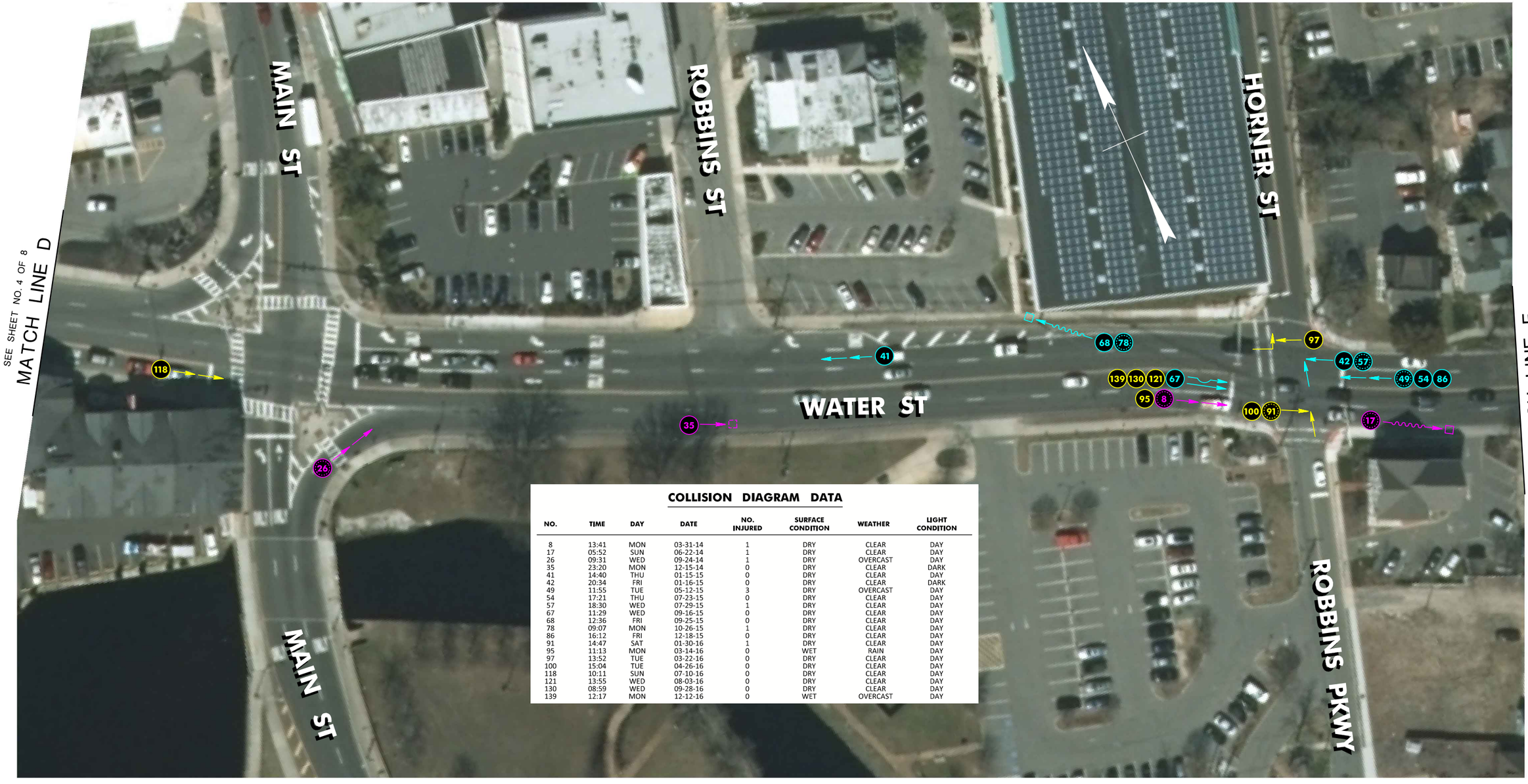
Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

GREENMAN-PEDERSEN, INC. DATE: 5/23/2018 TIME: 10:31:07 AM FILE: L:\2017639 HSIP Program and Project Development Support\NJDOT HSIP Year 1\Cadd\Hwy\07 Ocean\Crash Sheets\Crash Sheet 4.dgn



COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
8	13:41	MON	03-31-14	1	DRY	CLEAR	DAY
17	05:52	SUN	06-22-14	1	DRY	CLEAR	DAY
26	09:31	WED	09-24-14	1	DRY	OVERCAST	DAY
35	23:20	MON	12-15-14	0	DRY	CLEAR	DARK
41	14:40	THU	01-15-15	0	DRY	CLEAR	DAY
42	20:34	FRI	01-16-15	0	DRY	CLEAR	DARK
49	11:55	TUE	05-12-15	3	DRY	OVERCAST	DAY
54	17:21	THU	07-23-15	0	DRY	CLEAR	DAY
57	18:30	WED	07-29-15	1	DRY	CLEAR	DAY
67	11:29	WED	09-16-15	0	DRY	CLEAR	DAY
68	12:36	FRI	09-25-15	0	DRY	CLEAR	DAY
78	09:07	MON	10-26-15	1	DRY	CLEAR	DAY
86	16:12	FRI	12-18-15	0	DRY	CLEAR	DAY
91	14:47	SAT	01-30-16	1	DRY	CLEAR	DAY
95	11:13	MON	03-14-16	0	WET	RAIN	DAY
97	13:52	TUE	03-22-16	0	DRY	CLEAR	DAY
100	15:04	TUE	04-26-16	0	DRY	CLEAR	DAY
118	10:11	SUN	07-10-16	0	DRY	CLEAR	DAY
121	13:55	WED	08-03-16	0	DRY	CLEAR	DAY
130	08:59	WED	09-28-16	0	DRY	CLEAR	DAY
139	12:17	MON	12-12-16	0	WET	OVERCAST	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	14
INJURIES	7
FATALITIES	0
TOTAL NO. OF CRASHES	21

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
5	16:30	MON	03-10-14	0	DRY	CLEAR	DAY
11	18:17	THU	04-24-14	0	DRY	CLEAR	DAY
12	11:49	MON	05-05-14	1	DRY	CLEAR	DAY
13	16:48	THU	05-15-14	0	DRY	CLEAR	DAY
21	13:05	MON	07-21-14	0	DRY	CLEAR	DAY
22	02:00	SUN	08-10-14	1	DRY	CLEAR	DARK
25	14:56	TUE	09-09-14	0	WET	RAIN	DAY
29	21:00	SUN	10-19-14	0	DRY	CLEAR	DARK
31	06:54	WED	11-12-14	0	WET	FOG	DAY
39	14:14	WED	01-07-15	0	DRY	CLEAR	DAY
43	07:05	WED	01-21-15	0	ICY	OVERCAST	DAY
52	19:10	SUN	06-28-15	0	DRY	CLEAR	DAY
70	12:35	TUE	09-29-15	1	DRY	OVERCAST	DAY
71	05:17	WED	09-30-15	0	WET	RAIN	DARK
77	13:04	THU	10-15-15	2	DRY	CLEAR	DAY
92	12:43	WED	02-03-16	0	WET	OVERCAST	DAY
110	10:53	WED	06-22-16	2	DRY	CLEAR	DAY
116	15:43	SAT	07-09-16	0	DRY	CLEAR	DAY
132	20:31	MON	10-10-16	0	DRY	CLEAR	DARK
135	12:28	THU	11-03-16	0	DRY	OVERCAST	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	15
INJURIES	5
FATALITIES	0
TOTAL NO. OF CRASHES	20

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc. Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
7	21:53	SUN	03-30-14	0	WET	RAIN	DARK
23	19:38	TUE	08-12-14	1	WET	RAIN	DARK
33	17:49	TUE	12-09-14	0	DRY	CLEAR	DARK
55	14:14	MON	07-27-15	0	WET	RAIN	DAY
72	16:11	THU	10-01-15	2	WET	RAIN	DAY
80	09:03	SUN	11-29-15	0	WET	RAIN	DAY
104	15:36	MON	05-30-16	0	WET	RAIN	DAY
115	08:01	TUE	07-05-16	2	WET	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	5
INJURIES	3
FATALITIES	0
TOTAL NO. OF CRASHES	8

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

SEE SHEET NO. 7 OF 8
MATCH LINE G

COLLISION DIAGRAM DATA

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

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

- 2014 CRASHES
- 2015 CRASHES
- 2016 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2014 - 2016 COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

GREENMAN-PEDERSEN, INC. DATE: 5/23/2018 TIME: 10:46:21 AM FILE: L:\2017659 HSIP Program and Project Development Support\NJDOT HSIP Year 1\Cadd\Hwy\07 Ocean\Crash Sheets\Crash Sheet 8.dgn

APPENDIX E

PEDESTRIAN CRASH DIAGRAMS

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
4	16:31	MON	07-07-14	1	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
6	17:15	THU	01-22-15	1	DRY	CLEAR	DARK

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
3	16:36	MON	12-09-13	1	DRY	CLEAR	DUSK
5	11:32	THU	11-13-14	0	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	1
INJURIES	1
FATALITIES	0
TOTAL NO. OF CRASHES	2

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

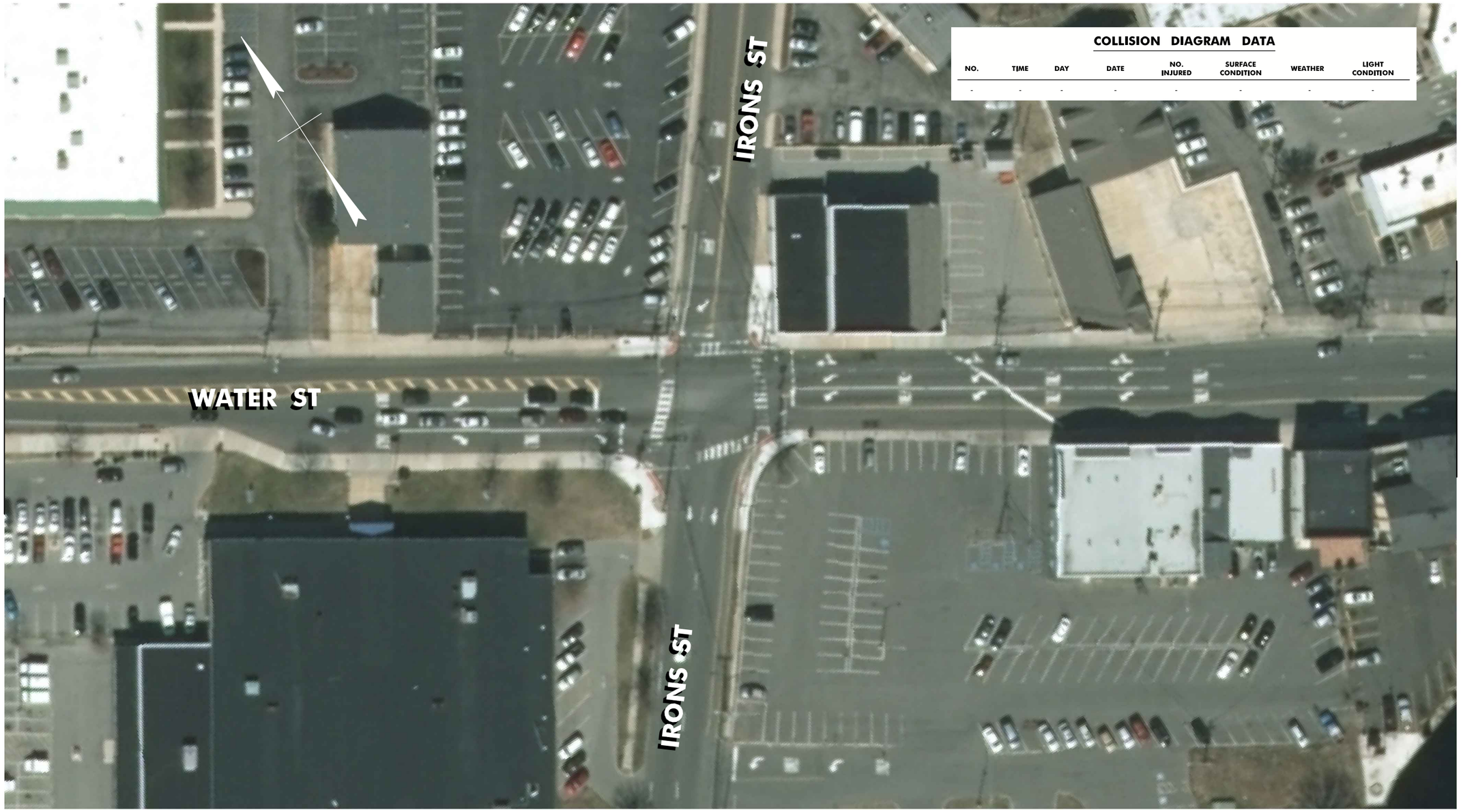
Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

SEE SHEET NO. 3 OF 8
MATCH LINE C



MATCH LINE D
SEE SHEET NO. 5 OF 8

COLLISION DIAGRAM DATA

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

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

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
1	21:40	FRI	07-20-12	1	WET	OVERCAST	DARK
2	17:35	THU	12-05-13	1	DRY	CLEAR	DARK

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

- MOVING VEHICLE
- BACKING VEHICLE
- NON-INVOLVED VEHICLE
- PEDESTRIAN
- BICYCLIST
- PROPERTY DAMAGE ONLY CRASH
- INJURY IN CRASH
- 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

