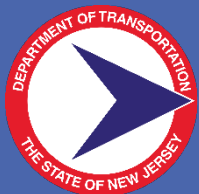




Road Safety Audit:

OAK TREE ROAD (CR 604),
FARMHAVEN AVE TO GARDEN STATE PARKWAY
(MP 2.31-3.28)



September 2023
Issued November 2023

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Executive Summary

This document is the draft report of the Road Safety Audit (RSA) conducted along Oak Tree Road (CR 604) from Farmhaven Avenue to Garden State Parkway, in Edison and Woodbridge Townships, Middlesex 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.

The aforementioned roadway section was identified on NJDOT's Network Screening list. According to the NJDOT crash database, there were 230 crashes from 2018 to 2020 along the study area section of Oak Tree Road. There were 10 pedestrian crashes from 2016 to 2020, none of which were fatal.

The hybrid RSA was conducted on Monday, April 24, and Tuesday, April 25, 2023. The pre-audit meeting was conducted online via Microsoft Teams on Monday and the field visit and post-audit were conducted on Tuesday. Representatives from Middlesex County, Edison Township, Woodbridge Township, NJDOT, NJTPA, NJ TRANSIT, and Keep Middlesex Moving TMA were in attendance during one or both days.

The RSA site and crash history are described in Sections II and III of this report, respectively. Section II also identifies previous and on-going studies conducted by the agency representatives. Corridor-wide and site-specific issues and recommendations, organized by location, are discussed in Section V. These recommendations addressed pedestrian safety by ensuring ADA compliance, repairing sidewalks, and providing compliant pedestrian signal equipment at traffic signals. Additionally, many suggestions were made to provide access management, provide a shared use path, improve, and simplify signage, and improve lighting.

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

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

I. Introduction

A. Site Selection

This section of Oak Tree Road was identified on NJDOT’s Network Screening lists, as shown below. The current Network Screening list rankings are based on 2014-2016 vehicular and 2012-2016 pedestrian crash data, unless noted otherwise.

Table 1 – County Ranking, Top 50 (Corridor)

Location	Ped Corridor	Regional Corridor
Oak Tree Road	#2 (MP 2.28-3.28)	#1 (MP 2.25-3.25)

Table 2 – County Ranking, Top 50 (Intersection)

Location	Intersections	Pedestrian Intersections
Wood Ave (MP 2.96)	-	#20

B. What is a Road Safety Audit (RSA)?

An 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. RSAs focus on evaluating the safety of both pedestrians and bicyclists, which may include looking beyond the roadway to include other paths, connections, and generators.

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



C. The RSA Event

This hybrid RSA was conducted on Monday, April 24, and Tuesday, April 25, 2023. The pre-audit meeting was conducted online via Microsoft Teams on Monday and the field visit and post-audit were

conducted on Tuesday. Representatives from Middlesex County, Edison Township, Woodbridge Township, NJDOT, NJTPA, NJ TRANSIT, and Keep Middlesex Moving TMA were in attendance during one or both days. A list of team members can be found in Appendix A. Other organizations that the RSA Team identified that may have an interest in the project area include the local businesses.

II. Corridor Description and Analysis

A. Study Location and Other Studies

The study area consists of approximately one (1) mile of Oak Tree Road (MP 2.31-3.28). The adjacent land use along the corridor is a mix of commercial and residential properties. Of note, Oak Tree Road between Farmhaven Road and Wood Avenue is under the jurisdiction of Edison Township, and Oak Tree Road between Wood Avenue and Garden State Parkway is under the jurisdiction of Woodbridge Township. The following sections provide additional information.

B. Roadway and Intersection Characteristics

Oak Tree Road is an undivided urban principal arterial, with 4 travel lanes between Farmhaven Road and Wood Avenue, and 2 travel lanes between Wood Avenue and Garden State Parkway. Shoulders are not present in either section. The posted speed is 40 mph west of Plymouth Drive, and 25 mph east of Plymouth Drive. There are 4 signalized and 9 unsignalized intersections.

C. Existing Bicycle/Pedestrian Accommodations

Sidewalk is provided along the majority of Oak Tree Road. Sidewalk is not present along Oak Tree Road westbound between Sugar Road and Wood Avenue. Some locations do not have a minimum of three (3) feet around an obstruction. Marked crosswalks consist of double lines, or ladder styles depending on location. Sidewalk and crosswalk conditions vary from newly installed to needing maintenance. There are no bicycle lanes or other bicycling infrastructure identified along the corridor. The Audit Team observed significant pedestrian volumes on Oak Tree Road.

D. Traffic Volumes

The 2020 Annual Daily Traffic (ADT) along Oak Tree Road in the vicinity of Wood Avenue is approximately 11,950 vehicles per day. The 2017 ADT along Oak Tree Road between Wood Avenue and Plymouth Drive is approximately 15,000 vehicles per day. A copy of the available data can be found in Appendix E.

E. Transit Service

NJ TRANSIT bus service is provided along Oak Tree Road via routes 48, 801, and 804. Stops are located at or near Farmhaven Avenue/Elmyer Avenue, Sugar Road, Henry Street, Wood Avenue, and Plymouth Drive/Magnolia Road.

F. Community Profile

The American Community Survey (ACS) estimate, which updates the 2010 Census population and income characteristics, was used to identify minority and low-income populations surrounding the project limits. The latest ACS for this study area is a five-year estimate from 2016 through 2020. A summary of the demographics is listed below. Bold denotes that the percentage is above the Middlesex County average.

Table 3 – Study Area Demographics

Characteristic	Study Area	County Average
Demographic Index	55%	-
Race/Ethnicity	-	-
<i>White</i>	16%	42%
<i>Hispanic/Latino</i>	8%	21%
<i>Black or African American</i>	5%	10%
<i>Asian American</i>	66%	24%
<i>American Indian/Alaskan</i>	1%	0%
<i>Other¹</i>	4%	2%
People over age 64	17%	15%
People under age 18	21%	22%
Low Income	5%	9%
Limited English Proficiency	26%	14%
Persons with a Disability	8%	10%
Use Public Transportation	9%	4%
Walk/Bike to Work	1%	1%
Homes with No Vehicle Available	10%	8%

The Demographic Index in the study area is above 50%. Therefore, this area may be considered to fall within a historically underserved community.

G. Land Use

The area surrounding Oak Tree Road is commercial/residential. The YMCA is located west of Farmhaven Avenue. The open/vacant lot in the northeast corner of Oak Tree Road and Sugar Road is utilized for holding cultural events that draws huge crowds and pedestrians cross Oak Tree Road to access the lot. Throughout the corridor are various restaurants and convenience stores. Additional features are shown on the project area map in Appendix B.

III. Crash Findings

The analysis used in the RSA was based on reportable crashes found in the NJDOT crash database resulting in a fatality, injury and/or property damage. Corridor-wide crash characteristics and overrepresentations were compared to the 2020 statewide average for the county road system as further detailed below. All crashes were plotted onto collision diagrams, which can be found in Appendix C and D.

According to the NJDOT crash database, 220 vehicular crashes occurred during the 3-year period between January 1, 2018 and December 31, 2020 along the study area. There were 10 pedestrian and zero bicyclist crashes over the 5-year period between January 1, 2016 and December 31, 2020. The total number of crashes used for the RSA was 230.

A. Temporal Trends

Total crashes varied (either higher or lower) from the county average except in April, October and November. In general, crashes were in line with day of week averages.

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'

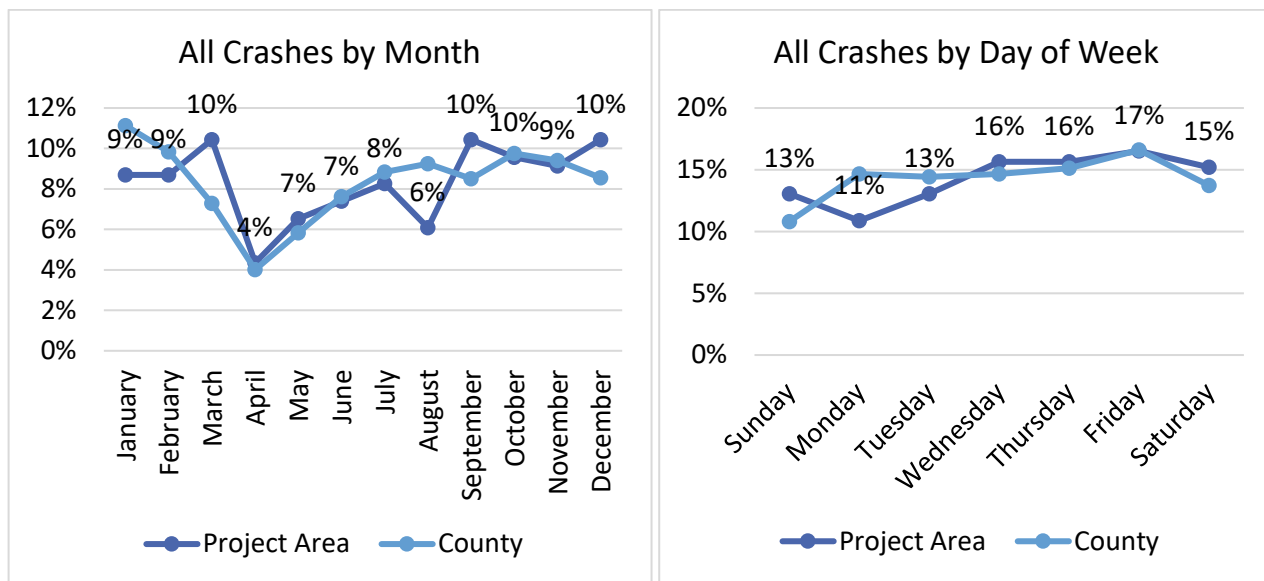


Figure 1 – Total Crashes by Month and Day of Week

Collisions with pedestrians and bicyclists were highest on Tuesdays and during January.

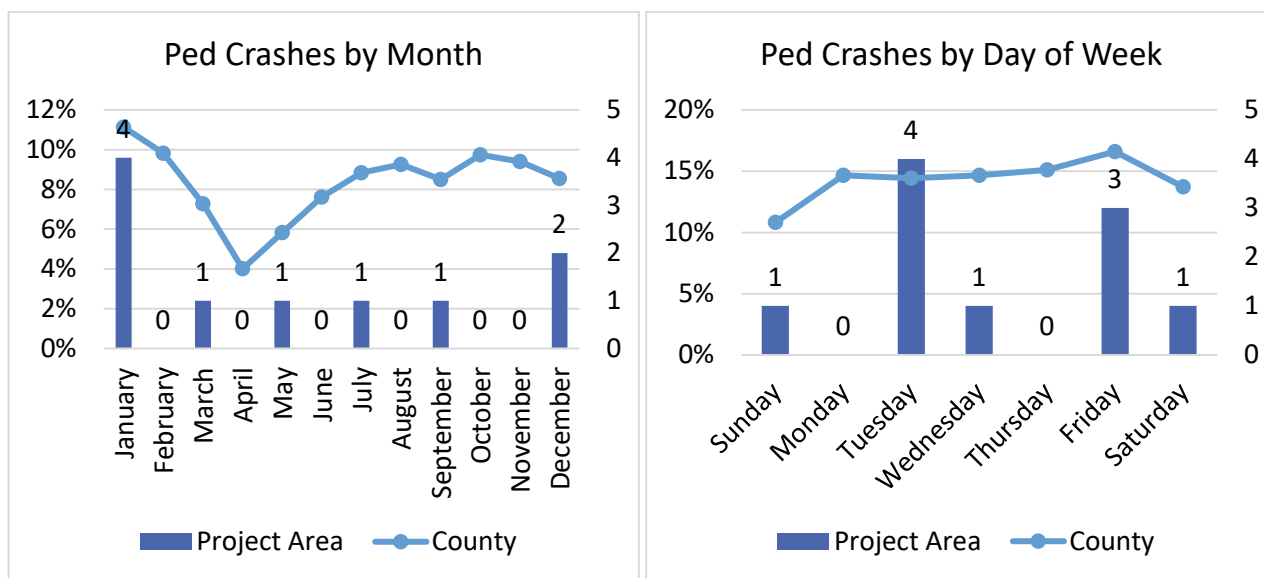


Figure 2 – Pedestrian/Bicyclist Crashes by Month and Day of Week

B. Collision Types

Overrepresented crash types included same direction-rear end, same direction-side swipe, right angle, left turn, and pedestrian. Same direction rear end and right angle crashes were the predominant crash types (58% of total).

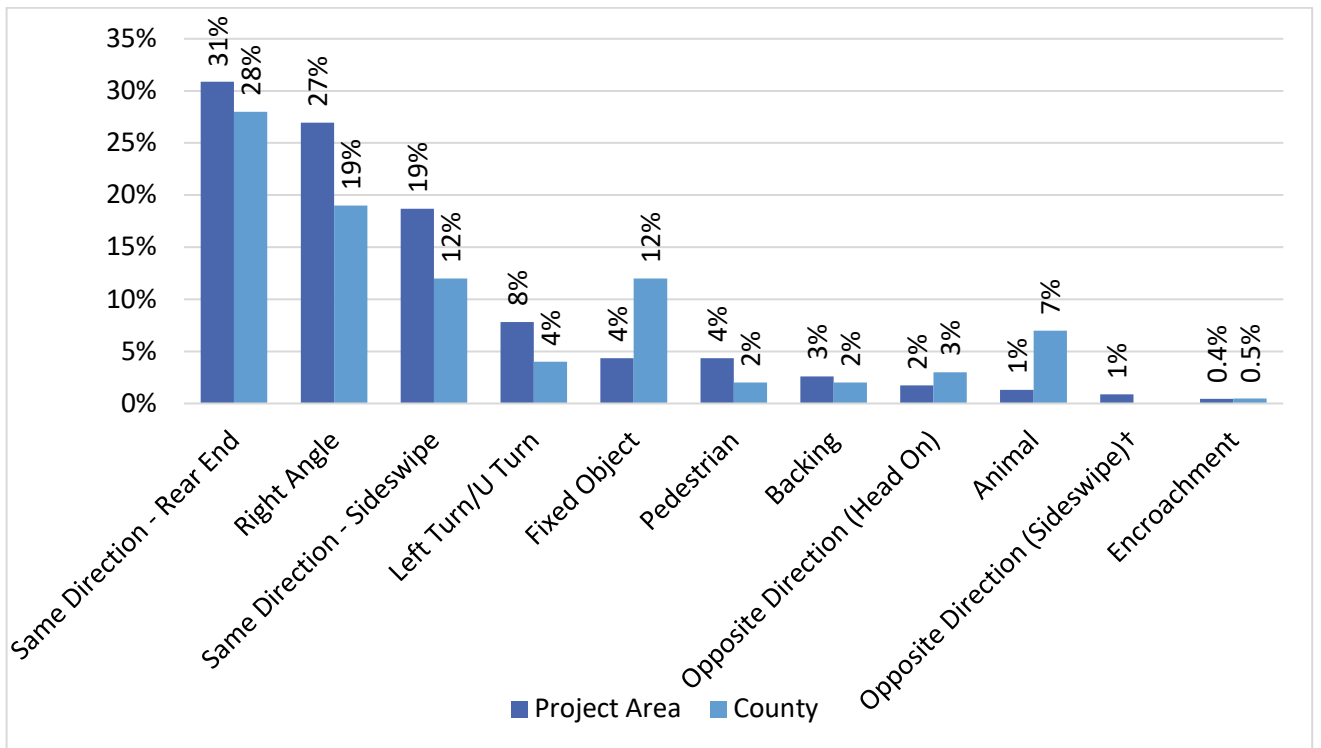


Figure 3 – Crash Type Breakdown

C. Severity

No fatal vehicular or pedestrian crashes were identified in the studied time period. Two (2) pedestrian crashes included a possible injury, 7 included a suspected minor injury, and 1 included a suspected serious injury during the time period studied.

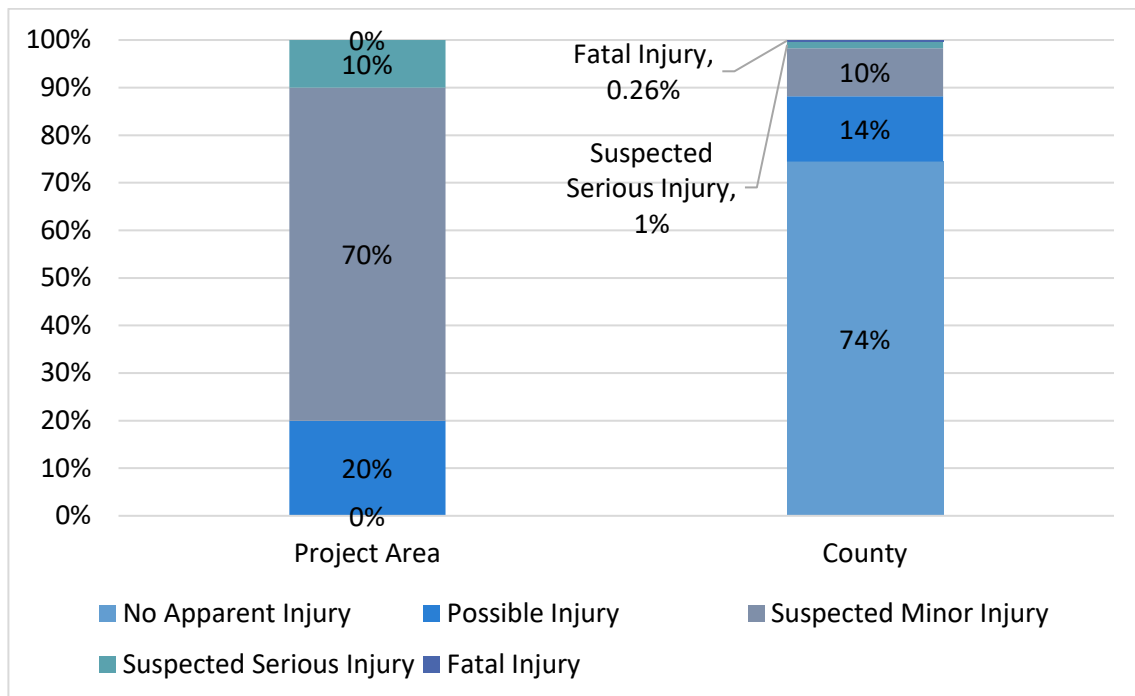


Figure 4 – Severity (Pedestrian/Bicycle Crashes)

D. Roadway Surface & Light Condition

Overrepresented conditions included nighttime (28%) and wet surface (18%). All other conditions are similar to or underrepresented compared to the county road system.

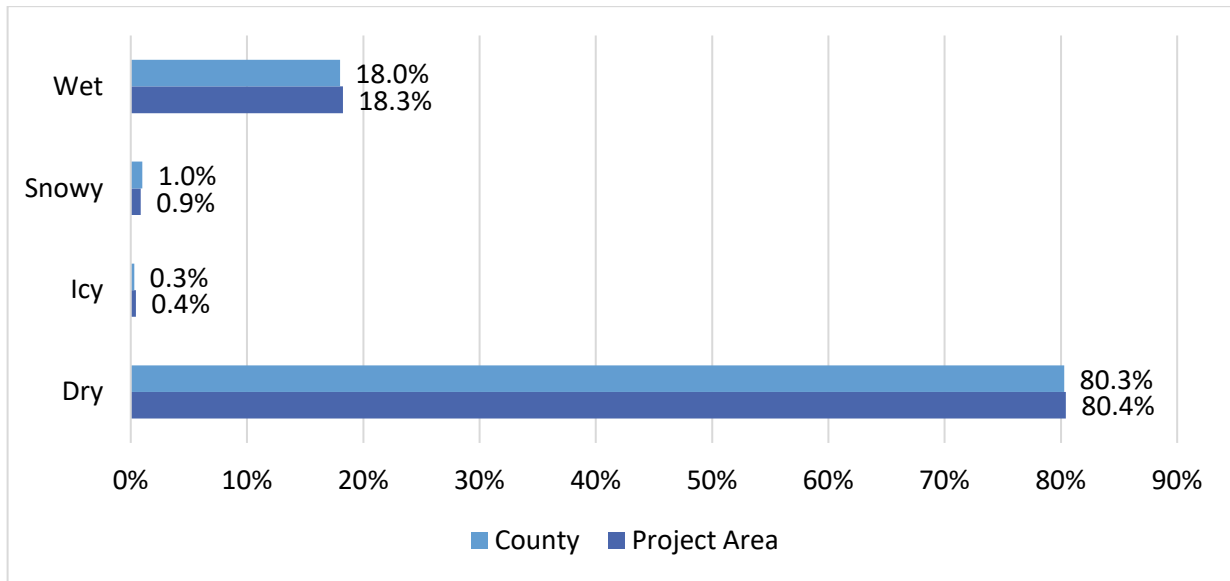


Figure 5 – Surface Conditions (All Crashes)

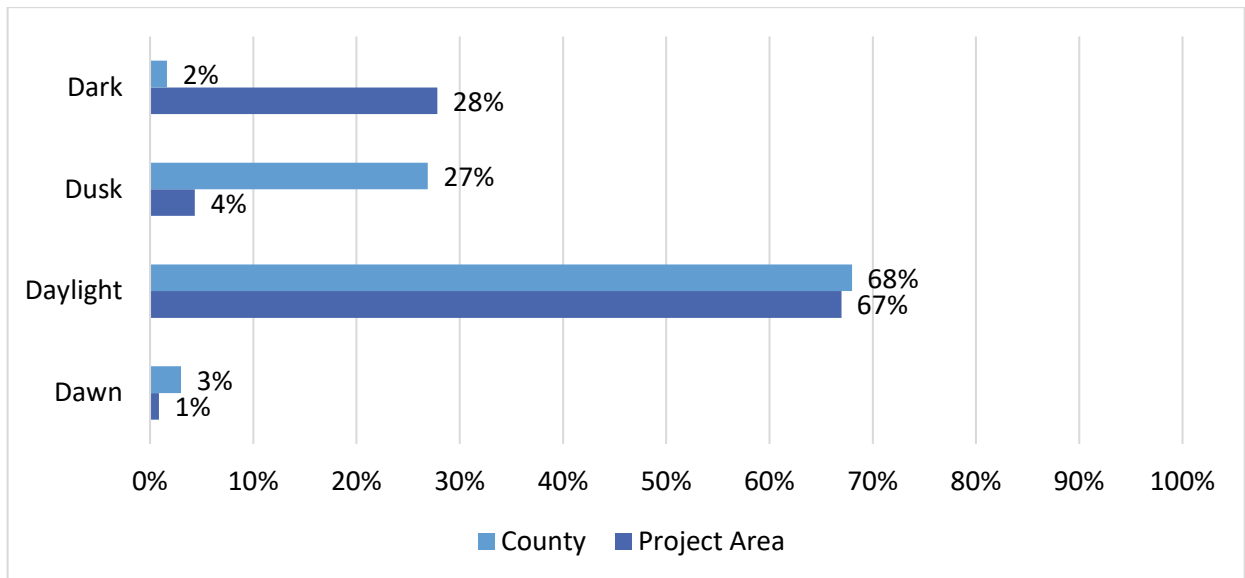


Figure 6 – Light Conditions (All Crashes)

Seventy percent (70%) of pedestrian crashes occurred at night and all occurred on dry surface. As shown in the figures below, these are overrepresented compared to the county road system.

