



Phase 4

Computerized Traffic Signal System Timing Plan Evaluation - CRCOG

JUNE 2023



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COMPUTERIZED TRAFFIC SIGNAL SYSTEM EVALUATION
Prepared for Connecticut Department of Transportation
By Gannett Fleming



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List of Acronyms

Acronym	Definition
@	At
a.m.	ante meridiem or “before midday”
AVE.	Avenue
CCTV	Closed Circuit Television
CRCOG	Capital Region Council of Governments
CTDOT	Connecticut Department of Transportation
CTSS	Coordinated Traffic Signal System
EB	Eastbound
FHWA	Federal Highway Administration
GPS	Global Positioning System
INDOT	Indiana Department of Transportation
INT	Intersection
LOS	Level of Service
MOE	Measures of Effectiveness
MPH	Miles Per Hour
N/A	Not Available
NB	Northbound
NCHRP	National Cooperative Highway Research Program
OST	Objectives, Strategies, Tactics
p.m.	post meridiem or “after midday”
SB	Southbound
ST.	Street
TSDWIN	Time Space Diagram Windows Program
Rd.	Road
RTE.	Route
UCONN	University of Connecticut
Vxx	Version Number
WB	Westbound

Glossary of Termsⁱ

Capacity

The maximum rate at which vehicles can pass through an intersection under prevailing conditions.

Congestion

An excess of vehicles on a portion of roadway at a particular time resulting in speeds that are slower — sometimes much slower — than normal or "free flow" speeds.

Coordination

The ability to synchronize multiple intersections to enhance the operation of one or more directional movements in a system.

Cycle Length

The duration of a complete sequence of phases in the absence of priority calls. In an actuated controller unit, a complete cycle is dependent on the presence of calls for all non-priority phases. Some indications may be served more than once in a cycle. Occasionally, an indication may not be part of a normal cycle (e.g., a left-turn arrow may only be displayed during railroad preemption).

Offset

The time relationship between the coordinated phase(s) based on the offset reference point and a defined master reference (i.e., master clock or sync pulse).

Operating Environment

An area with similar characteristics that would have similar signal timing objectives.

Phase Splits

The time assigned to a phase (green and the greater of the yellow change plus red clearance or the pedestrian walk plus clearance times) during coordinated operations. May be expressed in seconds or as a percentage.

Time-Space Diagram

A chart that plots the location of signalized intersections along the vertical axis and the signal timing along the horizontal axis. This is a visual tool that illustrates coordination relationships between intersections.

Traffic Signal Operations

The prioritization of objectives and active collection of information to efficiently manage traffic signal infrastructure and control devices to maximize safety and throughput while minimizing delays.

User Priority

A user may be assigned a relative or absolute priority based on operating environment and locally desired outcomes. These priorities may vary by movement.

Executive Summary

This document is meant to report the “before” and “after” results of the timing plan evaluation for the CTSS completed in Phase 4 of the optimization project. The Connecticut Department of Transportation (CTDOT) proposed the project to include approximately forty (40) corridors in the north central portion of the State of Connecticut known as Capital Region Council of Governments (CRCOG) crcog.org. See Figure 3 and 4 for CRCOG location maps. These corridors will be analyzed and refined to improve traffic flow and the safety of motorists and pedestrians. Below is a list of nine (9) corridors out of the approximately forty (40) included in Phase 4 of the project:

- Berlin - Route 5 & 15 (Berlin Turnpike) from Commuter Lot (Meriden) to Brickyard Plaza Drive
- Berlin/Newington/Wethersfield - Route 5 & 15 (Berlin Turnpike) from Rowley Street to Nott Street
- Enfield - Route 5 (King Street) from Depot Hill Road to South Road
- Farmington/New Britain/West Hartford - Route 71 (Hartford Road, SE Road, New Britain Avenue) from Costco Driveway to Westfarms Mall Main Entrance
- Rocky Hill - Route 3 (Cromwell Avenue) from Route 160 (New Britain Avenue) to Inwood Road
 - Route 411 (West Street) from Corporate Place to Veterans Home
 - Route 99 (Main Street) from Route 160 (Elm Street) to Gorman Road
- Simsbury - Route 10 & 202 South (Hopmeadow Street) from Route 185 (Hartford Road) to Powder Forest Drive
- Simsbury - Route 10 & 202 North (Hopmeadow Street) from Woodland Street to Iron Horse Boulevard
- Southington - Route 10 (Main Street) from Old Turnpike Road to Flanders Street
- West Hartford - Route 44 (Albany Avenue) from Renbrook School to Steele Road
 - Route 218 (North Main Street) from Starkel Road to Miller Road

The purpose of the project was to prepare and implement traffic signal coordination timing plans along the study corridors and to measure the resulting changes in traffic signal operations. These timing plans were developed based on a data collection effort, field observations, operational / safety review, FHWA guidance and recommendations, and detailed traffic signal timing analysis which included utilizing a computerized software model (Such as Synchro/SimTraffic 11ⁱⁱ and Tru-Trafficⁱⁱⁱ).

Each corridor was evaluated from 6 a.m. to 6 p.m. Monday through Friday to improve CTSS operations by following the step-by-step signal system timing plan evaluation process as shown in Figure 1 below. CTDOT Bureau of Highway Operations - Traffic Management Unit updated the timing plans from 6 p.m. to 10 p.m. Monday through Friday and Saturday/Sundays. The added weekday evening, Saturday, and Sunday hours timing plans by CTDOT did not include evaluation measures.

The signalized intersections coordination timings were adjusted based on operating environment, volume demand during congestion and uncongested conditions, signal phasing, and proximity of intersections. Cycle lengths were balanced to move motor vehicles through the closely spaced signalized intersections while limiting wait times for side streets.

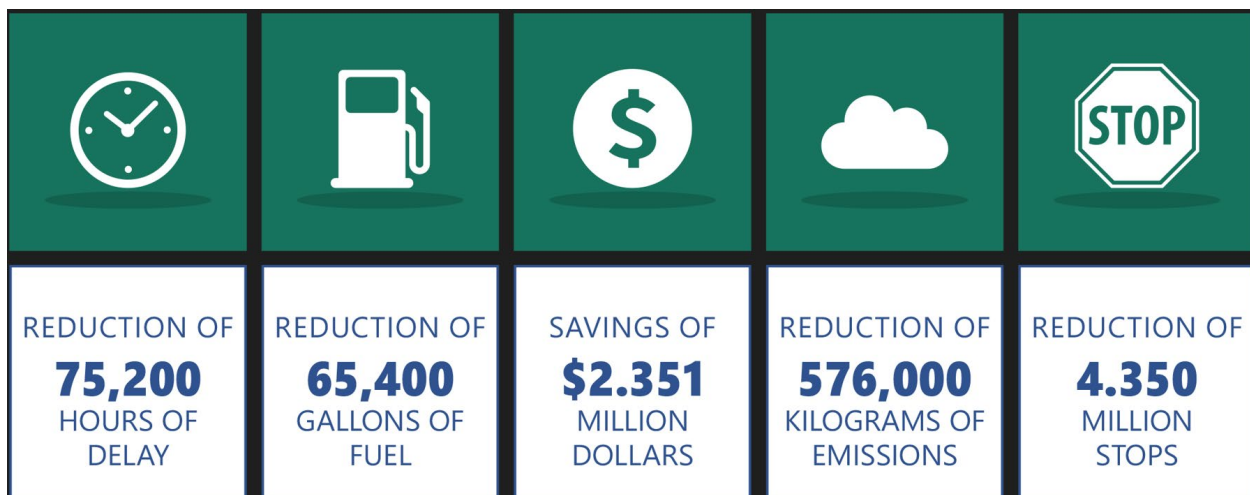
Figure 1: Timing Plan Evaluation Process



Source: NCHRP 954^{lv}

The new traffic signal timing plans were implemented by the CTDOT Bureau of Engineering and Construction- Division of Traffic Engineering's Traffic Signal Lab and Bureau of Highway Operations - Traffic Management Unit. The timing plans were fine-tuned based on field observations to achieve the best results possible. To confirm and quantify these results, performance measures were documented in the form of travel time studies, which occurred both before and after the signal timing implementation and field fine-tuning tasks. Based on the "Before" and "After" data of the corridors studied in Phase 4, we saw reduction in the following: delays, fuel consumption, road user costs, emissions, and number of stops. This resulted in reducing travel times and improving travel speed. See results of the Benefit Cost calculations provided below for Phase 4 corridors in Figure 2.

Figure 2: Phase 4 Corridors Performance Measures Summary



It is determined that significant cost savings are achieved in all nine (9) study corridors. On average, travel speeds were increased from an average of 25 mph to 27.4 mph, an increase of 10%. The number of stops were reduced by 4.35 million per year and travel times were reduced by an average of 10%. The

Phase 4 reductions to delay and fuel are estimated to save Connecticut motorists over 75,200 hours of delay and \$2,351,000 in user (time and fuel) costs per year.

A benefit-to-cost analysis was completed for each phase study area to understand the return benefit based on the State's investment. The Consultant's cost of Phase 4 is \$400,000 or \$100,000 per year for 4 years. The benefit-to-cost ratio for Phase 4 is calculated to be 24:1.

This shows a significant return on investment through delay and fuel savings to Connecticut motorists. The reduction to stops and emissions, provide a benefit to the air quality in Connecticut and is expected to provide added safety benefits by reducing crashes. Moreover, these savings are only inclusive for the portion of the day for which travel time data was collected.

Introduction

Timing plan evaluation of CTSS is a cost-effective method of improving traffic flow, reducing congestion, improving mobility and safety for all users. Federal Highway Administration (FHWA) guidance indicates that traffic signal systems need to be retimed every three (3) to five (5) years. The needs are based on changes in land use, population, demographics, and travel patterns. CTDOT's mission and goals emphasizes a commitment to improving safety and mobility for all transportation users. This document identifies the results of the timing plan evaluation for approximately forty (40) corridors within the limits of the CRCOG area. This will help improve mobility and safety for all CTSS users and achieve CTDOT's mission and goals.

Phase 4 report documents the results of the final nine (9) corridors out of the approximately forty (40) studied in the CRCOG area. Figure 4 below shows the approximate CTDOT's CTSS locations for all four phases of the Region.

Figure 3: CTDOT Statewide Map – CRCOG Region

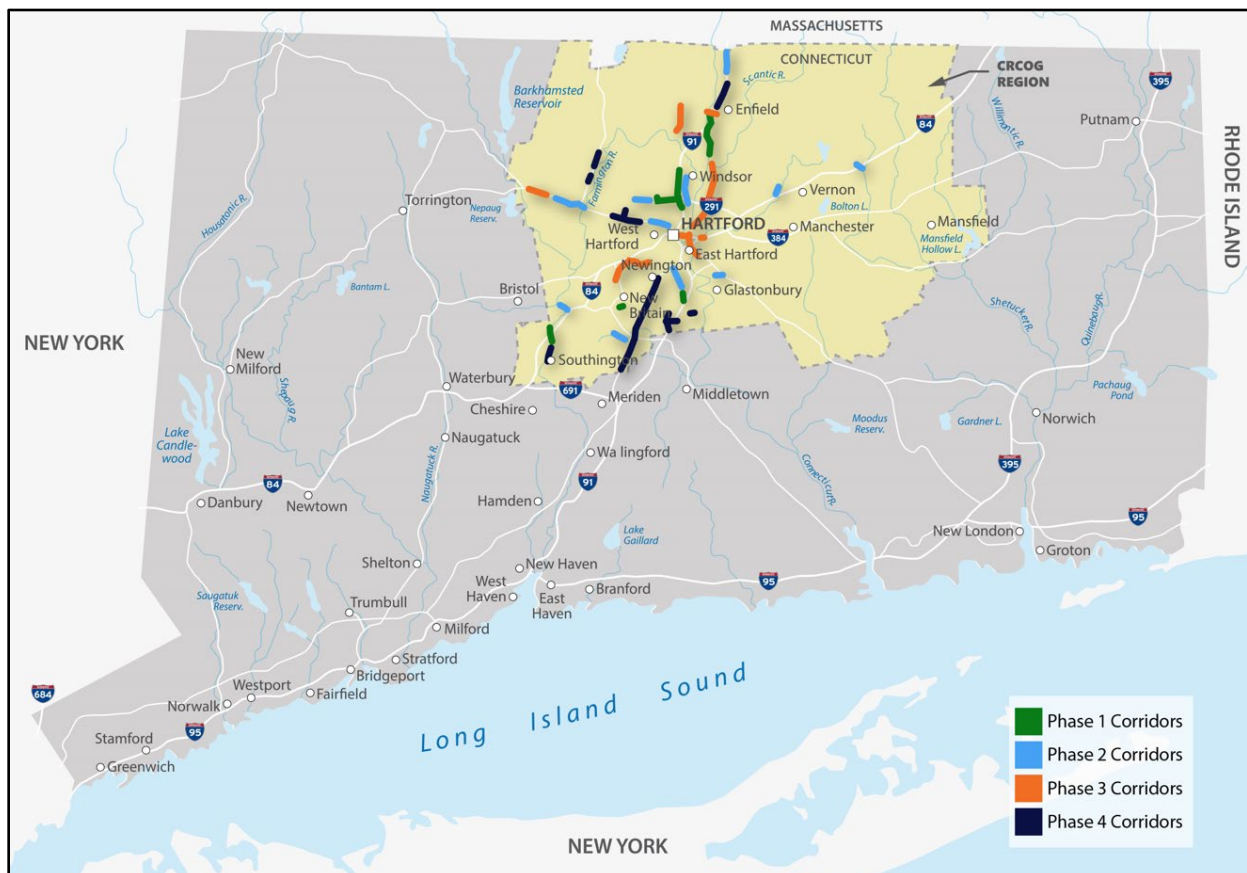
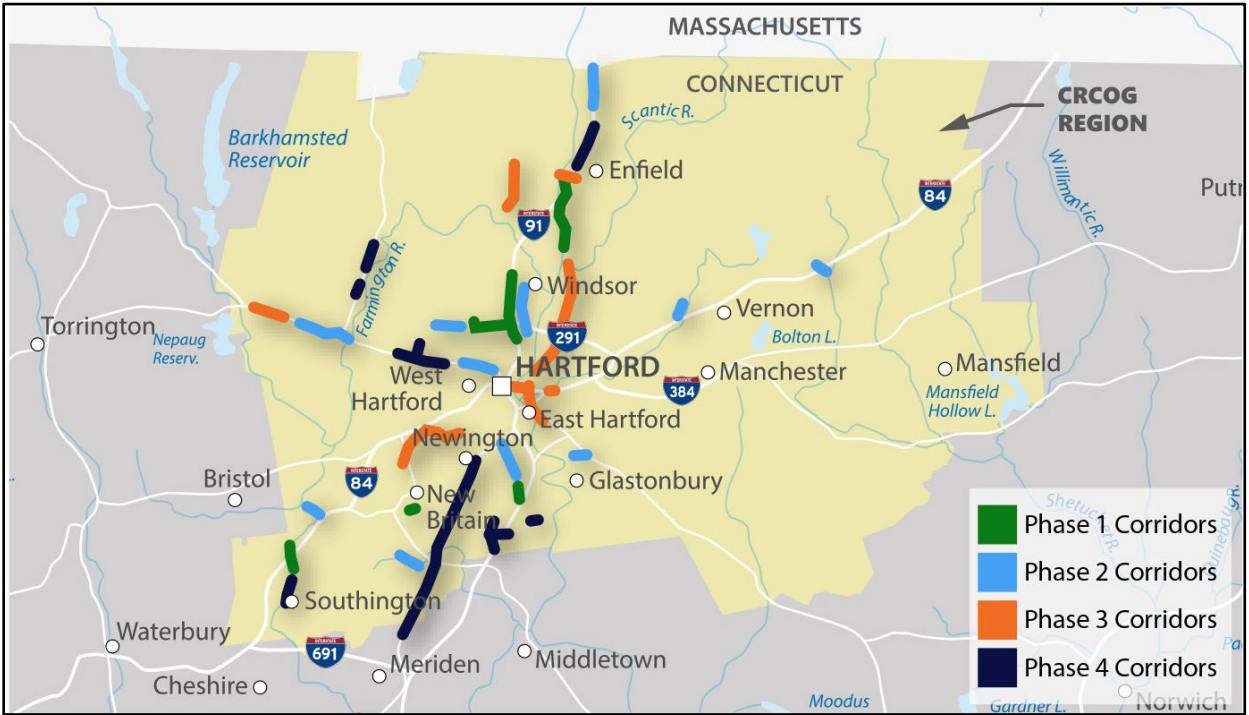
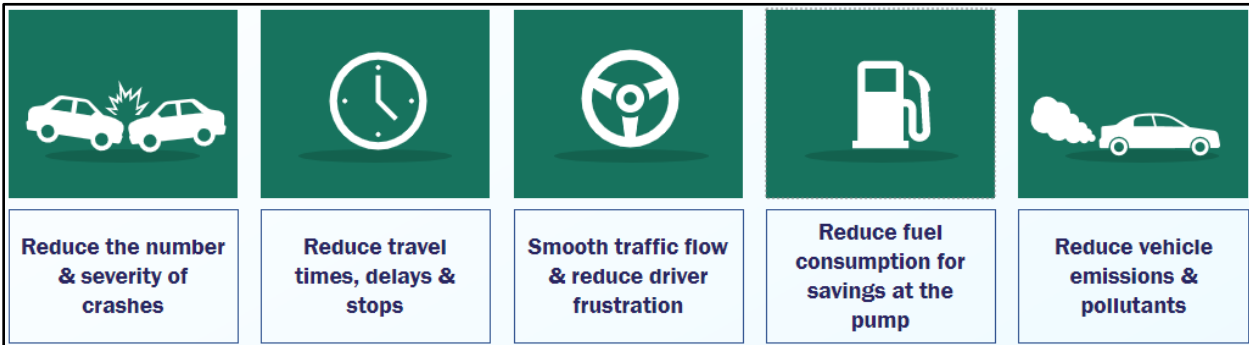


Figure 4: CTDOT CTSS Locations – CRCOG Region



CTDOT Green Light effort includes meeting key objectives and strategies shown below in Figure 5 that contribute to supporting CTDOT’s mission and goals. The tactics are described in the timing plan development process below.

Figure 5: Project Objectives and Strategies



CTDOT and its Consultant team worked together to review the context of the corridors, perform traffic counts, travel time runs and perform analysis to optimize each corridor using Synchro V11, SimTraffic, Tru-Traffic and field observations. Upon completion of the data collection tasks and optimization, new timing plans were implemented. CTDOT and the Consultant team then performed “after” travel time runs to quantify the benefits of the timing changes using the performance measures established by the project. The following is a list of the corridors, location and system numbers included in Phase 4. A detailed list of intersections within each corridor is provided in Appendix A.

- Berlin/Meriden - Route 5 & 15 (Berlin Turnpike) from Commuter Lot (Meriden) to Brickyard Plaza Drive
- Berlin/Newington/Wethersfield - Route 5 & 15 (Berlin Turnpike) from Rowley Street to Nott Street
- Enfield - Route 5 (King Street) from Depot Hill Road to South Road
- Farmington/New Britain/West Hartford - Route 71 (Hartford Road, SE Road, New Britain Avenue) from Costco Driveway to Westfarms Mall Main Entrance
- Rocky Hill - Route 3 (Cromwell Avenue) from Route 160 (New Britain Avenue) to Inwood Road
 - Route 411 (West Street) from Corporate Place to Veterans Home
 - Route 99 (Main Street) from Route 160 (Elm Street) to Gorman Road
- Simsbury - Route 10 & 202 South (Hopmeadow Street) from Route 185 (Hartford Road) to Powder Forest Drive
- Simsbury - Route 10 & 202 North (Hopmeadow Street) from Woodland Street to Iron Horse Boulevard
- Southington - Route 10 (Main Street) from Old Turnpike Road to Flanders Street
- West Hartford - Route 44 (Albany Avenue) from Renbrook School to Steele Road
 - Route 218 (North Main Street) from Starkel Road to Miller Road

The timing adjustments for the CROCOG area included travel time runs to calculate travel time measurement. Travel time runs include driving a vehicle through the study limits during weekday peak morning and afternoon hours to gather speed, stops, delay, and travel time measurements for both directions of travel. To learn more about the concept of how travel time runs are taken, watch the side-by-side video on the CTDOT Green Light website ([CTDOT Green Light Main Page](#)). The video demonstrates the before and after travel time runs for corridor Route 218 (Cottage Grove Road/Putnam Highway). See Appendix B for before and after travel times.

Figure 6: Route 218 (Travel Time Run Video)



Data Collection

Data collection and information review efforts were dual-purposed. First, it yielded the corridor characteristics, operating environment, and technical traffic signal information to perform calculations and support the development of new timing plans. Second, it provided the means to compare traffic signal operations from updated conditions to baseline conditions. See data sources used below:

State Provided Information

CTDOT provided the following:

- GRIDSMART or Miovision traffic volumes where available
- CTDOT Planning Unit volume counts
- Speed profiles from Google Maps
- Existing traffic signal plans
- Existing timing plan coversheets
- Existing time space diagrams
- Context of the corridors
- Travel time runs for assigned corridors

Consultant Collected Information

The Consultant team collected/created the following for each corridor

- Collected turning movement counts by classification from 6 a.m. to 6 p.m. Monday – Friday for specific intersections
- Collected crash data
- Collected distance between intersections
- Created travel time run data for assigned corridors
- Collected timing plan coversheets for assigned corridors
- Collected time space diagrams for assigned corridors
- Collected existing and created optimized Synchro V11 models for assigned corridors
- Collected field observations of traffic operations

Phase 4 Corridors Descriptions

The characteristic of each corridor was provided through CTDOT data sources, desktop reviews, and field observations as well as detailed discussion with CTDOT staff regarding the context of each intersection and corridor. Each corridor is described within this section including a map of locations and detailed technical table.

Berlin/Meriden, Route 5 & Route 15 (Berlin Turnpike)

Route 5 and Route 15 (Berlin Turnpike) corridor is a north/south principal arterial through the towns of Berlin and Meriden. The arterial functional classifications for the project can be found on CTDOT's website at [CTDOT Functional Classification](#). The corridor includes thirteen (13) signalized intersections beginning in Meriden at the CTDOT Commuter Lot (Int. 079-211) and ending at the Brickyard Mall (Int. 007-243). See Figure 7 below for location map. This corridor is approximately 4.5 miles long, has two travel lanes in each direction with a median divider. Sidewalks and pedestrian crosswalks do not exist along the corridor; however, pedestrian push buttons are provided with red, yellow, and green indications at all locations. The pedestrian activity is considered light for this corridor. There are no bike lanes and bus stops throughout the corridor. The average two-way peak hour volumes are approximately 3,100, 1,800, and 3,400 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 50 mph. Route 5 & Route 15 is considered a diversion route for I-91 & Route 9 when the highways experience significant delays and queues.

The corridor is comprised of industrial, commercial, and residential properties along the roadway. The users are predominantly motor vehicles. The corridor's functional use has a moderate variation by time of day, day of week. The corridor serves as a commuter route during the weekday mornings and again later in the afternoon. Table 1 below shows further details of each signalized intersection throughout this corridor.

The corridor has one subsystem to meet the user needs and movement priorities. Route 160 (Int. 007-208) and Brickyard Mall operate non-coordinated to better meet the user movement needs and priorities.

The subsystem includes widely spaced intersections with higher average speeds than most systems in the CRCOG Region. The corridor's signalized intersections coordination timing was adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The corridor experiences higher volumes during a.m. and p.m. peak hours. The a.m. volume flow favors northbound where p.m. volumes favor southbound. Midday volumes are moderate with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings, Route 5 & Route 15 in Berlin achieved better traffic flow in both directions with improved timing for local operational movements to meet all the user needs. The corridor traffic signal equipment is scheduled to be reconstructed starting in June 2023 through State Project 0007-0262.

Figure 7: Berlin/Meriden, Route 5 & Route 15 Location Map

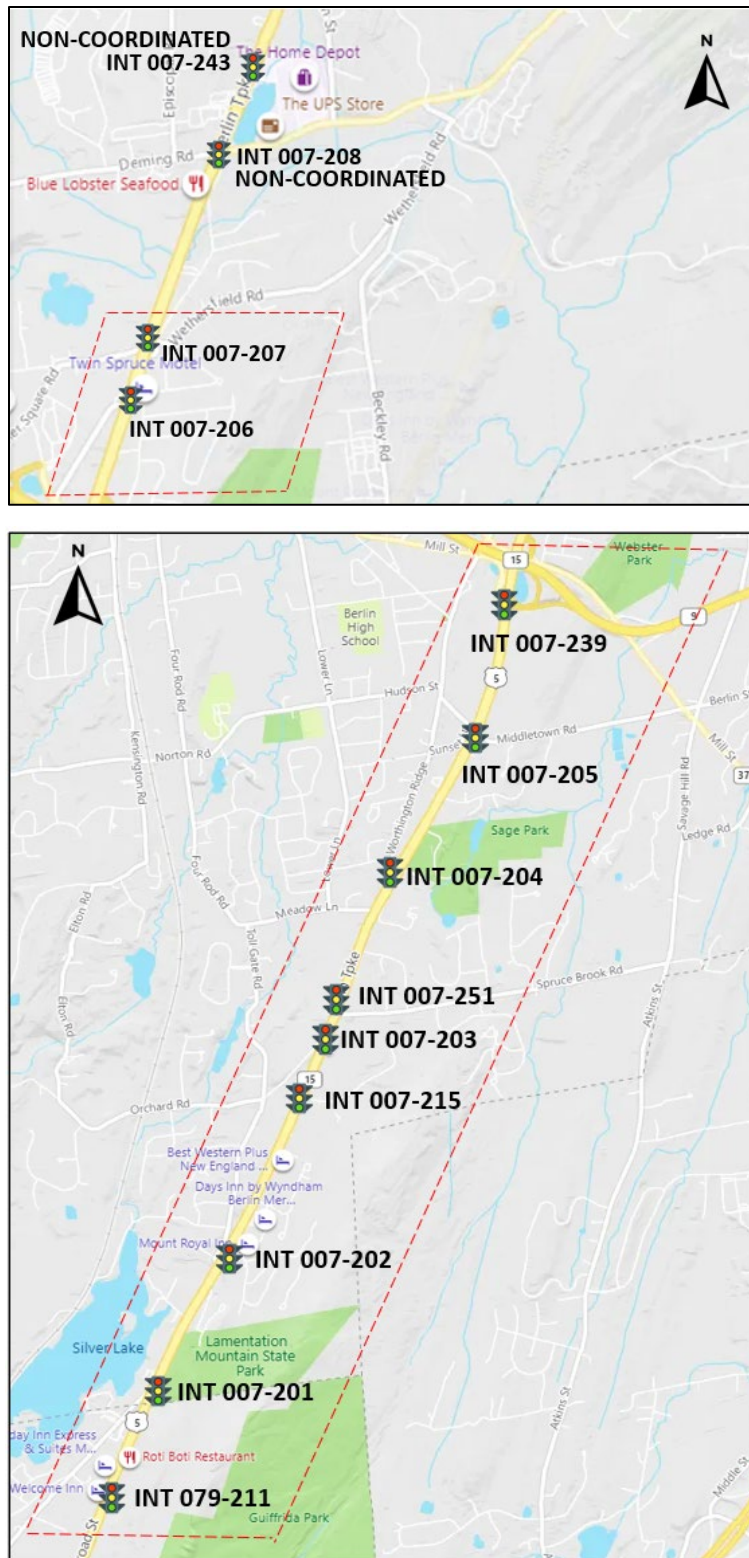


Table 1: Berlin/Meriden Details, Route 5 & Route 15 (Berlin Turnpike)

Berlin/Meriden Route 5 & Route 15						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
079-211	A	RTE 15 AT COMMUTER LOT	V	NONE	Copper Underground	Naztec V41
007-201	A	RTE 15 AT NORTH COLONY RD	V	NONE	Copper Underground	Naztec V41
007-202	A	RTE 15 AT TOLL GATE RD	V	NONE	Copper Underground	Naztec V41
007-215	A	RTE 15 AT NEW PARK DR	V	NONE	Copper Underground	Naztec V41
007-203	A	RTE 15 AT ORCHARD RD	V	NONE	Copper Underground	Naztec V41
007-251	A	RTE 15 AT SPRUCE BROOK RD	V	NONE	Copper Underground	Naztec V41
007-204	A	RTE 15 AT S. WORTHINGTON RIDGE	V	NONE	Copper Underground	Naztec V41
007-205	A	RTE 15 AT MIDDLETOWN RD	V	NONE	Copper Underground	Naztec V41
007-239	A	RTE 15 AT RTE 9 RAMPS	V	NONE	Copper Underground	Naztec V41
007-206	A	RTE 15 AT N. WORTHINGTON RIDGE	V	NONE	Copper Underground	Naztec V41
007-207	A	RTE 15 AT WOODLAWN & WETHERSFIELD	V	NONE	Copper Underground	Naztec V41
007-208	N/A	RTE 15 AT RTE 160 DEMING RD	V	V	Copper Underground	Naztec V41
007-243	N/A	RTE 15 AT BRICKYARD MALL	V	V	Copper Underground	Naztec V41
V = Video (Non recording)						

Berlin, Newington, Wethersfield, Route 5 & Route 15 (Berlin Turnpike)

Route 5 and Route 15 (Berlin Turnpike) corridor is a north/south principal arterial through the towns of Berlin, Newington, and Wethersfield. The corridor includes fifteen (15) signalized intersections beginning at Rowley and Seldon (Int. 007-209) and ending at Nott Street (Int. 159-228). See Figure 8 below for location map. This corridor is approximately 4.5 miles long, has two travel lanes in each direction with a median divider, and no existing bike lanes throughout the corridor. There are three segments of the corridor that include three lanes in each direction to improve capacity and safety. From south to north, segment one begins just south of Lowe's Drive (Int. 093-255) and ends just south of Pascone Place (Int. 093-245). Segment two begins at Kitts Lane (Int. 093-228) and ends just north of Route 287 (Int. 093-234). Segment three begins just south of Arrow Road (Int. 159-210) and ends at Nott Street. The corridor does not include sidewalks however, pedestrian crosswalks with pedestrian signal heads and push buttons were recently installed at some intersections as part of State Project 0007-0250. There is one bus stop at Route 5 & Route 15 southbound and Kitts Lane. The pedestrian activity is considered light for this corridor. The average two-way peak hour volumes are approximately 3,750, 2,500, and 4,300 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 50 mph. Route 5 & Route 15 is considered a diversion route for I-91 when the highway experiences significant delays and queues.

The corridor is comprised of significant commercial businesses along the roadway with industrial areas and residential neighborhoods adjacent to the corridor. The users are predominantly motor vehicles. The corridor's functional use has a moderate variation by time of day, day of week. Table 2 below shows further details of each signalized intersection throughout this corridor. The corridor is divided into three Subsystems A, B, and C to meet the user needs and movement priorities.

The subsystems include widely spaced intersections with higher average speeds than most systems in the CRCOG Region. Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing was adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimizing wait times, and proximity of intersections.

The corridor experiences higher volumes than other corridors in the CRCOG Region. The a.m. volume flow favors northbound where p.m. volumes favor southbound. Midday volumes are moderate to heavy with additional volume in the southbound direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings, Route 5 & Route 15 corridor in Berlin, Newington, and Wethersfield achieved better traffic flow in both directions with improved timing for local operational movements to meet all the user needs. The corridor's traffic signal technology has been installed and is scheduled to be fully integrated and operational in summer of 2023 through State Project 0007-0250.

Figure 8: Berlin, Newington, Wethersfield, Route 5 & 15 Location Map

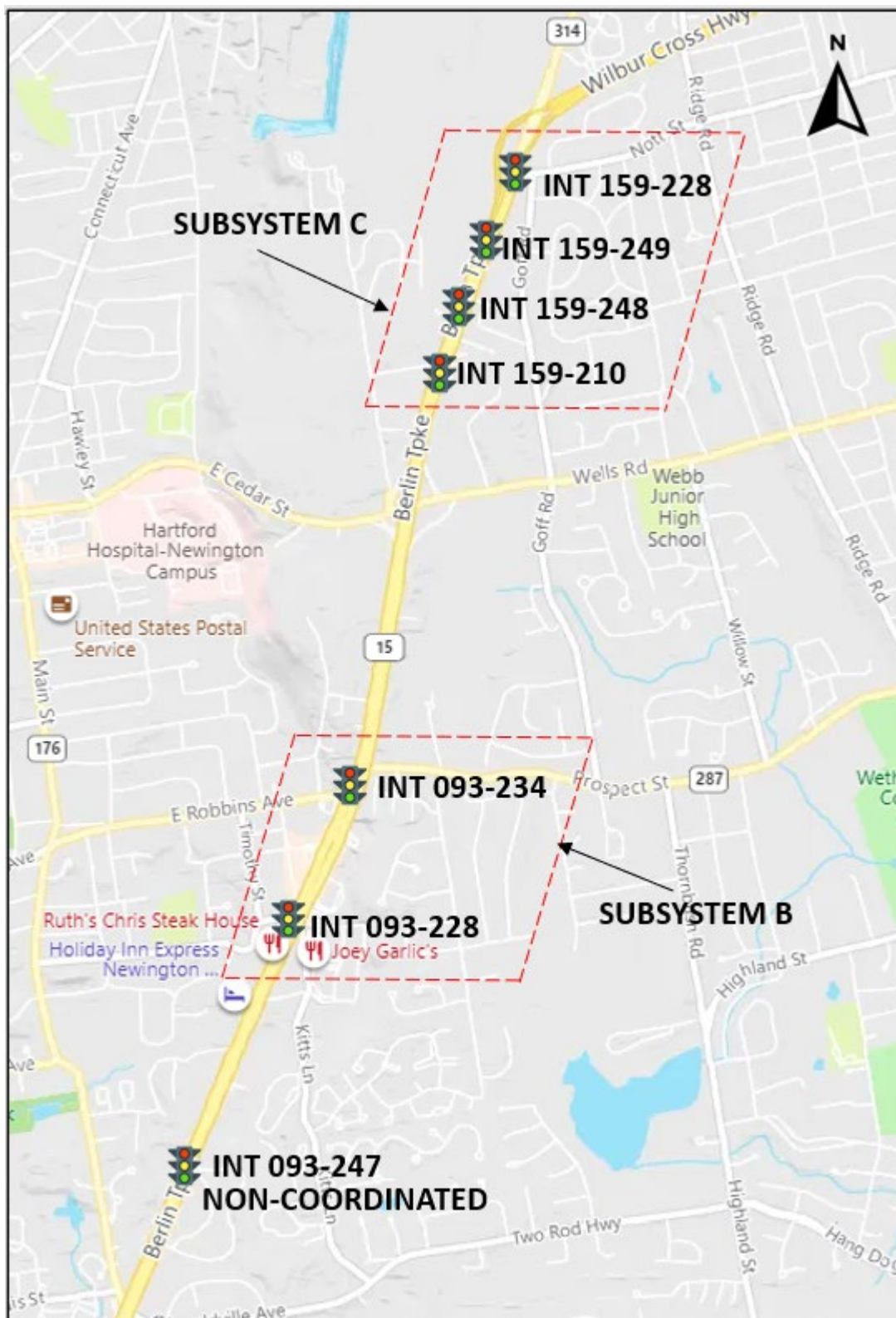


Figure 8: Berlin, Newington, Wethersfield, Route 5 & 15 Location Map - Continued

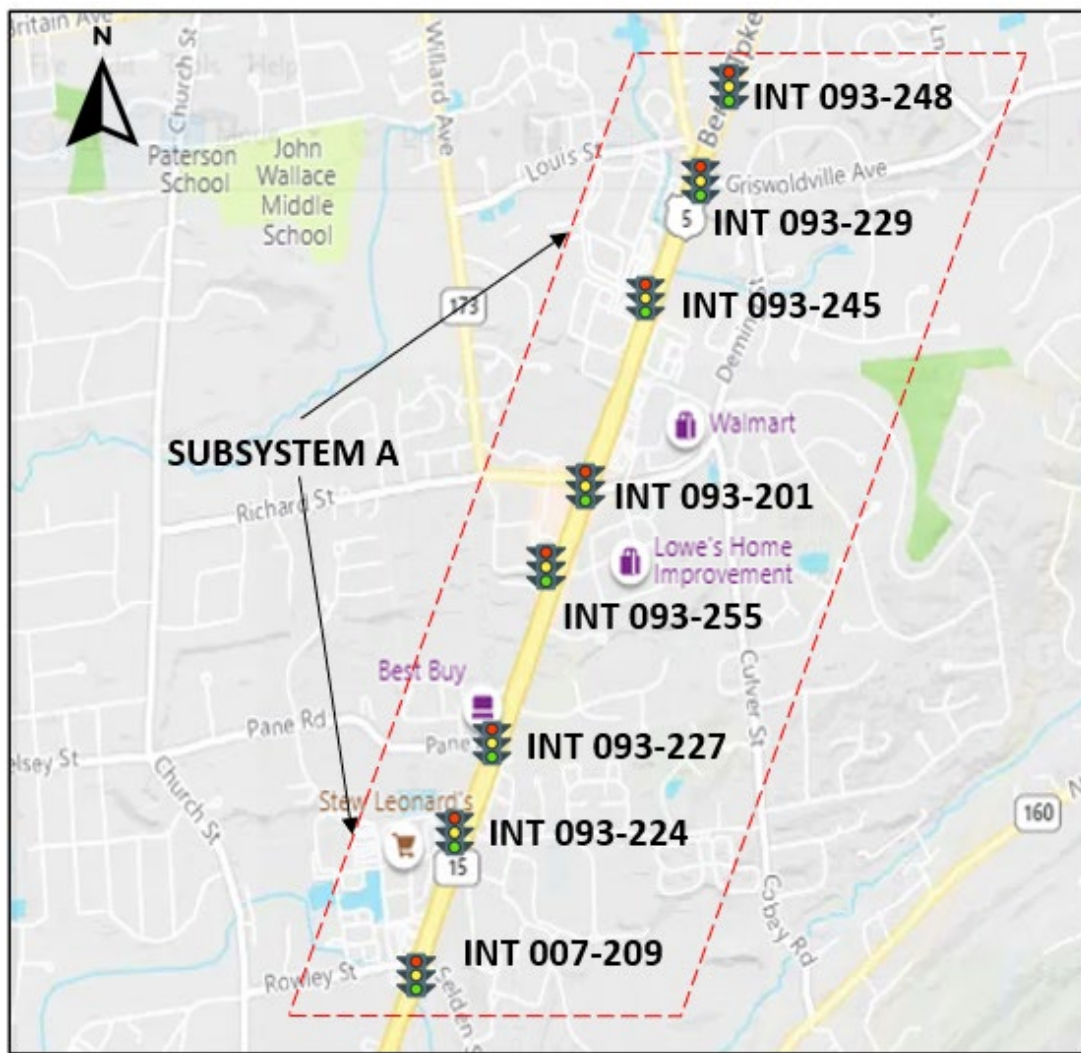


Table 2: Berlin, Newington, Wethersfield Details, Route 5 & 15 (Berlin Turnpike)

Berlin/Newington/Wethersfield Route 5 & 15						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
007-209	A	RTE 15 AT ROWLEY & SELDEN	V	Radar	Fiber Underground	Cubic V85
093-224	A	RTE 15 AT WEBSTER ST	V	Radar	Fiber Underground	Cubic V85
093-227	A	RTE 15 AT PANE RD	V	Radar	Fiber Underground	Cubic V85
093-255	A	RTE 15 AT LOWES DR	V	Radar	Fiber Underground	Cubic V85
093-201	A	RTE 15 AT RICHARD & DEMING	V	Radar	Fiber Underground	Cubic V85
093-245	A	RTE 15 AT PASCONI PL	V	Radar	Fiber Underground	Cubic V85
093-229	A	RTE 15 AT MAIN ST (RTE 176) & GRISWOLDVILLE	V	Radar	Fiber Underground	Cubic V85
093-248	A	RTE 15 AT DOT SOUTH DR.	V	Radar	Fiber Underground	Cubic V85
093-247	N/A	RTE 15 AT DOT NORTH DR.	V	Radar	Fiber Underground	Cubic V85
093-228	B	RTE 15 AT KITTS LANE	V	Radar	Fiber Underground	Cubic V85
093-234	B	RTE 15 AT RTE 287 (E. ROBBINS)	V	Radar	Fiber Underground	Cubic V85
159-210	C	RTE 15 AT ARROW RD	V	Radar	Fiber Underground	Cubic V85
159-248	C	RTE 15 AT PAWTUCKET	V	Radar	Fiber Underground	Cubic V85
159-249	C	RTE 15 AT RTE 314	V	Radar	Fiber Underground	Cubic V85
159-228	C	RTE 15 AT NOTT ST	V	Radar	Fiber Underground	Cubic V85
V = Video (Non recording)						

Enfield, Route 5 South (King Street)

Route 5 (King Street) corridor is a north/south principal arterial through the town of Enfield. The corridor is approximately 2.5 miles long and includes six (6) signalized intersections. See Figure 9 below for location map. The corridor begins as a two lane roadway from Depot Hill Road (Int. 048-243) to north of I-91 Ramps and Bernies (Int. 048-250) and turns into a four lane roadway with median divider to just south of Orlando Drive (Int. 048-219) where the roadway returns to a two lane road to South Road (Int. 048-210). The corridor includes a portion of sidewalk on the east side between Depot Hill Road and Weymouth Road (Int. 048-242) at the CREC Academy and again at the I-91 Ramp for a short distance to the north of the intersection. There is a sidewalk on the west side of the roadway from south of Orlando Drive to South Road. Pedestrian push buttons are provided with red, yellow, and green indications at Depot Hill Road, Weymouth Road, and Orlando Drive with crosswalks on the side street. No pedestrian indications or sidewalks are provided at I-91 and Bernies location. The Post Office Road (Int. 048-214) and South Road include Walk/Don't Walk indications with crosswalks. The pedestrian activity is considered light for the north portion of the corridor and light to the south of the corridor. There are no bike lanes or bus stops throughout the corridor. The average two-way peak hour volumes are approximately 850, 700, and 1,200 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 45 mph. Route 5 is considered a diversion route for I-91 when the highway experiences significant delays and queues.

The corridor is comprised of commercial businesses along the roadway with mostly residential neighborhoods. The users are predominantly motor vehicles. The corridor's functional use has a minor variation by time of day, day of week. Table 3 below shows further details of each signalized intersection throughout this corridor. The corridor has one subsystem to meet the user needs and movement priorities. I-91 intersects the corridor between Weymouth Road and Orlando Drive.

The subsystem includes widely spaced intersections with higher average speeds than most systems in the CRCOG Region. Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The corridor experiences higher volumes than other corridors in the CRCOG Region. The a.m. volume flow favors southbound where p.m. volumes favor northbound. Midday volumes are moderate to light with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings, Route 5 Enfield achieved better traffic flow in both directions with improved timing for local operational movements to meet all the user needs.

Figure 9: Enfield, Route 5 South Location Map



Table 3: Enfield Details, Route 5 South (King Street)

Enfield Route 5 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
048-243	A	RTE 5 AT SR 510 (DEPOT HILL RD)	L	NONE	Copper Aerial	Naztec V41
048-242	A	RTE 5 AT WEYMOUTH RD	L	L	Copper Aerial	Naztec V41
048-250	A	RTE 5 AT 91 SB RMPS & BERNIES DR	L	NONE	Copper Aerial/Underground	Naztec V41
048-219	A	RTE 5 AT ORLANDO DR	V	NONE	Copper Aerial	Naztec V41
048-214	A	RTE 5 AT POST OFFICE RD	V	NONE	Copper Aerial	Naztec V41
048-210	A	RTE 5 AT SOUTH RD	V	NONE	Copper Aerial	Naztec V41
L = Loop, V = Video (Non recording)						

Farmington/New Britain/West Hartford - Route 71 (Hartford Road, Southeast Road, New Britain Avenue)

Route 71 (Hartford Road/Southeast Road/New Britain Avenue) corridor is a north/south minor arterial through the towns of Farmington, New Britain, and West Hartford and is one of the major commuter routes in the area. The corridor includes nine (9) signalized intersections divided into two Subsystems, A and B. Subsystem A begins at Costco Driveway (Int. 088-294) and spans 6 signalized intersections to Mall Entrance No. 1 (Int. 051-236). Subsystem B begins at Shepard Road (Int. 155-236) and spans 3 signalized intersections to Mall Main Entrance (Int. 155-238). Figure 10 below shows the locations of signalized intersections studied in the corridor. This corridor is 1.1 miles long and has two travel lanes in each direction with a median north of Village Square Drive (Int. 088-248). The corridor does not have sidewalks through portions of the corridor and no bike lanes. Pedestrian push buttons are provided with red, yellow, and green indications at Village Square Drive, Route 9 southbound ramps (Int. 088-283), Shepard Road (Int. 155-236), Westfarms South Drive (Int. 051-236), and South Entrance to Corbin Corner (Int. 155-237). Pedestrians are restricted from crossing Route 71 at Route 9 northbound ramps and the Costco Driveway. The intersections of the mall's Main Entrance and McDonald's Driveway provide a Walk/Don't Walk indications with crosswalks. There are several bus stops located along the corridor with intermittent schedules. The average two-way peak hour volumes are approximately 1,000, 1,850, and 1,950 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 35 mph. Route 71 is considered a diversion route for Route 9 and I-84 when the highways experiences significant delays and queues.

The primary source of traffic generation on this arterial originates from I-84 and Route 9 corridors destined toward retail establishments along the Route 71 corridor. Table 4 below shows further details of each signalized intersection throughout this corridor. The subsystems include closely spaced intersections with left-turn signal phasing and left-turn lanes. The corridor's signalized intersections coordination timing was adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimizing wait times, and proximity of intersections. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce side street wait times by not providing preferential time for arterial coordination. In optimizing the traffic signal system timings on Hartford Road, Southeast Road, and New Britain Avenue in New Britain, Farmington, and West Hartford achieved better traffic flow in both directions that improved timing for local operational movements that meet all the user needs.

Figure 10: Farmington/New Britain/West Hartford – Route 71 Location Map

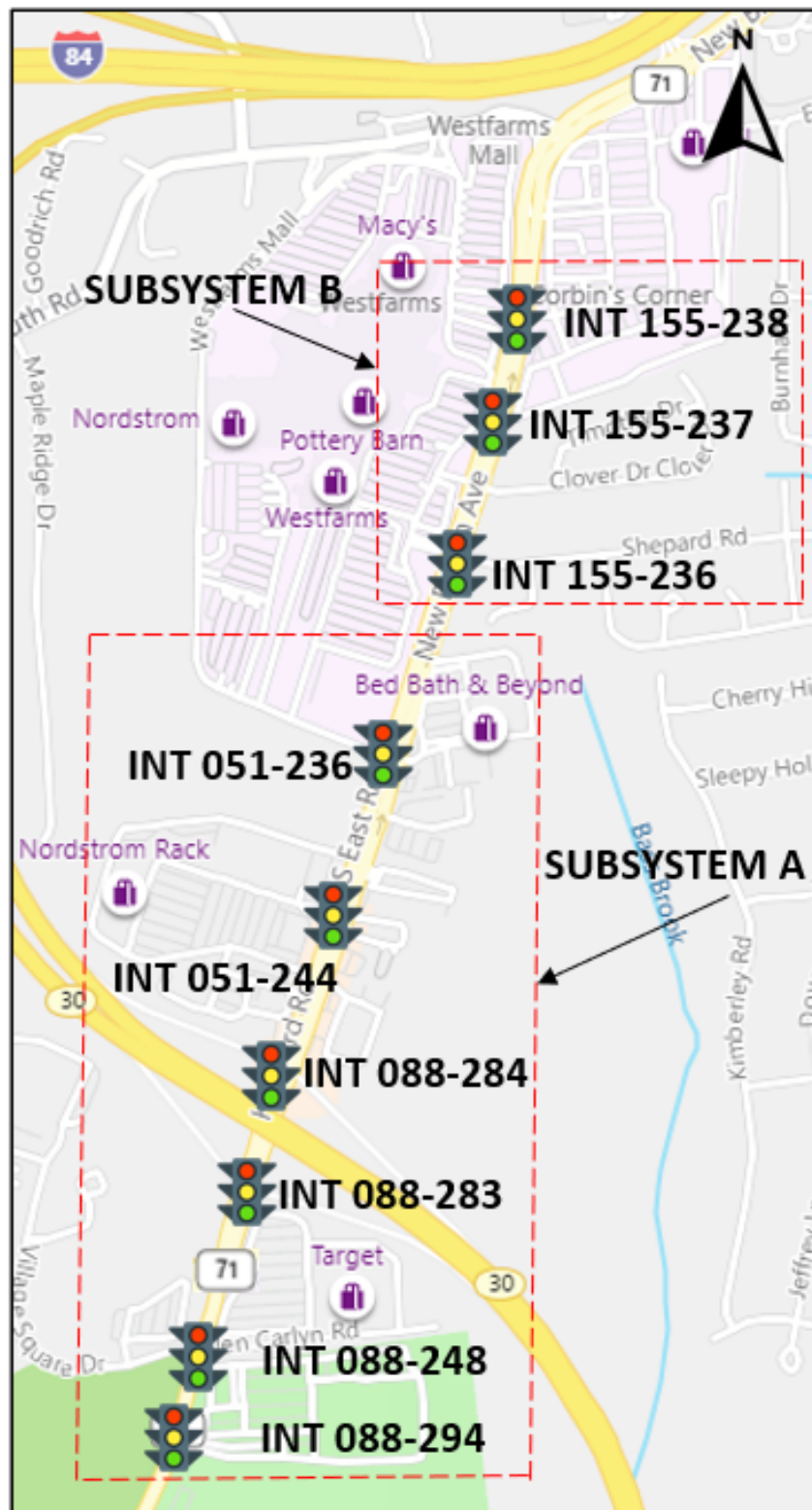


Table 4: Farmington/New Britain/West Hartford - Route 71 (Hartford Road, Southeast Road, New Britain Avenue)

New Britain/ Farmington / West Hartford Route 71						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
088-294	A	RTE 71 AT COSTCO	V	V	Aerial/Underground	Cubic V85
088-248	A	RTE 71 AT VILLAGE SQ	V	V	Aerial	Cubic V85
088-283	A	RTE 71 AT ROUTE 9 S. BND. RAMP	V	NONE	Aerial/Underground	Cubic V85
088-284	A	RTE 71 AT ROUTE 9 N. BND. RAMP	V	NONE	Underground	Cubic V85
051-244	A	RTE 71 AT SPORTS AUTHORITY	V	V	Underground	Cubic V85
051-236	A	RTE 71 AT ENTANCE # 1	L, Mag	L, Mag	Underground	Cubic V85
155-236	B	RTE 71 AT SHEPARD RD	L	L	Underground	Cubic V85
155-237	B	RTE 71 AT CORBIN CORNER	L	L	Underground	Cubic V85
155-238	B	RTE 71 AT MALL MAIN ENT	L, Mag	L, Mag	Underground	Cubic V85
L = Loop, V = Video (Non recording), Mag = Magnetometer						

Rocky Hill, Route 3, 411, 99 (Cromwell Avenue, Main Street, West Street)

The Rocky Hill system is constructed with three corridors within the central area of the town. The traffic signal equipment, field communications and technology were recently reconstructed under State Project 0118-0170 to upgrade the aging equipment, improve traffic signal efficiency, and safety. The reconstruction project included three Subsystems A, B, and C connected by fiber optic communications back to a central facility. Subsystem A is a north/south minor arterial that includes eight (8) traffic control signals on Route 3 from Inwood Road (Int. 118-235) to Route 160 (New Britain Avenue) (Int. 118-216). Subsystem B is an east/west minor arterial that includes six (6) traffic control signals on Route 411 (West Street) from Corporate Place (Int. 118-224) to CTDOT Signal Lab (Int. 118-210). Subsystem C is a north/south minor arterial that includes five (5) traffic signals on Route 99 (Main Street) from Gorman Road & Old Forge Road (Int. 118-211) to Route 160 (Elm Street) (Int. 118-204). See Figure 11 below for location map. Routes 3, 99, and 411 are considered a diversion route for I-91 when the highway experiences significant delays and queues.

Subsystem A is 1.6 miles in length with intermittent sidewalks on both sides of the roadway throughout the corridor. There are bus stops between France Street and West Street (Int. 118-201) on both sides of the roadway and again on the west side of the roadway at Cold Spring Road (Int. 118-215). There are crosswalks and Walk/Don't Walk pedestrian indications for all locations except at Brook Street (Int. 118-227) and Westside Market (Int. 118-239). The pedestrian activity is considered light for this corridor. There are no designated bike lanes. The average two-way peak hour volumes are approximately 2,200, 2,600, and 3,000 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 40 mph.

The corridor is comprised of significant commercial businesses along the roadway with industrial areas and residential neighborhoods adjacent to the corridor. The users are predominantly motor vehicles. The corridor's functional use has a moderate variation by time of day, day of week. Table 5 below shows further details of each signalized intersection throughout this corridor.

Subsystem B is 1.25 miles in length with an existing sidewalk between the I-91 Northbound Ramps (Int. 118-230) and Capital Boulevard (Int. 118-234). No other sidewalks are provided on the corridor. There are bus stops at the DOT Signal Lab and Veterans Home and Hospital on both sides of the roadway. There are crosswalks and Walk/Don't Walk indications for pedestrians at Corporate Place and DOT Signal Lab. The remaining locations do not have crosswalks or pedestrian indications. There are no designated bike lanes. The average two-way peak hour volumes are approximately 1,600, 1,350, and 1,900 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 40 mph. The corridor is comprised of business parks to the west with State facilities in the center of the system. There are mostly residential areas to the east of the corridor. The users are predominantly motor vehicles. The pedestrian activity is considered light for this corridor. The corridor's functional use has a small variation by time of day, day of week. Table 5 below shows further details of each signalized intersection throughout this corridor.

Subsystem C is 1.32 miles in length with an existing sidewalk on the east side of the roadway from Moser Elementary School to Forest Street (Int. 118-206) continuing north on the west side of the roadway from West Street to Route 160 (Elm Street). There is a short segment of sidewalk from Dividend Road (Int. 118-207) to Route 160 (Elm Street) on the east side of the roadway. There are bus stops located on both sides of the corridor. All locations have crosswalks and Walk/Don't Walk pedestrian indications. There are no designated bike lanes. The average two-way peak hour volumes are approximately 1,400, 1,000, and 1,400 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 40 mph. The corridor is comprised of residential areas to the south of the corridor with moderate commercial businesses from Dividend Road to Elm Street. The users are predominantly motor vehicles. The pedestrian activity is considered light to moderate for this corridor. The corridor's functional use has a small variation by time of day, day of week. Table 4 below shows further details of each signalized intersection throughout this corridor.

The subsystems include moderately spaced intersections to with moderate average speeds for the CRCOG Region. Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The corridor experiences moderate volumes compared to other corridors in the CRCOG Region. The a.m. and p.m. volumes with a balance by direction. Midday volumes are light to moderate with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings, Route 3, 99, and 411 in Rocky Hill achieved better traffic flow in both directions with improved timing for local operational movements to meet all the user needs.

Figure 11: Rocky Hill, Route 3, Location Map

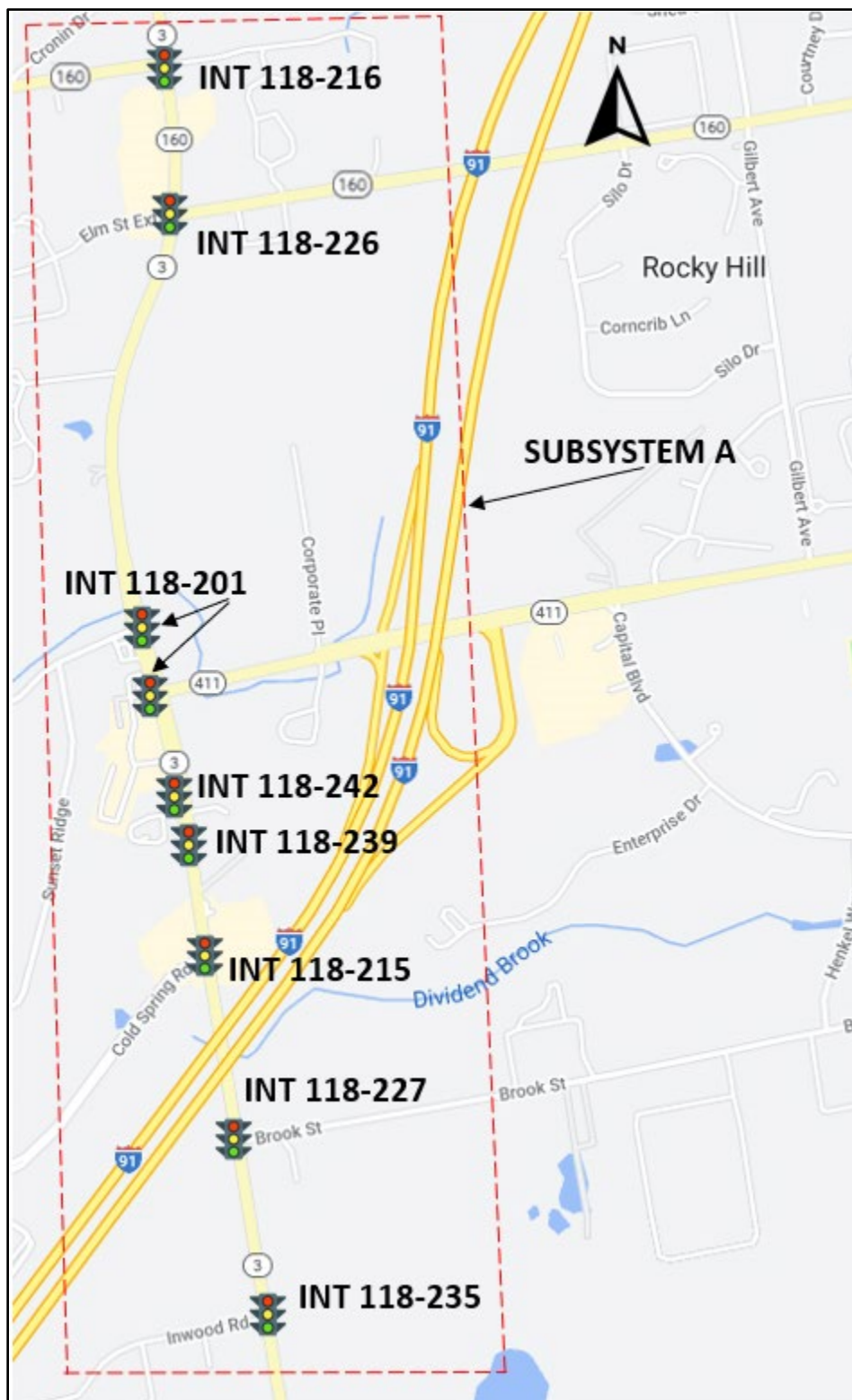


Figure 11: Rocky Hill, Route 411, Location Map

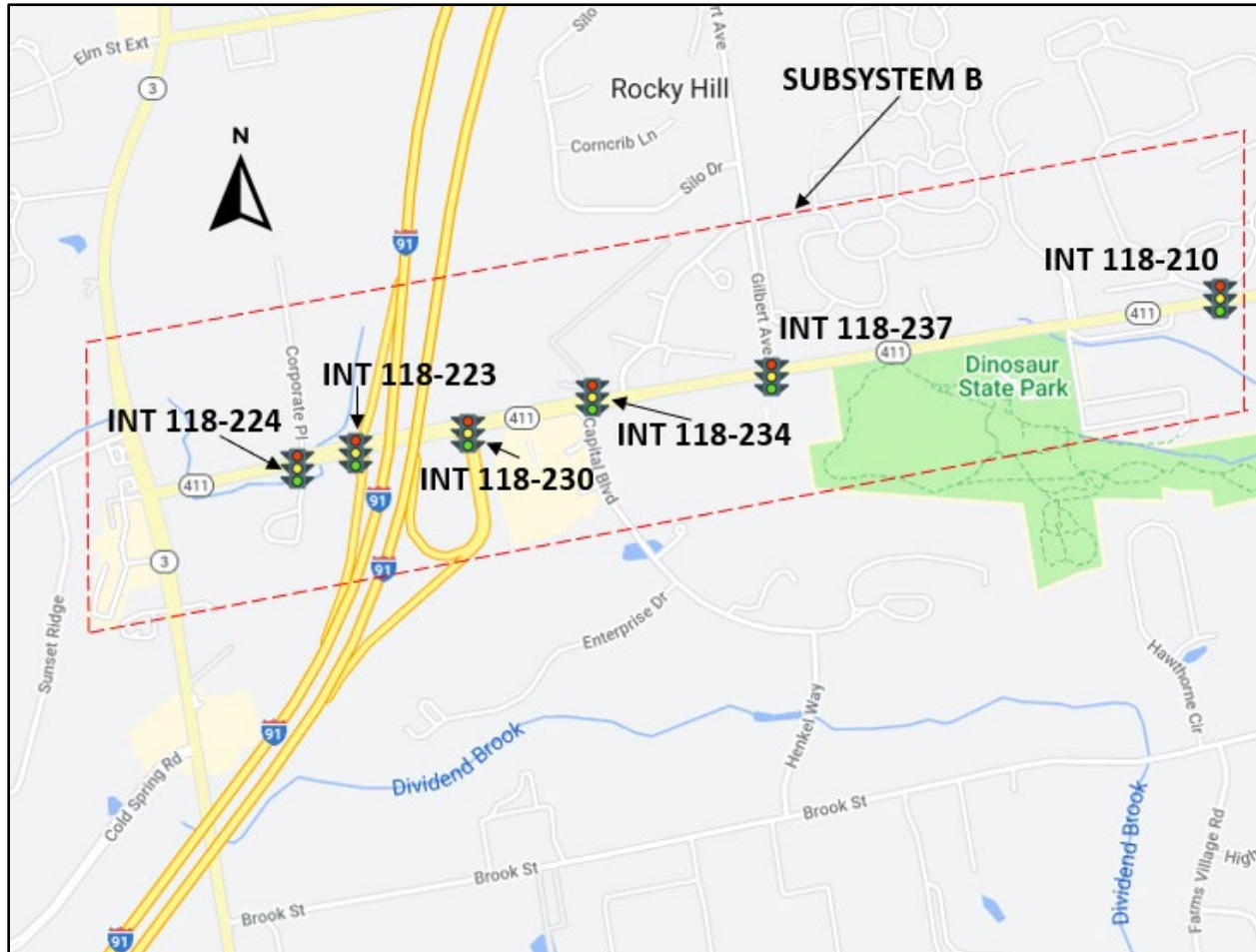


Figure 11: Rocky Hill, Route 99, Location Map

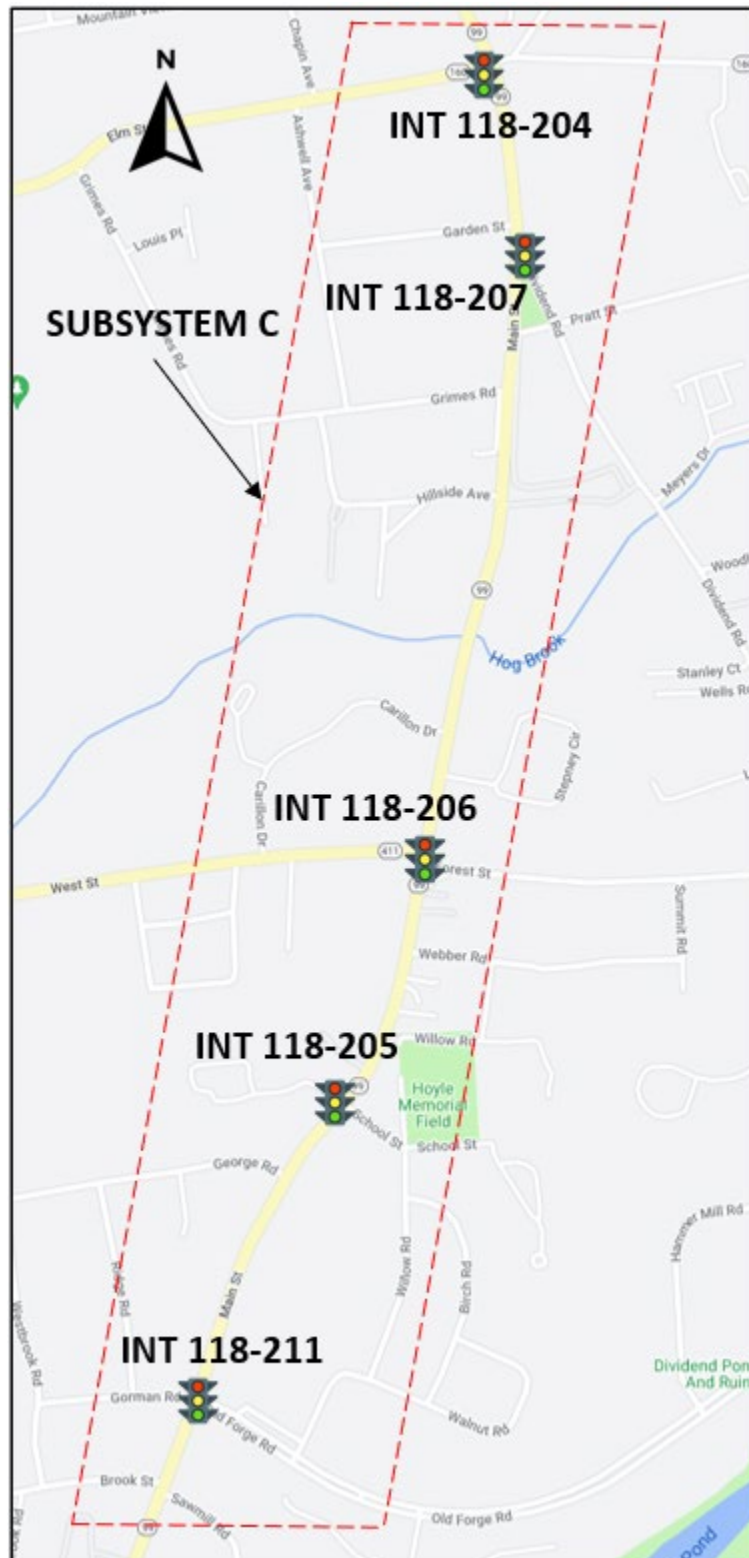


Table 5: Rocky Hill Details, Route 3, 99, 411 (Cromwell Avenue, Main Street, West Street)

Rocky Hill Route 3, 411 & 99						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
118-235	A	RTE 3 AT INWOOD RD	V	V	Fiber Underground	Cubic V85
118-227	A	RTE 3 AT BROOK ST	V	V	Fiber Underground	Cubic V85
118-215	A	RTE 3 AT COLD SPRING RD	V	V	Fiber Underground	Cubic V85
118-239	A	RTE 3 AT WESTSIDE MARKET	V	V	Fiber Underground	Cubic V85
118-242	A	RTE 3 AT TOWN CENTER & MODERN TIRE	V	V	Fiber Underground	Cubic V85
118-201	A	RTE 3 AT SR 411 (WEST ST)	V	V	Fiber Underground	Cubic V85
118-226	A	RTE 3 AT RT 160 SO. JCT	V	V	Fiber Underground	Cubic V85
118-216	A	RTE 3 AT RT 160 NO. JCT	V	V	Fiber Underground	Cubic V85
118-224	B	RTE 411 AT CORPORATE PL	V	V	Fiber Underground	Cubic V85
118-223	B	RTE 411 AT I-91 SB RAMPS	V	V	Fiber Underground	Cubic V85
118-230	B	RTE 411 AT I-91 NB RAMPS	V	V	Fiber Underground	Cubic V85
118-234	B	RTE 411 AT CAPITAL BLVD	V	V	Fiber Aerial/Underground	Cubic V85
118-237	B	RTE 411 AT GILBERT AVE	V	V	Fiber Aerial	Cubic V85
118-210	B	RTE 411 AT SIGNAL LAB	V	V	Fiber Aerial	Cubic V85
118-211	C	RTE 99 AT GORMAN & OLD FORGE	V	V	Fiber Aerial	Cubic V85
118-205	C	RTE 99 AT SCHOOL & LOCUST ST	V	V	Fiber Aerial	Cubic V85
118-206	C	RTE 99 AT SR 411 (WEST ST) AND FOREST	V	V	Fiber Aerial	Cubic V85
118-207	C	RTE 99 AT DIVIDEND RD & GARDEN ST	V	V	Fiber Aerial	Cubic V85
118-204	C	RTE 99 AT RTE 160 (ELM ST)	V	V	Fiber Aerial	Cubic V85
V = Video (Non recording)						

Simsbury, Route 10 & 202 South (Hopmeadow Street)

Route 10 and Route 202 (Hopmeadow Street) south corridor is a north/south principal arterial through the town of Simsbury. The corridor includes four (4) signalized intersections and is approximately 0.57 miles long. See Figure 12 below for location map. The corridor is a two lane roadway from Route 185 (Hartford Road) (Int. 128-216) to north Powder Forest Drive (Int. 128-243) and no sidewalks exist throughout the corridor. There are crosswalks and Walk/Don't Walk indications at Canal and Winslow Place (Int. 128-234). The remaining locations include pedestrian push buttons with red, yellow, and green indications. The corridor includes a bike trail at Canal Street that crosses to Winslow Place. There is a Park & Ride lot at Winslow Place. There are no bike lanes or bus stops throughout the corridor. The average two-way peak hour volumes are approximately 1,200, 1,150, and 1,200 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 35 mph.