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
7	07:32	THU	06-09-16	1	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
8	09:35	TUE	07-05-16	1	DRY	OVERCAST	DAY

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

COLLISION DIAGRAM DATA

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

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
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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

Water/Dock Street
between the Garden State Parkway
and Washington Street
Toms River Township, Ocean County

2012-2016 PEDESTRIAN COLLISION DIAGRAMS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

NOT TO SCALE

GREENMAN-PEDERSEN, INC. DATE: 5/23/2018 TIME: 10:41:31 AM FILE: L:\2017659 HSIP Program and Project Development Support\NJDOT HSIP Year 1\Cadd\Hwy\07 Ocean\Crash Sheets\Crash Sheet 8.dgn

APPENDIX F

SITE PHOTOGRAPHS

Potential perceived conflict between WB left turn and channelized EB right turn attempting to enter the GSP SB ramp

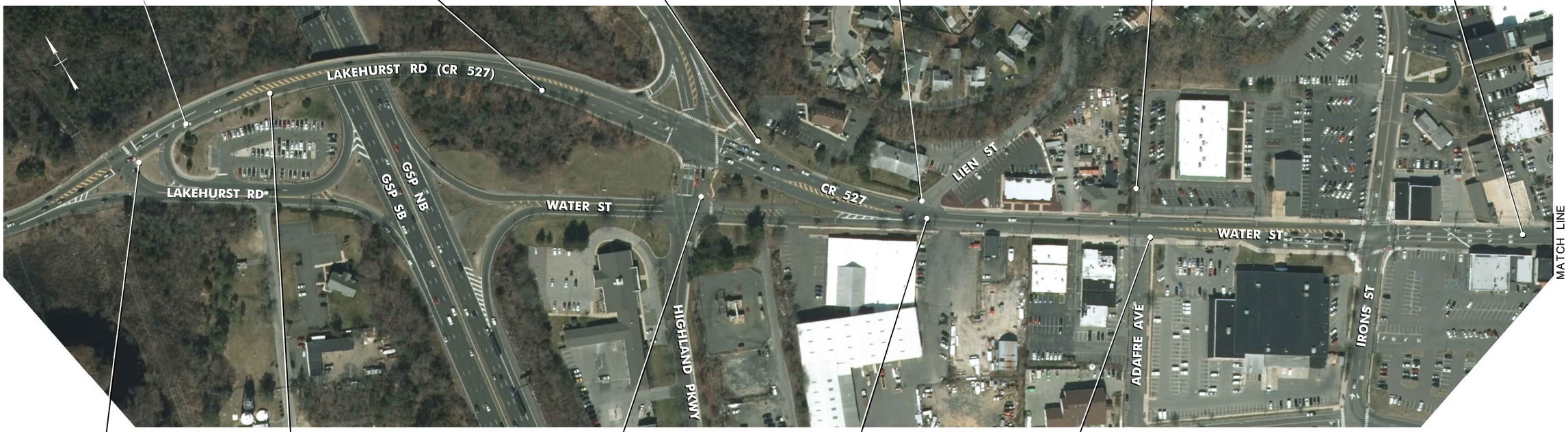
Visibility of queues and signal blocked by geometry and overgrown vegetation

Left turns across two through lanes results in shadow crashes

Wide curb radius and intersection skew creates longer pedestrian crossing; may reduce motorist visibility of the same

Lane use can result in vehicles getting trapped in the rightmost left turn lane, causing last minute lane changes

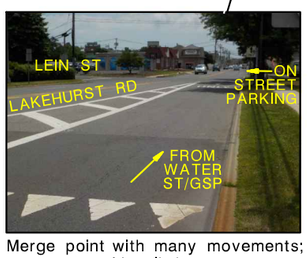
WB overhead lane use signs are undersized and do not command attention



No ADA compliant curb ramps; faded crosswalk

Limited visibility EB of Highland Parkway intersection (over GSP)

Insufficient vehicle storage due to short space between intersections



Merge point with many movements; on-street parking limits recovery area

Ponding observed at intersection corners and curb ramps

NJDOT HSIP
ROAD SAFETY AUDIT
WATER/DOCK STREET

TOMS RIVER TOWNSHIP
OCEAN COUNTY

PROJECT LOCATION

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

N.T.S.

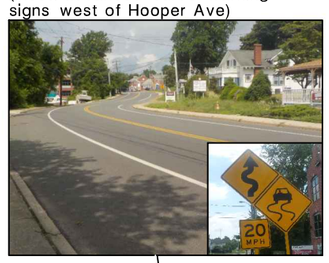
Lane configuration at Irons St results in de-facto weaving section where SB channelized right enters

Vegetation, geometry and inadequate lighting may obscure pedestrians in crosswalks

No ADA curb ramps, DWS, crosswalk, stop sign or striping

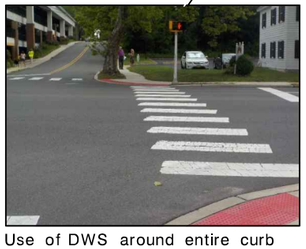
Vehicles make wide left turns at higher speeds; no ADA curb ramps

Sidewalk abutting curb is narrow (inset: advanced curve warning signs west of Hooper Ave)



Pedestrian crossing infrequently used with no ADA ramps. Roadway crown in EB lane (i.e. not along center line)

Broken sign post and damaged pole foundation



Use of DWS around entire curb radii may be confusing to vision impared

Lack of/narrow shoulders, utility poles within pedestrian path, and limited sidewalk width increases driver and pedestrian discomfort

Signs obscured by vegetation and close spacing

Sidewalks and pavement in poor condition; inlets filled with water; no ADA curb ramps

NJDOT HSIP
ROAD SAFETY AUDIT
WATER/DOCK STREET

TOMS RIVER TOWNSHIP
OCEAN COUNTY

SITE PHOTOGRAPHS

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

N.T.S.

APPENDIX G

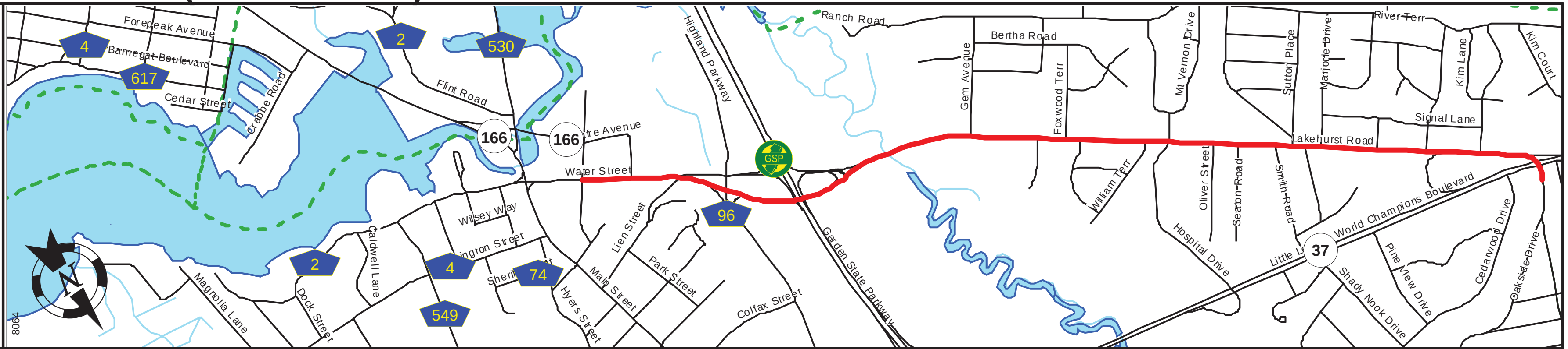
STRAIGHT LINE DIAGRAMS

ROUTE 527 (South to North)

Mile Posts: 0.110 - 2.000

Secondary Direction

Primary Direction



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	

Interstate Route (287)

US Route (22)

NJ Route (33)

County Road (689)

Interchange Number (2)

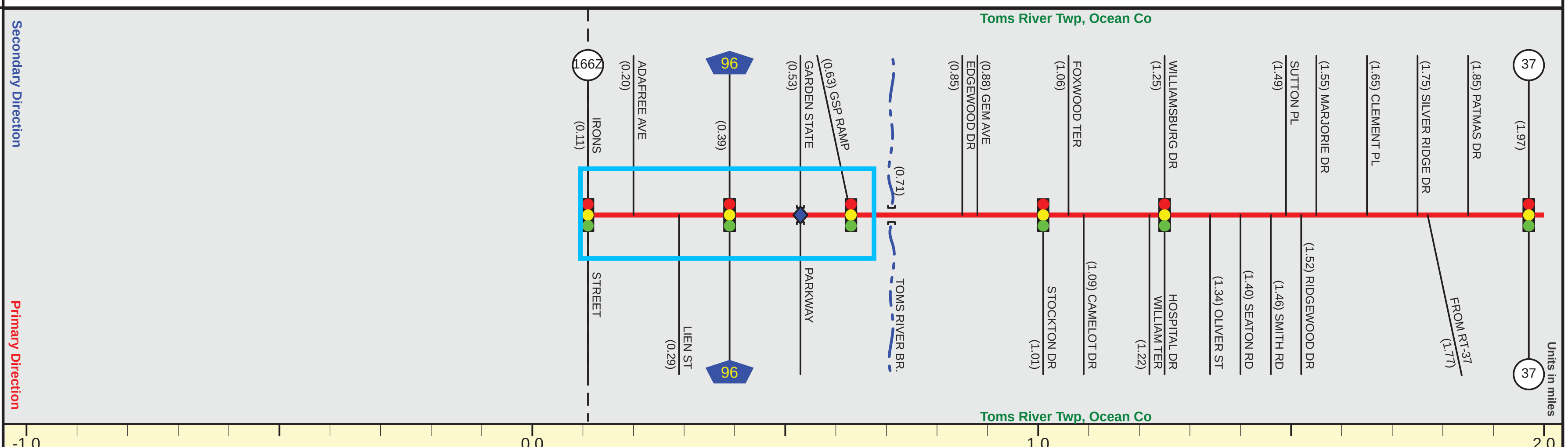
Grade Separated Interchange

Traffic Signal

Traffic Monitoring Sites (WIM, AVC, VOL)

Road Underpass

Road Overpass



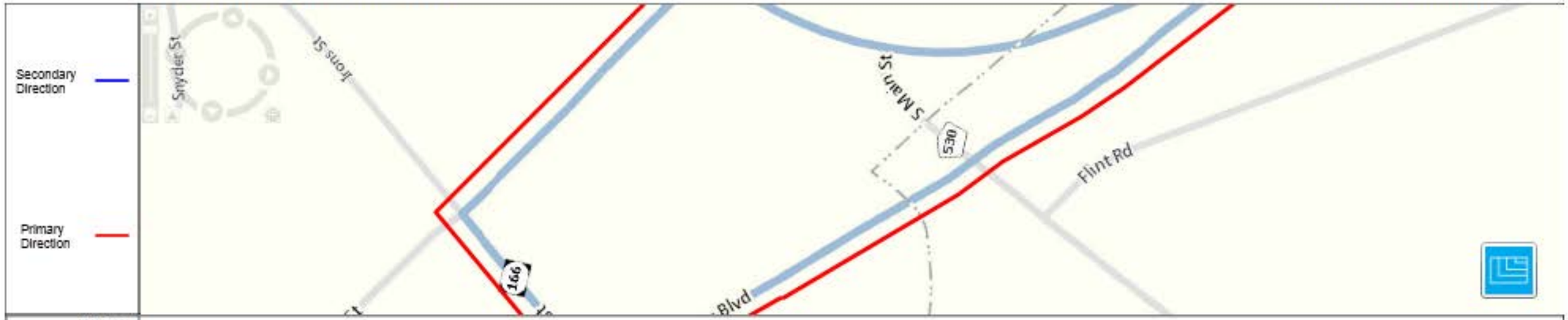
MP 0.00-0.11 See NJ 166Z 0-0.11
MP=0.11 = End Coinc With NJ 166Z MP 0.11

Street Name	Water Street | Lakehurst Road | Oak Ridge Parkway
Jurisdiction	County
Functional Class	Urban Minor Arterial | Urban Major Collector
Federal Aid - NHS Sy	STP
Control Section	
Speed Limit	30 | 40 | 35
Number of Lanes	2
Med. Type	None
Med. Width	0
Pavement	34 | 48 | 36 | 24 | 36 | 48
Shoulder	6 | 0 | 4 | 6 | 8 | 6 | 14 | 0 | 8
Traffic Volume	15,358 (2011)
Traffic Sta. ID	6-5-602
Structure No.	N/A | N/A
Enlarged Views	