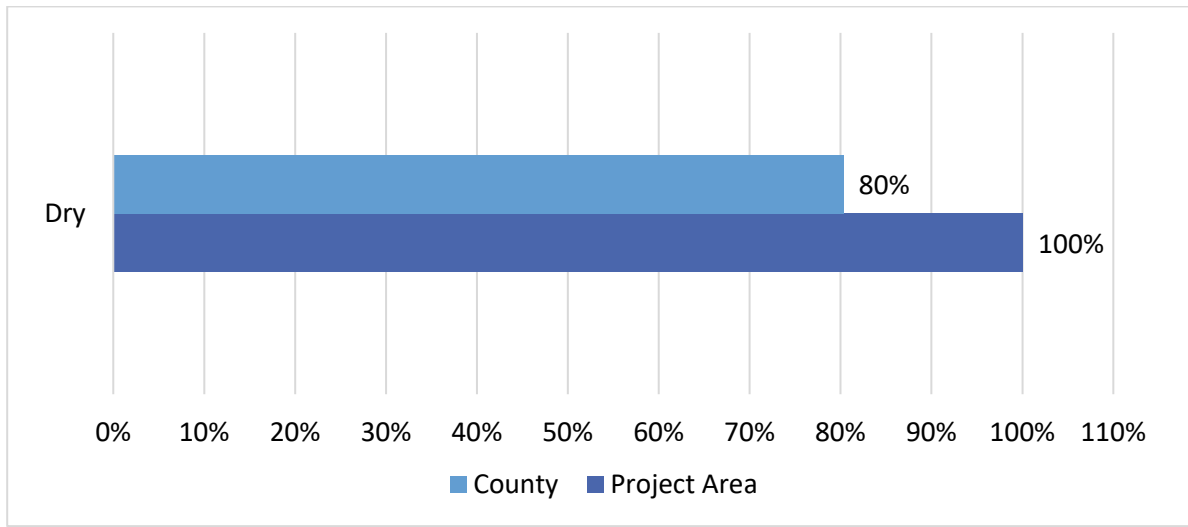


Figure 7 – Surface Conditions (Pedestrian/Bicycle Crashes)

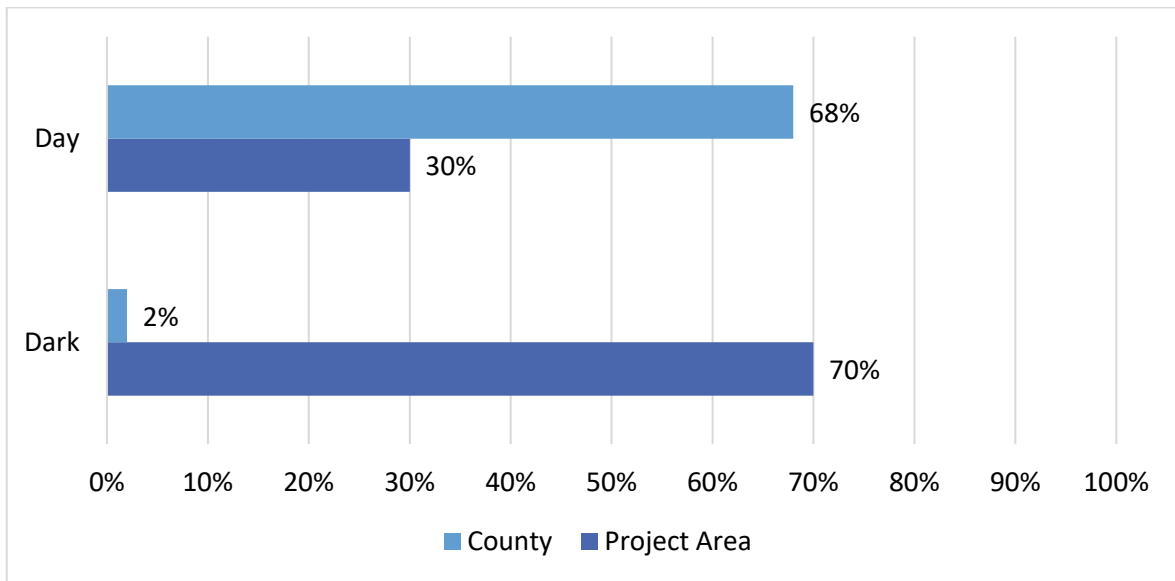


Figure 8 – Light Conditions (Pedestrian/Bicycle Crashes)

E. Location

Ten percent (10%) of crashes occurred at signalized intersections, 12% occurred at unsignalized intersections, and 77% occurred between intersections. In comparison, 14%, 23%, and 63% of crashes on all county roads occur at signalized intersections, unsignalized intersections, and between intersections, respectively. One (1) pedestrian/bicyclist crashes occurred at a midblock location with the remaining 9 occurring at an intersection. Of those at an intersection, 4 of the 9 crashes occurred outside a marked crosswalk (e.g., crossing over a median barrier or divisional island; crossing not striped).

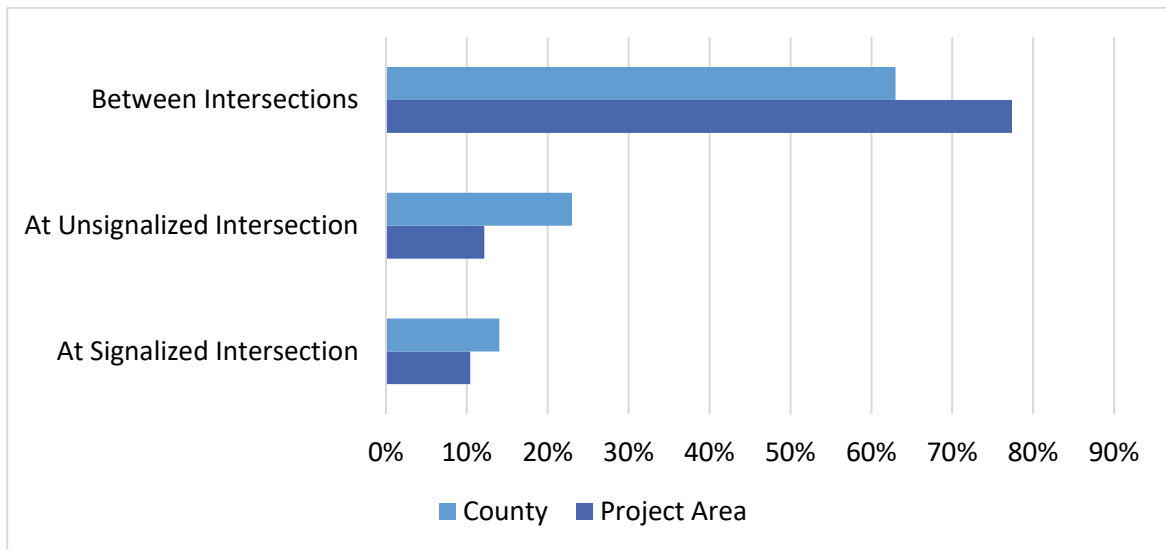


Figure 9 – Crash Location

IV. Identified Issues & Observations

This section summarizes the common corridor-wide safety issues identified during the RSA and are not all inclusive. They are categorized into operations (including visibility) and maintenance issues, and pedestrian and bicyclist issues. Additional site-specific issues and photographs are in Appendix F.

A. Pedestrian/Bicyclist



Observation / Photo Location

Uneven sidewalk may pose tripping hazard; No buffer between sidewalk and roadway

Oak Tree Road between Farmhaven Avenue and Cinder Road



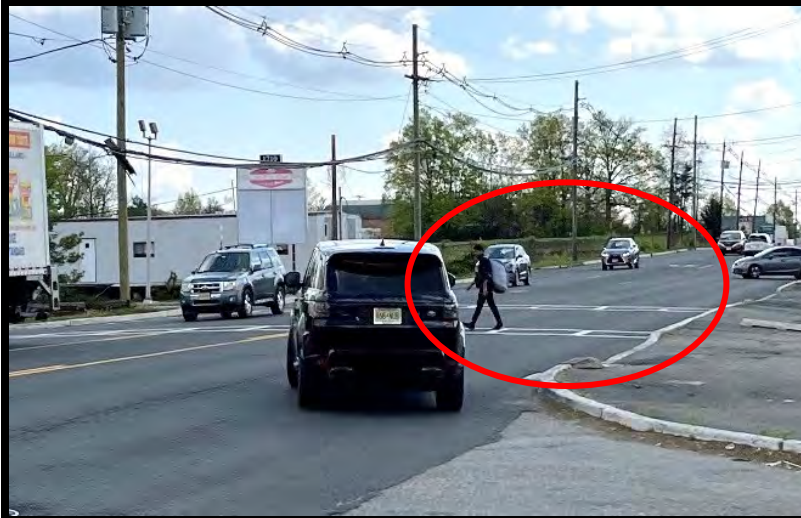
Missing curb ramps and crosswalks to cross the main street and side street

Oak Tree Road and Farmhaven Avenue / Ellmyer Avenue



Debris at base of curb ramp indicates possible drainage issues

Oak Tree Road and Sugartree Plaza / Cittone Institute



Observation / Photo Location

Missing ADA curb ramps
Long crossing distance for pedestrians; Absence of pedestrian warning signs;
Vehicles traveling at higher speeds do not yield to pedestrians

Oak Tree Road and Sugar Road



Missing sidewalk, ADA ramps, and crosswalks

Oak Tree Road between Sugar Road and Dayton Drive



Observation / Photo Location

Steep slope along sidewalk; lack of concrete sidewalk

Oak Tree Road between Dayton Drive and Mehtani Way



Observation / Photo Location

Ramps not ADA compliant; Missing crosswalk; No ramps at refuge island

Oak Tree Road between Henry Street and Wood Avenue



Retail signs obstructing sidewalk
Oak Tree Road near Sugar Road

B. Operations, Visibility, and Maintenance



Observation / Photo Location

Confusion on proper use of the center two way left turn lanes

Oak Tree Road and Farmhaven Road



Observation / Photo Location

Mast arm signs not retro-reflective
 Cittone Ave / driveway closed;
 pedestrian push button for east crosswalk triggers phase for Cittone Ave and just the east crosswalk.

Oak Tree Road and Sugartree Plaza / Cittone Institute



Sightline obstructed by building
Oak Tree Road and Minebrook Road



Broken pedestrian push button and sign
Oak Tree Road and Wood Avenue

The Audit Team also observed vehicles traveling at higher speeds than the posted speed limit; large curb radii at intersections; sightline obstructions from the side streets due to vegetation and retail signs; lack of shoulder markings; narrow pavement markings; worn crosswalk markings; intermittent sidewalk; and signs obstructing the sidewalk.

V. Findings and Recommendations

This section summarizes the site-specific and corridor-wide safety issues, potential strategies, and recommendations to improve the same. The safety benefit, time frame, cost, and jurisdiction are listed alongside each recommendation. Ratings used in the tables are described as follows. N/A indicates safety benefit not determined. Recommendations in ***bold italics*** are FHWA Proven Safety Countermeasures.

Symbol	Meaning	Definition
N/A	Not available	Safety benefit not determined
✓	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

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.

Symbol	Meaning	Definition
✓✓✓	Moderate safety benefit potential	May reduce total crashes by 50-74% ³
✓✓✓✓	High safety benefit potential	May reduce total crashes by 75+% ³
\$	Low cost	Could be accomplished through maintenance
\$\$	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 and analysis
◑	Long term	Could be accomplished in 3 years or more; may require full engineering and analysis

A. Recommendations

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

Table 4 – Corridor-Wide Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
Operations					
1	Consider upgrading all ramps for ADA compliance	✓✓✓ ⁴	\$\$\$	◐	County/ Township
2	Consider corridor-wide signal upgrades (8" to 12" signal heads, install backplates with retroreflective border , evaluate clearance intervals, update to countdown pedestrian signal heads, replace push buttons for ADA compliance, signal timings, lighting, etc.)	✓✓	\$\$\$	◑	County/ Township
3	Consider installing additional signage (speed limit, intersection warning signs) and updating signage and ensure it is consistent throughout corridor	✓	\$	☉	County/ Township
4	Consider conducting a lighting analysis for the corridor and add pedestrian or street-level lighting as appropriate	✓✓✓	\$\$	◐	County/ Township
5	Review access management for the corridor and consider driveway revisions or consolidation	✓	\$\$\$	◑	County/ Township
6	Consider road diet for the corridor (reduce 5 lanes to 3 lanes)	✓✓ ⁴	\$\$	◐	County/ Township

³ Based on existing Crash Modification Factors (CMFs), the Highway Safety Manual (HSM), FHWA Proven Safety Countermeasures and current research, where applicable. All safety benefits are approximate.

⁴ CMF/quantitative data not available for this type of roadway or treatment. Therefore, perceived safety benefit of the same was estimated relative to other similar treatments.

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
7	Investigate installing edge lines and providing shoulder, especially east of Wood Avenue where the roadway width is 40' for two travel lanes	✓ ⁵	\$	☉	County/ Township
8	Consider reconfiguring stop-controlled intersections to right-in, right-out (RIRO) only operations	✓✓	\$\$	☉	County/ Township
9	Consider installing dynamic speed feedback signs	✓	\$	☉	County/ Township
10	Consider clearing sight triangles at intersections	✓✓	\$	☉	County/ Township
11	Consider providing raised median island where there are no driveways present	✓✓✓	\$\$	☉	County/ Township
12	Consider installing curb in areas where missing	✓	\$\$	☉	County/ Township
Bicycle/Pedestrian					
13	Inspect, repair and construct sidewalk in compliance with ADA as needed with appropriate buffer from travel lanes, including driveway aprons; complete any missing connections, including installing concrete sidewalk across driveways where missing	✓✓✓	\$\$	☉	County/ Township
14	Examine crosswalks status: check placement, alignment, and markings	✓✓	\$	☉	County/ Township
15	Consider improvements to bus stops including providing floating bus stops	N/A	\$	☉	County/ NJ TRANSIT
16	Consider providing high-visibility crosswalk markings for all intersections throughout corridor	✓✓	\$	☉	County/ Township
17	Investigate providing Leading Pedestrian Interval (LPI) at signalized intersections	✓✓✓	\$	☉	County/ Township
18	Consider shared use path throughout the corridor	✓	\$	☉	County/ Township
Maintenance					
19	Inspect existing striping for wear and restripe accordingly	✓✓	\$	☉	County/ Township
20	Inspect and replace missing, faded, damaged or incorrect/outdated signage as needed (i.e., signs mounted below 7-ft, or on non-breakaway posts)	✓	\$	☉	County/ Township
21	Inspect and trim foliage/vegetation and take out retail signs to improve sidewalk paths	✓ ⁵	\$\$	☉	County/ Township
22	Inspect drainage facilities; ensure they are free of debris	✓ ⁵	\$\$	☉	County/ Township
Education					
23	Consider periodic sidewalk, crosswalk, multimodal education campaign and code enforcement	✓ ⁵	\$	☉	KMM TMA/ Township

⁵ 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.

The following site-specific recommendations are in addition to the corridor-wide improvements, except if noted otherwise. Since Wood Avenue has planned construction, and Plymouth Drive / Magnolia Avenue is currently under construction, it is advised to coordinate any recommendations with Woodbridge and Edison Townships.

Table 5 – Site-Specific Recommendations

No.	Recommendation	Safety Benefit	Cost	Time Frame	Jurisdiction
Farmhaven Avenue					
24	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁶	\$\$\$	●	County/ Township
25	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⌚	County/ Township
26	Consider corridor-wide recommendation 8 for RIRO only operations; install <i>median</i> to restrict left turns	✓✓	\$\$	⌚	County/ Township
27	Consider providing deer crossing signs (frequent animal migration area)	✓ ⁶	\$	⌚	County
Meridian Road					
28	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁶	\$\$\$	●	County/ Township
29	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⌚	County/ Township
Cinder Road					
30	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁶	\$\$\$	●	County/ Township
31	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⌚	County/ Township
32	Consider corridor-wide recommendation 8 for RIRO only operations and connecting Cinder and Minebrook Roads	✓✓	\$\$	⌚	County/ Township
33	Consider adding two-way left-turn lane markings	✓✓	\$	⌚	County/ Township
Sugartree Plaza / Cittone Institute					
34	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁶	\$\$\$	●	County/ Township
35	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⌚	County/ Township

⁶ 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
36	Consider corridor-wide recommendation 2 regarding signal upgrades, including signal phasing for protected only left turns and east and west crosswalk with Cittone Avenue phase	✓✓	\$\$\$	●	County
37	Investigate relocation of pedestrian sign placement on southwest corner	✓	\$	⦿	County
38	Consider corridor-wide recommendation 5 regarding access management	✓	\$\$\$	●	County/ Township
39	Consider installing Signal Ahead warning sign	✓	\$	⦿	County
Minebrook Road					
40	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁷	\$\$\$	●	County/ Township
41	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⦿	County/ Township
42	Consider corridor-wide recommendation 10 regarding clearing sight triangles	✓✓	\$	⦿	County/ Township
43	Consider building curb bump outs and reducing curb radii	✓✓	\$	⦿	County/ Township
44	Consider installing Signal Ahead warning sign for the intersection	✓	\$	⦿	County/ Township
45	Consider corridor-wide recommendation 8 for RIRO only operations	✓✓	\$\$	●	County/ Township
Sugar Road					
46	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks; consider providing barrier between parking and sidewalk	✓✓✓ ⁷	\$\$\$	●	County/ Township
47	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	⦿	County/ Township
48	Consider installing pedestrian warning signs	✓	\$	⦿	County/ Township
49	Consider installing Rectangular Rapid Flashing Beacon (RRFB)	✓✓	\$	●	County
50	Consider installing pedestrian refuge island ; investigate eliminating west crosswalk	✓✓✓	\$\$	●	County/ Township
51	Investigate removal of utility remnants on northeast corner and relocation of retail signs impeding walkway	✓✓ ⁷	\$	⦿	County/ Township
52	Consider relocating bus stops to far side at Dayton Drive	N/A	\$	●	NJ TRANSIT
Dayton Drive					

⁷ 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
53	Consider installing a traffic signal if warranted	✓✓	\$\$\$	●	County/ Township
54	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁸	\$\$\$	●	County/ Township
55	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	●	County/ Township
56	Consider replacing left and thru arrow marking on Dayton Drive with left arrow marking	✓✓	\$	●	County/ Township
57	Consider corridor-wide recommendation 10 regarding clearing sight triangles	✓✓	\$	●	County/ Township
58	Investigate relocating retail signs, and the Hilltop and Trafalgar Apartments sign	✓✓	\$	●	County/ Township
59	Consider installing <i>pedestrian refuge island</i>	✓✓✓	\$\$	●	County/ Township
60	Consider flattening cross slope along King Palace driveway for improving walkway accessibility	✓✓✓ ⁸	\$\$\$	●	County/ Township
61	Consider adding Dayton Drive street name sign	✓	\$	●	County/ Township
Mehtani Way					
62	Consider corridor-wide recommendations 1, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁸	\$\$\$	●	County/ Township
63	Consider installing pedestrian warning signs	✓	\$	●	County/ Township
64	Consider installing traffic signal ahead warning sign to west of the intersection on Oak Tree Road	✓	\$	●	County/ Township
65	Consider installing Yield to Pedestrian signs on Mehtani Way approaches	✓	\$	●	County/ Township
Henry Street					
66	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁸	\$\$\$	●	County/ Township
67	Consider providing barrier between parking and sidewalk at TRAX Car Wash Edison to eliminate overhang parking over sidewalk	✓✓✓ ⁸	\$\$\$	●	County/ Township
68	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and stop bar	✓✓	\$	●	County/ Township
Wood Avenue					
69	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁸	\$\$\$	●	County/ Township

⁸ 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
70	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and lining up left turn lanes	✓✓	\$	☉	County/ Township
71	Consider corridor-wide recommendation 2 and 17 regarding signal upgrades and <i>LPIs</i>	✓✓	\$\$\$	●	County/ Township
72	Consider installing advance lane use and signal ahead warning for the intersection	✓	\$	☉	County
73	Consider installing <i>pedestrian refuge island</i>	✓✓✓	\$\$	●	County/ Township
Plymouth Drive / Magnolia Avenue					
74	Consider corridor-wide recommendations 1, 4, 13, and 16 regarding ADA compliance, sidewalk, and crosswalks	✓✓✓ ⁹	\$\$\$	●	County/ Township
75	Consider corridor-wide recommendation 14 and 19 regarding crosswalk and lining up left turn lanes	✓✓	\$	☉	County/ Township
76	Consider providing left turn phasing	✓	\$	☉	County
77	Consider corridor-wide recommendation 2 regarding signal upgrades	✓✓	\$\$\$	●	County/ Township
78	Consider adding a vertical curb or physical barrier at northeast corner to provide separation between driveway and curb ramps	✓	\$\$	☉	County/ Township

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. A copy of Middlesex County’s response is provided in Appendix H.