The corridor is comprised of commercial businesses along the roadway with mostly residential neighborhoods along the corridor. The users are predominantly motor vehicles. The pedestrian activity is considered light for the corridor. The corridor's functional use has a minor variation by time of day, day of week. Table 6 below shows further details of each signalized intersection throughout this corridor. The corridor has one subsystem to meet the user needs and movement priorities.

Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The a.m. volume flow favors southbound where p.m. volumes favor northbound. Midday volumes are light with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings for Hopmeadow Street, Route 10 & 202 in Simsbury achieved better traffic flow in both directions with improved timing for local operational movements to meet all the user needs.

Figure 12: Simsbury, Route 10 & 202 South Location

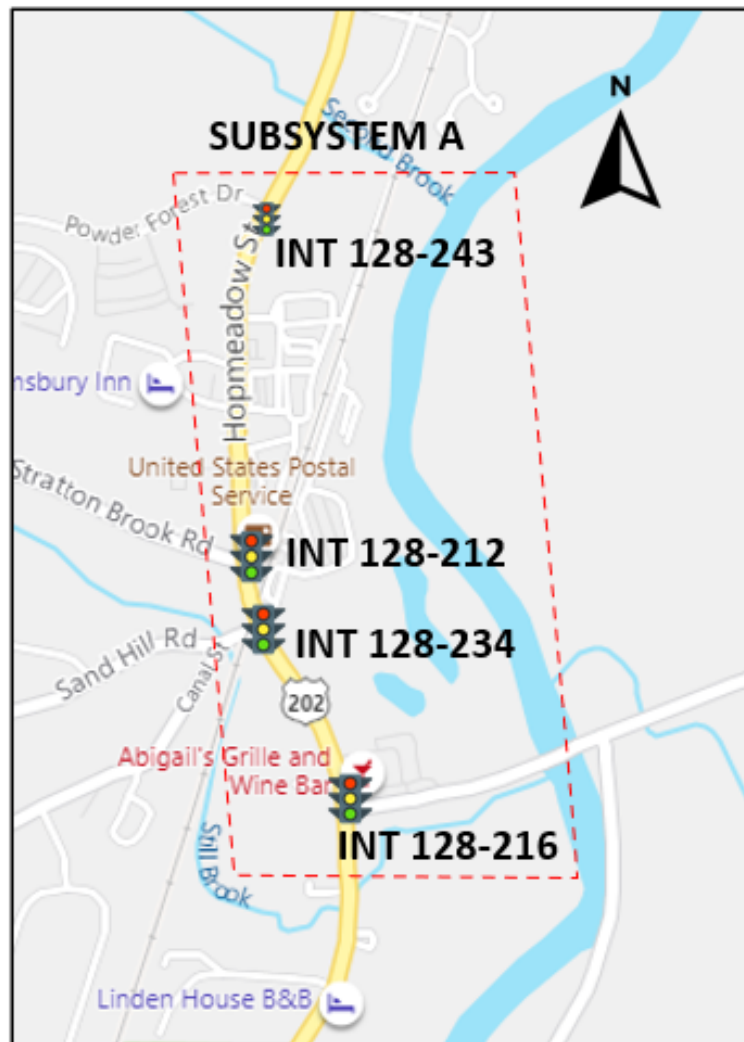


Table 6: Simsbury Details, Route 10 & 202 South (Hopmeadow Street)

Simsbury Route 10 & 202 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
128-216	A	RTE 10/202 AT RTE 185	V	V	Aerial	Naztec V41
128-234	A	RTE 10/202 AT CANAL ST	V	NONE	Aerial/Underground	Naztec V41
128-212	A	RTE 10/202 AT STRATTON BROOK RD	V	NONE	Aerial/Underground	Naztec V41
128-243	A	RTE 10/202 AT POWDER FOREST DR	V	V	Aerial	Naztec V41
L = Loop, V = Video (Non recording)						

Simsbury, Route 10 & 202 North (Hopmeadow Street)

Route 10 and Route 202 (Hopmeadow Street) north corridor is a north/south principal arterial through the town of Simsbury. The corridor includes eight (8) signalized intersections and is approximately 1.34 miles long. See Figure 13 below for location map. The corridor is a two lane roadway from north of Woodland Place (Int. 128-227) to Iron Horse Boulevard (Int. 128-221). There are sidewalks on both sides of the corridor from Woodland Place to Seminary Road (Int. 128-218). The east sidewalk discontinues while the west sidewalk continues to Iron Horse Boulevard. There are crosswalks and Walk/Don't Walk indications for all locations in the corridor including mid-block crosswalks throughout the corridor. There are no bike lanes in the corridor. There is one bus stop in each direction located just south of Seminary Road. The average two-way peak hour volumes are approximately 1,200, 1,100, and 1,500 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 30 mph from north of Woodland Place to the vicinity of Plank Hill Road (Int. 128-236) where the speed limit changes to 35 mph north to Iron Horse Boulevard.

The corridor is comprised of a large industrial employer to the south of Route 167 – West Street/Drake Hill Road (Int. 128-202) with dense commercial businesses continuing north from Drake Hill Road to just north of Seminary Road. The users are predominantly motor vehicles. The pedestrian activity is considered moderate for the corridor. The corridor's functional use has a minor variation by time of day, day of week. Table 7 below shows further details of each signalized intersection throughout this corridor. The corridor has two Subsystems A and B to meet the user needs and movement priorities.

Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The a.m. volume flow favors southbound where p.m. volumes favor northbound. Midday volumes are light with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination.

Figure 13: Simsbury, Route 10 & 202 North Location Map

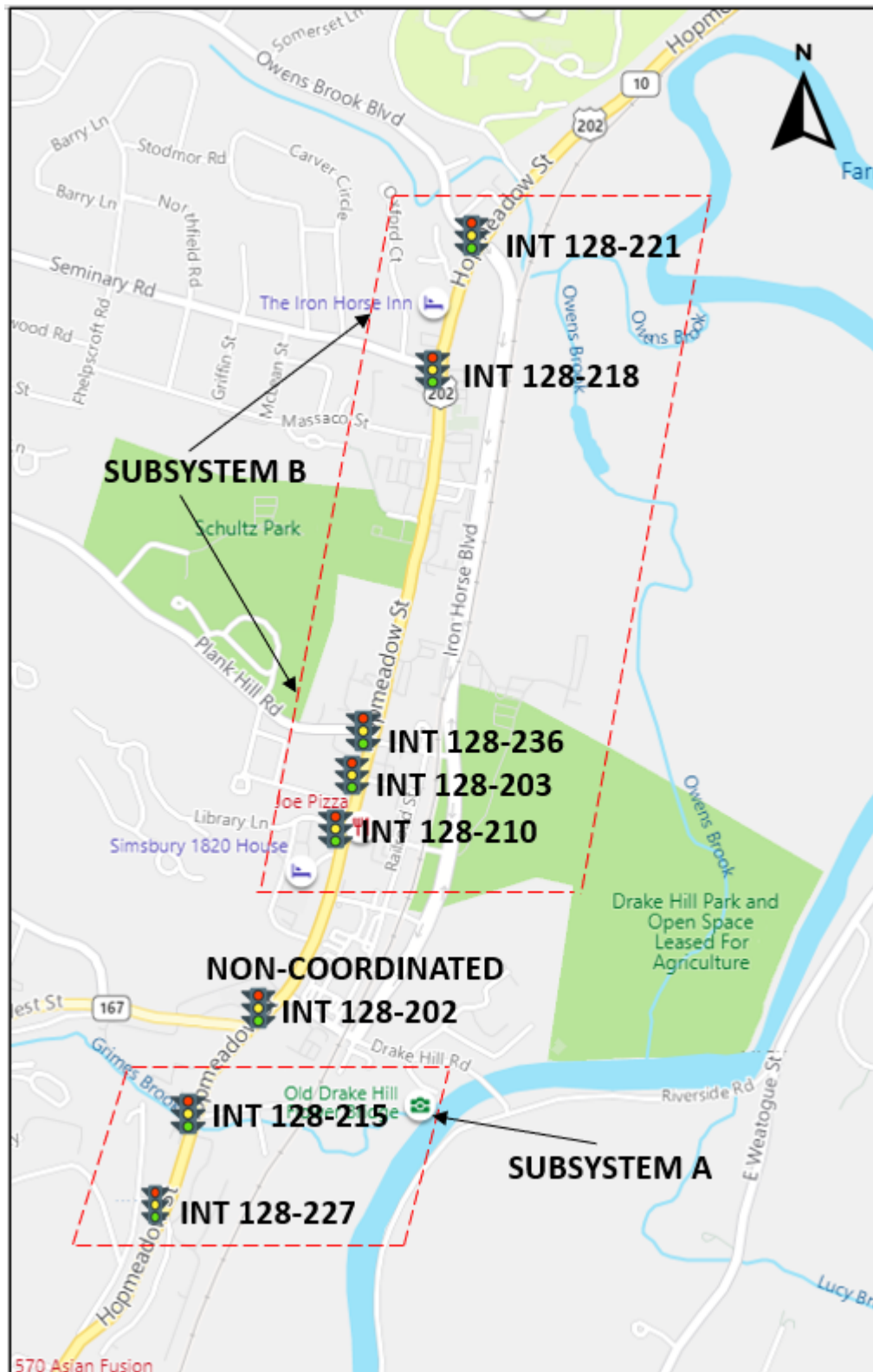


Table 7: Simsbury Details, Route 10 & 202 North (Hopmeadow Street)

Simsbury Route 10 & 202 North						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
128-227	A	RTE 10/202 AT WOODLAND & ENSIGN	V	NONE	Copper Aerial	Naztec V41
128-215	A	RTE 10/202 AT NORTH DRV TO ENSIGN	L	NONE	Copper Aerial	Naztec V41
128-202	N/A	RTE 10/202 AT RTE 167	V	V	Copper Aerial	Naztec V41
128-210	B	RTE 10/202 AT WILCOX & LIBRARY	V	V	Copper Aerial/Underground	Naztec V41
128-203	B	RTE 10/202 AT STATION ST	L	NONE	Copper Underground	Naztec V41
128-236	B	RTE 10/202 AT PHELPS & PLANK HILL	L	NONE	Aerial/Underground	Naztec V41
128-218	B	RTE 10/202 AT SEMINARY & ST MARY'S	L	NONE	Copper Aerial/Underground	Naztec V41
128-221	B	RTE 10/202 AT OWENS BROOK & IRON HORSE	L	L	Copper Underground	Naztec V41
L = Loop, V = Video (Non recording)						

Southington, Route 10 South (Main Street, North Main Street)

Route 10 (Main Street, North Main Street) south corridor is a north/south principal arterial through the town of Southington. The corridor includes nine (9) signalized intersections and is approximately 1.6 miles long. See Figure 14 below for location map. The corridor is a two lane roadway from Old Turnpike Road (Int. 131-205) to Flanders Street (Int. 131-239). There are sidewalks on both sides of the corridor except on the west side between Curtiss Street (Int. 131-210) and Flanders Street. There are crosswalks at all locations except for Flanders Street. There are Walk/Don't Walk indications for Old Turnpike Road, Route 120 (Meriden Turnpike) (Int. 131-206), Columbus Avenue (Int. 131-207), Center Street (Int. 131-208), and Hobart Street (Int. 131-230). High Street (Int. 131-209), Mill Street (Int. 131-257), Curtis Street and Flanders Street have red, yellow, and green pedestrian indications. There are mid-block crosswalks and town green median between Columbus Avenue and Center Street throughout the corridor. There is a crosswalk at the unsignalized intersection of Darling Street. There are no bike lanes or bus stops in the corridor. The average two-way peak hour volumes are approximately 1,000, 1,200, and 1,350 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 30 mph for the corridor. Route 10 is considered a diversion route for Interstate 84 when the highway experiences significant delays and queues.

The corridor is comprised high density commercial business. The users are predominantly motor vehicles. The pedestrian activity is considered moderate to heavy for the corridor. The corridor's functional use has moderate variation by time of day, day of week. Table 8 below shows further details of each signalized intersection throughout this corridor. The corridor has three Subsystems A, B, and C to meet the user needs and movement priorities.

Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The a.m. volume flow favors northbound where p.m. volumes favor southbound. Midday volumes are moderate with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings for Route 10 Southington South, we will achieve better traffic flow in both directions with improved timing for local operational movements to meet all the user needs.

Figure 14: Southington, Route 10 South Location Map

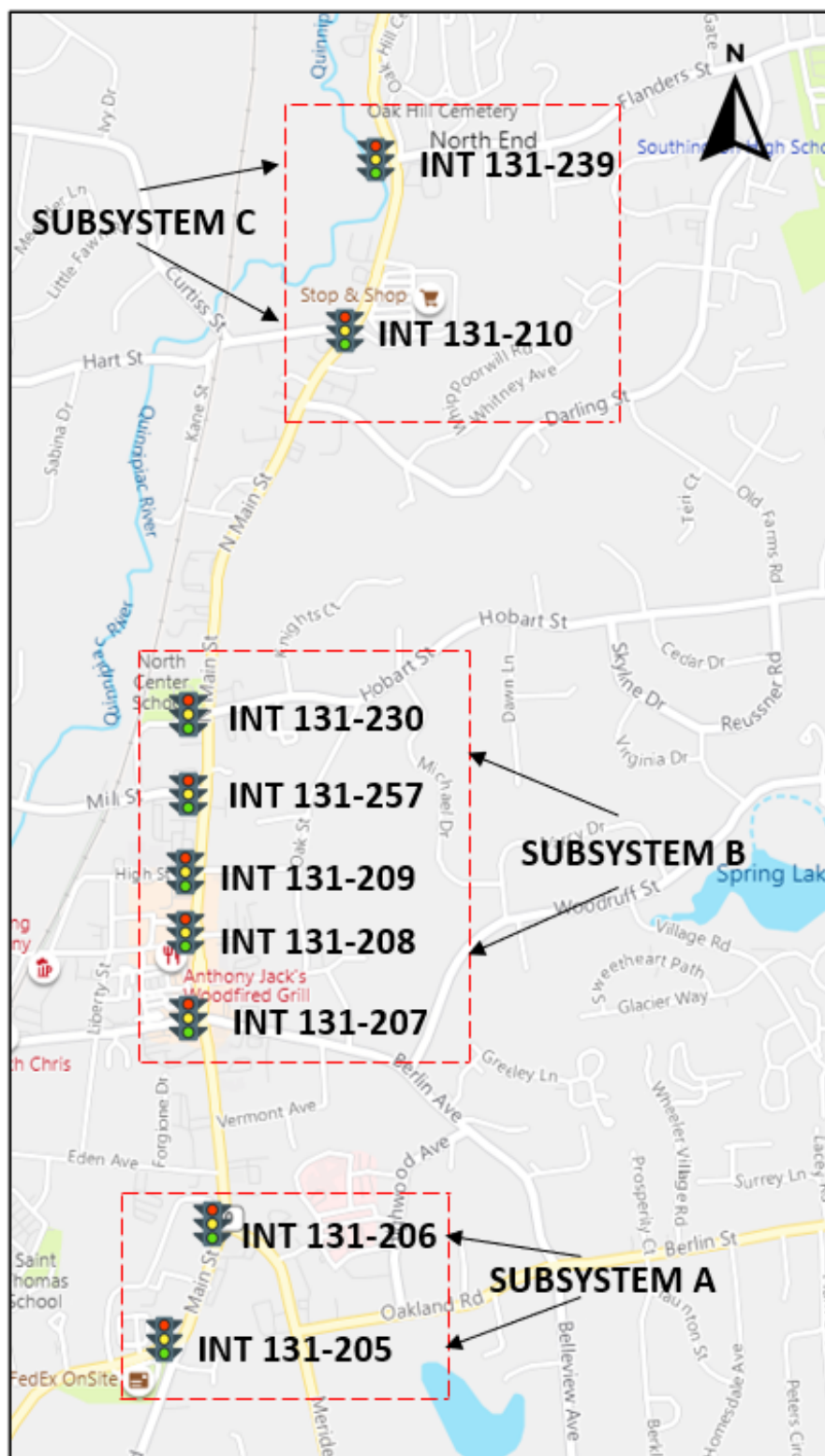


Table 8: Southington Details, Route 10 South (Main Street, North Main Street)

Southington Route 10 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
131-205	A	RTE 10 AT TURNPIKE RD	L	NONE	Copper Aerial	Cubic V85
131-206	A	RTE 10 AT RTE 120	L	L	Copper Aerial	Cubic V85
131-207	B	RTE 10 AT COLUMBUS AVE	L, V	L, V	Copper Aerial	Cubic V85
131-208	B	RTE 10 AT CENTER ST	L	NONE	Copper Aerial	Cubic V85
131-209	B	RTE 10 AT HIGH ST	V	NONE	Copper Aerial	Cubic V85
131-257	B	RTE 10 AT MILL ST	L	NONE	Copper Aerial	Cubic V85
131-230	B	RTE 10 AT HOBART ST	L	NONE	Copper Aerial	Cubic V85
131-210	C	RTE 10 AT CURTISS ST	L	NONE	Copper Aerial	Cubic V85
131-239	C	RTE 10 AT FLANDERS ST	V	NONE	Copper Aerial	Cubic V85
L = Loop, V = Video (Non recording)						

West Hartford, Route 44 (Albany Avenue), Route 218 (North Main Street)

Route 44 (Albany Avenue) corridor is an east/west principal arterial through the town of West Hartford. The corridor includes nine (9) signalized intersections and is approximately 2.9 miles long. See Figure 15 below for location map. There are two Subsystems A and B for the Route 44 corridor to meet the user needs and movement priorities. The corridor is a two lane roadway from Renbrook School (Int. 155-202) to Steele Road (Int. 155-210). There are no sidewalks, crosswalks, and pedestrian indications in Subsystem A from Renbrook School to Flagg Road (Int. 155-204). There are sidewalks on both sides of the corridor, crosswalks, and Walk/Don't Walk pedestrian indications on Subsystem B except no sidewalk on the south side of the corridor from east of Mohegan Drive (Int. 155-208) to Steele Road. There are no bike lanes for the corridor. There are bus stops from Mountain Road (Int. 155-203) to Steele Road. There is a median divider at Flagg Road and a short distance to the west. The average two-way peak hour volumes are approximately 2,000, 1,200, and 1,800 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 40 mph from Renbrook School to west of Flagg Road, transitioning to 35 mph from west of Flagg Road back to 40 mph east of Trout Brook Drive (Int. 155-207) to Steele Road.

Route 44 corridor is comprised of residential area from Renbrook School to Flagg Road with high density commercial business from Flagg Road to Trout Brook Drive back to residential area from Trout Brook Drive to Steel Road. The users are predominantly motor vehicles with moderate bus and pedestrian activity. The corridor's functional use has moderate variation by time of day, day of week. Table 9 below shows further details of each signalized intersection throughout this corridor.

Route 218 (North Main Street) corridor is a north/south principal arterial through the town of West Hartford. The corridor includes three (3) signalized intersections and is approximately 0.7 miles long. See Figure 15 below for location map. There is one Subsystem C for the Route 218 corridor to meet the user needs and movement priorities. The corridor is a two lane roadway from Overhill Road (Int. 155-250) to Miller Road (Int. 155-228). There are sidewalks, crosswalks and Walk/Don't Walk pedestrian indications for all three locations. There are no bike lanes for the corridor. There are bus stops along the length of the corridor. The average two-way peak hour volumes are approximately 1,400, 1,200, and 1,650 vehicles for a.m., midday, and p.m. peak hours, respectively. The speed limit is 35 mph for the length of the corridor.

Route 218 corridor is comprised of residential area for all three locations. The users are predominantly motor vehicles with light bus and pedestrian activity. The corridor's functional use has moderate variation by time of day, day of week. Table 9 below shows further details of each signalized intersection throughout this corridor.

Cycle lengths were balanced to meet the needs of moving motor vehicles through the signalized intersections while limiting wait times for side streets. The corridor's signalized intersections coordination timing will be adjusted based on operating environment, operational objectives, volume demand, signal phasing, minimize wait times, and proximity of intersections.

The a.m. volume flow favors eastbound where p.m. volumes favor westbound. Midday volumes are moderate to heavy with a balance by direction. Late evening/night is uncongested with lower volume that is better suited for equitable green to reduce wait times by not providing preferential time for coordination. In optimizing the traffic signal system timings for Route 44 and Route 218 West Hartford achieve better traffic flow in both directions with improved timing for local operational movements to meet all the user needs.

Figure 15: West Hartford, Route 44 Location Map

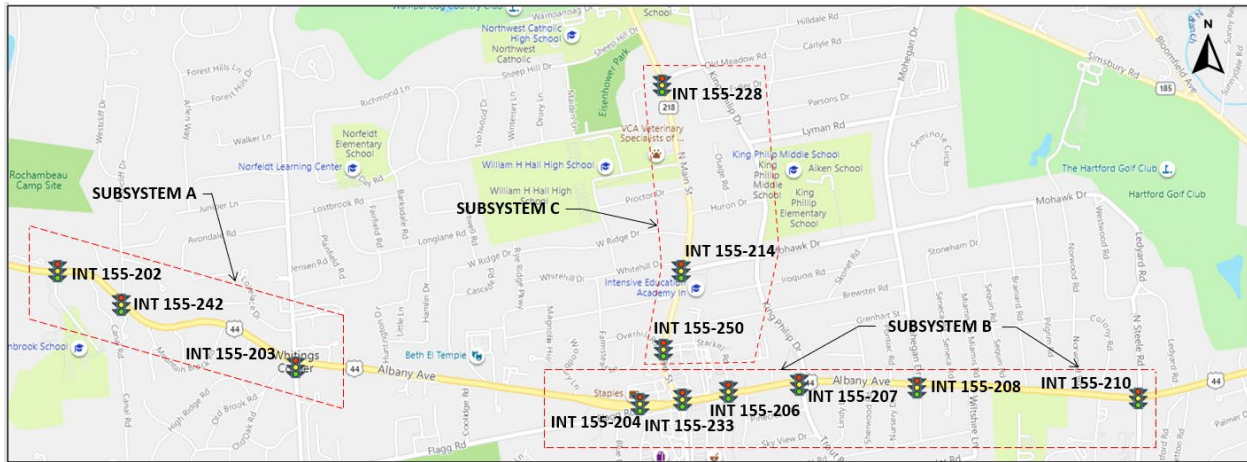


Table 9: West Hartford Details, Route 44 (Albany Avenue), Route 218 (North Main Street)

West Hartford Route 44 & 218						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
155-202	A	RTE 44 AT RENBROOK	L	NONE	Underground	Naztec V41
155-242	A	RTE 44 AT FERNCLIFF	L	NONE	Aerial/Underground	Naztec V41
155-203	A	RTE 44 AT MOUNTAIN	L	NONE	Aerial	Naztec V41
155-204	B	RTE 44 AT FLAGG RD	L	NONE	Aerial/Underground	Naztec V41
155-233	B	RTE 44 @ RTE 218	L	L	Underground	Naztec V41
155-206	B	RTE 44 AT STARKLE RD	L	NONE	Aerial	Naztec V41
155-207	B	RTE 44 AT TROUT BROOK	L	NONE	Aerial	Naztec V41
155-208	B	RTE 44 AT MOHEGAN	V	NONE	Aerial	Naztec V41
155-210	B	RTE 44 AT STEELE RD	L	NONE	Aerial	Naztec V41
155-250	C	RTE 218 AT OVERHILL	L	NONE	Aerial	Naztec V41
155-214	C	RTE 218 AT WHITEHILL	L	NONE	Aerial	Naztec V41
155-228	C	RTE 218 AT MILLER	L	NONE	Aerial	Naztec V41
L = Loop, V = Video (Non recording)						

Traffic Signal Optimization

Synchro Network Development

A base network was created for each corridor by using a computer-based software (Synchro /SimTraffic V11). Existing intersection geometry, posted speed limits, traffic volumes (Appendix C), and signal timings were used in the creation of these models. The models were then calibrated using the “before” travel time run data from Tru-Traffic and SimTraffic to make sure that Synchro/SimTraffic V11 was reflecting existing conditions as closely as possible.

Operational Analysis

Building upon the base networks developed and calibrated as described in the previous section, an analysis was performed to optimize cycle lengths and phase splits. The operational analysis focused on improving mobility in the corridor based on the objectives and strategies established for each corridor. Context discussions were held to identify characteristics of each corridor to be considered in the analysis. For example, in some corridors, the user needs, and priorities are to improve traffic flow for uncongested conditions. In other corridors, the user needs, and priorities are to manage queues for congested conditions. Most corridors included user needs and priorities to address both uncongested and congested conditions for various hours of day and day of week time periods.

The operational analysis imbeds NCHRP Report 812 *Signal Timing Manual 2nd Ed.*^v guidance to include an outcome-based approach utilizing traffic signal system timing objectives and performance measures that ensures all the user needs and priorities are met. The outcome-based approach to signal timing allows the analyst to develop signal timing based on the operating environment, users, user priorities by movement, and local operational objectives. Performance measures are then used to assess how well the objectives are being met. Once the objectives and performance measures are established, timing strategies and timing values can be chosen. The final steps of the process involve implementation and observation (i.e., determining if the timing strategies and values are working), as well as sustaining operations that meet the operational objectives through monitoring and maintenance.

Crash Data

Crash data was downloaded from the UCONN Connecticut Crash Data Repository Website^{vi} ctcrash.uconn.edu for each corridor studied in Phase 4 of the project. The crash data time frame is from 1/1/2017 to 12/31/2019. The data was reviewed for crash patterns that may reduce or be eliminated by changes to signal coordination timings. For example, rear-end and same direction side swipe type crashes are related to quality of traffic flow and queue management. If these types of conditions were identified, then the crash data was used in developing the timing plans and are noted in the corridor descriptions if applicable. Detailed crash reports for each corridor can be found in Appendix D. It is planned that the crash data provided in Appendix D will be used in a comparative analysis three to five years from the date of timing plan implementation. The comparison of future crash data with the crash data in Appendix D can be used to determine if any crashes related to timing plan changes have been reduced or corrected.

Traffic Signal Timing Development

Development of traffic signal timings were completed through a multi-step process which included the calculation of each intersection's coordination timing parameters (cycle lengths, splits, and offsets) from Monday through Friday during 6 a.m. to 6 p.m. Timings were then refined in the field based on observations and/or complaints. The following sections detail how these calculations were developed and modified for each corridor.

Cycle Length

An optimal cycle length provides sufficient green time to effectively serve all movements at an intersection while providing efficient flow of traffic through a corridor from one intersection into the next. Longer cycle lengths can typically accommodate higher mainline volumes, however, they may cause greater delays for the minor approaches to the intersections. Short cycle lengths can help to reduce the delay for minor approaches but will cause disruption to the flow of traffic. An optimal cycle length balances these two considerations of delay and flow. Additionally, it is important to consider how the selection of a cycle length at an intersection affects operations at adjacent intersections. System-wide coordination can be accomplished by using a similar cycle length throughout the system or grouping of intersections into subsystems. The optimal cycle length is the merging of the following factors:

- System-wide coordination
- Intersection vehicular demand (user through and turning movements priorities)
- Minimum cycle length
- Pedestrian and bicycle user phase activation and volumes
- Overall intersection delay and level of service (LOS)
- Intersection approach/movement delays
- Flow of traffic

A critical movement analysis was performed following the guidance from NCHRP *Signal Timing Manual 2nd Ed* ^{vii}. Using the peak hour volumes, lane configuration and existing phasing at the intersections, the critical volume was calculated by time of day for each intersection to identify a system cycle length by time of day. Exhibit 5-30 of the NCHRP *Signal Timing Manual 2nd Ed* ^{viii} recommends cycle length and effective green time per cycle is based on a maximum peak hour volume.

Cycle lengths were evaluated against the items listed above, with consideration given to the performance of existing cycle lengths. Up to five cycle lengths were considered for a 24-hour period including the existing cycle length, the cycle length identified through the critical movement analysis and cycle lengths within 5 to 10 second increments of the existing and critical cycle lengths. Resulting MOEs such as travel time and delay were evaluated in the selection of the cycle length to be implemented.

Splits and Offsets

Splits were calculated based on the minimum and maximum green times plus the clearances (total time of red and yellow) from the traffic signal plans. The existing splits were considered in optimizing green times in Synchro V11. Offsets were initially calculated by using the Tru-Traffic and SimTraffic programs.

Time of Day Schedule

A schedule was developed to operate the proposed timing plans based on patterns for Monday through Friday 6 a.m. to 10 p.m. Traffic volumes throughout the day were used as the basis for developing the time-of-day schedule. The spikes in the a.m., midday, and p.m. periods of the traffic volumes guided the core hours of operation. The graphical representation of volumes developed in the critical movement analysis were used to identify variations in volumes by time of day and develop the time-of-day schedule for a corridor. The time of day, day of week schedules include coordinating with the programmed hours of flash and determination of time periods for non-coordinated operation. The flash and non-coordination operation aid in meeting the needs of the users for uncongested time periods to reduced wait times for green, improved flow, and provide users' equitable green time. The time-of-day schedules were selected to minimize transition time between changes in cycle lengths.

CTDOT Review and Adjustments

Upon completion of the proposed traffic signal timing changes, CTDOT performed a review of the timing plans using pertinent operational objectives and performance measures as well as various technical and engineering tools. CTDOT's review included data collection with field reviews before implementation. CTDOT recognizes the importance of visual observations to gain an understanding of the arterial functionality and the surrounding environment (Context of the corridor). Combining field observations with technology such as data from the controllers, 360-degree video detectors and CCTV, the CTDOT engineers evaluated the timing plans and adjusted as appropriate. Additionally, prior to implementing new timing plans, the engineers use a visual software tool called TSDWIN^{ix} to analyze coordination strategies to refine the time space diagrams and confirm the proposed offsets.

Implementation and Field Fine-Tuning

Recommended changes to the existing timing plans were developed by the Consultant and submitted to CTDOT for review. Upon discussion and completion of the recommended changes, new optimized signal timings were downloaded through the remote system communications from central control or implemented by the Traffic Signal Lab. The new timing plans were observed through split monitoring, field observations, and travel time data collection by CTDOT staff after implementation. Fine tuning continued in the weeks following the initial implementation in a corridor to address operational deficiencies that were noted during monitoring of the new timing's operations and address citizen's complaints.

Fine-tuning mainly included adjusting splits and offsets. Movements found needing more split time were addressed based on the tradeoff between improving the movement operations and the impact to the overall coordination along the corridor. Offsets were adjusted along the corridor to improve progression based on the field observations and travel time runs. Any revision made during the fine-tuning process was recorded and revised on the excel coversheets.

Final Data Collection

Upon completion of the field fine tuning, the Consultant collected travel time data using Tru-Traffic and the travel time runs. The travel time runs are used to calculate travel time measurement. Travel time runs include driving a vehicle through the study limits during weekday peak morning and afternoon hours to gather speed, stops, delay, and travel time measurements for both directions of travel. To learn more about the concept of how travel time runs are taken, watch the side-by-side video on the CTDOT Green Light website ([CTDOT Green Light Main Page](#)). The video demonstrates the before and after travel time runs for corridor Route 218 (Cottage Grove Road/Putnam Highway). Delay and travel time collected for each corridor “after” field fine tuning was compared to the “before” travel runs performed prior to optimization to determine operational improvements for the timing evaluation.

Changes by Corridors in Phase 4:

This section describes the signal timing changes implemented for each corridor by comparing the “before” evaluation timing plans to the “after” evaluation timing plans.

CTDOT used equitable distribution of time for the hours 10 p.m. to 6 a.m. and minimum cycle lengths to reduce wait times. Coordination between intersections is provided where intersection proximity, or other user needs could be addressed by the coordination. Otherwise, the intersections are programmed non-coordinated or flashing operation for late night early morning time periods as needed.

Each corridor has tables to show the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections.

Each traffic signal in a system or subsystem may be required to operate differently after 10 p.m. Therefore, the cycle lengths are listed as “variable” to represent the several types of operation. For example, some signals may remain coordinated while other signals operate flash or non-coordinated.

Berlin/Meriden, Route 5 & Route 15 (Berlin Turnpike)

Route 5 and Route 15 (Berlin Turnpike) corridor is a north/south principal arterial through the towns of Berlin and Meriden. This corridor is approximately 4.5 miles long, has two travel lanes in each direction with a median divider. This project corridor is currently under design and scheduled for construction beginning in June 2023. The improvements include new traffic signal equipment, new detection, adaptive signal control technology, automated traffic signal performance measures and connected vehicle technology. The corridor timing plans are currently under development for the proposed adaptive signal control technology and new timings have not been implemented on this corridor as part of this traffic signal system timing evaluation project. It is anticipated that new timings will be implemented with the completion of construction and implementation of the adaptive signal control technology. This will then be verified and validated in accordance with the approved Systems Engineering Management Plan.

Figure 16: Berlin/Meriden, Route 5 & 15 Location Map

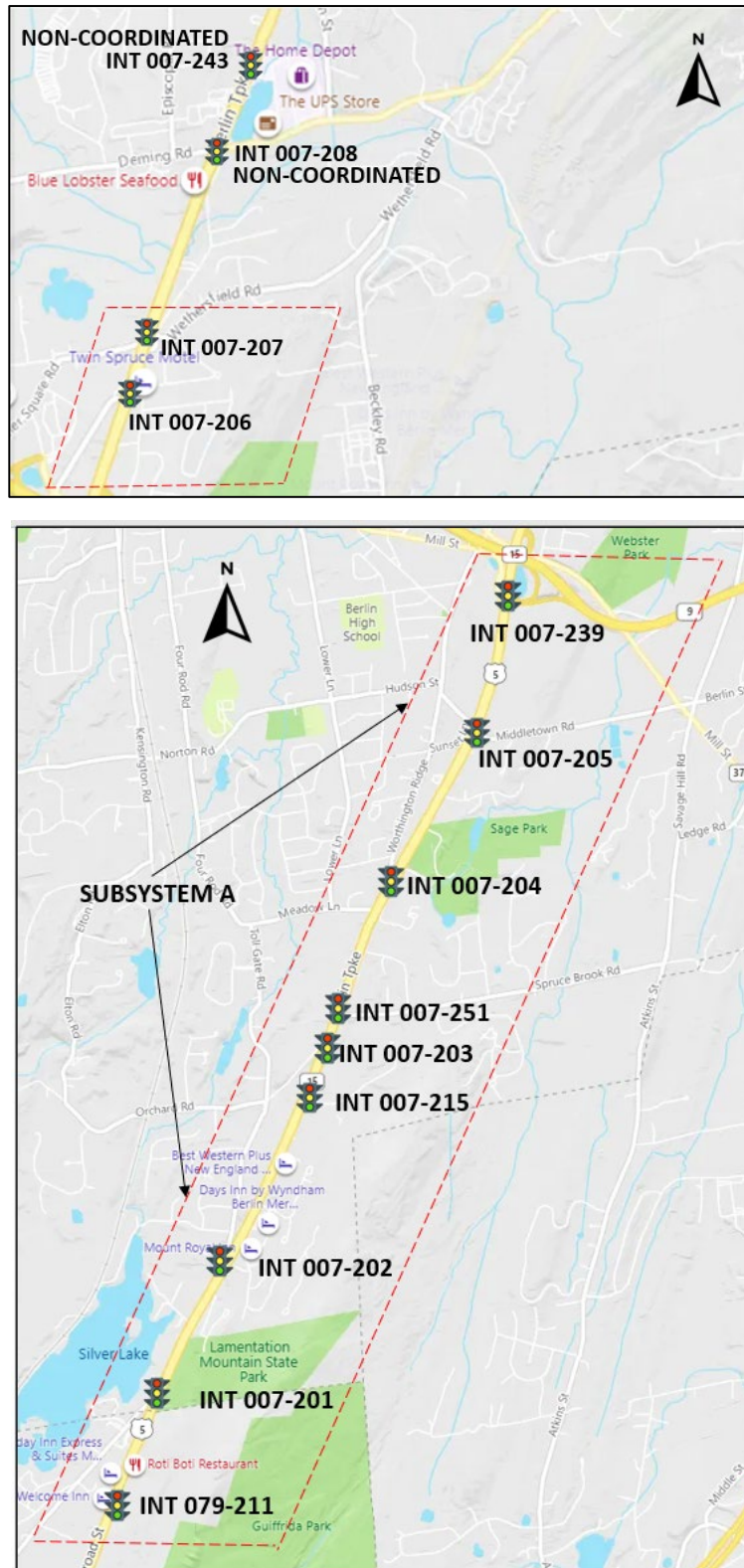


Table 10: Berlin/Meriden, Route 5 & 15 Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation - Berlin/Meriden																								
Timings (Cycle - Offset)																								
Intersection		Time of Day																						
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable					
079-211	Commuter Lot	110 - 80			85 - 68			100 - 60			65 - 01													
007-201	North Colony Rd.	110 - 21			85 - 03			100 - 84			65 - 39													
007-202	Toll Gate Rd.	110 - 62			85 - 52			100 - 42			65 - 15													
007-215	New Park Dr.	110 - 22			85 - 18			100 - 90			65 - 60													
007-203	Orchard Rd.	110 - 42			85 - 48			100 - 86			65 - 45													
007-251	Spruce Brook Rd.	110 - 53			85 - 48			100 - 86			65 - 54													
007-204	S. Worthington Ridge	110 - 01			85 - 10			100 - 31			65 - 02													
007-205	Middletown Rd.	110 - 47			85 - 48			100 - 82			65 - 18													
007-239	Route 9 Ramps	110 - 84			85 - 12			100 - 42			65 - 49													
007-206	N. Worthington Ridge	110 - 44			85 - 57			100 - 00			65 - 25													
007-207	Woodlawn & Wethersfield	110 - 56			85 - 57			100 - 00			65 - 25													
007-208	Route 160 Deming Rd.	Variable																						
007-243	Brickyard Mall	Variable																						

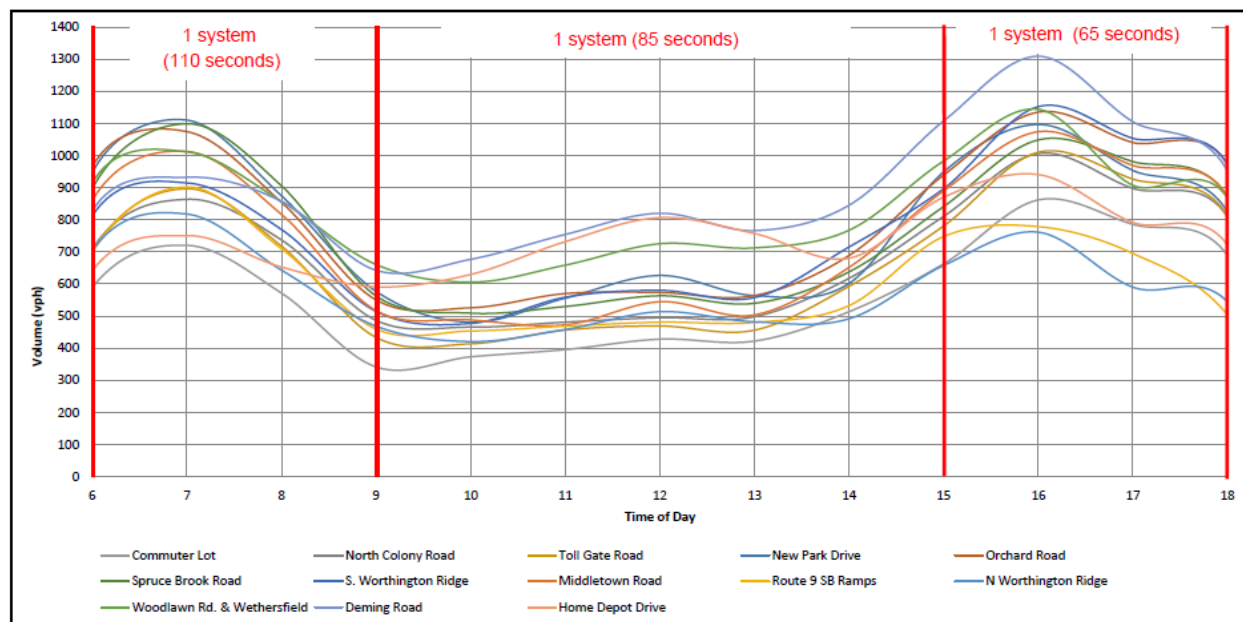
Variable

After Evaluation - Berlin/Meriden																								
Timings (Cycle - Offset)																								
Intersection		Time of Day																						
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable					
079-211	Commuter Lot	110 - 80			85 - 68			100 - 60			65 - 01													
007-201	North Colony Rd.	110 - 21			85 - 03			100 - 84			65 - 39													
007-202	Toll Gate Rd.	110 - 62			85 - 52			100 - 42			65 - 15													
007-215	New Park Dr.	110 - 22			85 - 18			100 - 90			65 - 60													
007-203	Orchard Rd.	110 - 42			85 - 48			100 - 86			65 - 45													
007-251	Spruce Brook Rd.	110 - 53			85 - 48			100 - 86			65 - 54													
007-204	S. Worthington Ridge	110 - 01			85 - 10			100 - 31			65 - 02													
007-205	Middletown Rd.	110 - 47			85 - 48			100 - 82			65 - 18													
007-239	Route 9 Ramps	110 - 84			85 - 12			100 - 42			65 - 49													
007-206	N. Worthington Ridge	110 - 44			85 - 57			100 - 00			65 - 25													
007-207	Woodlawn & Wethersfield	110 - 56			85 - 57			100 - 00			65 - 25													
007-208	Route 160 Deming Rd.	Variable																						
007-243	Brickyard Mall	Variable																						

Variable

Note: New timings will be implemented under project No. 0007-0262

Figure 17: Berlin/Meriden, Route 5 & 15 Critical Volume Chart



Berlin, Newington, Wethersfield, Route 5 & 15 (Berlin Turnpike)

Route 5 and Route 15 (Berlin Turnpike) corridor is a north/south principal arterial through the towns of Berlin, Newington, and Wethersfield. This project corridor is currently under construction and scheduled for completion in the Summer 2023. The improvements include new traffic signal equipment, new detection, adaptive signal control technology, automated traffic signal performance measures and connected vehicle technology. The corridor timing plans have been completed and awaiting the proposed adaptive signal control technology to be implemented. The After Evaluation has not been completed as part of this traffic signal timing evaluation project.

Figure 18: Berlin, Newington, Wethersfield, Route 5 & 15 Location Map

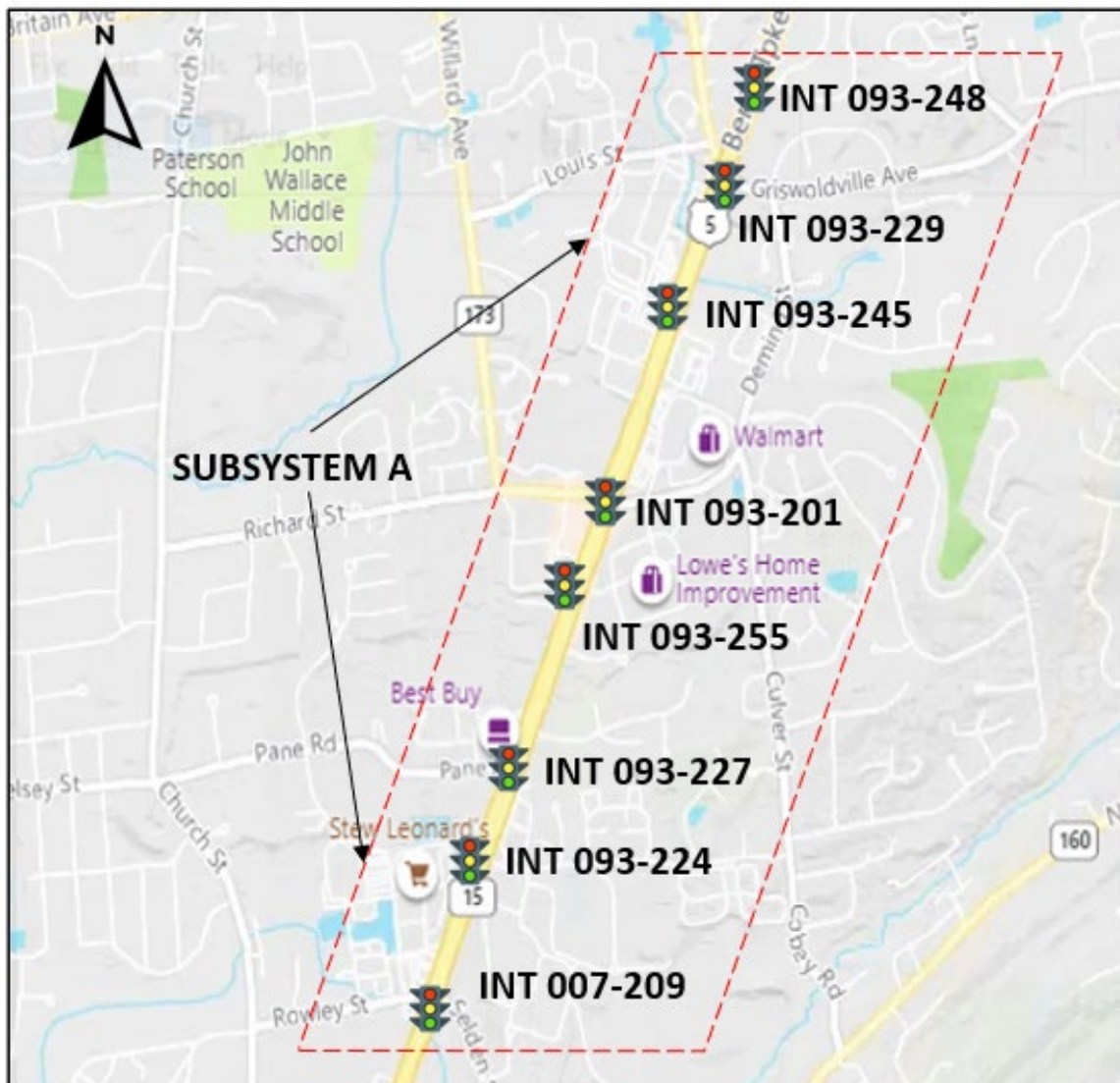


Figure 18: Berlin, Newington, Wethersfield, Route 5 & 15 Location Map, Continued

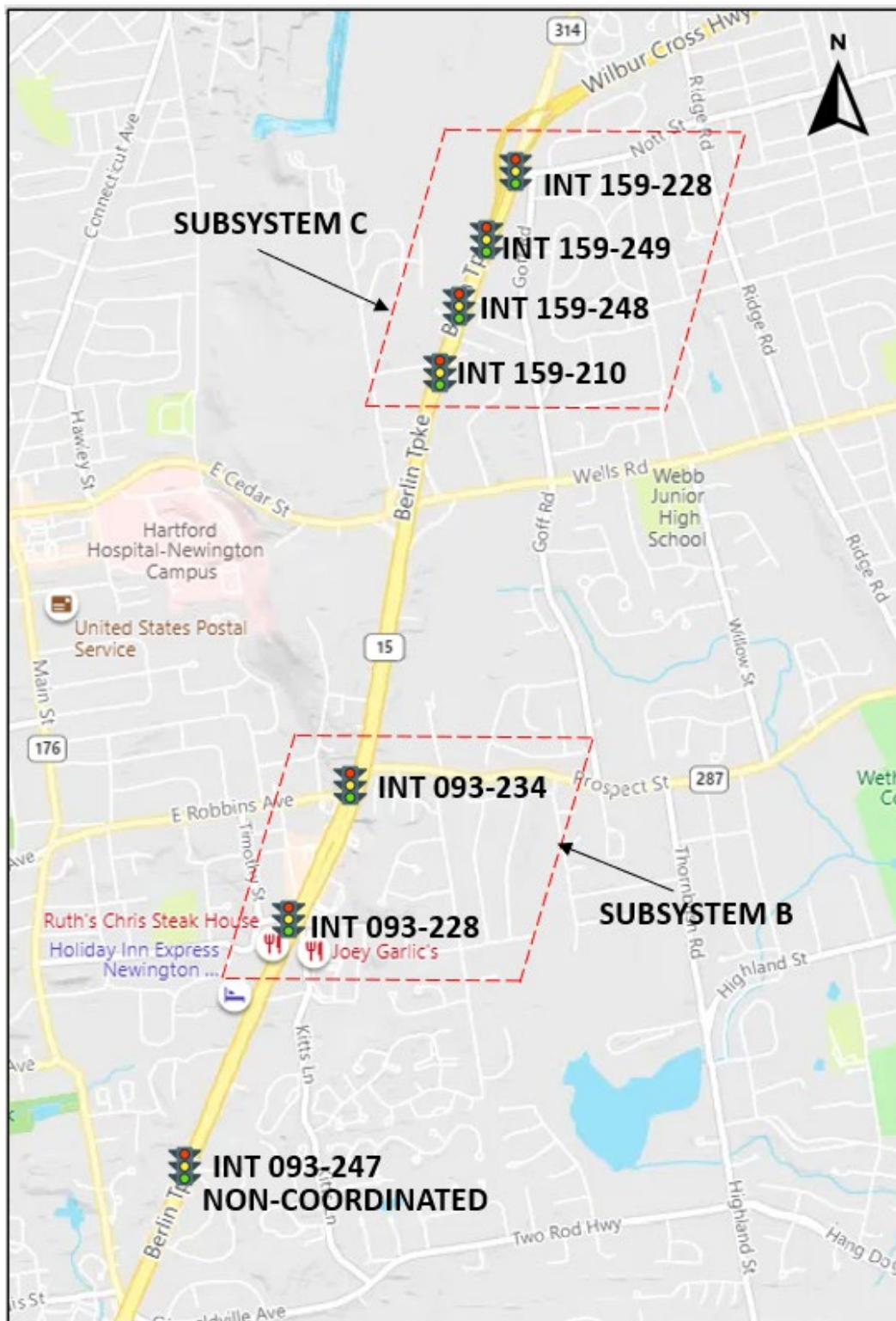


Table 11: Berlin, Newington, Wethersfield, Route 5 & 15 Changes to Cycle Lengths and Offsets

Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation - Newington																							
Timings (Cycle - Offset)																							
Intersection		Time of Day																					
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					
007-209	Rowley & Selden St.	120 - 00			90 - 08				120 - 59				70 - 26										
093-224	Webster St.	120 - 28			90 - 38				120 - 62				70 - 23										
093-227	Pane Rd.	120 - 28			90 - 31				120 - 48				70 - 23										
093-255	Lowes Dr.	120 - 71			90 - 86				120 - 05				70 - 63										
093-201	Richard & Deming	120 - 67			90 - 77				120 - 116				70 - 00										
093-245	Pascone Place	120 - 23			90 - 48				120 - 92				70 - 38										
093-229	Rte 176 Main St.	120 - 10			90 - 36				120 - 59				70 - 17										
093-248	DOT South Drive	120 - 26			90 - 50				120 - 76				70 - 31										

After Evaluation - Newington																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21				
007-209	Rowley & Selden St.	120 - 00				110 - 08				130 - 49				80 - 31				Variable				
093-224	Webster St.	120 - 23				110 - 38				130 - 44				80 - 17								
093-227	Pane Rd.	120 - 28				110 - 31				130 - 18				80 - 38								
093-255	Lowes Dr.	120 - 66				110 - 86				130 - 114				80 - 00								
093-201	Richard & Deming	120 - 64				110 - 77				130 - 98				80 - 63								
093-245	Pascone Place	120 - 08				110 - 48				130 - 79				80 - 23								
093-229	Rte 176 Main St.	120 - 117				110 - 36				130 - 61				80 - 23								
093-248	DOT South Drive	120 - 26				110 - 50				130 - 73				80 - 26								

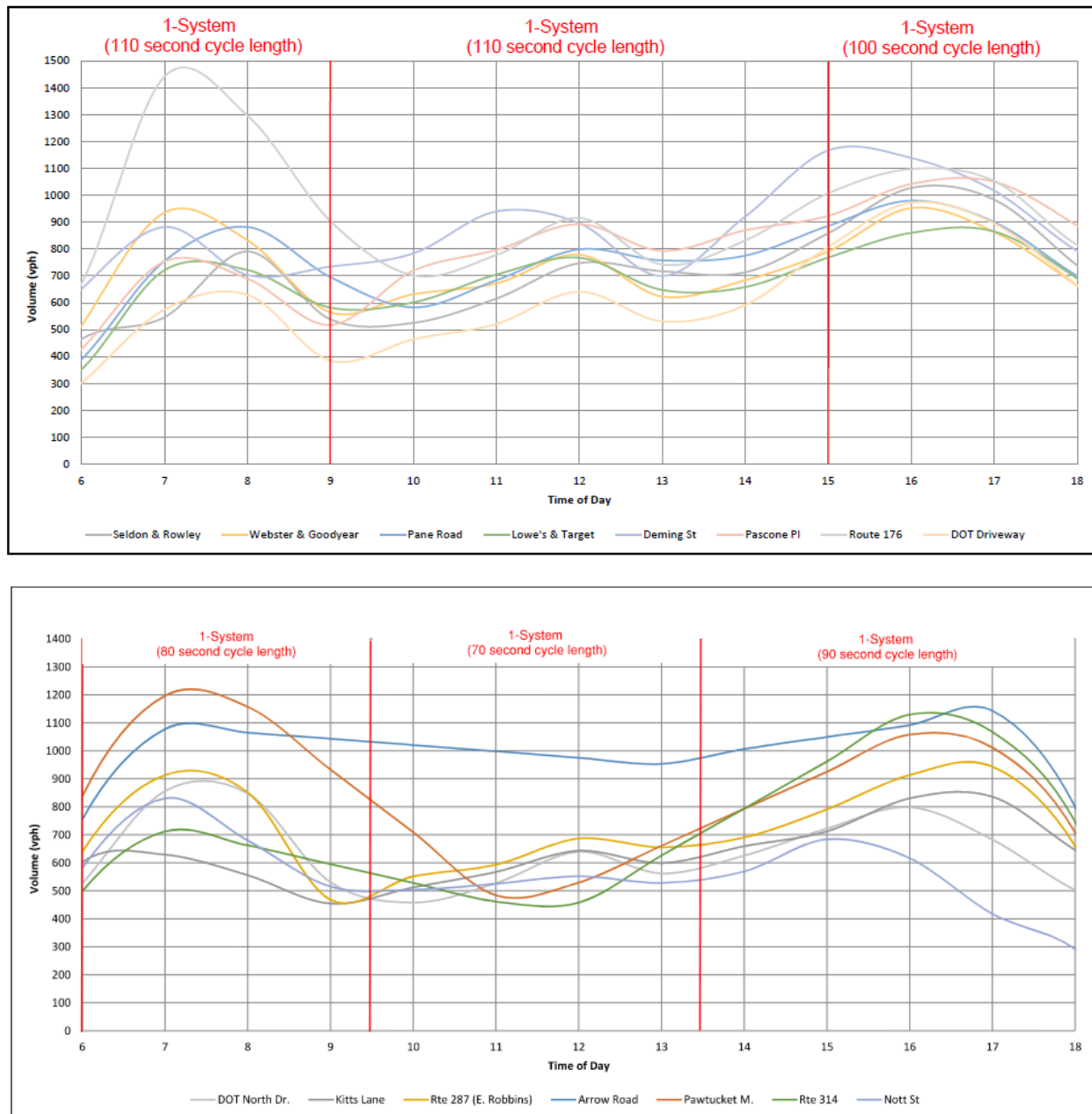
Variable

Table 11. Newington, Wethersfield, Route 5 & 15 Changes to Cycle Lengths and Offsets - Continued

		Before Evaluation Timings (Cycle - Offset)																					
Intersection		Time of Day																					
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					
093-247	DOT North Drive	Variable																					
093-228	Kitts Lane	Variable	120 - 94				100 - 10				120 - 63				80 - 16				Variable				
093-234	Route 287 E. Robbins		120 - 20				100 - 44				120 - 60				80 - 44								
159-210	Arrow Rd.	140 - 124				90 - 76				100 - 88				60 - 48									
159-248	Pawtucket	140 - 00				90 - 00				100 - 00				60 - 00									
159-249	Route 314	140 - 00				90 - 63				100 - 77				60 - 38									
159-228	Nott St.	140 - 05				90 - 28				100 - 26				60 - 22									

		After Evaluation																						
		Timings (Cycle - Offset)																						
Intersection		Time of Day																						
No.	Description	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Variable					
093-247	DOT North Drive	Variable																						
093-228	Kitts Lane	120 - 71				110 - 71				130 - 71				80 - 45										
093-234	Route 287 E. Robbins	120 - 65				110 - 65				130 - 71				80 - 05										
159-210	Arrow Rd.	140 - 60				90 - 60				120 - 60				70 - 53										
159-248	Pawtucket	140 - 70				90 - 70				120 - 72				70 - 55										
159-249	Route 314	140 - 46				90 - 41				120 - 35				70 - 28										
159-228	Nott St.	140 - 92				90 - 02				120 - 26				70 - 08										

Figure 19: Newington, Wethersfield, Route 5 & 15 Critical Volume Chart



Enfield, Route 5 South (King Street)

Route 5 South (King Street) is a north/south corridor through the southern area in the town of Enfield. The changes implemented are to improve traffic flow and overall capacity. The Synchro analysis results required increasing the cycle lengths to meet the volumes and user demands. The volume variation between peak hours and midday are significant, requiring changes to the cycle start and end time periods. The a.m. and p.m. volumes are similar however the p.m. cycle length is lower than the a.m. to reduce wait times on side streets. The midday volume continued to be much lower than peak hours and this was accommodated by maintaining a lower cycle length. These changes simplified operations, increased capacity, and adjusted the shifts between cycle lengths to increase the effectiveness of coordination. The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 20: Enfield, Route 5 South Location Map

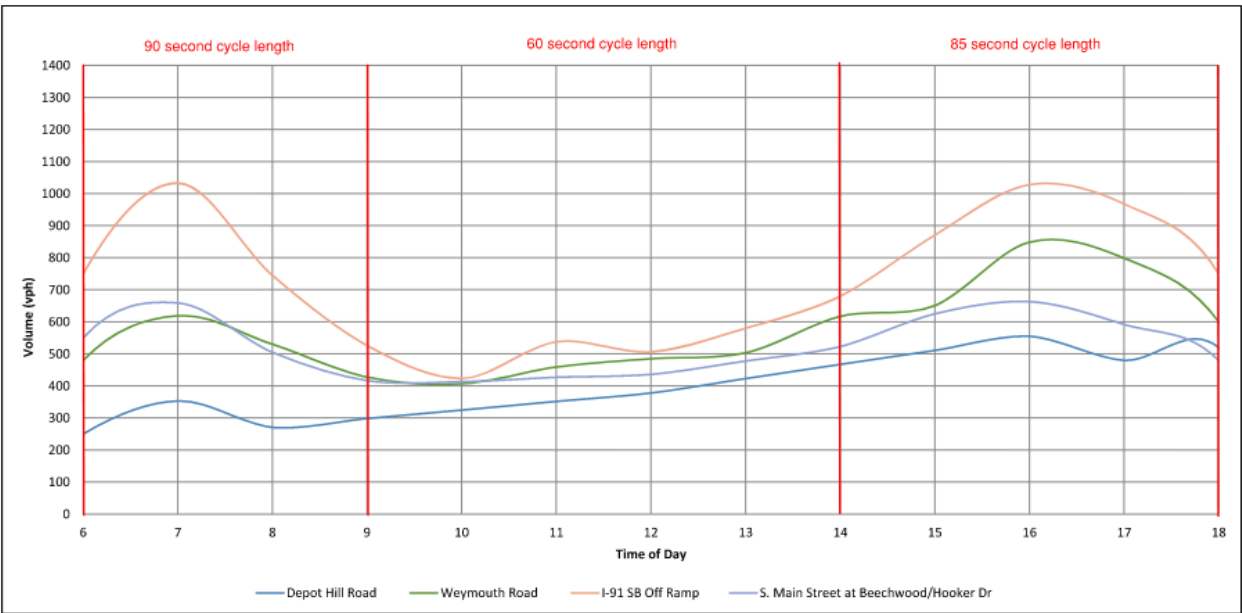


Table 12: Enfield, Route 5 South, Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																							
Timings (Cycle - Offset)																							
Intersection		Time of Day																					
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					
048-243	SR 510 Depot Road	Variable	65 - 26				55 - 34				75 - 53		55 - 34										
048-242	Weymouth		65 - 52				55 - 05				75 - 07		55 - 05										
048-250	I-91 SB & Bernies		65 - 23				55 - 36				75 - 34		55 - 36										
048-219	Orlando		65 - 20				55 - 05				75 - 46		55 - 05										
048-214	Post Office		65 - 00				55 - 45				75 - 46		55 - 45										
048-210	South		65 - 30				55 - 55				75 - 46		55 - 55										

After Evaluation																					
Timings (Cycle - Offset)																					
Intersection		Time of Day																			
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable		
048-243	SR 510 Depot Road	90 - 52			60 - 13				85 - 38				60 - 13								
048-242	Weymouth	90 - 00			60 - 40				85 - 76				60 - 40								
048-250	I-91 SB & Bernies	90 - 00			60 - 11				85 - 64				60 - 11								
048-219	Orlando	90 - 86			60 - 11				85 - 77				60 - 11								
048-214	Post Office	90 - 52			60 - 41				85 - 18				60 - 41								
048-210	South	90 - 52			60 - 11				85 - 38				60 - 11								

Figure 21: Enfield, Route 5 South Critical Volume Chart



Farmington, New Britain, West Hartford, Route 71 (Hartford Road, Southeast Road, New Britain Avenue)

Route 71 (Hartford Road, Southeast Road, New Britain Avenue) is a north/south corridor located in New Britain, Farmington, and West Hartford that has maintained stable levels of traffic volume in recent years. The changes implemented improved traffic flow that include longer cycle length to accommodate the high volume and numbers of turning vehicles. The a.m. cycle length was kept shorter at 80 seconds to reflect the lower traffic volumes and reduce wait times. The midday and p.m. traffic volumes were found to be best accommodated by a single pattern. This allows a higher capacity on the artery and eliminates an unnecessary switch between timing plans. The midday/p.m. cycle length of 105 seconds was found to be an optimal timing for the southern six (6) intersections and 120 seconds was found to be optimal for the northern three (3) intersections. The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 22: Farmington, New Britain, West Hartford, Route 71 Location Map

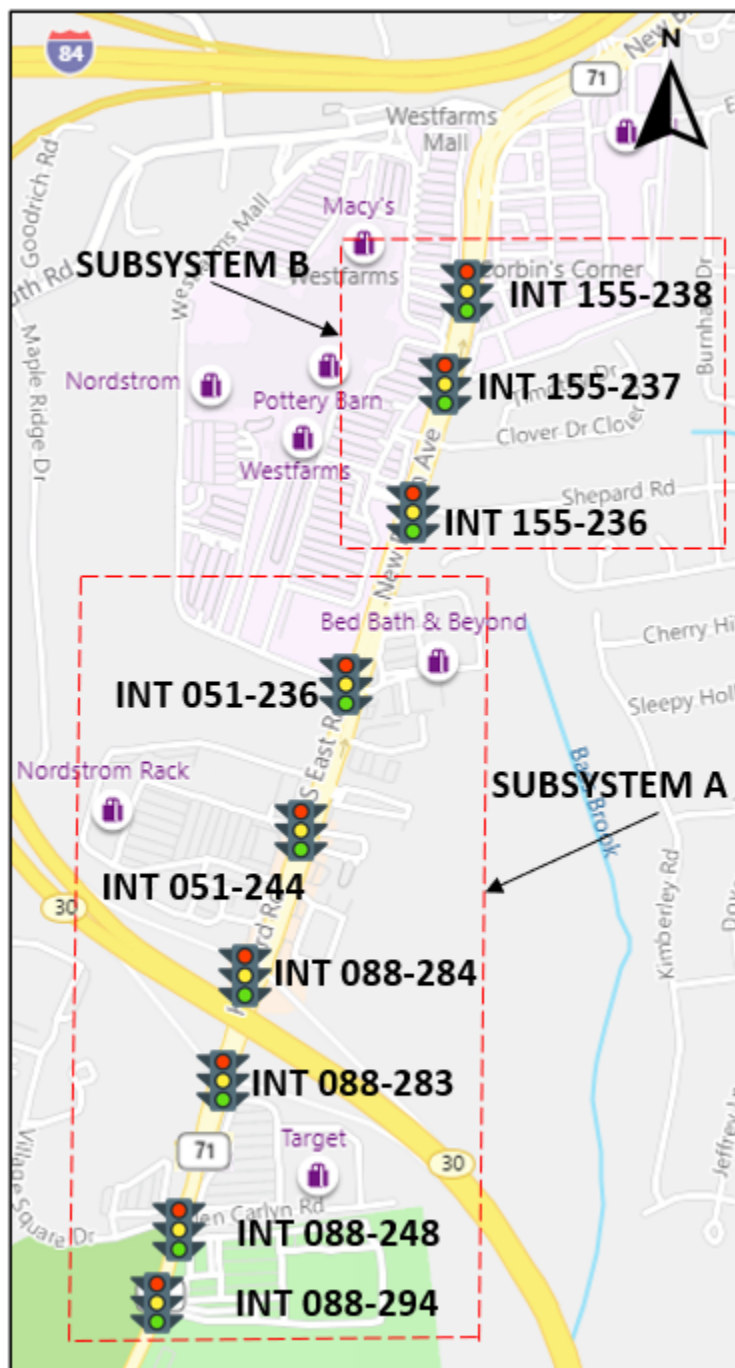
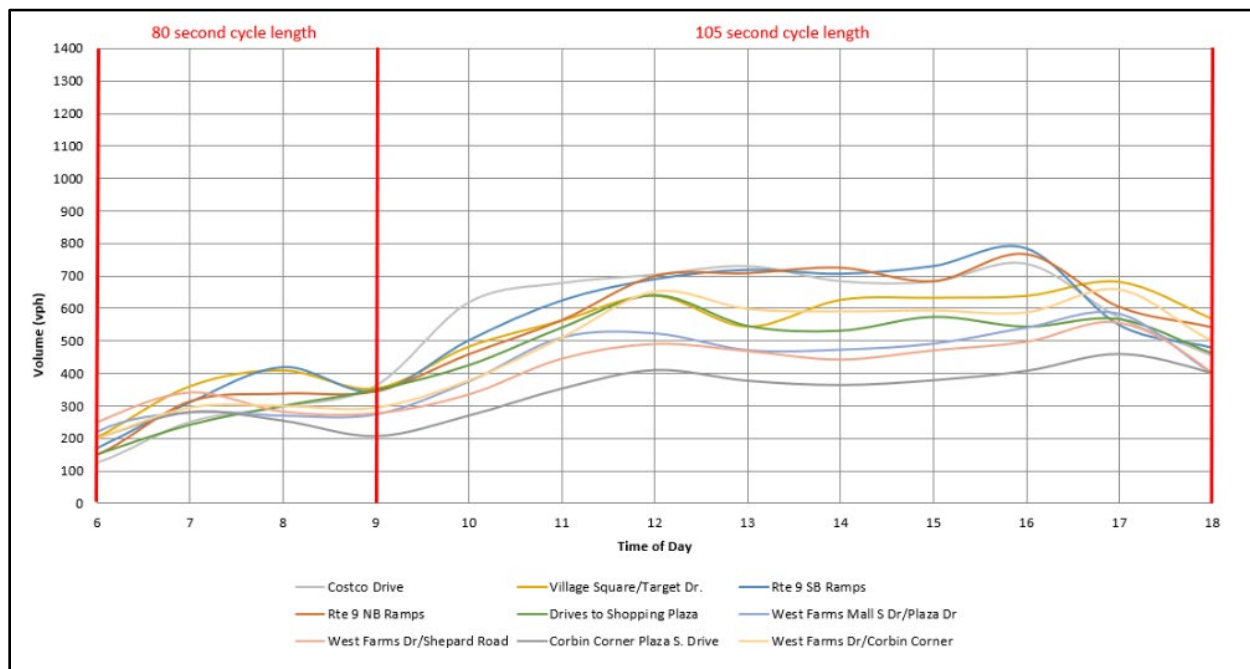


Table 13: Farmington, New Britain, West Hartford, Route 71 Changes to Cycle Lengths and Offsets

Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																							
Timings (Cycle - Offset)																							
Intersection		Time of Day																					
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable				
088-294	Costco		Variable															80 - 33					
088-248	Village Square	Variable	70 - 30															80 - 33					
088-283	Route 9 Southbound Ramp		70 - 45															80 - 00					
088-284	Route 9 Northbound Ramp		70 - 06															80 - 00					
051-244	Sports Authority		Variable															100 - 00					
051-236	Entrance #1	100 - 00																					
155-236	Shepard Road	100 - 39										100 - 24											
155-237	Corbin Corner	100 - 28										100 - 31											
155-238	Main Entrance	Variable																					

After Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable			
088-294	Costco	80 - 00			105 - 00															80 - 00		
088-248	Village Square	80 - 00			105 - 00															80 - 00		
088-283	Route 9 Southbound Ramp	80 - 00			105 - 00															80 - 00		
088-284	Route 9 Northbound Ramp	80 - 00			105 - 00															80 - 00		
051-244	Sports Authority	80 - 00			105 - 00															80 - 00		
051-236	Entrance #1	Variable			105 - 00															80 - 00		
155-236	Shepard Road	80 - 00			120 - 13															80 - 00		
155-237	Corbin Corner	80 - 00			120 - 25															80 - 00		
155-238	Main Entrance	Variable			120 - 01															80 - 00		

Figure 23: Farmington, New Britain, West Hartford, Route 71 Critical Volume Chart

Rocky Hill, Route 3, 99, 411 (Cromwell Avenue, Main Street, West Street)

The Rocky Hill system is made up of three corridors within the central area of town. The traffic signal equipment, field communications, detection and technology were recently re-constructed in State Project 0118-0170 to upgrade the aging equipment, improve traffic signal efficiency, and safety. Timing plans were optimized as part of this project.