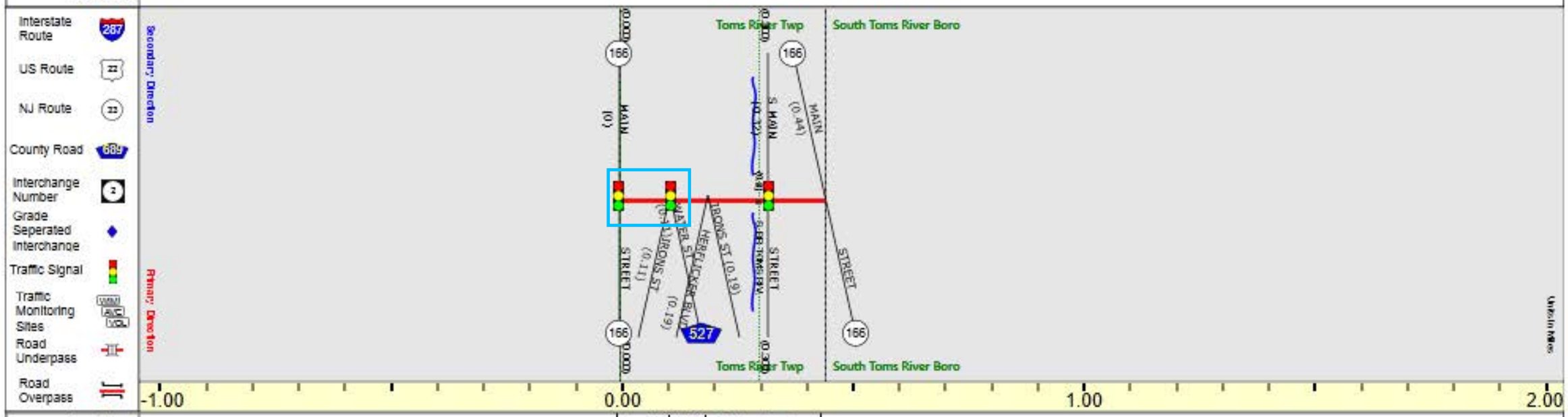
Page Created: June, 2015

ROUTE 166 Z (North to South)

Mileposts: 0.000 - 0.440



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



Street Name	Water Street / Main Street / Herbertsville Boulevard
Jurisdiction	County
Functional Class	Urban Minor Arterial
Federal Aid - NHS Sy	STP
Control Section	
Speed Limit	30 + 25 + 35
Number of Lanes	2
Med. Type	None
Med. Width	0
Pavement	45 + 30 + 24
Shoulder	0 + 3 + 6
Traffic Volume	
Traffic Sta. ID	
Structure No.	
Enlarged Views	

(Begin Rt. 166 Z MP 0.000)

(End Rt. 166 Z MP 0.440)

Page Created April 2018

SRI = 00000166Z_

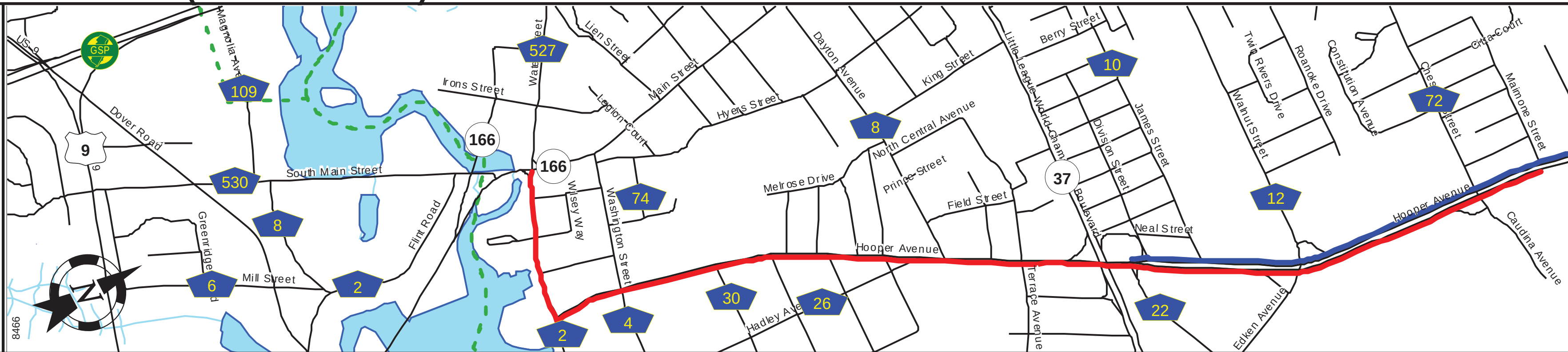
Date Last Inventoried: May 2013

ROUTE 549 (South to North)

Mile Posts: 0.000 - 2.000

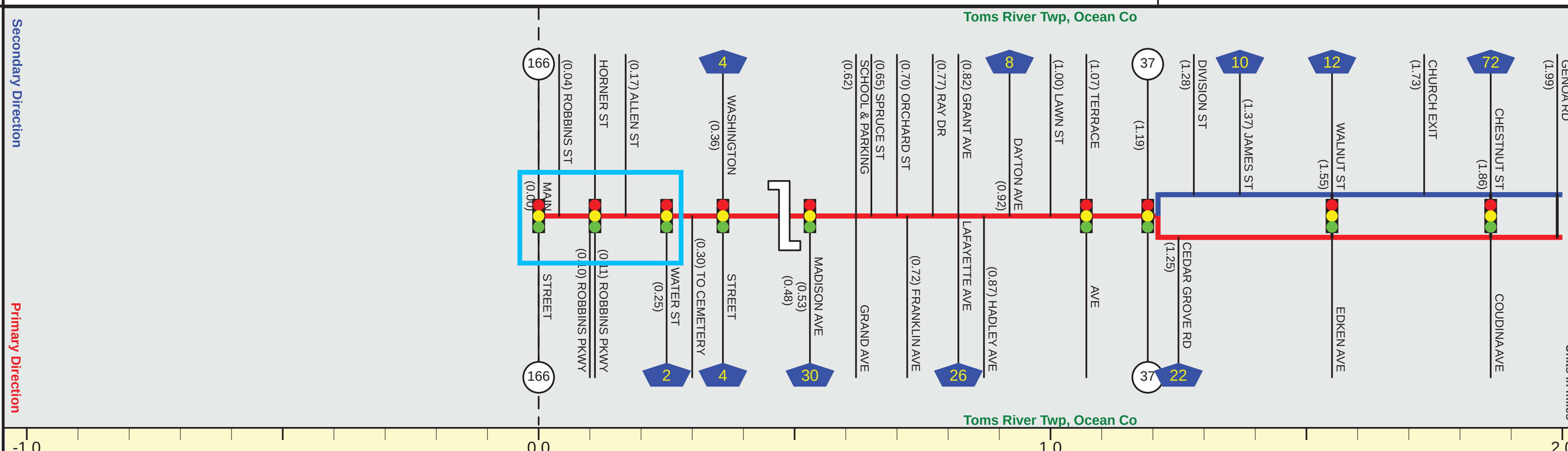
Secondary Direction

Primary Direction



Pavement	36	24
Shoulder	0	12
Number of Lanes	3	2
Speed Limit	40	45
Street Name	Hooper Avenue	

Legend	
Interstate Route	287
US Route	22
NJ Route	33
County Road	689
Interchange Number	2
Grade Separated Interchange	
Traffic Signal	
Traffic Monitoring Sites	WIM, AVC, VOL
Road Underpass	
Road Overpass	



Street Name	Water Street	Hooper Avenue							
Jurisdiction	County								
Functional Class	Urban Minor Arterial					Urban Principal Arterial			
Federal Aid - NHS Sy	STP					NHS			
Control Section									
Speed Limit	30			35		40	45		
Number of Lanes	4	2	4	2	4	3	2		
Med. Type	None					Positive			
Med. Width	0					4			
Pavement	48			40	48	36	24		
Shoulder	0				2	0	12		
Traffic Volume									
Traffic Sta. ID									
Structure No.	N/A								
Enlarged Views									

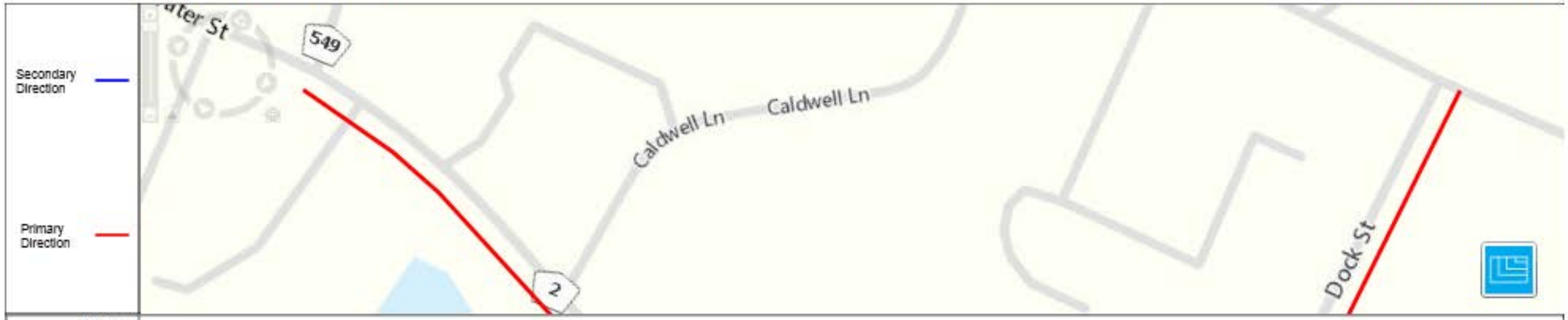
Begin Rt. 549 MP=0.00

Page Created: June, 2015

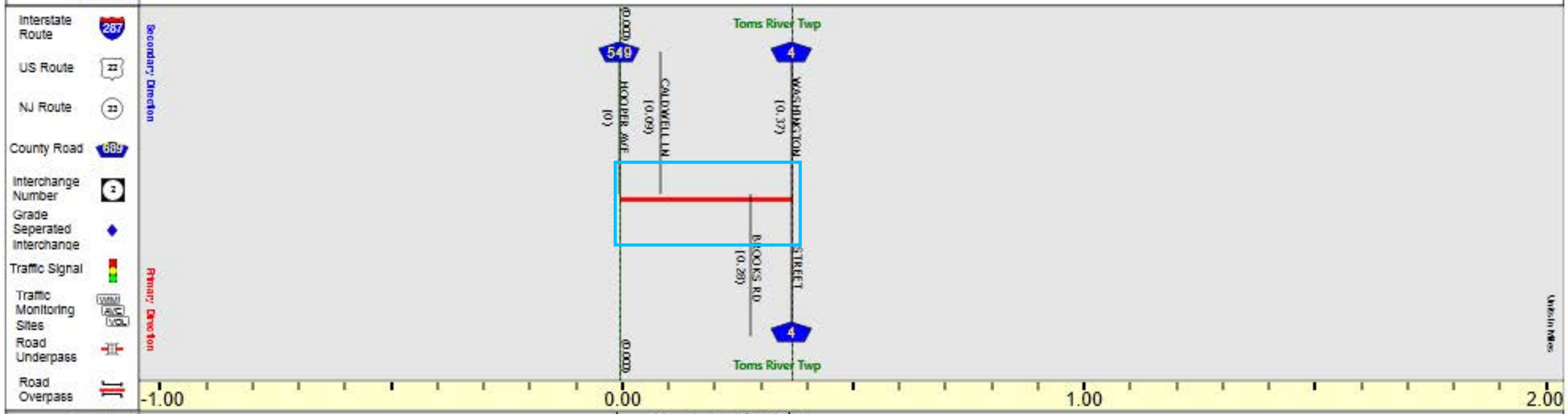
SRI = 00000549__

Date last inventoried: October 2012

WATER ST (West to East) **Mileposts: 0.000 - 0.370**



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



Street Name	Water Street	Dock Street
Jurisdiction	County	
Functional Class	Urban Local	
Federal Aid - NHS Sy	Non-Federal Aid	
Control Section		
Speed Limit	Not Posted	
Number of Lanes	2	
Med. Type	None	
Med. Width	0	
Pavement	24	
Shoulder	6 | 2	
Traffic Volume		
Traffic Sta. ID		
Structure No.		
Enlarged Views		

(Begin Water St MP=0.00)

(End Water St MP=0.37)

Page Created: April 2018

SRI = 15070002__ Date Last Inventoried: September 2011

APPENDIX H

PRE-AUDIT PRESENTATION

Road Safety Audit:

Water/Dock Street between Garden State Parkway and Washington Street

Toms River Township, Ocean County

June 28, 2018

Audit Team Introductions

- *Funded by Federal Highway Administration and NJDOT*
- NJDOT, Bureau of Transportation Data & Safety
  - Bicycle & Pedestrian Programs
  - Local Aid
- NJTPA
- Ocean County
- Toms River Township
- Greenman-Pedersen, Inc., NJDOT Consultant

NJTPA

GPI

2

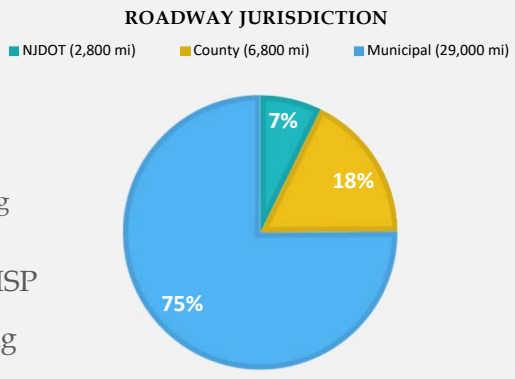
Today's Schedule

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

3

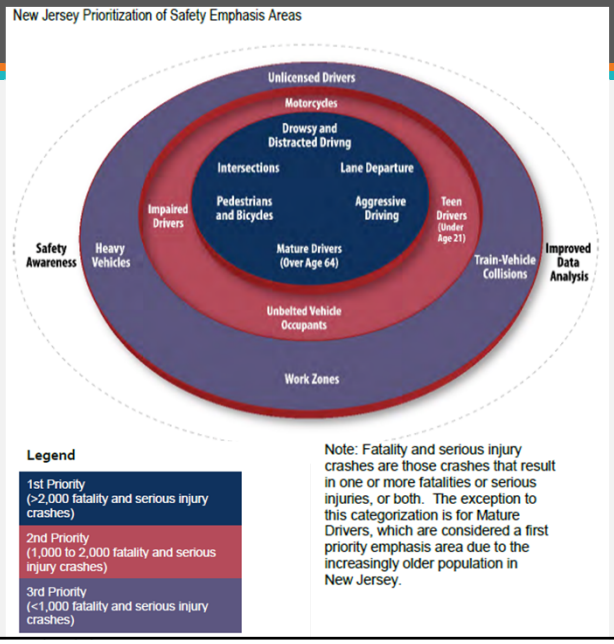
Highway Safety Improvement Program/ Local Safety Program