C. Recommendation Visualizations

Examples of some of the site-specific and corridor-wide safety recommendations identified in Tables 4 and 5 are shown below and are based on current practices and standards. Descriptions and images of each treatment are from the *2017 NJ Complete Street Design Guide* (CSDG) and NACTO’s *Urban Street Design Guide* (NACTO-US) and *Urban Bikeway Design Guide* (NACTO-UB), including sources contained therein. These examples are meant to be generic and for informational purposes only.

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, as well as current and

⁹ 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.

future pedestrian demand. ADA curb ramps should be oriented in the direction of the crosswalk approaches and should have compliant detectable warning surfaces.

Crossing islands, or pedestrian refuge islands, reduce the exposure time of pedestrians to vehicular traffic. Pedestrians can cross in two stages — crossing one direction of vehicular travel lanes, pausing at the island, and then completing the crossing. While recommended for crossing three lanes of traffic in one or both directions, they may be implemented on smaller cross sections where space permits. Curb extensions physically and visually narrow the roadway at intersections and midblock locations, creating safer and shorter pedestrian crossings, while increasing the available space for streetscape. They increase the overall visibility of pedestrians by aligning them with the shoulder or parking lane and help prohibit vehicles from parking in violation of Title 39.

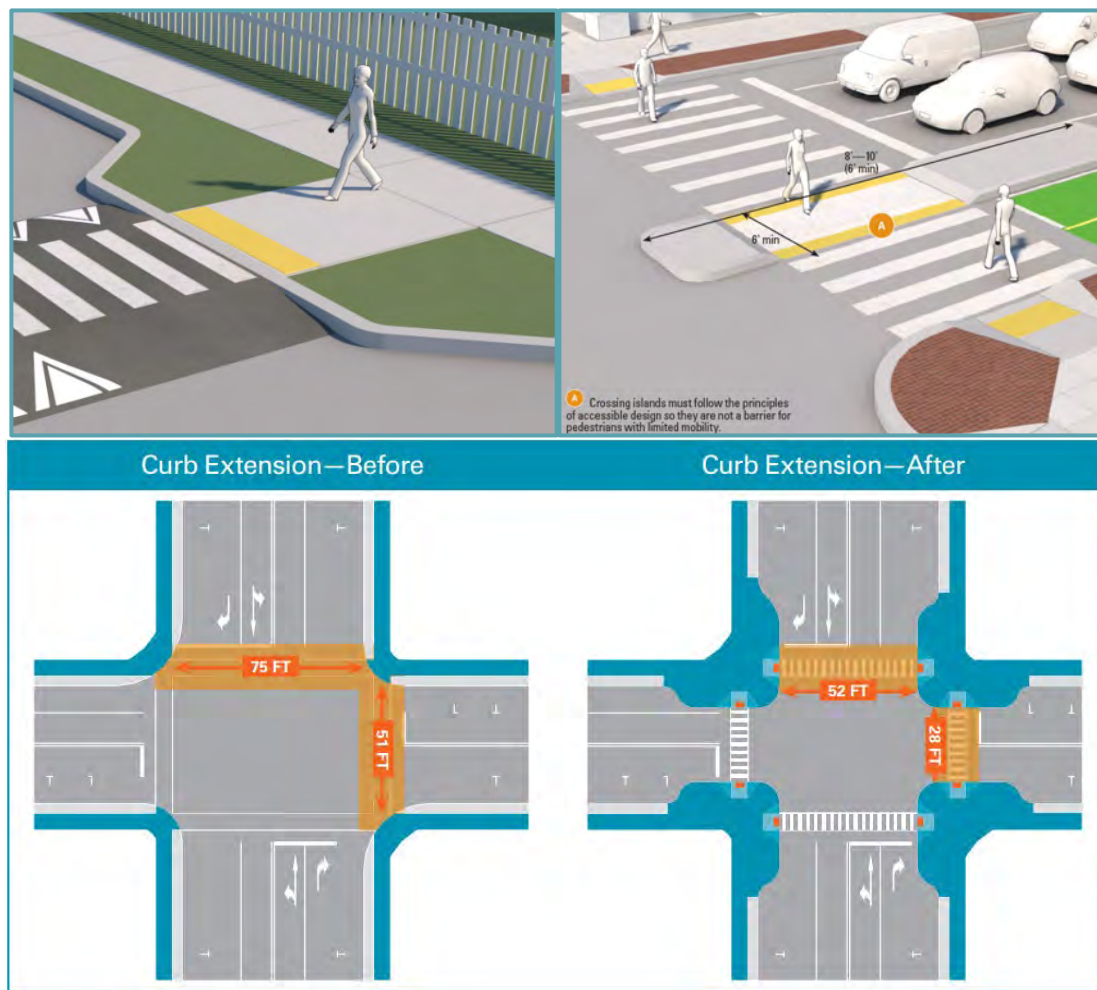


Figure 10 – Pedestrian Facility Examples
Left: Midblock Curb Extension. Right: Crossing Island. Bottom: Curb Extension (Source: CSDG)

The design of driveways should provide a continuous and level pedestrian path across the vehicular zone, encouraging drivers to stop for pedestrians on the sidewalk. Driveways should not be designed where the sidewalk is interrupted by the driveway.

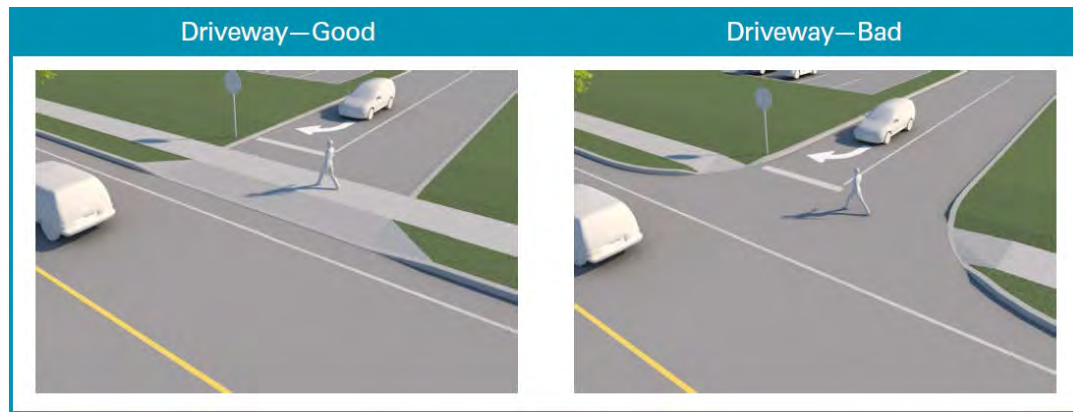


Figure 11 – Sidewalk and Driveways (Source: CSDG)

Crosswalk visibility enhancements, a FHWA Proven Safety Countermeasure, help make crosswalks and the pedestrians, bicyclists, wheelchair and other mobility device users, and transit users using them more visible to drivers. These include high-visibility crosswalks, lighting, and signing and pavement markings. These enhancements can also assist users in deciding where to cross.

2. Bicycle Facilities

Bicycle lanes provide an exclusive space for bicyclists using pavement markings and signage. These lanes enable bicyclists to ride at their preferred speed, free from interference from motorists. Curbside protected bike lanes address conflicts with parking, bus stops, and other curbside activities. 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.

Shared-use paths are bikeways that are distinctly separate from the roadway. Located outside of the cartway, they are separated physically from motorized traffic by a buffer. Shared-use paths are typically designed to accommodate two-way travel for all non-motorized users and are paved or concrete. They can help provide low-stress bicycle accommodations in a variety of circumstances: a shortcut through residential neighborhoods, a commuting route from residential to commercial centers, a recreation route in a park or greenway, or as a side path along a roadway in lieu of (or in addition to) an on-road bicycle facility. Shared-use paths should be built as a system of off-road transportation routes that complements and enhances the on-road bicycle network.



Figure 12 – Bicycle Facility Examples

Left: Curbside bicycle lane (Source: NATCO: UBG). Right: Sharrow Markings (Source: [Eric Gilliland/Flickr](#))
Bottom: Shared-use Path (Source: CSDG)

3. Roadway Reconfiguration

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

The main goal of a road diet is to improve safety by eliminating conflict points between turning, crossing and through traffic and reducing the speed differential which reduces crash severity when crashes do occur. Road diets also benefit pedestrian and bicyclist safety by reducing the number of lanes to cross at an intersection and reallocating space from the travel lane to non-motorized use, such as bicycle lanes. FHWA's *Road Diet Informational Guide* advises that roadways with an ADT of 20,000 vehicles per day (vpd) or less may be good candidates for a road diet. If the ADT of the roadway is near the upper limit, further analysis should be conducted, such as review of peak hour volumes by direction, turning volumes at intersections and driveways, and signal spacing. As noted in Section II.D, the ADT along Oak Tree Road is approximately 11,950 vpd.

4. Bus Stops

In New Jersey, the bus network plays an integral role in the daily transportation needs of residents. Every transit passenger is a pedestrian before and after their transit trip. Safe, comfortable, and convenient pedestrian connections are therefore critical to an effective transit service and encouraging higher ridership. At bus stops, it is important to have an accessible boarding area that must be provided, typically measuring 5 feet long (parallel to the curb) by 8 feet wide (perpendicular to the curb). This includes 5 feet of width for a wheelchair waiting area, plus additional width to deploy a wheelchair ramp to serve the waiting area¹⁰. To reduce conflicts between through traffic and buses at stops, turnouts may be provided. Bus turnouts generally consist of entrance and exit tapers, a stopping area, and length for the bus to accelerate or decelerate.

5. Rectangular Rapid Flashing Beacons

To enhance pedestrian conspicuity and increase driver awareness at uncontrolled, marked crosswalks, transportation agencies can install a pedestrian actuated Rectangular Rapid Flashing Beacon (RRFB) to accompany a pedestrian warning sign. RRFBs consist of two, rectangular-shaped yellow indications, each with a light-emitting diode (LED)-array-based light source¹¹. RRFBs flash with an alternating high frequency when activated to enhance conspicuity of pedestrians at the crossing to drivers. RRFBs can also accompany school or trail crossing warning signs.



**Figure 13 - Example of a Rectangular Rapid Flashing Beacon
(Source: NACTO-Urban Bikeway Design Guide)**

¹⁰ NACTO. *Transit Street Design Guide*. April 2016.

¹¹ MUTCD Interim Approval 21 - RRFBs at Crosswalks

VI. Conclusions

The Oak Tree Road RSA was conducted to identify safety issues and corresponding countermeasures that compromise the multimodal nature of this roadway. The team identified a thorough 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 road users. Some of the strategies identified can be implemented through routine maintenance; however, 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, the Towards Zero Deaths vision, and the Middlesex County Vision Zero Action Plan.

A. RSA TEAM

Audit Team

Name	Agency	Day 1	Day 2
Michael Dannemiller	Middlesex County	X	X
George Fallat	Middlesex County	X	X
Julio Mora	Middlesex County	X	X
Andrew Lappitt	Middlesex County	X	X
Marjoly Mascarenhas	Middlesex County	X	
Valerio D'aloia	Middlesex County	X	
Mike Gelin	Woodbridge Township	X	X
Brian Piccirillo	Edison Engineering	X	X
Sgt. Mike Winters	Edison Police Department		X
Elmira Buongiorno	NJ Transit	X	X
Hailey Graf	NJ Transit		X
Bill Neary	Keep Middlesex Moving TMA	X	X
Yosy Cosme	NJDOT – Bureau of Safety, Bicycle and Pedestrian Programs	X	X
Roseann DiBenedetto	NJDOT – Traffic Engineering	X	X
Dharmesh Patel	NJDOT – Traffic Engineering	X	
Marhaba Omer	NJDOT – Bureau of Safety, Bicycle and Pedestrian Programs	X	
Andy Kaplan	NJTPA	X	X
Patricia Newton	NJTPA	X	X
Aimee Jefferson	NJTPA	X	X
Julia Steponanko	Greenman-Pedersen, Inc.	X	X
Kruti Barot	Greenman-Pedersen, Inc.	X	X
Victoria Rubinetti	Greenman-Pedersen, Inc.	X	X
Romesh Radhakrishnan	Greenman-Pedersen, Inc.	X	X



B. AREA MAP

AREA MAP



IN71 MATCH LINE

Edison YMCA
JCC Middlesex



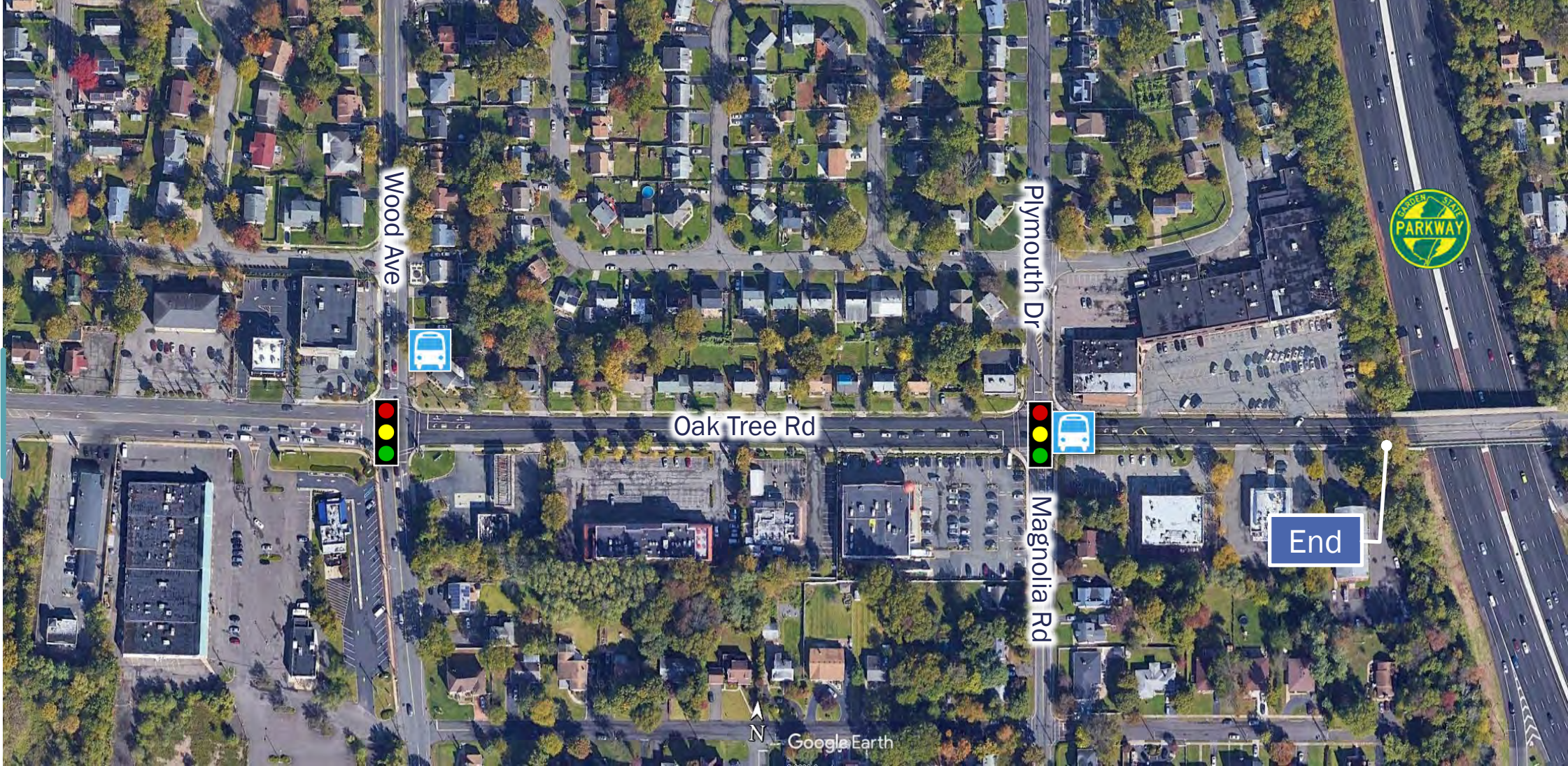
Google Earth

Google Earth

AREA MAP



MATCH LINE



C. PEDESTRIAN CRASH DIAGRAMS

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MATCH LINE A
 SEE SHEET NO. 2 OF 7

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

PEDESTRIAN CRASH

1 / 7

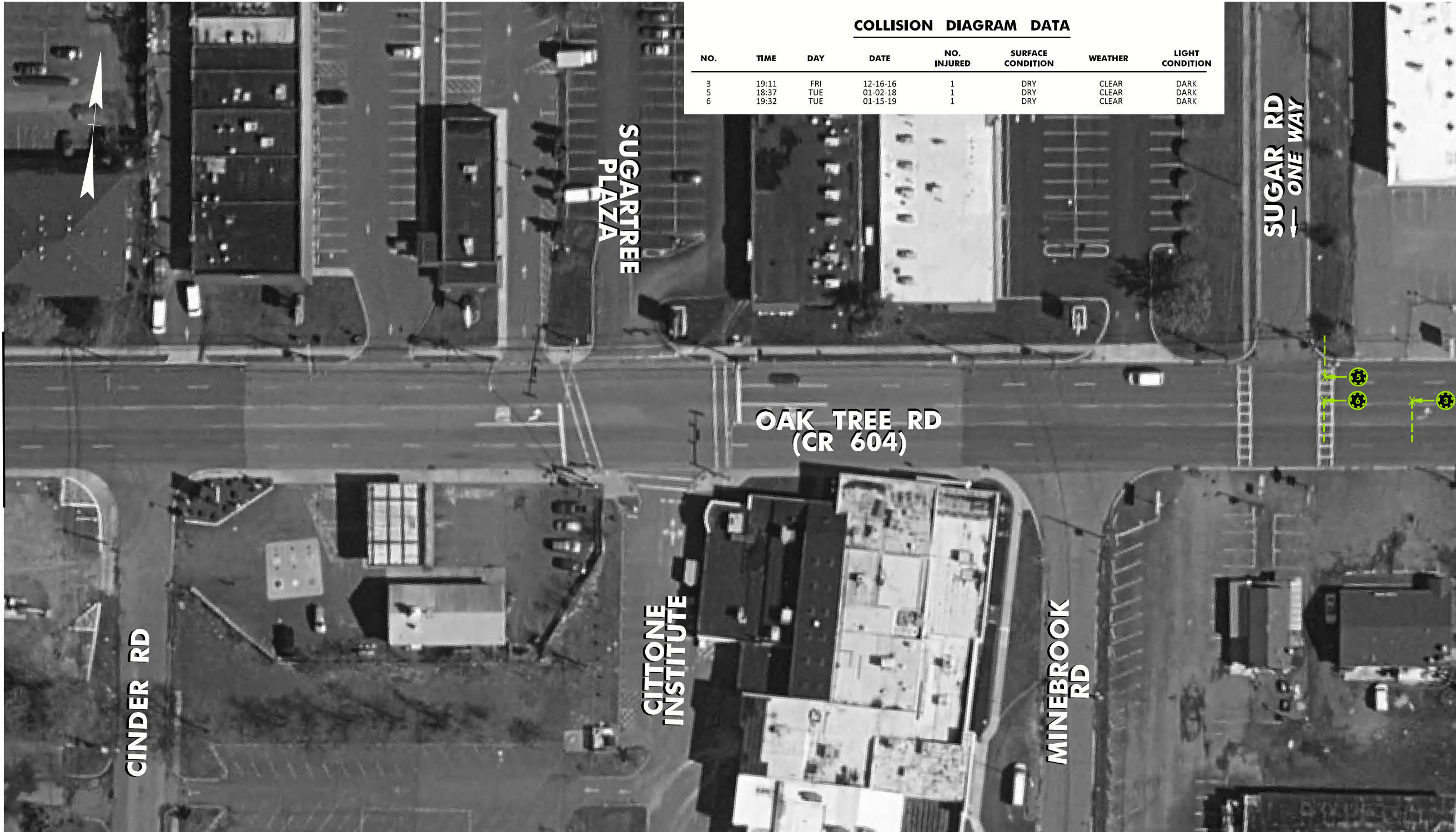
NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
 FROM ELLMYER ROAD TO GARDEN STATE PKWY
 EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAM

GPI Engineering
 Design
 Planning
 Construction Management

NOT TO SCALE



COLLISION DIAGRAM DATA

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5	18:37	TUE	01-02-18	1	DRY	CLEAR	DARK
6	19:32	TUE	01-15-19	1	DRY	CLEAR	DARK

MATCH LINE A
SEE SHEET NO. 1 OF 7

MATCH LINE B
SEE SHEET NO. 3 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	0
INJURIES	3
FATALITIES*	0
TOTAL NO. OF CRASHES	3

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
	ENCROACHMENT
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS

PEDESTRIAN CRASH

2 / 7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

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MATCH LINE B
SEE SHEET NO. 2 OF 7