The changes implemented improved traffic flow that include longer cycle lengths during the a.m. and p.m. The midday cycle length was kept shorter at 70 seconds to reflect the lower traffic volumes and reduce wait times. The number of traffic patterns were reduced, and three intersections on Route 99 were added to the coordination system (Int. #118-206, #118-205, and #118-211). It was determined based on the lower volumes; all traffic signals could operate on variable cycles after 7 p.m.

Adaptive signal control technology was recently installed at the intersections on the Route 411 (West Street) subsystem and all intersections were configured for automated traffic signal performance measures under State Project 0007-0264. These technologies are still under evaluation and verification and validation has not yet been performed.

The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 24: Rocky Hill, Route 3, Location Map

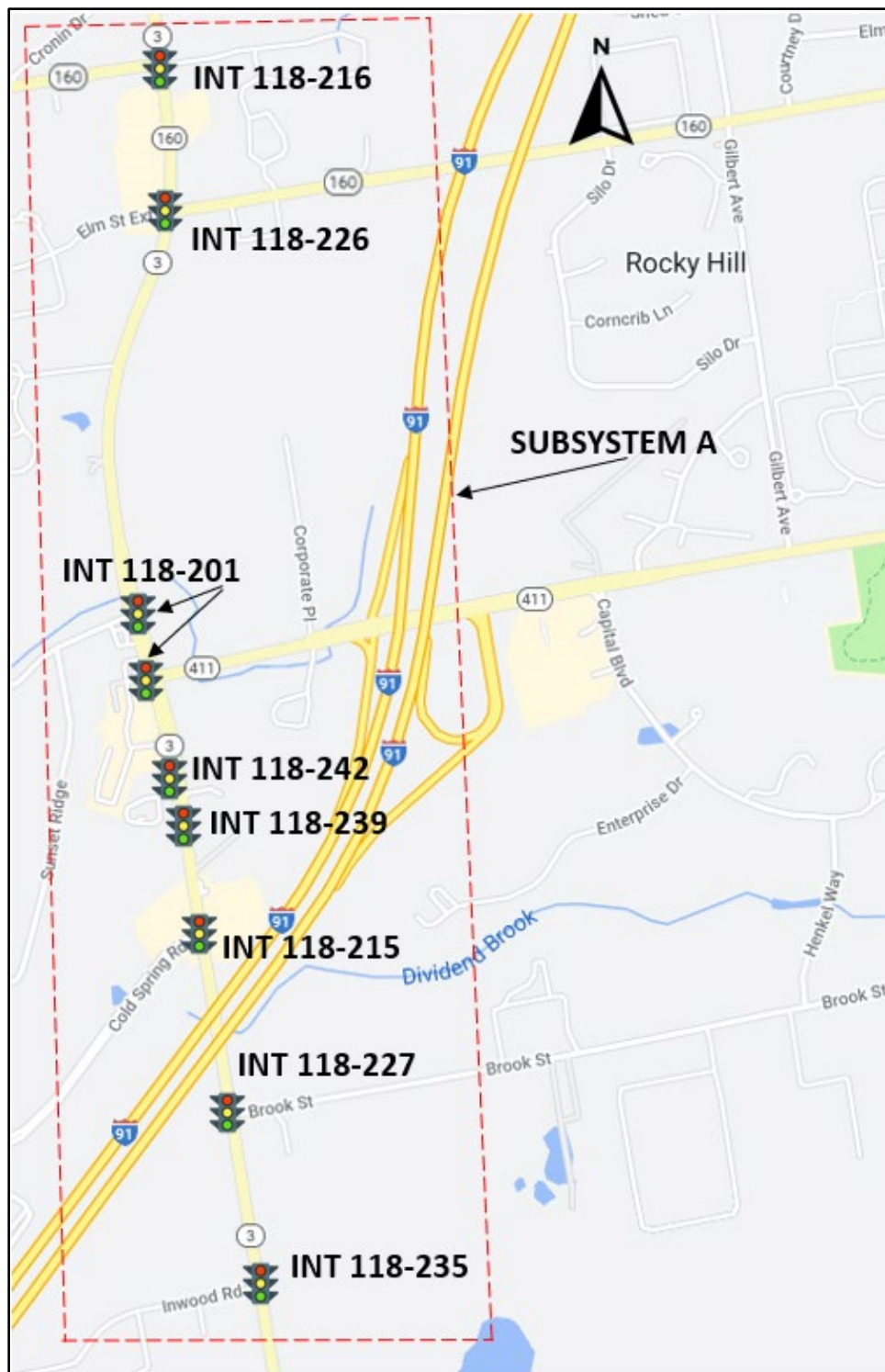


Figure 24: Rocky Hill, Route 411 Location Map, Continued

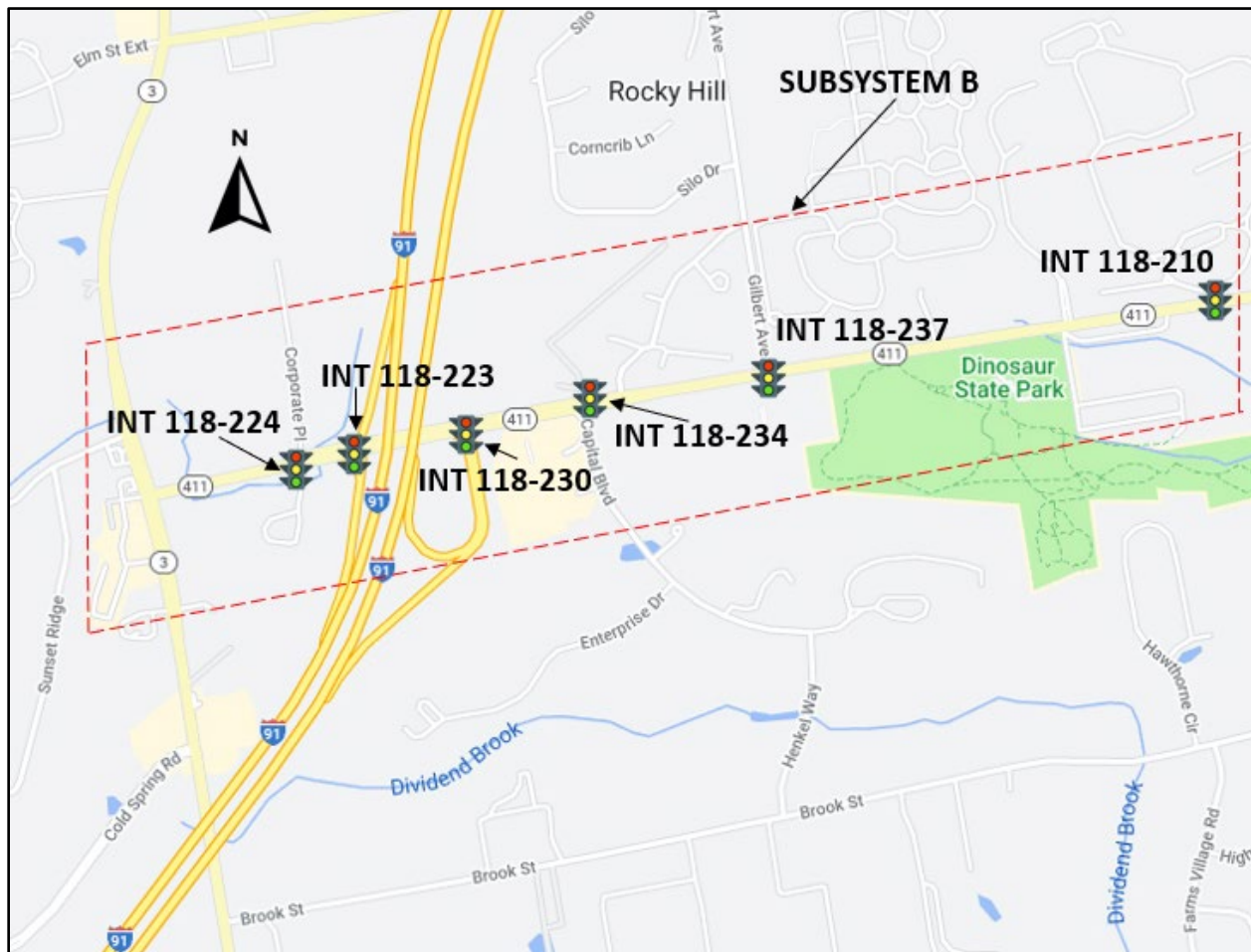


Figure 24: Rocky Hill, Route 99, Location Map, Continued

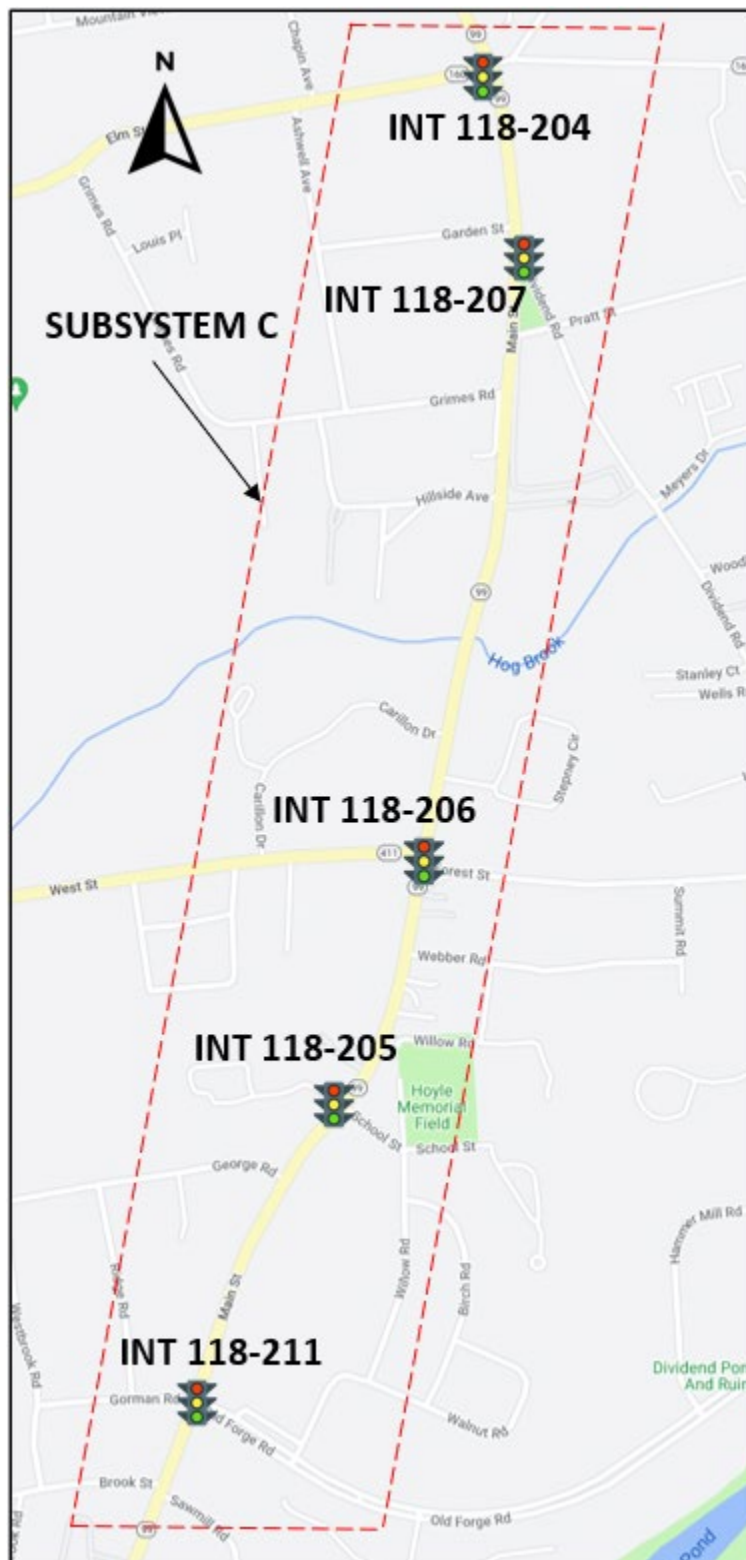


Table 14: Rocky Hill, Route 3, 99, 411 Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																																		
Timings (Cycle - Offset)																																		
Intersection		Time of Day																																
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																
118-235	Rte 3 @ Inwood Rd.	Variable	70 - 30		70 - 10						80 - 45				70 - 10																			
118-227	Rte 3 @ Brook St.		70 - 50		70 - 30						80 - 70				70 - 30																			
118-215	Rte 3 @ Cold Spring Rd.		70 - 50		70 - 30						80 - 70				70 - 30																			
118-239	Rte 3 @ Westside Market		70 - 50		70 - 30						80 - 70				70 - 30																			
118-242	Rte 3 @ Town Cnt Dr.		70 - 46		70 - 20						80 - 56				70 - 20																			
118-201	Rte 3 @ Route 411 & France		Variable																															
118-226	Rte 3 @ Rte 160 S Jct		70 - 15		70 - 05						80 - 15				70 - 05																			
118-216	Rte 3 @ Rte 160 N Jct		70 - 31		70 - 05						80 - 66				70 - 05																			
118-211	Rte 99 @ Gorman & Old Forge		Variable																															
118-205	Rte 99 @ School & Locust		Variable																															
118-206	Rte 99 @ SR 411 & Forest		Variable																															
118-207	Rte 99 @ Dividend & Garden		70 - 08																															
118-204	Rte 99 @ Rte 160		70 - 00																															
118-224	SR 411 @ Corporate Pl		70 - 05		70 - 30						80 - 22				70 - 30																			
118-223	SR 411 @ I-91 SB Ramps		70 - 37		70 - 04						80 - 29				70 - 04																			
118-230	SR 411 @ I-91 NB Ramps		70 - 14		70 - 10						80 - 09				70 - 10																			
118-234	SR 411 @ Capital Blvd.		70 - 22		70 - 00						80 - 12				70 - 00																			
118-237	SR 411 @ Gilbert		Variable																															
118-210	SR 411 @ Signal Lab		Variable																															

After Evaluation																																		
Timings (Cycle - Offset)																																		
Intersection		Time of Day																																
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																
118-235	Rte 3 @ Inwood Rd.	80 - 30		70 - 09						90 - 17				Variable																				
118-227	Rte 3 @ Brook St.	80 - 26		70 - 64						90 - 12																								
118-215	Rte 3 @ Cold Spring Rd.	80 - 56		70 - 16						90 - 54																								
118-239	Rte 3 @ Westside Market	80 - 65		70 - 15						90 - 74																								
118-242	Rte 3 @ Town Cnt Dr.	80 - 71		70 - 32						90 - 78																								
118-201	Rte 3 @ Route 411 & France	80 - 48		70 - 03						90 - 48																								
118-226	Rte 3 @ Rte 160 S Jct	80 - 70		70 - 26						90 - 09																								
118-216	Rte 3 @ Rte 160 N Jct	80 - 33		70 - 69						90 - 64																								
118-211	Rte 99 @ Gorman & Old Forge	90 - 38		70 - 24						90 - 54																								
118-205	Rte 99 @ School & Locust	90 - 74		70 - 52						90 - 12																								
118-206	Rte 99 @ SR 411 & Forest	90 - 46		70 - 09						90 - 80																								
118-207	Rte 99 @ Dividend & Garden	90 - 88		70 - 52						90 - 37																								
118-204	Rte 99 @ Rte 160	90 - 89		70 - 14						90 - 26																								
118-224	SR 411 @ Corporate Pl	80 - 00		80 - 00						90 - 00																								
118-223	SR 411 @ I-91 SB Ramps	80 - 00		80 - 00						90 - 00																								
118-230	SR 411 @ I-91 NB Ramps	80 - 34		80 - 24						90 - 14																								
118-234	SR 411 @ Capital Blvd.	80 - 54		80 - 44						90 - 31																								
118-237	SR 411 @ Gilbert	80 - 75		80 - 71						90 - 84																								
118-210	SR 411 @ Signal Lab	80 - 69		80 - 27						90 - 23																								

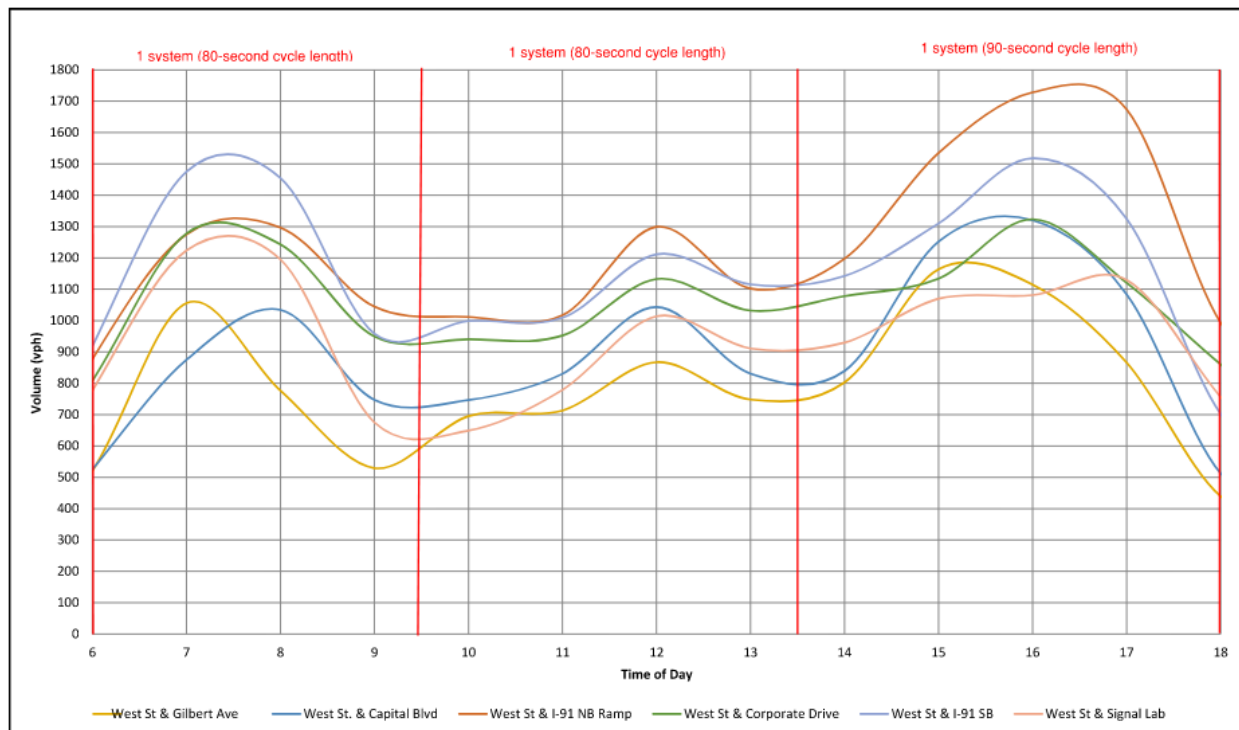
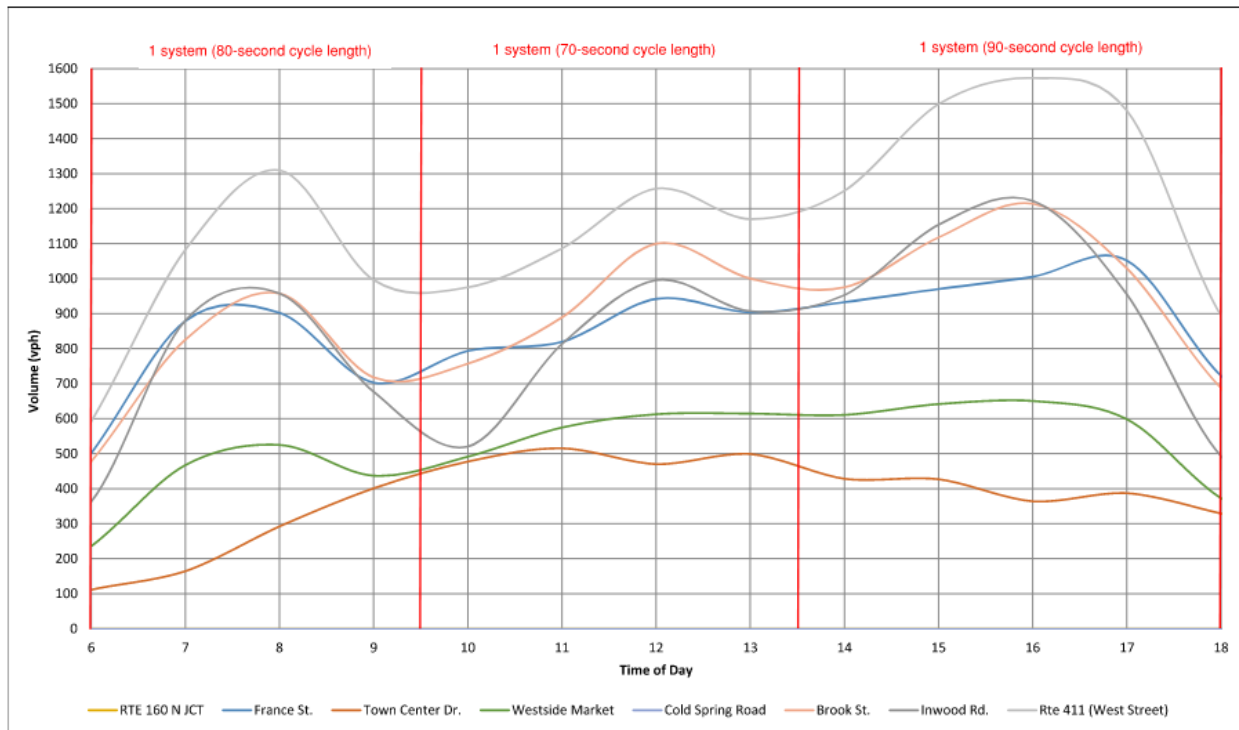
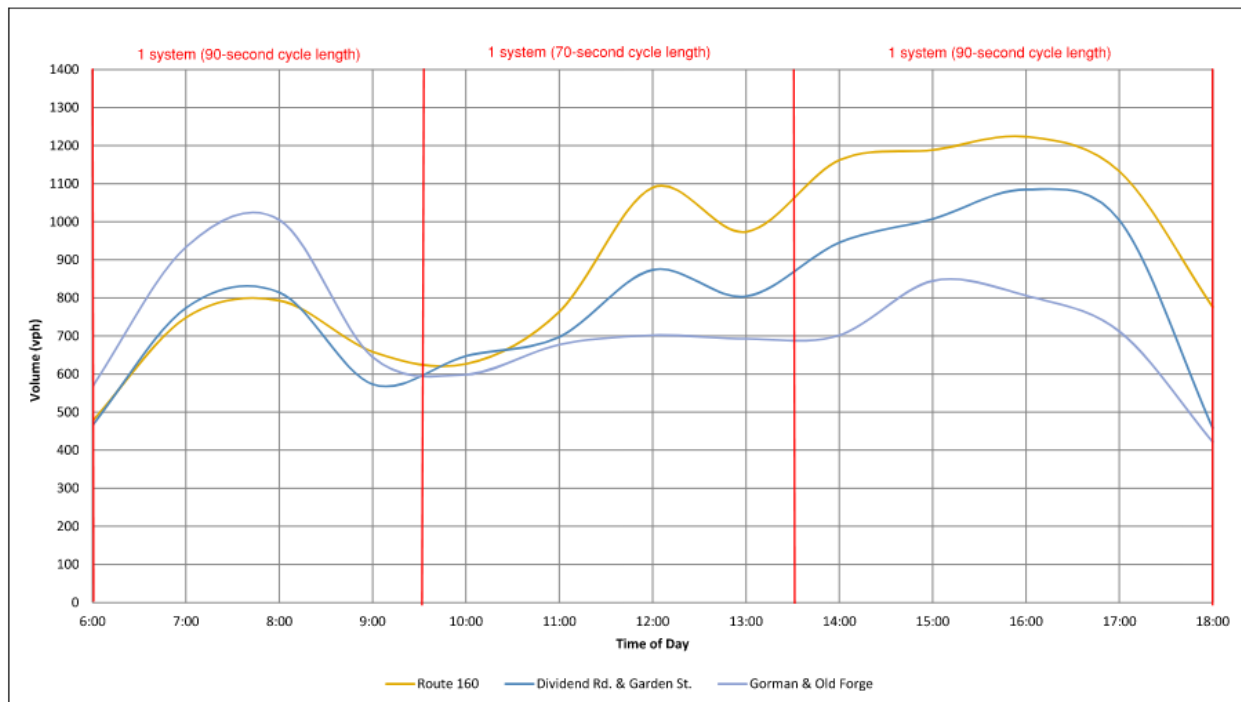
Figure 25: Rocky Hill, Route 3, 99, 411 Critical Volume Chart


Figure 25: Rocky Hill, Route 3, 99, 411 Critical Volume Chart, Continued



Simsbury, Route 10 & 202 South (Hopmeadow Street)

Route 10 & 202 South (Hopmeadow Street) is a north/south corridor in Simsbury. The changes implemented include an increase in cycle length for the midday, p.m. peak, and off-peak time periods to increase capacity and improve flow. The a.m. period did not require changes as the Synchro analysis results proved to be comparable with the existing operations. The slight volume drop after the a.m. peak did not warrant a change as the volumes begin to increase after the a.m. drop. The change in the cycle length increased for the midday, p.m., and off-peak hours to correspond with the changes in volumes. The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 26: Simsbury, Route 10 & 202 South Location Map

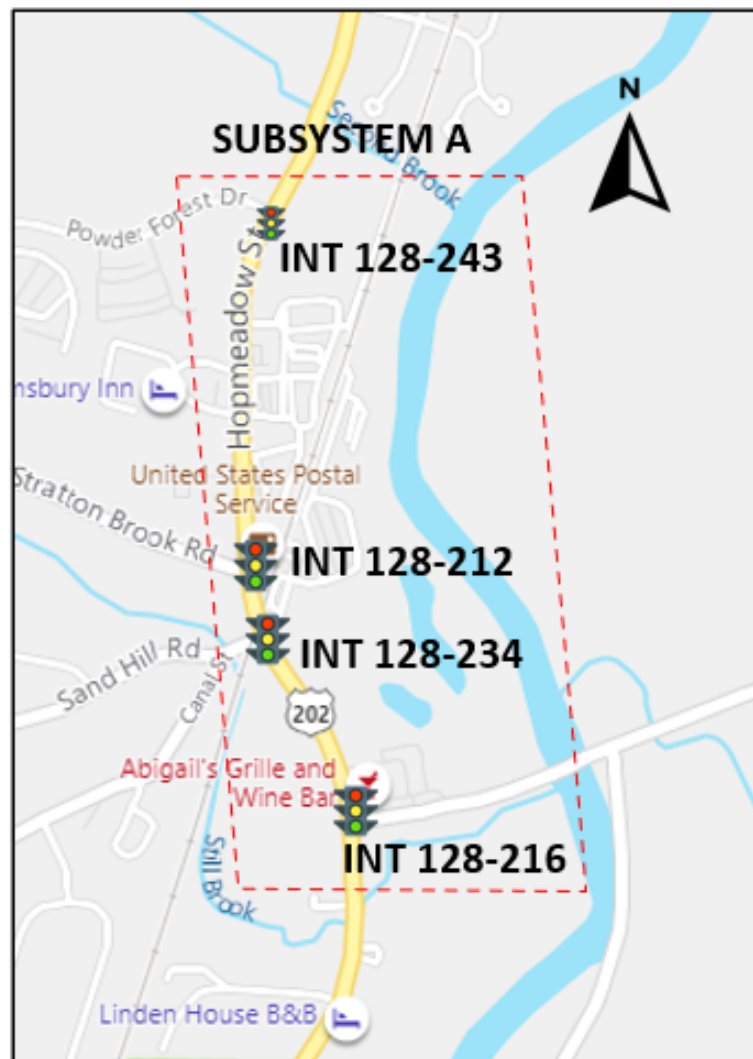
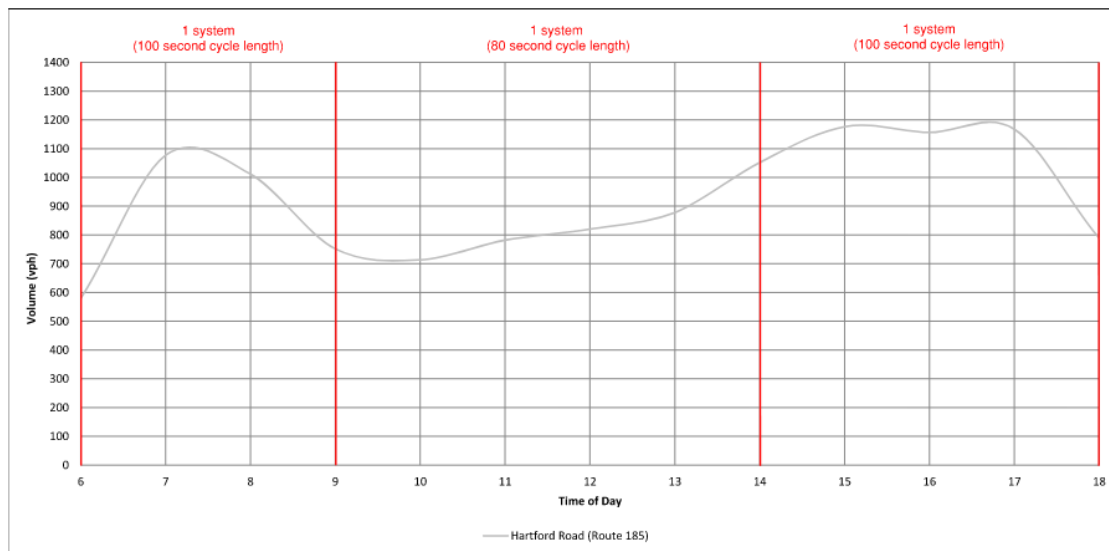


Table 15: Simsbury, Route 10 & 202 South Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
128-216	Route 185	Variable	100 - 69			75 - 43					90 - 00			60 - 25			Variable					
128-234	Canal Street		100 - 56			75 - 05					90 - 58			60 - 11								
128-212	Stratton Brook Road		100 - 44			75 - 05					90 - 48			60 - 05								
128-243	Powder Forrest Drive		100 - 07			Variable					90 - 84			60 - 40								

After Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
128-216	Route 185	100 - 55			80 - 44					100 - 00			Variable			Variable						
128-234	Canal Street	100 - 10			80 - 00					100 - 49			70 - 00									
128-212	Stratton Brook Road	100 - 10			80 - 00					100 - 48			70 - 00									
128-243	Powder Forrest Drive	100 - 35			80 - 44					100 - 48			Variable									

Figure 27: Simsbury, Route 10 & 202 South Critical Volume Chart



*Data available for one intersection only

Simsbury, Route 10 & 202 North (Hopmeadow Street)

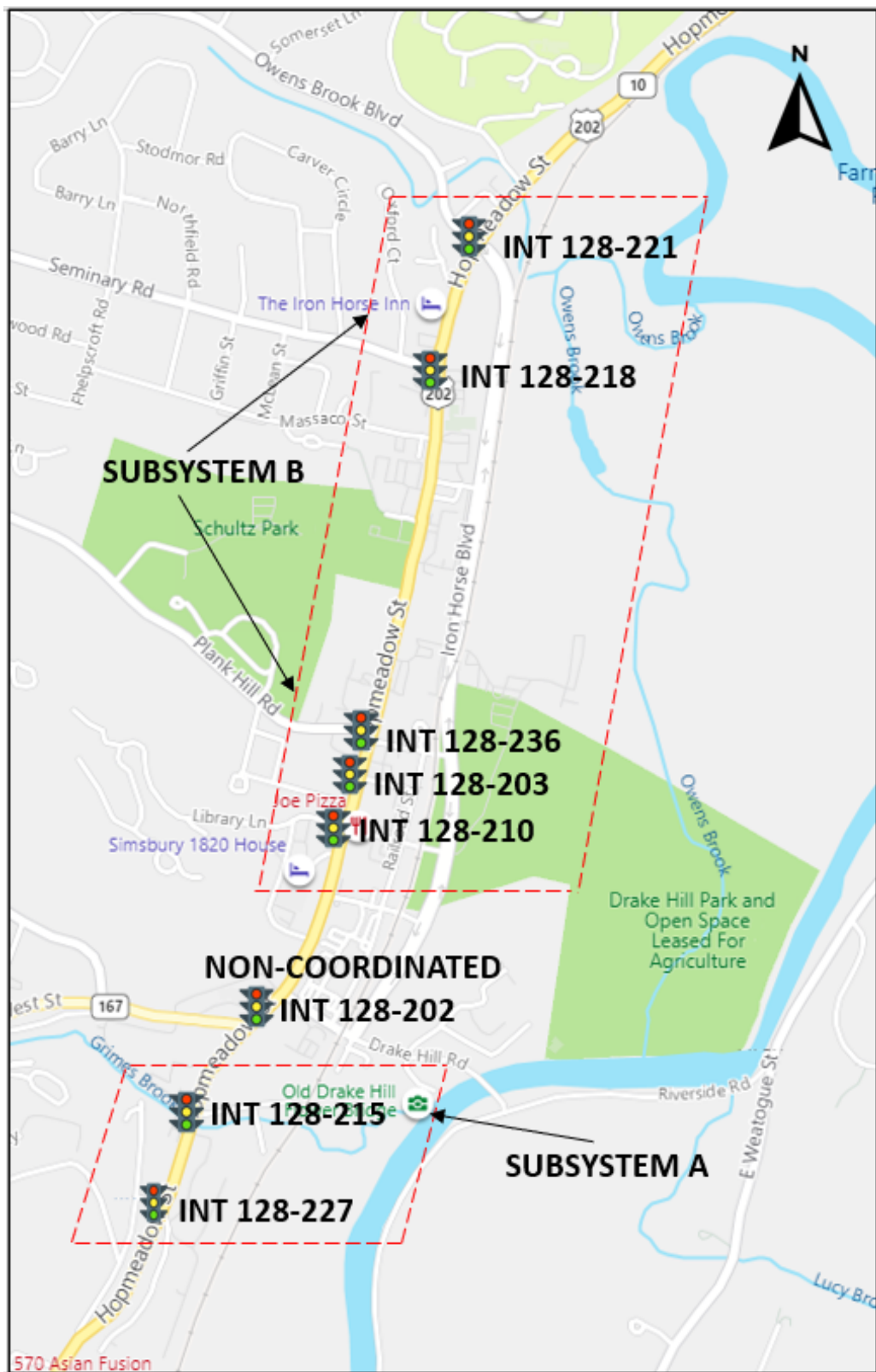
Route 10 & 202 North (Hopmeadow Street) is a north/south corridor in Simsbury. The travel times conducted after the new signal timings were implemented showed no appreciable benefits between the “Before” to “After” conditions resulting in a return to the “Before” timings for the midday and p.m. peak hours. It should be noted that most of the travel time comparisons that showed an increase in travel time with the new timings are minor increases.

Some reasons for an increased travel time include but are not limited to:

- A change in signal progression to improve flow and reduce travel time in one direction resulted in an increase to travel time in the opposing direction
- Progression needs of a crossing arterial with higher traffic volumes result in added delay of a study corridor at the crossing intersection
- Consistent time of day plans along a corridor that reduce the likelihood of random progression through signals
- Day-to-day variation in traffic demand
- Increase in pedestrian and vehicle clearance timings
- Faulty detection, resulting in a constant call on the cross-street, which was not yet fixed during the after runs but was functioning properly during the before runs

Table 16 shows the coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 28: Simsbury, Route 10 & 202 North Location Map

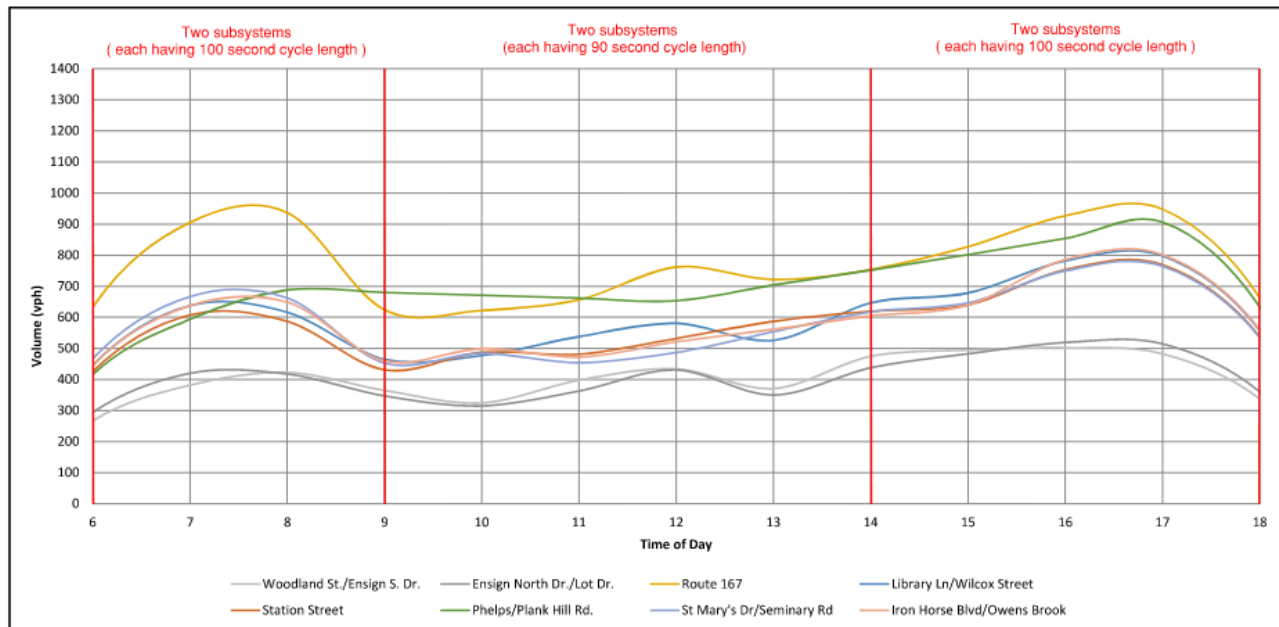


**Table 16: Simsbury, Route 10 & 202 North, Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.**

Before Evaluation																								
Timings (Cycle - Offset)																								
Intersection		Time of Day																						
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
128-227	Woodland & Ensign	Variable	90 - 38		75 - 38				90 - 35				60 - 34											
128-215	Nrth Drv to Ensign		90 - 15		75 - 31				90 - 14				60 - 06											
128-202	Route 167 & Drake Hill		Variable																					
128-210	Wilcox & Library		90 - 75		75 - 27				90 - 42				60 - 40											
128-203	Station St.		90 - 75		75 - 27				90 - 42				60 - 40											
128-236	Phelps & Plank Hill		90 - 75		75 - 27				90 - 42				60 - 40											
128-218	Seminary & St Mary's		90 - 15		75 - 02				90 - 12				60 - 36											
128-221	Owens Brk & Iron Horse		90 - 11		75 - 00				90 - 14				Variable											
After Evaluation																								
Timings (Cycle - Offset)																								
Intersection		Time of Day																						
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22						
128-227	Woodland & Ensign	100 - 26		75 - 38				90 - 35				65 - 00												
128-215	Nrth Drv to Ensign	100 - 28		75 - 31				90 - 14				65 - 00												
128-202	Route 167 & Drake Hill	Variable																						
128-210	Wilcox & Library	100 - 35		75 - 27				90 - 42				65 - 40												
128-203	Station St.	100 - 35		75 - 27				90 - 42				65 - 40												
128-236	Phelps & Plank Hill	100 - 35		75 - 27				90 - 42				65 - 40												
128-218	Seminary & St Mary's	100 - 88		75 - 02				90 - 12				65 - 36												
128-221	Owens Brk & Iron Horse	100 - 74		75 - 00				90 - 14				Variable												

Note: After Evaluation timings for midday and p.m. peak were reverted to original values. No appreciable benefits were achieved during the evaluation.

Figure 29: Simsbury, Route 10 & 202 North Critical Volume Chart



Southington, Route 10 South (Main Street, North Main Street)

Route 10 South (Main Street, North Main Street) is a north/south corridor in Southington. The changes implemented to improve traffic flow include adjusting intersections within the subsystems, bringing all signals into coordination during peak periods, and increasing cycle lengths. The intersections at Curtis Street (Int. 131-210) and Flanders Street (Int. 131-239) retained the 80 second cycle length, while the remaining intersections were increased from 80 to 90 second cycle lengths. This longer cycle length allows Columbus Avenue (Int. 131-207) to be brought into coordination to improve mainline progression at these closely spaced intersections. The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 30: Southington, Route 10 South Location Map

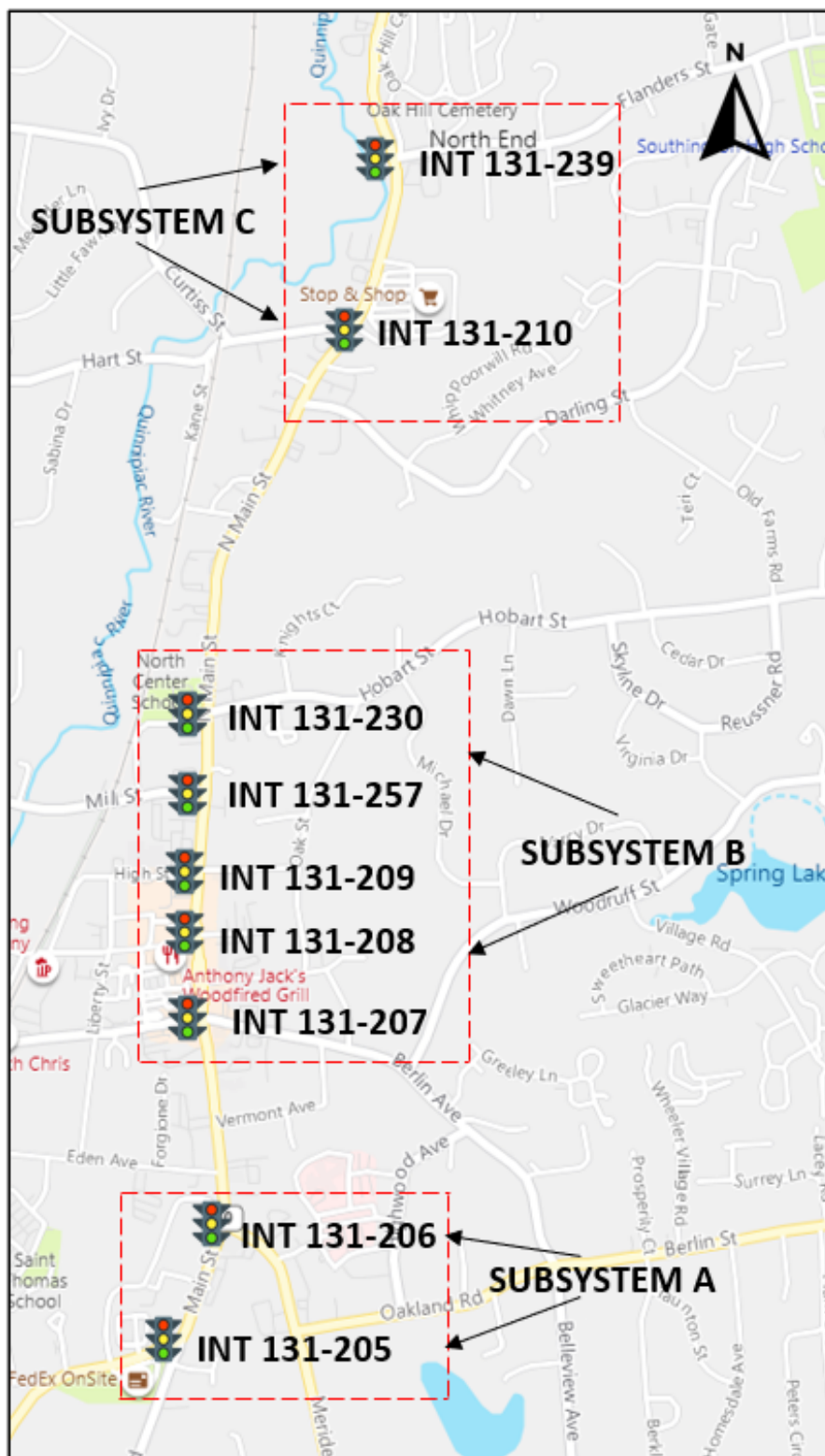
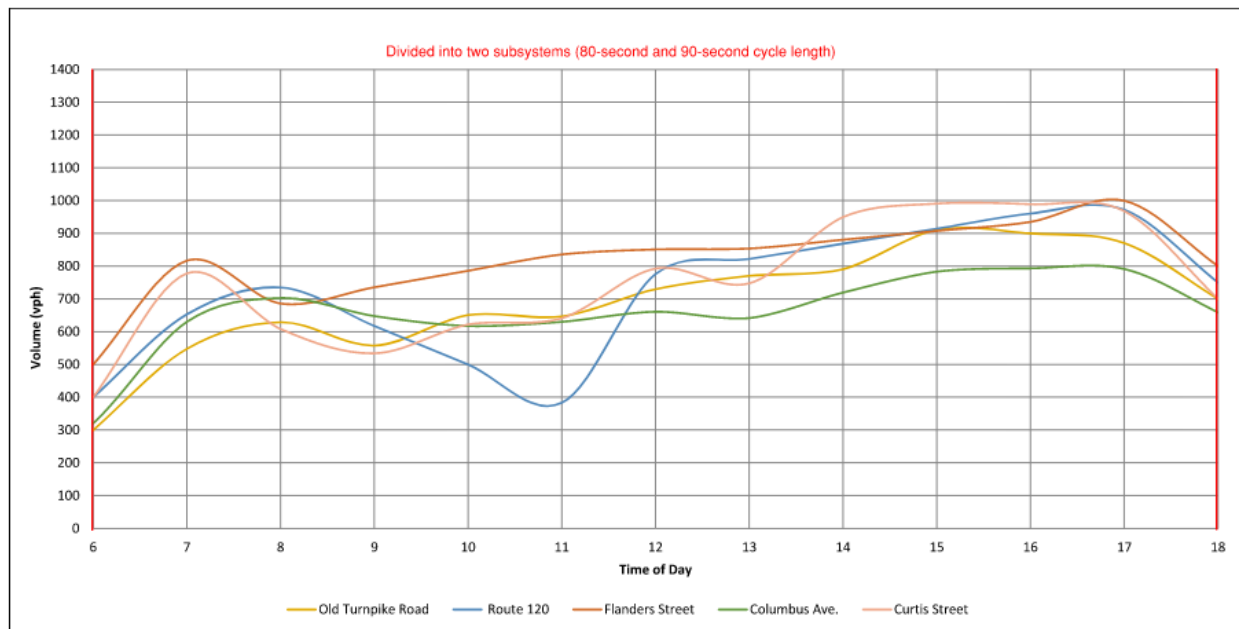


Table 17: Southington, Route 10 South Changes to Cycle Lengths and Offsets
Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable			
131-205	Turnpike Rd	80 - 36														65 - 36						
131-206	Route 120	80 - 45														65 - 44						
131-207	Columbus Ave.	Variable																				
131-208	Center St.	80 - 46														65 - 15						
131-209	High St.	80 - 45														65 - 26						
131-257	Mill St.	80 - 50														65 - 55						
131-230	Hobart St.	80 - 50														65 - 54						
131-210	Curtiss St.	80 - 44														65 - 45						
131-239	Flanders St.	80 - 53														65 - 10						
After Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable			
131-205	Turnpike Rd	90 - 74														70 - 56						
131-206	Route 120	90 - 82														70 - 00						
131-207	Columbus Ave.	90 - 00														Variable						
131-208	Center St.	90 - 00														70 - 00						
131-209	High St.	90 - 00														70 - 00						
131-257	Mill St.	90 - 00														70 - 00						
131-230	Hobart St.	90 - 00														70 - 00						
131-210	Curtiss St.	80 - 23														70 - 50						
131-239	Flanders St.	80 - 40														70 - 66						

Figure 31: Southington, Route 10 South Critical Volume Chart

West Hartford, Route 44 (Albany Avenue) & Route 218 (North Main Street)

Route 44 (Albany Avenue) is an east/west corridor in West Hartford. Route 218 (North Main Street) is a north/south corridor in West Hartford. The changes implemented to improve traffic flow include increase in cycle lengths for the a.m. and p.m. peak periods to increase overall capacity. This allowed greater optimization of signal cycle lengths and allowed for a decrease in mainline red time throughout the corridor. These changes simplified operations, increased capacity, and eliminated multiple shifts between cycle lengths to increase the effectiveness of coordination. The following table shows the before and after coordination schedules applicable to Monday through Friday operations from 6:00 a.m. to 10:00 p.m. These schedules contain a separate block for each pattern. Each block shows the coordinated cycle length followed by the offset (in seconds) for each of the corresponding intersections. The cycle length is listed as “variable” for the intersections that run “non-coordinated.”

Figure 32: West Hartford, Route 44 & Route 218 Location Map

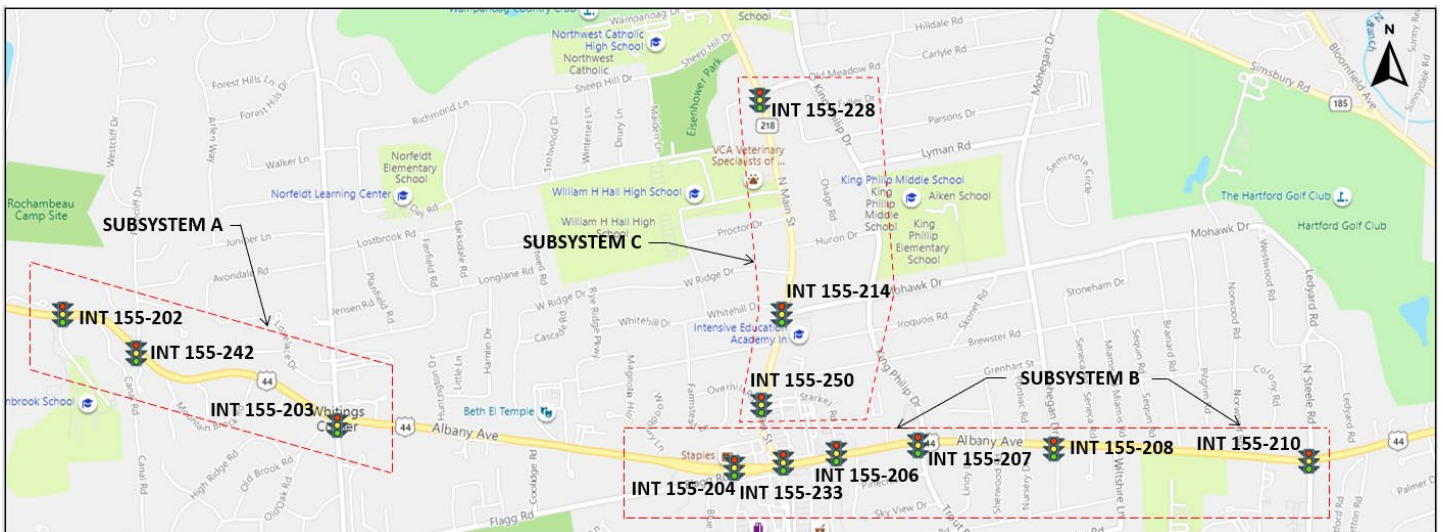
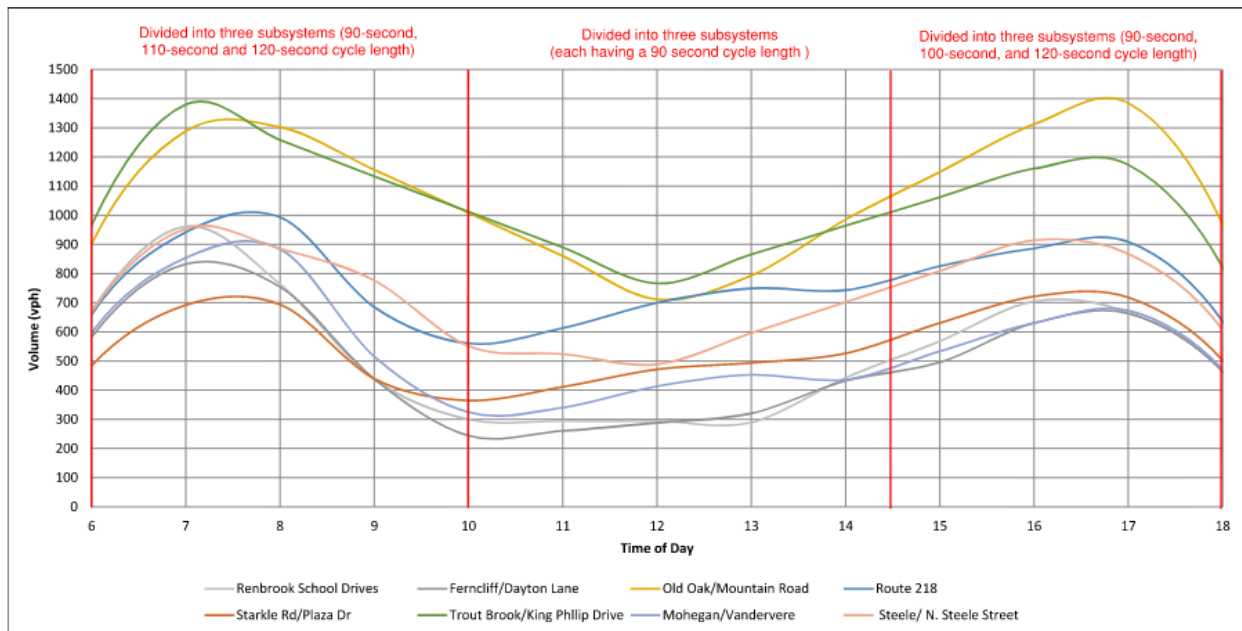


Table 18: West Hartford, Route 44 & Route 218 Changes to Cycle Lengths and Offsets

Monday – Friday 6 a.m. – 10 p.m.

Before Evaluation																						
Timings (Cycle - Offset)																						
Intersection		Time of Day																				
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22				
155-202	Renbrook School	Variable	100 - 54				90 - 41				100 - 54				70 - 30				Variable			
155-242	Ferncliff & Dayton		100 - 00				90 - 68				100 - 00				70 - 51							
155-203	Mountain & Old Oak		100 - 05				90 - 00				100 - 14				70 - 00							
155-204	Flagg & Sims & Commerc		100 - 16				90 - 00				100 - 16				70 - 00							
155-233	Rte 44 @ Rte 218		100 - 00				90 - 00				100 - 00				70 - 00							
155-206	Starkle & Firehouse 4		100 - 13				90 - 11				100 - 13				80 - 10							
155-207	Trout Brook & King Philips		100 - 22				90 - 88				100 - 65				80 - 00							
155-208	Vandervere & Mohegan		100 - 58				90 - 63				100 - 58				80 - 57							
155-210	Steele & No. Steele		100 - 04				90 - 15				100 - 04				80 - 17							
155-250	Route 218 @ Overhill		90 - 08				90 - 03								Variable							
155-214	Route 218 @ Whitehill		90 - 00				90 - 00								Variable							
155-228	Route 218 @ Miller & Old		90 - 53				90 - 53								Variable							

		After Evaluation																						
		Timings (Cycle - Offset)																						
Intersection		Time of Day																						
No.	Description	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Variable					
155-202	Renbrook School	110 - 86				90 - 45				100 - 84				80 - 66										
155-242	Ferncliff & Dayton	110 - 104				90 - 69				100 - 81				80 - 01										
155-203	Mountain & Old Oak	110 - 24				90 - 10				100 - 09				80 - 44										
155-204	Flagg & Sims & Commerc	120 - 00				90 - 00				120 - 00				90 - 00										
155-233	Rte 44 @ Rte 218	120 - 00				90 - 00				120 - 00				90 - 00										
155-206	Starkle & Firehouse 4	120 - 55				90 - 66				120 - 04				90 - 76										
155-207	Trout Brook & King Philips	120 - 48				90 - 46				120 - 64				90 - 34										
155-208	Vandervere & Mohegan	120 - 100				90 - 67				120 - 102				90 - 60										
155-210	Steele & No. Steele	120 - 24				90 - 26				120 - 50				90 - 20										
155-250	Route 218 @ Overhill	90 - 13				90 - 30				90 - 38				80 - 34										
155-214	Route 218 @ Whitehill	90 - 78				90 - 10				90 - 07				80 - 12										
155-228	Route 218 @ Miller & Old	90 - 52				90 - 75				90 - 82				80 - 74										

Figure 33: West Hartford, Route 44 & Route 218 South Critical Volume Chart

Post Implementation Assessment

Upon completion of field fine-tuning, the Consultant conducted travel time runs using Tru-Traffic to report the results of the timing changes. Videos of the travel runs were also collected to view any specific issues or queues that were encountered. The post-implementation travel times were then compared to the initial travel time runs to calculate the improvements. Results are presented by corridor in the following sections of this report.