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



4

Highway Safety Improvement Program (HSIP)

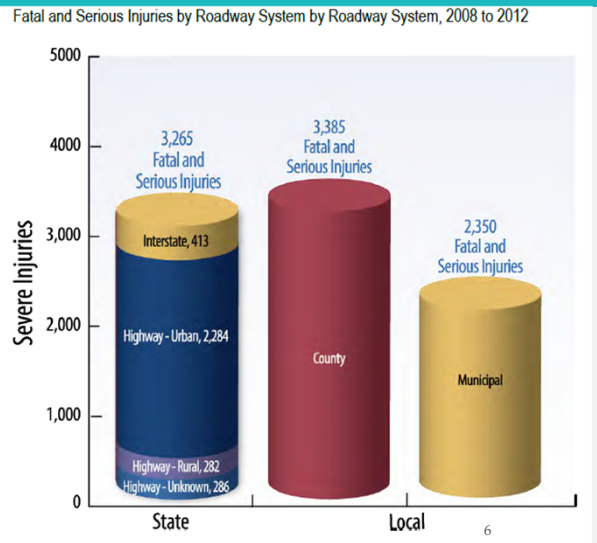


- 14 Emphasis Areas
- Pedestrian Safety and Intersection Focus State
- Top priority: lane departure, intersections, and pedestrians
- 7 sub-programs including Local Safety Program
- Core Federal Aid Program, NJ receives ~$57M

5

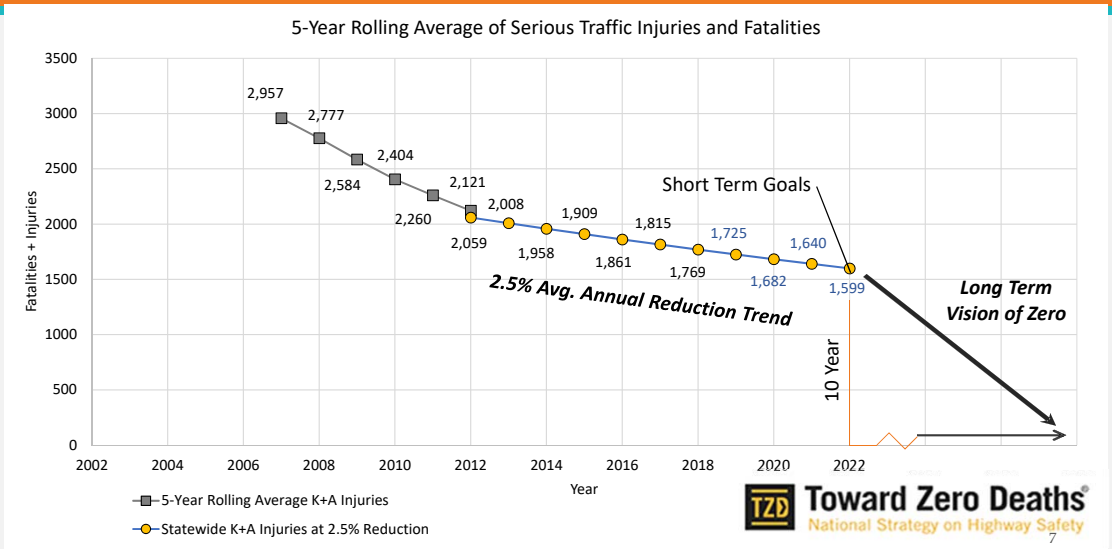
Local Safety Program (LSP)

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



6

National Strategy – Toward Zero Deaths

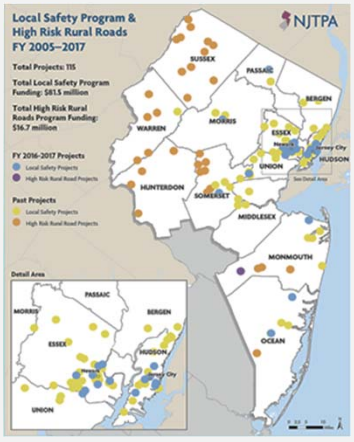


Federal Transportation Funding

through the

North Jersey Transportation Planning Authority

The Metropolitan Planning Organization for Northern New Jersey



Local Safety and High Risk Rural Roads Programs

Over $98 million in funding since 2005 on County and Local Roadways

Relatively quick-fix safety improvements

Highway Safety Improvement Program (HSIP) funds

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

Network Screening

Identifies locations experiencing:

High crash frequencies

Severe crash injuries

Specific crash types such as right-angle or roadway departures

Community Outreach

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

Defining the Vision. Shaping the Future.

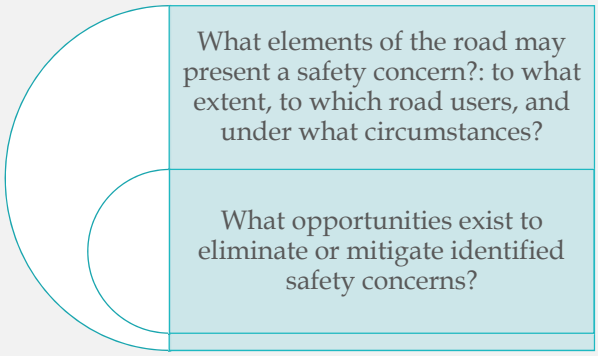
NJTPA

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

RSA Purpose

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

- Goals:



9

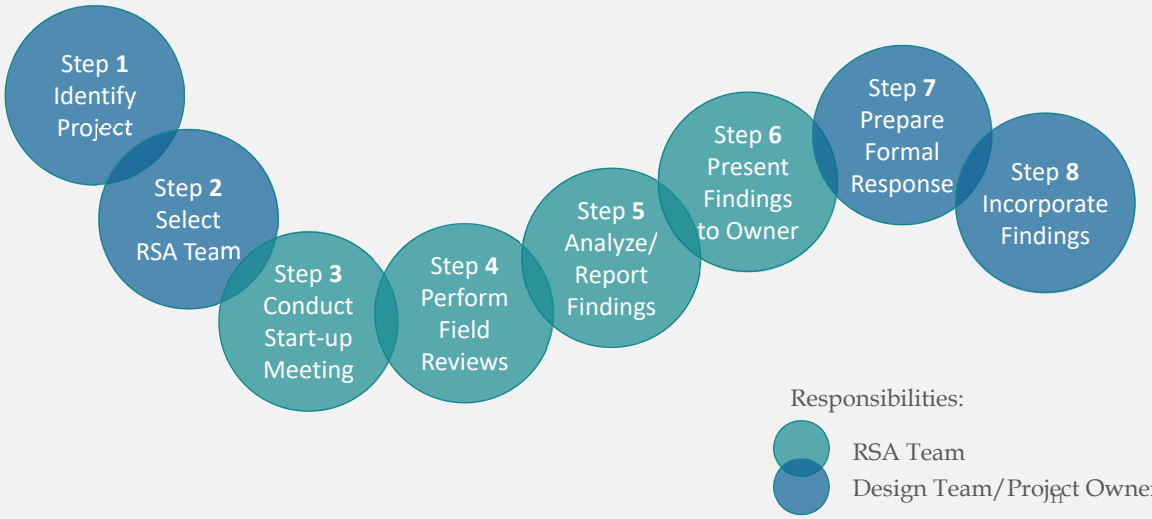
RSA Benefits

- Pro-actively address safety
- Audited designs should produce fewer, less severe crashes
- Identify low-cost/high-value improvements
- Enhance consistency in how safety is considered; promote "safety culture"
- Provide continuous advancement of safety skills and knowledge
- Contribute feedback on safety issues for future projects
- Support optimized savings of lives, money and time

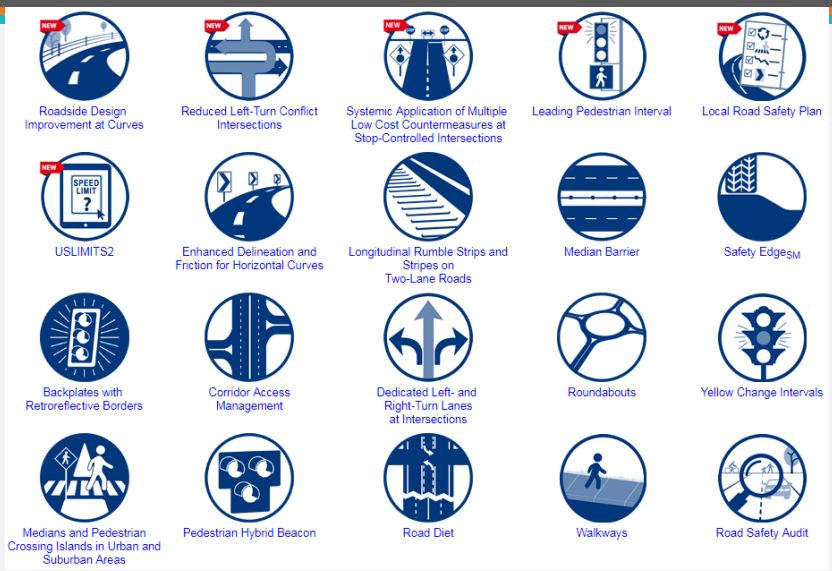
- Not a replacement for:
  - Design quality control
  - Standard compliance
  - Traffic or safety impact studies
  - Safety conscious planning
  - Road safety inventory programs
  - Traffic safety modeling efforts

10

RSA Process



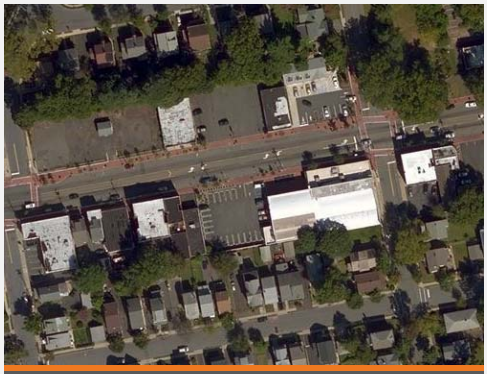
FHWA Proven Safety Countermeasures



Descriptions provided in your handouts

12

FHWA Proven Safety Countermeasures



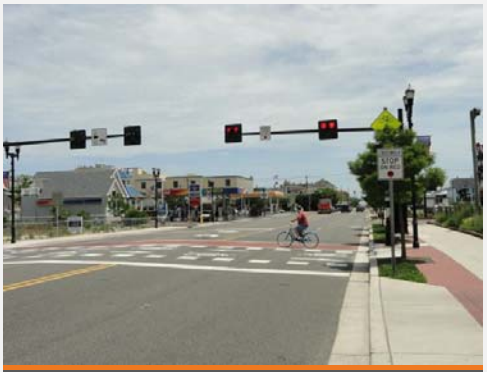
Road Diet
Maplewood Township, Essex County

Roundabout
Chesterfield Township, Burlington County

13

FHWA Proven Safety Countermeasures

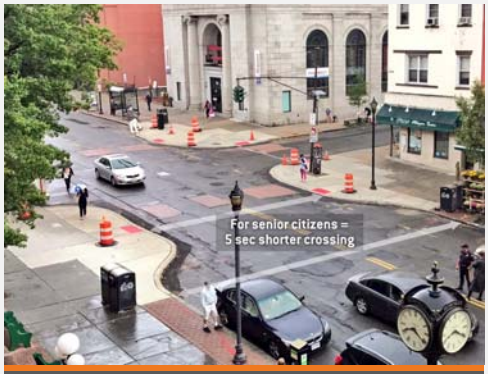
Backplates with Retroreflective Borders



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

14

Additional Considerations



Curb Extensions
Hoboken City, Hudson County

Enhanced signing / pedestrian crossings
Bellevue City, WA

15

16

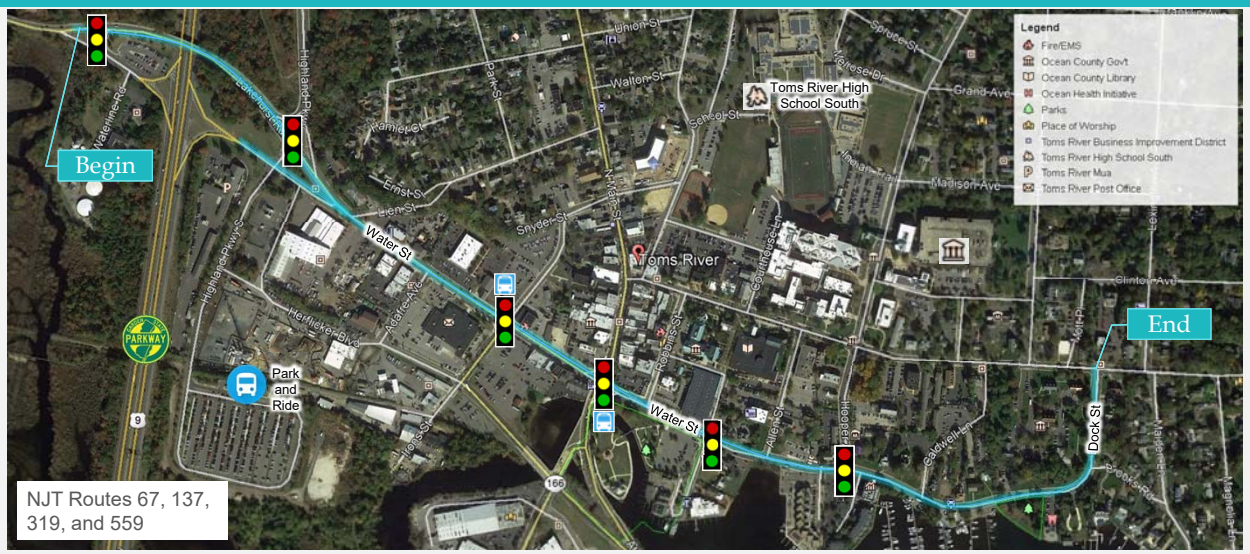
Project Area

- Urban Minor Arterial, undivided 2- to 4-lanes
- No on-street parking
- 30 mph
- Sidewalk on both sides
- Continental/ladder x-walks