MATCH LINE C
SEE SHEET NO. 4 OF 7

LEGEND

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

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

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

COLORS	
	PEDESTRIAN CRASH

3 / 7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

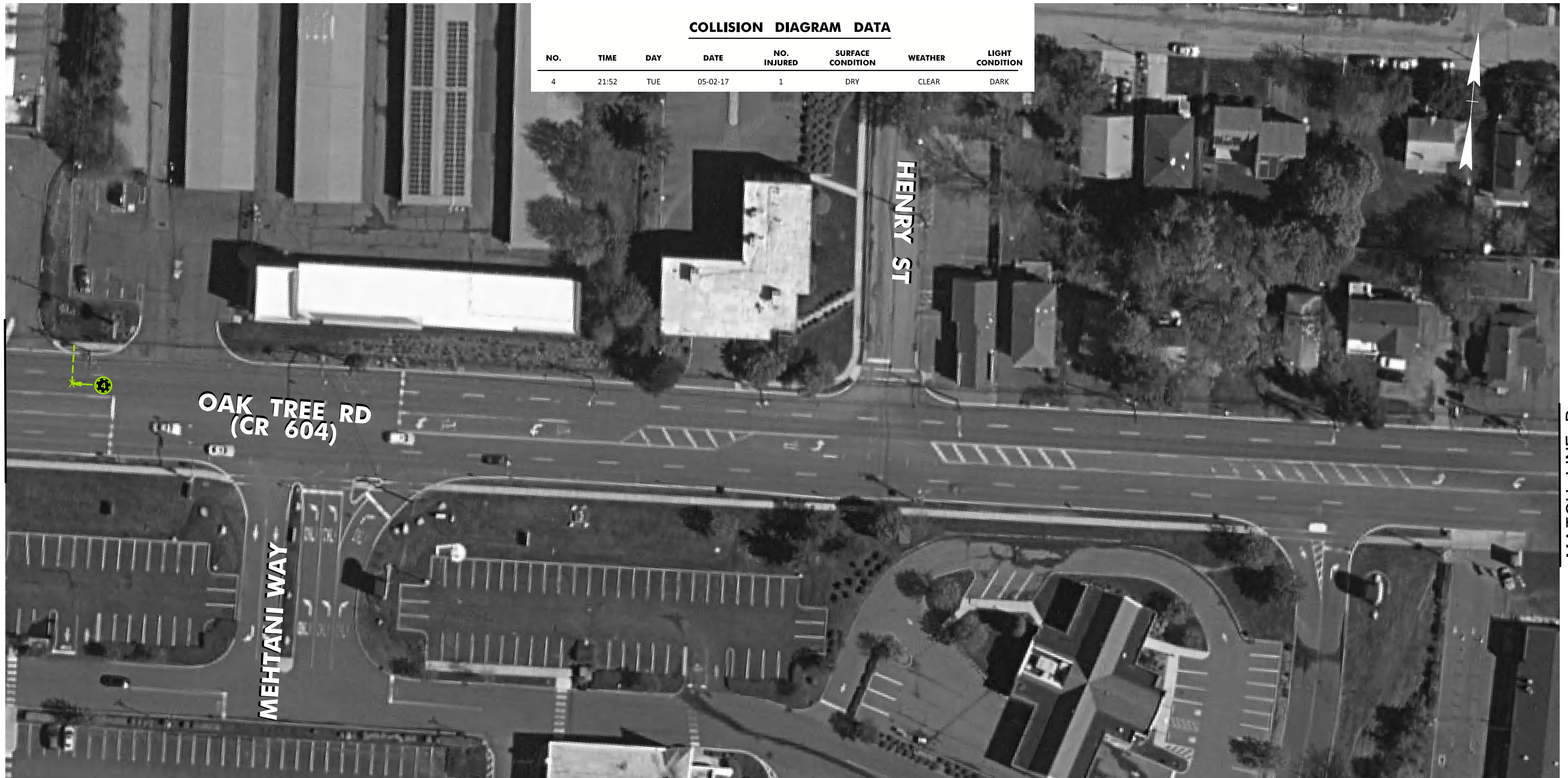
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 FROM ELLMYER ROAD TO GARDEN STATE PKWY
 EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management	NOT TO SCALE
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MATCH LINE C
SEE SHEET NO. 3 OF 7

MATCH LINE D
SEE SHEET NO. 5 OF 7

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
	ENCROACHMENT
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

4 / 7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

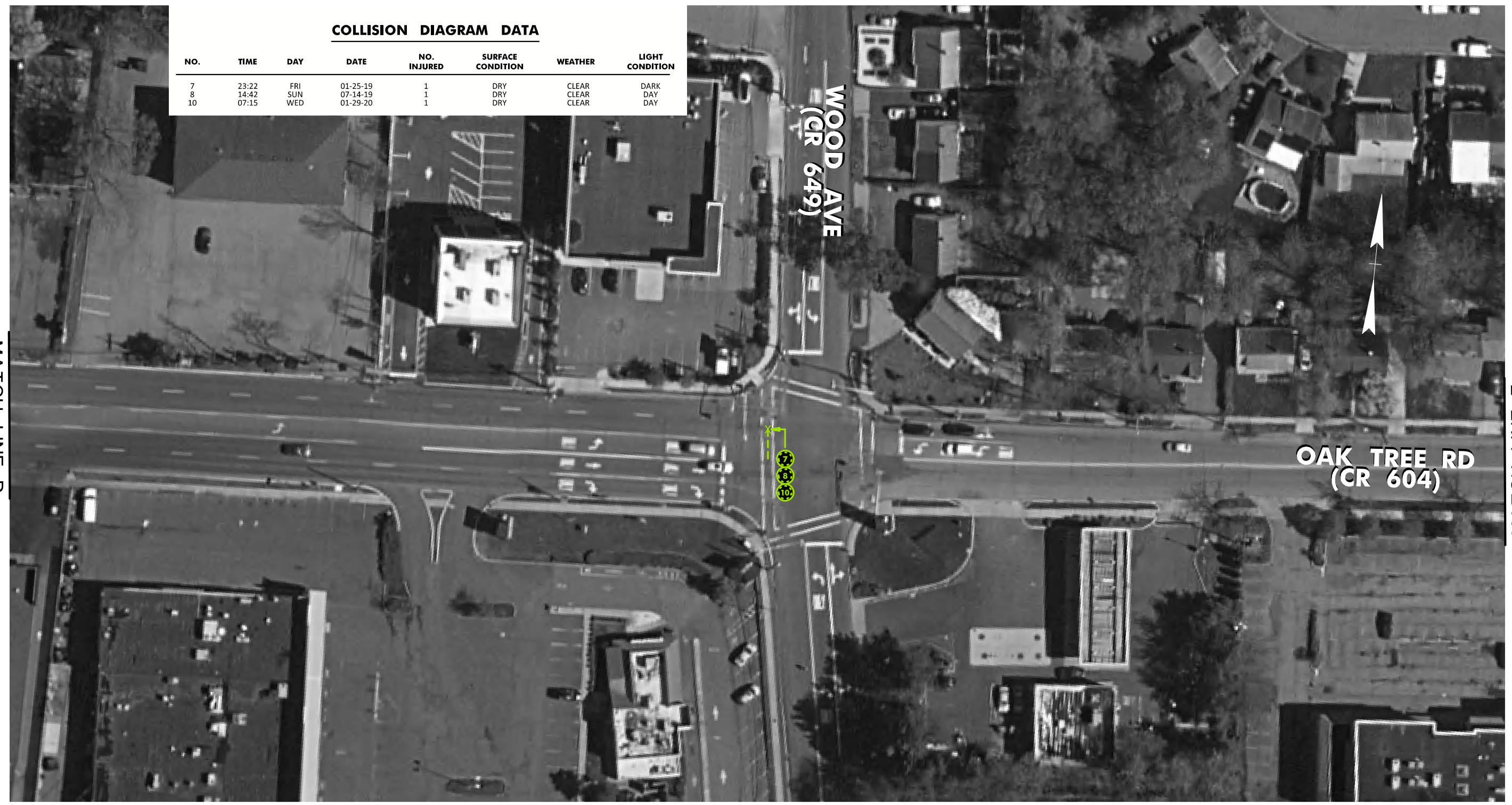
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MATCH LINE D
SEE SHEET NO. 4 OF 7

MATCH LINE E
SEE SHEET NO. 6 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	0
INJURIES	3
FATALITIES*	0
TOTAL NO. OF CRASHES	3

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
	ENCROACHMENT
	LEFT TURN
	RIGHT ANGLE
	STRUCK PARKED VEHICLE

COLORS	
	PEDESTRIAN CRASH

5
7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

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 MATCH LINE F
 SEE SHEET NO. 7 OF 7

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
	FIXED OBJECT
	NON-FIXED OBJECT
	FATAL CRASH
	ANIMAL
	POTHOLE

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

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAMS

Engineering Design Planning Construction Management	NOT TO SCALE
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MATCH LINE F
SEE SHEET NO. 6 OF 7

LEGEND

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

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

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

COLORS	
	PEDESTRIAN CRASH

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2016-2020 PEDESTRIAN COLLISION DIAGRAM



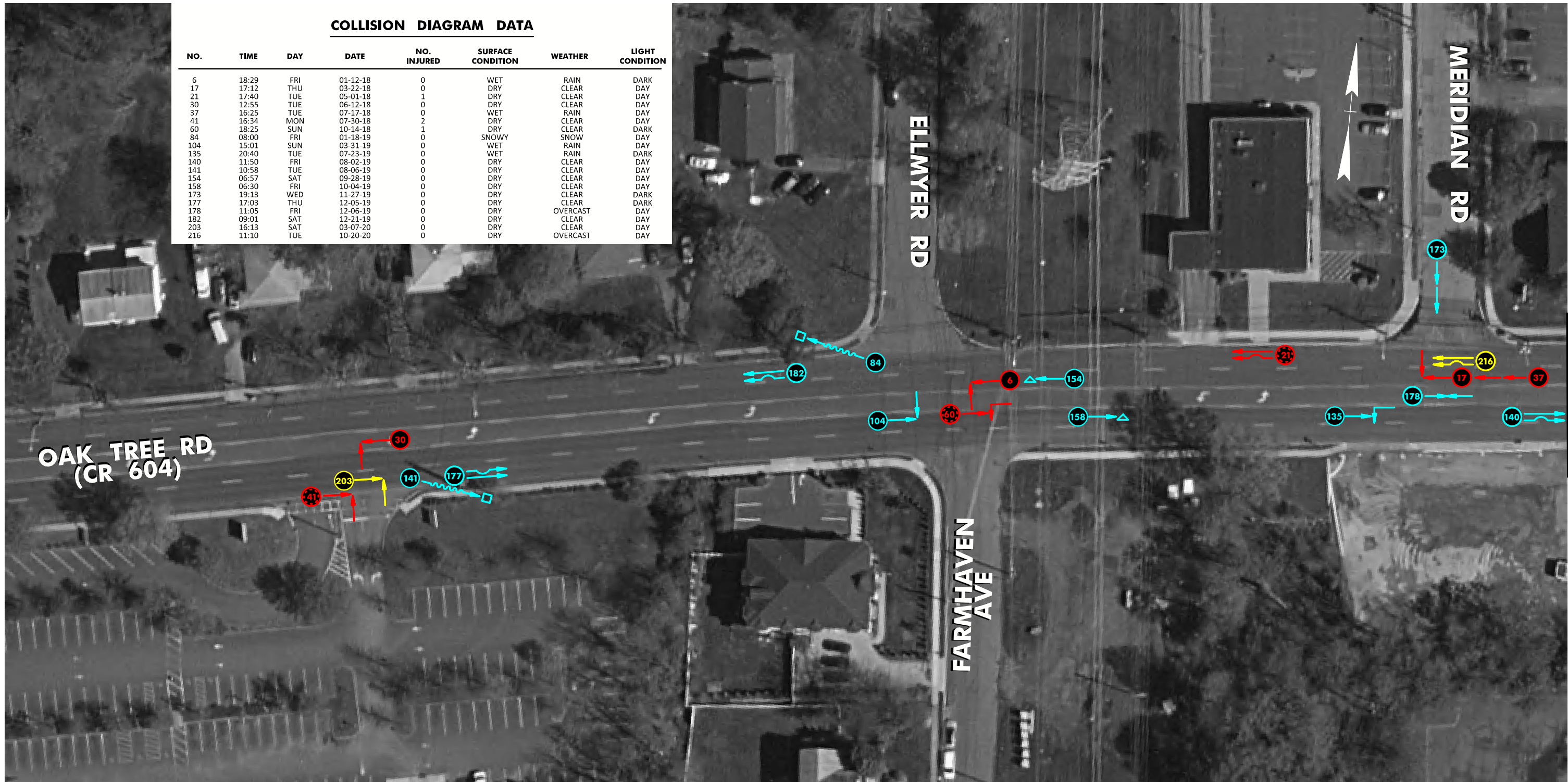
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D. VEHICULAR CRASH DIAGRAMS

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30	12:55	TUE	06-12-18	0	DRY	CLEAR	DAY
37	16:25	TUE	07-17-18	0	WET	RAIN	DAY
41	16:34	MON	07-30-18	2	DRY	CLEAR	DAY
60	18:25	SUN	10-14-18	1	DRY	CLEAR	DARK
84	08:00	FRI	01-18-19	0	SNOWY	SNOW	DAY
104	15:01	SUN	03-31-19	0	WET	RAIN	DAY
135	20:40	TUE	07-23-19	0	WET	RAIN	DARK
140	11:50	FRI	08-02-19	0	DRY	CLEAR	DAY
141	10:58	TUE	08-06-19	0	DRY	CLEAR	DAY
154	06:57	SAT	09-28-19	0	DRY	CLEAR	DAY
158	06:30	FRI	10-04-19	0	DRY	CLEAR	DAY
173	19:13	WED	11-27-19	0	DRY	CLEAR	DARK
177	17:03	THU	12-05-19	0	DRY	CLEAR	DARK
178	11:05	FRI	12-06-19	0	DRY	OVERCAST	DAY
182	09:01	SAT	12-21-19	0	DRY	CLEAR	DAY
203	16:13	SAT	03-07-20	0	DRY	CLEAR	DAY
216	11:10	TUE	10-20-20	0	DRY	OVERCAST	DAY



MATCH LINE A
 SEE SHEET NO. 2 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	17
INJURIES	3
FATALITIES*	0
TOTAL NO. OF CRASHES	20

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

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

COLORS	
⊙	2018 CRASHES
⊙	2019 CRASHES
⊙	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
 FROM ELLMYER ROAD TO GARDEN STATE PKWY
 EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

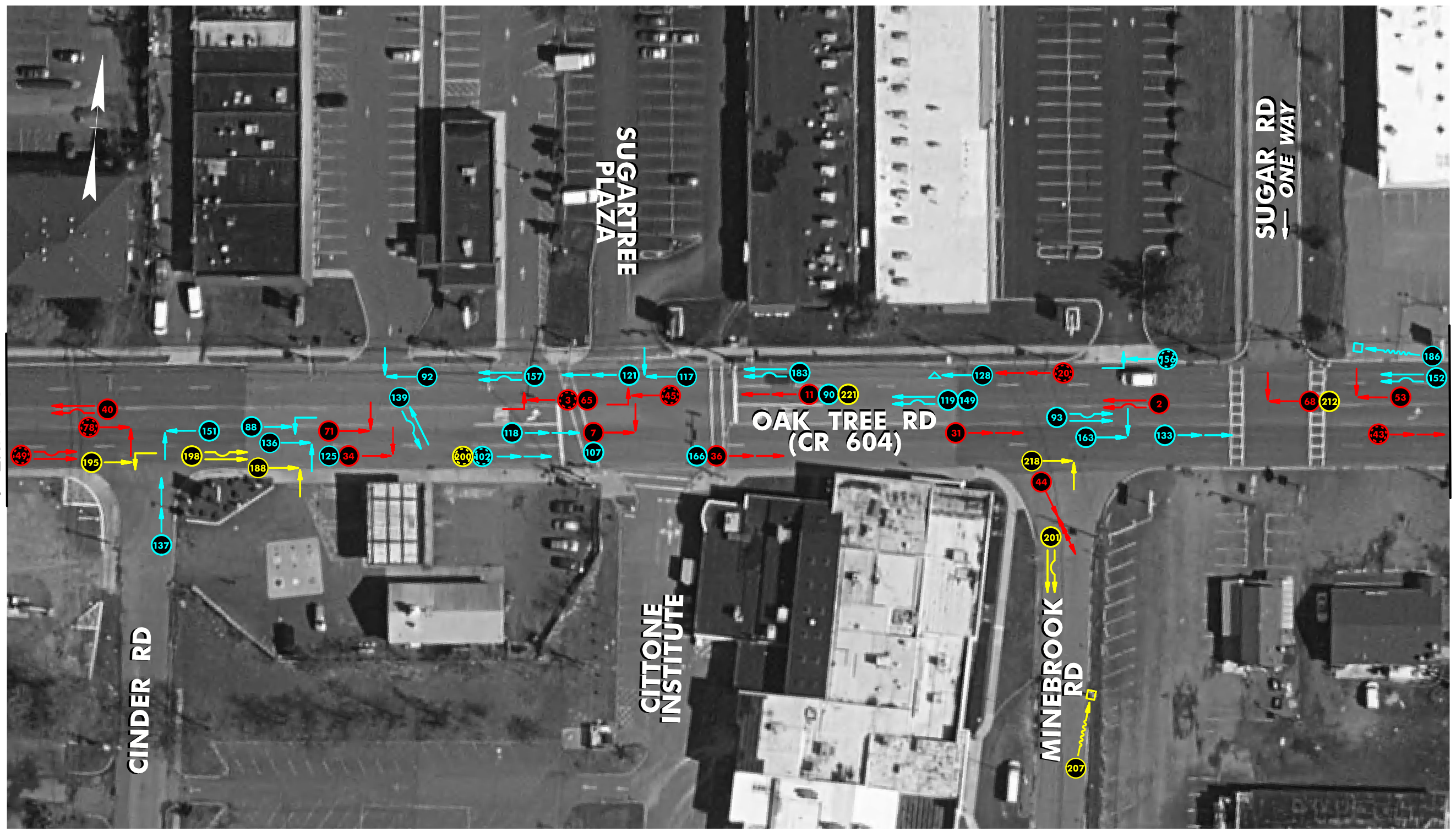
GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: \\NJ-IST\vidal\2021085 -RIP- Project Development and Support\Cad\HWY\Crash Diagrams\Middlesex County\veh\Sheet 2.dgn
 TIME: 10:40:19 AM
 DATE: 7/28/2022
 GREENMAN-PEDERSEN, INC.

MATCH LINE A
 SEE SHEET NO. 1 OF 7

MATCH LINE B
 SEE SHEET NO. 3 OF 7



LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	43
INJURIES	9
FATALITIES*	0
TOTAL NO. OF CRASHES	52

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

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

COLORS	
	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
 FROM ELLMYER ROAD TO GARDEN STATE PKWY
 EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
2	17:55	WED	01-10-18	0	DRY	CLEAR	DARK
3	07:30	THU	01-11-18	2	WET	OVERCAST	DAY
7	19:24	FRI	01-12-18	0	WET	RAIN	DARK
11	19:10	SAT	02-17-18	0	SNOWY	SNOW	DARK
20	11:00	MON	04-30-18	2	DRY	OVERCAST	DAY
31	17:36	SUN	06-17-18	0	DRY	CLEAR	DAY
34	11:17	MON	07-09-18	0	DRY	CLEAR	DAY
36	20:42	WED	07-11-18	0	DRY	CLEAR	DUSK
40	17:43	THU	07-26-18	0	DRY	CLEAR	DAY
43	19:25	FRI	08-03-18	1	DRY	CLEAR	DAY
44	12:25	SAT	08-18-18	0	DRY	CLEAR	DAY
45	15:35	SAT	08-18-18	1	DRY	CLEAR	DAY
49	10:12	SUN	09-09-18	1	DRY	CLEAR	DAY
53	21:04	TUE	09-18-18	0	DRY	CLEAR	DARK
65	11:41	MON	11-05-18	0	WET	RAIN	DAY
68	14:02	WED	11-07-18	0	DRY	CLEAR	DAY
71	20:56	SUN	11-25-18	0	DRY	CLEAR	DARK
78	15:51	MON	12-24-18	1	DRY	CLEAR	DAY
88	08:15	WED	02-13-19	0	WET	CLEAR	DAY
90	23:44	THU	02-14-19	0	DRY	CLEAR	DARK
92	10:55	THU	02-21-19	0	DRY	CLEAR	DAY
93	17:21	WED	03-06-19	0	DRY	CLEAR	DAWN
102	18:44	WED	03-27-19	1	DRY	CLEAR	DAY
107	11:50	SUN	04-14-19	0	DRY	OVERCAST	DAY
117	19:20	TUE	06-04-19	0	DRY	CLEAR	DAY
118	21:57	MON	06-10-19	0	WET	RAIN	DARK
119	20:51	THU	06-13-19	0	WET	RAIN	DARK
121	08:14	TUE	06-18-19	0	WET	RAIN	DAY
125	19:53	TUE	06-25-19	0	DRY	CLEAR	DAY
128	20:25	SUN	06-30-19	0	DRY	CLEAR	DAY
133	19:25	SAT	07-20-19	0	DRY	CLEAR	DAY
136	13:00	SAT	07-27-19	0	DRY	CLEAR	DAY
137	21:12	MON	07-29-19	0	DRY	CLEAR	DARK
139	20:29	THU	08-01-19	0	DRY	CLEAR	DARK
149	07:40	WED	09-18-19	0	DRY	CLEAR	DAY
151	13:06	SUN	09-22-19	0	DRY	CLEAR	DAY
152	20:30	THU	09-26-19	0	WET	CLEAR	DARK
156	21:28	TUE	10-01-19	2	DRY	CLEAR	DARK
157	19:25	THU	10-03-19	0	WET	RAIN	DARK
163	17:34	SAT	10-19-19	0	DRY	CLEAR	DAY
166	16:07	SAT	10-26-19	0	DRY	CLEAR	DAY
183	15:43	MON	12-23-19	0	DRY	CLEAR	DAY
186	12:00	SUN	12-29-19	0	DRY	CLEAR	DAY
188	14:26	THU	01-02-20	0	DRY	CLEAR	DAY
195	18:13	THU	02-20-20	0	DRY	CLEAR	DARK
198	12:30	TUE	02-25-20	0	WET	RAIN	DAY
200	10:03	FRI	02-28-20	1	DRY	CLEAR	DAY
201	18:05	TUE	03-03-20	0	WET	RAIN	DARK
207	12:51	WED	04-08-20	0	DRY	CLEAR	DAY
212	20:36	FRI	09-25-20	0	DRY	CLEAR	DARK
218	18:54	SUN	11-01-20	0	WET	CLEAR	DARK
221	11:28	THU	11-26-20	0	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	<u>43</u>
INJURIES	<u>9</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>52</u>