Corridor Performance Evaluation

The study corridors were evaluated to determine the effectiveness of the timing changes. The corridor evaluations consisted of comparing performance measures from “Before” and “After” studies conducted prior to and post implementation of new signal timings. This chapter provides details on the methodology used to evaluate corridor performance and the results of those evaluations.

Performance Evaluation Data

Travel time study data was used to calculate a variety of performance measures. Corridor performance results were based on data from “Before” and “After” travel time studies conducted for each study corridor. The corridor travel time studies occurred during multiple periods throughout the weekdays (Monday through Friday) for “Before” and “After” conditions of implementing the new signal timing plans. The periods for the travel time studies were:

- a.m. peak period – 7:00 a.m. to 8:30 a.m. (Weekday) – All study corridors
- midday period – 11:30 a.m. to 1:00 p.m. (Weekday) – All study corridors
- p.m. peak period – 4:00 p.m. to 6:00 p.m. (Weekday) – All study corridors
- Saturday midday period – 11:00 a.m. to 3:00 p.m. -Varies by corridor

The “Before” travel time studies were conducted in February 2020 prior to implementation of new signal timings. The “After” travel time studies were conducted in September/October 2021 after implementation and fine-tuning of new signal timings. The travel time studies were conducted with a pilot vehicle traveling each study corridor for a minimum of three travel time runs for each period “Before” and “After” conditions. During these studies, travel time data was collected with Tru-Traffic software. Tru-Traffic, accompanied with a GPS device, is used to track a vehicle’s position while it travels along a corridor. It records the position of the vehicle every second and uses that information, along with inputs on the locations of intersections, to calculate performance measures along the corridor such as number of stops and travel time.

Performance Measures

The following performance measures were identified to be reported for this project *See Appendix A:

- **Travel Time** – The time to travel from one end of a study corridor to the other
- **Corridor Performance**
 - Delay – The amount of time corridor through traffic is slowed or stopped by traffic signals on a trip from one end of a study corridor to the other
 - Fuel Consumption – The estimated amount of fuel consumed by through traffic on a trip from one end of a study corridor to the other.
 - Emissions – The estimated emissions produced by through traffic on a trip from one end of a study corridor to the other.
 - Stops – The number of stops experienced by through traffic on a study corridor on a trip from one end of a study corridor to the other.

User Savings Analysis

This travel time performance measure was reported as the change in travel time between “Before” and “After” conditions by comparing the average time to travel from one end of a study corridor to the other end during the study periods. Travel time was extracted from the travel time run data in Tru-Traffic for each period of “Before” and “After” conditions. “Time” is of value to all people. A reduction in travel time, delay, and fuel consumption lowers costs to motorists. These direct savings were tracked and quantified to determine community savings. Corridor performance measures of delay, stops, fuel consumption, and emissions were calculated using output from Tru-Traffic travel time runs, year 2019 local demographics, and formulas developed by Indiana Department of Transportation (INDOT) & Purdue University^x. Each of the corridor performance measures was reported as the change between “Before” and “After” conditions.

Summary of Performance Measures and User Savings

Travel Time Results

Table 19: Travel Time Comparison from “Before” to “After” Conditions

Corridor	Time Period	Travel Time Change (Min:Sec)		
		NB/EB	SB/WB	Total
*Berlin, Meriden Route 5 & 15	a.m.	-	-	-
	midday	-	-	-
	p.m.	-	-	-
**Berlin, Newington, Wethersfield Route 5 & 15	a.m.	-	-	-
	midday	-	-	-
	p.m.	-	-	-
Enfield, Route 5	a.m.	-0:18	-0:12	-0:30
	midday	-0:22	0:21	-0:01
	p.m.	-0:22	-0:26	-0:48
Farmington, New Britain, West Hartford Route 71	a.m.	-0:16	0:11	-0:05
	midday	-0:39	-1:29	-2:08
	p.m.	-0:27	-0:14	-0:41
Rocky Hill, Route 3	a.m.	-0:03	-0:27	-0:30
	midday	0:17	-0:28	-0:11
	p.m.	-1:10	-0:06	-1:16
Rocky Hill, Route 411	a.m.	-0:28	-0:39	-1:07
	midday	0:05	-0:05	0:00
	p.m.	-0:30	-0:11	-0:41
Rocky Hill, Route 99	a.m.	-0:32	-0:48	-1:20
	midday	-0:37	-0:03	-0:40
	p.m.	-0:01	0:36	0:35
Simsbury, Route 10 & 202 South	a.m.	-0:24	-2:56	-3:20
	midday	-0:09	0:18	0:09
	p.m.	-0:06	-0:14	-0:20

Corridor	Time Period	Travel Time Change (Min:Sec)		
		NB/EB	SB/WB	Total
***Simsbury, Route 10 & 202 North	a.m.	-0:22	-0:23	-0:45
	midday	-	-	-
	p.m.	-	-	-
Southington, Route 10 South	a.m.	-0:18	-0:29	-0:47
	midday	-1:20	-0:12	-1:32
	p.m.	-0:48	0:38	-0:10
West Hartford, Route 44, 218	a.m.	-0:59	-1:01	-2:00
	Midday	-1:32	1:26	-0:06
	p.m.	-1:09	-0:06	-1:15

It should be noted in Table 17, negative time values represent a decrease in travel time during the “After” condition as compared to the “Before” condition; Positive time values represent an increase in travel time during the “After” condition.

*The corridor is currently under construction and awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

**The corridor is currently awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

***Simsbury After Evaluation timings for midday and p.m. peak were reverted to original timings. No appreciable benefits were achieved during the evaluation.

Corridor Performance Results

The total benefits to corridor performance from “Before” to “After” conditions are summarized in Table 18 below. The corridor performance results show sizable reductions for motorist delay, fuel consumption, stops, and emissions. The reductions to delay and fuel for the optimization of these nine (9) corridors are estimated to save Connecticut motorists over 72,500 hours of delay and \$2,351,000 in user (time and fuel) costs per year. More detailed corridor performance measures, including a breakdown by study period, are provided in Appendix E.

Table 20: Corridor Performance Results

Corridor	Annual Savings (From “Before” to “After” Conditions)				
	Delay (Veh-hours)	Fuel (Gallons)	Stops (Veh-stops)	Emissions (kg)	User Savings (\$)
*Berlin, Route 5 & 15	-	-	-	-	-
**Berlin, Newington, Wethersfield Routes 5 & 15	-	-	-	-	-
Enfield, Route 5	2,900	2,500	320,000	22,000	\$90,000
Farmington, New Britain, W. Hartford, Route 71	13,000	11,300	340,000	100,000	\$406,000
Rocky Hill, Route 3	11,600	10,100	1,050,000	89,000	\$363,000
Rocky Hill Route 411	7,000	6,100	180,000	54,000	\$220,000
Rocky Hill Route 99	7,400	6,500	420,000	57,000	\$232,000
Simsbury, Route 10 & 202 South	10,600	9,200	620,000	81,000	\$331,000
Simsbury, Route 10 & 202 North (a.m.)	2,000	1,700	110,000	15,000	\$63,000
Southington, Route 10 South	6,000	5,200	880,000	46,000	\$188,000
West Hartford, Route 44, 218	14,700	12,800	430,000	112,000	\$458,000
Total	75,200	65,400	4,350,000	576,000	\$2,351,000

Note: User savings in Table 18 are based on reductions in delay, fuel, and local demographic information.

*The corridor is currently under construction and awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

**The corridor is currently awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

Table 21: Corridor Average Travel Speed Increase

Corridor	Avg. Speed Before (mph)	Avg. Speed After (mph)	Increase in Travel Speed %
*Berlin, Route 5 & 15	-	-	-
**Berlin, Newington, Wethersfield Route 5 & 15	-	-	-
Enfield, Route 5	38.0	39.8	5%
Farmington, New Britain, West Hartford Route 71	21.2	22.1	4%
Rocky Hill, Route 3	24.5	26.6	9%
Rocky Hill, Route 411	24.2	27.0	12%
Rocky Hill, Route 99	28.1	31.1	11%
Simsbury, Route 10 & 202 South	24.6	28.7	17%
Simsbury, Route 10 & 202 North (AM)	21.7	22.4	3%
Southington, Route 10 South	19.2	21.2	10%
West Hartford, Route 44, 218	23.8	27.9	17%

*The corridor is currently under construction and awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

**The corridor is currently awaiting implementation of an adaptive signal control technology and automated traffic signal performance measures. Traffic signal timings will be further evaluated after implementation.

Study Benefit-to-Cost Comparison

The total user savings cost for Phase 4 is \$2,351,000 annually. The costs of the timing plan evaluation Phase 4 corridors are estimated to be approximately \$100,000 per year. This yields benefit-to-cost ratio of 24:1.

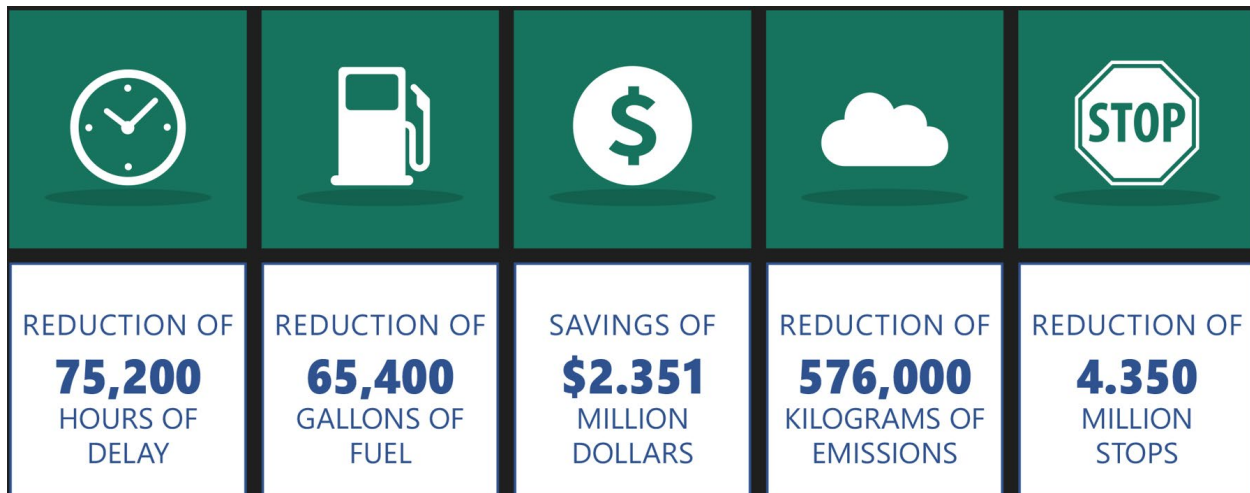
These benefits are measured and published on [CTDOT Green Light Web Page](#)

Summary/Conclusion

The evaluation of the CTSS coordination timing resulted in a wide range of transportation, economic, and environmental improvements that increase user quality of life. The project offers better flow to improve safety, a reduction in congestion, fuel savings and improved air quality for the CRCOG corridors.

It is determined that significant cost savings are achieved in all nine (9) study corridors. On average, travel speeds were increased from an average of 25 mph to 27.4 mph, an increase of 10%. The number of stops were reduced by 4.35 million per year and travel times were reduced by an average of 10%. The Phase 4 reductions to delay and fuel are estimated to save Connecticut motorists over 72,200 hours of delay and \$2,351,000 in user (time and fuel) costs per year. More detailed corridor performance measures, including a breakdown by study period, are provided in the appendices. Figure 33 below summarizes Phase 4 performance measures improvements.

Figure 34: Phase 4 Corridors Performance Measures Results Summary



Note: Performance measures were summarized for times of the day when travel time studies were completed. This means that benefits derived from the timing plan evaluation effort are only reported for those hours during the day in which travel time studies were conducted. For the remaining hours of the day and weekends, it is expected that additional benefits are realized that are not reported in this study since travel studies were not collected during those times of day.

References

- ⁱ National Academies of Sciences, Engineering, and Medicine 2015. *Signal Timing Manual - Second Edition*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22097>, Appendix A. Glossary
- ⁱⁱ Synchro/SimTraffic Version 11.0 [Computer Software]. (2019). Cubic Transportation Systems
- ⁱⁱⁱ Tru-Traffic 10.0 [Computer Software] (2019). Tru-Traffic, Gregory Bullock.
- ^{iv} National Academies of Sciences, Engineering, and Medicine 2020. *Performance-Based Management of Traffic Signals*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25875>. p. 5
- ^v National Academies of Sciences, Engineering, and Medicine 2015. *Signal Timing Manual - Second Edition*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22097>, p. 3-19
- ^{vi} Connecticut Crash Data Repository [Computer Software]. University of Connecticut
- ^{vii} National Academies of Sciences, Engineering, and Medicine 2015. *Signal Timing Manual - Second Edition*. p. 5-19
- ^{viii} National Academies of Sciences, Engineering, and Medicine 2015. *Signal Timing Manual - Second Edition*. p. 5-26
- ^{ix} TSDWIN Version 4.3.5 [Computer Software]. (2017). Fortran Traffic
- ^x Day, C.M., T.M. Brennan, A.M. Hainen, S.M. Remias, H. Premachandra, J.R. Sturdevant, G. Richards, J.S. Wasson, and D.M. Bullock. "Quantifying Benefits of Traffic Signal Retiming." Joint Transportation Research Program Project No. C-36-661 File No. 8-7-10 SPR-3208. Conducted in cooperation with the Indiana Department of Transportation and the U.S. Department of Transportation Federal Highway Administration. Purdue University West Lafayette, IN 47905. October 2010.

Appendix A

Phase 4 Intersection

List

Berlin/Meriden Route 5 & Route 15						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
079-211	A	RTE 15 AT COMMUTER LOT	V	NONE	Copper Underground	Naztec V41
007-201	A	RTE 15 AT NORTH COLONY RD	V	NONE	Copper Underground	Naztec V41
007-202	A	RTE 15 AT TOLL GATE RD	V	NONE	Copper Underground	Naztec V41
007-215	A	RTE 15 AT NEW PARK DR	V	NONE	Copper Underground	Naztec V41
007-203	A	RTE 15 AT ORCHARD RD	V	NONE	Copper Underground	Naztec V41
007-251	A	RTE 15 AT SPRUCE BROOK RD	V	NONE	Copper Underground	Naztec V41
007-204	A	RTE 15 AT S. WORTHINGTON RIDGE	V	NONE	Copper Underground	Naztec V41
007-205	A	RTE 15 AT MIDDLETOWN RD	V	NONE	Copper Underground	Naztec V41
007-239	A	RTE 15 AT RTE 9 RAMPS	V	NONE	Copper Underground	Naztec V41
007-206	A	RTE 15 AT N. WORTHINGTON RIDGE	V	NONE	Copper Underground	Naztec V41
007-207	A	RTE 15 AT WOODLAWN & WETHERSFIELD	V	NONE	Copper Underground	Naztec V41
007-208	N/A	RTE 15 AT RTE 160 DEMING RD	V	V	Copper Underground	Naztec V41
007-243	N/A	RTE 15 AT BRICKYARD MALL	V	V	Copper Underground	Naztec V41
V = Video (Non recording)						

Berlin/Newington/Wethersfield Route 5 & 15						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
007-209	A	RTE 15 AT ROWLEY & SELDEN	V	Radar	Fiber Underground	Cubic V85
093-224	A	RTE 15 AT WEBSTER ST	V	Radar	Fiber Underground	Cubic V85
093-227	A	RTE 15 AT PANE RD	V	Radar	Fiber Underground	Cubic V85
093-255	A	RTE 15 AT LOWES DR	V	Radar	Fiber Underground	Cubic V85
093-201	A	RTE 15 AT RICHARD & DEMING	V	Radar	Fiber Underground	Cubic V85
093-245	A	RTE 15 AT PASCONE PL	V	Radar	Fiber Underground	Cubic V85
093-229	A	RTE 15 AT MAIN ST (RTE 176) & GRISWOLDVILLE	V	Radar	Fiber Underground	Cubic V85
093-248	A	RTE 15 AT DOT SOUTH DR.	V	Radar	Fiber Underground	Cubic V85
093-247	N/A	RTE 15 AT DOT NORTH DR.	V	Radar	Fiber Underground	Cubic V85
093-228	B	RTE 15 AT KITTS LANE	V	Radar	Fiber Underground	Cubic V85
093-234	B	RTE 15 AT RTE 287 (E. ROBBINS)	V	Radar	Fiber Underground	Cubic V85
159-210	C	RTE 15 AT ARROW RD	V	Radar	Fiber Underground	Cubic V85
159-248	C	RTE 15 AT PAWTUCKET	V	Radar	Fiber Underground	Cubic V85
159-249	C	RTE 15 AT RTE 314	V	Radar	Fiber Underground	Cubic V85
159-228	C	RTE 15 AT NOTT ST	V	Radar	Fiber Underground	Cubic V85
V = Video (Non recording)						

Enfield Route 5 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
048-243	A	RTE 5 AT SR 510 (DEPOT HILL RD)	L	NONE	Copper Aerial	Naztec V41
048-242	A	RTE 5 AT WEYMOUTH RD	L	L	Copper Aerial	Naztec V41
048-250	A	RTE 5 AT 91 SB RMPS & BERNIES DR	L	NONE	Copper Aerial/Underground	Naztec V41
048-219	A	RTE 5 AT ORLANDO DR	V	NONE	Copper Aerial	Naztec V41
048-214	A	RTE 5 AT POST OFFICE RD	V	NONE	Copper Aerial	Naztec V41
048-210	A	RTE 5 AT SOUTH RD	V	NONE	Copper Aerial	Naztec V41
L = Loop, V = Video (Non recording)						

New Britain/ Farmington / West Hartford Route 71						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
088-294	A	RTE 71 AT COSTCO	V	V	Aerial/Underground	Cubic V85
088-248	A	RTE 71 AT VILLAGE SQ	V	V	Aerial	Cubic V85
088-283	A	RTE 71 AT ROUTE 9 S. BND. RAMP	V	NONE	Aerial/Underground	Cubic V85
088-284	A	RTE 71 AT ROUTE 9 N. BND. RAMP	V	NONE	Underground	Cubic V85
051-244	A	RTE 71 AT SPORTS AUTHORITY	V	V	Underground	Cubic V85
051-236	A	RTE 71 AT ENTANCE # 1	L, Mag	L, Mag	Underground	Cubic V85
155-236	B	RTE 71 AT SHEPARD RD	L	L	Underground	Cubic V85
155-237	B	RTE 71 AT CORBIN CORNER	L	L	Underground	Cubic V85
155-238	B	RTE 71 AT MALL MAIN ENT	L, Mag	L, Mag	Underground	Cubic V85
L = Loop, V = Video (Non recording), Mag = Magnetometer						

Rocky Hill Route 3, 411 & 99						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
118-235	A	RTE 3 AT INWOOD RD	V	V	Fiber Underground	Cubic V85
118-227	A	RTE 3 AT BROOK ST	V	V	Fiber Underground	Cubic V85
118-215	A	RTE 3 AT COLD SPRING RD	V	V	Fiber Underground	Cubic V85
118-239	A	RTE 3 AT WESTSIDE MARKET	V	V	Fiber Underground	Cubic V85
118-242	A	RTE 3 AT TOWN CENTER & MODERN TIRE	V	V	Fiber Underground	Cubic V85
118-201	A	RTE 3 AT SR 411 (WEST ST)	V	V	Fiber Underground	Cubic V85
118-226	A	RTE 3 AT RT 160 SO. JCT	V	V	Fiber Underground	Cubic V85
118-216	A	RTE 3 AT RT 160 NO. JCT	V	V	Fiber Underground	Cubic V85
118-224	B	RTE 411 AT CORPORATE PL	V	V	Fiber Underground	Cubic V85
118-223	B	RTE 411 AT I-91 SB RAMPS	V	V	Fiber Underground	Cubic V85
118-230	B	RTE 411 AT I-91 NB RAMPS	V	V	Fiber Underground	Cubic V85
118-234	B	RTE 411 AT CAPITAL BLVD	V	V	Fiber Aerial/Underground	Cubic V85
118-237	B	RTE 411 AT GILBERT AVE	V	V	Fiber Aerial	Cubic V85
118-210	B	RTE 411 AT SIGNAL LAB	V	V	Fiber Aerial	Cubic V85
118-211	C	RTE 99 AT GORMAN & OLD FORGE	V	V	Fiber Aerial	Cubic V85
118-205	C	RTE 99 AT SCHOOL & LOCUST ST	V	V	Fiber Aerial	Cubic V85
118-206	C	RTE 99 AT SR 411 (WEST ST) AND FOREST	V	V	Fiber Aerial	Cubic V85
118-207	C	RTE 99 AT DIVIDEND RD & GARDEN ST	V	V	Fiber Aerial	Cubic V85
118-204	C	RTE 99 AT RTE 160 (ELM ST)	V	V	Fiber Aerial	Cubic V85
V = Video (Non recording)						

Simsbury Route 10 & 202 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
128-216	A	RTE 10/202 AT RTE 185	V	V	Aerial	Naztec V41
128-234	A	RTE 10/202 AT CANAL ST	V	NONE	Aerial/Underground	Naztec V41
128-212	A	RTE 10/202 AT STRATTON BROOK RD	V	NONE	Aerial/Underground	Naztec V41
128-243	A	RTE 10/202 AT POWDER FOREST DR	V	V	Aerial	Naztec V41
L = Loop, V = (Non recording)						

Simsbury Route 10 & 202 North						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
128-227	A	RTE 10/202 AT WOODLAND & ENSIGN	V	NONE	Copper Aerial	Naztec V41
128-215	A	RTE 10/202 AT NORTH DRV TO ENSIGN	L	NONE	Copper Aerial	Naztec V41
128-202	N/A	RTE 10/202 AT RTE 167	V	V	Copper Aerial	Naztec V41
128-210	B	RTE 10/202 AT WILCOX & LIBRARY	V	V	Copper Aerial/Underground	Naztec V41
128-203	B	RTE 10/202 AT STATION ST	L	NONE	Copper Underground	Naztec V41
128-236	B	RTE 10/202 AT PHELPS & PLANK HILL	L	NONE	Aerial/Underground	Naztec V41
128-218	B	RTE 10/202 AT SEMINARY & ST MARY'S	L	NONE	Copper Aerial/Underground	Naztec V41
128-221	B	RTE 10/202 AT OWENS BROOK & IRON HORSE	L	L	Copper Underground	Naztec V41
L = Loop, V = Video (Non recording)						

Southington Route 10 South						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
131-205	A	RTE 10 AT TURNPIKE RD	L	NONE	Copper Aerial	Cubic V85
131-206	A	RTE 10 AT RTE 120	L	L	Copper Aerial	Cubic V85
131-207	B	RTE 10 AT COLUMBUS AVE	L, V	L, V	Copper Aerial	Cubic V85
131-208	B	RTE 10 AT CENTER ST	L	NONE	Copper Aerial	Cubic V85
131-209	B	RTE 10 AT HIGH ST	V	NONE	Copper Aerial	Cubic V85
131-257	B	RTE 10 AT MILL ST	L	NONE	Copper Aerial	Cubic V85
131-230	B	RTE 10 AT HOBART ST	L	NONE	Copper Aerial	Cubic V85
131-210	C	RTE 10 AT CURTISS ST	L	NONE	Copper Aerial	Cubic V85
131-239	C	RTE 10 AT FLANDERS ST	V	NONE	Copper Aerial	Cubic V85
L = Loop, V = Video (Non recording)						

West Hartford Route 44 & 218						
Intersection #	Subsystem	Location	Detection	Artery Detection	Field Communications	Controller
155-202	A	RTE 44 AT RENBROOK	L	NONE	Underground	Naztec V41
155-242	A	RTE 44 AT FERNCLIFF	L	NONE	Aerial/Underground	Naztec V41
155-203	A	RTE 44 AT MOUNTAIN	L	NONE	Aerial	Naztec V41
155-204	B	RTE 44 AT FLAGG RD	L	NONE	Aerial/Underground	Naztec V41
155-233	B	RTE 44 @ RTE 218	L	L	Underground	Naztec V41
155-206	B	RTE 44 AT STARKLE RD	L	NONE	Aerial	Naztec V41
155-207	B	RTE 44 AT TROUT BROOK	L	NONE	Aerial	Naztec V41
155-208	B	RTE 44 AT MOHEGAN	V	NONE	Aerial	Naztec V41
155-210	B	RTE 44 AT STEELE RD	L	NONE	Aerial	Naztec V41
155-250	C	RTE 218 AT OVERHILL	L	NONE	Aerial	Naztec V41
155-214	C	RTE 218 AT WHITEHILL	L	NONE	Aerial	Naztec V41
155-228	C	RTE 218 AT MILLER	L	NONE	Aerial	Naztec V41
L = Loop, V = Video (Non recording)						

Appendix B

Phase 4 Travel Time Runs Comparison

Route 5 (King Street), Enfield, from Depot Hill Road to South Road										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	NB	37.4	39.5	2.1	6%	246	228	-18	1.0	1.0
	SB	41.0	43.0	2.0	5%	220	208	-12	0.3	0.0
MID	NB	36.3	39.9	3.6	10%	247	225	-22	1.8	0.7
	SB	40.7	37.2	-3.5	-9%	221	242	21	0.7	0.3
PM	NB	35.8	38.8	3.0	8%	250	228	-22	1.3	1.3
	SB	36.6	40.2	3.6	10%	248	222	-26	2.0	1.0
Average:		38.0	39.8	1.8	5%	239	226	-79	1.2	0.7

Route 71 (Hartford Rd.), Farmington, New Britain, West Hartford, from Costco Driveway to Westfarms Mall Main Entrance										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	NB	24.6	26.9	2.3	9%	139	123	-16	1.3	1.7
	SB	26.9	25.6	-1.3	-5%	122	133	11	1.0	2.0
MID	NB	17.5	18.7	1.2	7%	226	187	-39	3.0	2.6
	SB	20.3	20.1	-0.2	-1%	262	173	-89	2.0	2.6
PM	NB	15.9	18.2	2.3	14%	219	192	-27	4.0	2.5
	SB	21.8	23.1	1.3	6%	162	148	-14	2.0	1.5
Average:		21.2	22.1	0.9	4%	188	159	-174	2.2	2.2

Route 3 (Cromwell Avenue), Rocky Hill, from Inwood Road to New Britain Avenue										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	EB	31.6	32.4	0.8	2%	182	179	-3	1.3	1.7
	WB	23.6	26.6	3.0	13%	245	218	-27	2.0	2.0
MID	EB	23.0	21.5	-1.5	-6%	252	269	17	3.0	3.0
	WB	23.8	28.0	4.2	18%	242	214	-28	2.7	2.3
PM	EB	18.7	24.1	5.4	29%	311	241	-70	4.0	2.3
	WB	26.4	26.9	0.5	2%	221	215	-6	2.3	1.3
Average:		24.5	26.6	2.1	9%	242	223	-117	2.6	2.1

SR411 (West Street), Rocky Hill, from I-91 SB Ramps to Signal Lab										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	EB	21.6	25.0	3.4	16%	150	122	-28	1.7	1.3
	WB	17.4	23.4	6.1	35%	174	135	-39	2.0	2.0
MID	EB	30.2	29.3	-0.9	-3%	99	104	5	1.0	1.5
	WB	27.5	30.0	2.5	9%	104	99	-5	0.7	1.0
PM	EB	22.1	26.4	4.3	19%	144	114	-30	2.3	1.7
	WB	26.2	27.9	1.7	7%	130	119	-11	1.3	1.0
Average:		24.2	27.0	2.8	12%	134	116	-108	2	1.4

Route 99 (Main Street), Rocky Hill, from Old Forge Road to Elm Street										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	EB	26.1	31.3	5.3	20%	185	153	-32	2.0	1.3
	WB	27.7	37.4	9.7	35%	176	128	-48	1.3	0.7
MID	EB	27.8	34.8	7.0	25%	175	138	-37	1.7	0.7
	WB	31.1	31.8	0.7	2%	156	153	-3	1.0	1.0
PM	EB	24.6	24.8	0.2	1%	196	195	-1	2.0	2.0
	WB	31.2	26.3	-4.8	-16%	156	192	36	0.7	2.0
Average:		28.1	31.1	3.0	11%	174	160	-85	1.4	1.3

Route 10 & 202 (Hopmeadow Street), Simsbury, from Rte 185 (Hartford Road) to Powder Forest Drive										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	NB	23.6	31.2	7.6	32%	90	66	-24	1.0	0.3
	SB	10.0	29.6	19.6	196%	246	70	-176	3.0	0.3
MID	NB	31.2	34.0	2.8	9%	69	60	-9	0.0	0.0
	SB	33.3	25.1	-8.2	-25%	64	82	18	0.0	0.8
PM	NB	25.7	27.1	1.4	5%	83	77	-6	0.7	0.3
	SB	23.9	25.4	1.5	6%	96	82	-14	1.3	0.7
Average:		24.6	28.7	4.1	17%	108	73	-211	1.0	0.4

Route 10/202 (Hopmeadow Street), Simsbury, from Woodland Street to Iron Horse Boulevard										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	NB	22.0	22.1	0.1	0%	244	222	-22	2.7	2.7
	SB	21.3	22.6	1.3	6%	240	217	-23	2.0	1.3
Average:		21.7	22.4	0.7	3%	242	220	-45	2.4	2

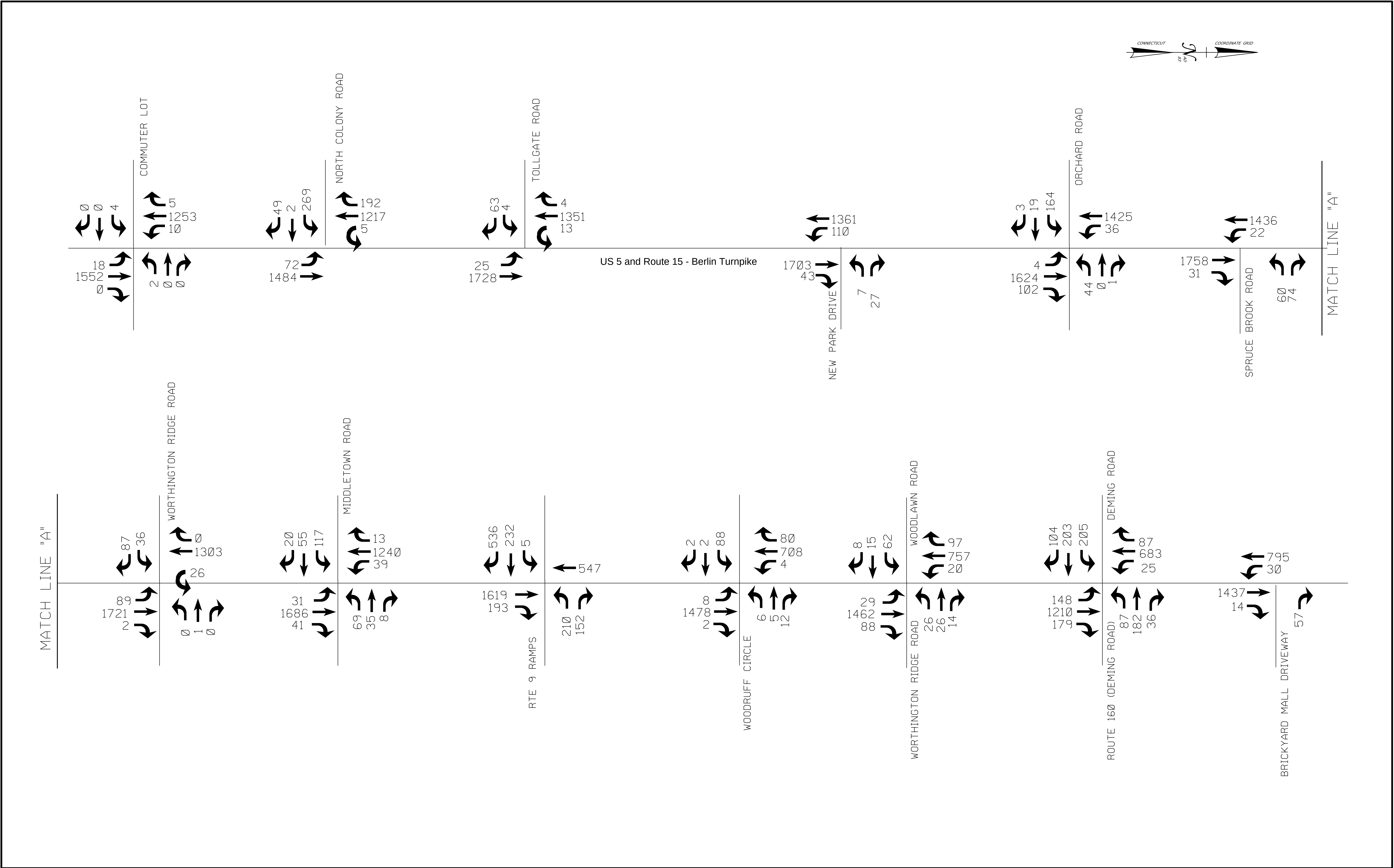
Route 10 (Main Street), Southington, from Old Turnpike Road to Flanders Street										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	NB	22.2	23.5	1.3	6%	264	246	-18	3.0	2.0
	SB	21.8	24.3	2.5	11%	266	237	-29	3.0	1.7
MID	NB	16.7	21.7	5.0	30%	347	267	-80	4.0	2.7
	SB	17.5	18.4	0.9	5%	334	322	-12	4.3	3.3
PM	NB	19.9	23.3	3.4	17%	299	251	-48	3.3	2.3
	SB	17.3	16.0	-1.3	-8%	336	374	38	5.0	4.7
Average:		19.2	21.2	2.0	10%	308	283	-149	3.8	2.8

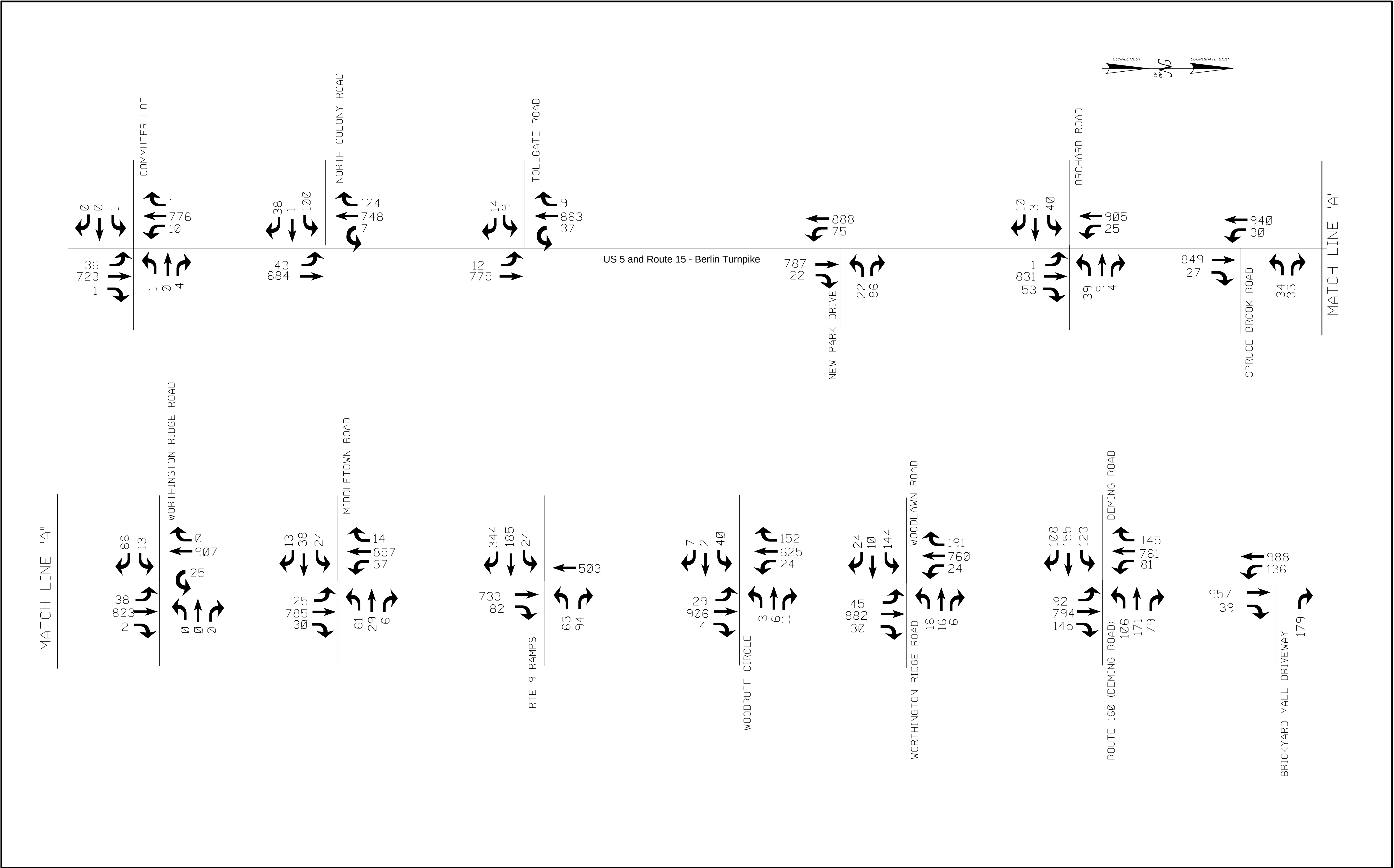
Route 44 (Albany Avenue), West Hartford, from Renbrook School to Steele Road & Route 218 (North Main Street) from Starkel Road to Miller Road										
Period	Direction	Avg Speed Before (mph)	Avg Speed After (mph)	Δ Avg Speed (mph)	% change in Avg Speed	Travel Time (TT) Before (sec)	Travel Time (TT) After (sec)	Total Δ TT (sec)	Avg # of Stops Before	Avg # of Stops After
AM	EB	25.4	28.2	2.8	11%	530	471	-59	4.0	3.3
	WB	18.3	21.8	3.5	19%	381	320	-61	7.0	2.7
MID	EB	26.9	32.8	5.9	22%	489	397	-92	4.0	2.3
	WB	21.4	30.7	9.3	44%	333	419	86	3.0	2.7
PM	EB	25.2	28.7	3.5	14%	526	457	-69	5.0	2.7
	WB	25.5	25.4	-0.1	-1%	519	513	-6	2.0	5.0
Average:		23.8	27.9	4.1	17%	463	430	-201	4.2	3.1

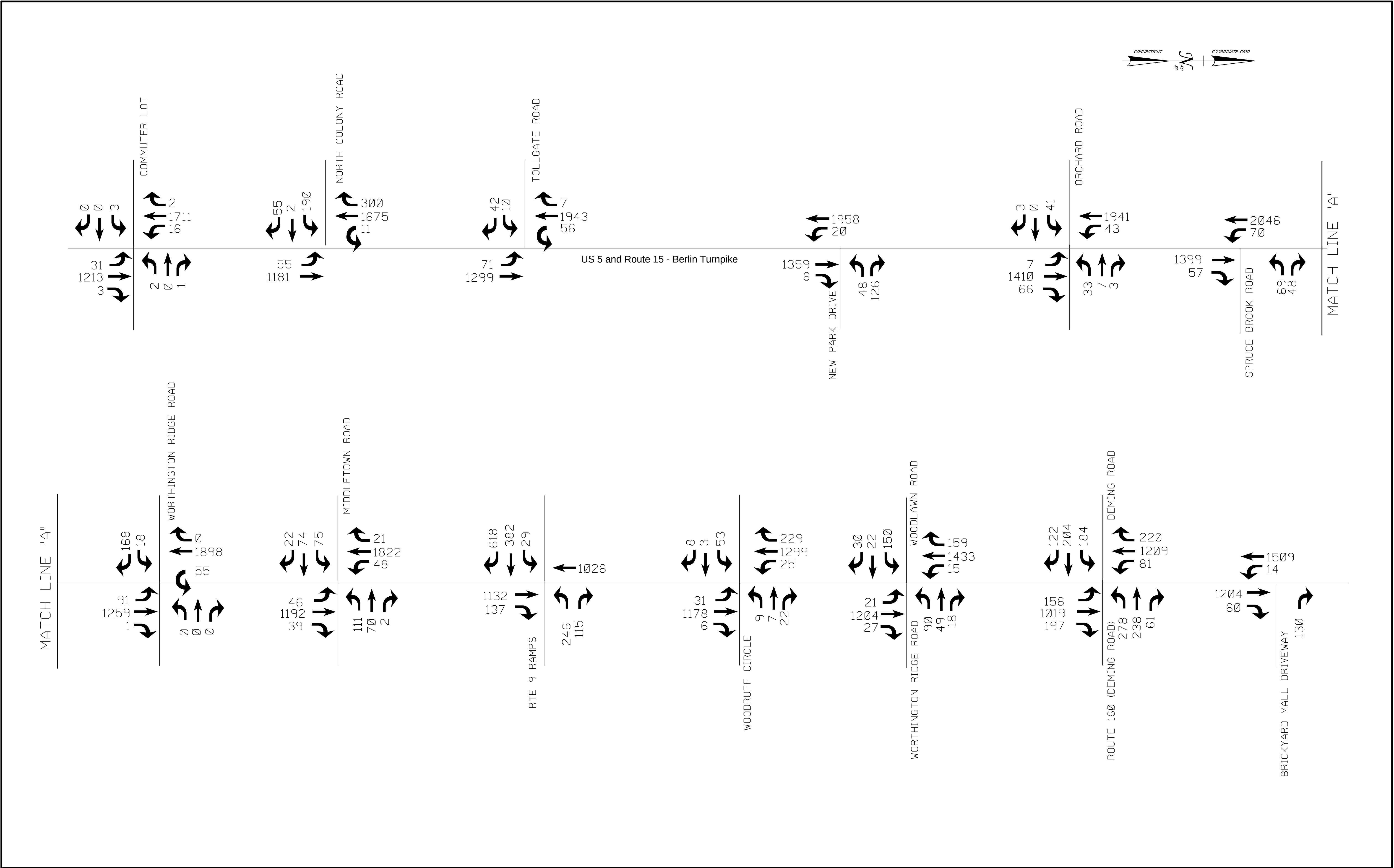
Appendix C

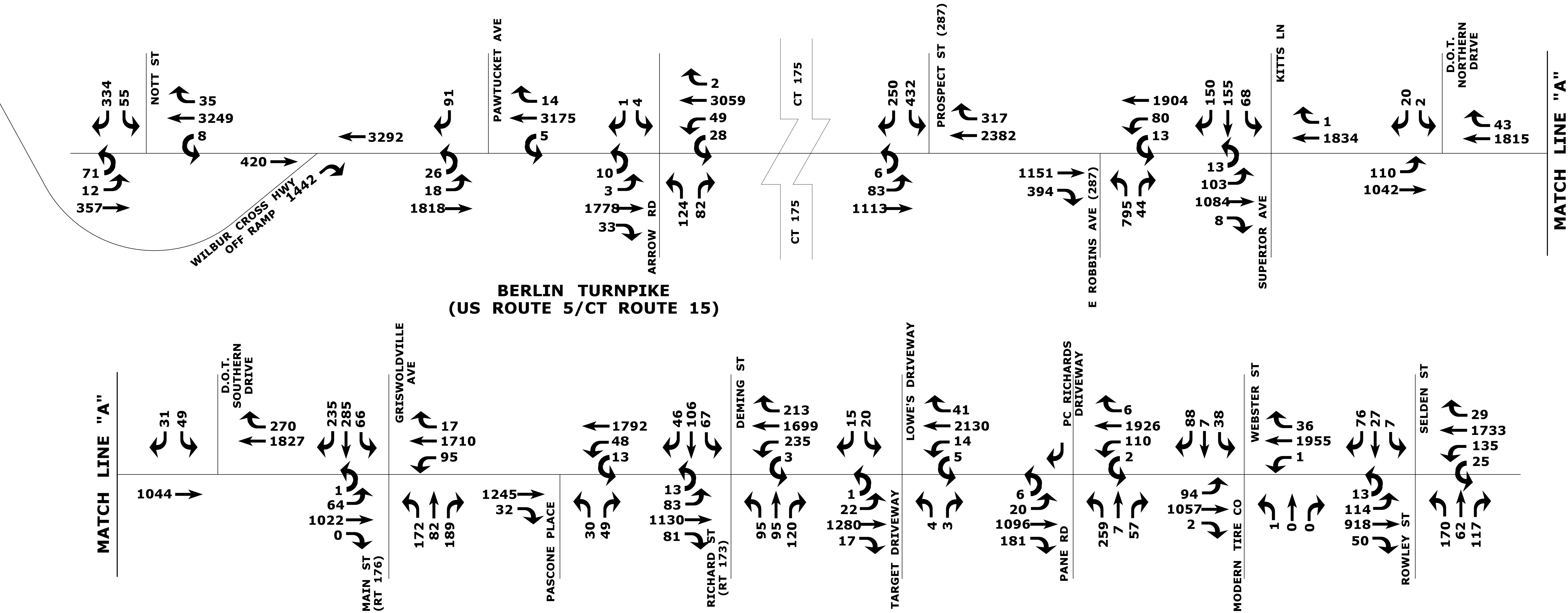
Phase 4 Traffic

Volumes



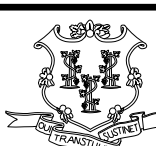


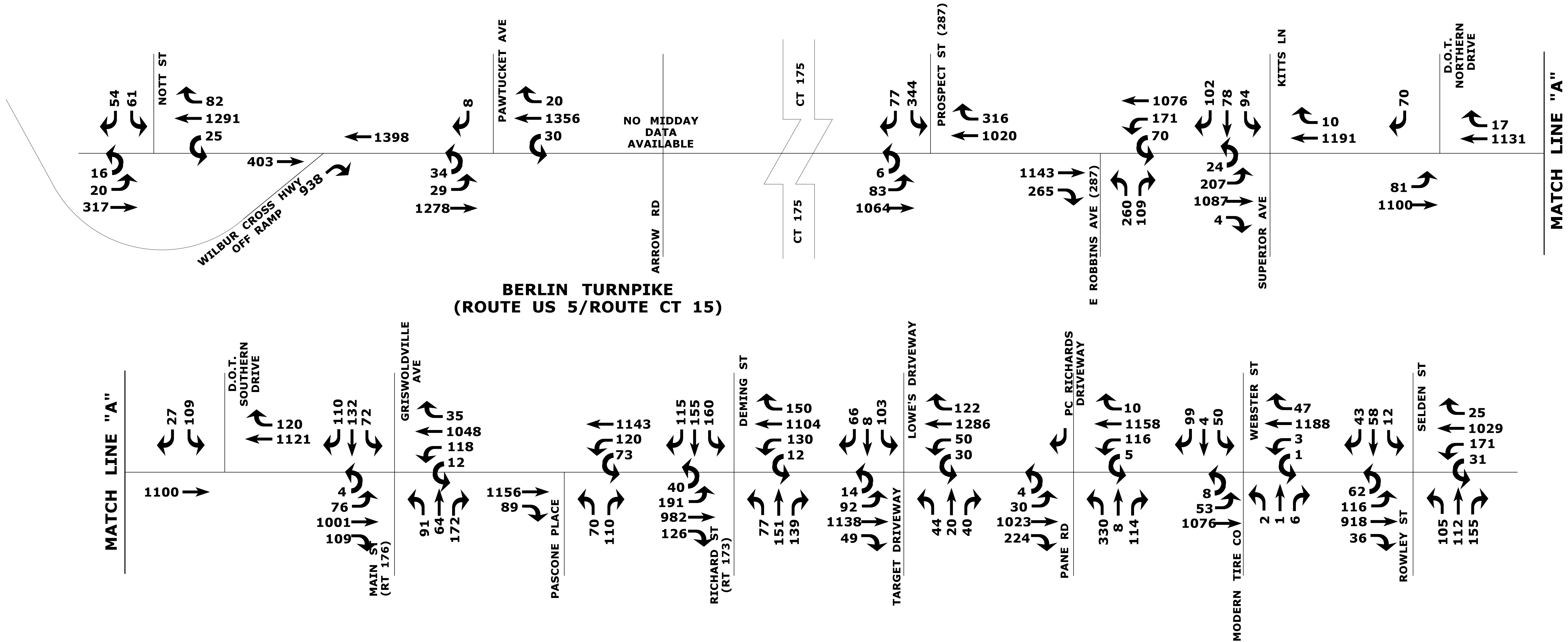




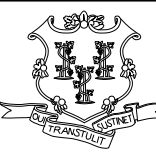
NOT TO SCALE

PRELIMINARY ENGINEERING

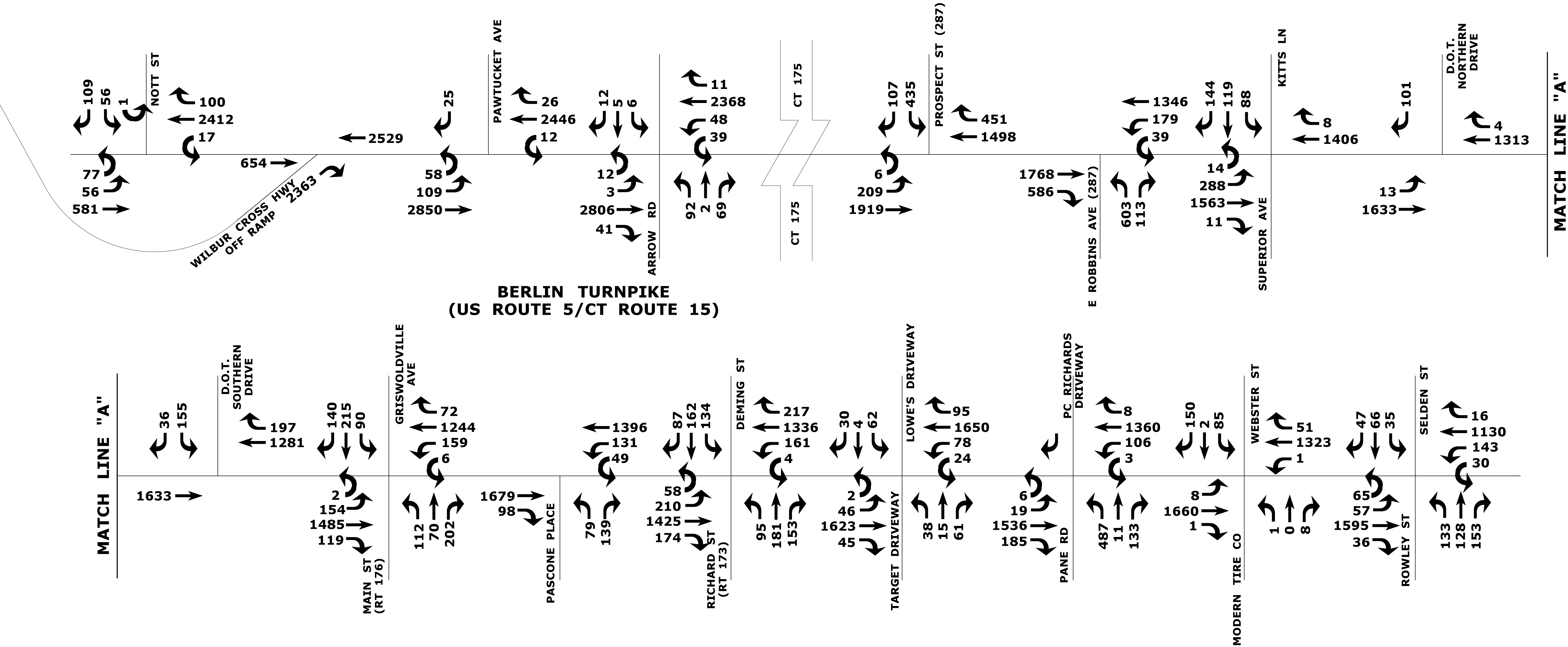
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					CHECKED BY: J. KEISER							DRAWING TITLE: 2019 EXISTING YEAR TRAFFIC VOLUMES MORNING PEAK HOUR		DRAWING NO. TMC-01
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PRELIMINARY ENGINEERING

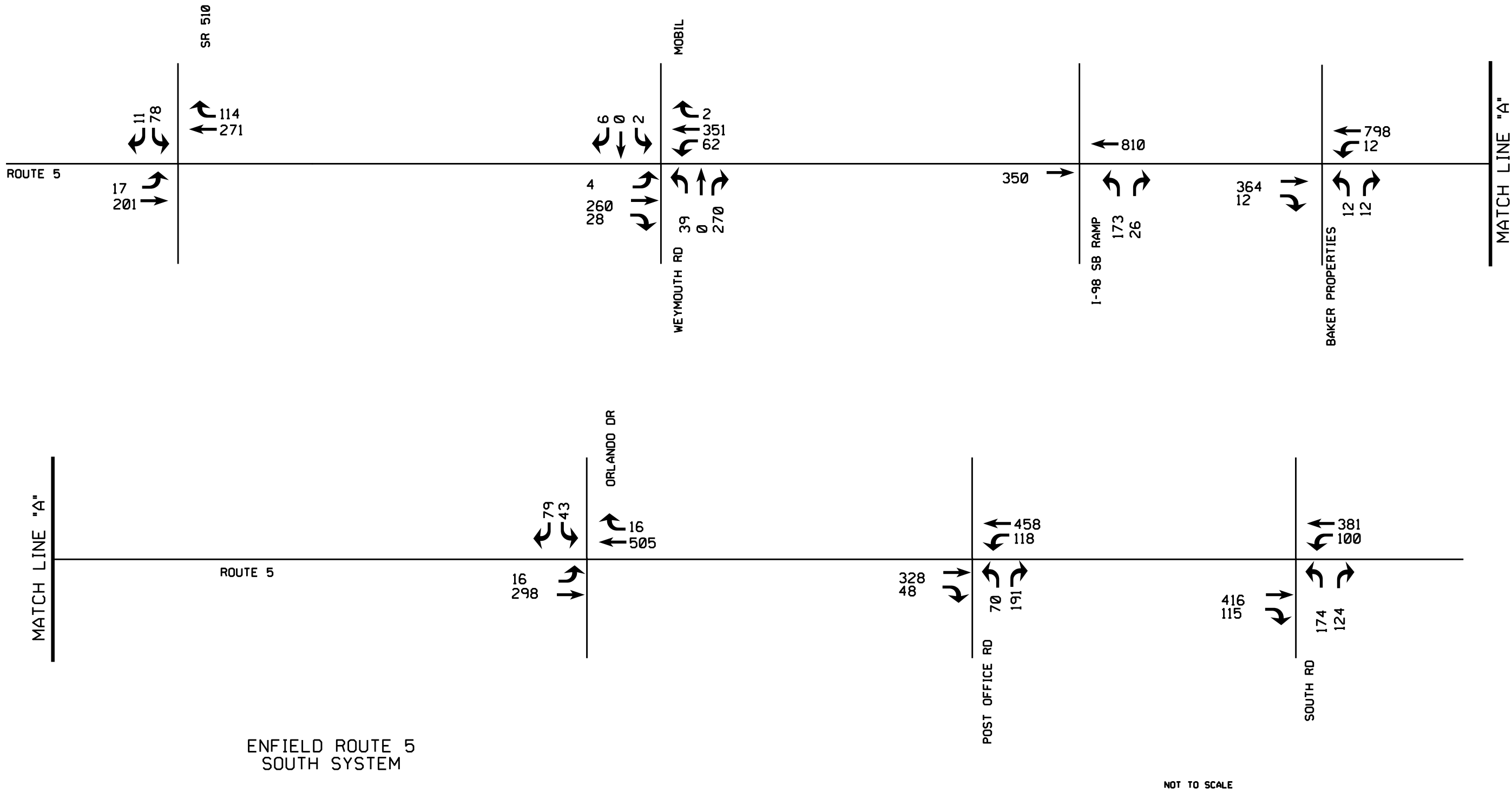
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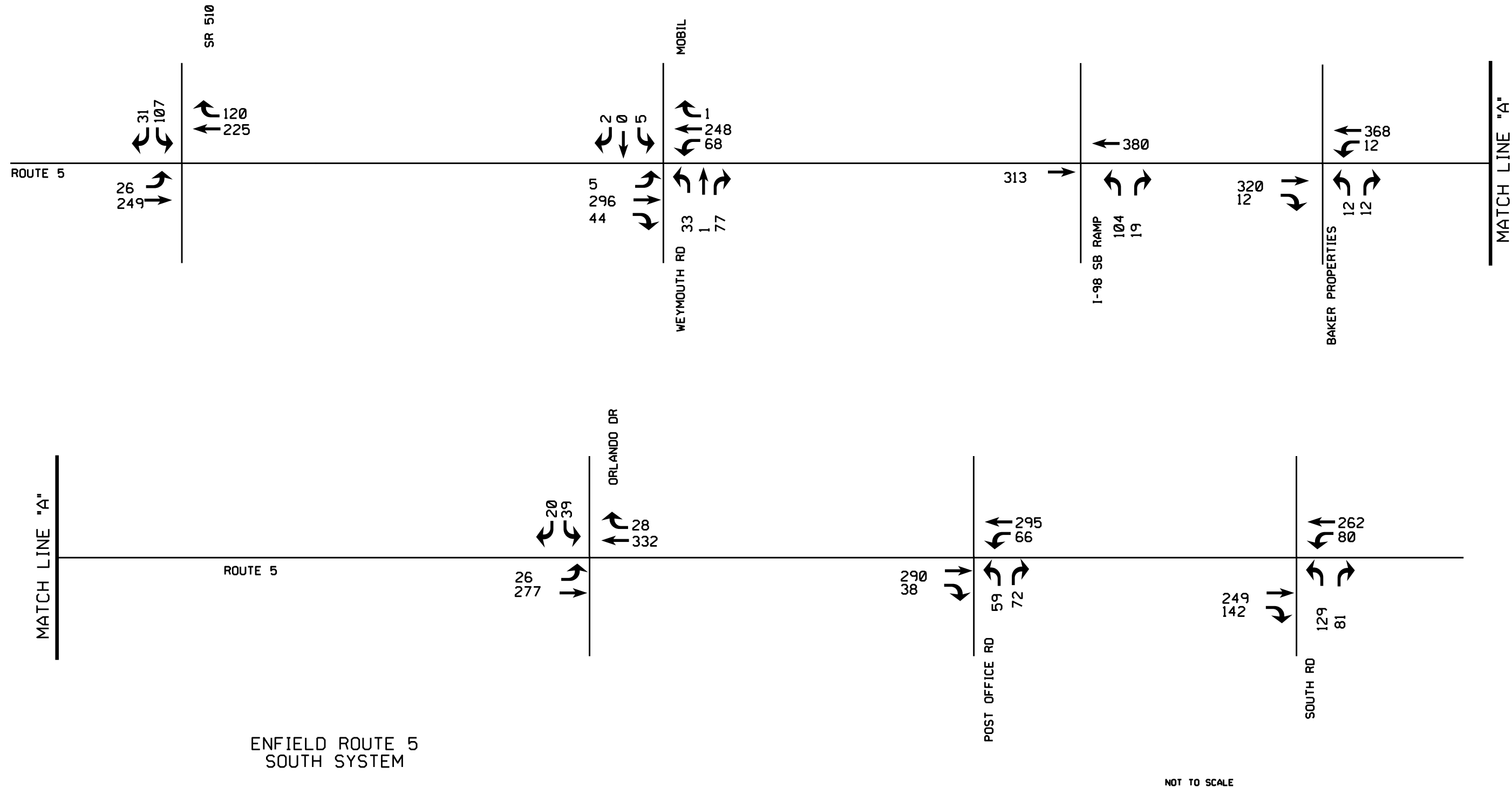


PRELIMINARY ENGINEERING

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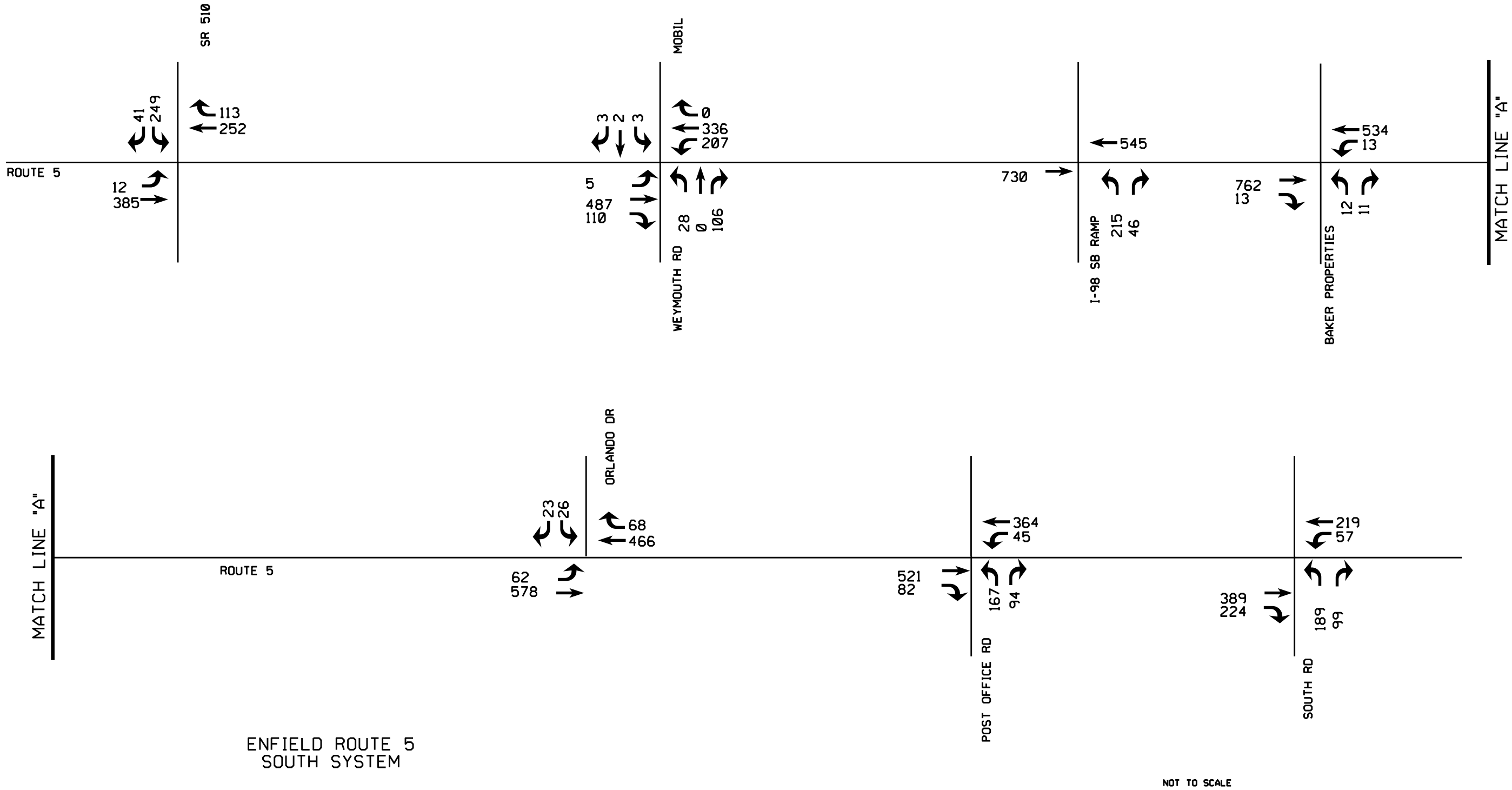


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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date/DATES						