- Urban Local, undivided 2-lanes
- No on-street parking
- 25 mph statutory (not posted)
- Sidewalk on both sides
- Continental midblock x-walk

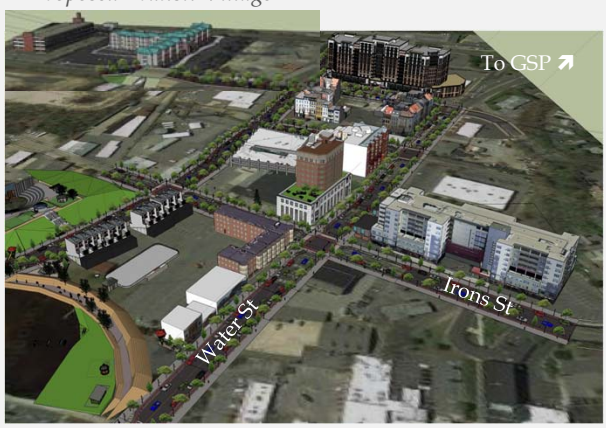
Area Map

17



Project Area

Proposed Transit Village



West Water Street Redevelopment, Phase 1
Facing West from Intersection of Water and Main

- Traffic Data
  - Nov. 2016 ADT: around 16,500 vpd
  - Aug. 2014 ADT: around 22,000 vpd
- Land Use
  - Commercial/retail (residential Dock St)
  - Medium density
  - Park and Ride/GSP access
- Census Demographics (near Water St)
  - 83% White
  - 9% Hispanic/Latino
  - 4% Asian
  - 7% below poverty level
  - 2% use public transportation
  - 3% walk or bike to work

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NJTPA's FY 2017-2018 LSP Network Screening List

Location	Ped Corridor	Regional Corridor
Water/Dock St	#42 County (527 MP 0.11-1.11)	*Not Ranked*

Location	Intersection (Top 200)	Ped Intersection (Top 200)
Irons St (527 MP 0.11)	#26 County	
Lakehurst Rd (527 MP 0.30)	#78 County	

Lists use 2009-2013 crash data

19

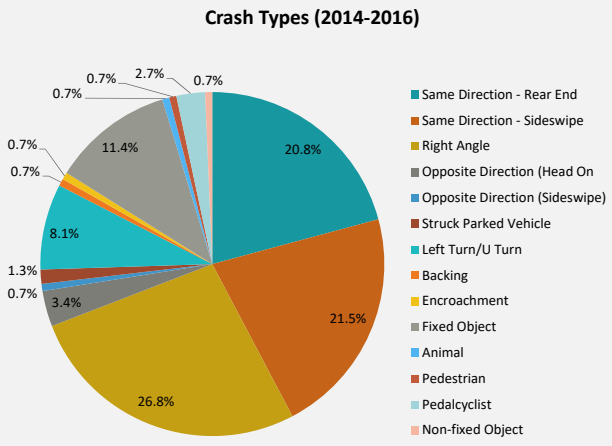
Crash Data

149 Crashes (2014-2016)

- Overrepresentations:
  - Right Angle, Sideswipe, Rear End, Fixed Object
  - Pedestrian/Pedalcyclist (5)
  - At Signalized Intersection
  - Wet Surface

8 Pedestrian Crashes (2012-2016)

- Overrepresentations:
  - Min./Maj. Injury
  - At Signalized Intersection
  - Non-daylight hours



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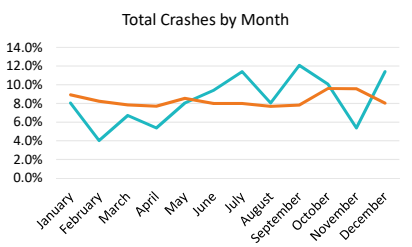
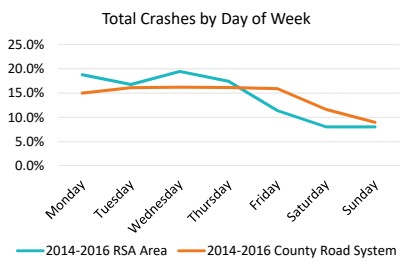
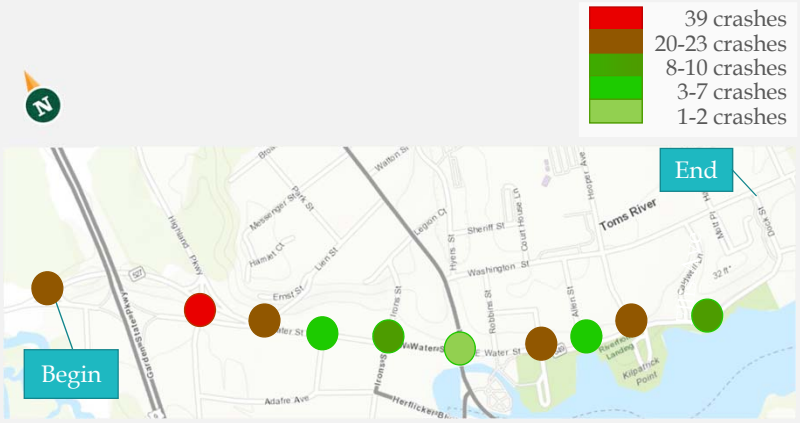
Crash Data (2014-2016)

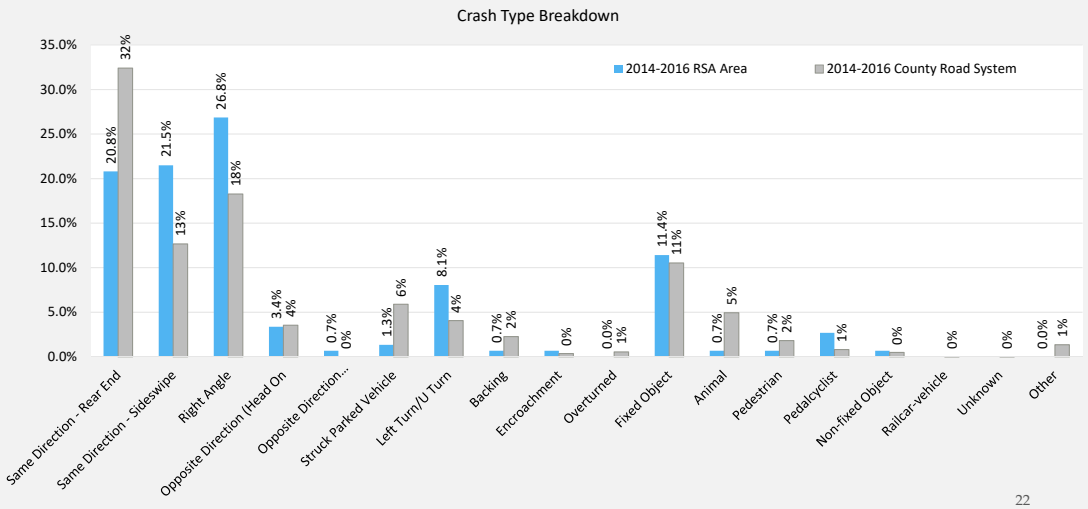






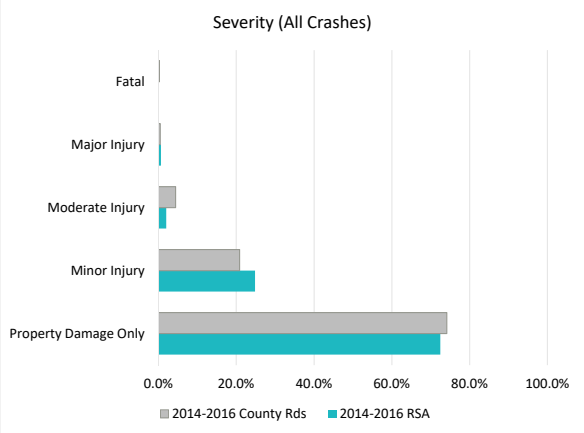
21

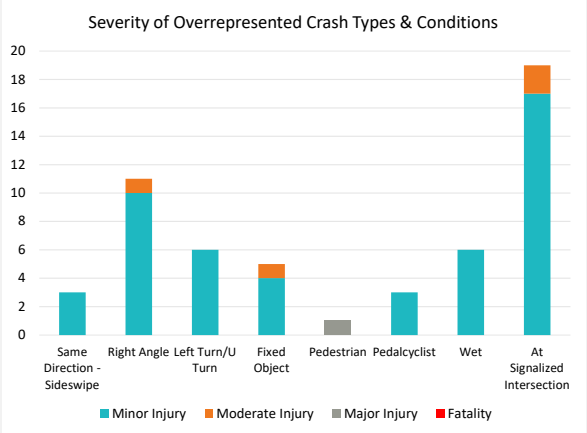
Crashes: RSA Project Area v. County Road System



22

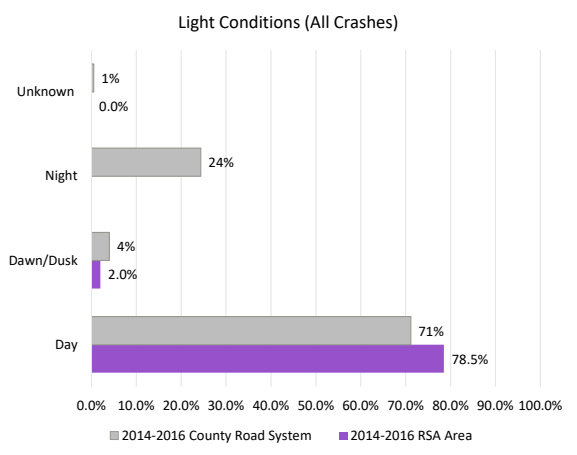
Crashes: Severity

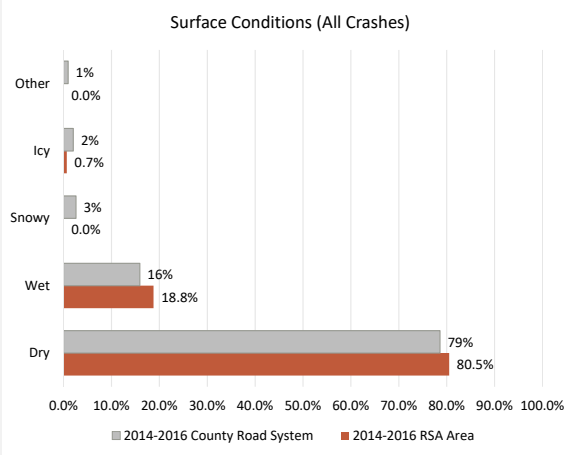




23

Crashes: Light & Surface Conditions





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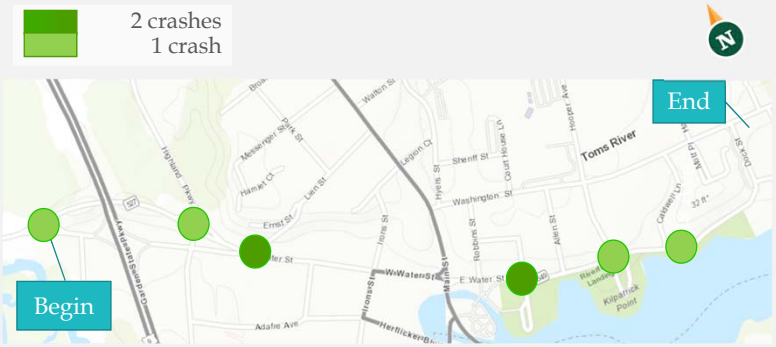
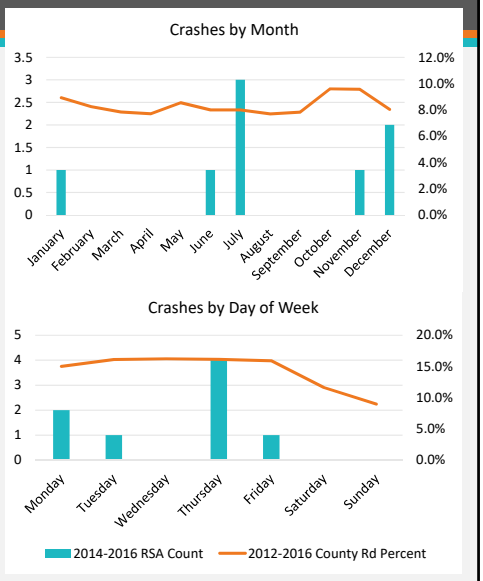
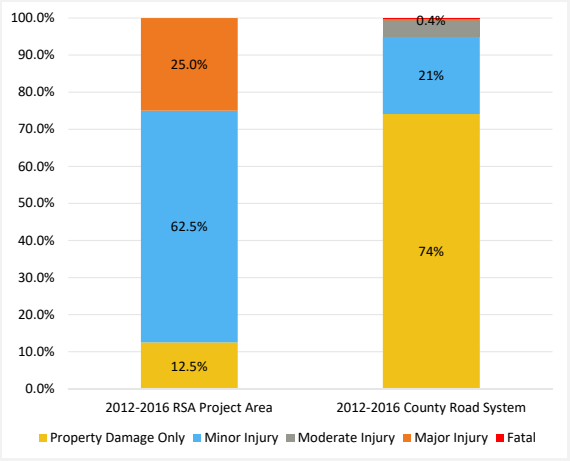
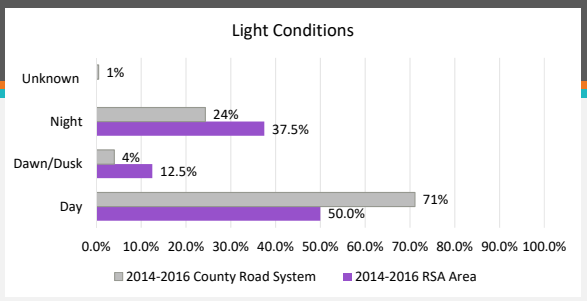
Pedestrian Crash Data (2012-2016)