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering
Design
Planning
Construction Management

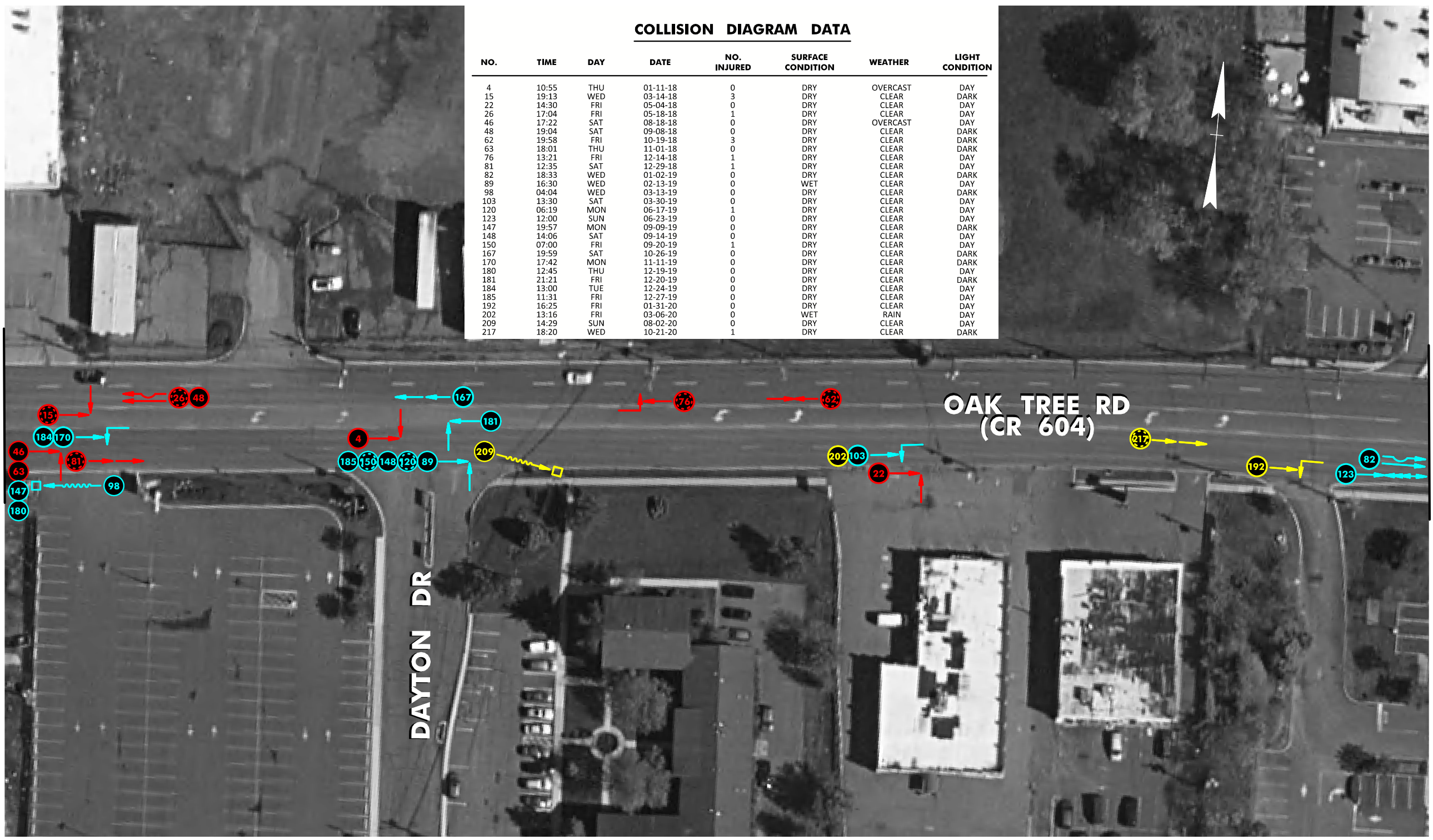
NOT TO SCALE

FILE: \\nj-ist\project\2021085_HSP_Project_Development_and_Support\Cadd\Hwy_Crash_Diagrams\Middlesex_County_Veh_Sheet_2A.dgn
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TIME: 10:46:57 AM
GREENMAN-PEDERSEN, INC.

FILE: \\NJ-IsV\videt\2021085_HSP_Project_Development_and_Support\Cad\HWY_Crash_Diagrams\Middlesex_County\veh\Sheet_3.dgn
 TIME: 10:54:48 AM
 DATE: 7/28/2022
 GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
4	10:55	THU	01-11-18	0	DRY	OVERCAST	DAY
15	19:13	WED	03-14-18	3	DRY	CLEAR	DARK
22	14:30	FRI	05-04-18	0	DRY	CLEAR	DAY
26	17:04	FRI	05-18-18	1	DRY	CLEAR	DAY
46	17:22	SAT	08-18-18	0	DRY	OVERCAST	DAY
48	19:04	SAT	09-08-18	0	DRY	CLEAR	DARK
62	19:58	FRI	10-19-18	3	DRY	CLEAR	DARK
63	18:01	THU	11-01-18	0	DRY	CLEAR	DARK
76	13:21	FRI	12-14-18	1	DRY	CLEAR	DAY
81	12:35	SAT	12-29-18	1	DRY	CLEAR	DAY
82	18:33	WED	01-02-19	0	DRY	CLEAR	DARK
89	16:30	WED	02-13-19	0	WET	CLEAR	DAY
98	04:04	WED	03-13-19	0	DRY	CLEAR	DARK
103	13:30	SAT	03-30-19	0	DRY	CLEAR	DAY
120	06:19	MON	06-17-19	1	DRY	CLEAR	DAY
123	12:00	SUN	06-23-19	0	DRY	CLEAR	DAY
147	19:57	MON	09-09-19	0	DRY	CLEAR	DARK
148	14:06	SAT	09-14-19	0	DRY	CLEAR	DAY
150	07:00	FRI	09-20-19	1	DRY	CLEAR	DAY
167	19:59	SAT	10-26-19	0	DRY	CLEAR	DARK
170	17:42	MON	11-11-19	0	DRY	CLEAR	DARK
180	12:45	THU	12-19-19	0	DRY	CLEAR	DAY
181	21:21	FRI	12-20-19	0	DRY	CLEAR	DARK
184	13:00	TUE	12-24-19	0	DRY	CLEAR	DAY
185	11:31	FRI	12-27-19	0	DRY	CLEAR	DAY
192	16:25	FRI	01-31-20	0	DRY	CLEAR	DAY
202	13:16	FRI	03-06-20	0	WET	RAIN	DAY
209	14:29	SUN	08-02-20	0	DRY	CLEAR	DAY
217	18:20	WED	10-21-20	1	DRY	CLEAR	DARK



LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>21</u>
INJURIES	<u>8</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>29</u>

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

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

COLORS	
	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
 FROM ELLMYER ROAD TO GARDEN STATE PKWY
 EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

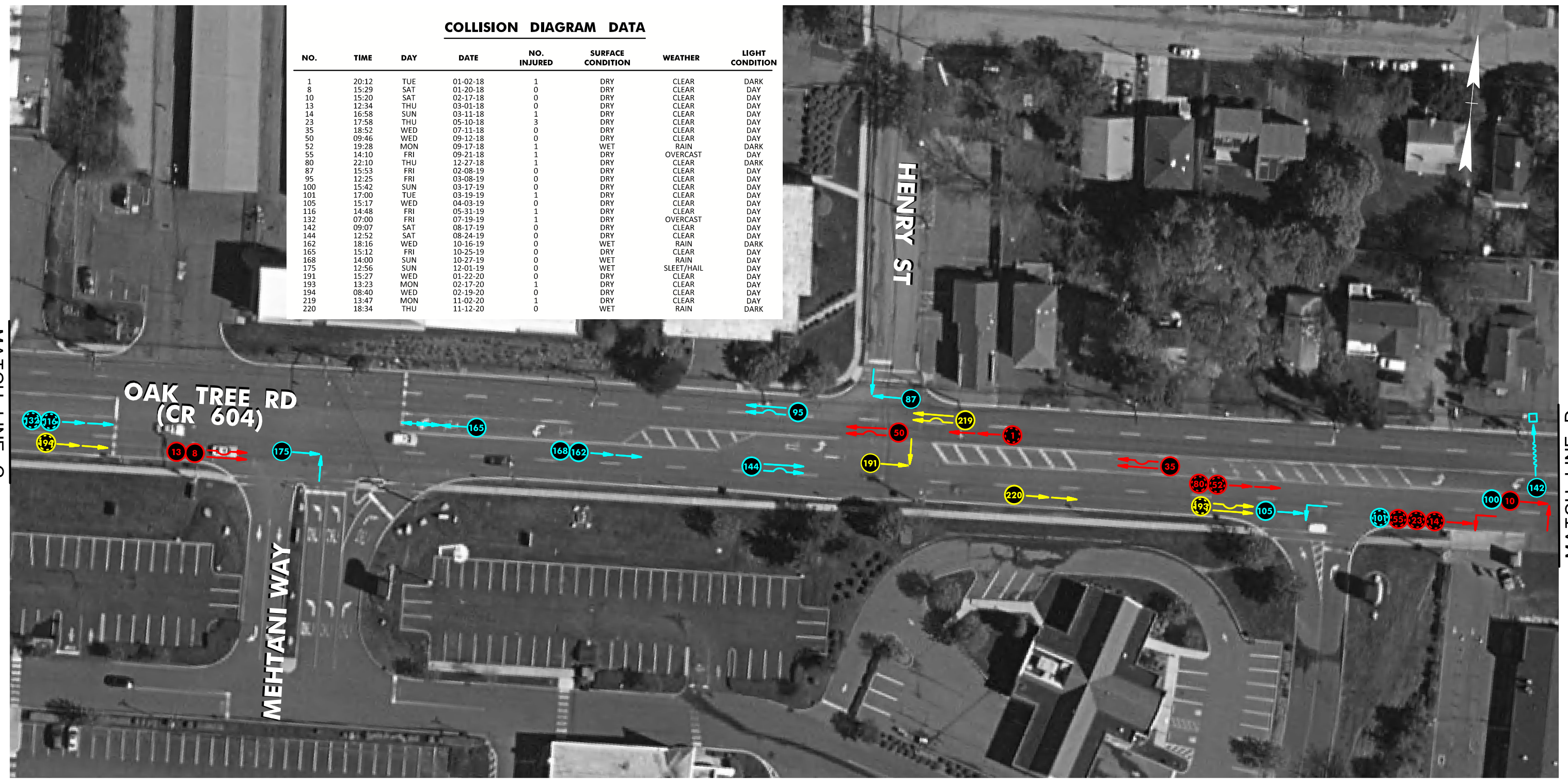
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TIME: 11:00:42 AM

DATE: 7/28/2022 GREENMAN-PEDERSEN, INC.

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
1	20:12	TUE	01-02-18	1	DRY	CLEAR	DARK
8	15:29	SAT	01-20-18	0	DRY	CLEAR	DAY
10	15:20	SAT	02-17-18	0	DRY	CLEAR	DAY
13	12:34	THU	03-01-18	0	DRY	CLEAR	DAY
14	16:58	SUN	03-11-18	1	DRY	CLEAR	DAY
23	17:58	THU	05-10-18	3	DRY	CLEAR	DAY
35	18:52	WED	07-11-18	0	DRY	CLEAR	DAY
50	09:46	WED	09-12-18	0	DRY	CLEAR	DAY
52	19:28	MON	09-17-18	1	WET	RAIN	DARK
55	14:10	FRI	09-21-18	1	DRY	OVERCAST	DAY
80	22:10	THU	12-27-18	1	DRY	CLEAR	DARK
87	15:53	FRI	02-08-19	0	DRY	CLEAR	DAY
95	12:25	FRI	03-08-19	0	DRY	CLEAR	DAY
100	15:42	SUN	03-17-19	0	DRY	CLEAR	DAY
101	17:00	TUE	03-19-19	1	DRY	CLEAR	DAY
105	15:17	WED	04-03-19	0	DRY	CLEAR	DAY
116	14:48	FRI	05-31-19	1	DRY	CLEAR	DAY
132	07:00	FRI	07-19-19	1	DRY	OVERCAST	DAY
142	09:07	SAT	08-17-19	0	DRY	CLEAR	DAY
144	12:52	SAT	08-24-19	0	DRY	CLEAR	DAY
162	18:16	WED	10-16-19	0	WET	RAIN	DARK
165	15:12	FRI	10-25-19	0	DRY	CLEAR	DAY
168	14:00	SUN	10-27-19	0	WET	RAIN	DAY
175	12:56	SUN	12-01-19	0	WET	SLEET/HAIL	DAY
191	15:27	WED	01-22-20	0	DRY	CLEAR	DAY
193	13:23	MON	02-17-20	1	DRY	CLEAR	DAY
194	08:40	WED	02-19-20	0	DRY	CLEAR	DAY
219	13:47	MON	11-02-20	1	DRY	CLEAR	DAY
220	18:34	THU	11-12-20	0	WET	RAIN	DARK



MATCH LINE C
SEE SHEET NO. 3 OF 7

MATCH LINE D
SEE SHEET NO. 5 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	18
INJURIES	11
FATALITIES*	0
TOTAL NO. OF CRASHES	29

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
⊗	POT HOLE

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

COLORS	
⊙	2018 CRASHES
⊙	2019 CRASHES
⊙	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

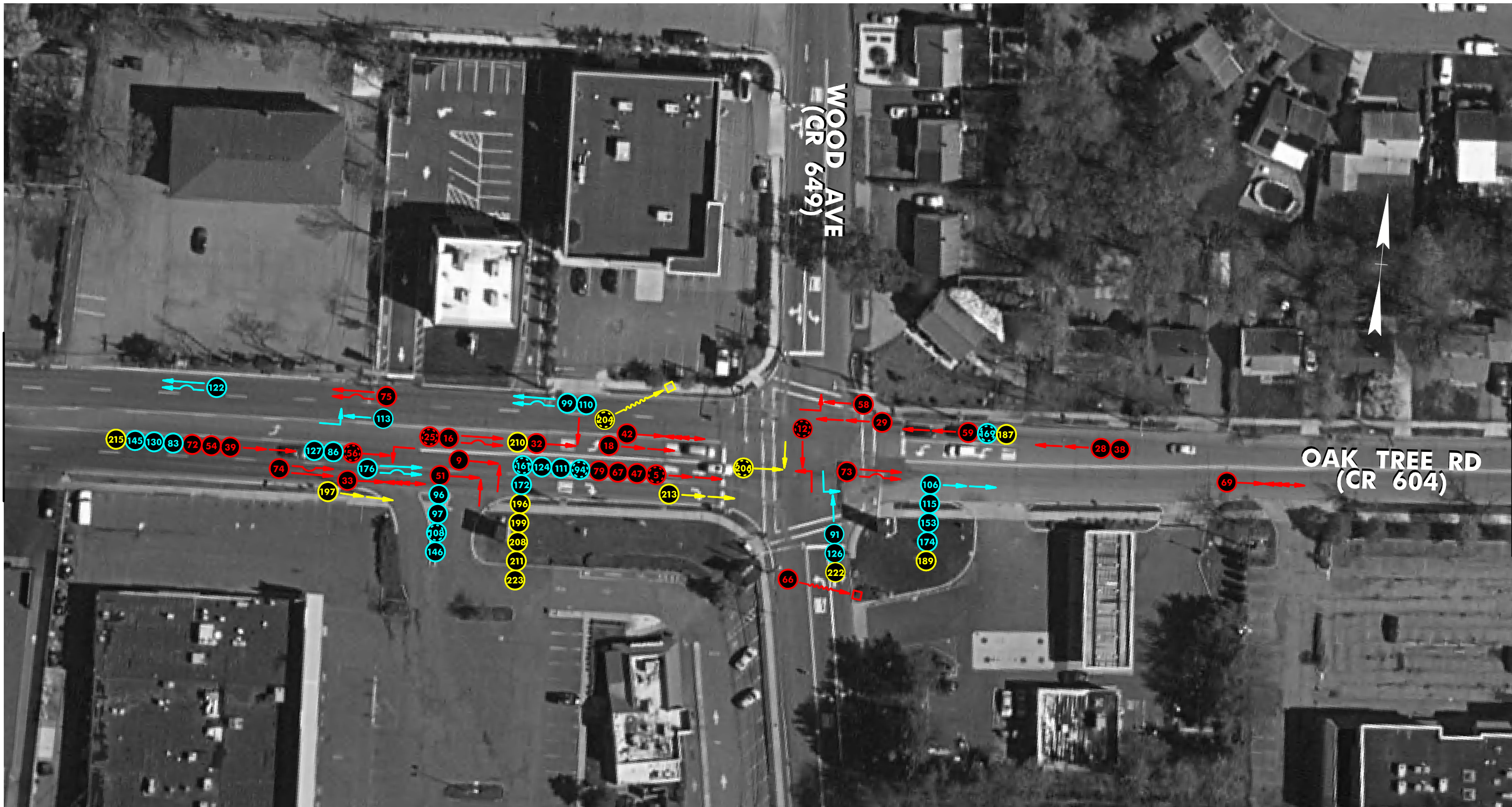
GPI Engineering Design Planning Construction Management

NOT TO SCALE

FILE: \\NJ-IsV\pda\2021085_HSP_ProjectDevelopmentand_Support\Cad\HWY_Crash_Diagrams\Middlesex_County\Sheet 5.dgn

TIME: 3:57:32 PM

DATE: 7/26/2022 GREENMAN-PEDERSEN, INC.



MATCH LINE D
SEE SHEET NO. 4 OF 7

MATCH LINE E
SEE SHEET NO. 6 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	<u>56</u>
INJURIES	<u>11</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>67</u>

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

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

COLORS	
	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

5 / 7

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering Design Planning Construction Management

NOT TO SCALE

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
5	16:00	THU	01-11-18	1	DRY	CLEAR	DAY
9	08:15	TUE	02-13-18	0	DRY	CLEAR	DAY
12	14:47	WED	02-21-18	1	DRY	CLEAR	DAY
16	17:15	FRI	03-16-18	0	DRY	CLEAR	DAY
18	17:56	THU	03-29-18	0	DRY	FOG/SMOG/SMOKE	DAY
25	17:51	THU	05-17-18	1	DRY	OVERCAST	DAY
28	09:18	SAT	06-02-18	0	DRY	CLEAR	DAY
29	14:29	MON	06-04-18	0	DRY	CLEAR	DAY
32	21:58	MON	06-18-18	0	WET	CLEAR	DARK
33	16:30	THU	07-05-18	0	DRY	CLEAR	DAY
38	18:25	TUE	07-17-18	0	WET	CLEAR	DAY
39	16:50	TUE	07-24-18	0	DRY	CLEAR	DAY
42	18:54	MON	07-30-18	0	DRY	OVERCAST	DUSK
47	08:50	WED	09-05-18	0	DRY	CLEAR	DAY
51	13:48	THU	09-13-18	0	DRY	OVERCAST	DAY
54	19:35	THU	09-20-18	0	DRY	CLEAR	DARK
56	12:30	SUN	09-30-18	1	WET	CLEAR	DAY
58	20:12	WED	10-10-18	0	DRY	CLEAR	DARK
59	17:33	SAT	10-13-18	0	DRY	CLEAR	DAY
66	18:32	MON	11-05-18	0	WET	RAIN	DARK
67	19:03	MON	11-05-18	0	WET	RAIN	DARK
69	17:03	WED	11-07-18	0	ICY	CLEAR	DUSK
72	17:33	MON	11-26-18	0	WET	RAIN	DUSK
73	18:58	MON	11-26-18	0	WET	RAIN	DARK
74	16:00	SUN	12-02-18	0	WET	RAIN	DUSK
75	11:48	FRI	12-14-18	0	DRY	CLEAR	DAY
79	18:37	WED	12-26-18	0	DRY	CLEAR	DARK
83	18:07	FRI	01-04-19	0	DRY	CLEAR	DARK
86	14:30	WED	02-06-19	0	DRY	OVERCAST	DAY
91	23:52	FRI	02-15-19	0	DRY	CLEAR	DARK
94	12:15	THU	03-07-19	2	DRY	CLEAR	DAY
96	10:55	SUN	03-10-19	0	WET	RAIN	DAY
97	15:19	MON	03-11-19	0	DRY	CLEAR	DAY
99	15:16	THU	03-14-19	0	DRY	CLEAR	DAY
106	20:37	FRI	04-12-19	0	WET	RAIN	DARK
108	18:25	TUE	04-16-19	1	DRY	CLEAR	DAY
110	11:10	TUE	04-23-19	0	DRY	CLEAR	DAY
111	19:48	SUN	05-12-19	0	WET	RAIN	DUSK
113	19:30	SUN	05-19-19	0	DRY	CLEAR	DAY
115	18:57	THU	05-23-19	0	DRY	CLEAR	DAY
122	09:20	WED	06-19-19	0	WET	OVERCAST	DAY
124	09:00	TUE	06-25-19	0	WET	RAIN	DAY
126	22:19	WED	06-26-19	0	DRY	CLEAR	DARK
127	18:20	SUN	06-30-19	0	DRY	CLEAR	DAY
130	16:34	FRI	07-12-19	0	DRY	CLEAR	DAY
145	17:05	SAT	08-24-19	0	DRY	CLEAR	DAY
146	16:29	SAT	08-31-19	0	DRY	CLEAR	DAY
153	07:11	FRI	09-27-19	0	DRY	CLEAR	DAY
161	11:53	WED	10-16-19	1	DRY	OVERCAST	DAY
169	10:15	SUN	11-03-19	2	DRY	CLEAR	DAY
172	15:00	WED	11-27-19	1	DRY	CLEAR	DAY
174	15:16	FRI	11-29-19	0	DRY	CLEAR	DAY
176	13:29	SUN	12-01-19	0	WET	SLEET/HAIL	DAY
187	12:04	THU	01-02-20	0	DRY	CLEAR	DAY
189	16:02	SUN	01-12-20	0	DRY	CLEAR	DAY
196	20:07	FRI	02-21-20	0	DRY	CLEAR	DARK
197	13:20	SAT	02-22-20	0	DRY	CLEAR	DAY
199	16:41	THU	02-27-20	0	DRY	CLEAR	DAY
204	18:09	SAT	03-07-20	1	DRY	CLEAR	DUSK
206	15:02	THU	04-02-20	1	DRY	CLEAR	DAY
208	12:05	FRI	05-29-20	0	DRY	OVERCAST	DAY
210	14:30	SAT	08-22-20	0	DRY	CLEAR	DAY
211	15:02	TUE	09-08-20	0	DRY	CLEAR	DAY
213	12:03	SAT	09-26-20	0	DRY	CLEAR	DAY
215	14:12	FRI	10-09-20	0	DRY	CLEAR	DAY
222	16:27	MON	12-07-20	0	DRY	CLEAR	DUSK
223	11:58	THU	12-31-20	0	WET	OVERCAST	DAY