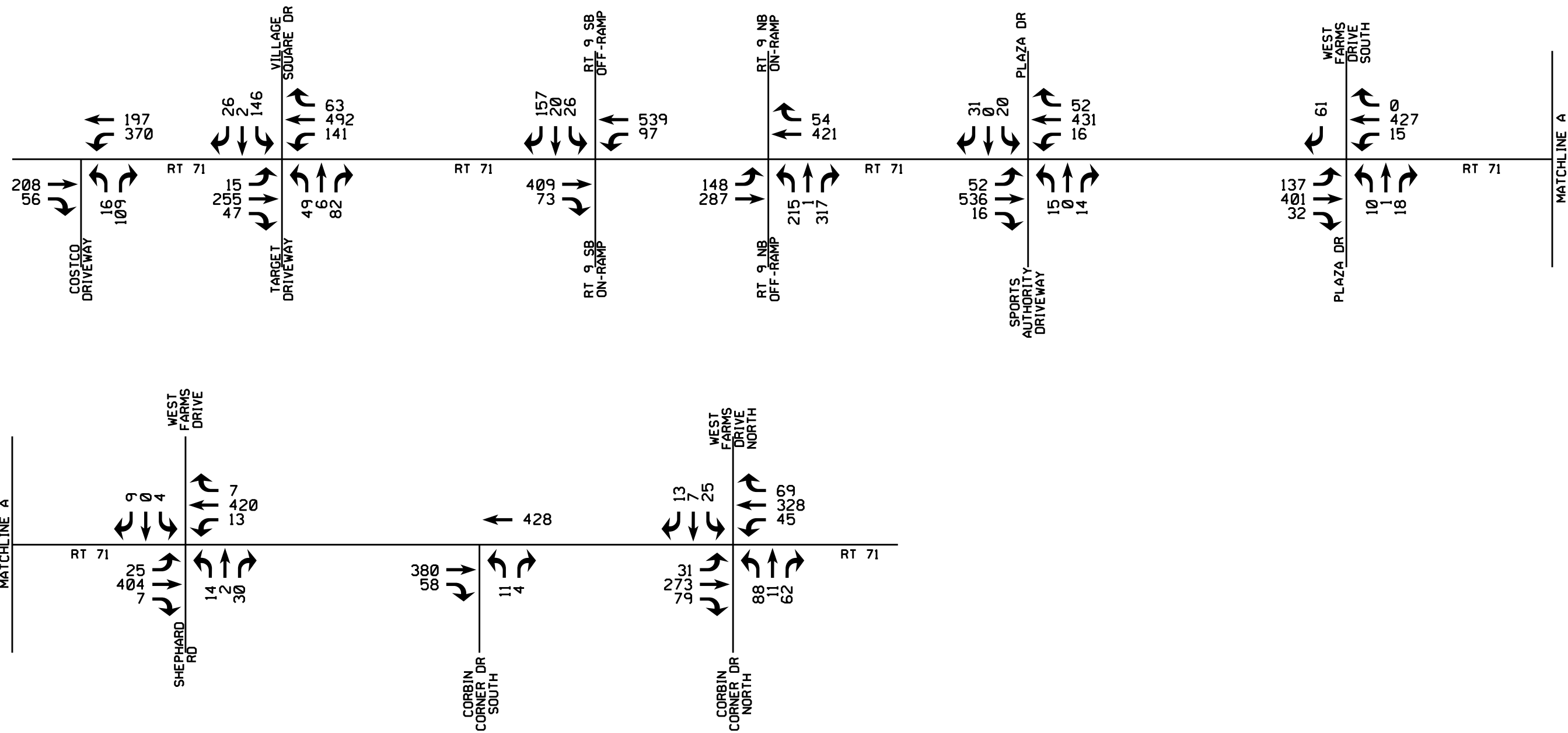


PRELIMINARY ENGINEERING

DESIGNER/DRAFTER: G. HOWELL			CHECKED BY: J. KEISER			STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION			SIGNATURE/BLOCK: OFFICE OF ENGINEERING			PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION			TOWN: ENFIELD			PROJECT NO.: 171-421		
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATES															



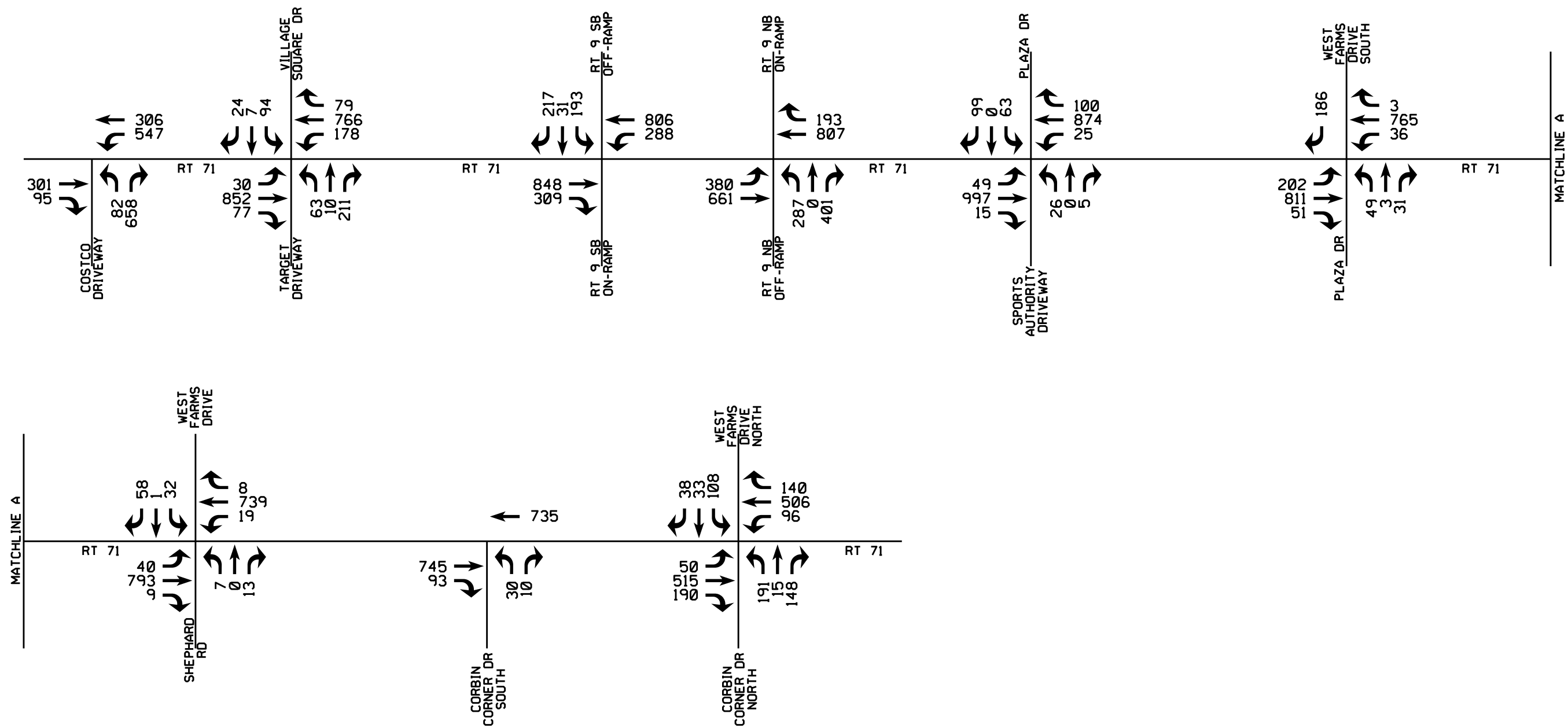
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date/DATES						



FARMINGTON NEW BRITAIN W-HARTFORD T-54 RT 71 (4737M)

NOT TO SCALE

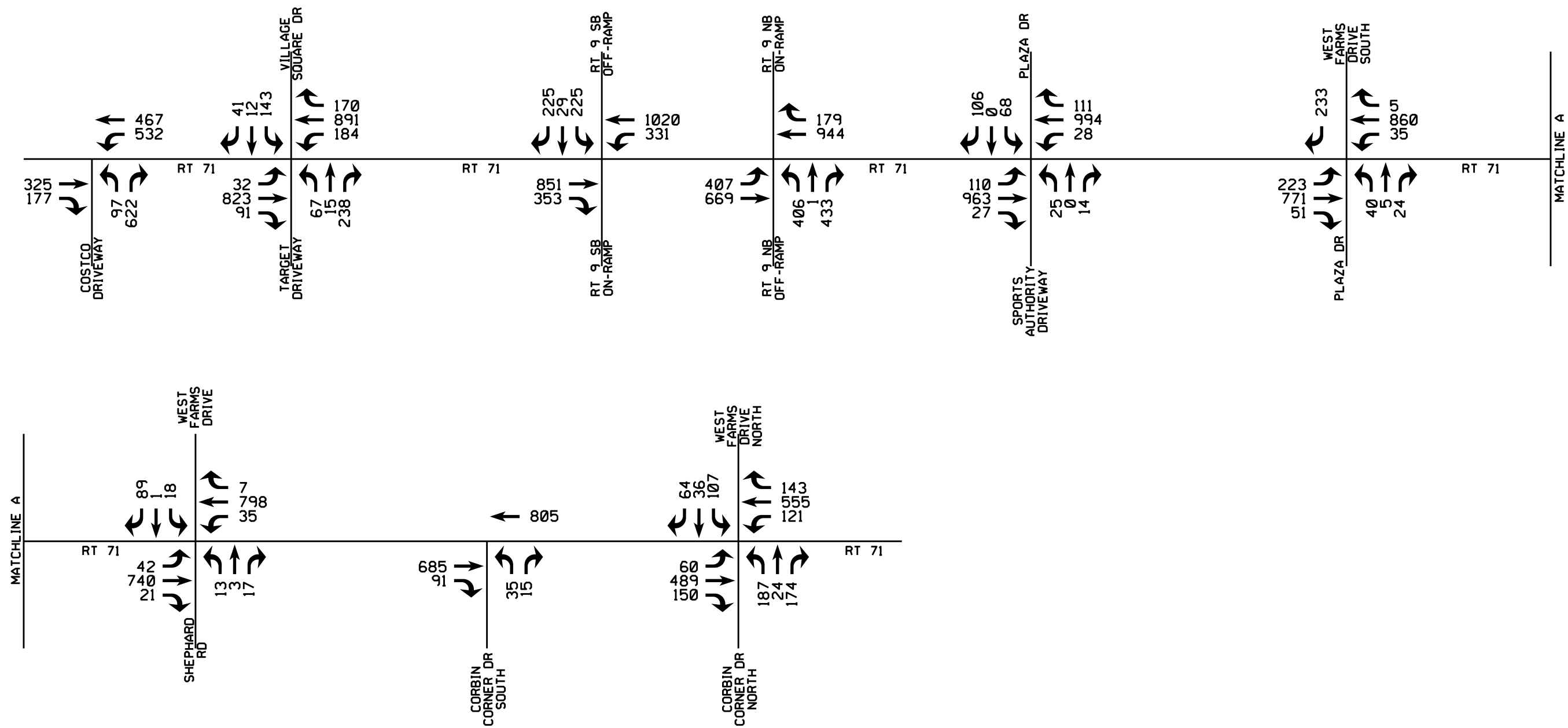
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATE		DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES AM PEAK HOUR	DRAWING NO.: TMC-43
								SHEET NO.: 1



FARMINGTON NEW BRITAIN W-HARTFORD T-54 RT 71 (4737M)

NOT TO SCALE

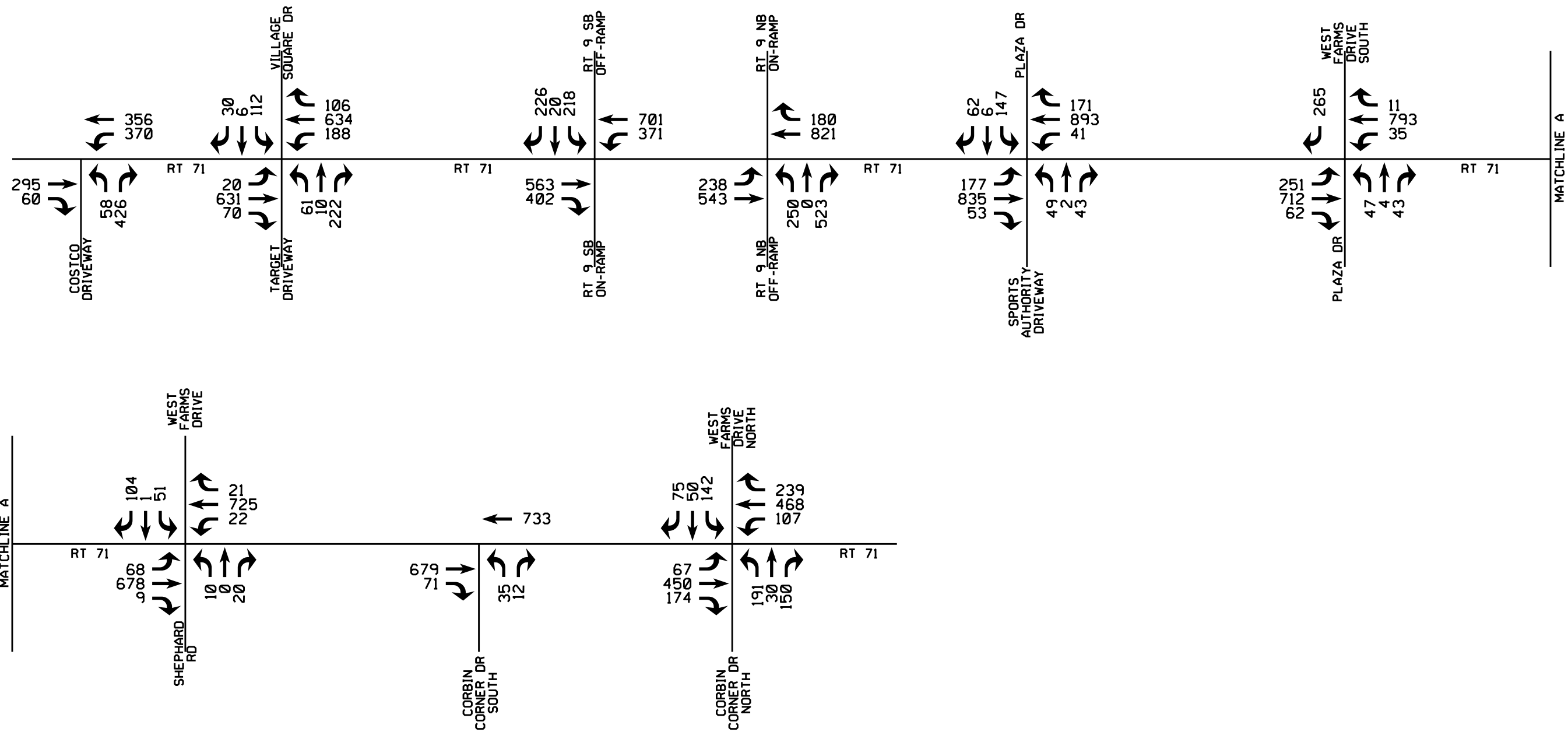
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					CHECKED BY: J. KEISER				DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES MIDDAY PEAK HOUR	DRAWING NO. TMC-43



FARMINGTON NEW BRITAIN W-HARTFORD T-54 RT 71 (4737M)

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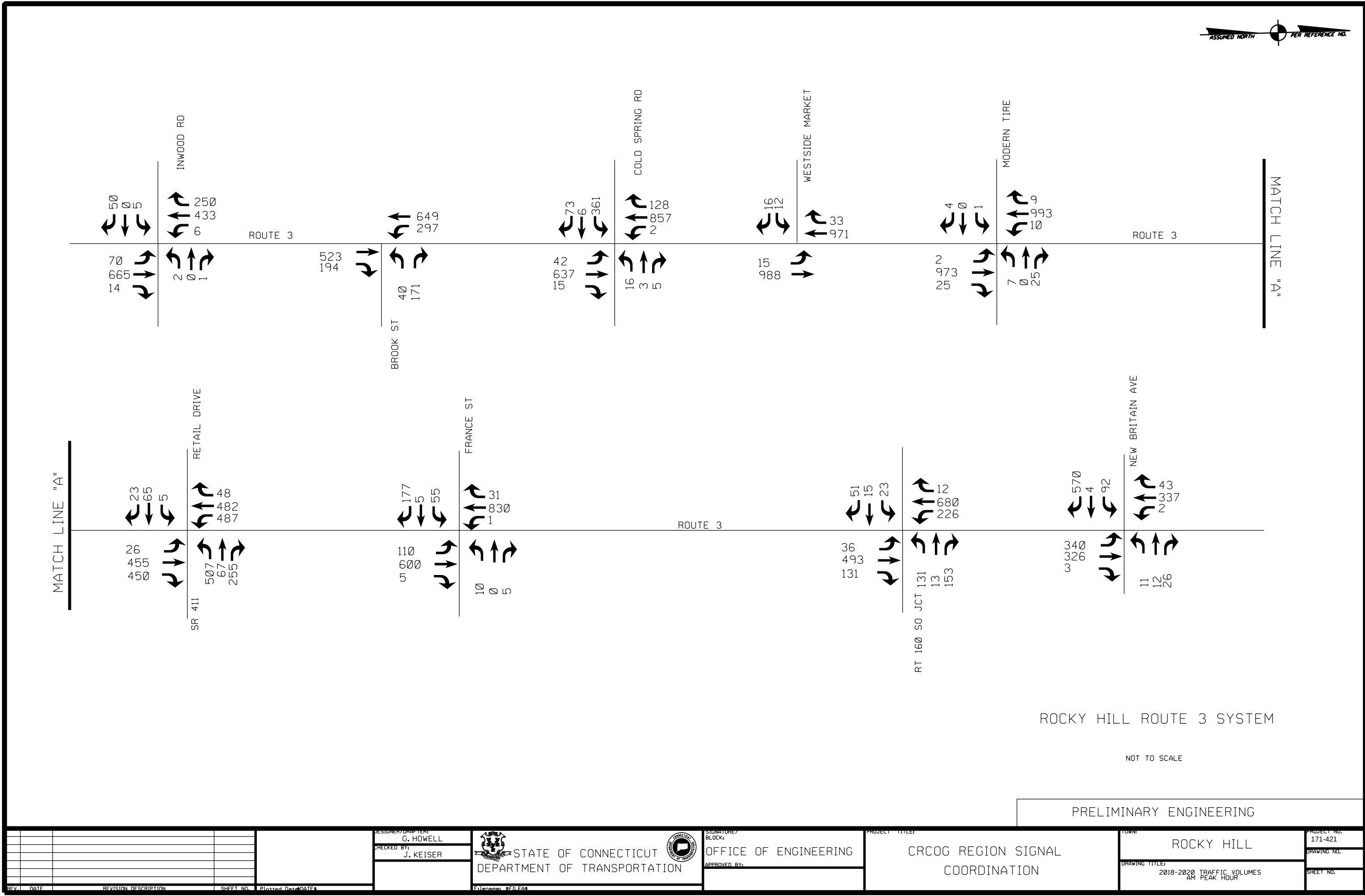
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DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR										SHEET NO. 3

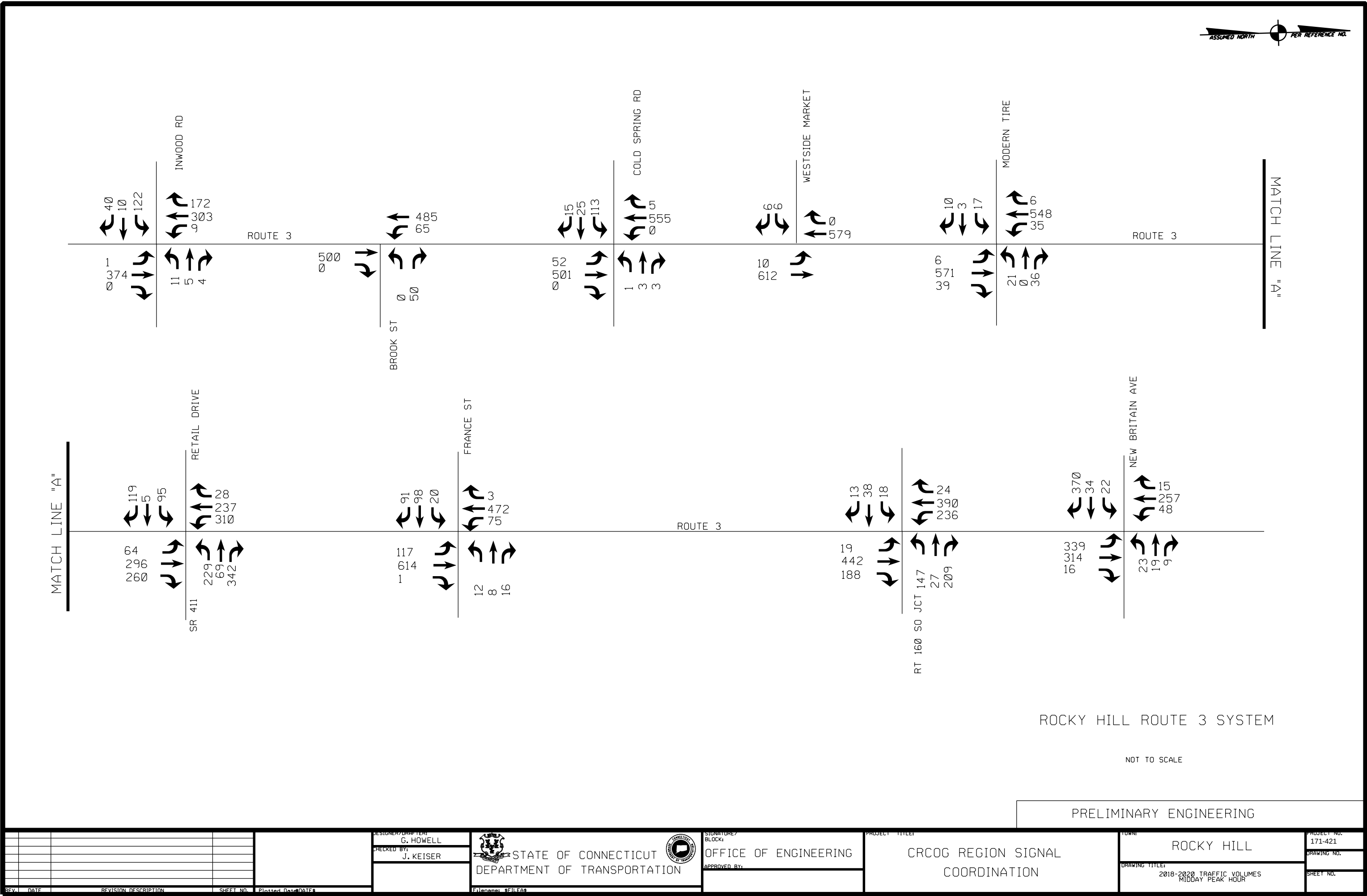


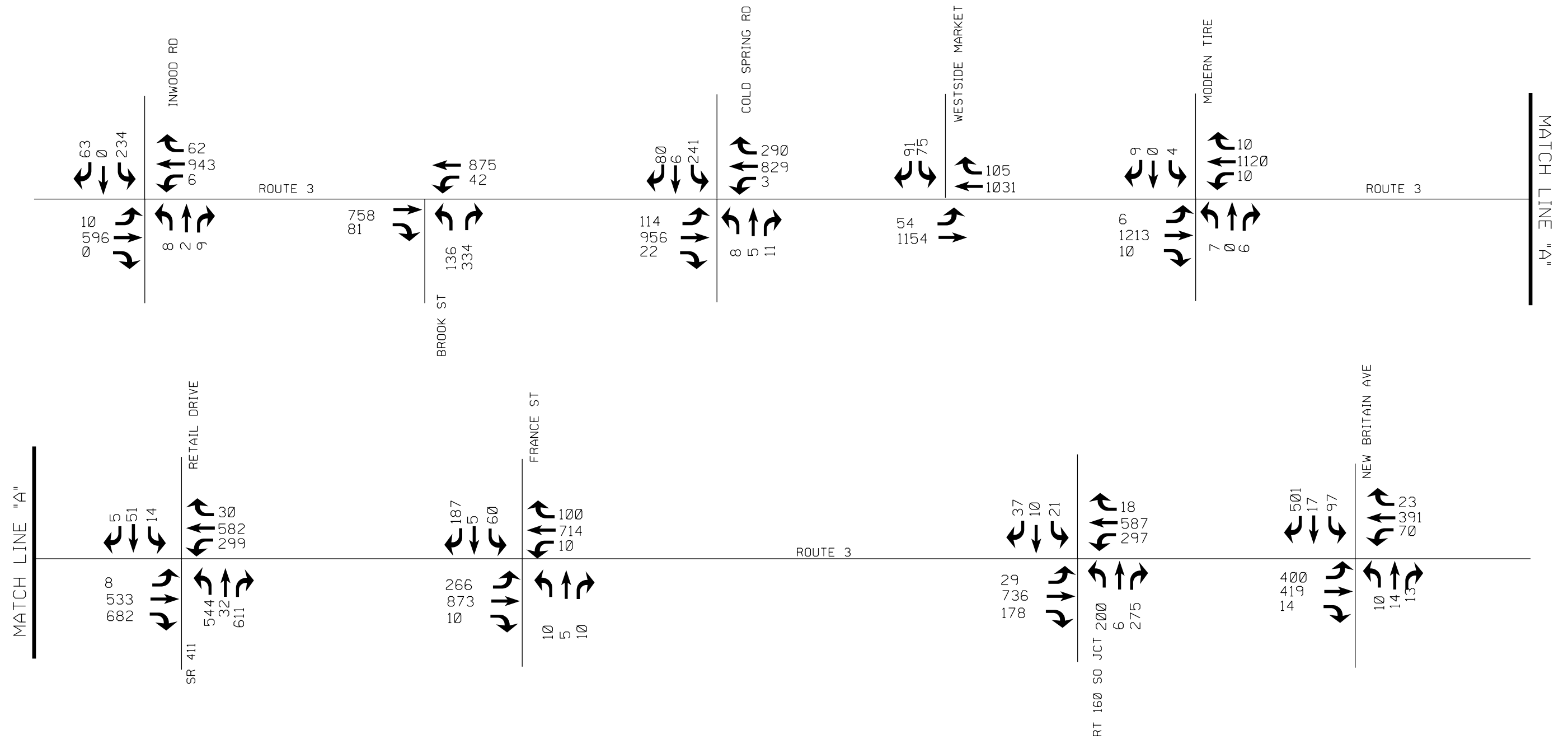
FARMINGTON NEW BRITAIN W-HARTFORD T-54 RT 71 (4737M)

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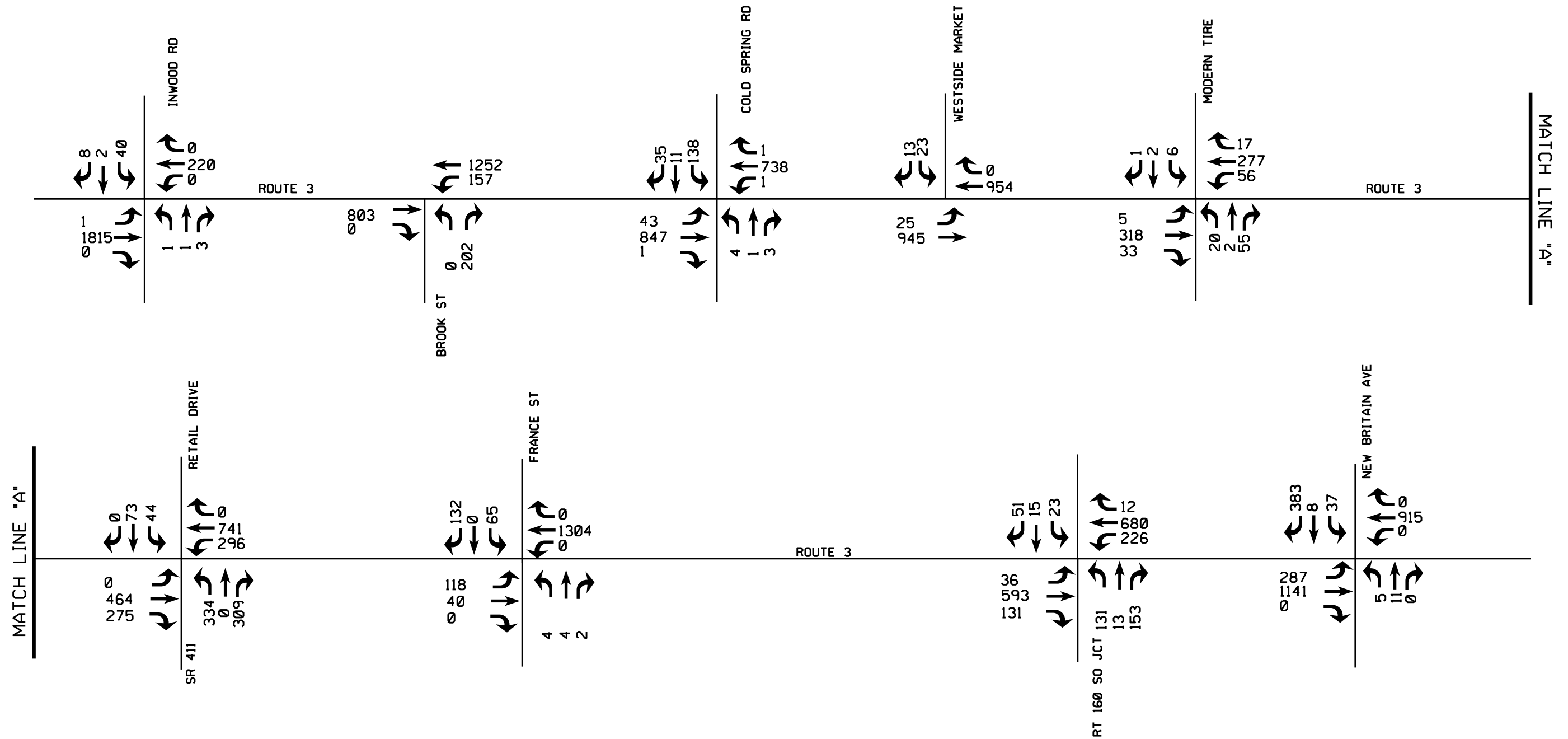


ROCKY HILL ROUTE 3 SYSTEM

NOT TO SCALE

PRELIMINARY ENGINEERING

DESIGNER/DRAFTER: G. HOWELL			CHECKED BY: J. KEISER			SIGNATURE/BLOCK: OFFICE OF ENGINEERING			PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION			TOWN: ROCKY HILL			PROJECT NO. 171-421		
STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION			APPROVED BY:									DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR			DRAWING NO.		
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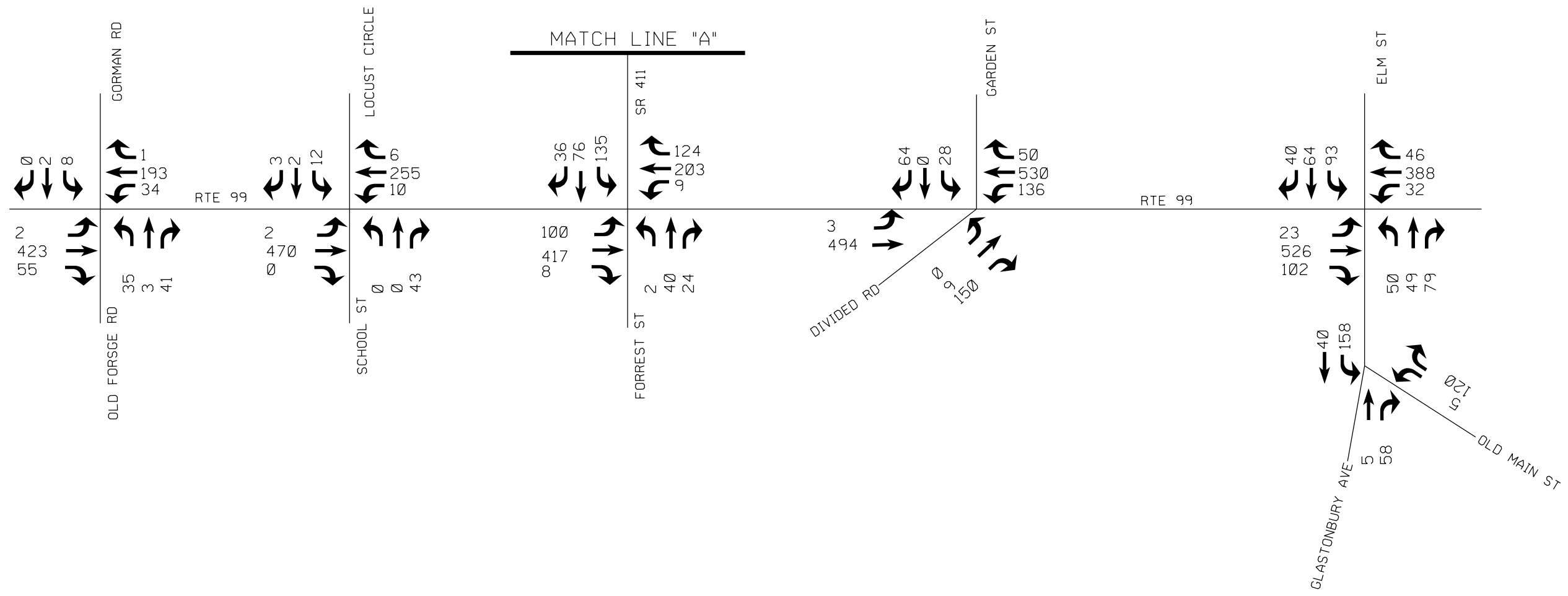


ROCKY HILL ROUTE 3 SYSTEM

NOT TO SCALE

PRELIMINARY ENGINEERING

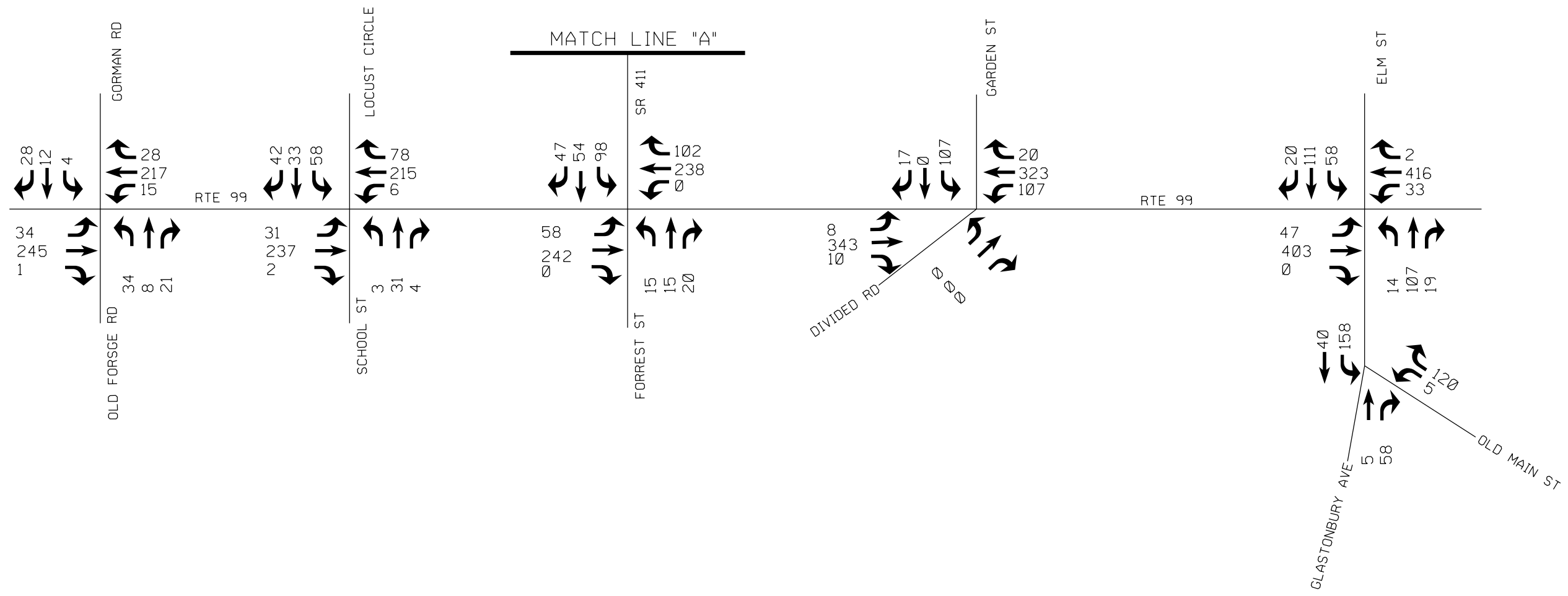
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			CHECKED BY: J. KEISER				DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES SATURDAY PEAK HOUR	DRAWING NO.:
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: DATE	Filename: \$FILE.FAS	SHEET NO.		



ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

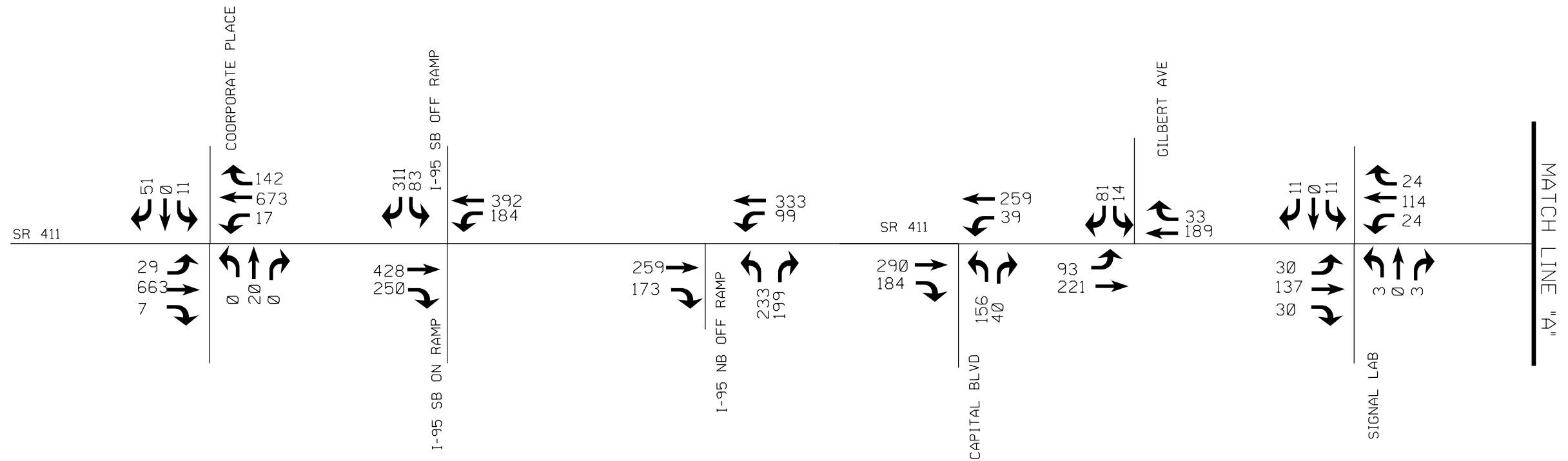
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CHECKED BY: J. KEISER					DRAWING NO.:	
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ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

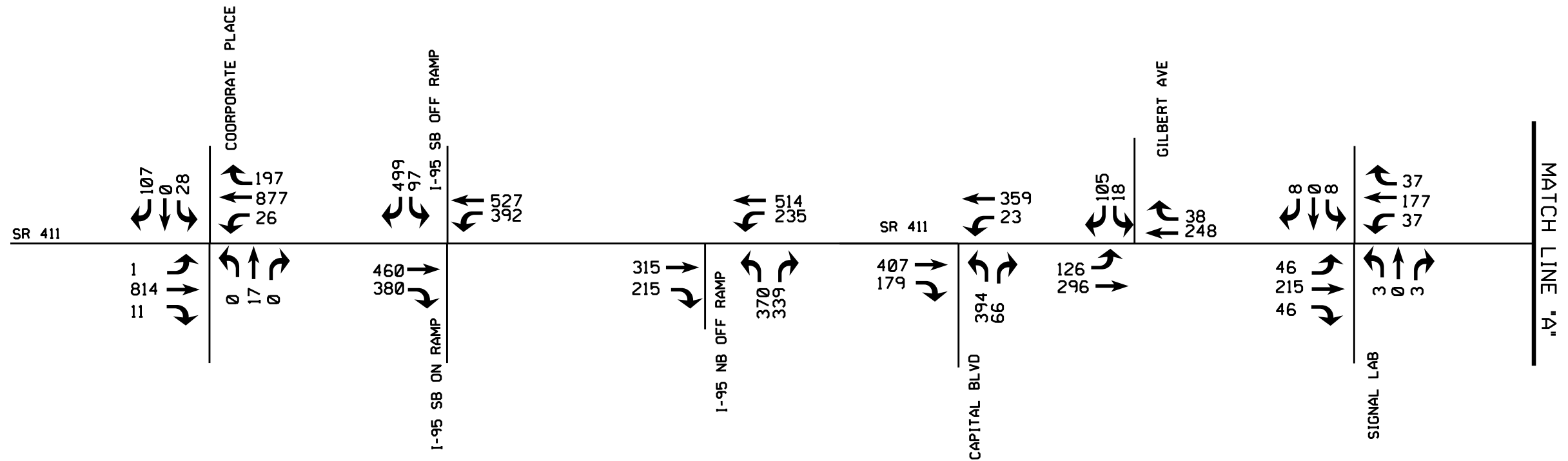
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REV. DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: DATE\$	Filename: \$FILE.F\$	



ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

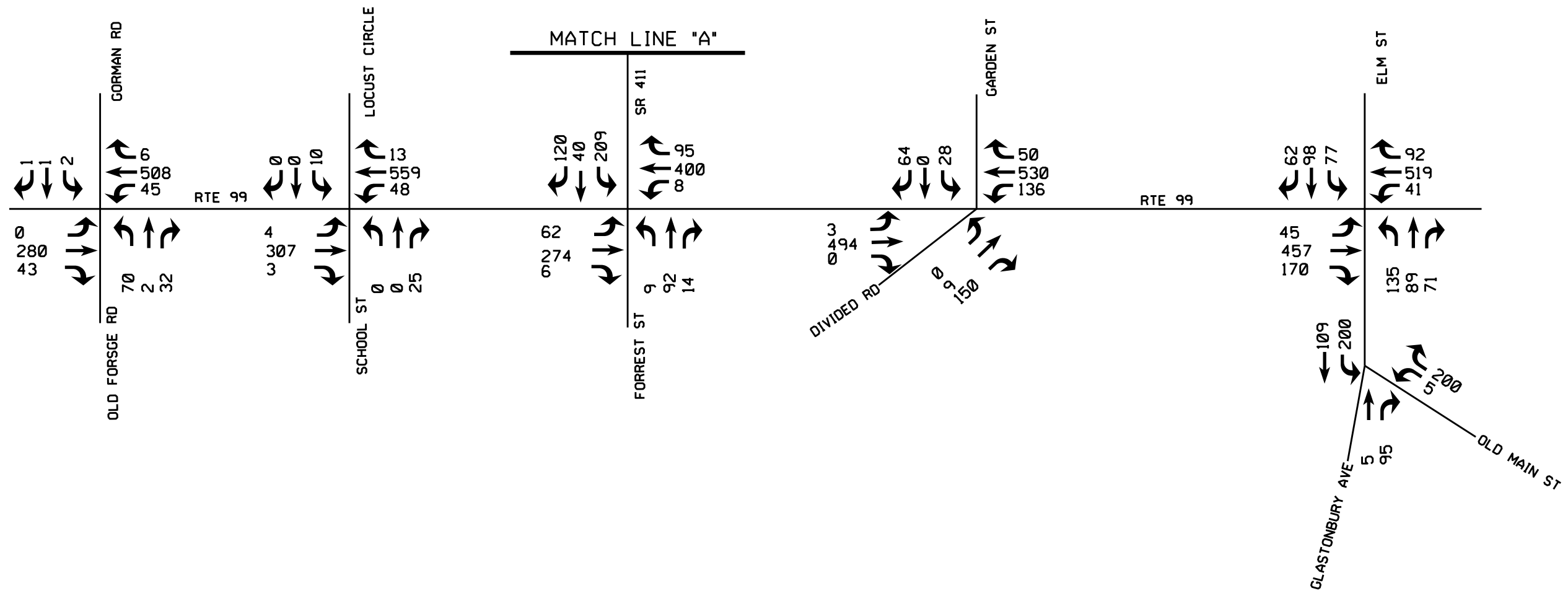
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date:DATE\$											



ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING		
DESIGNER/DRAFTER: G. HOWELL		
CHECKED BY: J. KEISER		
 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		
SIGNATURE/BLOCK: OFFICE OF ENGINEERING		
APPROVED BY:		
PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION		
TOWN: ROCKY HILL		
DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR		
PROJECT NO. 171-421		
DRAWING NO.		
SHEET NO. 1		

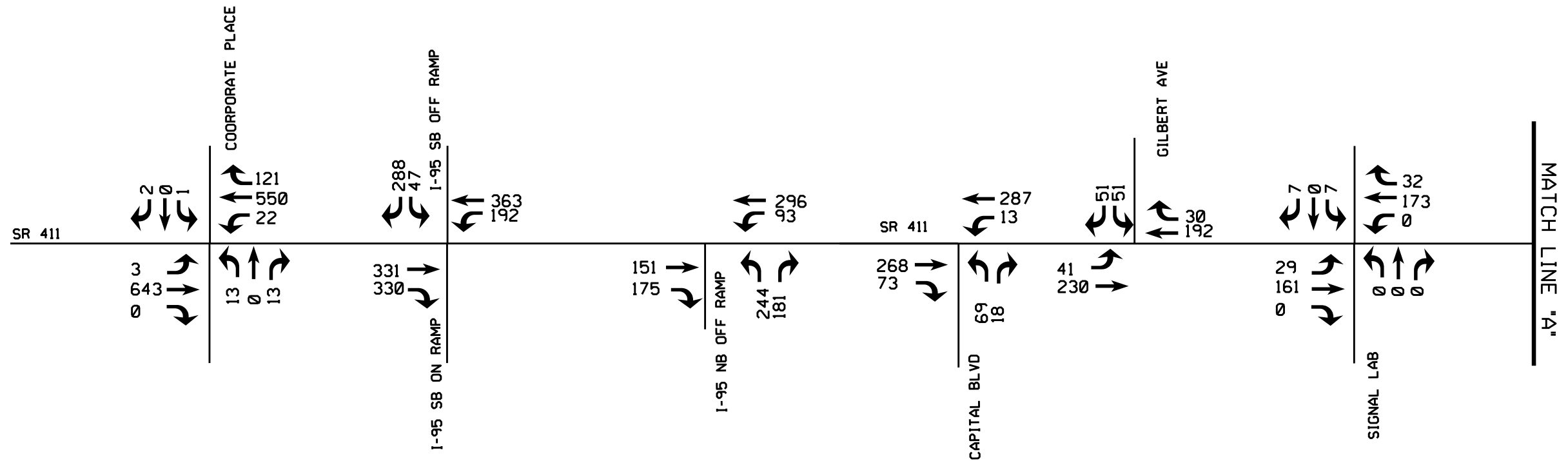
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ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
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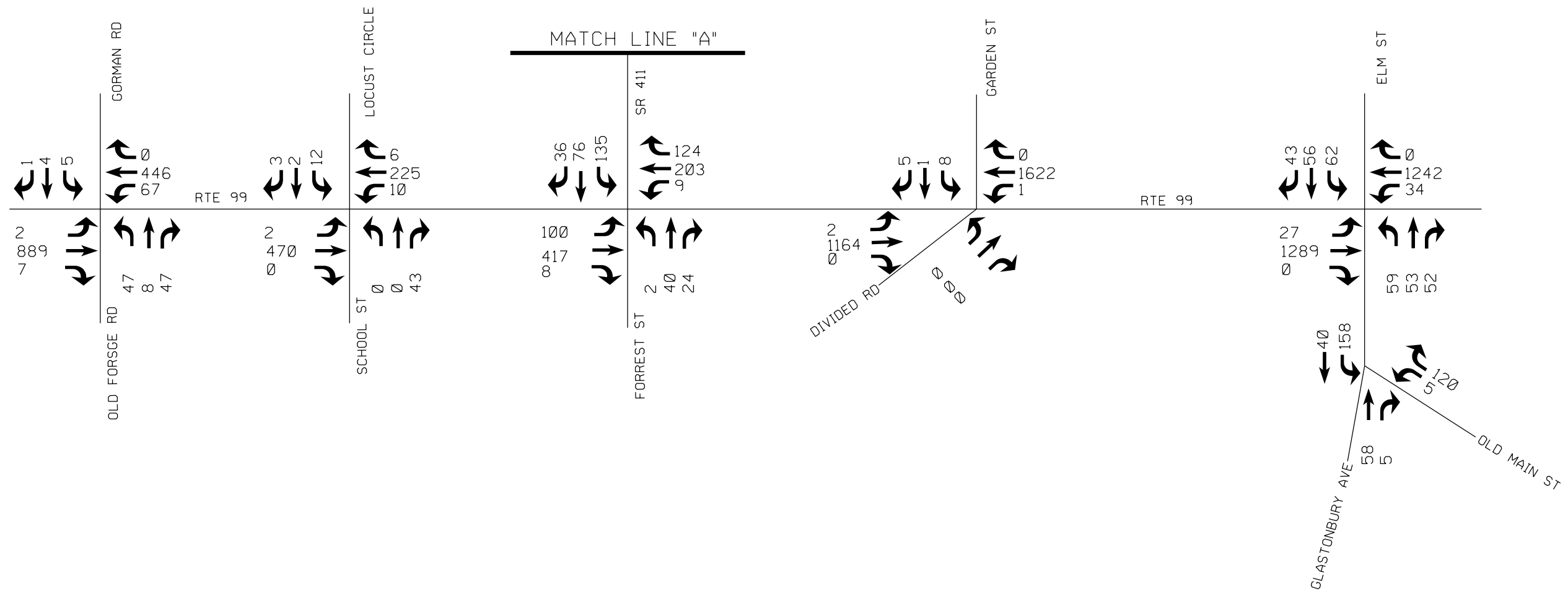
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DESIGNER/DRAFTER: G. HOWELL		SIGNATURE/BLOCK: OFFICE OF ENGINEERING	PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	TOWN: ROCKY HILL	PROJECT NO.: 171-421
CHECKED BY: J. KEISER				DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR	DRAWING NO.:
REV. DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date/DATES	File name: \$FILE.FAS	SHEET NO.: 2



ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

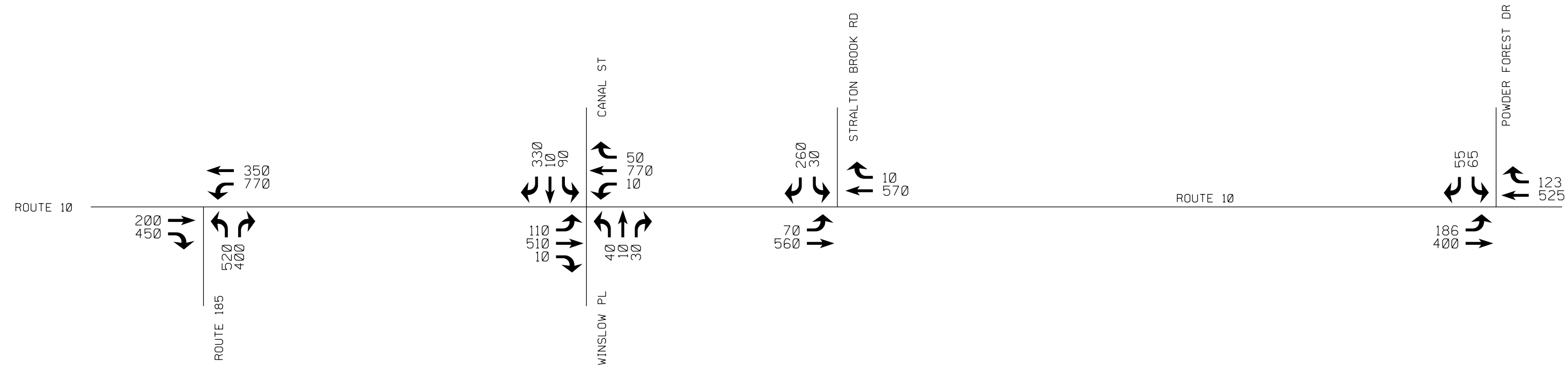
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APPROVED BY:						
PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION						
TOWN: ROCKY HILL						
DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES SATURDAY PEAK HOUR						
PROJECT NO. 171-421						
DRAWING NO.						
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATES	Filename: \$FILE.FAS



ROCKY HILL ROUTE 99 & ROUTE 411 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

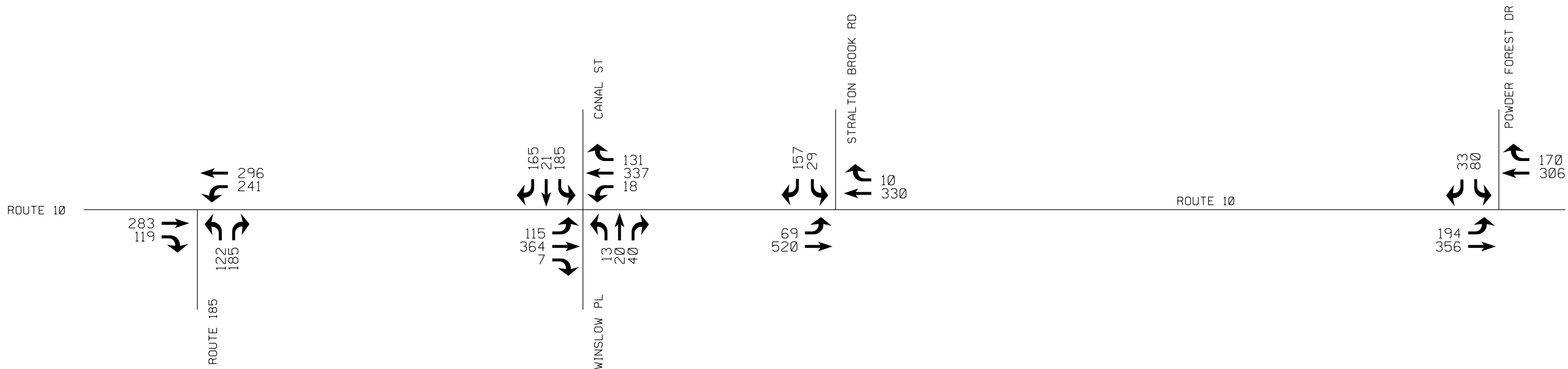
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SIMSBURY ROUTE 10 & 202 SOUTH

NOT TO SCALE

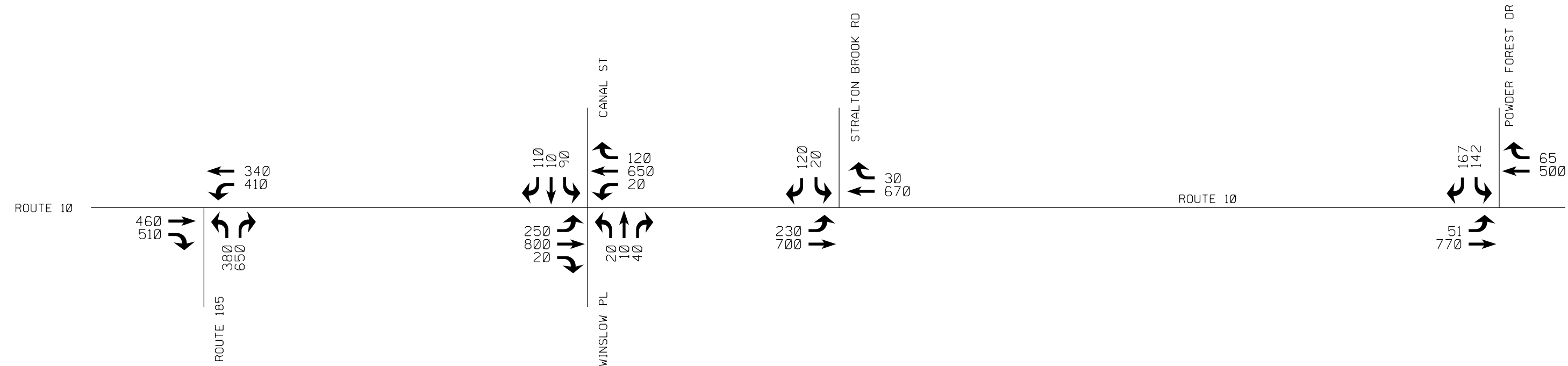
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SIMSBURY ROUTE 10 & 202 SOUTH

NOT TO SCALE

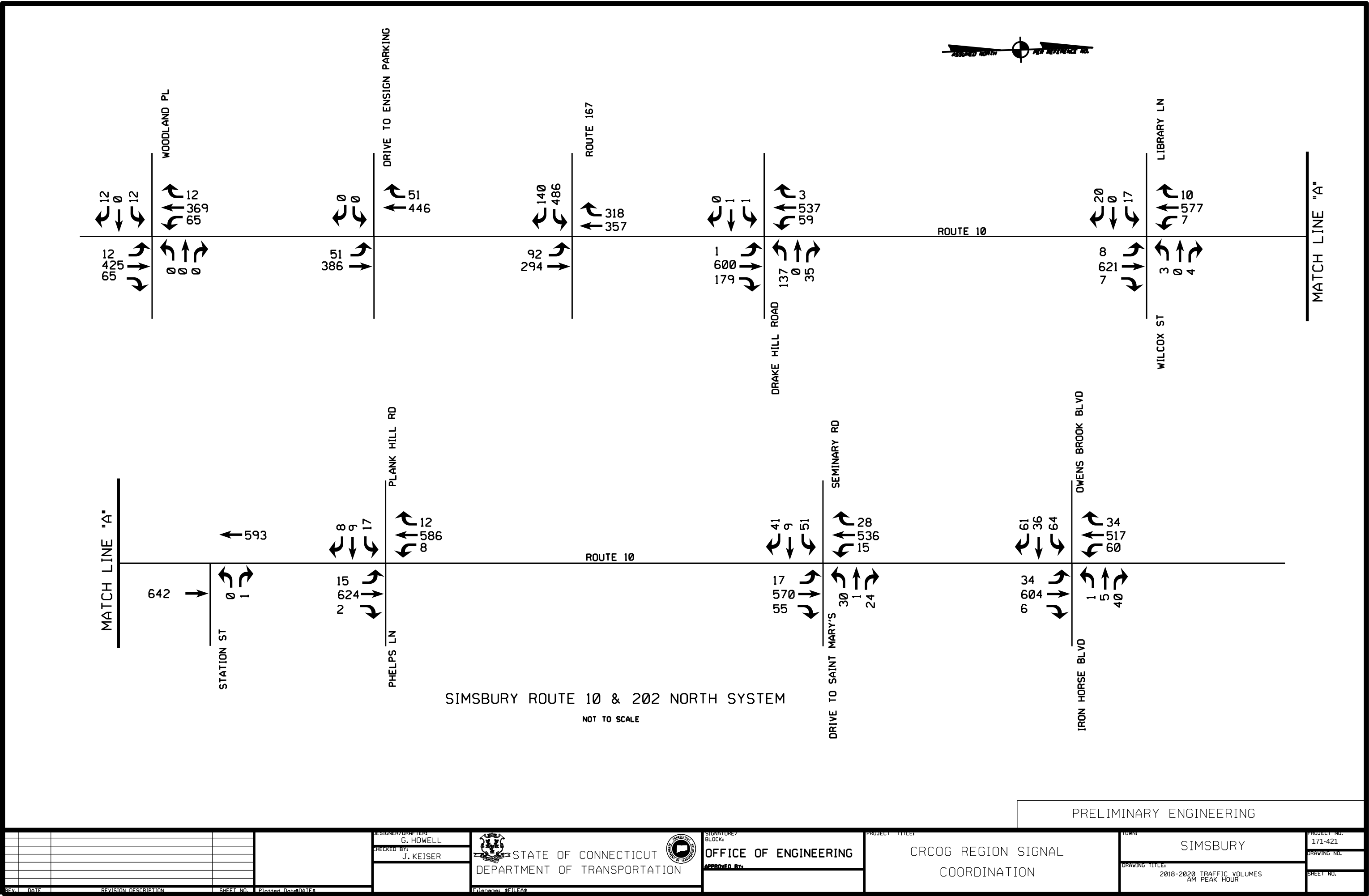
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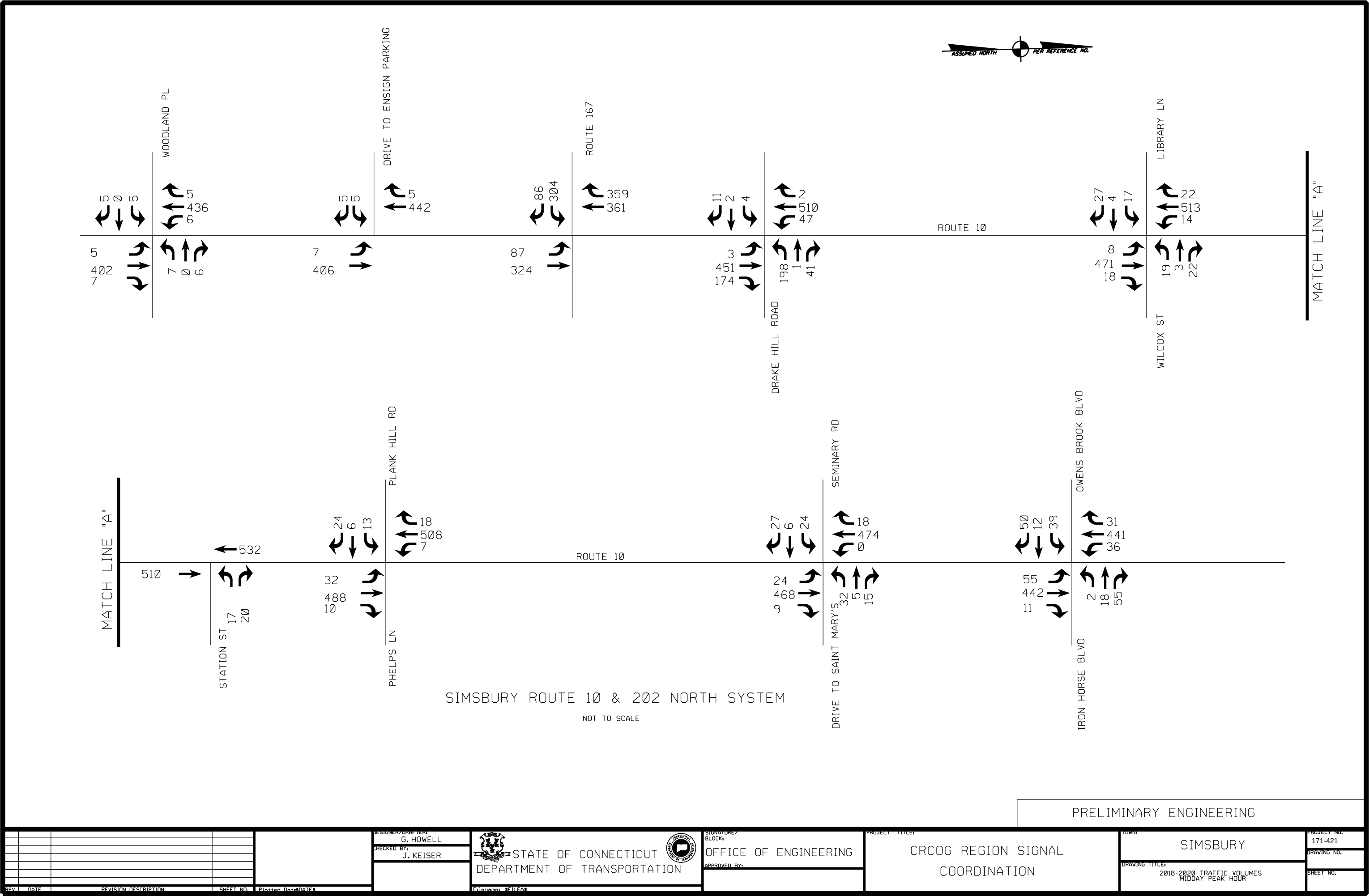
SIMSBURY ROUTE 10 & 202 SOUTH

NOT TO SCALE

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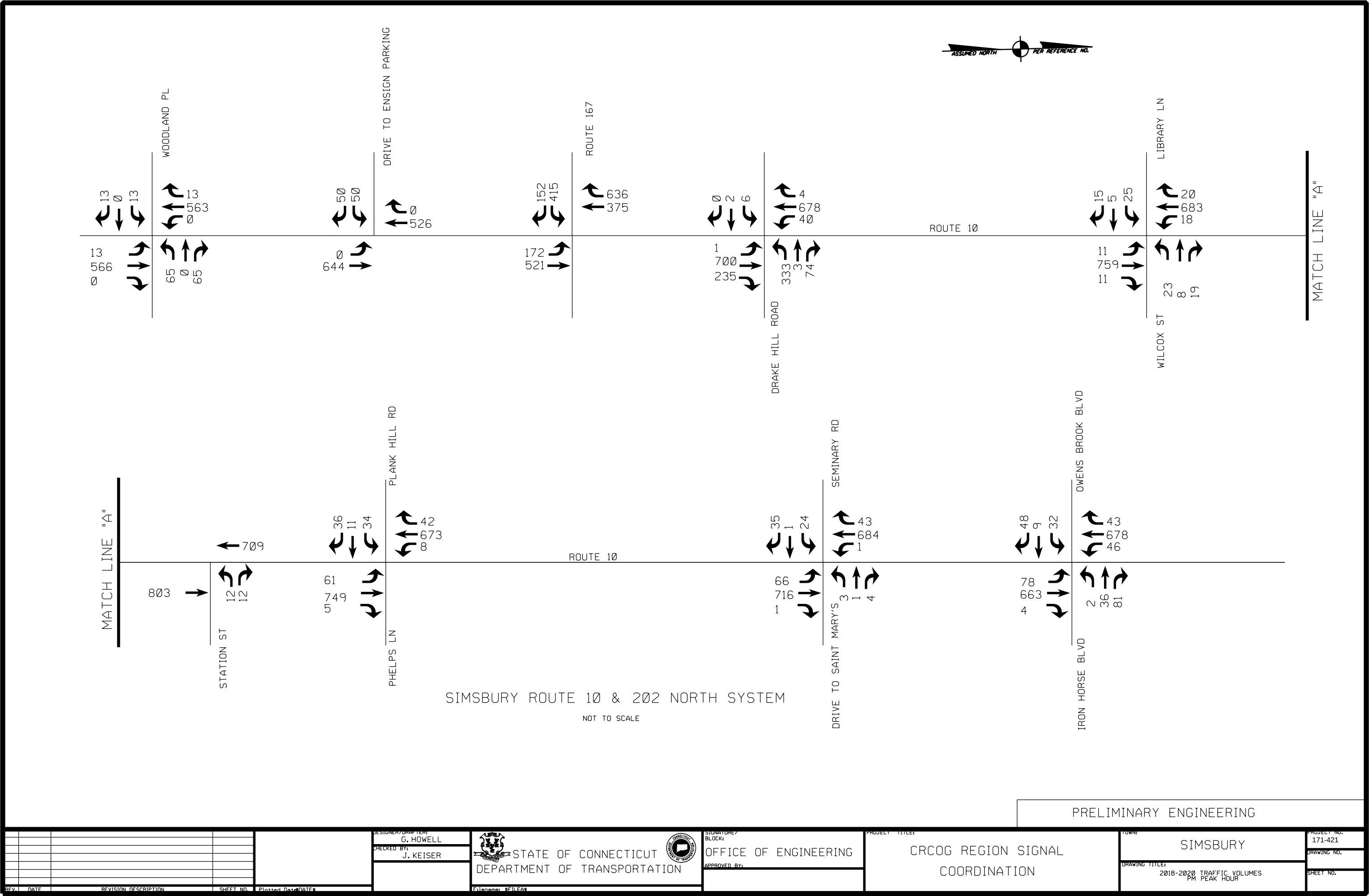


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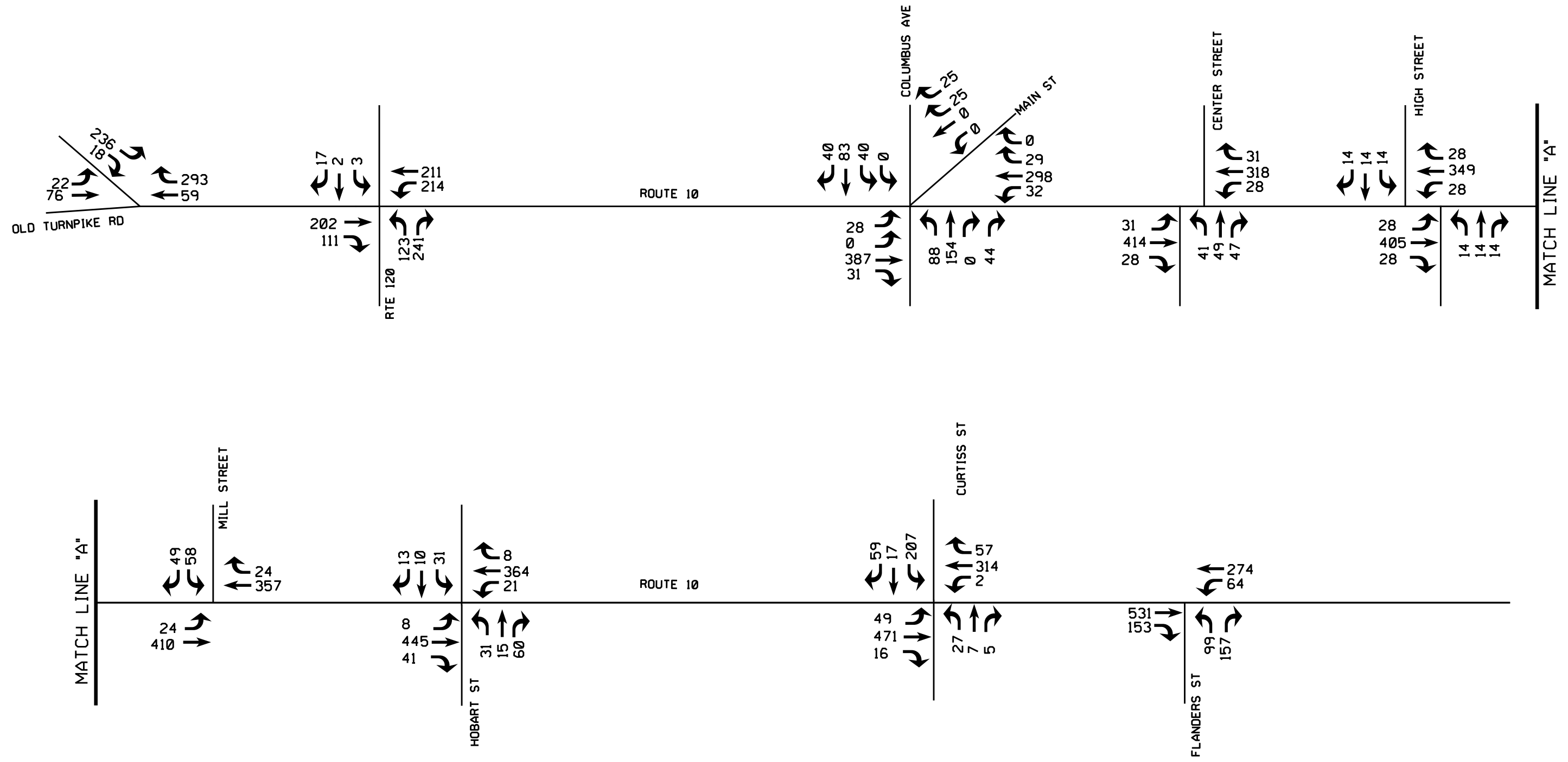


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PRELIMINARY ENGINEERING



			PRELIMINARY ENGINEERING								
DESIGNER/DRAFTER: G. HOWELL		 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		SIGNATURE/BLOCK: OFFICE OF ENGINEERING		PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION		TOWN: SIMSBURY		PROJECT NO. 171-421	
CHECKED BY: J. KEISER				APPROVED BY:		DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR		SHEET NO.			
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATE	Filename: \$FILE.F&S					



SOUTHINGTON ROUTE 10 SOUTH SYSTEM

NOT TO SCALE

PRELIMINARY ENGINEERING	
TOWN	SOUTHINGTON
DRAWING TITLE	2018-2020 TRAFFIC VOLUMES AM PEAK HOUR
PROJECT NO.	171-421
DRAWING NO.	TMC-04
SHEET NO.	