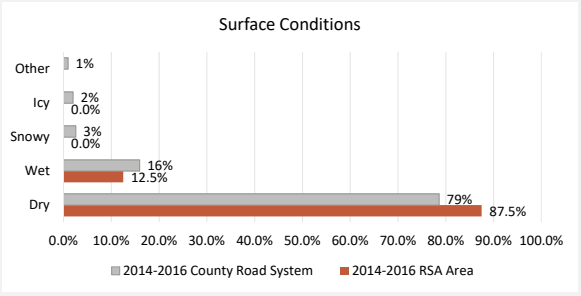




Pedestrian Crashes







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Crash Diagrams

Vehicle (2014-2016)

Pedestrian (2012-2016)

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Field Visit Itinerary

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

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

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Field Visit & Observations

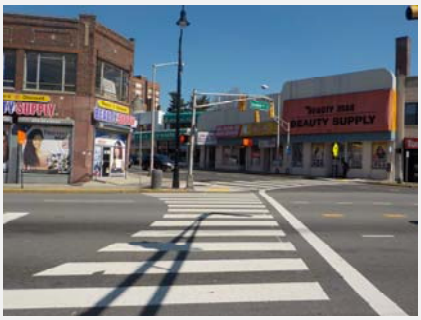
(pause presentation)

Post Audit Analysis

(resume presentation)

RSA 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



Ergonomic crosswalks, Irvington, NJ

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Post Audit Analysis

Observations

What elements of the road may present a safety concern?: to what extent, to which road users, and under what circumstances?

What opportunities exist to eliminate or mitigate identified safety concerns?

Recommendations

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

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Next Steps

- Preparation of RSA Report
- Review/comments from RSA Team
- Preparation of Preliminary Final Report
- NJDOT review
- Preparation of Final Report
- Approximate timeframe: 12 weeks

Ortley Beach ACoE Project
Source: Toms River Twp Website

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Thank you!
Questions/Comments

APPENDIX I

EXCERPTS FROM WATERFRONT REDEVELOPMENT PHASE 1

REDEVELOPMENT PLAN

for

PHASE 1
DOWNTOWN WATERFRONT
REDEVELOPMENT AREA

TOWNSHIP OF TOMS RIVER
OCEAN COUNTY, NEW JERSEY

Draft:

Revised November 16, 2017

I – INTRODUCTION AND PROJECT DESCRIPTION

The proposed redevelopment plan (Plan) for the Downtown Waterfront Redevelopment Phase 1 Area addresses the need for revitalizing Downtown Toms River into a true center for Toms River Township that meets the description of a sustainable neighborhood found in the LEED (Leadership for Energy and Environmental Design) for Neighborhood Development (LEED-ND) Rating System of the US Green Building Council (USGBC), which is that it is "compact, complete and connected".

The redevelopment of the blocks within the Phase 1 portion of the Downtown Waterfront Redevelopment with residential units above retail services within walking distance to the Toms River Bus Depot and the existing Downtown Core is appropriate for the community and essential to making Toms River's downtown a true 24/7 center and serve as a catalyst for additional rehabilitative efforts within Downtown, including Block 658.01, which was added to the Downtown Waterfront Redevelopment Area to enable a direct pedestrian connection to the Downtown Core.

The Toms River Township 2017 Master Plan and the incorporated Downtown Master Plan support the concepts of sustainable design as a response to combating suburban sprawl and reducing the Township's "carbon footprint". Because of the significance of the Downtown Waterfront Redevelopment Area as part of the historic center of Toms River Township, this redevelopment plan leans on the LEED for Neighborhood Development (LEED ND) rating system as a guide for design standards that will promote sustainable design of the Phase 1 area.

The Plan begins with what will be developed along the south side of Water Street between Highland Parkway and Main Street and extends up Irons Street where Washington Avenue is envisioned to extend as a retail lined pedestrian walkway to connect the current Downtown Core to a new redevelopment parcel consisting of the two parking lots on the west side of Irons Street. This approach fits perfectly within the objectives of the various Prerequisites and Credits of LEED ND and ensures that the redevelopment will produce valuable positive ratables for the Township, serve as a catalyst for economic investment in other properties in the area.

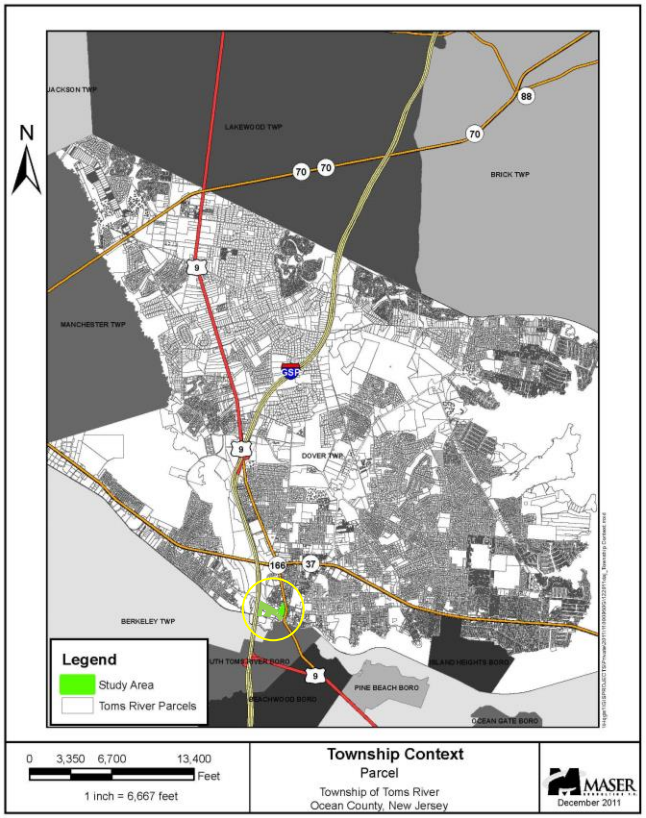

Figure 1: Location Map

II – PLAN OVERVIEW AND BACKGROUND

A. Plan Intent and Purpose

The purpose of the Redevelopment Plan is to serve as the principal tool to guide the revitalization of the Downtown Waterfront Redevelopment Phase 1 Area. The Downtown Waterfront Redevelopment Phase 1 Area will be developed as a compact community of higher density housing types in buildings with ground level retail or office uses, thereby providing a compact, complete and connected infill development within walking distance of local-oriented retail and service uses, bus routes, recreation spaces, and civic uses, consistent with the "Green Neighborhood" principles of LEED-ND.

Successful implementation will require the sensitive use of redevelopment powers and financial incentives by the Township, working with the Toms River Business Improvement District, Inc. (Downtown Toms River) to facilitate site-specific redevelopment projects.

The redevelopment policy of the Township is to balance efforts to attract new mixed-use residential and commercial development to the Downtown Waterfront Redevelopment Area with the need to encourage the rehabilitation of existing properties adjacent to the Downtown Waterfront Redevelopment Area and within Block 658.01. Accordingly, the present owners of property in designated redevelopment parcels will be given every opportunity to participate in the redevelopment program through the reinvestment and redevelopment of their properties in accordance with the land uses, building and design requirements of this Plan

Figure 2: Aerial view of Downtown Toms River facing east towards Barnegat Bay.

B. Declaration of Need of Redevelpment

"Redevelopment Area" or "Area in Need of Redevelopment" is defined in Section 40A:12A-3 of the Local Redevelopment and Housing Law (LRHL).

The Township governing body designated the original Downtown Waterfront Redevelopment Area by Resolution #2008-94 on December 13, 2008. Block 658.01 was added to the redevelopment area in 2012 based on a finding that

it was needed for the effective redevelopment of the rest of the redevelopment area because of its interface with the existing Downtown Core, especially Washington Street.

C. Plan Area Location and Description

The Redevelopment Area that led to the development of this Redevelopment Plan include the properties between the Garden State Parkway and Main Street south of Water Street and the two parking lots along the west side of Irons Street in Block 658. However the Redevelopment Plan Area addressed by this Redevelopment Plan is composed only of Downtown Waterfront Redevelopment Phase 1 Area property (Redevelopment Plan Area). Table 1 lists the Blocks and Lots included in the Redevelopment Plan Area.

TABLE 1
Redevelopment Plan Area Properties

Block	Lot
566.01	All
566.02	3, 7, 8, 9 and portion of Lot 5
566.03	All
567	All
569	4, 5, 6, 7, 8, 9, 10, 11
658	25, 47, 48, 58
658.01	All

D. Local Setting and Surrounding Land Uses

Surrounding land uses are comprised of a mixture of retail and office uses. Along Water Street, a several small retail buildings with multiple small business tenants line Water Street to the north of the redevelopment area. Across Main Street from the redevelopment area to the east is Huddy Park. As Main Street crosses Water Street and continues uphill on its way to Route 37, the Downtown Waterfront Redevelopment Area now fronts it with the addition of

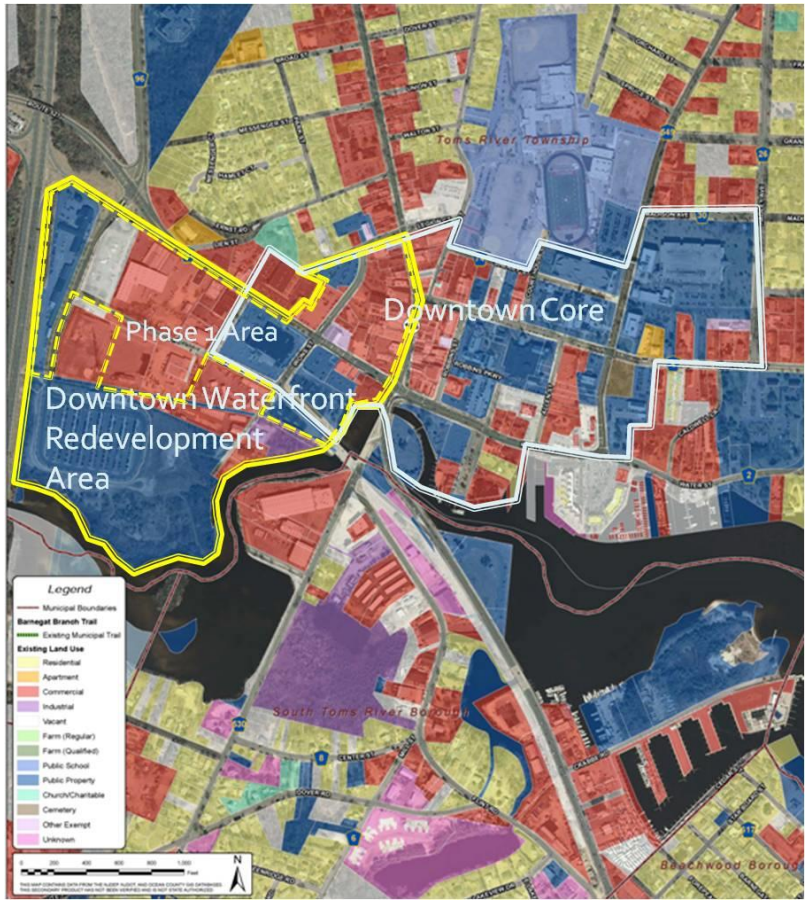

Figure 3: Land Use Plan

Block 658.01, which includes a 7-Eleven Convenience Store, two banks, a multi-tenanted commercial building, a mixed use building recently rehabilitated with residential units above street level office or retail, the office of the Toms River Business Improvement District Corporation (Downtown Toms River) and several older wood frame buildings with office space near the corner of Main Street and Irons Street. Washington Street intersects Main Street at about the halfway point of the Block 658.01 frontage near the center of the three buildings that make up the Wells Fargo bank. From Washington Street down to Water Street the east side of Main Street contains several buildings that contain retail and restaurant uses with professional offices mixed in. From Washington Street north along Main Street to Legion Court uses are consistent with other office and retail buildings of the Downtown Core. However, north of Legion Court, Main Street abruptly transitions into predominantly older wood frame and architecturally significant homes and converted offices.