LEGEND

NUMBER OF CRASHES WITH

PROPERTY DAMAGE ONLY	<u>56</u>
INJURIES	<u>11</u>
FATALITIES*	<u>0</u>
TOTAL NO. OF CRASHES	<u>67</u>

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering
Design
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Construction Management

NOT TO SCALE

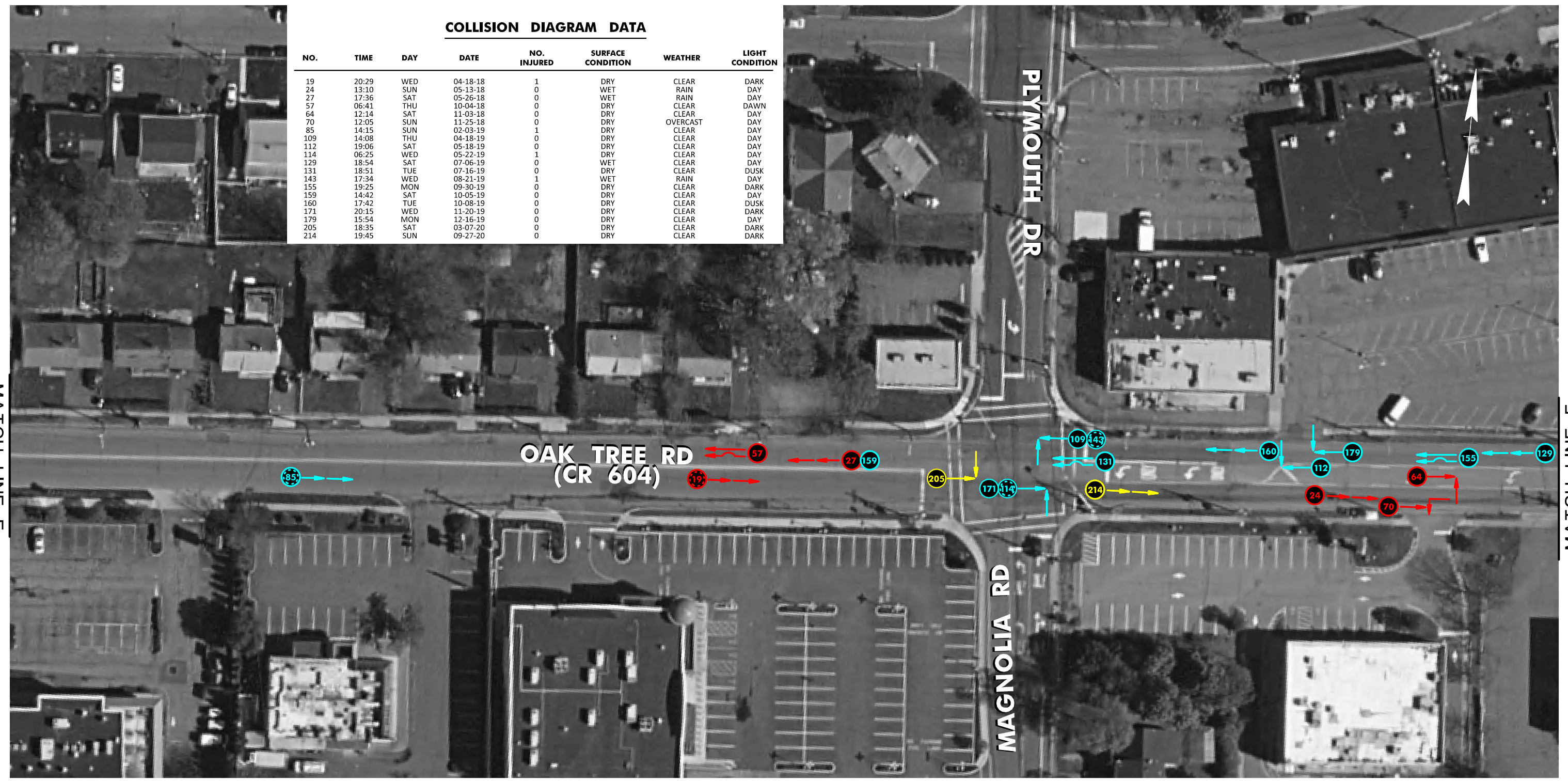
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TIME: 4:10:15 PM

DATE: 7/26/2022

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
19	20:29	WED	04-18-18	1	DRY	CLEAR	DARK
24	13:10	SUN	05-13-18	0	WET	RAIN	DAY
27	17:36	SAT	05-26-18	0	WET	RAIN	DAY
57	06:41	THU	10-04-18	0	DRY	CLEAR	DAWN
64	12:14	SAT	11-03-18	0	DRY	CLEAR	DAY
70	12:05	SUN	11-25-18	0	DRY	OVERCAST	DAY
85	14:15	SUN	02-03-19	1	DRY	CLEAR	DAY
109	14:08	THU	04-18-19	0	DRY	CLEAR	DAY
112	19:06	SAT	05-18-19	0	DRY	CLEAR	DAY
114	06:25	WED	05-22-19	1	DRY	CLEAR	DAY
129	18:54	SAT	07-06-19	0	WET	CLEAR	DAY
131	18:51	TUE	07-16-19	0	DRY	CLEAR	DUSK
143	17:34	WED	08-21-19	1	WET	RAIN	DAY
155	19:25	MON	09-30-19	0	DRY	CLEAR	DARK
159	14:42	SAT	10-05-19	0	DRY	CLEAR	DAY
160	17:42	TUE	10-08-19	0	DRY	CLEAR	DUSK
171	20:15	WED	11-20-19	0	DRY	CLEAR	DARK
179	15:54	MON	12-16-19	0	DRY	CLEAR	DAY
205	18:35	SAT	03-07-20	0	DRY	CLEAR	DARK
214	19:45	SUN	09-27-20	0	DRY	CLEAR	DARK



MATCH LINE E
SEE SHEET NO. 5 OF 7

MATCH LINE F
SEE SHEET NO. 7 OF 7

LEGEND

NUMBER OF CRASHES WITH	
PROPERTY DAMAGE ONLY	16
INJURIES	4
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
	NON-FIXED OBJECT
	ANIMAL
	POT HOLE

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

COLORS	
	2018 CRASHES
	2019 CRASHES
	2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS



NOT TO SCALE



MATCH LINE F
SEE SHEET NO. 6 OF 7

COLLISION DIAGRAM DATA

NO.	TIME	DAY	DATE	NO. INJURED	SURFACE CONDITION	WEATHER	LIGHT CONDITION
61	18:13	THU	10-18-18	0	DRY	CLEAR	DARK
77	16:59	WED	12-19-18	0	DRY	CLEAR	DARK
164	14:03	TUE	10-22-19	1	DRY	CLEAR	DAY

LEGEND

NUMBER OF CRASHES WITH

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

SYMBOLS

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

TYPES OF CRASHES

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

COLORS

- 2018 CRASHES
- 2019 CRASHES
- 2020 CRASHES

NEW JERSEY DEPARTMENT OF TRANSPORTATION

OAK TREE ROAD (CR 604)
FROM ELLMYER ROAD TO GARDEN STATE PKWY
EDISON TWP, MIDDLESEX COUNTY

2018 - 2020 COLLISION DIAGRAMS

GPI Engineering
Design
Planning
Construction Management

NOT TO SCALE

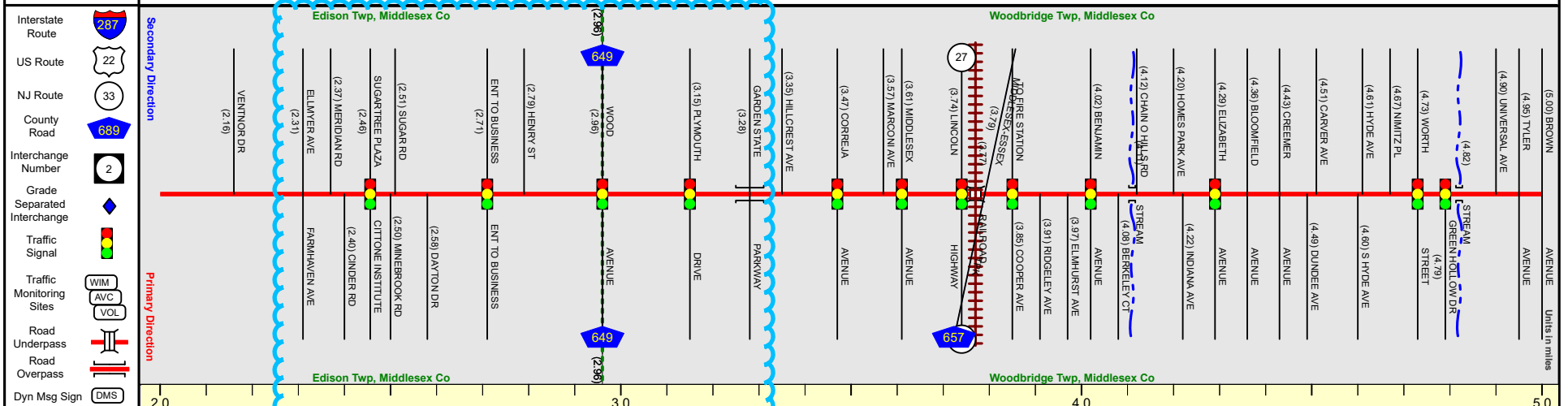
E. TRAFFIC DATA STRAIGHT LINE DIAGRAMS

MIDDLESEX COUNTY 604 (West to East)

Mile Posts: 2.000 - 5.000



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



Street Name	Oak Tree Road		Green Street	
Jurisdiction	County			
Functional Class	Urban Principal Arterial		Urban Minor Arterial	
Federal Aid - NHS Sy	NHS		IM - Transit Term.	
Control Section				
Speed Limit	40		25	
Number of Lanes	4		2	
Med. Type	None			
Med. Width				
Pavement	60		40	
Shoulder				
Traffic Volume				
Traffic Sta. ID				
Structure No.	361322T		1215081	
Enlarged Views				

SRI = 12000604_

Date last inventoried: June 2011



New Jersey DOT

Most Recent 48 Hour Count for Year for 1/1/2020 - 12/31/2020
 Criteria: Type = I-SECTION, Is Perm Station = 0, From 1/1/2020 To 12/31/2020

Location ID: 111209

County: Middlesex

Location: OAK TREE RD BET CO 649 WOOD AVE AND PLYMOUTH DR

Tuesday, September 22, 2020

Time	EB Hourly	WB Hourly	2-WAY Hourly
0:00-1:00	42	33	75
1:00-2:00	22	15	37
2:00-3:00	7	8	15
3:00-4:00	17	15	32
4:00-5:00	19	28	47
5:00-6:00	75	81	156
6:00-7:00	161	154	315
7:00-8:00	278	341	619
8:00-9:00	376	355	731
9:00-10:00	308	323	631
10:00-11:00	349	323	672
11:00-12:00	449	347	796
12:00-13:00	466	406	872
13:00-14:00	472	402	874
14:00-15:00	491	453	944
15:00-16:00	533	432	965
16:00-17:00	567	428	995
17:00-18:00	647	471	1,118
18:00-19:00	581	510	1,091
19:00-20:00	461	448	909
20:00-21:00	346	326	672
21:00-22:00	210	173	383
22:00-23:00	109	123	232
23:00-24:00	88	63	151

Count Total	7,074	6,258	13,332
AM Peak	08:00-09:00 376	07:15-08:15 355	08:00-09:00 731
Mid Peak	12:30-13:30 490	13:30-14:30 428	13:30-14:30 910
PM Peak	16:30-17:30 669	16:45-17:45 475	16:30-17:30 1,135

Wednesday, September 23, 2020

Time	EB Hourly	WB Hourly	2-WAY Hourly
0:00-1:00	41	27	68
1:00-2:00	24	29	53
2:00-3:00	9	12	21
3:00-4:00	3	16	19
4:00-5:00	29	31	60
5:00-6:00	94	71	165
6:00-7:00	147	155	302
7:00-8:00	281	335	616
8:00-9:00	318	354	672
9:00-10:00	328	322	650
10:00-11:00	364	326	690
11:00-12:00	422	368	790
12:00-13:00	472	397	869
13:00-14:00	493	437	930
14:00-15:00	483	467	950
15:00-16:00	551	405	956
16:00-17:00	552	424	976
17:00-18:00	660	500	1,160
18:00-19:00	589	538	1,127
19:00-20:00	539	499	1,038
20:00-21:00	329	342	671
21:00-22:00	205	211	416
22:00-23:00	135	124	259
23:00-24:00	77	50	127

Count Total	7,145	6,440	13,585
AM Peak	07:30-08:30 341	08:00-09:00 354	08:00-09:00 672
Mid Peak	13:30-14:30 513	13:45-14:45 472	13:30-14:30 975
PM Peak	17:00-18:00 660	17:00-18:00 500	17:00-18:00 1,160

Station AADT * 11,950

* The AADT Estimate is based on factors in use on the date the report was generated

Peak Hour Starts Between		
Period	Begin	End
AM	6:00	9:00
MID	9:15	14:45
PM	15:00	18:00



New Jersey DOT

Most Recent 48 Hour Count for Year for 1/1/2020 - 12/31/2020
Criteria: Type = I-SECTION, Is Perm Station = 0, From 1/1/2020 To 12/31/2020

Location Map

New Jersey Department of Transportation

Short-term Hourly Traffic Volume for 05/30/2017 to 06/02/2017

Site names: 111209,Oak Tree Road-3.06,12000604__
 County: MIDDLESEX
 Funct Class: Urban Principal Arterial - Other
 Location: BET CO 649 WOOD AVE AND PLYMOUTH DR

Seasonal Factor Grp: rg1_4U
 Daily Factor Grp: rg1_4U
 Axle Factor Grp: rg1_4U
 Growth Factor Grp: rg1_4U

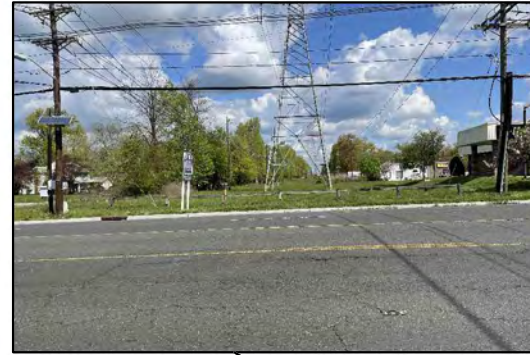
	Sun, May 28, 2017			Mon, May 29, 2017			Tue, May 30, 2017			Wed, May 31, 2017			Thu, Jun 1, 2017			Fri, Jun 2, 2017			Sat, Jun 3, 2017		
	Road	E	W	Road	E	W	Road	E	W	Road	E	W	Road	E	W	Road	E	W	Road	E	W
00:00										124	73	51	133	85	48	141	85	56			
01:00										58	39	19	70	31	39	58	36	22			
02:00										24	13	11	21	12	9	26	12	14			
03:00										25	11	14	26	12	14	34	22	12			
04:00										45	20	25	57	33	24	44	22	22			
05:00										203	107	96	195	100	95	204	100	104			
06:00										477	263	214	491	266	225	478	258	220			
07:00										1,131	624	507	1,137	627	510						
08:00										1,265	673	592	1,204	673	531						
09:00										1,025	557	468	1,003	546	457						
10:00										901	477	424	922	502	420						
11:00										952	526	426	1,043	604	439						
12:00										1,051	564	487	1,082	576	506						
13:00							1,147	600	547	1,097	594	503	1,116	604	512						
14:00							1,110	605	505	1,171	639	532	1,118	631	487						
15:00							1,230	670	560	1,182	683	499	1,191	673	518						
16:00							1,237	698	539	1,241	723	518	1,286	776	510						
17:00							1,391	772	619	1,397	824	573	1,474	870	604						
18:00							1,416	820	596	1,377	746	631	1,348	785	563						
19:00							1,224	636	588	1,240	702	538	1,268	678	590						
20:00							927	494	433	1,129	587	542	1,205	640	565						
21:00							654	331	323	868	405	463	791	387	404						
22:00							445	238	207	505	261	244	524	283	241						
23:00							219	131	88	270	181	89	279	176	103						
Total							11,000	5,995	5,005	18,758	10,292	8,466	18,984	10,570	8,414	985	535	450			
AM Peak Vol										1,341	759	595	1,309	731	578						
AM Peak Fct										.924	.944	.918	.96	.972	.944						
AM Peak Hr										7: 30	7: 30	7: 45	7: 30	7: 30	7: 30						
PM Peak Vol										1,422	830	639	1,487	891	611						
PM Peak Fct										.951	.965	.962	.963	.952	.926						
PM Peak Hr										17: 15	17: 15	17: 45	16: 45	16: 45	17: 30						
Seasonal Fct							.948	.948	.948	.948	.948	.948	.946	.946	.946	.946	.946	.946			
Daily Fct							.888	.888	.888	.869	.869	.869	.844	.844	.844	.917	.917	.917			
Axle Fct							.492	.492	.492	.492	.492	.492	.493	.493	.493	.493	.493	.493			
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			

F. PHOTOGRAPHS

No marked crosswalk to cross Oak Tree Road;
No marked crosswalk and stop bar across Ellmyer Road



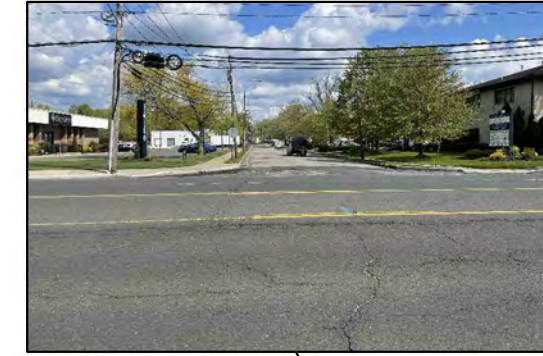
Missing curb ramps; no sidewalk



Faded pedestrian ahead sign
with low vertical clearance



No marked crosswalk to cross Oak Tree Road;
No marked crosswalk and stop bar across Meridian Road



Faded two-way center turn lane sign



Poor pavement condition



Missing edge lines and shoulder lines;
tripping hazard due to uneven sidewalk;
no offset between sidewalk and roadway

LEGEND



SIGNALIZED INTERSECTION



PROJECT CORRIDOR

1
6

**NJDOT HSIP – ROAD SAFETY AUDIT
OAK TREE ROAD**

**EDISON
MIDDLESEX COUNTY**

SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

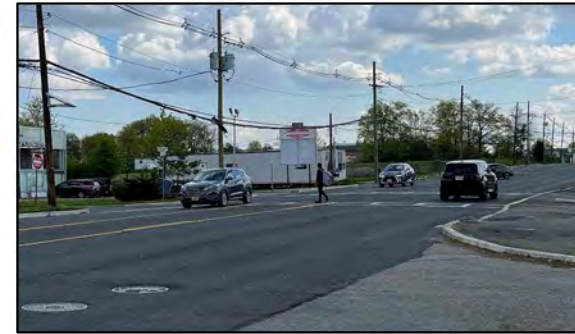
No offset between sidewalk and roadway



Faded crosswalk markings



No pedestrian warning signs; Missing ADA curb ramps



No marked crosswalk, ADA curb ramps and sidewalk; Remnant utility debris; Lack of lighting



No marked crosswalk, no ADA curb ramps
Missing stop bar and stop sign



Pedestrian crossing sign at incorrect location;
Low vertical clearance for lane usage sign