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATES

DESIGNER/DRAFTER	G. HOWELL
CHECKED BY:	J. KEISER

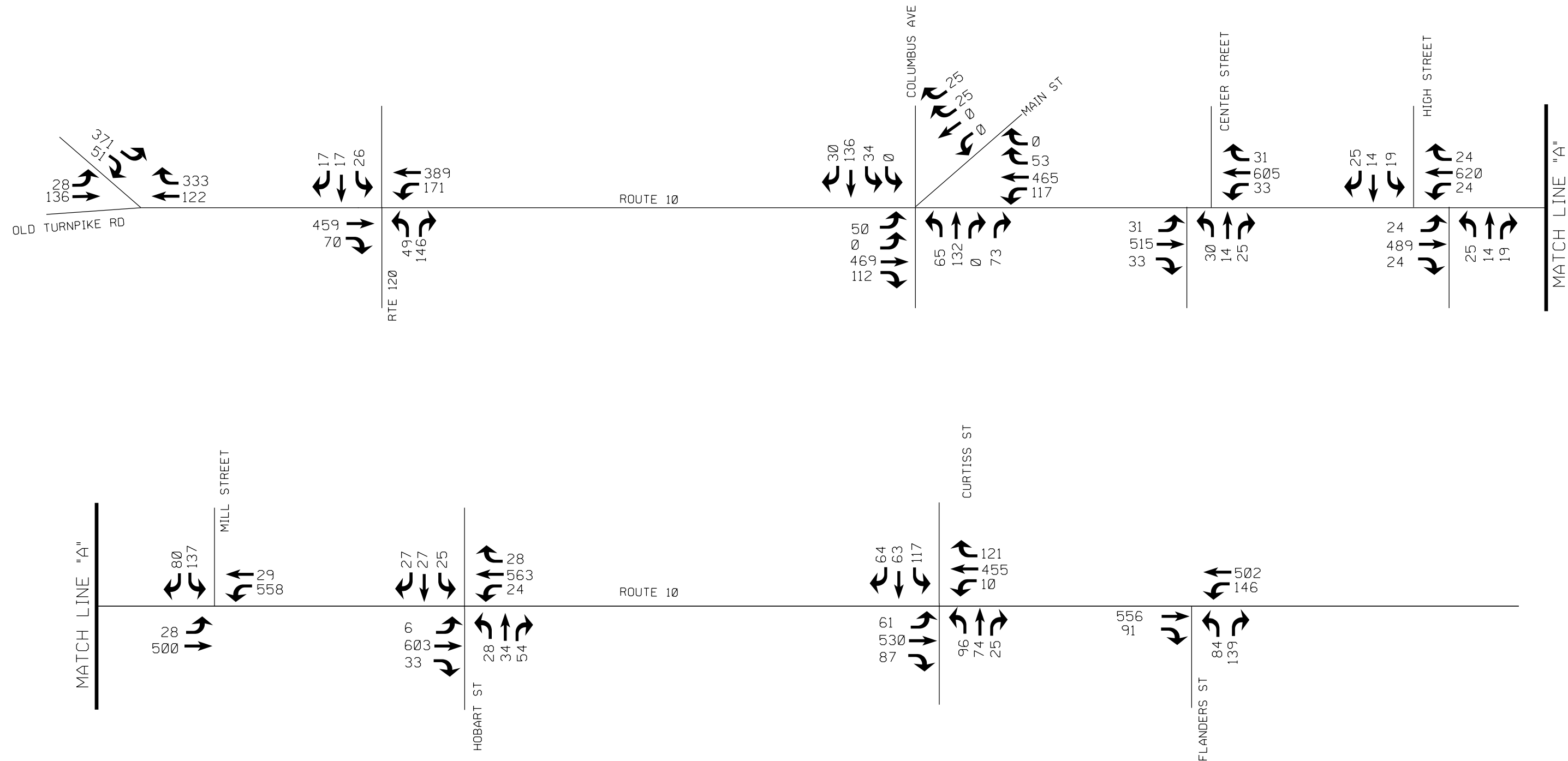


STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



SIGNATURE / BLOCK:	OFFICE OF ENGINEERING
APPROVED BY:	

PROJECT TITLE:	CRCOG REGION SIGNAL COORDINATION
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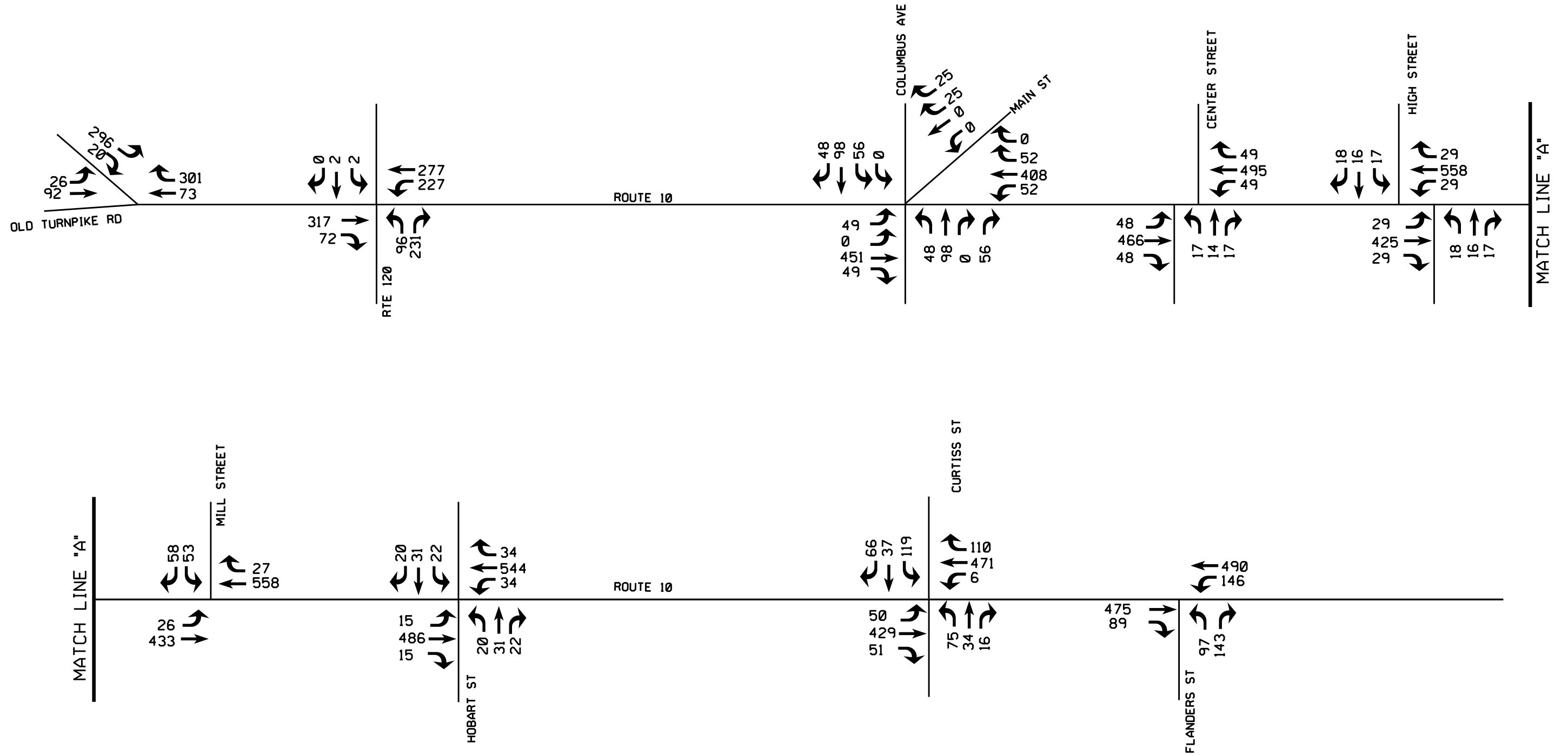


SOUTHINGTON ROUTE 10 SOUTH SYSTEM

NOT TO SCALE

PRELIMINARY ENGINEERING

				DESIGNER/DRAFTER: G. HOWELL		 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: OFFICE OF ENGINEERING	PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	TOWN: SOUTHINGTON	PROJECT NO. 171-421	
				CHECKED BY: J. KEISER						DRAWING NO. TMC-04	
										SHEET NO.	
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATES	DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES SATURDAY PEAK HOUR					

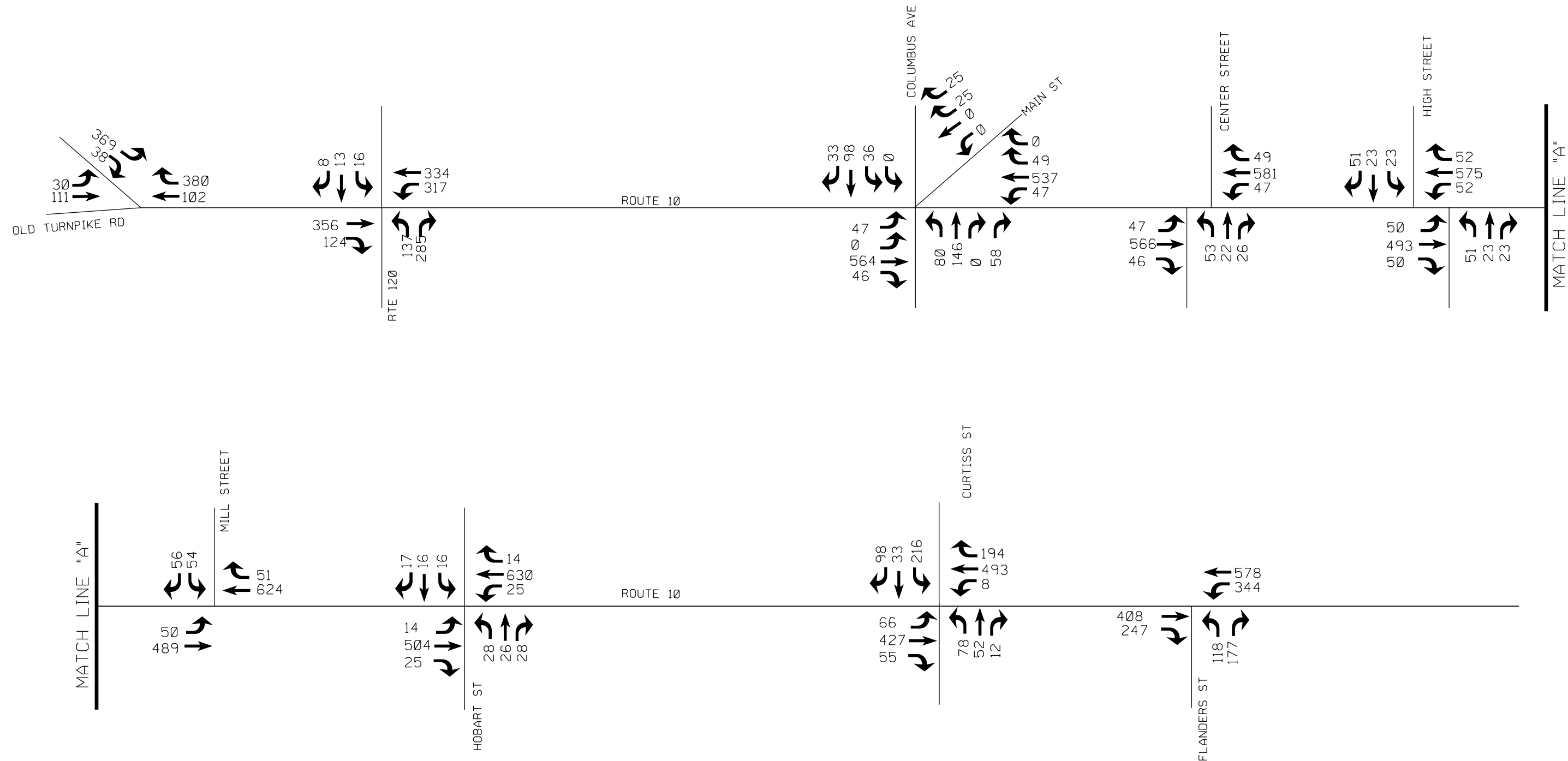


SOUTHINGTON ROUTE 10 SOUTH SYSTEM

NOT TO SCALE

PRELIMINARY ENGINEERING

				DESIGNER/DRAFTER: G. HOWELL		 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: OFFICE OF ENGINEERING	PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	TOWN: SOUTHINGTON	PROJECT NO. 171-421
				CHECKED BY: J. KEISER						
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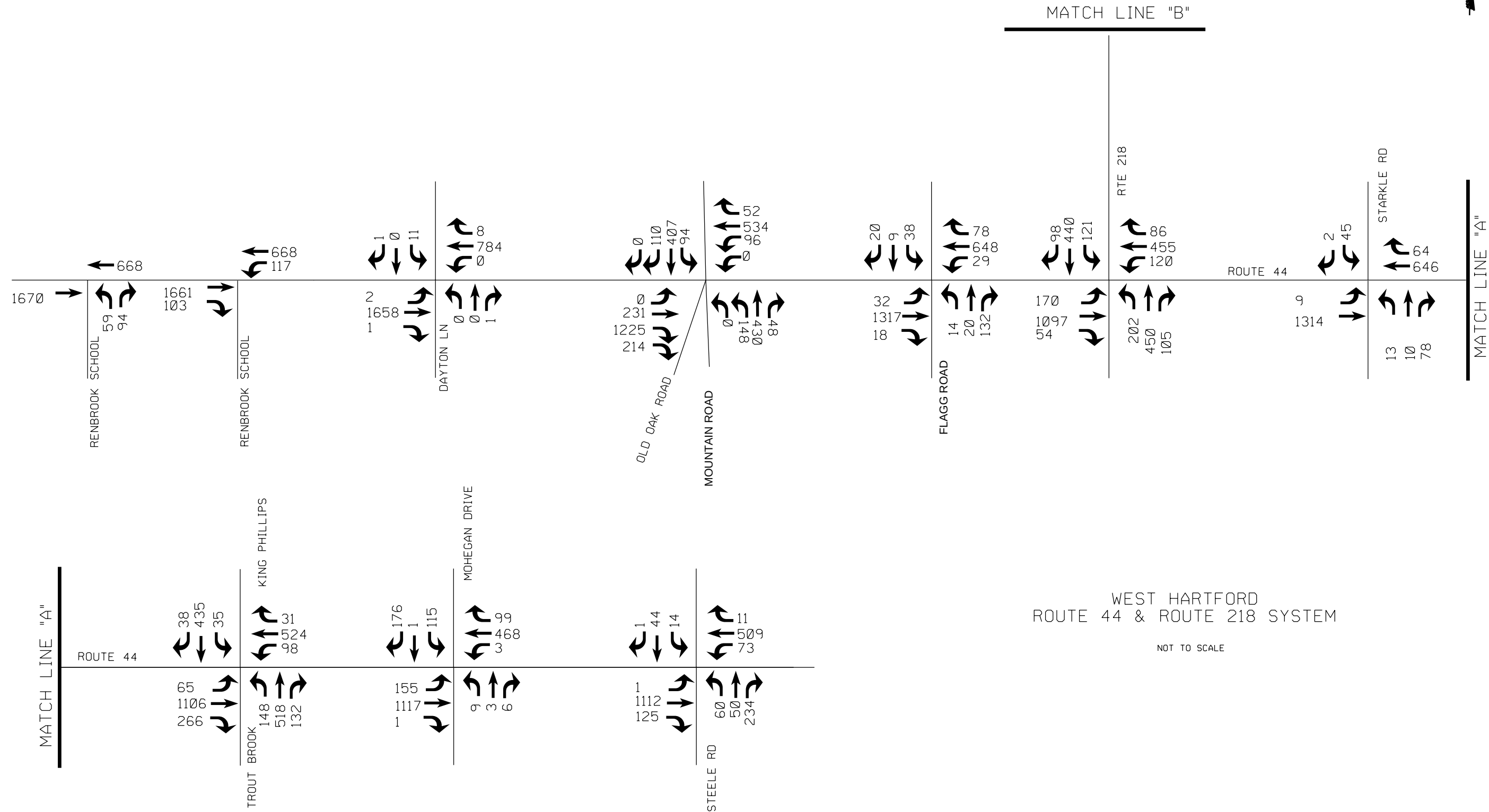


SOUTHINGTON ROUTE 10 SOUTH SYSTEM

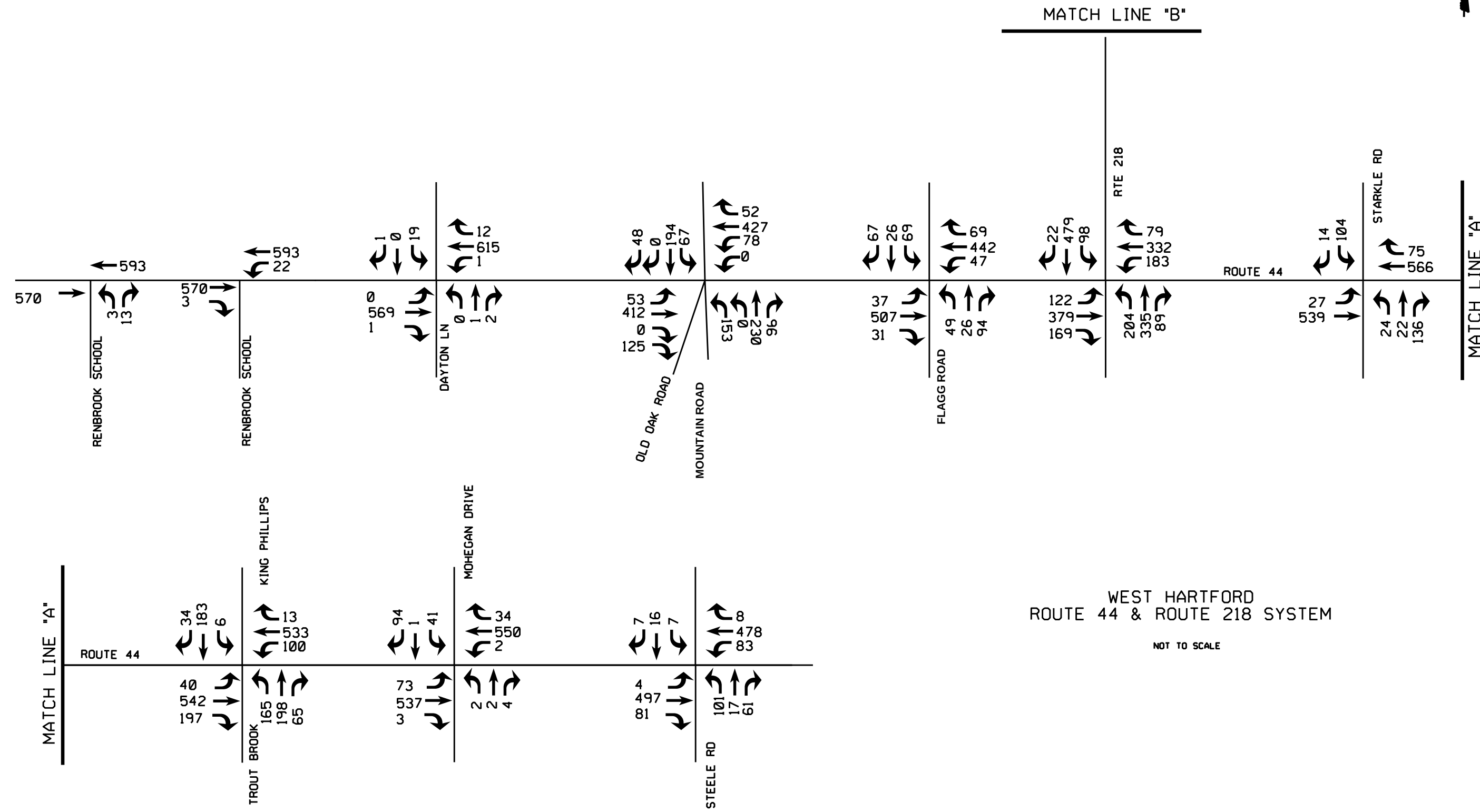
NOT TO SCALE

PRELIMINARY ENGINEERING

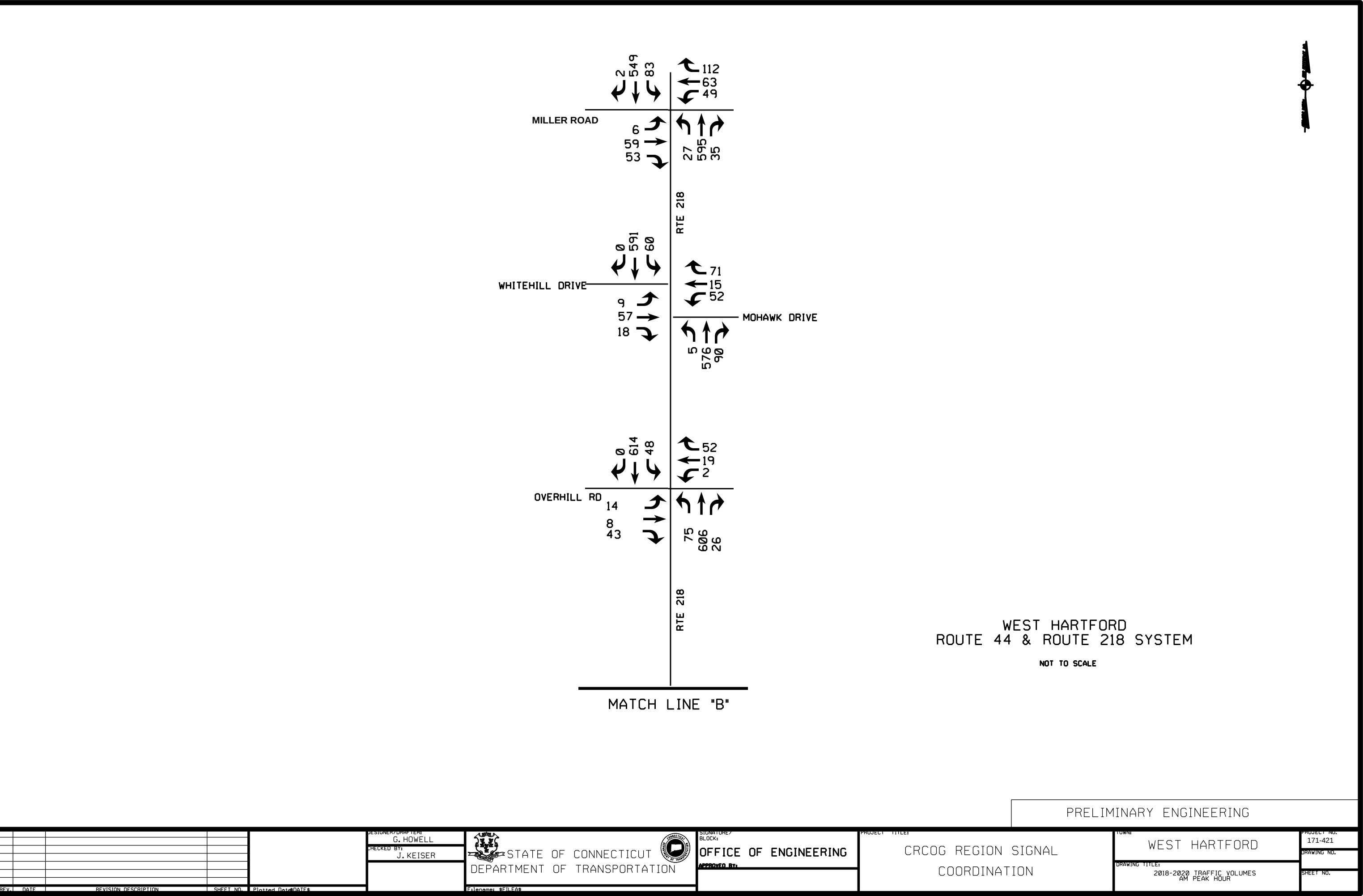
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				CHECKED BY: J. KEISER					DRAWING NO.: TMC-04
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: DATE\$	File name: \$FILE.F\$	DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR			SHEET NO.



PRELIMINARY ENGINEERING			PROJECT NO. 171-421	
TOWN WEST HARTFORD			DRAWING NO.	
DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES AM PEAK HOUR			SHEET NO.	
DESIGNER/DRAFTER: G. HOWELL	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	
CHECKED BY: J. KEISER	OFFICE OF ENGINEERING		TOWN: WEST HARTFORD	
	APPROVED BY:		DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES AM PEAK HOUR	
REV. DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: DATE	File name: \$FILE.F&S



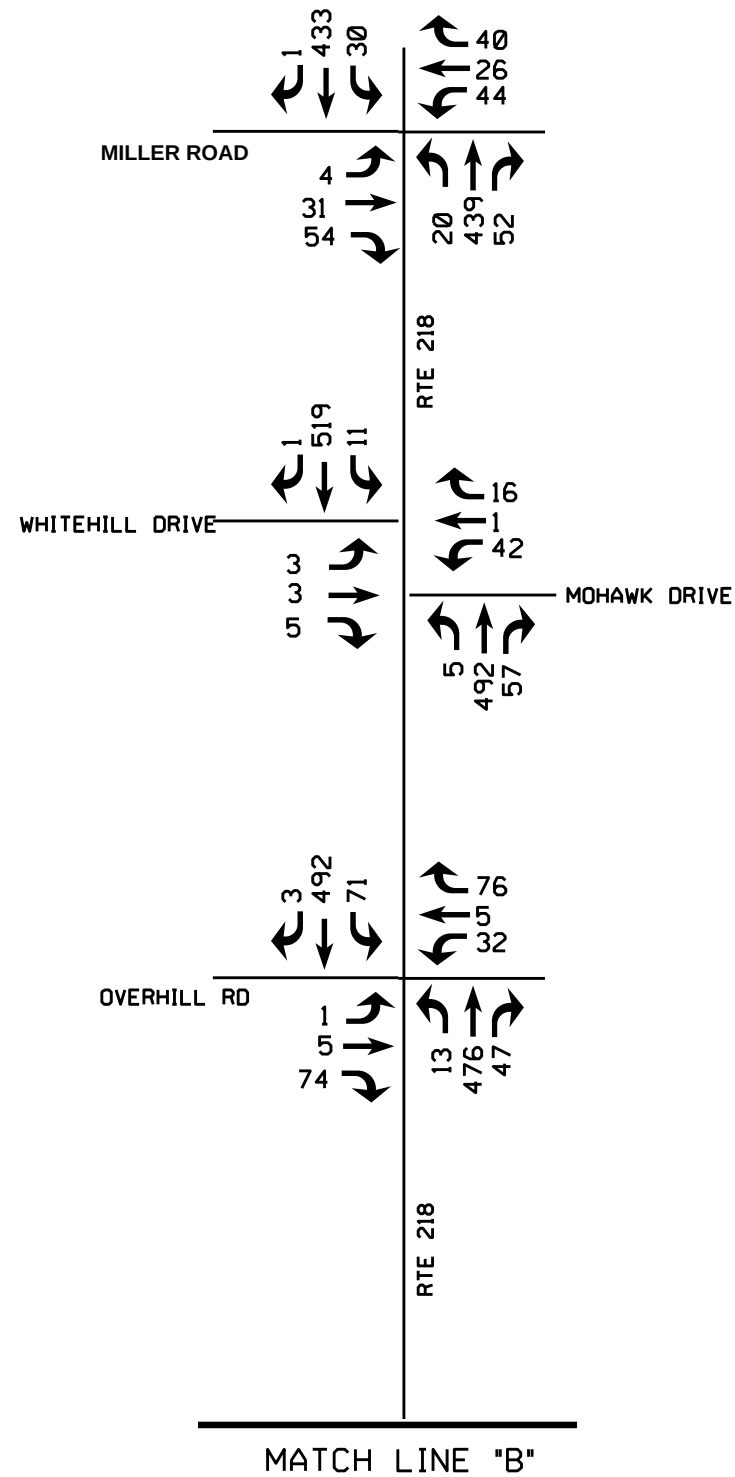
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TOWN: WEST HARTFORD			DRAWING NO.	
DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES MIDDAY PEAK HOUR			SHEET NO.	
DESIGNER/DRAFTER: G. HOWELL	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		OFFICE OF ENGINEERING	
CHECKED BY: J. KEISER	APPROVED BY:		CRCOG REGION SIGNAL COORDINATION	
REV. DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 11/1/2018	File name: \$FILE.FAS



WEST HARTFORD
ROUTE 44 & ROUTE 218 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

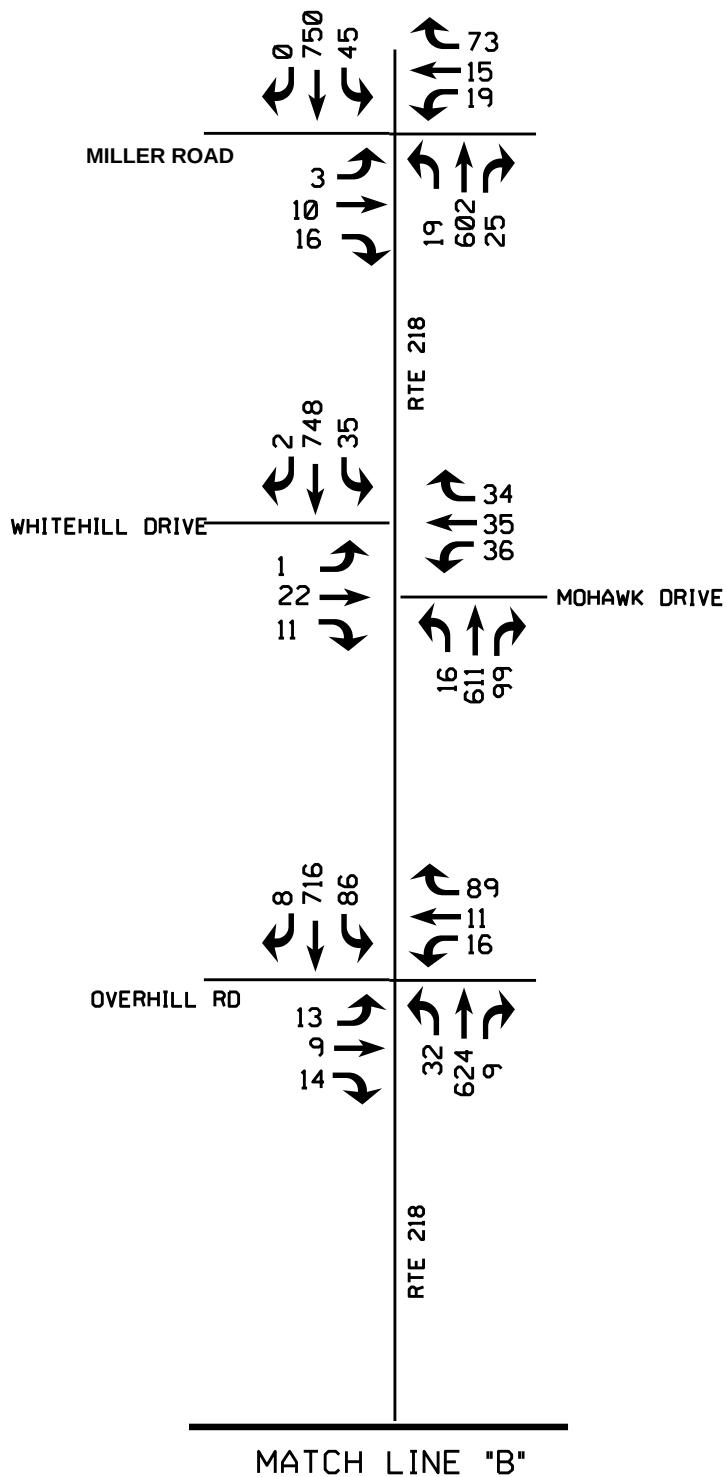
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WEST HARTFORD
ROUTE 44 & ROUTE 218 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

			DESIGNER/DRAFTER: G. HOWELL	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: OFFICE OF ENGINEERING APPROVED BY:	PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	TOWN: WEST HARTFORD	PROJECT NO. 171-421
			CHECKED BY: J. KEISER				DRAWING NO.	
							SHEET NO.	
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date	DATES	Filename: \$FILE.FAS	DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES MIDDAY PEAK HOUR	



WEST HARTFORD
ROUTE 44 & ROUTE 218 SYSTEM
NOT TO SCALE

PRELIMINARY ENGINEERING

				DESIGNER/DRAFTER: G. HOWELL		 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		SIGNATURE/ BLOCK: OFFICE OF ENGINEERING	PROJECT TITLE: CRCOG REGION SIGNAL COORDINATION	TOWN: WEST HARTFORD	PROJECT NO. 171-421
				CHECKED BY: J. KEISER							
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date		DATES			DRAWING TITLE: 2018-2020 TRAFFIC VOLUMES PM PEAK HOUR		

Appendix D

Phase 4 Crash

Diagrams

Key

Crash Severity and Type

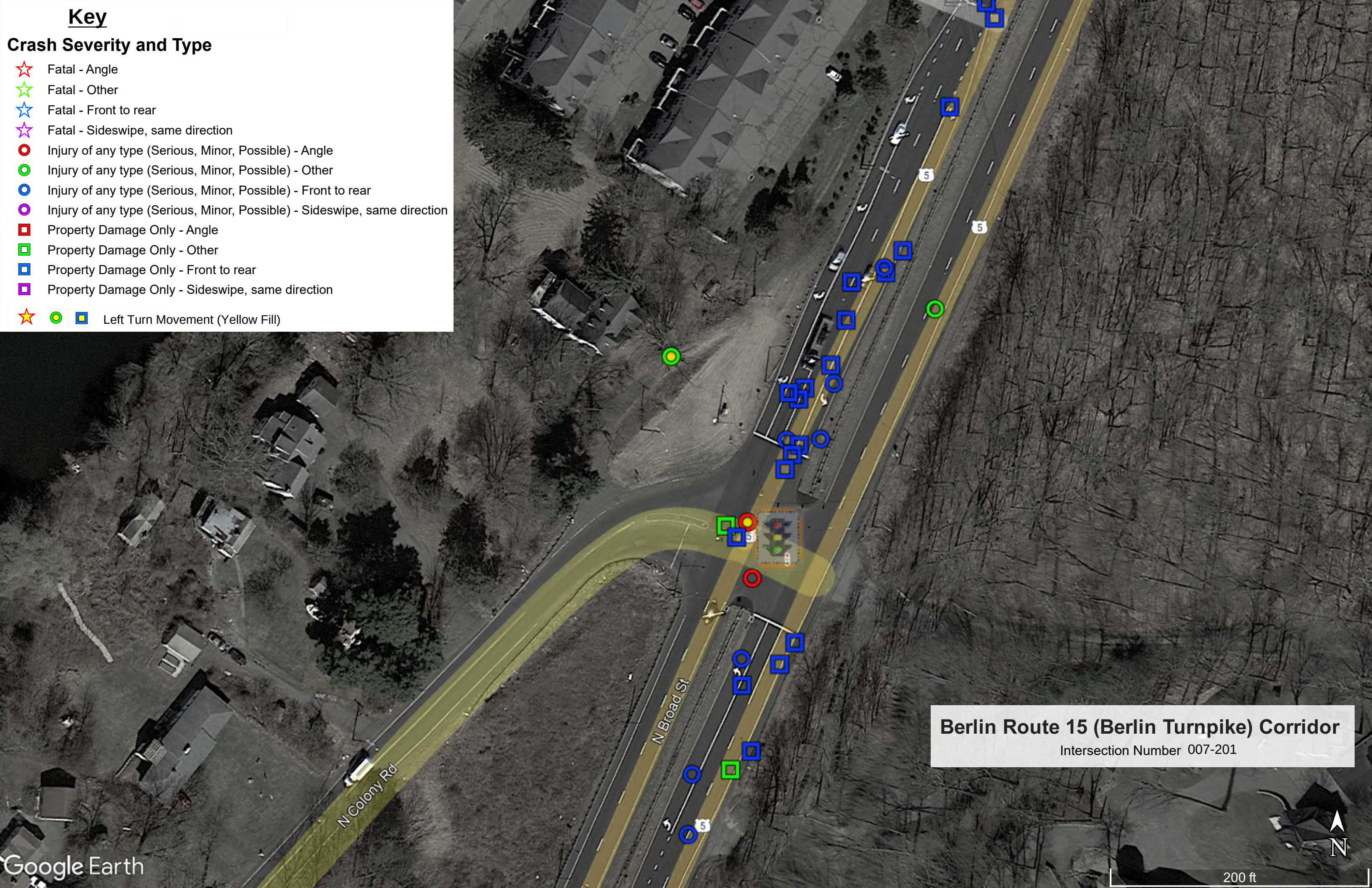
- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
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■

Left Turn Movement (Yellow Fill)



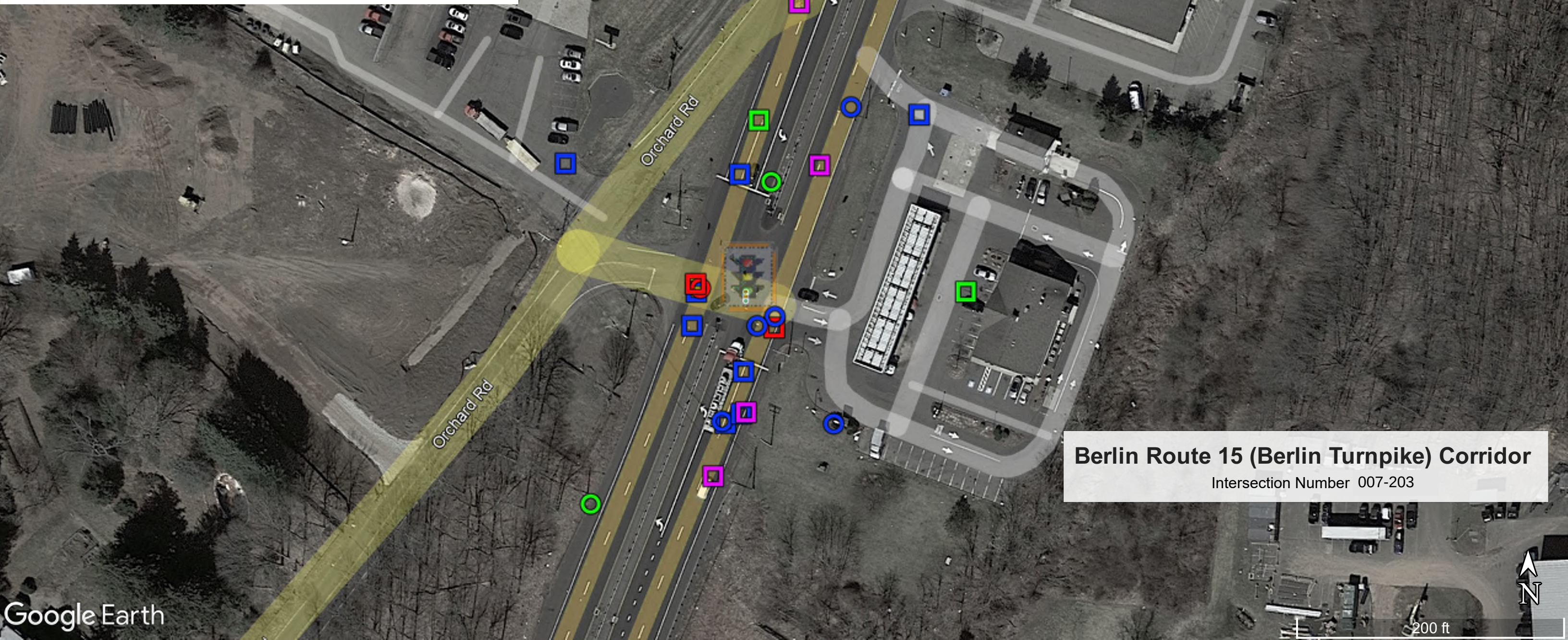
Berlin Route 15 (Berlin Turnpike) Corridor
Intersection Number 007-215

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

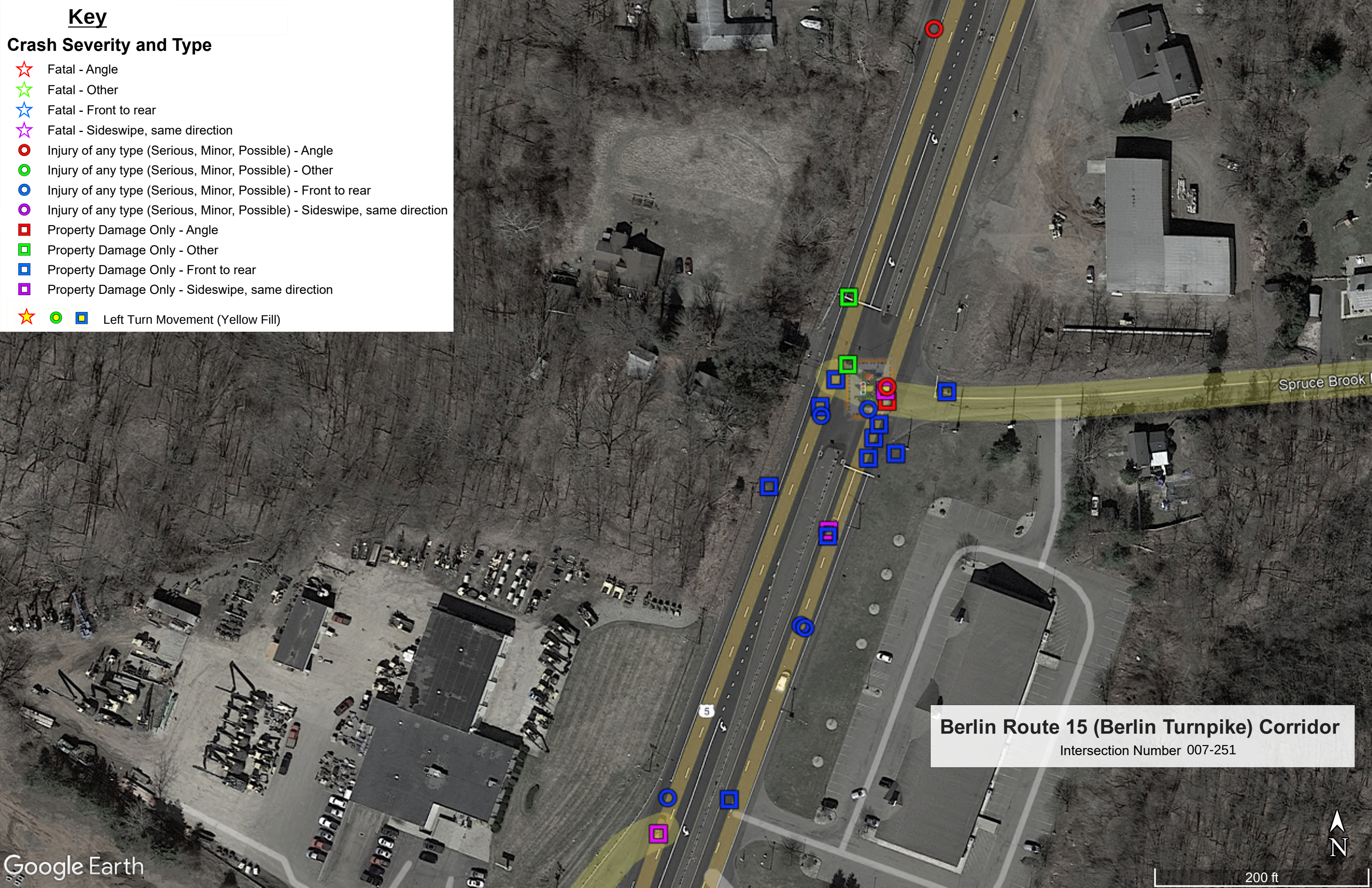
Intersection Number 007-203

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)

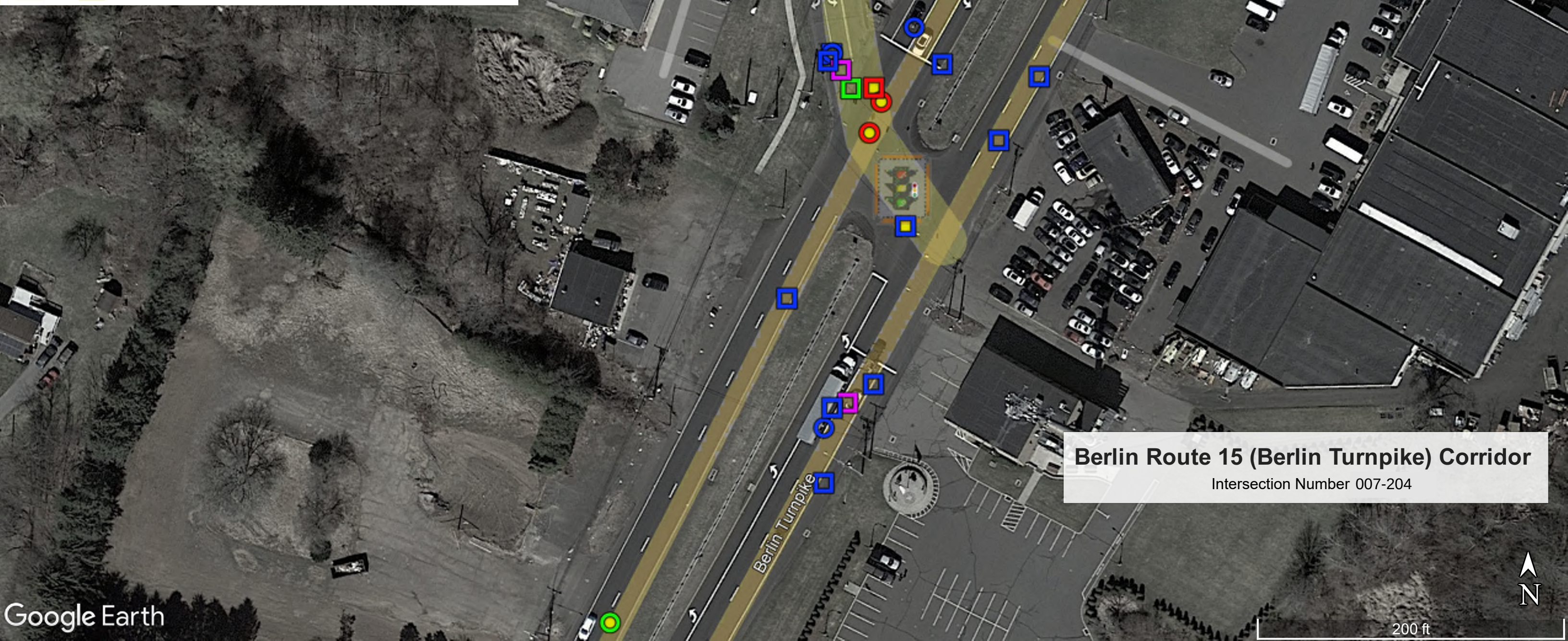


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★
-
- ▣
- Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

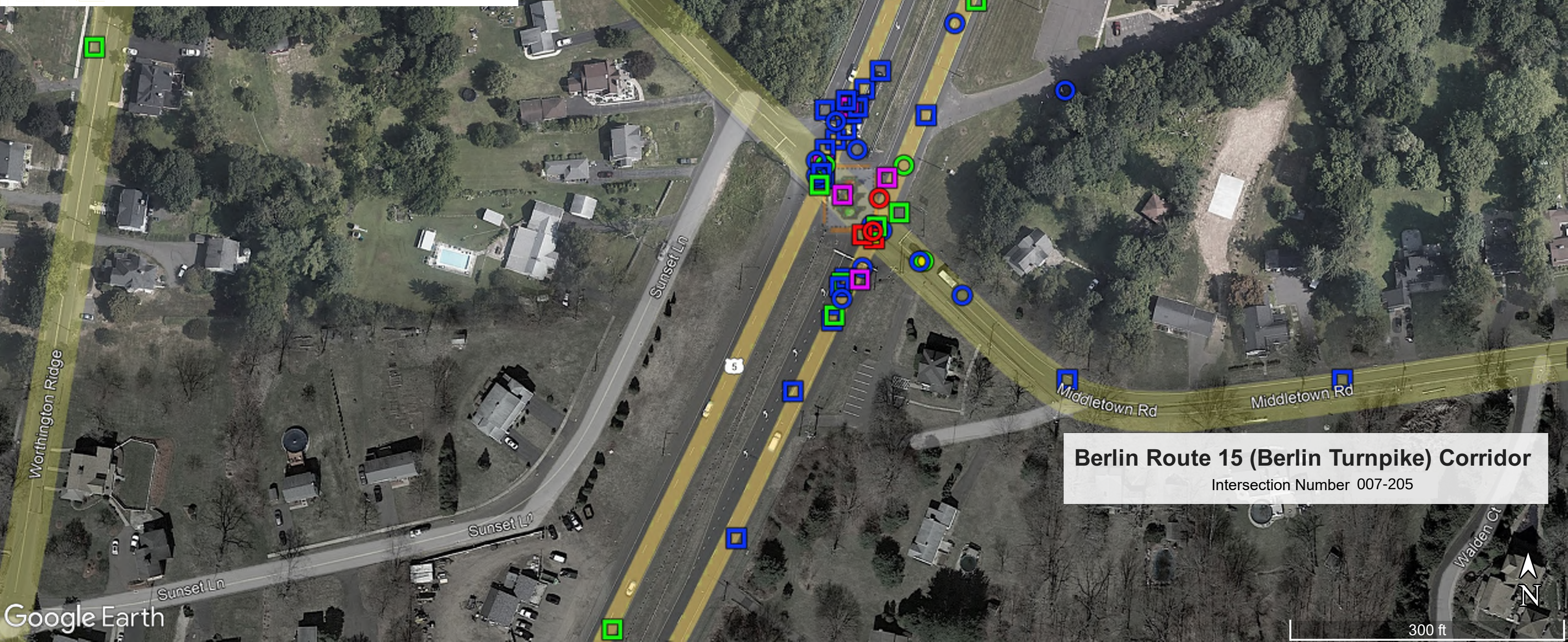
Intersection Number 007-204

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)

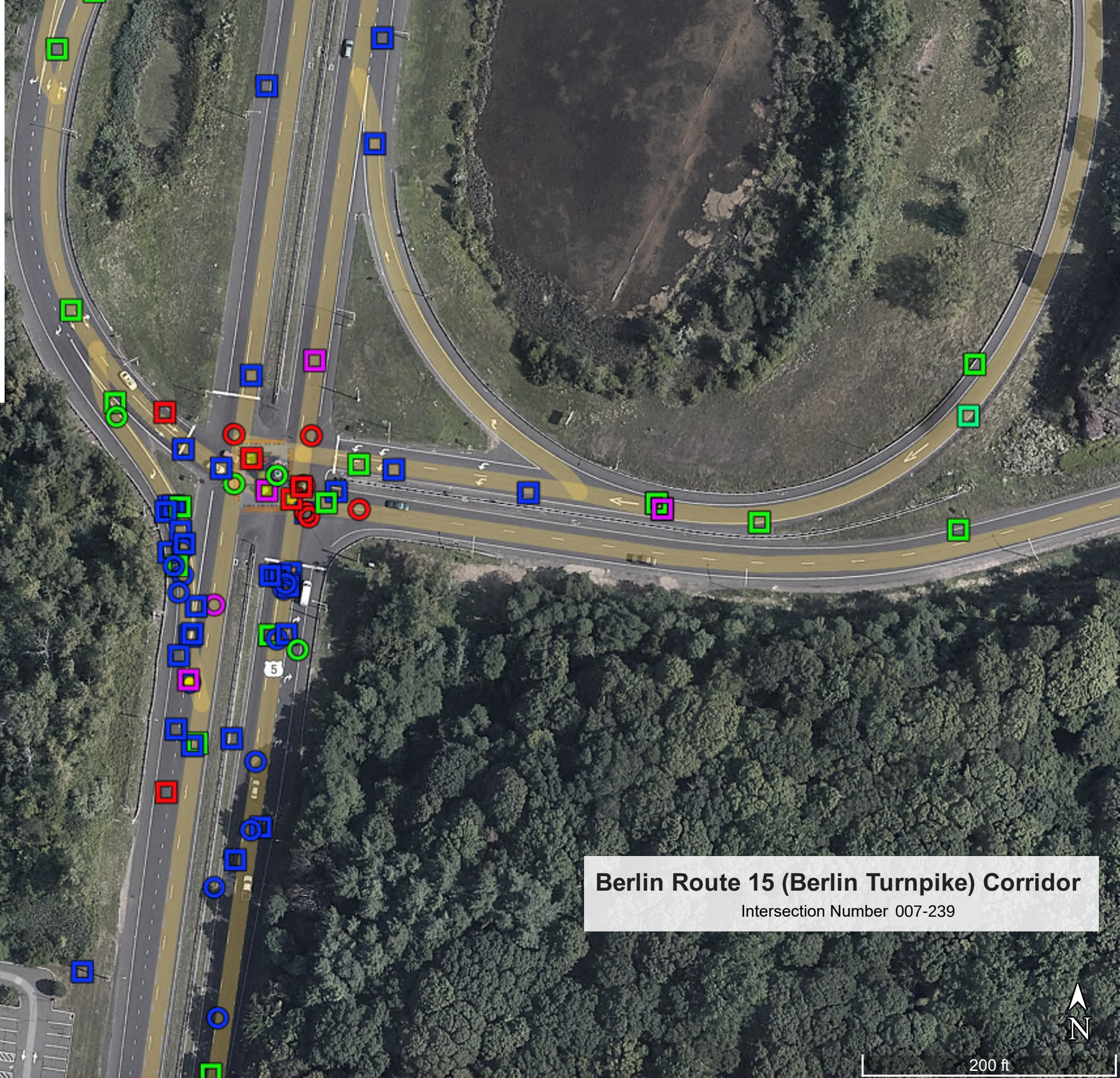


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

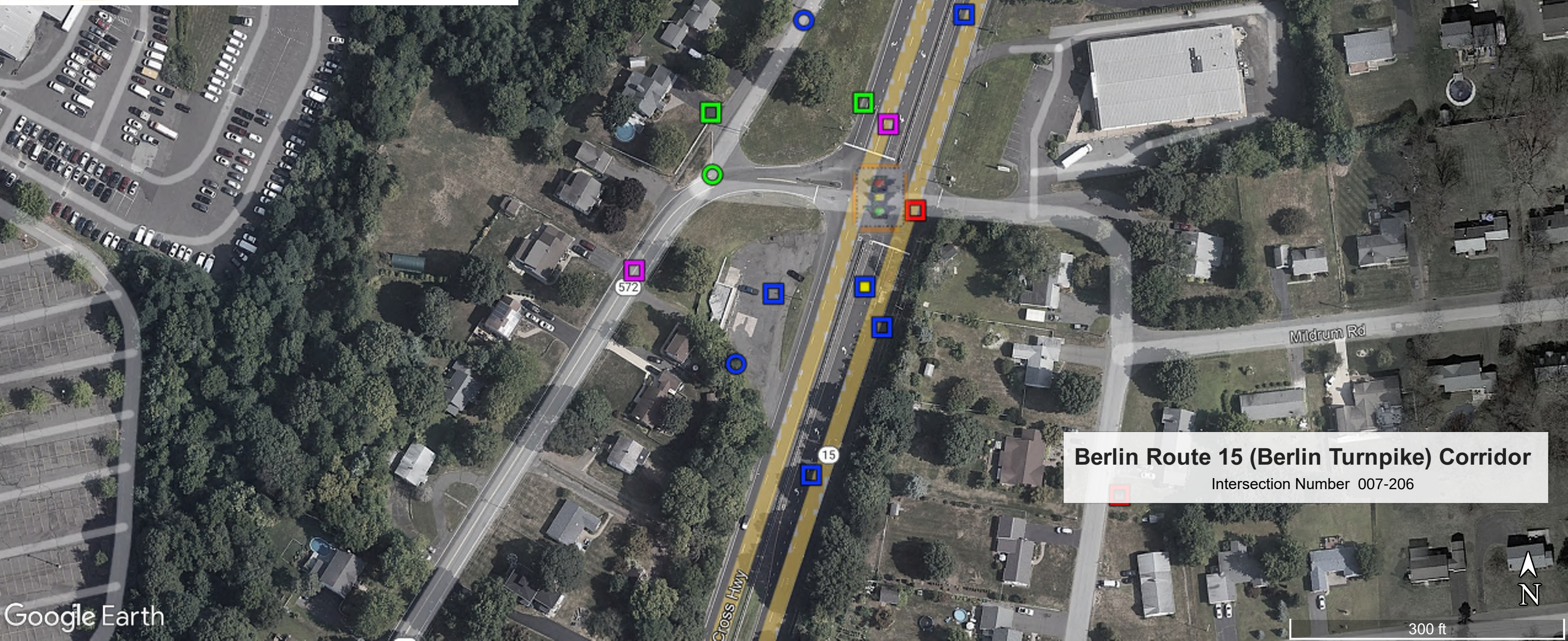
Intersection Number 007-239

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★ ○ ▣ Left Turn Movement (Yellow Fill)