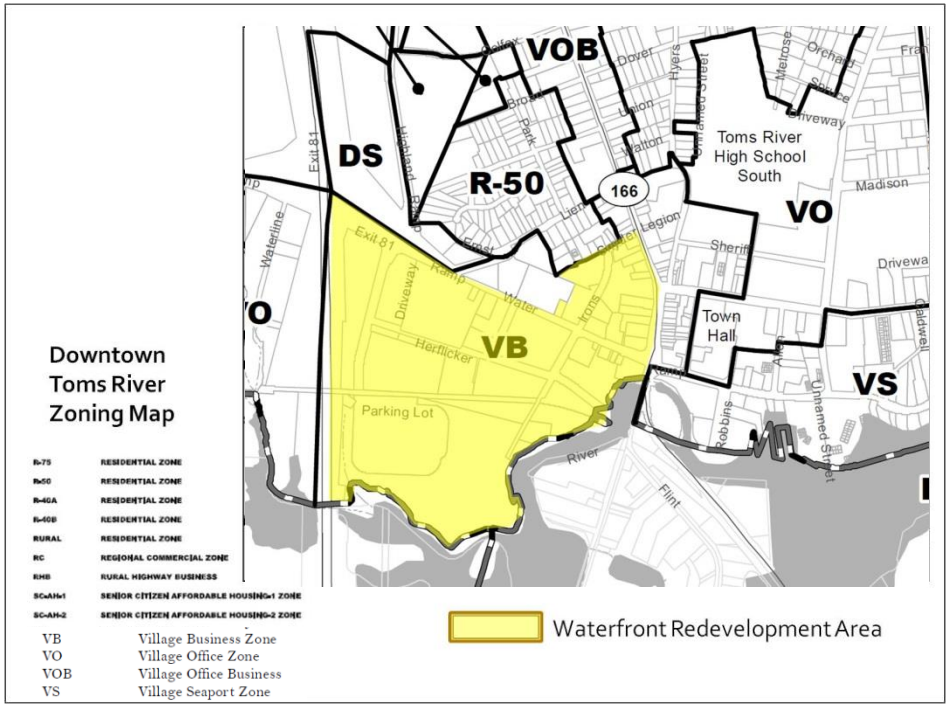

Figure 4: Existing Zoning - Downtown Toms River

E. Existing Zoning

Zoning within the entire Downtown Waterfront Redevelopment Area is Village Business (VB). The VB District is one of four village zoning districts along with Village Office (VO), Village Office-Business and Village Seaport (VS) that essentially define downtown Toms River. It is noteworthy that the majority of the VB District is within the Downtown Waterfront Redevelopment Area, whereas no portion of the VO (predominantly County and Township governmental buildings and supporting private professional offices) and VS (Huddy Park, public parking on both sides of Water Street east of Robbins Street and the Seaport waterfront area) has been designated as being in need of redevelopment. Additional areas of the Downtown Core are expected to be considered for designation as an Area In Need of Rehabilitation, as recommended in the 2017 Master Plan.

Permitted uses within the VB District include:

- The retail sale of goods, which may include the following:
  - Grocery stores.

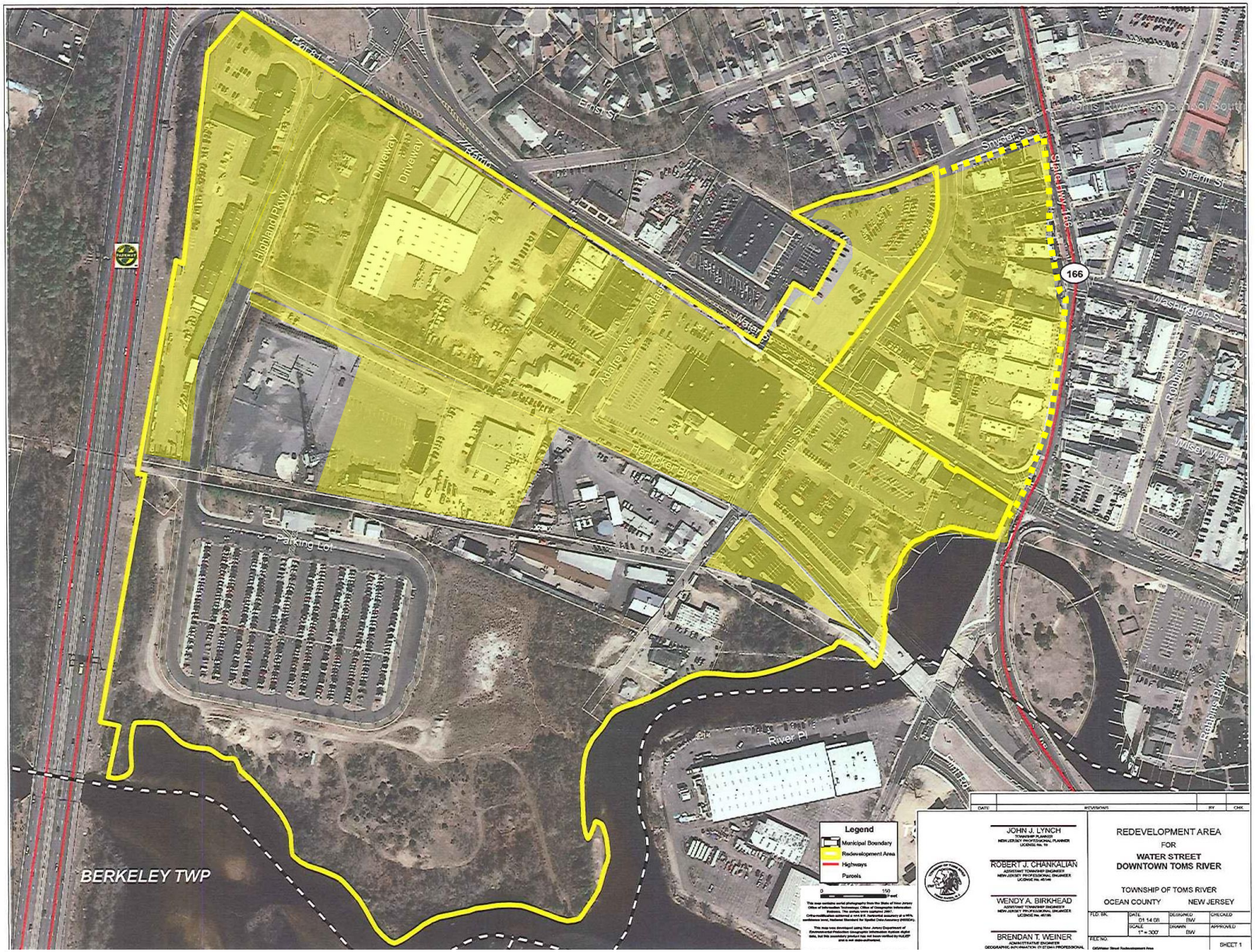

Figure 5: Waterfront Redevelopment Area and Phase 1 Plan Area

APPENDIX J

EXCERPTS FROM DOWNTOWN CIRCULATION NEIGHBORHOOD PLAN

DOWNTOWN CIRCULATION NEIGHBORHOOD PLAN

DOWNTOWN WATERFRONT, TOMS RIVER, NEW JERSEY

August 26, 2016

PREPARED BY :

MASER CONSULTING P.A.

Consulting, Municipal & Environmental Engineers
Planners ▪ Surveyors ▪ Landscape Architects

David G. Roberts, AICP/PP, LLA, LEED AP ND
Project Manager

John J. Jahr, PTP, TSOS
Traffic/Transportation Team Leader

Juan Restrepo, Traffic Engineer

Brian Kempf, Planner

David G. Roberts, AICP/PP, LLA, RLA,

The original of this report was signed in accordance with NJSA 45:14A-12.

This document has been prepared with a Post Sandy Recovery Planning Grant (Phase II) from the New Jersey Department of Community Affairs with funds provided by the U.S. Department of Housing and Urban Development.

Post Sandy Recovery Phase II Planning

Downtown Circulation Neighborhood Plan

DOWNTOWN WATERFRONT, Toms River, New Jersey

INTRODUCTION

This Downtown Circulation Plan was undertaken to study traffic and circulation issues affecting Downtown Toms River. Toms River's Downtown Waterfront Redevelopment Area was impacted by flooding from Superstorm Sandy in October 2012. The flooding damaged a number of businesses and submerged the Township's Coastal Evacuation Route along Water Street. Flooding in the Township's downtown brought the area's vulnerabilities into sharp focus. As the area continues to rebuild and redevelop, circulation problems saw renewed focus within the context of resiliency. Meanwhile, the Township had concerns regarding the capacity of the existing street network along Water Street to handle any degree of future redevelopment and was not prepared to consider the adoption of the Phase 1 Redevelopment Plan (see Appendix A) until there was a reliable analysis of potential impacts and associated improvements to key intersections.

This Neighborhood Plan provides an analysis of the existing circulation challenges that impede future redevelopment in Downtown Toms River, recognizing the opportunity to determine specific recommendations for changes that would make the neighborhood more resilient to future storm events such as Superstorm Sandy as well as alleviate traffic congestion in the area, thus spurring redevelopment efforts. This plan builds upon project recommendations outlined in Toms River's Strategic Recovery Planning Report (SRPR) and the Draft Downtown Waterfront Phase 1 Redevelopment Plan (Appendix A) to duly serve the purpose of supporting the built form of the neighborhood's redevelopment in a way that can be supported by improvements to the road network and circulation system, improve pedestrian and bicycle circulation within the neighborhood, and improve the neighborhood's resilience in the face of future natural hazards.

In 2015, Maser Consulting conducted a traffic study of the Downtown Area. That study is appended to this report (Appendix B). It provides traffic counts of existing conditions and models the effects of the proposed circulation improvements given the projected buildout of the Phase 1 Redevelopment Plan.

PUBLIC OUTREACH

The nature of public outreach for this plan was through coordination with the Township Engineer's office on very technical analysis of specific intersections as described in the Scope of the grant. Our public stakeholder engagement was through the Downtown Toms River BID, which represents the business community of downtown Toms River. It was the Downtown Toms River BID that authorized and paid for the expansion of the Waterfront Redevelopment Area and then the Phase 1 Redevelopment Plan and that was impacted by Sandy. Engagement was also coordinated with the Ocean County Engineer's office given the County jurisdiction over Water Street and several of the intersections that were modeled for proposed improvements. Township Planner's office meets

regularly with the Downtown Toms River BID to provide updates on related projects such as the riverfront walkway (see Figure 8) and the remediation of the brownfield site along the Toms River (see Figure 10).

NEIGHBORHOOD PLANNING PRINCIPLES

This Neighborhood Plan for Downtown Circulation in the Waterfront Redevelopment Area seeks to advance the following principles:

- To promote the redevelopment of Toms River's downtown through physical conditions that facilitates economic activity, circulation, environmental protection, and resiliency.
- To create a sense of place and promote the utilization of inactivated areas of the Neighborhood, especially the Waterfront.
- To mitigate the impacts of future storm events and ensure the sustainability of the Neighborhood.
- To provide safe, efficient access for motorists, emergency vehicles, pedestrians, and bicycles to traverse and access the Neighborhood, as well as a more effective evacuation strategy in the event of future catastrophic storm events such as Superstorm Sandy.
- To reflect consistency with the Toms River Master Plan.

EXISTING CONDITIONS ANALYSIS

The Neighborhood Plan incorporates much of the Downtown Toms River Waterfront Redevelopment Plan area. In 2008, Toms River's Township Council directed the municipal Planning Board to study whether the waterfront area qualified as an Area in Need of Redevelopment. In 2008, Phillips Preiss Shapiro Associates, Inc. conducted the redevelopment area investigation. In 2012, Maser Consulting conducted an Area in Need of Redevelopment study to determine whether the entirety of Block 658.01 met the Redevelopment Criterion. Block 658.01 is bounded by Irons Street to the west, Legion Court to the north, Route 166/ North Main Street to the east, and CR 527/West Water Street to the south. The Redevelopment Area that led to the development of this Redevelopment Plan include the properties between the Garden State Parkway and Main Street south of Water Street and the two parking lots along the west side of Irons Street in Block 658. However the Redevelopment Plan Area addressed by the Phase 1 Redevelopment Plan is composed only of the properties on both sides of Water Street and one parcel south of Herflicker Boulevard. Table 1 lists the Blocks and Lots included in the Phase 1 Redevelopment Plan Area.

TABLE 1

Phase 1 Redevelopment Plan Area Properties

Block	Lot
566.01	All
566.02	3, 7, 8, 9 and portion of Lot 5
566.03	All
567	All
569	4, 5, 6, 7, 8, 9, 10, 11
658	25, 47, 48, 58
658.01	All

Figure 6: Storm surge coverage map from Hurricane Sandy with substantially damaged properties highlighted in yellow by Maser Consulting, 2014

GENERAL RECOMMENDATIONS

This Neighborhood Plan is grounded in a an extensive circulation study that utilized the Synchro computer model to test various scenarios for changes to the circulation patterns that affect the capacity of the roadway network to accept new redevelopment projects as envisioned in the Draft Phase 1 Area Waterfront Redevelopment Plan. The full circulation study is appended to this Neighborhood Plan.