Missing ADA curb ramps;
No crosswalk and stop bar markings;
Large curb radius

LEGEND

 SIGNALIZED INTERSECTION

 PROJECT CORRIDOR

2
6

**NJDOT HSIP – ROAD SAFETY AUDIT
OAK TREE ROAD**

EDISON
MIDDLESEX COUNTY

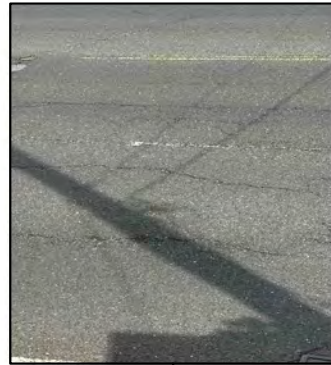
SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

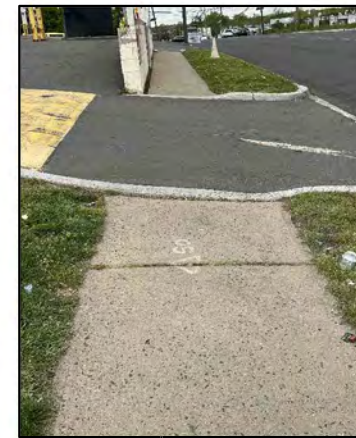
Faded pavement markings



Missing sidewalk, curb ramps and crosswalk



Non compliant ADA ramps



Retail sign obstructs walkway



Establishment signs and vegetation obstructing sight lines; Incorrect thru arrow pavement marking



Steep slope across driveway and lack of concrete sidewalk

LEGEND



SIGNALIZED INTERSECTION



PROJECT CORRIDOR

3/3

NJDOT HSIP - ROAD SAFETY AUDIT
OAK TREE ROAD

EDISON
MIDDLESEX COUNTY

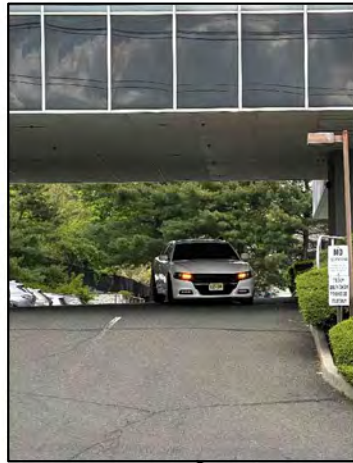
SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

Steep slope across driveway



No marked crosswalk; Debris in ADA curb ramp



Worn footpath



Non compliant ADA curb ramps



Faded no left turn sign; Stop sign tilted



Steep ADA curb ramp cross slope; Missing ADA curb ramp flares



Center turn lane sign tilted



Drop off along sidewalk



Worn travelpath across Wells Fargo building

LEGEND



SIGNALIZED INTERSECTION



PROJECT CORRIDOR

4
6

NJDOT HSIP - ROAD SAFETY AUDIT
OAK TREE ROAD

EDISON
MIDDLESEX COUNTY

SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

Poor pavement condition near inlet



Faded no left turn sign



Missing ADA curb ramps, missing sidewalk



Outdated pedestrian push buttons and sign; No pedestrian signal heads



Poor sidewalk condition



No marked crosswalk; Missing ADA curb ramps



Non compliant ADA curb ramps; Each crosswalk approach does not have a separate curb ramp

LEGEND



SIGNALIZED INTERSECTION



PROJECT CORRIDOR

5
6

NJDOT HSIP - ROAD SAFETY AUDIT
OAK TREE ROAD

EDISON
MIDDLESEX COUNTY

SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

Uneven sidewalk



Missing curb along sidewalk



Missing ADA curb ramp



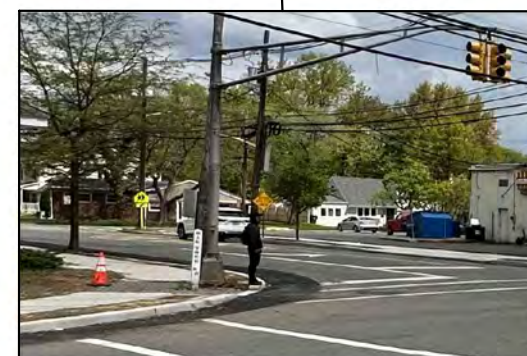
No physical barrier or vertical curb between sidewalk and driveway



Poor condition along walkway



Non compliant ADA curb ramps; Missing crosswalk



Missing pedestrian signal equipment; Missing ADA curb ramps

LEGEND



SIGNALIZED INTERSECTION



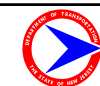
PROJECT CORRIDOR

6/6

NJDOT HSIP - ROAD SAFETY AUDIT
OAK TREE ROAD

EDISON
MIDDLESEX COUNTY

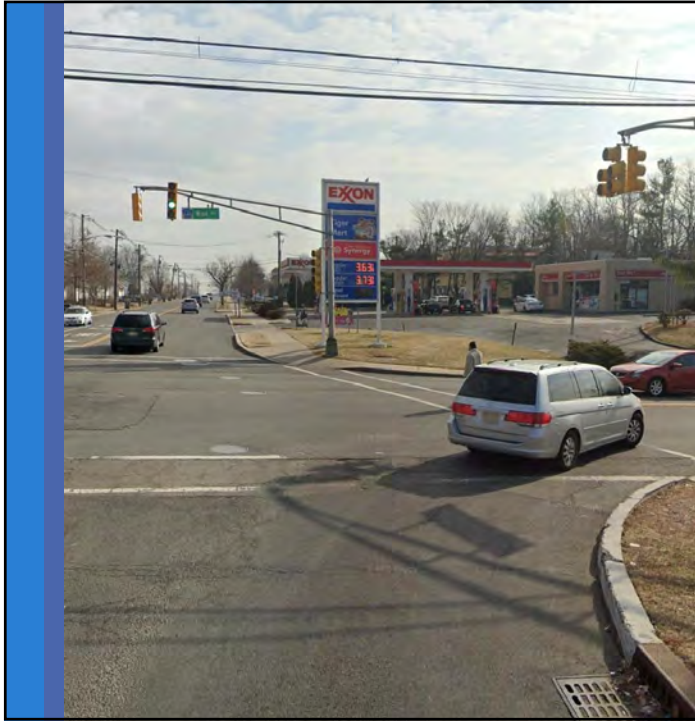
SITE PHOTOGRAPHS



GPI Engineering
Design
Planning
Construction Management

N.T.S.

G. PRE-AUDIT PRESENTATION



ROAD SAFETY AUDIT

OAK TREE RD (CR 604), FARMHAVEN
AVE TO GARDEN STATE PARKWAY
MIDDLESEX COUNTY

APRIL 2023

1

LOCATION / AUDIT TEAM



**NJDOT, NJTPA,
NJ Transit**



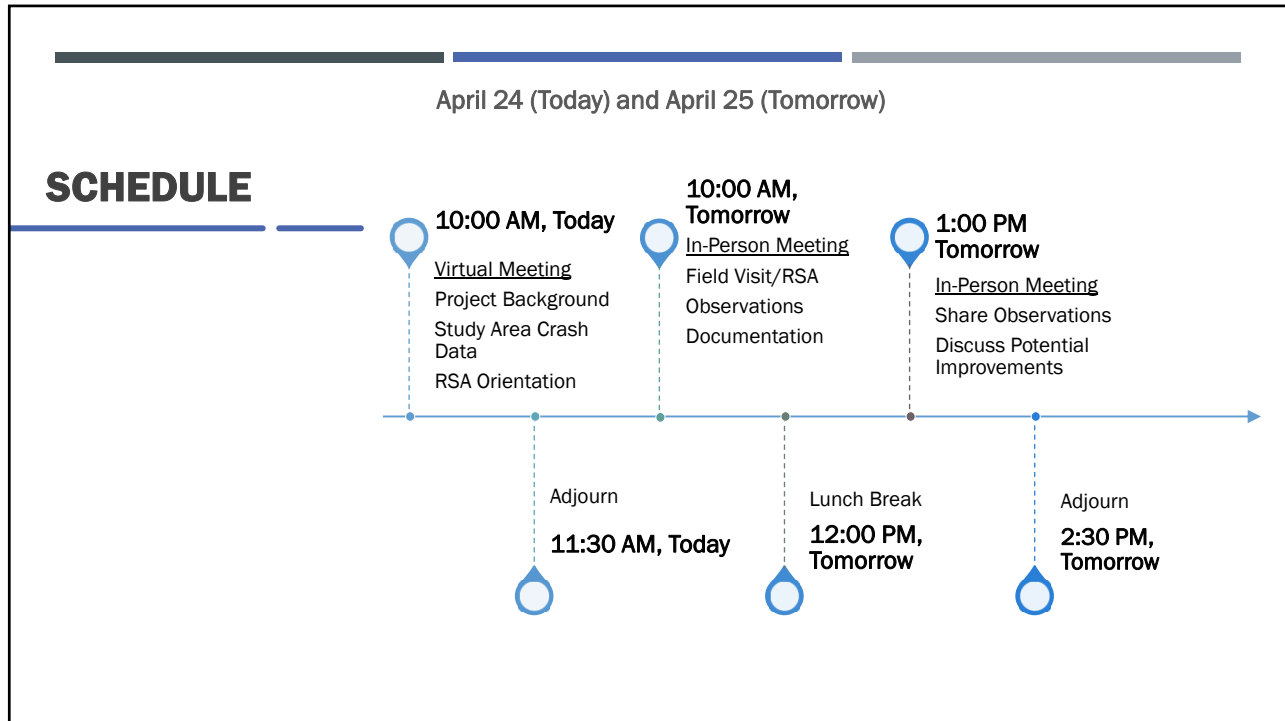
Middlesex County



**Edison Township
Woodbridge Township**

Funded by Federal Highway Administration and NJDOT
Presented by Greenman-Pedersen, Inc., NJDOT Consultant

2



3

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

- 7 Emphasis Areas (NJ 2020 Strategic Highway Safety Plan)
- 7 sub-programs including Local Safety Program – ROAD SAFETY AUDITS
- Core Federal Aid Program, NJ receives about \$75M

Equity

Lane Departure

Intersections

Driver Behavior

Pedestrians and Bicyclists

Other Vulnerable Road Users

Data

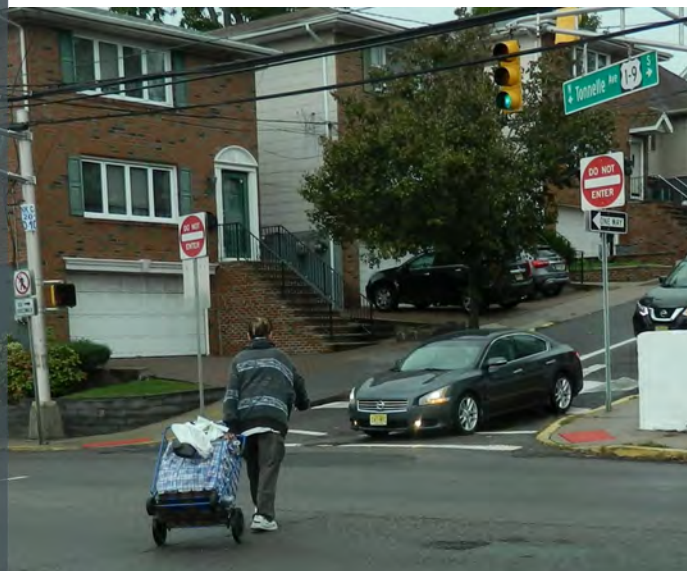
Driver Behavior: Drowsy and Distracted Driving, Aggressive Driving, Impaired Driving, Unlicensed Driving, and Unbelted Drivers and Occupants
Other Vulnerable Road Users: Mature Drivers, Younger Drivers, Motorcyclists, Work Zone Workers and Other Road Workers

4

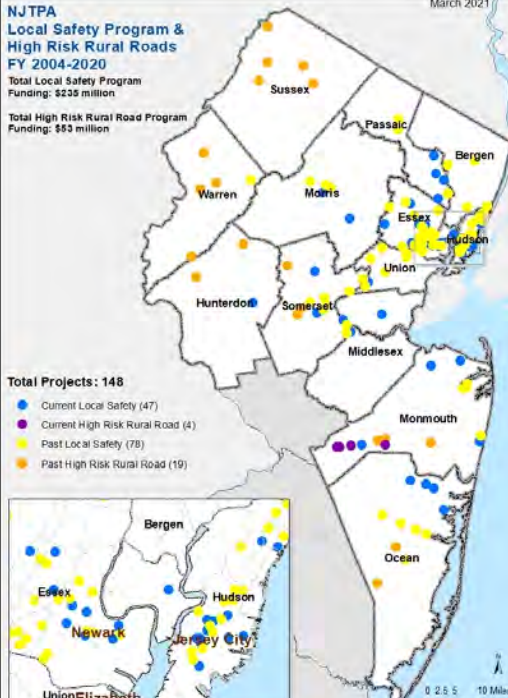
HUMAN PERSPECTIVE

“Humbly observe where people in the community struggle. Ask the question: What is the next smallest thing we can do right now to address the issue? Do that thing. Repeat.”

Charles Marohn
Founder, Strong Towns



5



FEDERAL TRANSPORTATION FUNDING

- **Local Safety and High Risk Rural Roads Programs**
 - \$235M on County / Local Roadways
 - Relatively quick-fix safety improvements
- **HSIP funds** – emphasizes data-driven, strategic approach to improving highway safety
- **Network Screening** – identifies locations experiencing:
 - High crash frequencies
 - Severe crash injuries
 - Specific crash types (e.g. right-angle, roadway departures)
- **Community Outreach** – opportunities for public, local officials and stakeholders to comment and ask questions

6

RSA PURPOSE

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



Benefits

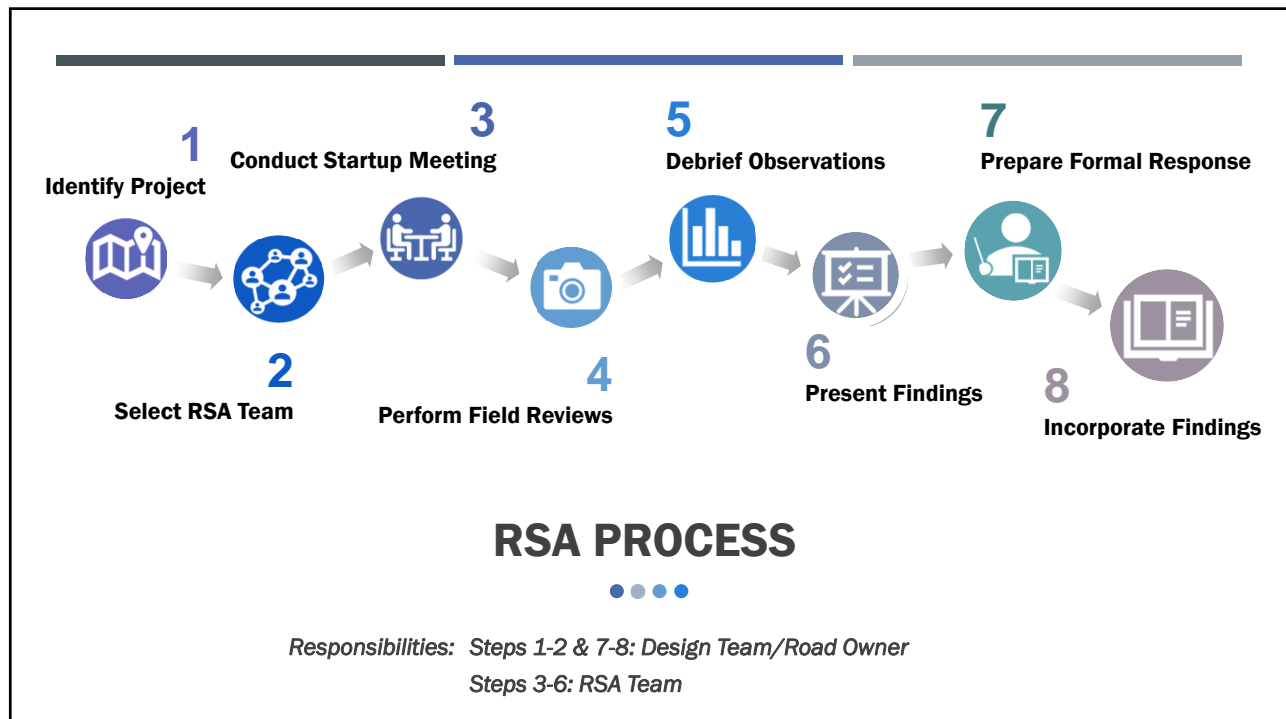
- Pro-actively address safety; reduce crashes
- Identify low-cost/high-value improvements
- Promote “safety culture”
- Provide continuous advancement of safety skills and knowledge
- Contribute feedback on safety issues
- Support optimized savings of lives, money and time



Not meant to replace

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

7



8

FHWA PROVEN SAFETY COUNTERMEASURES (PSC)

- 28 countermeasures
- Research proven strategies
 - ✓ Intersections
 - ✓ Roadway departures
 - ✓ Pedestrian/bicyclist
- Several crosscutting strategies address multiple safety focus areas



9

PSC EXAMPLES

Left:

- Roundabout, Cinnaminson Township, Burlington County
- Road diet, Maplewood Township, Essex County
- Pedestrian Hybrid Beacon (HAWK), Ocean City, Cape May County

Right:

- Backplates with Retroreflective Borders, Statewide
- Enhanced Delineation, Horizontal Curves, Statewide

Additional Considerations:

- Curb extensions



10

PROJECT AREA

Site Summary

- Undivided
- Urban principal arterial
- 2-4 lanes, no shoulders
- Areas with TWLTL
- 25/40 mph E/W Plymouth
- Commercial/residential mix



Demographics

Item*	Study Area	Middlesex Co.
DI	55%	-
POC	84%	58%
65+	17%	15%
18-	21%	22%
LI	5%	9%
LEP	26%	14%
PwD	8%	10%


* DI = Demographic Index
 POC = People of Color
 65+ = People over age 64
 18- = People under age 18

LI = Low Income (persons)
 LEP = Limited English Proficiency
 PwD = Persons with a Disability
 DI > 50% indicates underserved

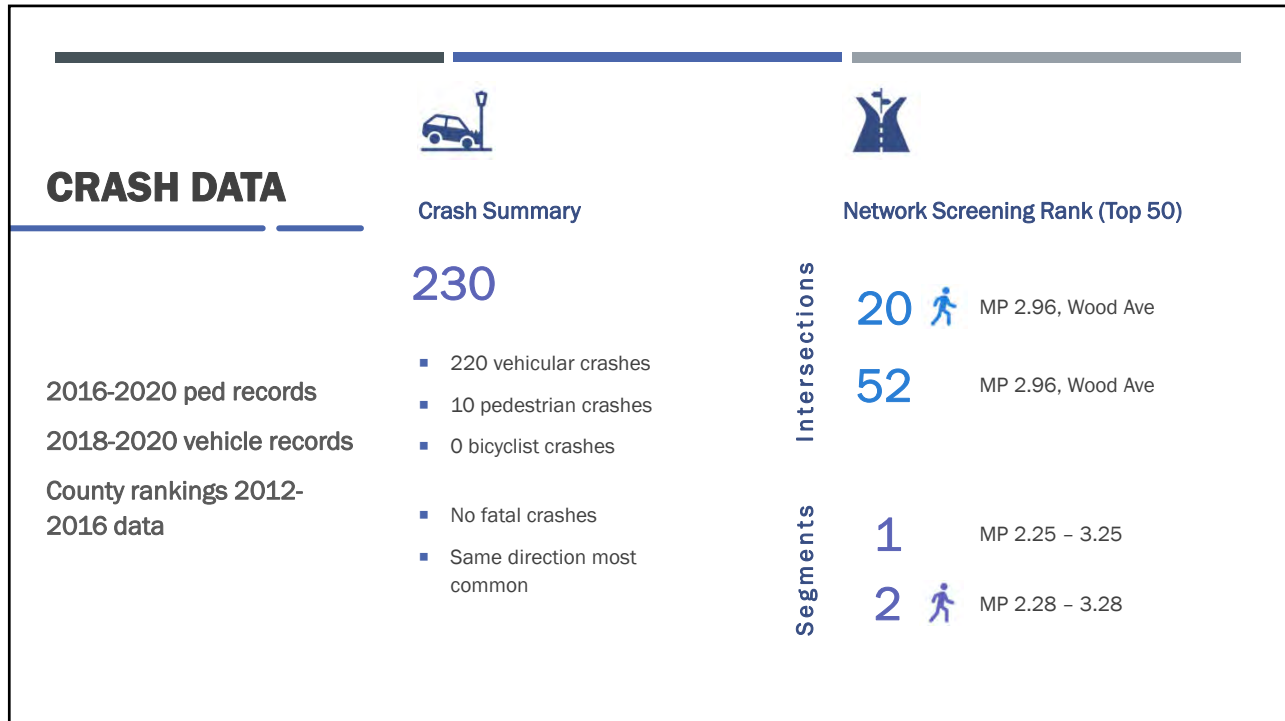
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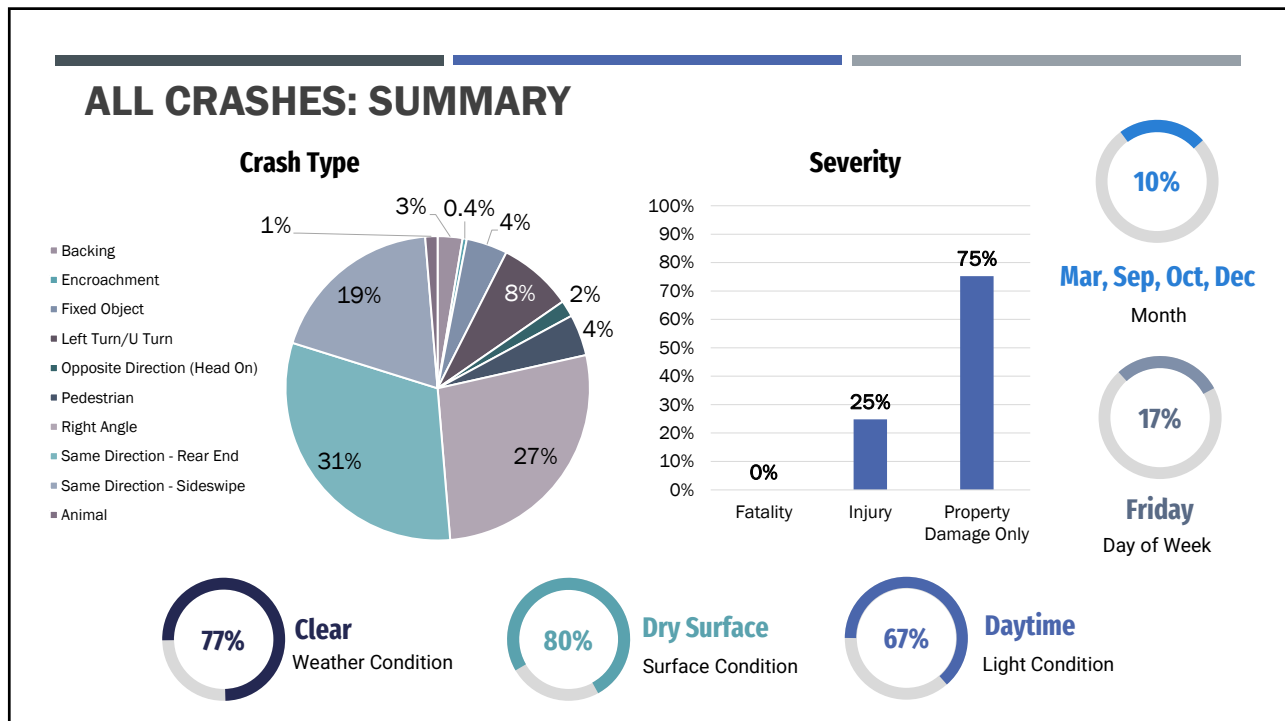
AREA MAP