Prior to the testing of scenarios, the circulation study performed traffic counts at key locations at the intersections along Water Street using automatic traffic counters and other means, including visual observation. The data was collected during a period while school was still in session, but after Memorial Day to capture any seasonal increase in vehicular trips on the road network. This collection period was chosen deliberately to represent a conservative (worst case) foundation for evaluating the existing performance of the intersections before the impacts of added trips projected from new redevelopment projects were added.

When the results of the data were entered into the computer model it was determined that the intersection of Main Street and Water Street was failing and the intersection of Water Street and Irons Street was operating at unsatisfactory levels of service at peak hour under existing conditions. Adding in the trips generated by overall background growth, but without any new redevelopment in the Waterfront Redevelopment Area, the Levels of Service showed increasing delays and degraded at certain intersection approaches. It became clear to the project team and the Township that improvements would be necessary in order to accommodate any new redevelopment in the Waterfront Redevelopment Area. It was also recognized that the “free” right turns (right on red) to Water Street from both approaches from Main Street made pedestrian crossings hazardous, as was recognized in the 2011

Pedestrian and Bicycle Mobility Study done by Maser under a NJTPA Subregional Planning Grant for Ocean County. It was agreed that the pressure of through traffic moving back and forth from Route 37 to the towns along Route 9 to the south (South Toms River, Beachwood, Pine Beach, Berkeley Township, Lacey Township, etc.), as well as the awkward access from Water Street on and off of the Garden State Parkway and the backup on Highlands Parkway of vehicles and NJ Transit buses trying to get back to the GSP, would continue to impact the Water Street intersections unless a solution could be found to relieve pressure on the Water Street intersections.

Through a succession of meetings with the Township Engineer's office and then demonstrations of the various scenarios of the SYNCRO model to the Ocean County Engineer's office and representatives from the Downtown Toms River Business Improvement District it was concluded that the full build-out of the Phase 1 Redevelopment Plan could be accommodated, along with an overall improvement in circulation over existing conditions, with the implementation of a series of recommended improvements and that an amendment to the Phase 1 Redevelopment Plan to reduce potential buildout would not be necessary. The recommended improvements are summarized below.

ALTERNATE RAMP APPROACH TO NORTHBOUND GARDEN STATE PARKWAY

The Draft Phase 1 Waterfront Redevelopment Plan incorporated a proposed new ramp for northbound access to the Garden State Parkway that would be connected to Highlands Parkway north of the Water Street intersection. It was assumed that eliminating the awkward existing left turn and short stacking condition at the Water Street/Highlands Parkway intersection would be necessary to accommodate the significant new development projected by the Redevelopment Plan. Therefore, the Township directed that an analysis be performed exploring the possibility of an alternate GSP ramp located along Highland Parkway approximately 1,000 feet north of its intersection with Lakehurst Road. Volumes from the existing ramp which were either through or turning movements onto Highland Parkway, were redirected to the new ramp and redistributed to the approach of Highland Parkway southbound utilizing the naturally occurring trip distributions observed during our turning movement counts.

The new ramp was modeled so that it was signalized and coordinated with the traffic signals along the Water Street Corridor in order to allow for smoother flow of traffic. The model results showed improvement at all approaches, except the northbound approach along Highland Parkway, which experienced a negative effect in the PM and Saturday Peak Hours as traffic which would normally be leaving the area through the existing GSP ramp along West Water Street was forced to travel north through the intersection of Lakeland Road increasing the delay along the NB approach to the intersection.

EXTENSION OF WASHINGTON STREET TO LIEN STREET

Initially in discussions with Township professionals, the feasibility of connection from Irons Street near "Parcel F" (Figure 1) to Water Street via Lien Street was explored. The concept in the Waterfront Redevelopment Plan of a pedestrian extension of Washington Street to Irons Street was explored as a vehicular connection, which would effectively cause Washington Street to run from Route 37 to the GSP at Highlands Parkway without the need to use Water Street at either Main or Irons Street. This was also contemplated as an opportunity to replace Water Street as an evacuation route to the Garden State Parkway (GSP) with a route that would be out of the flood hazard area.

Volumes from the intersections of Irons Street & Water Street and Main Street & Water Street which were either through or turning movements onto Water Street westbound/eastbound were redistributed to the proposed street where trips were then assigned utilizing the naturally occurring trip distributions observed during our turning movement counts. The changes to the GSP ramp described earlier and Standard Build were maintained through this scenario.

From the analysis, it was noted that the addition of a street from Irons Street through Parcel F, as identified in the Waterfront Redevelopment Plan, to Water Street, would allow for smoother operation of traffic at the intersection of Main Street and Water Street. This was achieved by diverting and balancing some of the traffic entering the intersection of Main Street & Water Street with the intention of traveling westbound toward Highland Parkway. This volume was redistributed based on the observed distributions throughout the network. However, the increased volume and increased throughput at the aforementioned intersection had a negative effect on the operation of the intersection of Irons Street & Water Street as backups may occur from vehicles feeding into the segment and vehicles turning left onto Irons Street southbound. Ultimately this option was determined not to be feasible because of the development of the new firehouse on the Township parcel and because right of way for the new street would impact existing businesses and require possible condemnation of property or easement. As a result, this option was eliminated from the final modeling in the traffic study in the Appendix of this Neighborhood Plan. This effectively also eliminated the possibility of a new road at a higher elevation that could replace Water Street as an evacuation route.

PREFERRED SCENARIO: THE "LOOP"

A number of scenarios for modifying access to the Garden State Parkway, reconfiguring the intersections at Highlands Parkway and Water Street and extending Herflicker Boulevard to Highlands Parkway were tested without arriving at improvements to vehicular circulation that would be sufficient to justify intensification of more trips in the network from new redevelopment projects. However, in the process of reviewing these scenarios the concept emerged of not only extending Herflicker to Highlands Parkway, but using it as a one-way eastbound route from Highlands Parkway to the Herflicker Bridge enabled Water Street to become one-way westbound from Irons Street to Highlands Parkway. This generated a "loop" which could provide alternative routes to and from the GSP and remove the backup of eastbound traffic at the Irons Street intersection in front of the Post Office. The Synchro model was then used to test the loop alternative as the preferred option.

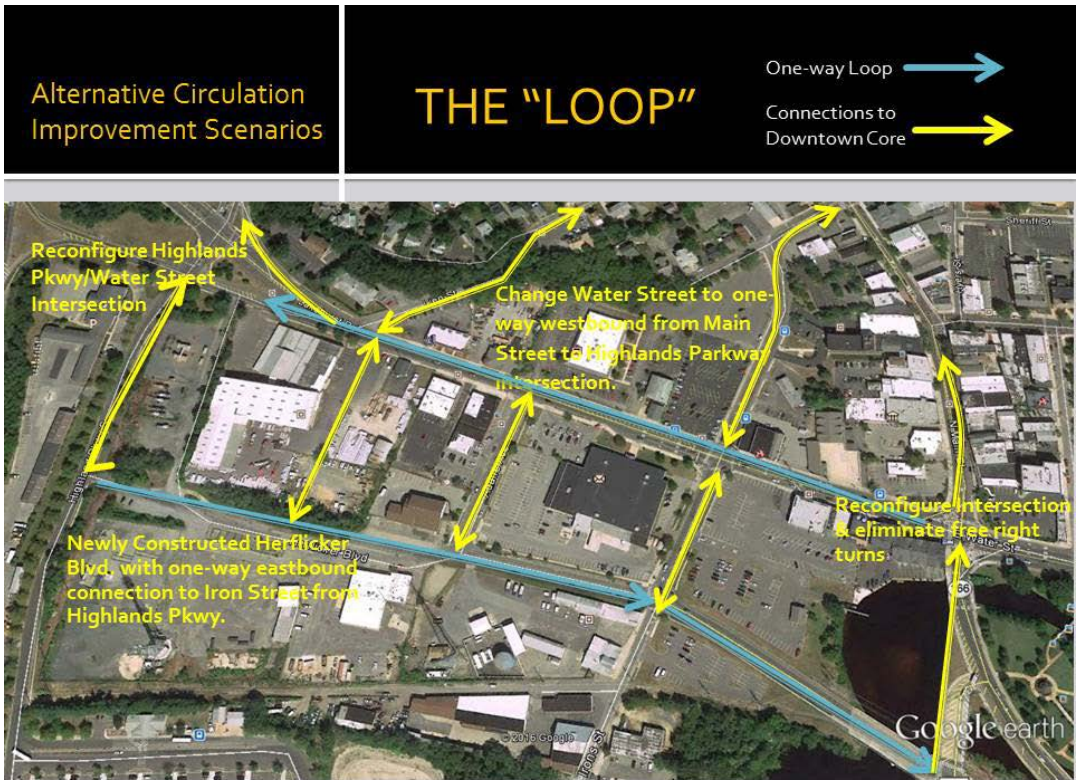

Figure 7: Diagram of the recommended "Loop" scenario.

1. Herflicker Boulevard Reconstruction

A reconstruction of Herflicker Boulevard as a one-way eastbound road extending from Highlands Parkway to the Herflicker Bridge will facilitate both circulation and resiliency improvements. Currently, the Boulevard is only improved between Route 166 and Adafre Avenue. Between Adafre Avenue and Highland Parkway South, the right-of-way narrows though a driveway continues on property owned by New Jersey Natural Gas. Land uses consist of commercial, light industrial, utility, and public works uses. The resulting reconstruction would alleviate congestion on Water Street. Through traffic to Route 166 from the north and west would be directed onto Highland Parkway South and to the reconstructed Herflicker Boulevard.

2. Intersection Improvements

Changes were modeled to the traffic controls, timing directives and roadway geometry throughout the Water Street Corridor and resulted in some improvements from the "No Build" to the "Full Build" (with projected redevelopment trips) conditions. These improvements are summarized as follows:

- The three existing signals along Water Street were changed to fully actuated and coordinated signals with the Main Street & Water Street intersection set as the master intersection. Coordination of these signals and assigning an adaptive cycle length of 90 – 120 seconds depending on the time of day, allowed for a steady improvement in throughput volume.
- The intersection of Highland Parkway South and West Water Street was also signalized in order to accommodate the traffic coming off of or looking to enter along the existing GSP NB ramp.
- Herflicker Boulevard was built out with one travel lane in each direction, interconnecting Irons Street and Highland Parkway South.
- An actuated-coordinated traffic signal was added at the intersection of Herflicker Boulevard & Irons Street for smoother traffic flow out of the system.
- A proposed side street was also built out west of Adafre Avenue in order to create another block for development and further increase interconnectivity between Herflicker Boulevard and Water Street. All side streets connecting Herflicker Boulevard and Water Street are proposed to have STOP controls at both ends. All left turns from Water Street WB leading to these STOP controlled side streets were given dedicated left turn lanes with 60 feet of storage in order to help alleviate any blockage to through traffic from stopped left turning vehicles.
- Traffic striping would need to be altered minimally in order to accommodate the proposed development in this scenario.

BICYCLE & PEDESTRIAN MOBILITY

1. Barnegat Branch Trail

The Barnegat Branch Trail is a proposed rail-trail connecting Toms River to Barnegat Township that has been constructed by Ocean County along segments in Barnegat, Ocean and Berkeley Townships. The Ocean County Pedestrian Bicycle Mobility Subregional Study of 2011 included a plan for pedestrian and bicycle mobility featuring the extension of the Barnegat Branch Trail from its current terminus at the intersection of Admiral Boulevard and Route 166 (Atlantic City Boulevard) in Beachwood Borough via Flint Street in South Toms River Borough to the Herflicker Bridge in Toms River. South Toms River Borough has obtained grant funding to secure an easement along the 50 foot former rail ROW that is privately owned, which would enable the County to construct another segment along Route 166 to the same point at the bridge. In Toms River, the trail will begin near Herflicker Boulevard, and is

APPENDIX K

ROAD OWNER RESPONSE

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

C. Roberts Mulloy, P.E., P.P.
Assistant County Engineer

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

Mark F. Jehnke, P.E.
Traffic Engineer

Lukasz Praski, P.E.
Supervising Engineer, Bridges

Gary Leemann, P.E.
Principal Engineer, Highways

OFFICE OF THE OCEAN COUNTY ENGINEER
129 Hooper Avenue • P.O. Box 2191
Toms River, New Jersey 08754-2191

Voice (732) 929-2130
Telefax (732) 506-5182
Road Opening Permit (732) 929-2124
Traffic (732) 349-8165

April 23, 2019

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

Re: Traffic Safety Evaluation
Water Street, Toms River Township

Dear Ms. Steponanko:

We would like to take this opportunity to thank the Road Safety Audit Team for their time and effort to evaluate traffic safety along Water Street in Toms River Township. The team provided identified many opportunities for improvements along the corridor that will be useful in our future evaluations.

Please note since the RSA occurred, Toms River Township has received a BUILD grant that includes the Water Street Corridor. Many of the improvements identified in their BUILD grant are the same as what was identified in the RSA. Ocean County is working in cooperation with Toms River Township in evaluating the recommendations identified in the BUILD grant for their possible implementation. Upon completion of this evaluation, The County will be in a better position to evaluate and consider the recommendations for implementation.

If you have any questions, please do not hesitate to contact this office.

Sincerely,

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

JNE/JS/kk
cc: C. Roberts Mulloy, Assistant County Engineer
Mark F. Jehnke, Traffic Engineer

RECEIVED APR 26 2019

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