 #48, 801, 804

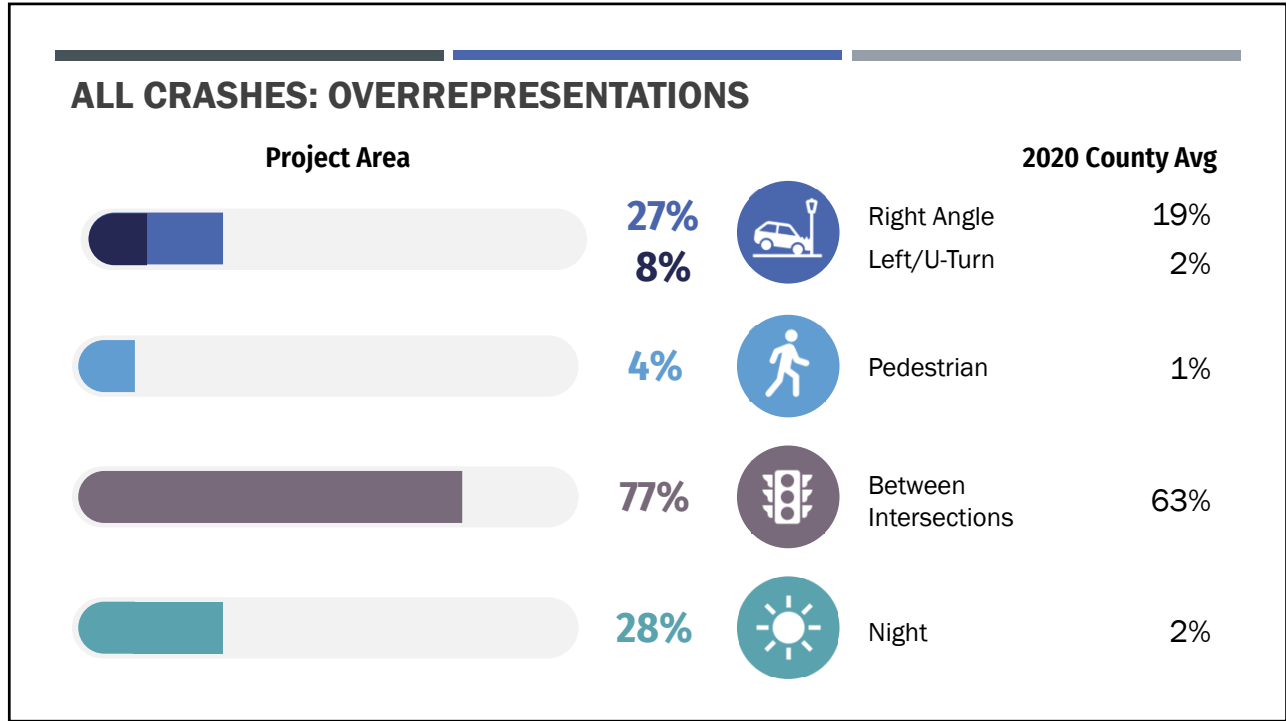
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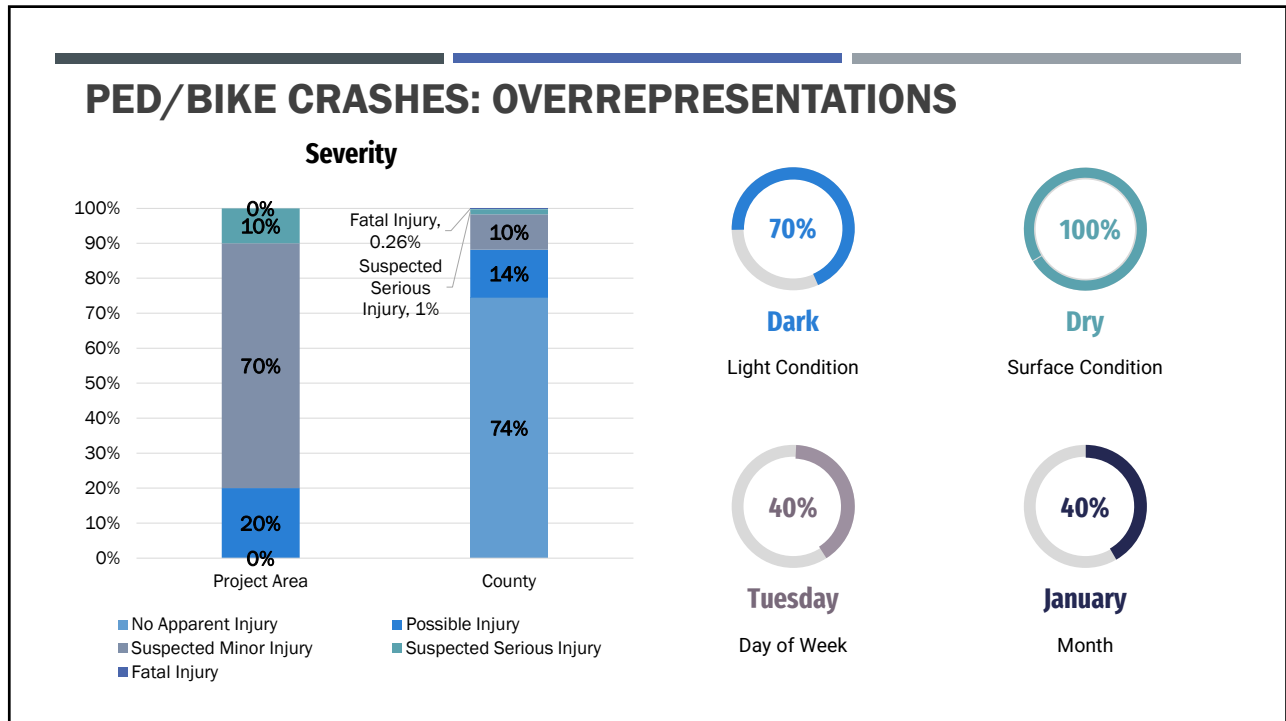
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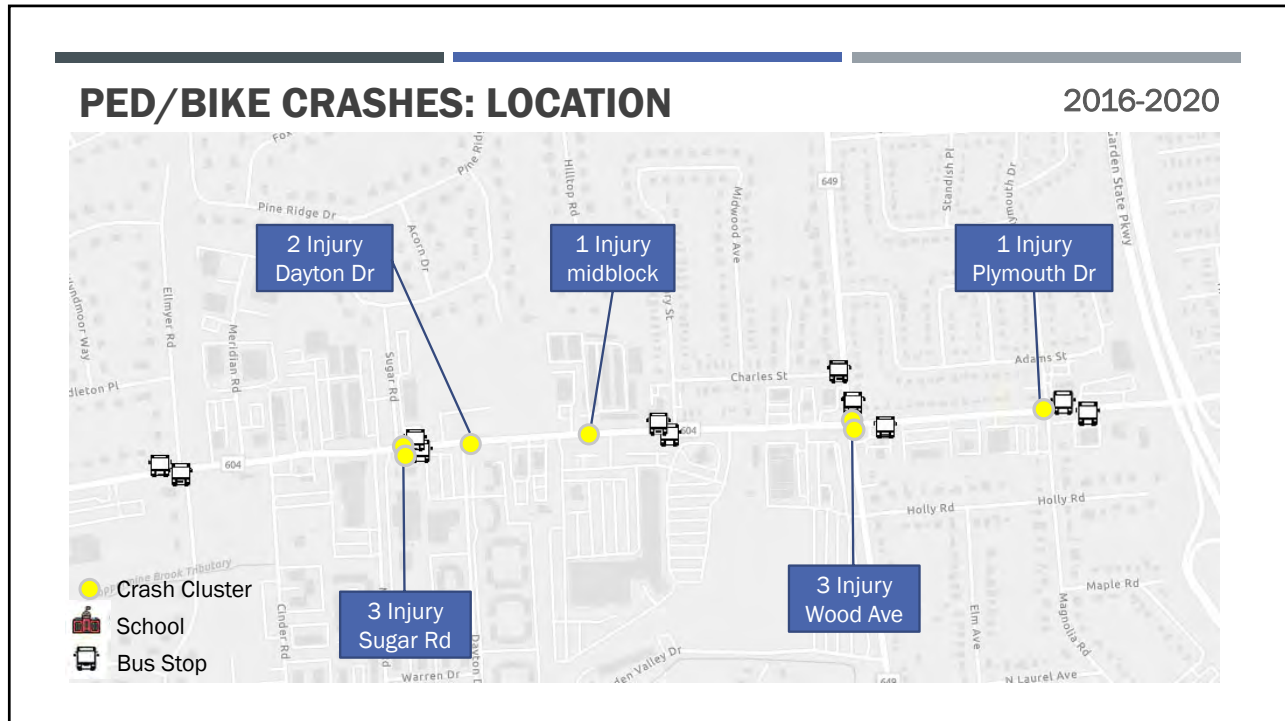
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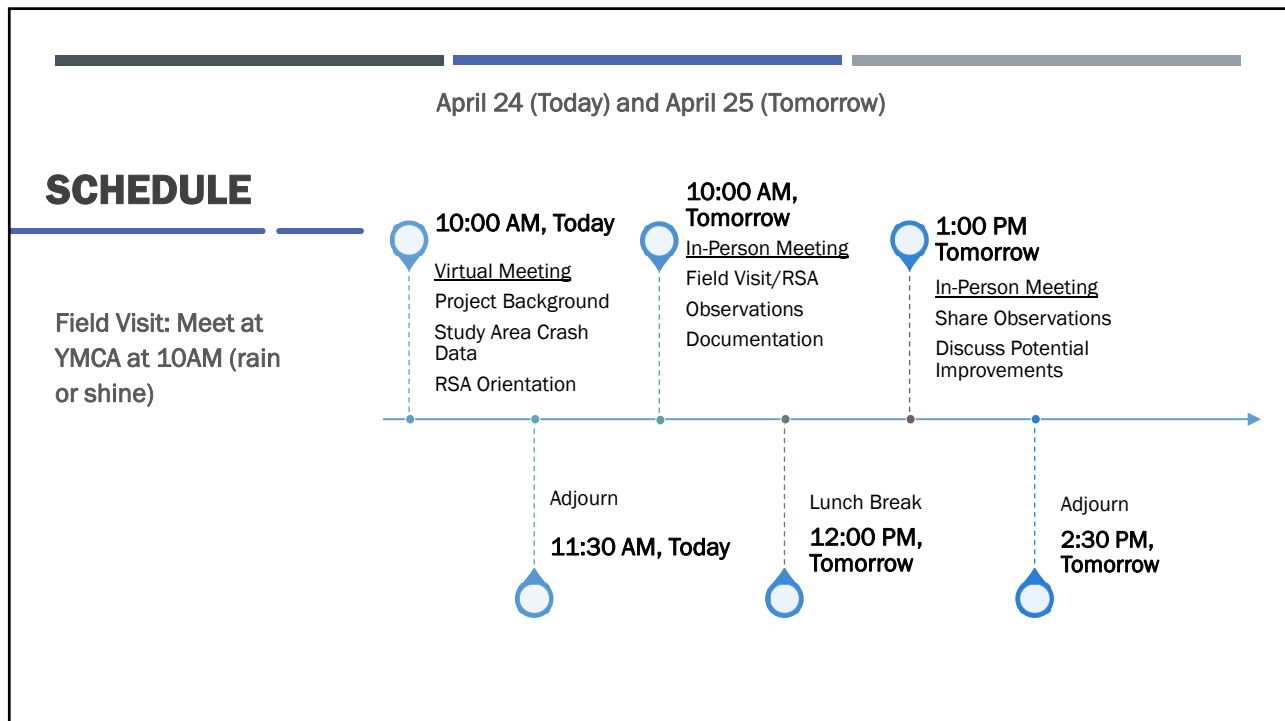
15



16



17



18

DISCUSSION DURING FIELD VISIT

Dress appropriately for safety and weather. Safety vests must be worn.



Observations

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



Recommendations

- What opportunities exist to eliminate or mitigate identified safety concerns?
- What improvements would you make?
- Are any of the FHWA countermeasures beneficial?

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NEXT STEPS

Problem Statement Development will be conducted separately.



- Preparation of RSA Report
- Review/comments from RSA Team
- Preparation of Preliminary Final Report
- Preparation of Final Report
- Approximate timeframe: 6-8 weeks

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H. ROAD OWNER REPOSE

Ronald G. Rios
County Commissioner Director

Shanti Narra
County Commissioner Deputy Director

Claribel A. Azcona-Barber
Charles Kenny
Leslie Koppel
Chanelle Scott McCullum
Charles E. Tomaro
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DEPARTMENT OF TRANSPORTATION
Office of Engineering

Charles Kenny
Chairperson,
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John A. Pulomena
County Administrator

Khalid Anjum
Department Head

Ronald Sendner
County Engineer

November 22, 2023

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

Re: Middlesex County Response To Road Safety Audit Recommendations
For Oak Tree Road (CR 604) From Farmhaven Avenue to Garden State Parkway,
Edison and Woodbridge Townships

Dear Ms. Steponanko:

I would first like to take this opportunity to thank everyone who participated in the Road Safety Audit of the Oak Tree Road Corridor from Farmhaven Avenue to the Garden State Parkway. Middlesex County is committed to improving safety for all our road users through implementing key elements of our Vision Zero Initiative, Complete Streets Policy as well as our Land Development Standards and Capital Improvement Program.

The County has reviewed the recommendations outlined in the Road Safety Audit (RSA), dated September 2023, and generally endorses the Corridor-Wide and Site-Specific recommendations described in Table 4 and Table 5 of the report, respectively. However, implementation of specific improvements will require further review and evaluation, municipal coordination and support and funding.

Middlesex County is currently underway with design of intersection safety and operational improvements to Oak Tree Road/Plymouth and Magnolia and Oak Tree Road and Wood Avenue. Recommendations provided by the RSA Team will either be implemented or given serious consideration as we advance the design of both intersections.

The following responses to Corridor-Wide Recommendation, which may also be applied to the site specific RSA recommendations are provided below.

75 Bayard Street, New Brunswick, NJ 08901
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No.	RSA Recommendation	Response
1	Consider upgrading all ramps for ADA compliance	Middlesex County requires ADA compliant sidewalk curb ramps on all new development applications, milling and resurfacing projects and county intersection upgrades.
2	Consider corridor-wide signal upgrades (8" to 12" signal heads, install backplates with retroreflective border , evaluate clearance intervals, update to countdown pedestrian signal heads, replace push buttons for ADA compliance, signal timings, lighting, etc.)	Installation of 12" signal heads and backplates with retroreflective border are required on all new traffic signal upgrade projects.
3	Consider installing additional signage (speed limit, intersection warning signs) and updating signage and ensure it is consistent throughout corridor	Sign upgrades are included as part of our milling and resurfacing projects and signal upgrade projects.
4	Consider conducting a lighting analysis for the corridor and add pedestrian or street-level lighting as appropriate	Installation/upgrades to street lighting would need to be pursued by the local municipality.
5	Review access management for the corridor and consider driveway revisions or consolidation	Middlesex County is currently underway with incorporating access management as part of our revised Land Development Standards.
6	Consider road diet for the corridor (reduce 5 lanes to 3 lanes)	Consideration of a Road Diet on Oak Tree Road could be explored but would require additional study and close coordination with Woodbridge and Edison Townships
7	Investigate installing edge lines and providing shoulder, especially east of Wood Avenue where the roadway width is 40' for two travel lanes	Installation of edge lanes would be considered.
8	Consider reconfiguring stop-controlled intersections to right-in, right-out (RIRO) only operations	The County would support such measures but implementing turn restrictions would require additional study and close coordination with Woodbridge and Edison Townships. Any such restrictions would require adoption of a local ordinance and enforcement as well. We would also need to ensure there is a safe location for accommodating prohibited turn movements.
9	Consider installing dynamic speed feedback signs	Middlesex County would consider allowing installation of Dynamic Driver Speed Feedback signs where posted speed reductions are 10 MPH or greater or where speed studies demonstrate travel speeds are excessive. Installation and maintenance of such devices would need to be undertaken by the local municipality.
10	Consider clearing sight triangles at intersections	Need to evaluate specific locations where sight distance is limited.



11	Consider providing raised <i>median</i> island where there are no driveways present	Could be considered at locations where the size of the medians would not pose maintenance issues for snow removal, drainage impediments or pose a traffic safety hazard. Impacts to adjacent site access would also need to be evaluated.
12	Consider installing curb in areas where missing	The County is neither responsible for maintenance nor installation of curb. However, the County will install curb if part of a Capital Improvement Project involving changes to the roadway width or roadway elevation. Drainage would also need to be accommodated with installation of curb. Middlesex County generally requires installation of curb as a condition of approval on land development projects.
13	Inspect, repair and construct sidewalk in compliance with ADA as needed with appropriate buffer from travel lanes, including driveway aprons; complete any missing connections, including installing concrete sidewalk across driveways where missing	Middlesex County generally requires installation of sidewalk as a condition of approval on land development projects and includes sidewalk construction in Capital Improvement Projects. The County also installs ADA compliant sidewalk ramps on County road milling and resurfacing projects and county intersection upgrades. However, the abutting land owner is responsible for sidewalk maintenance and repairs to existing sidewalk.
14	Examine crosswalks status: check placement, alignment, and markings	Acknowledged.
15	Consider improvements to bus stops including providing floating bus stops	Modifications/ relocations of existing bus stops must be initiated through NJTRANSIT.
16	Consider providing <i>high-visibility crosswalk</i> markings for all intersections throughout corridor	Middlesex County installs high visibility crosswalks at signalized intersections maintained by the County as and other crosswalks installed across a County roadway. However, marked crosswalks at other locations are targeted where there is a known or documented demand for pedestrian crossing movements.
17	Investigate providing <i>Leading Pedestrian Interval (LPI)</i> at signalized intersections	Acknowledged. However, LPIs would not be implemented where're there are advance lead left turn phases.
18	Consider shared use path throughout the corridor	Requires further study, but limited right of way would likely be an issue on the Oak Tree Road corridor. Shared Use Paths would need to be within a municipal easement and as such would be the maintenance responsibility of the local municipality or abutting land owner.
19	Inspect existing striping for wear and restripe accordingly	Acknowledged.

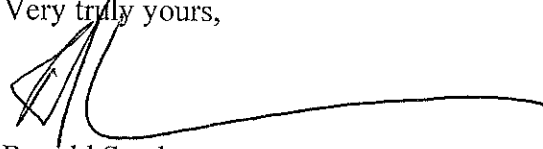


20	Inspect and replace missing, faded, damaged or incorrect/outdated signage as needed (i.e., signs mounted below 7-ft, or on non-breakaway posts)	Acknowledged. Sign upgrades would be included as part of our milling and resurfacing projects and signal upgrade projects.
21	Inspect and trim foliage/vegetation and take out retail signs to improve sidewalk paths	Removal of obstructing tree foliage would be undertaken by the adjacent landowner, through the local municipality.
22	Inspect drainage facilities; ensure they are free of debris	Acknowledged. Inspection of drainage facilities is done through Middlesex County's routine stormwater facility maintenance.
23	Consider periodic sidewalk, crosswalk, multimodal education campaign and code enforcement.	This would likely be an initiative undertaken through the local police department or as part of a local community development initiative.

Based on recommendations of the RSA Team, as a next step, the County would further review, evaluate and identify potential improvements and explore funding for design and construction. In the meantime, the County plans to implement certain short term spot improvements as indicated above, including signing and striping along the corridor as part of its regular maintenance efforts along County routes.

If you have any concerns regarding the comments, should you have any questions or comments, please feel free to contact me at (732) 745-3283.

Very truly yours,



Ronald Sendner,
County Engineer

Cc: George Fallat, Middlesex County Supervising Engineer
Linda Weber, Middlesex County Planning Director
Mike Dannemiller, Middlesex County Supervising Engineer
Andrew Lappitt, Middlesex County Principal Planner