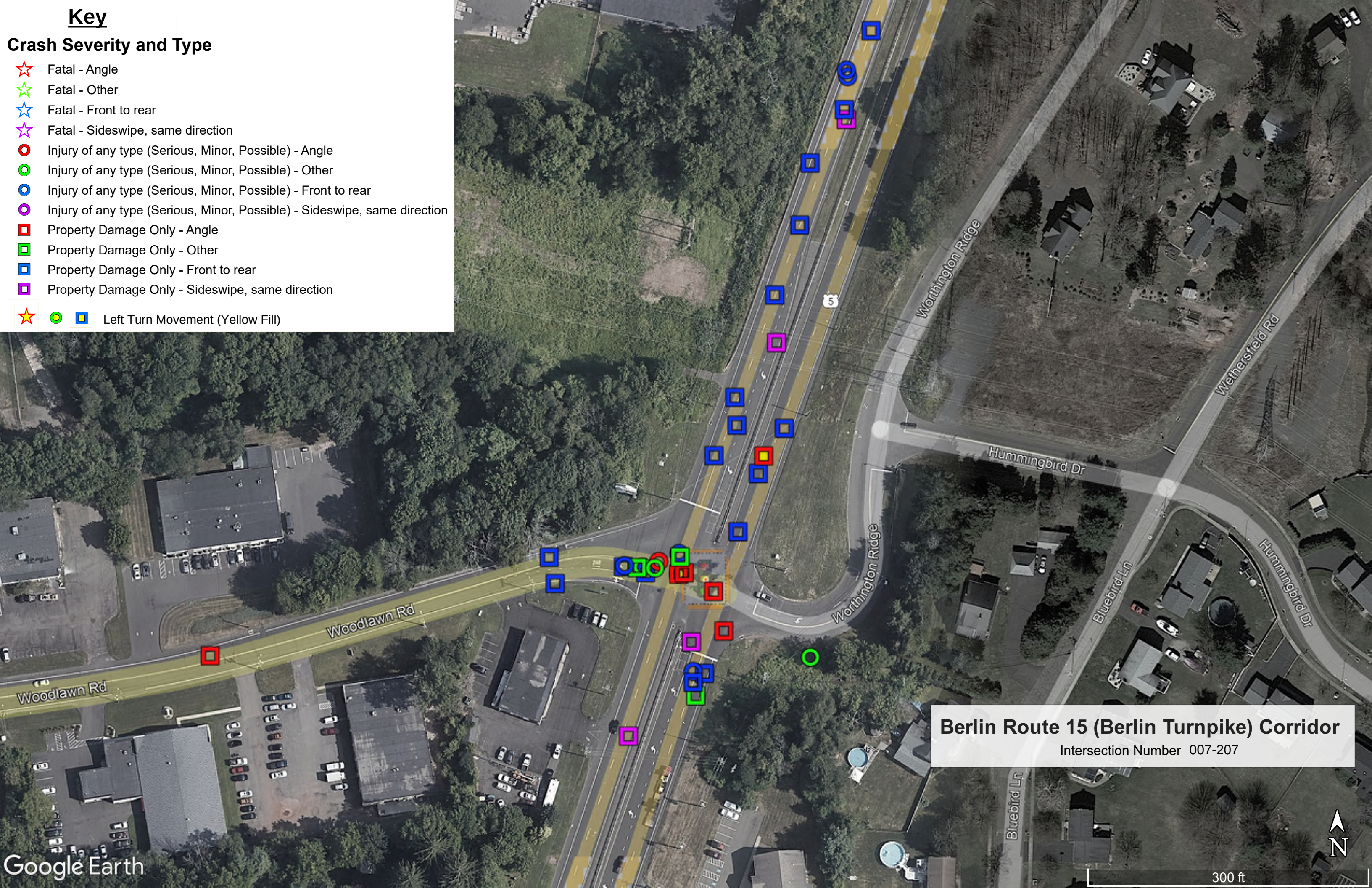


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

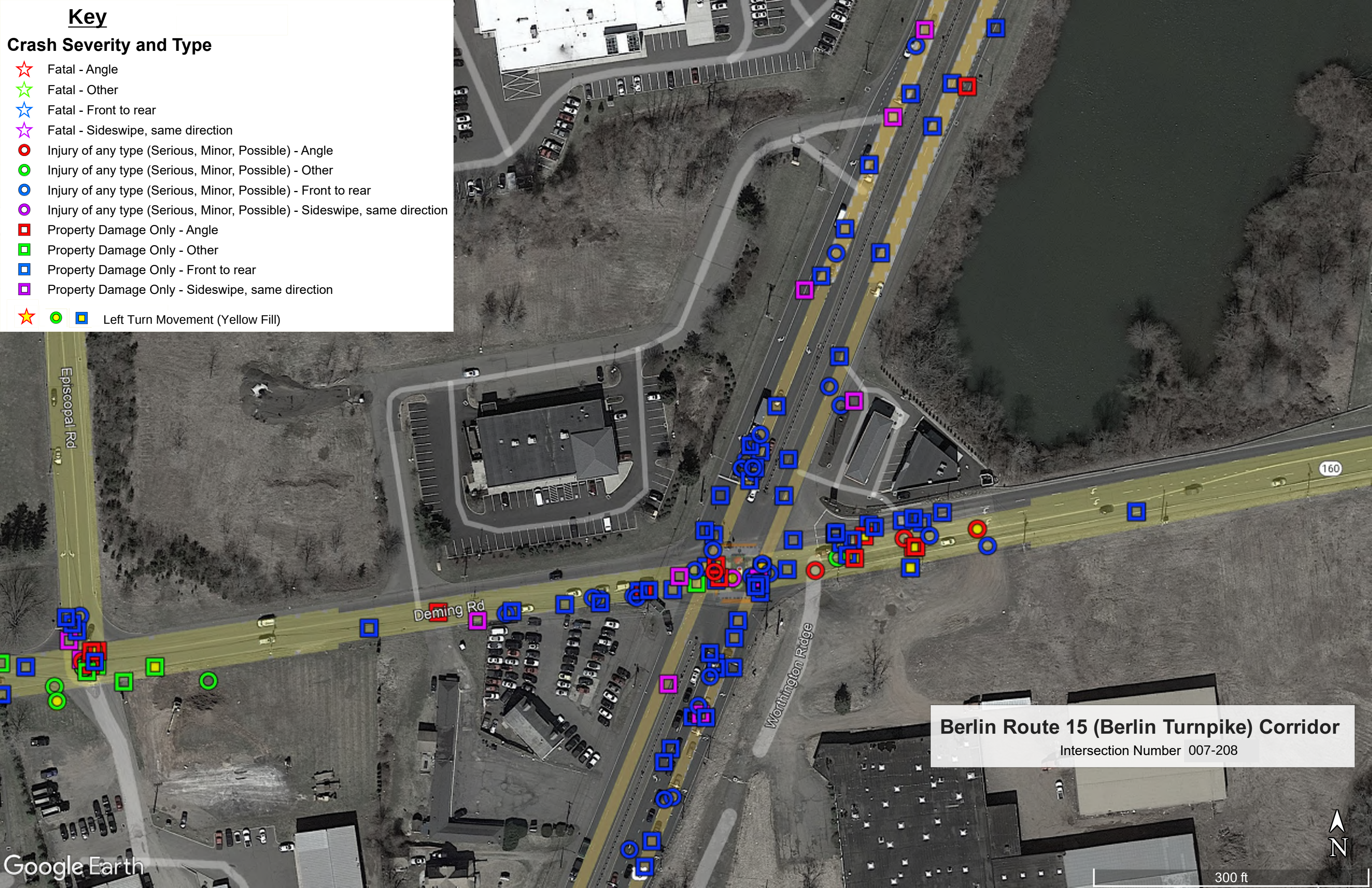
Intersection Number 007-207

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

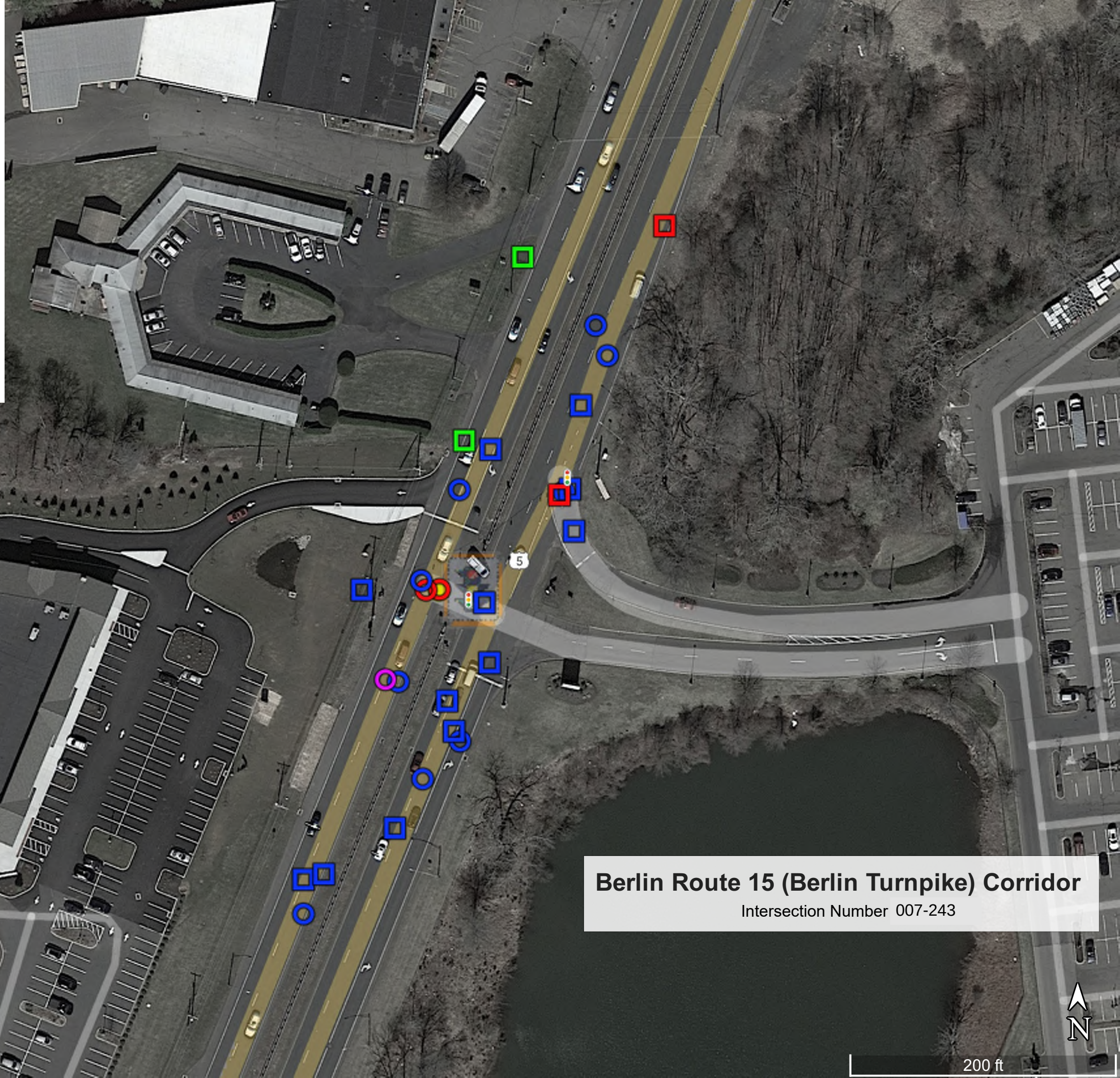
Intersection Number 007-208

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)

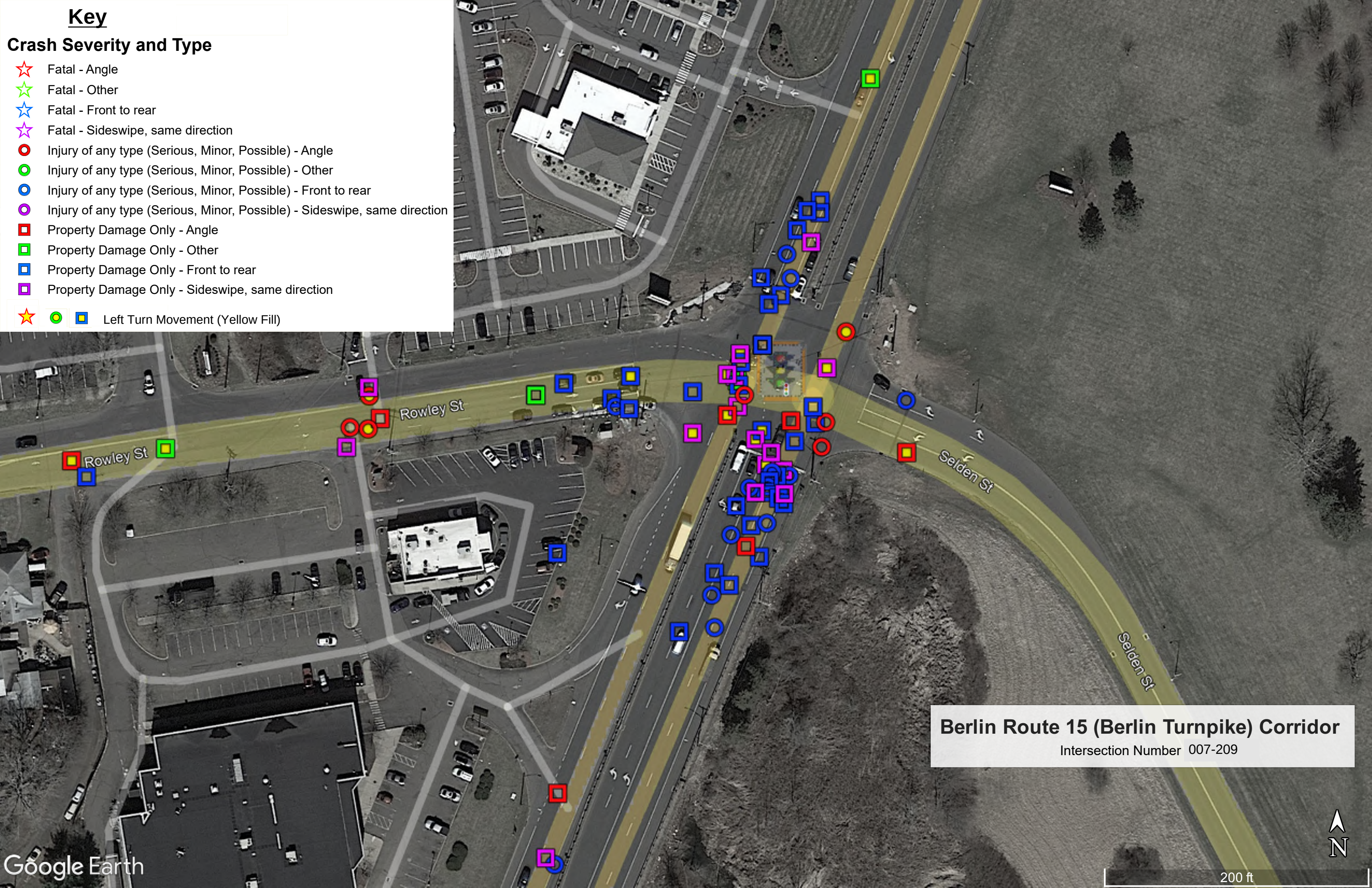


Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



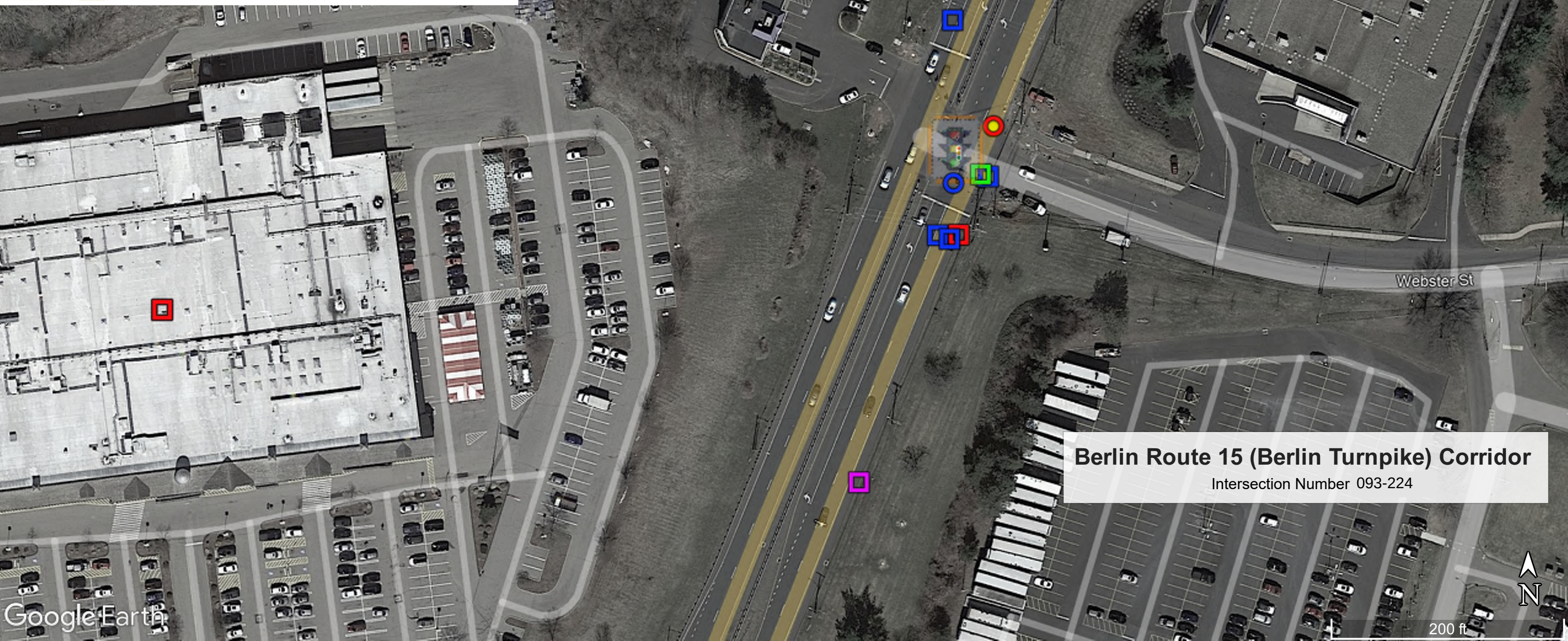
Berlin Route 15 (Berlin Turnpike) Corridor
Intersection Number 007-209

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

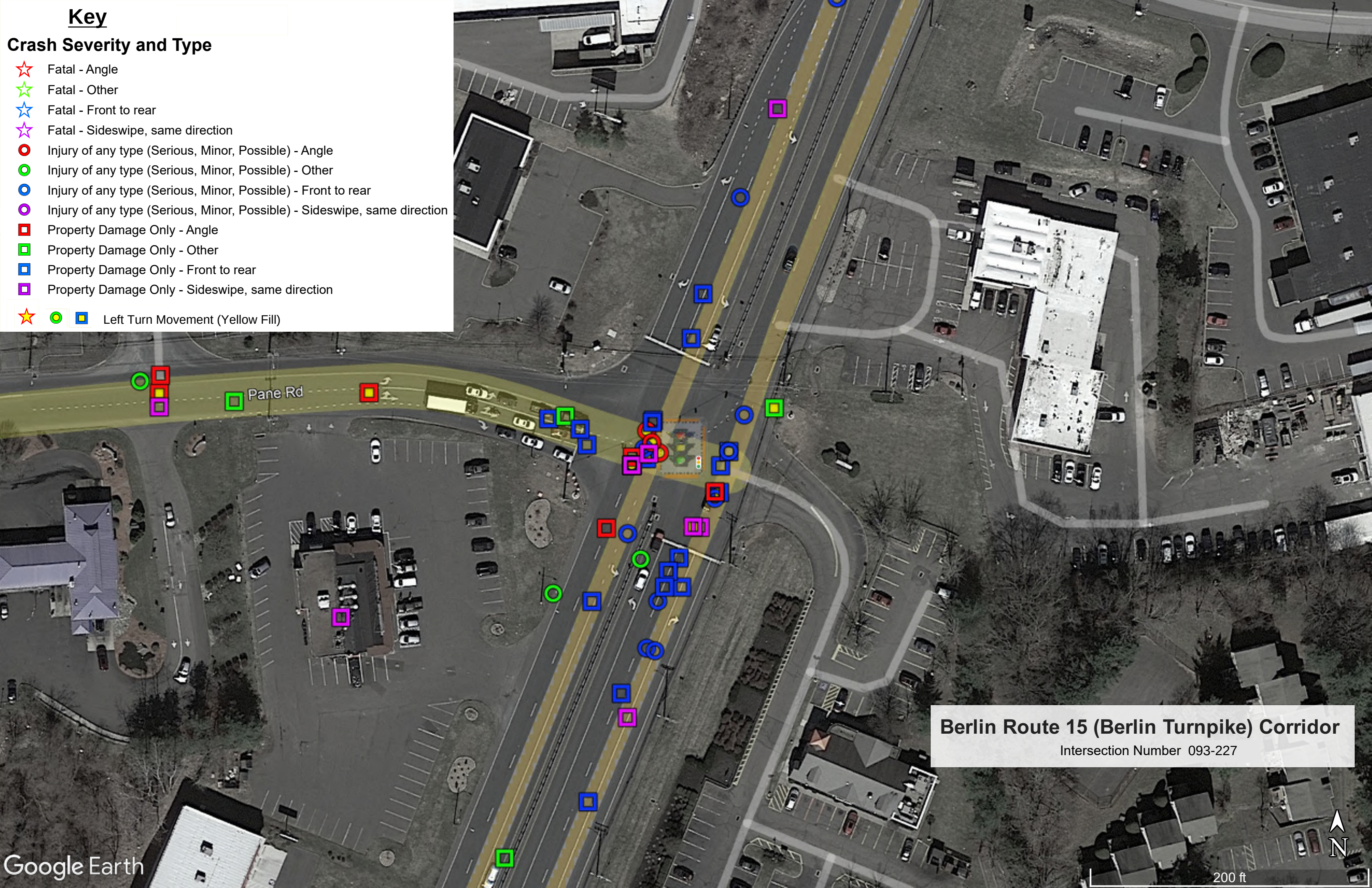
Intersection Number 093-224

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)

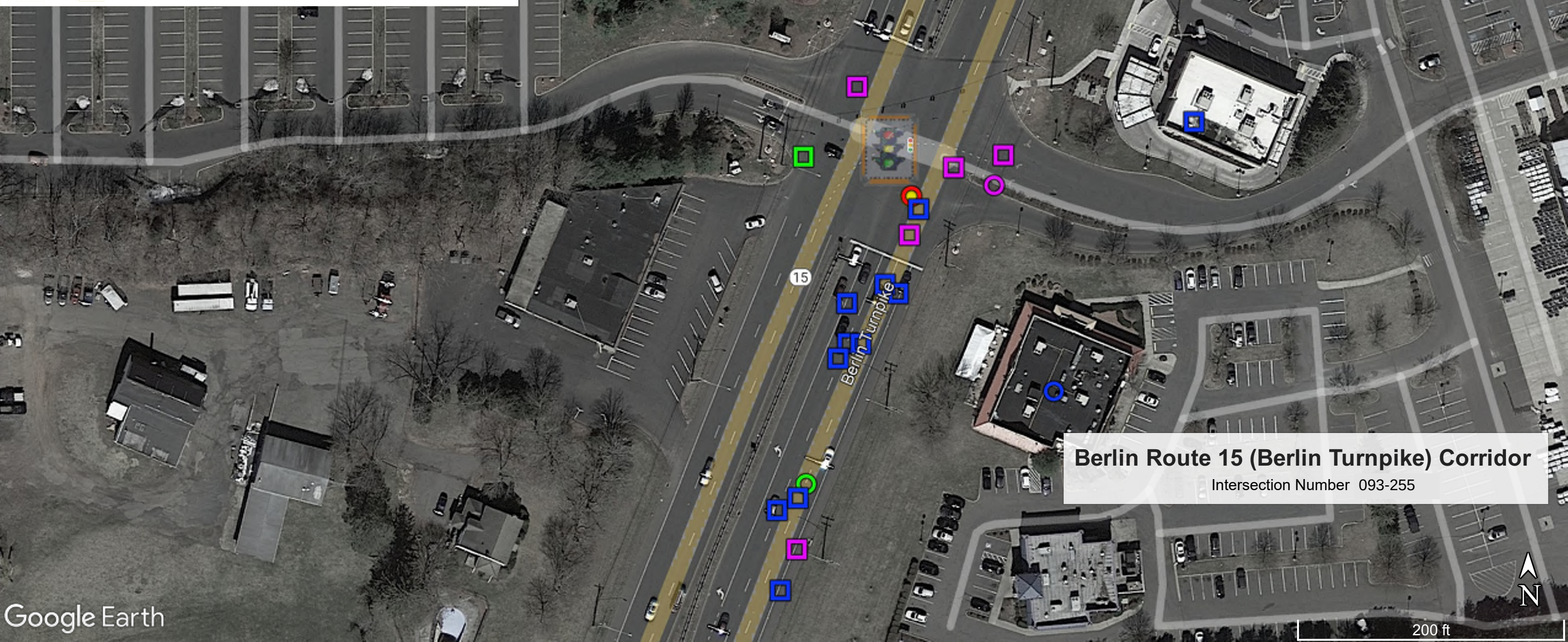


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

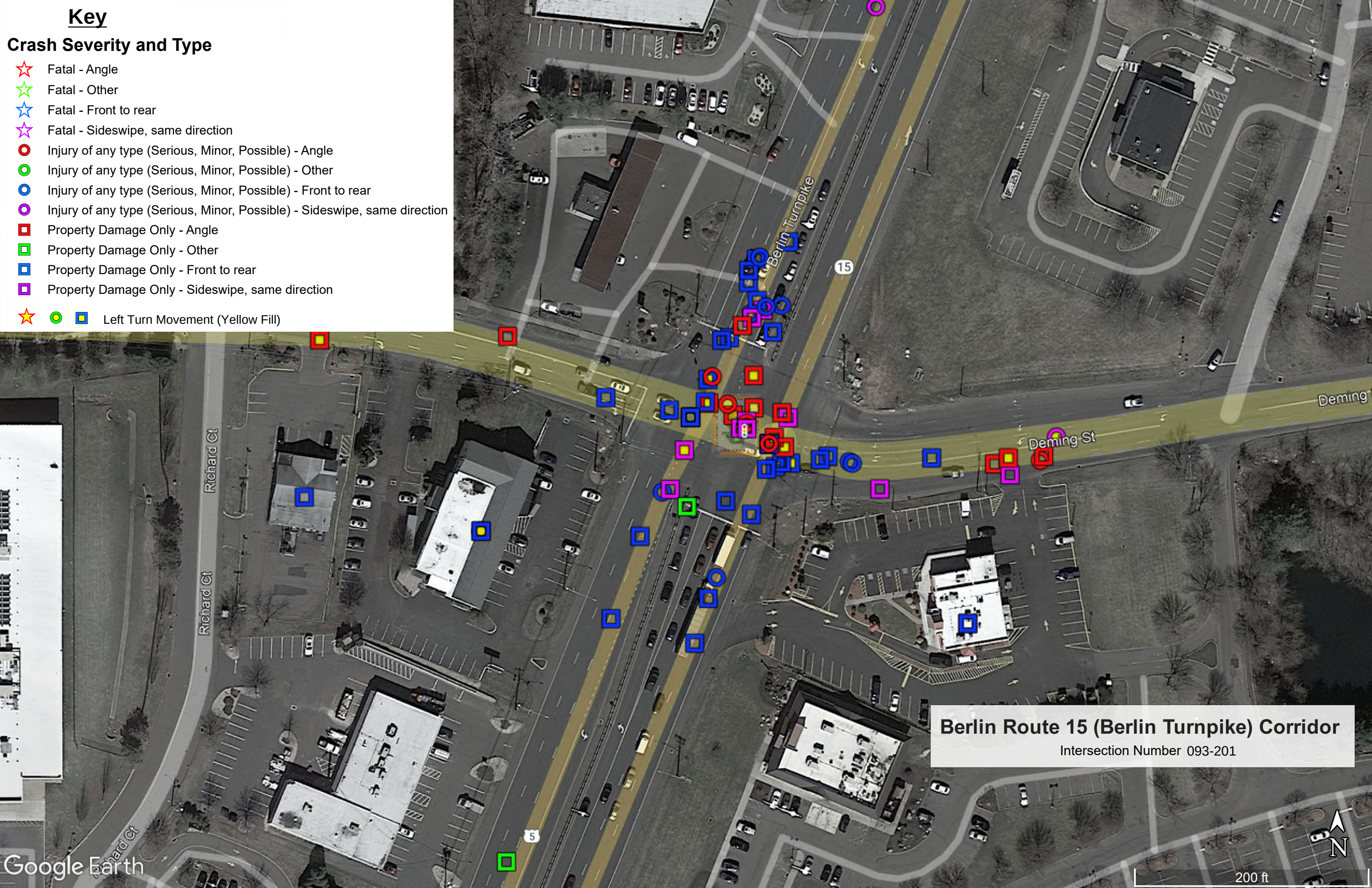
- ★ Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - ▣ Property Damage Only - Angle
 - ▣ Property Damage Only - Other
 - ▣ Property Damage Only - Front to rear
 - ▣ Property Damage Only - Sideswipe, same direction
- ★ ○ ▣ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor
Intersection Number 093-245

Key

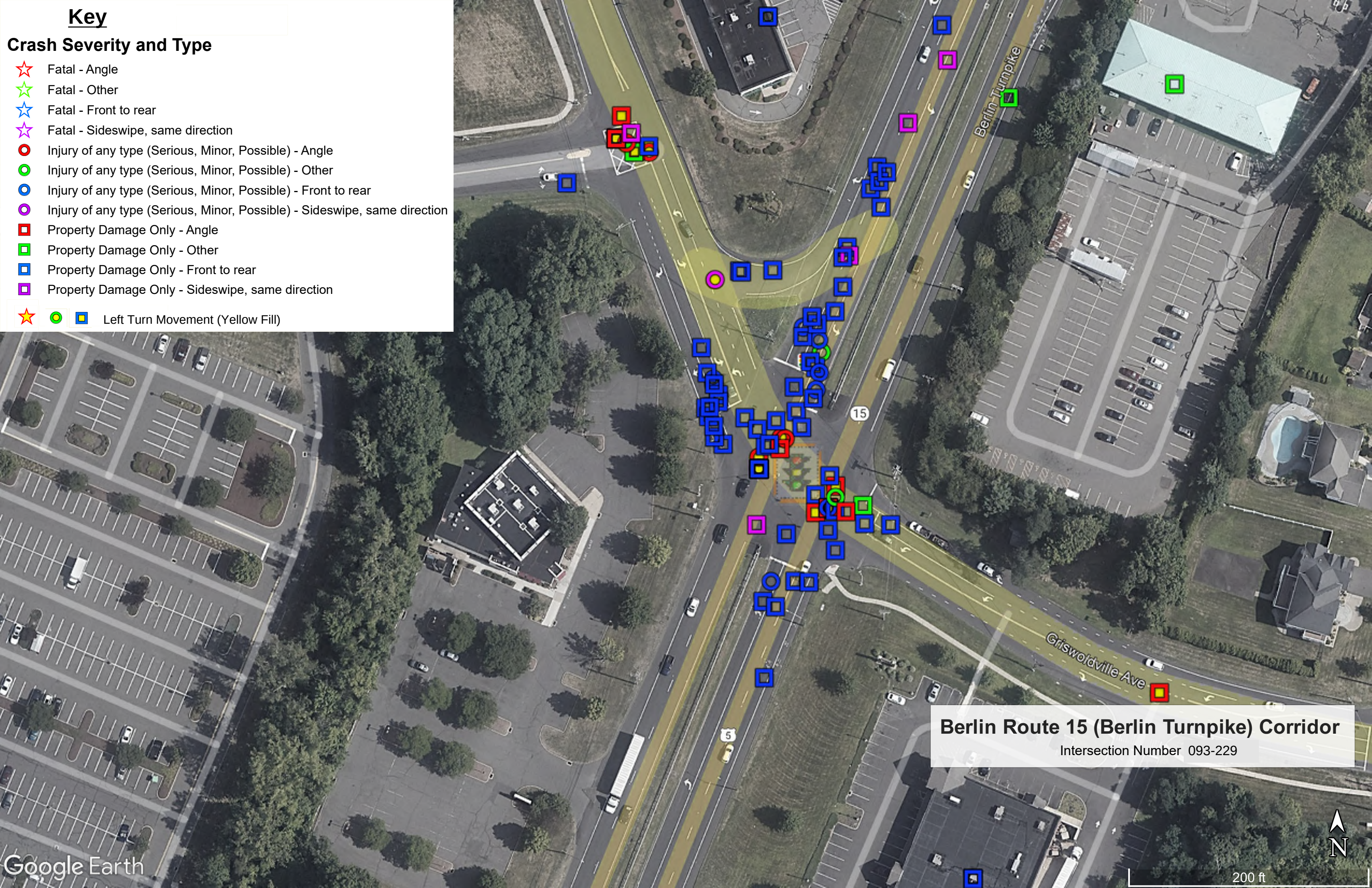
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor
Intersection Number 093-229

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)



Berlin Route 15 (Berlin Turnpike) Corridor

Intersection Number 093-248

Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

○ Injury of any type (Serious, Minor, Possible) - Angle

○ Injury of any type (Serious, Minor, Possible) - Other

○ Injury of any type (Serious, Minor, Possible) - Front to rear

○ Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

▣ Property Damage Only - Sideswipe, same direction

★

○

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Left Turn Movement (Yellow Fill)

Newington/Wethersfield Route 15 Corridor

Intersection Number 093-247

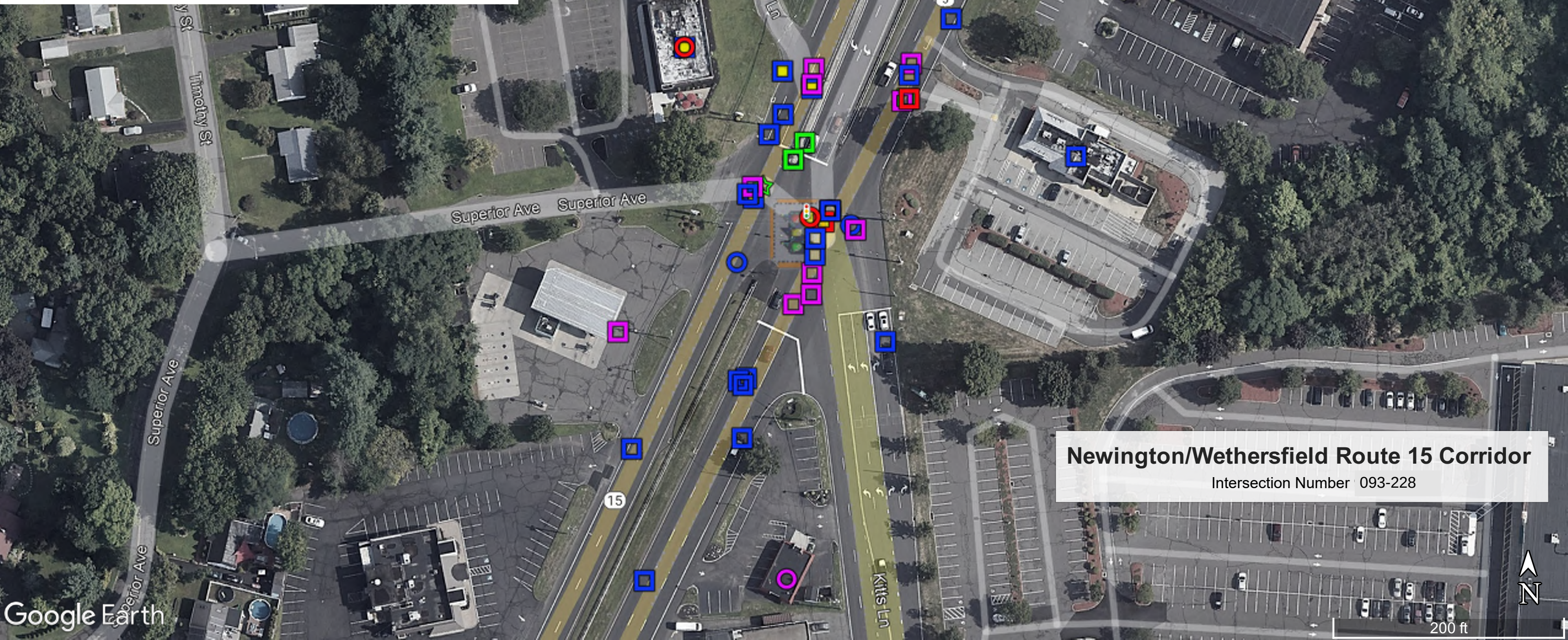
Google Earth

200 ft

Key

Crash Severity and Type

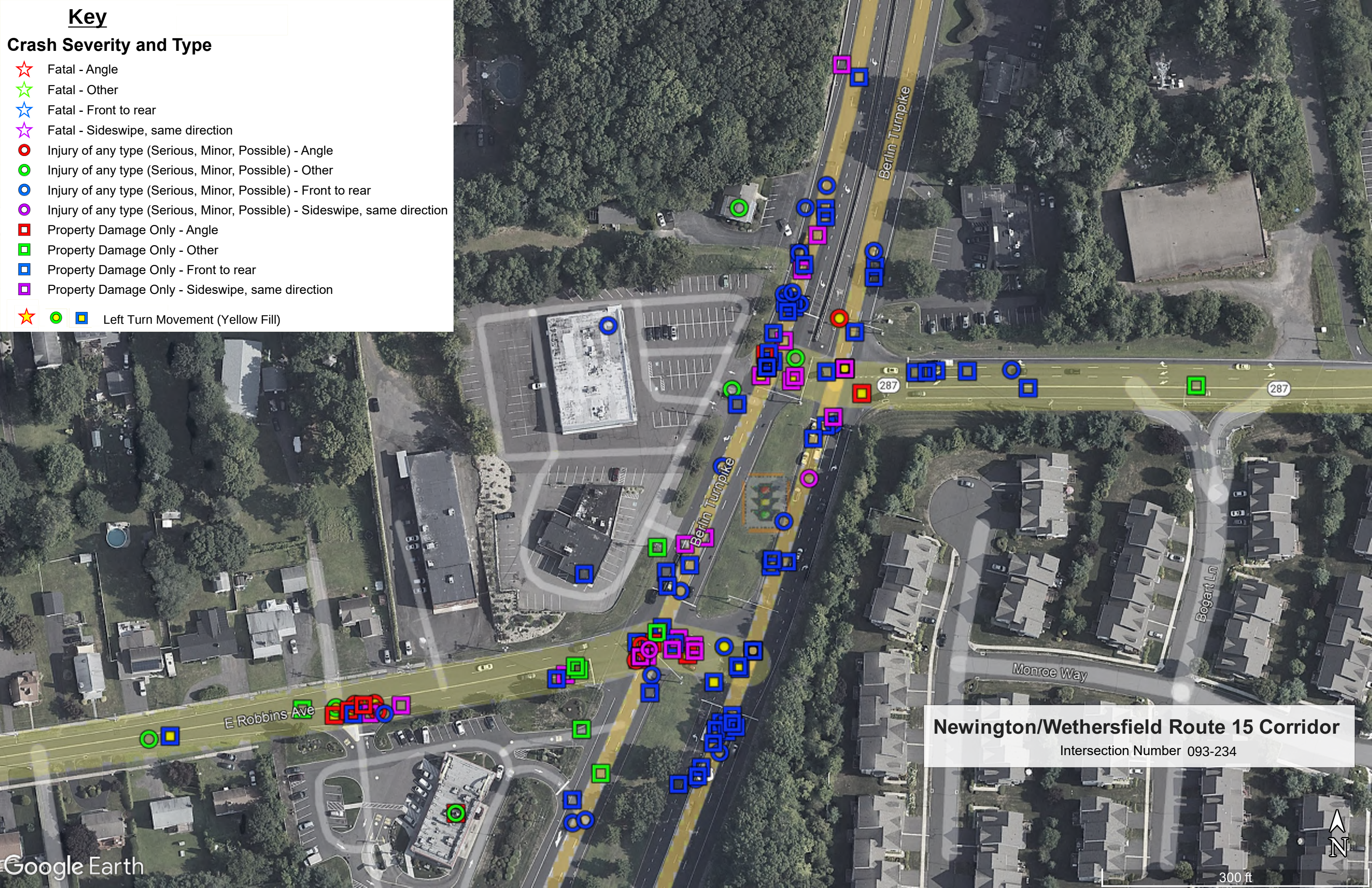
- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ ○ ▣ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★ ● ■ Left Turn Movement (Yellow Fill)

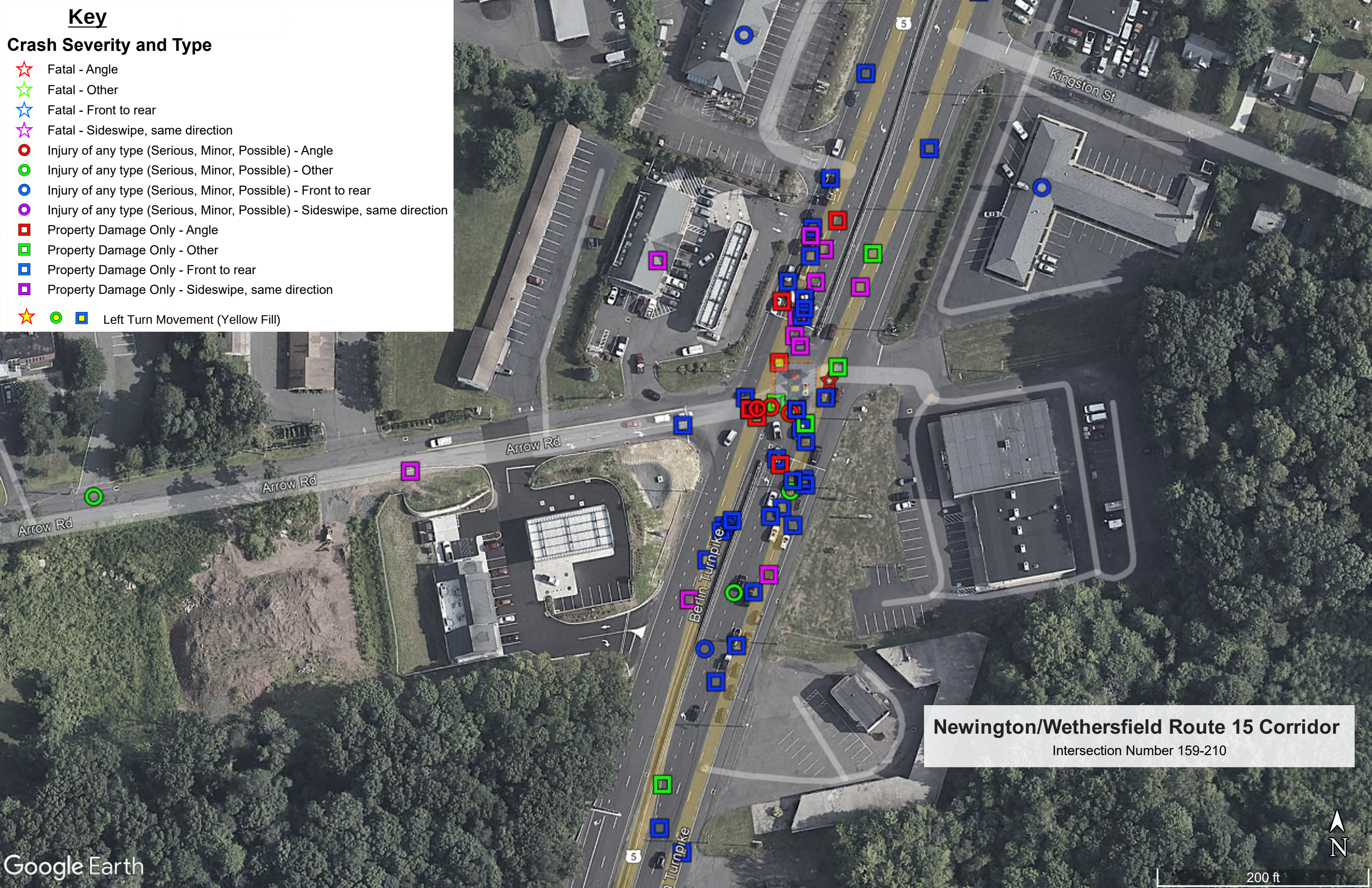


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)
- Left Turn Movement (Yellow Fill)



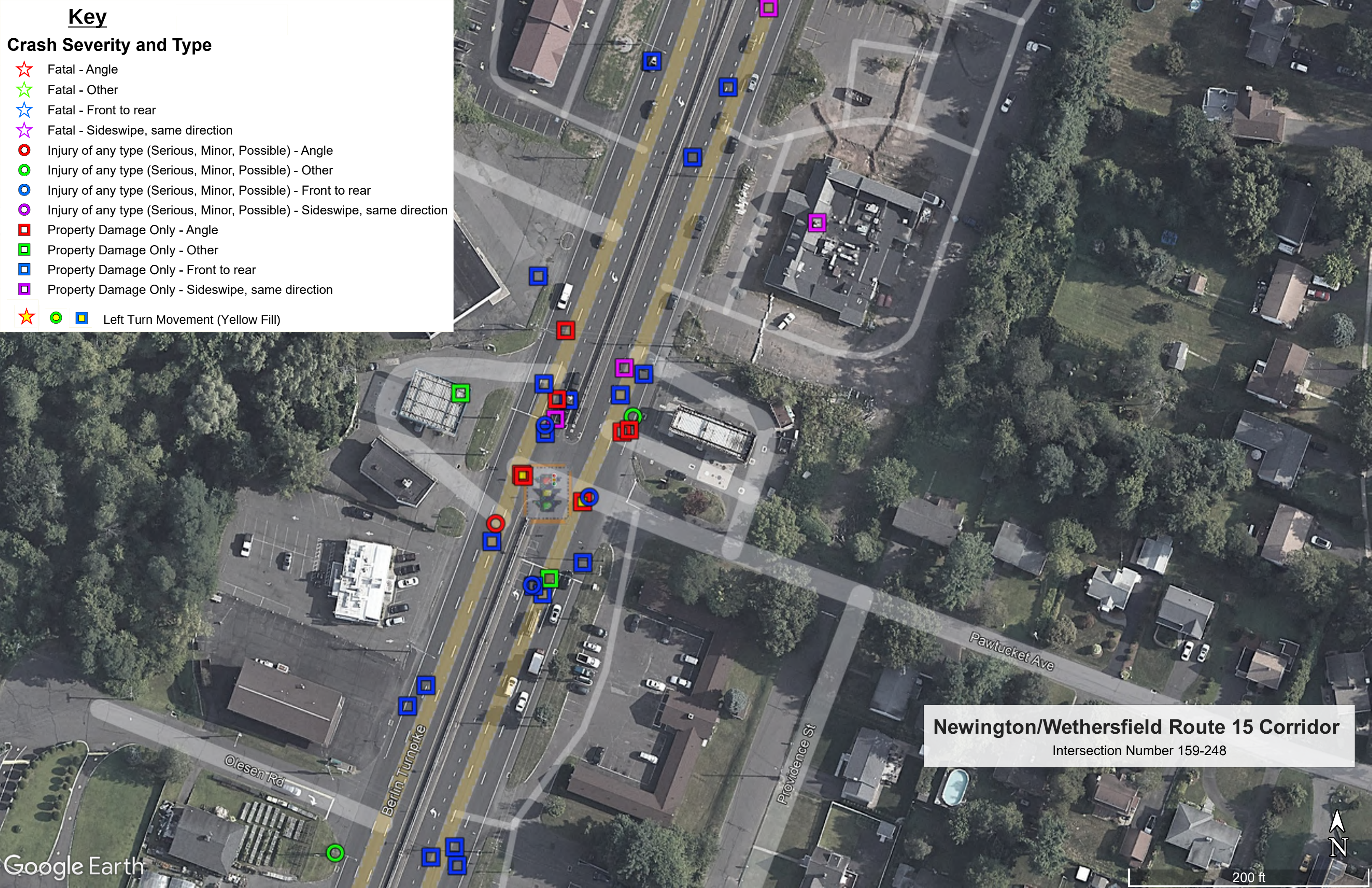
Newington/Wethersfield Route 15 Corridor
Intersection Number 159-210

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)

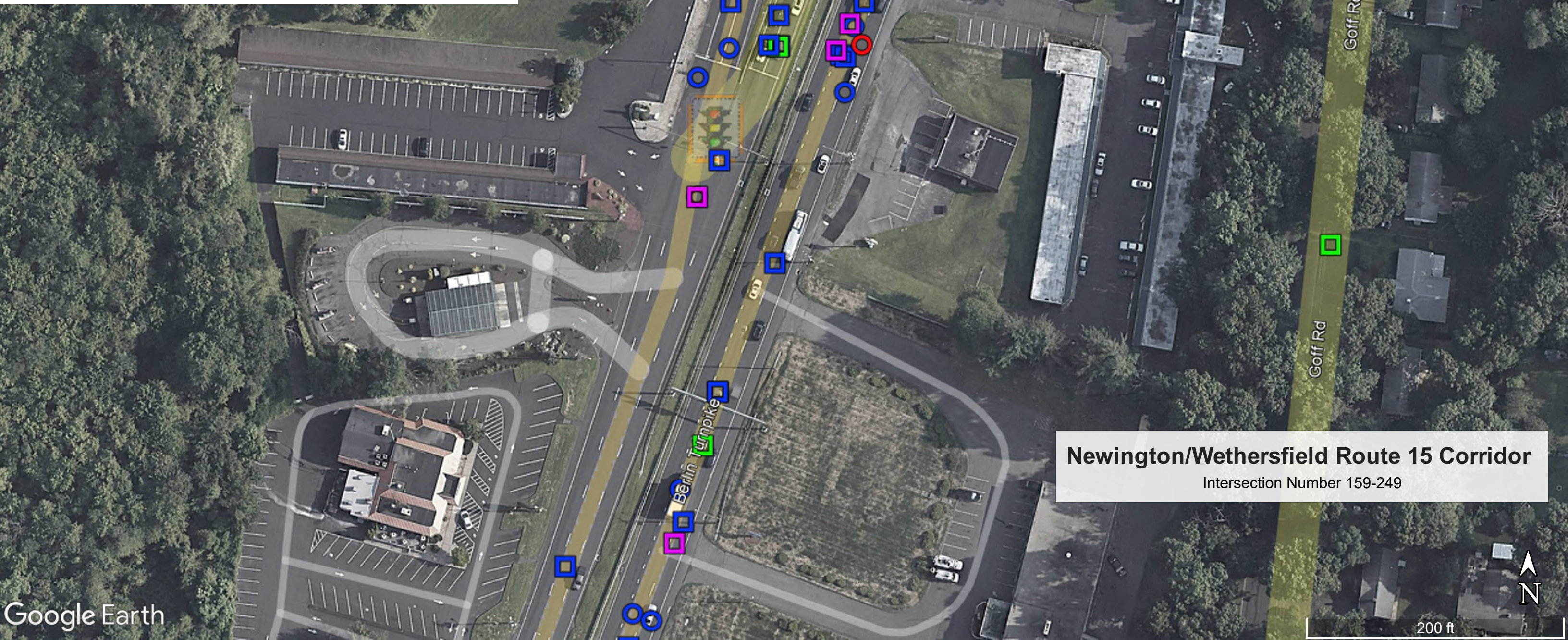


Newington/Wethersfield Route 15 Corridor
Intersection Number 159-248

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- Left Turn Movement (Yellow Fill)



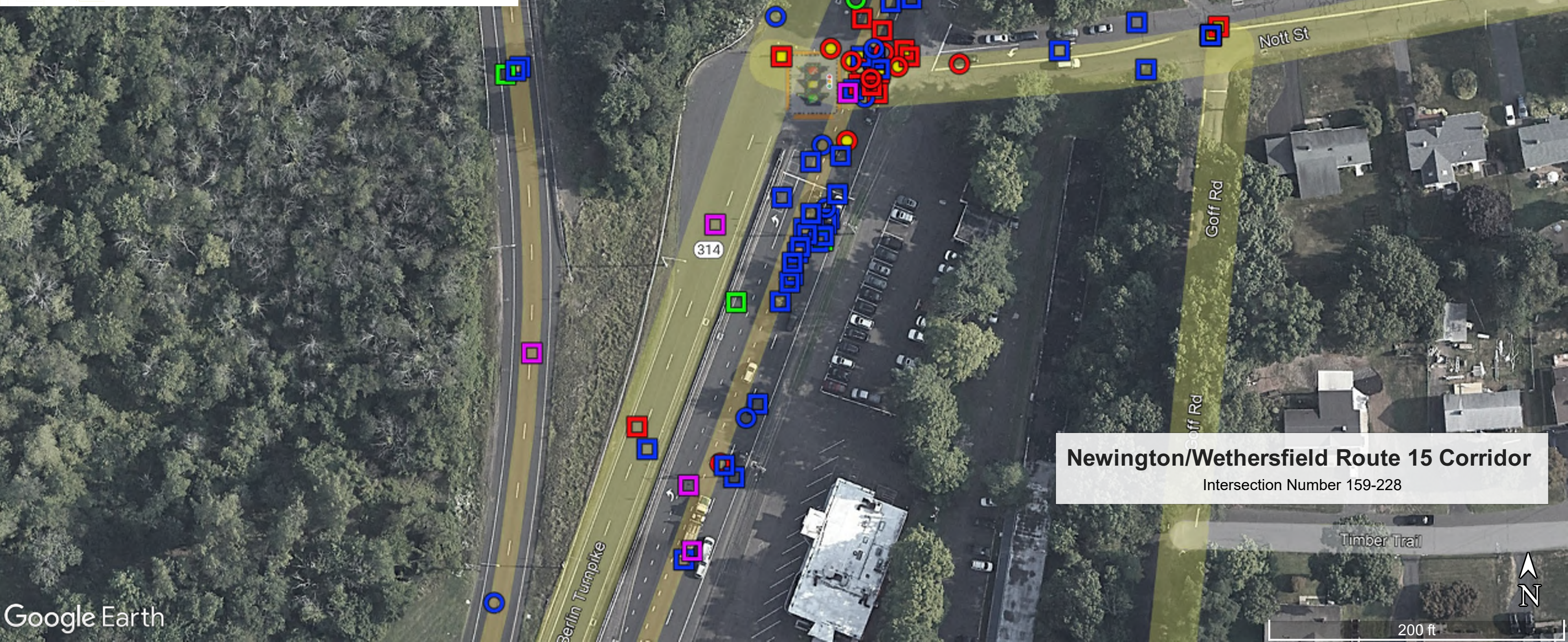
Newington/Wethersfield Route 15 Corridor
Intersection Number 159-249

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Newington/Wethersfield Route 15 Corridor
Intersection Number 159-228

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Enfield Route 5 Corridor

Intersection Number 048-243

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Key

Key

- ## Key



Enfield Route 5 Corridor

Intersection Number 048-250

Key



Key

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



Enfield Route 5 Corridor
Intersection Number 048-219

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Enfield Route 5 Corridor

Intersection Number 048-214

Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



Enfield Route 5 Corridor
Intersection Number 048-210

Key

Crash Severity and Type

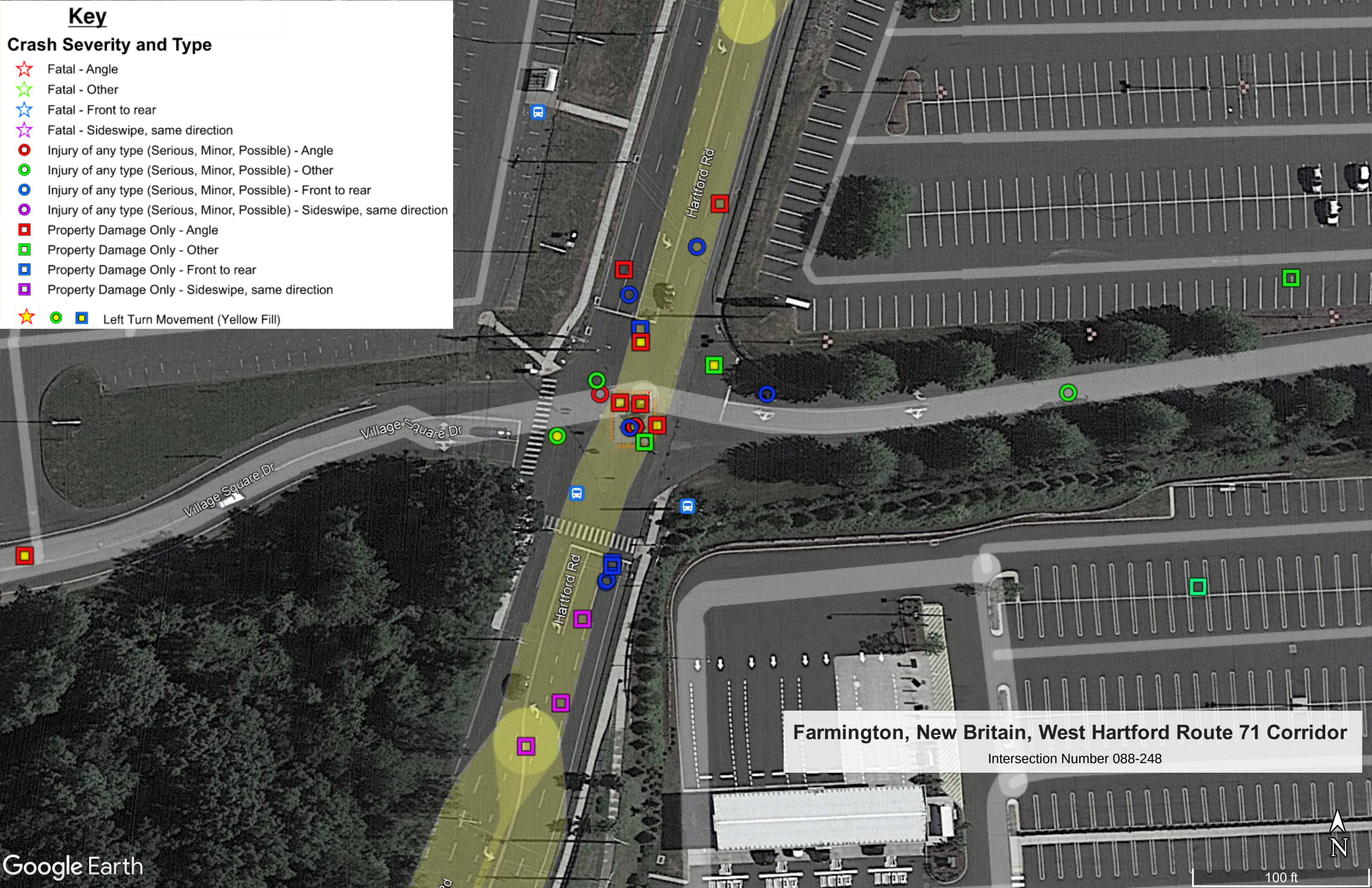
- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ ● ▣ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)

Farmington, New Britain, West Hartford Route 71 Corridor
Intersection Number 088-283

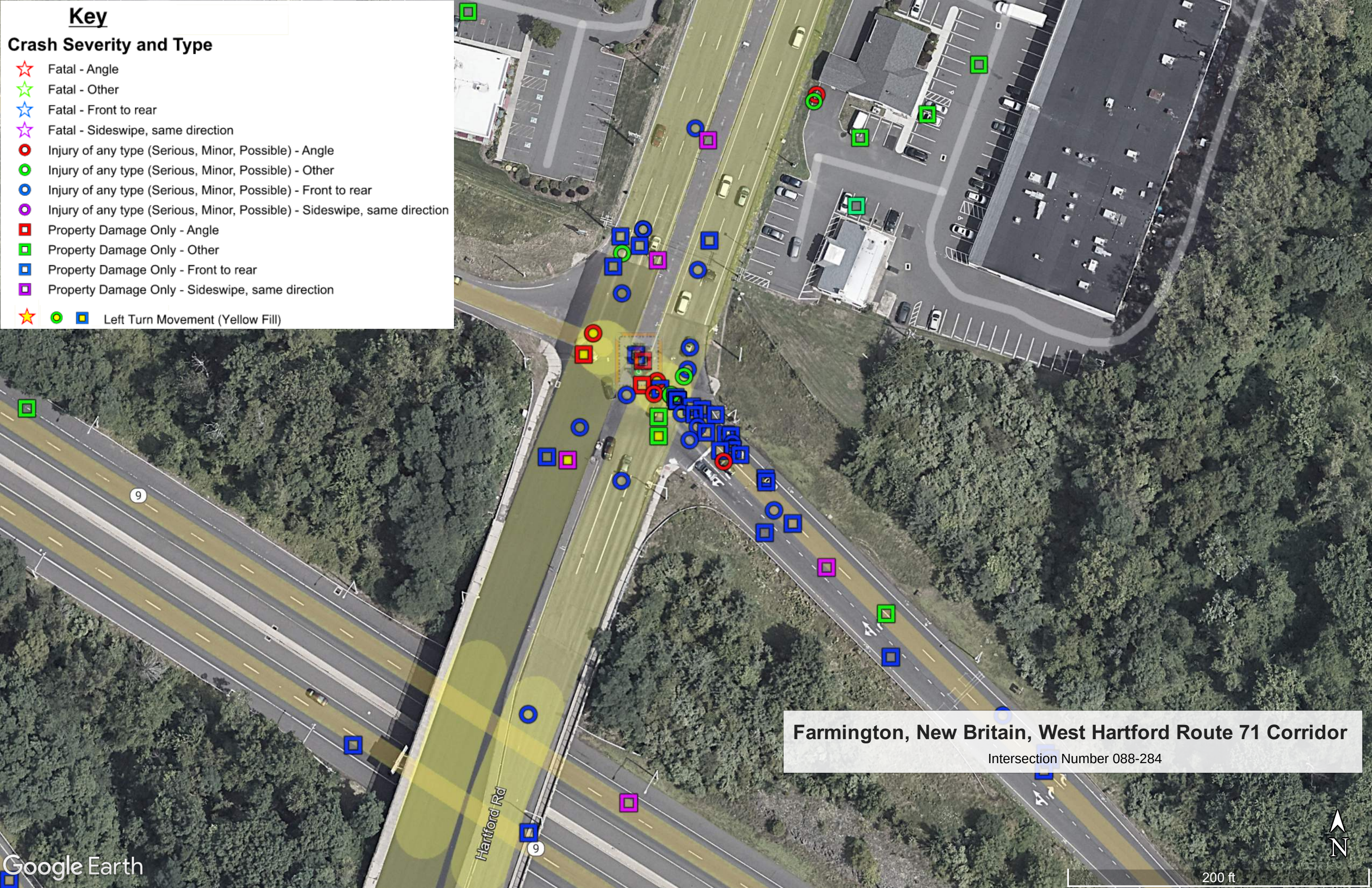


100 ft

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ○ ■ Left Turn Movement (Yellow Fill)

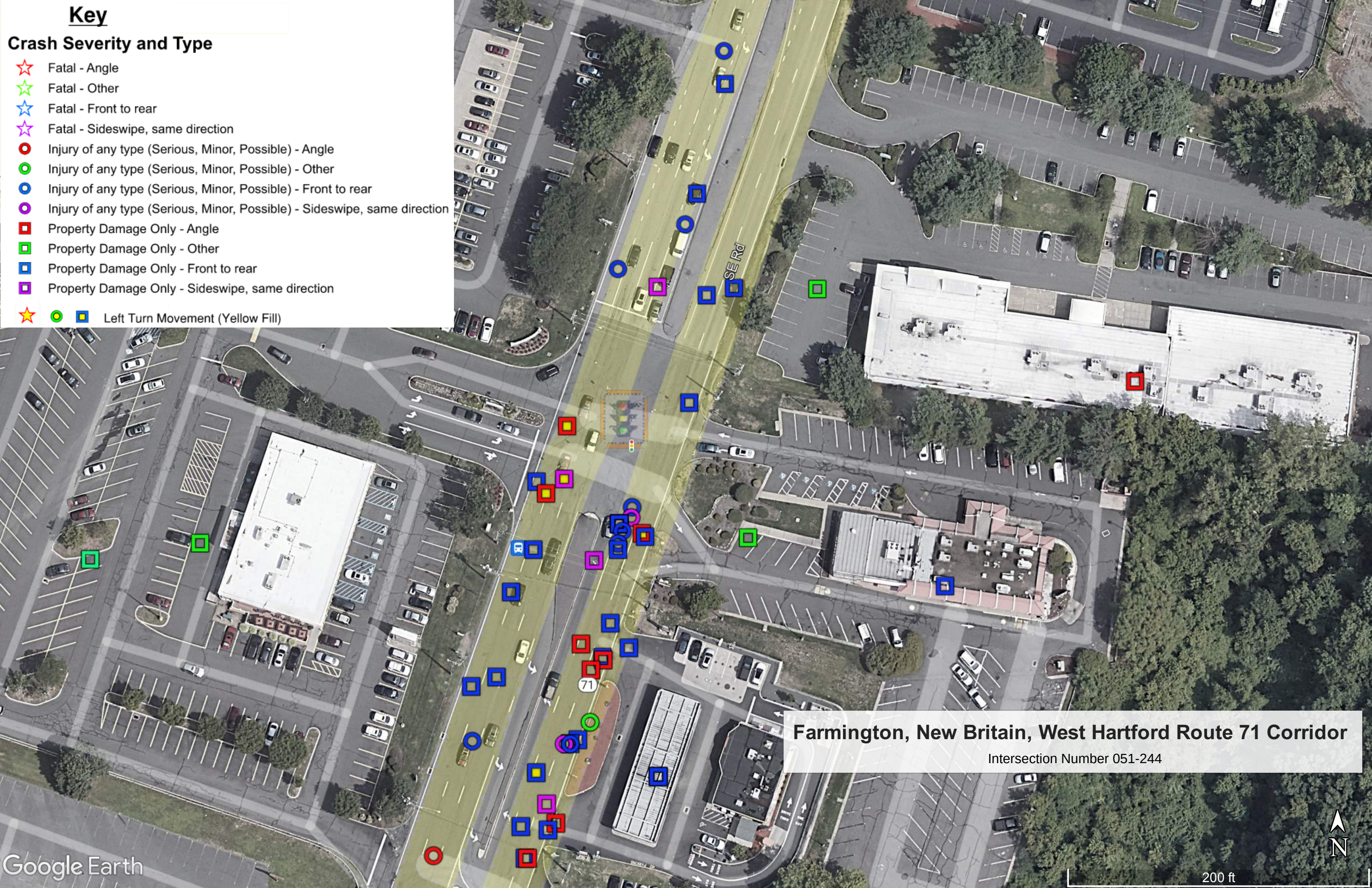


Farmington, New Britain, West Hartford Route 71 Corridor
Intersection Number 088-284

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ● ■ Left Turn Movement (Yellow Fill)



Farmington, New Britain, West Hartford Route 71 Corridor
Intersection Number 051-244

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

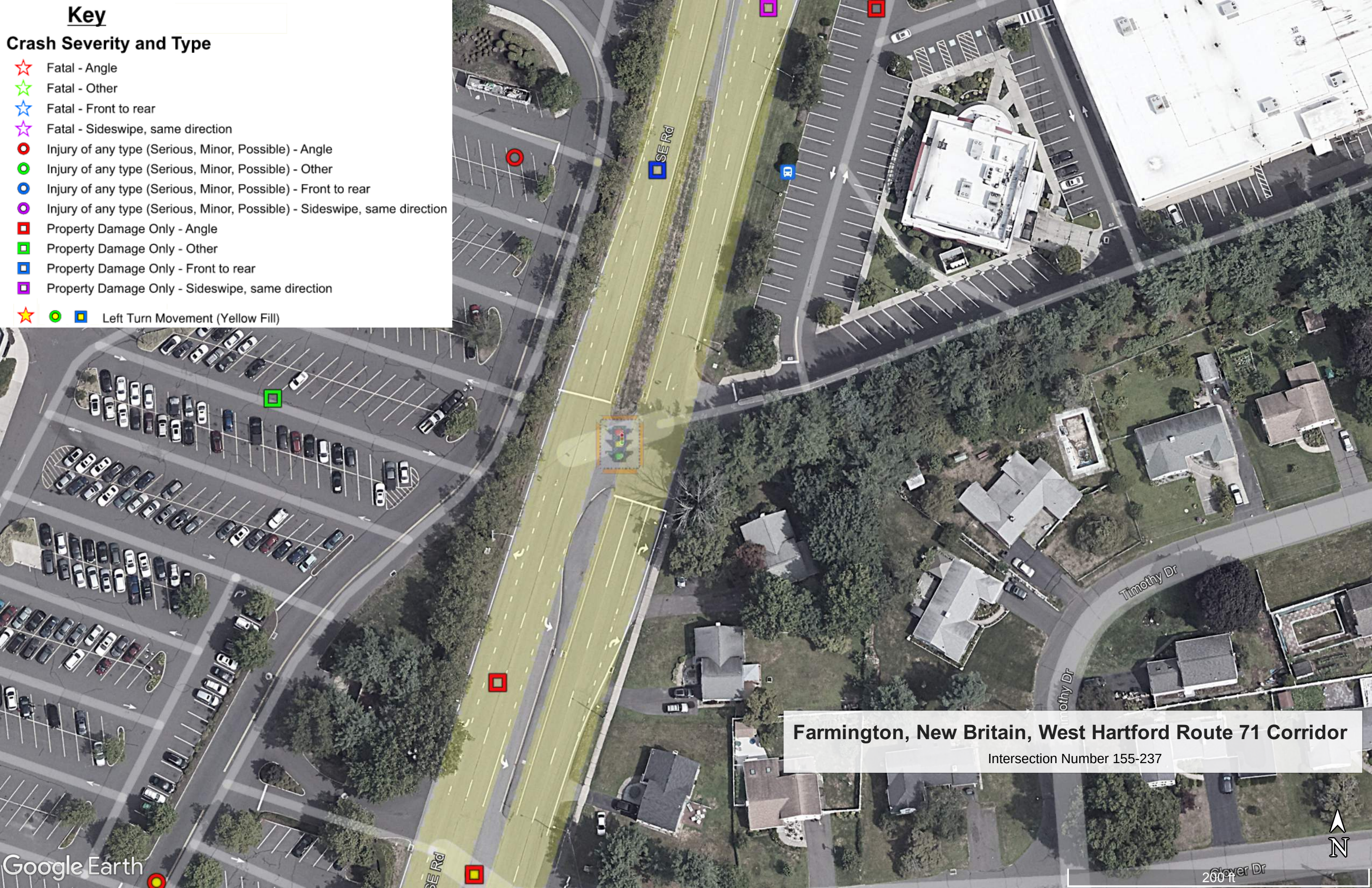
- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

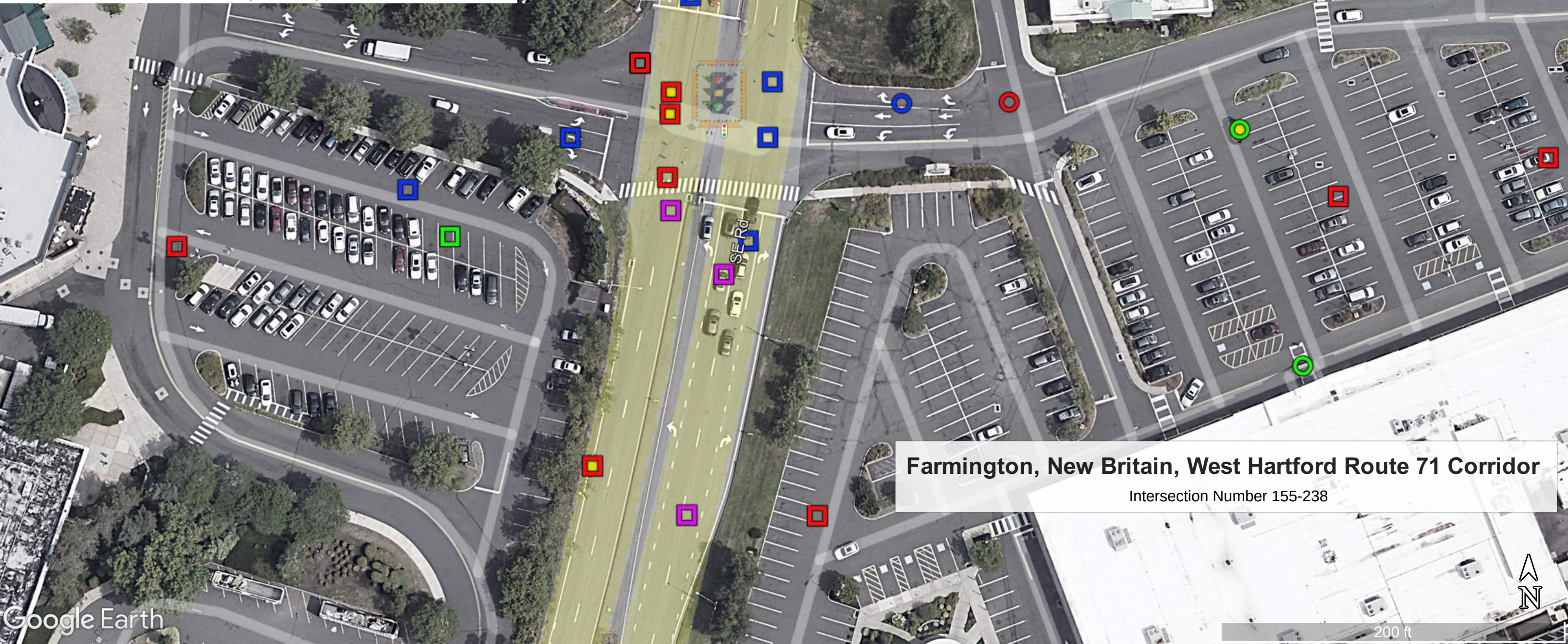
- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Farmington, New Britain, West Hartford Route 71 Corridor
Intersection Number 155-238

Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

● Injury of any type (Serious, Minor, Possible) - Angle

● Injury of any type (Serious, Minor, Possible) - Other

● Injury of any type (Serious, Minor, Possible) - Front to rear

● Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

■ Property Damage Only - Angle

■ Property Damage Only - Other

■ Property Damage Only - Front to rear

■ Property Damage Only - Sideswipe, same direction

★ ● ■

Left Turn Movement (Yellow Fill)

The figure is an aerial map of the Rocky Hill Routes 3,99,411 Corridor, specifically focusing on the intersection of Inwood Rd and a major corridor. The map displays various crash data points categorized by severity and type, as defined in the key. The key includes symbols for Fatal (stars), Injury of any type (circles), and Property Damage Only (squares), with colors indicating the type of crash (Angle, Other, Front to rear, Sideswipe, same direction). The map also shows a yellow-filled area for Left Turn Movement. The intersection is marked with a traffic light symbol. The map includes a title box in the bottom right corner, a north arrow, and a scale bar (100 ft).

Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-235

Google Earth

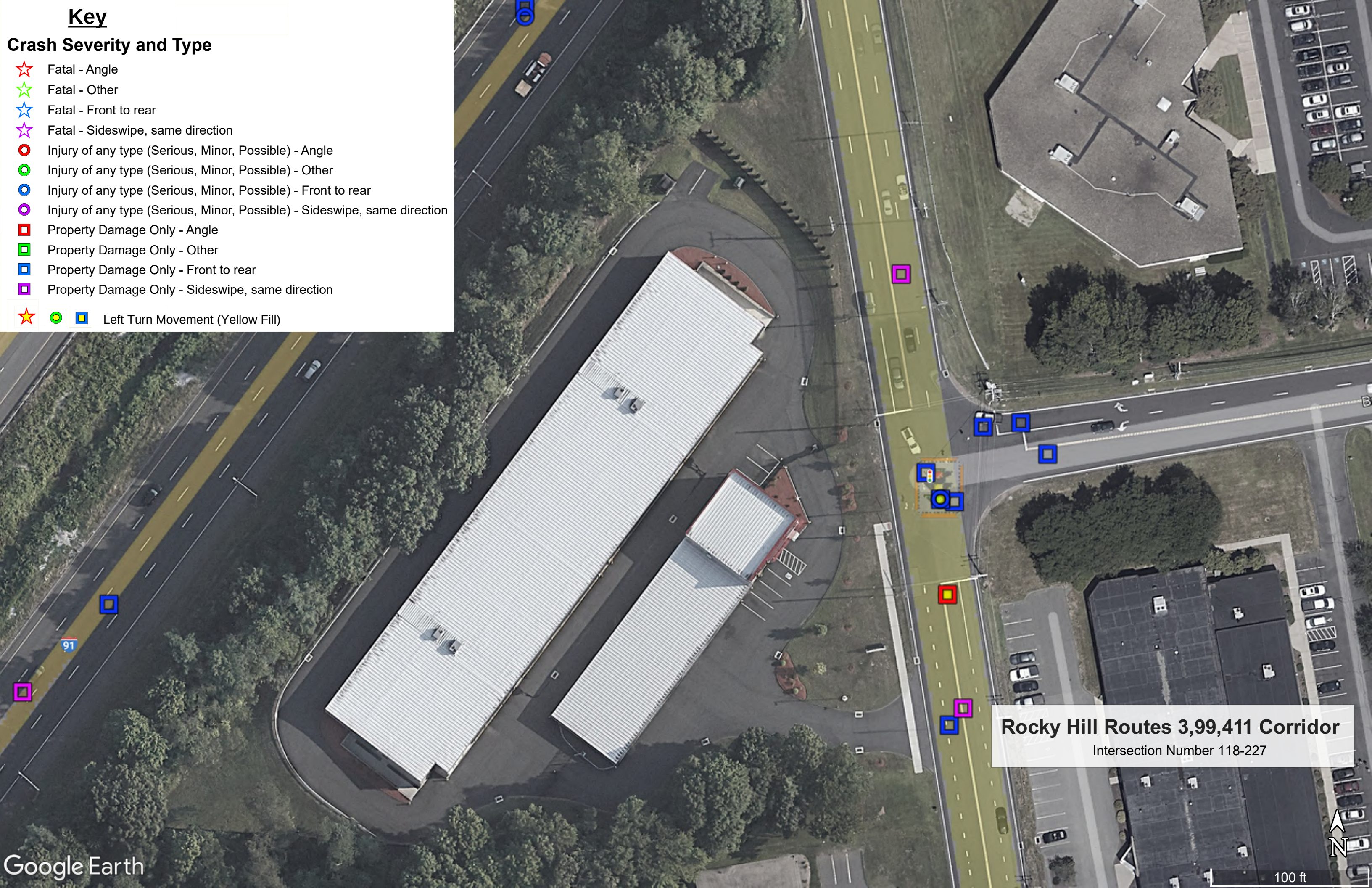
100 ft

Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)

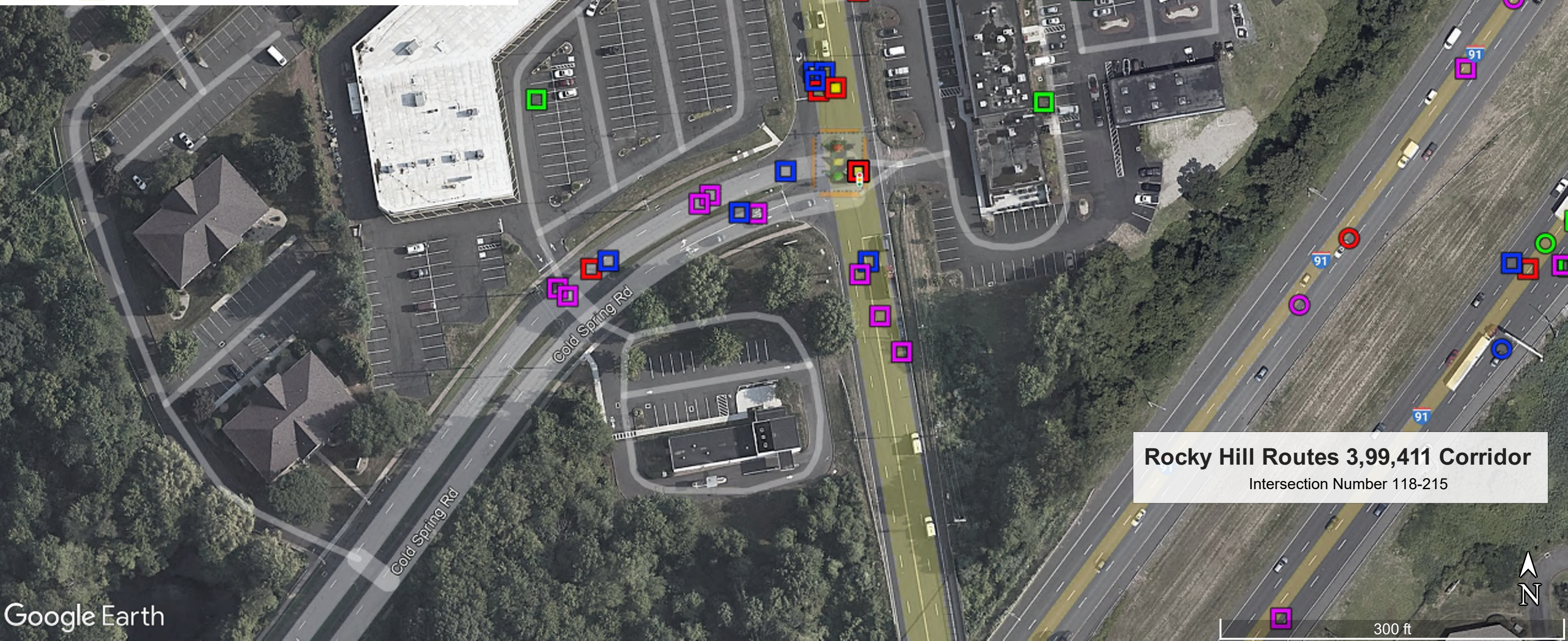


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

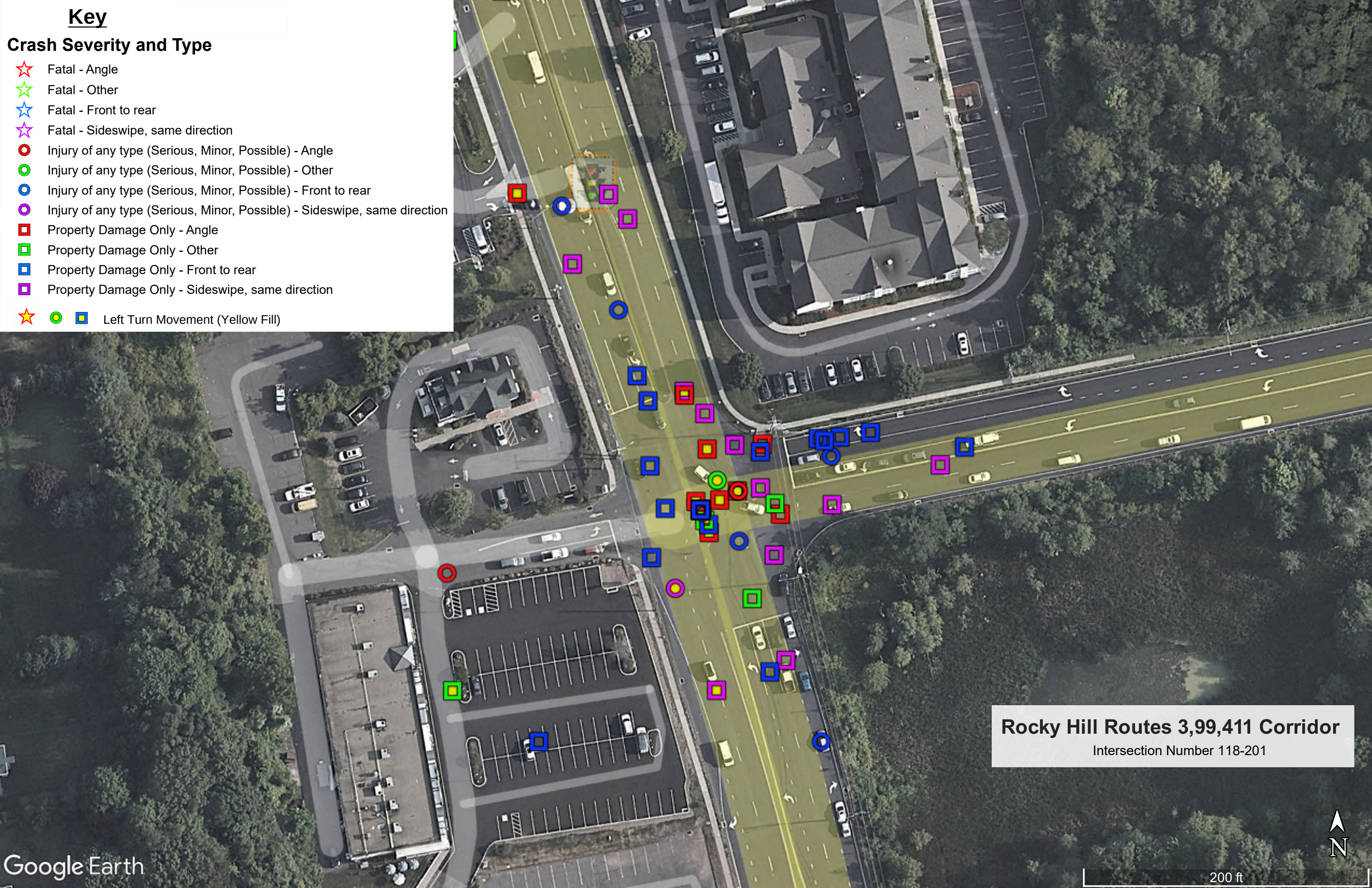
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

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Left Turn Movement (Yellow Fill)

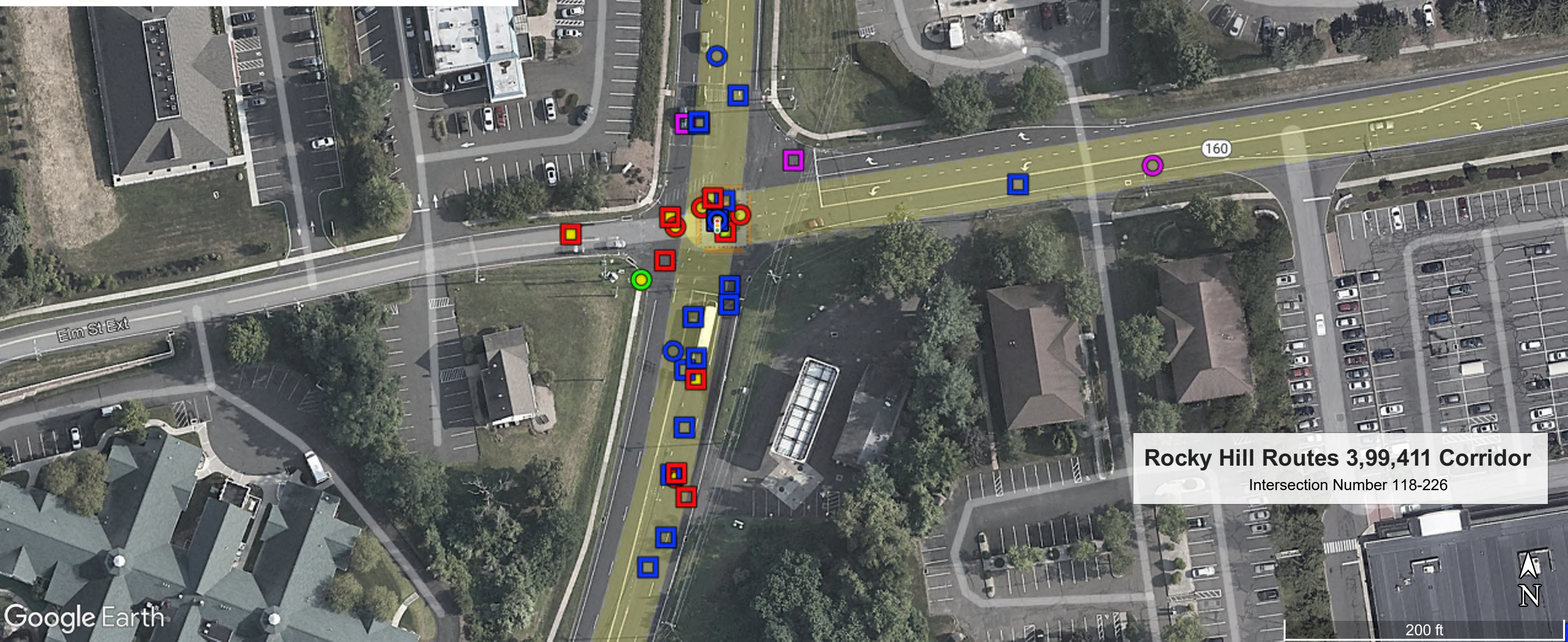


Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-201

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-226

Key

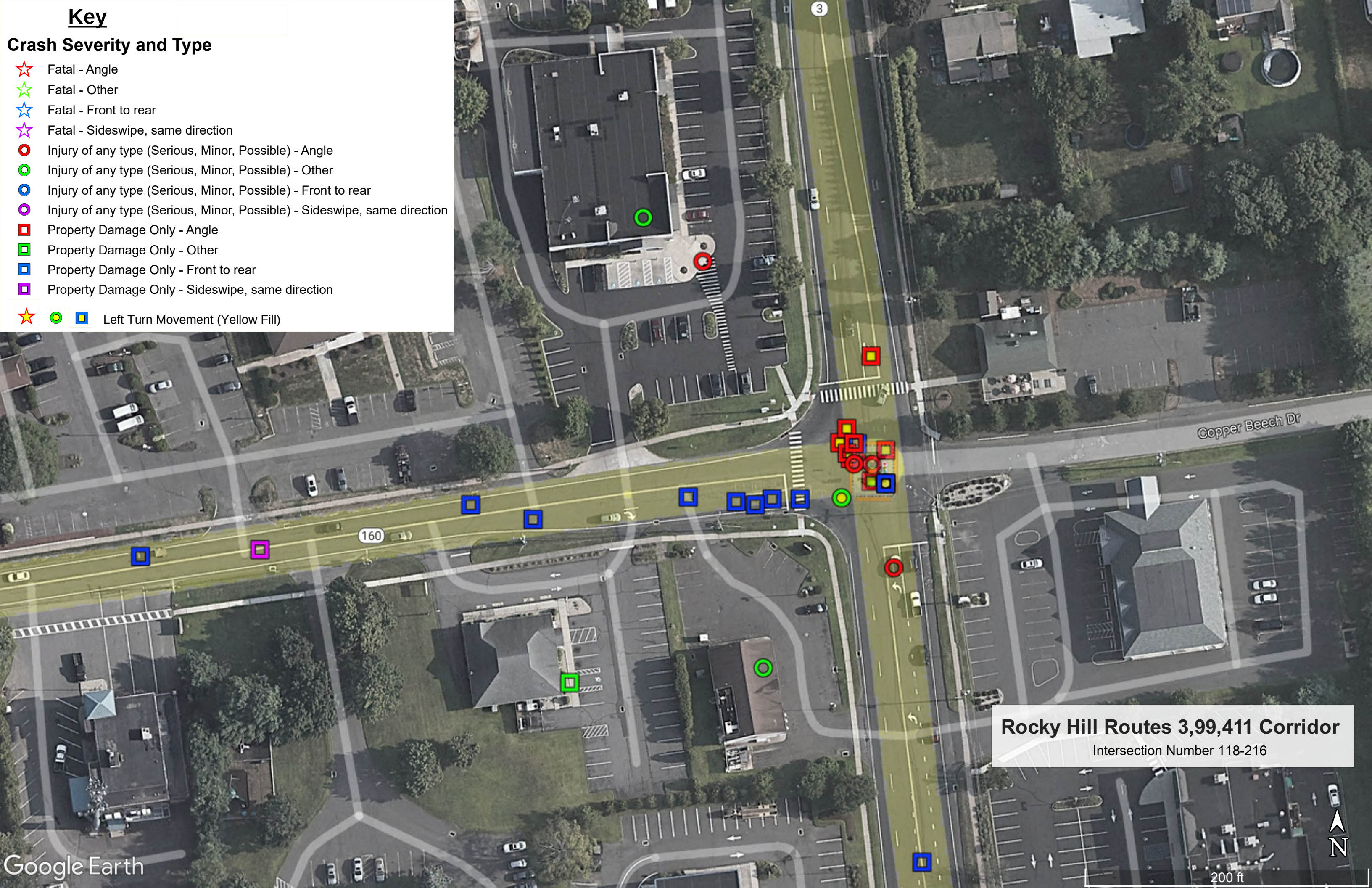
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

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Left Turn Movement (Yellow Fill)

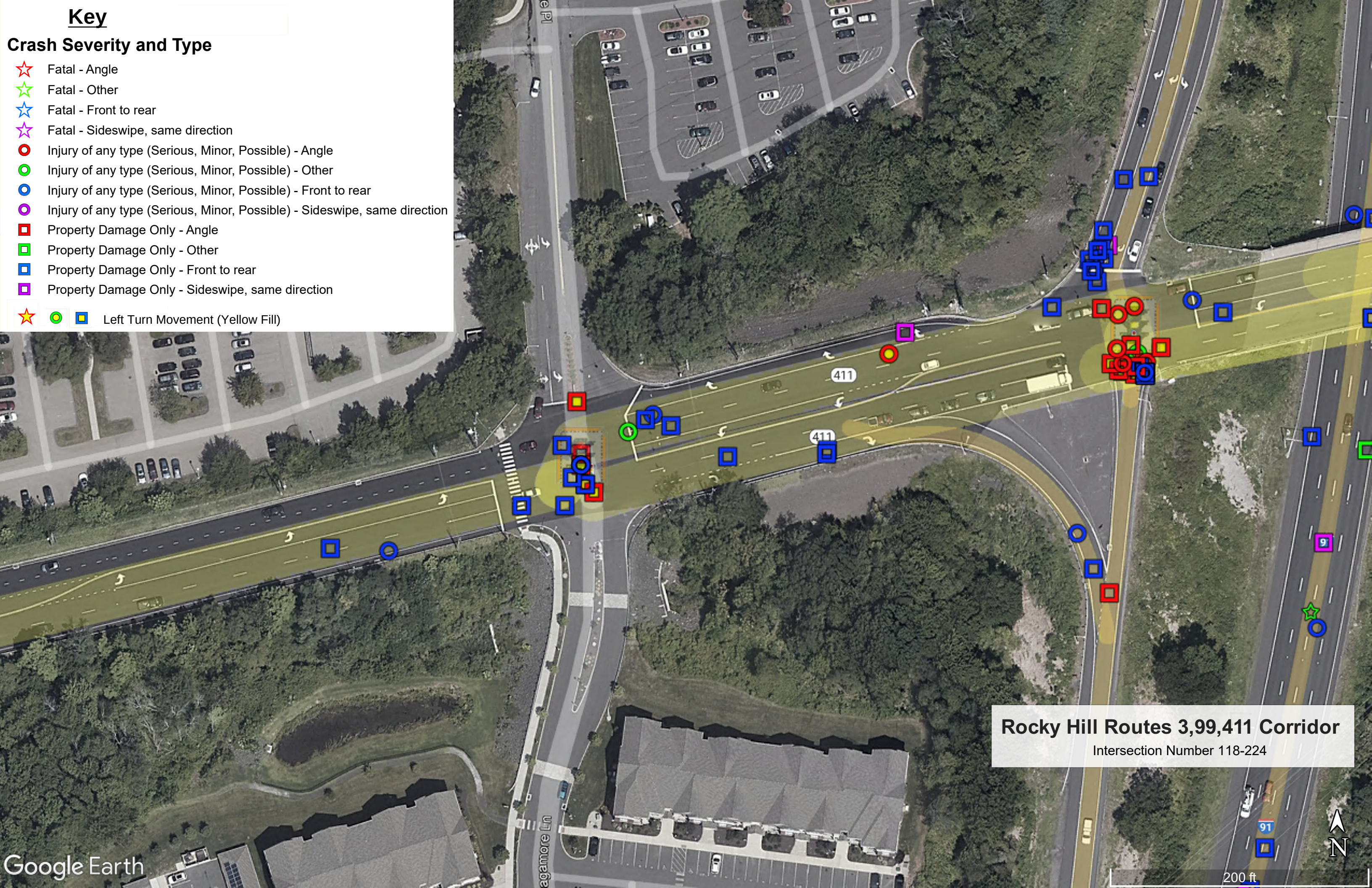


Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-216

Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



Rocky Hill Routes 3,99,411 Corridor

Intersection Number 118-224

Key

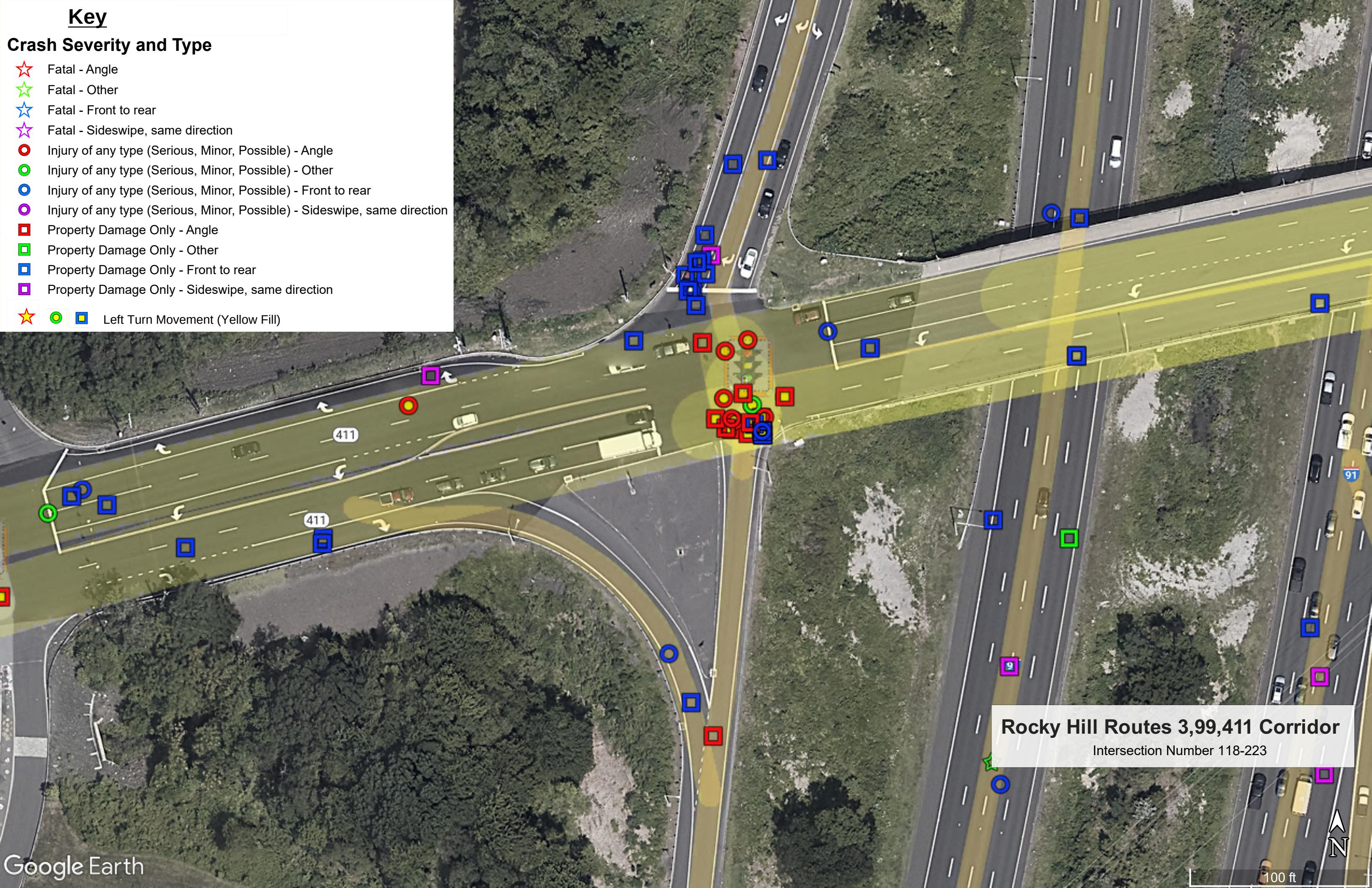
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

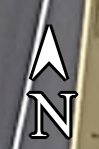
●

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Left Turn Movement (Yellow Fill)



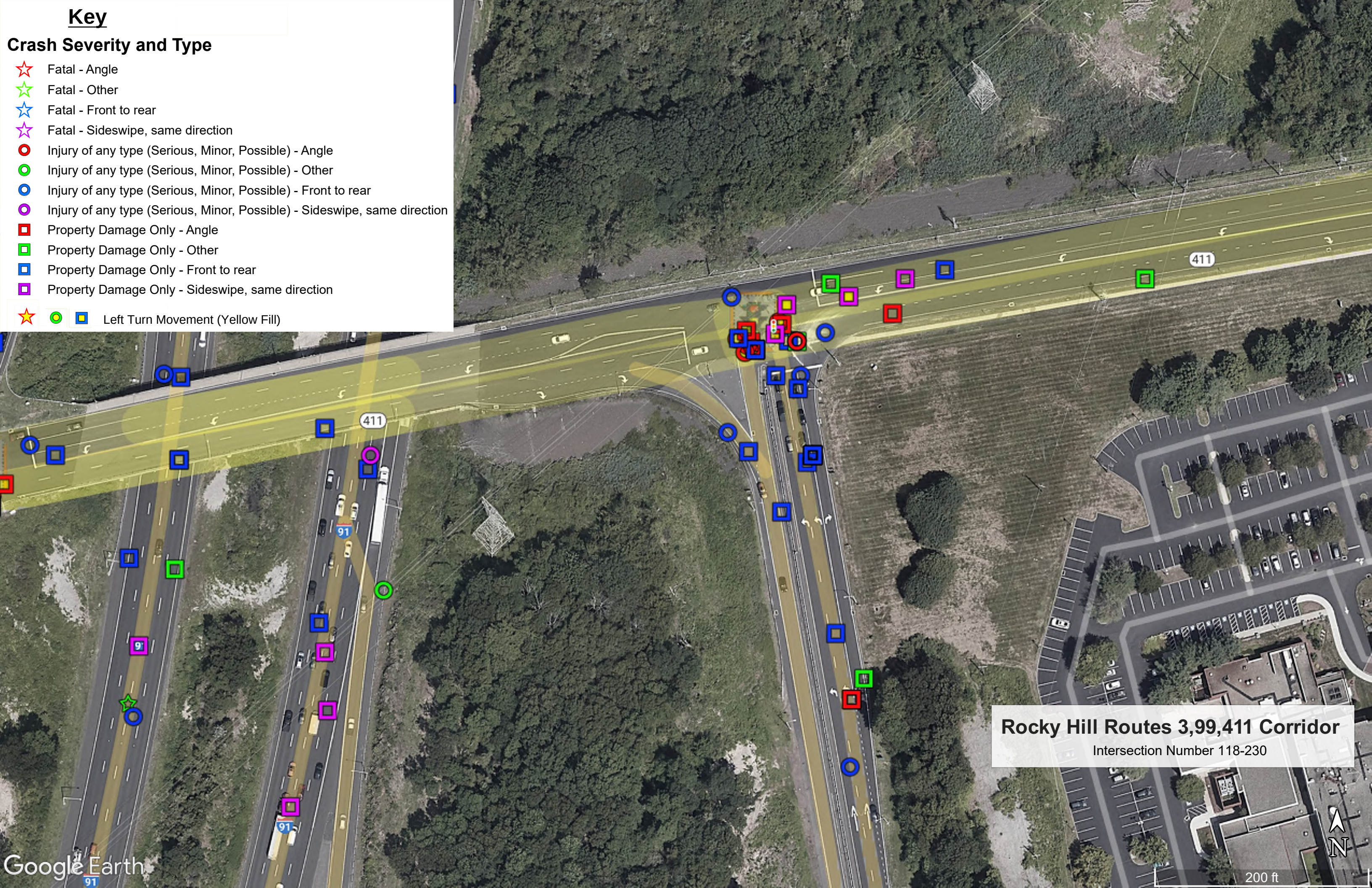
Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-223



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Rocky Hill Routes 3,99,411 Corridor

Intersection Number 118-234

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-237

Key

Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

○

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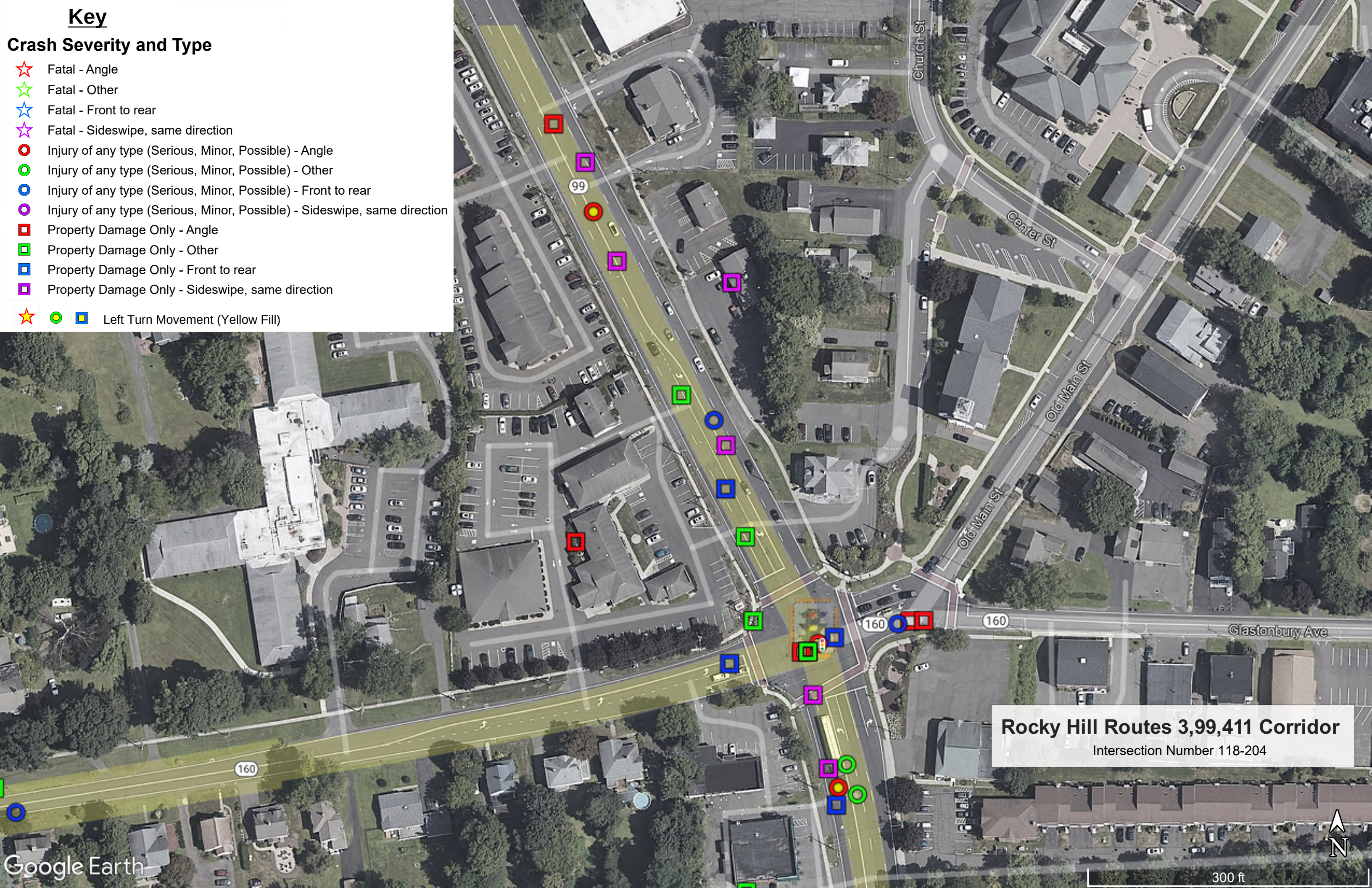
Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

	Fatal - Angle
	Fatal - Other
	Fatal - Front to rear
	Fatal - Sideswipe, same direction
	Injury of any type (Serious, Minor, Possible) - Angle
	Injury of any type (Serious, Minor, Possible) - Other
	Injury of any type (Serious, Minor, Possible) - Front to rear
	Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
	Property Damage Only - Angle
	Property Damage Only - Other
	Property Damage Only - Front to rear
	Property Damage Only - Sideswipe, same direction
	Left Turn Movement (Yellow Fill)
	

Key

Crash Severity and Type

	Fatal - Angle
	Fatal - Other
	Fatal - Front to rear
	Fatal - Sideswipe, same direction
	Injury of any type (Serious, Minor, Possible) - Angle
	Injury of any type (Serious, Minor, Possible) - Other
	Injury of any type (Serious, Minor, Possible) - Front to rear
	Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
	Property Damage Only - Angle
	Property Damage Only - Other
	Property Damage Only - Front to rear
	Property Damage Only - Sideswipe, same direction
	Left Turn Movement (Yellow Fill)
	

- ## Key
- ### Crash Severity and Type
- | | |
|---|---|
|  | Fatal - Angle |
|  | Fatal - Other |
|  | Fatal - Front to rear |
|  | Fatal - Sideswipe, same direction |
|  | Injury of any type (Serious, Minor, Possible) - Angle |
|  | Injury of any type (Serious, Minor, Possible) - Other |
|  | Injury of any type (Serious, Minor, Possible) - Front to rear |
|  | Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction |
|  | Property Damage Only - Angle |
|  | Property Damage Only - Other |
|  | Property Damage Only - Front to rear |
|  | Property Damage Only - Sideswipe, same direction |
|  | Left Turn Movement (Yellow Fill) |
|  | |

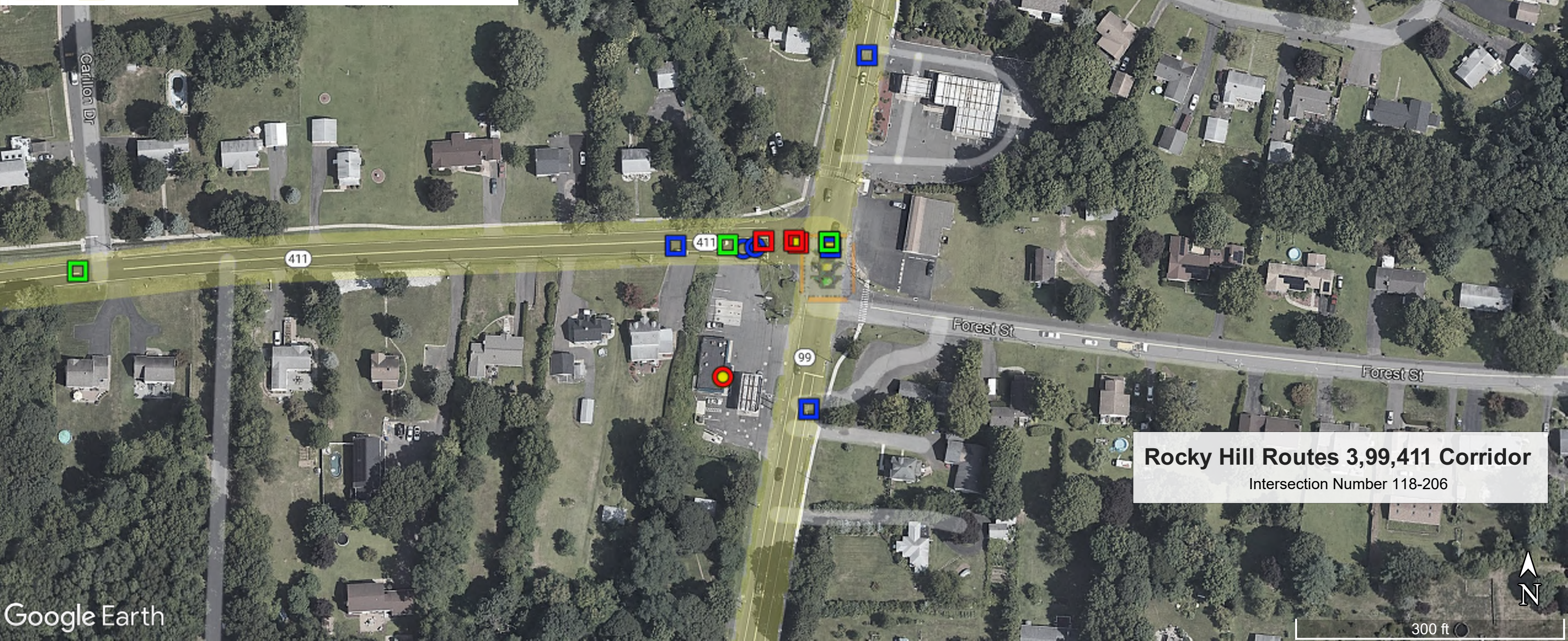


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)

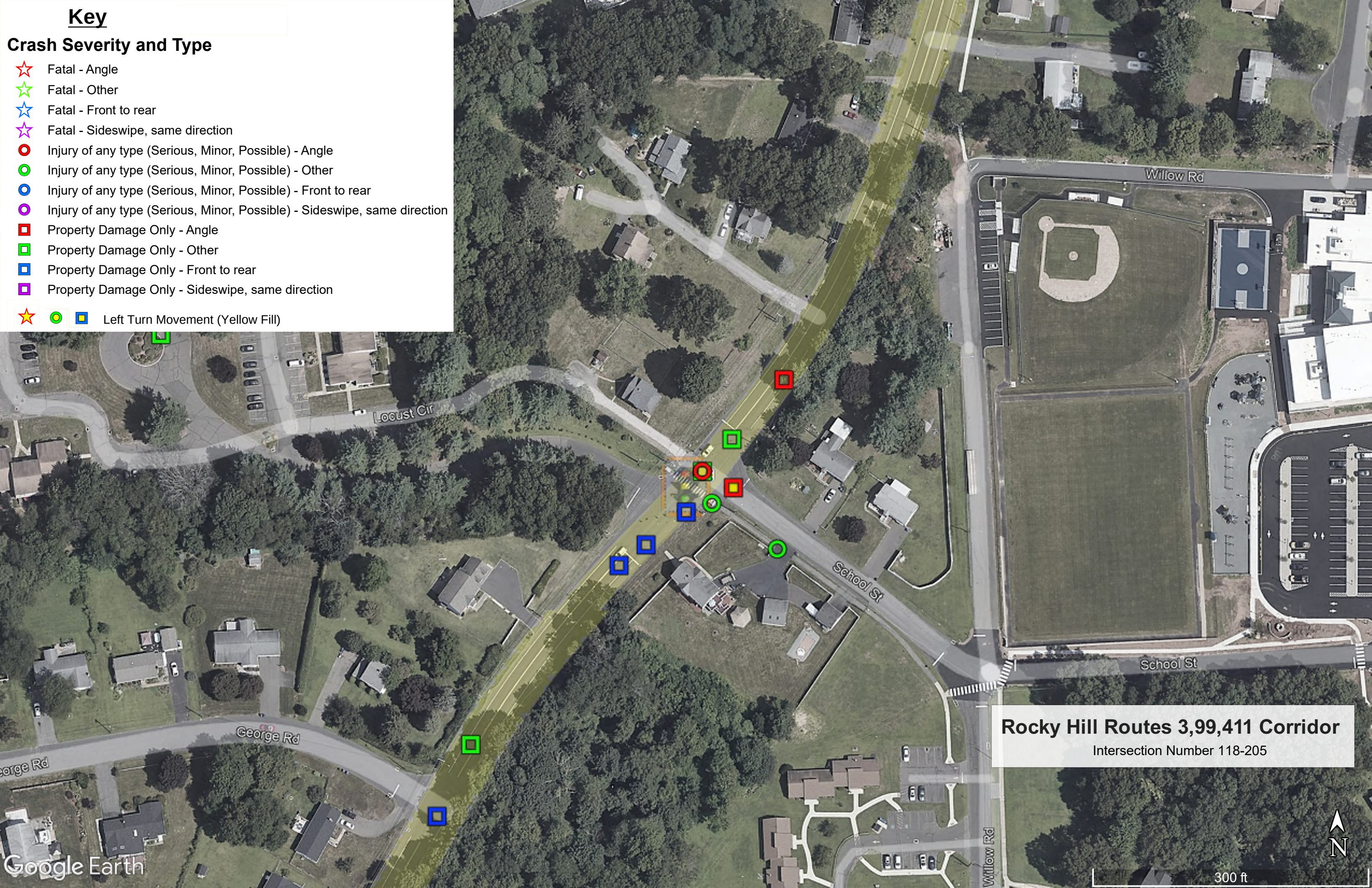


Rocky Hill Routes 3,99,411 Corridor
Intersection Number 118-206

Key

Crash Severity and Type

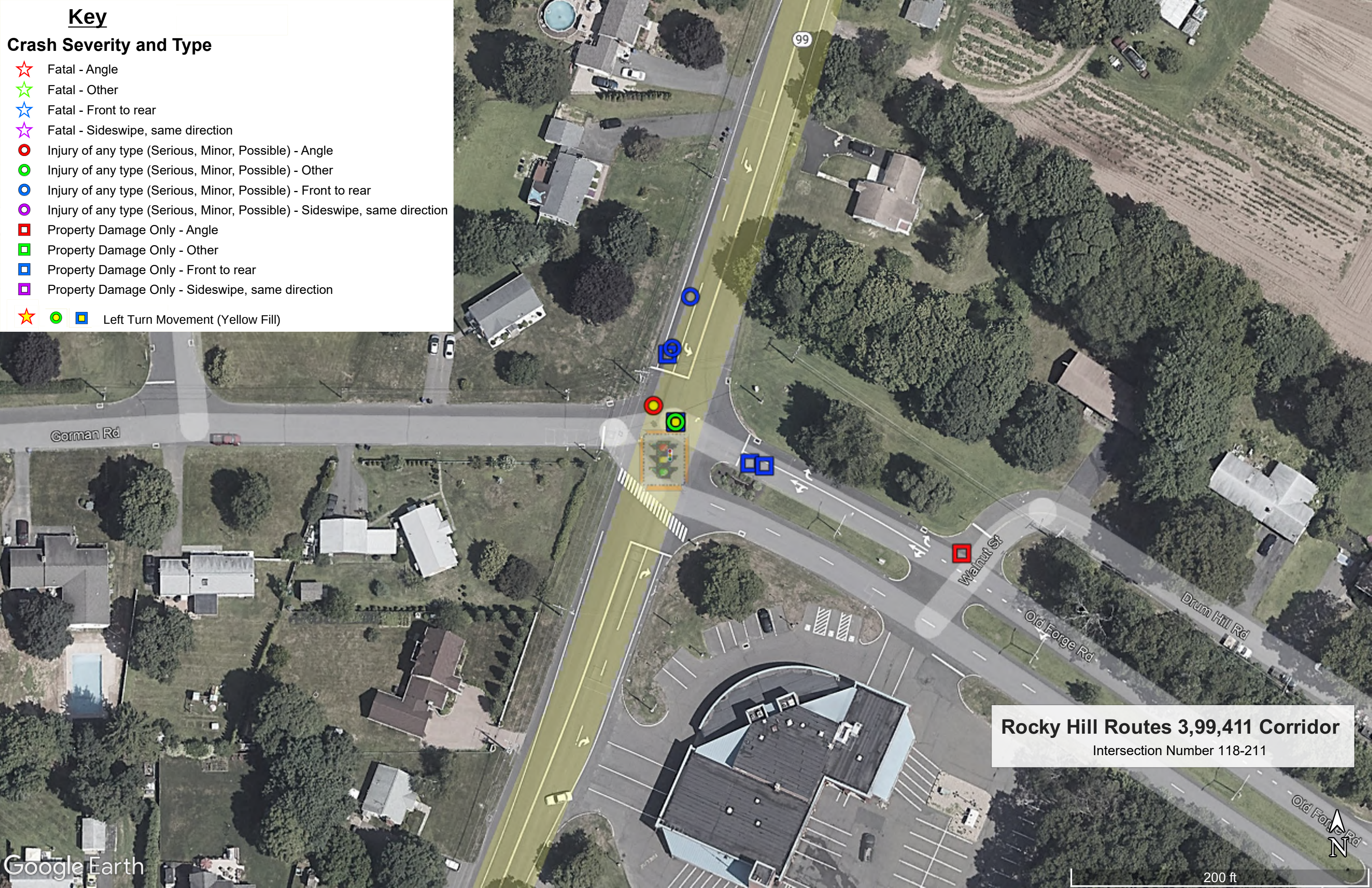
- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

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Left Turn Movement (Yellow Fill)



Simsbury Routes 10 & 202 South End Corridor
Intersection Number 128-216

Key

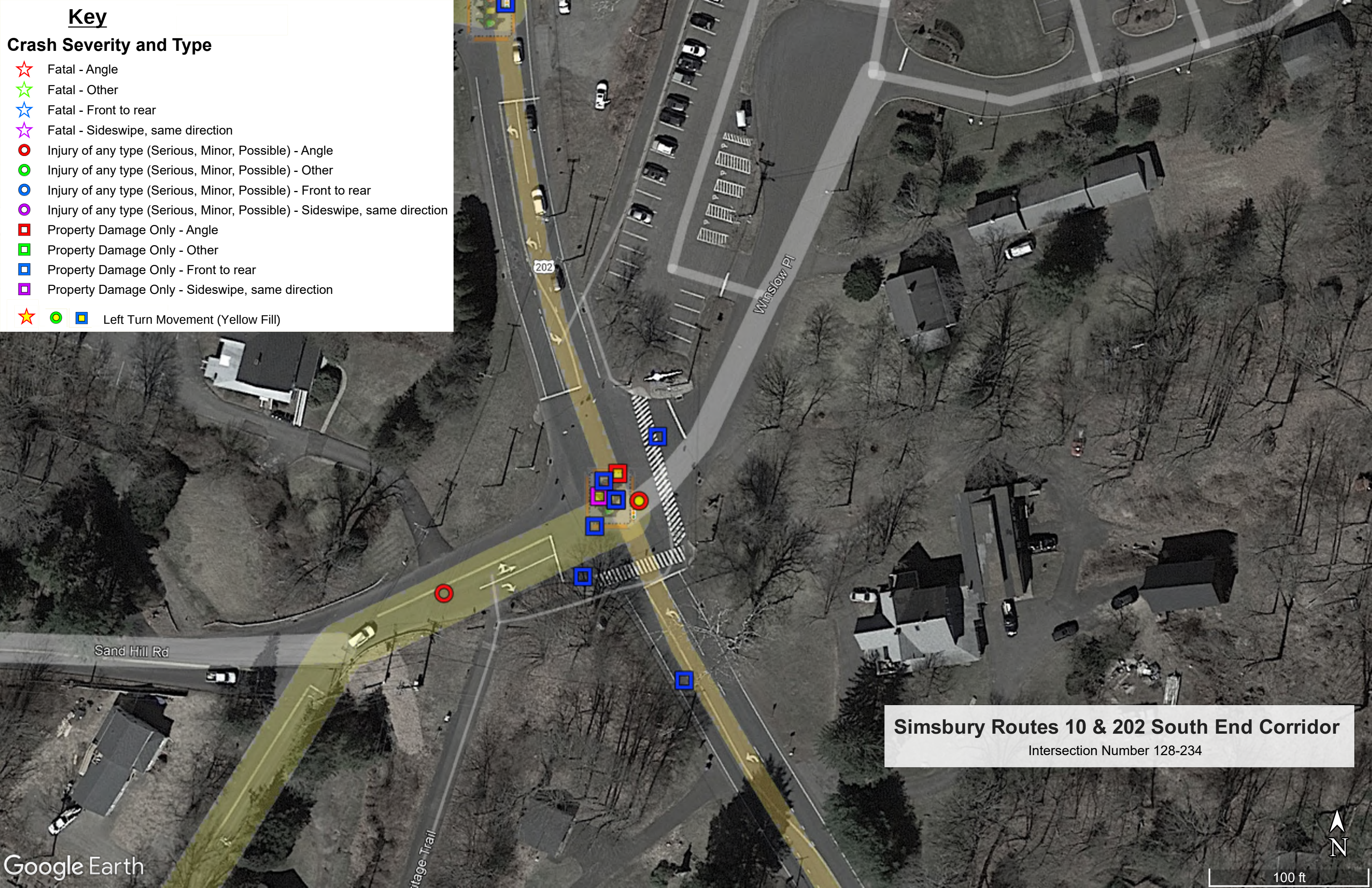
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



Key

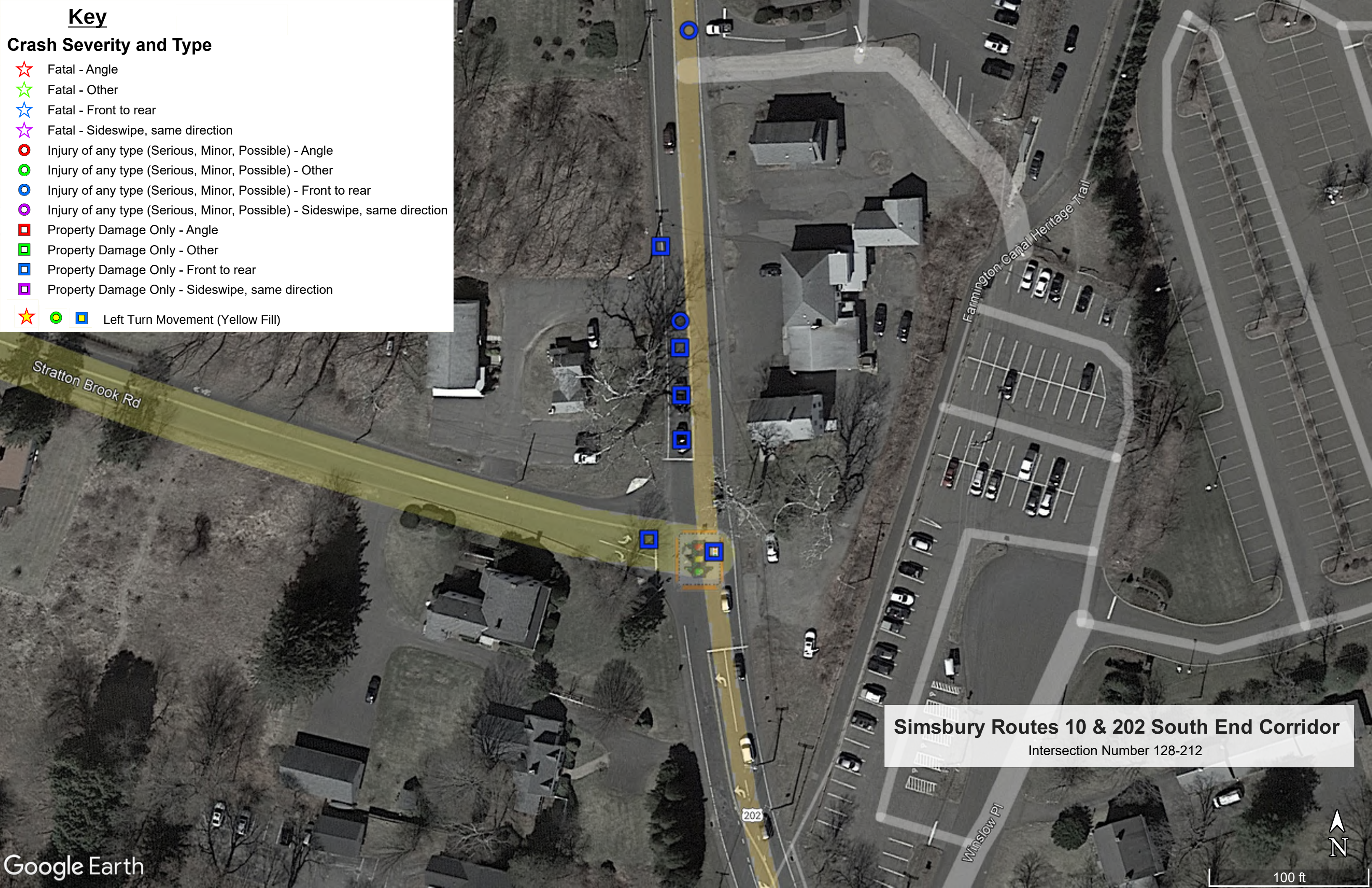
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



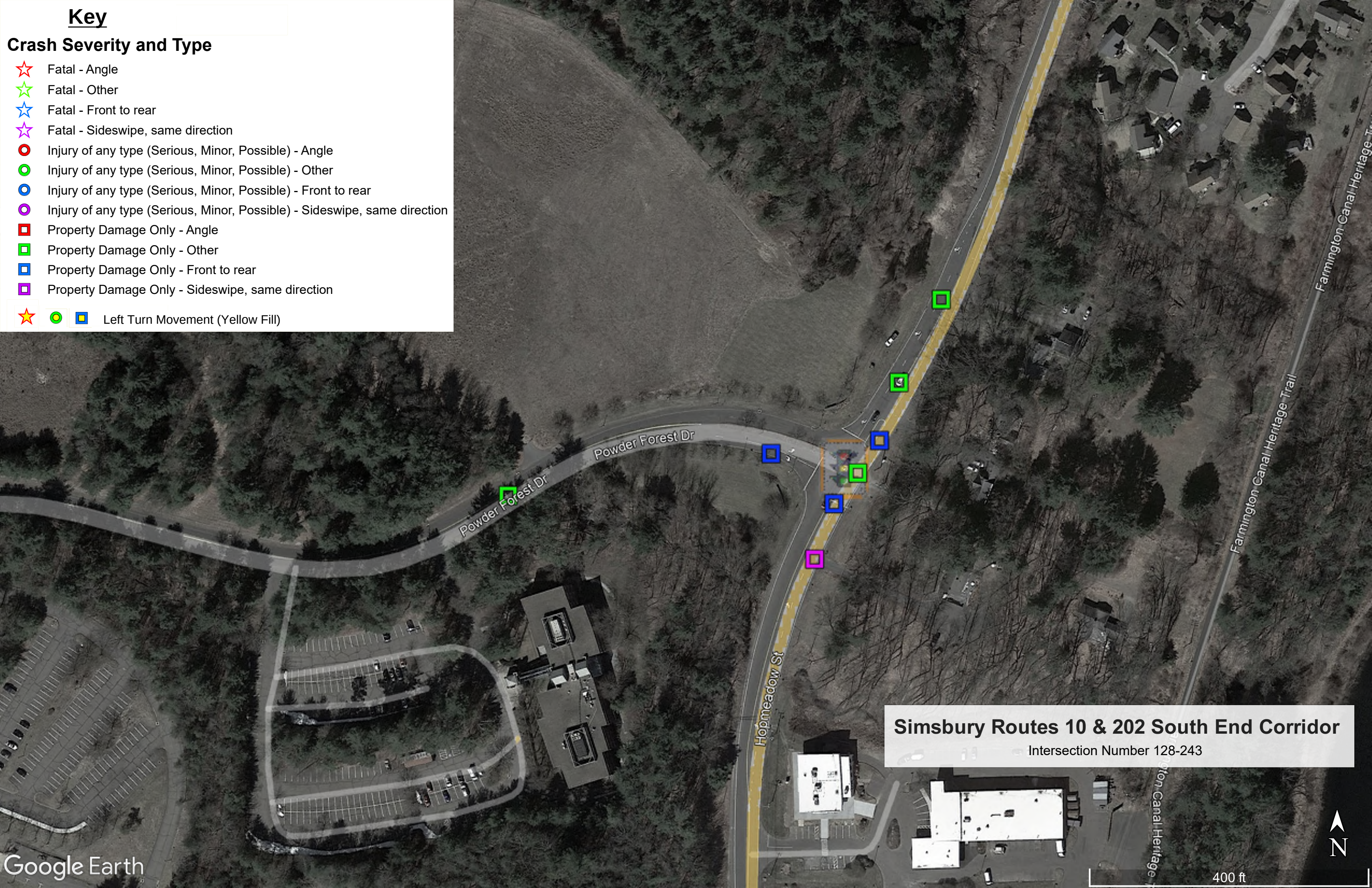
Simsbury Routes 10 & 202 South End Corridor
Intersection Number 128-212

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Simsbury Routes 10 & 202 South End Corridor

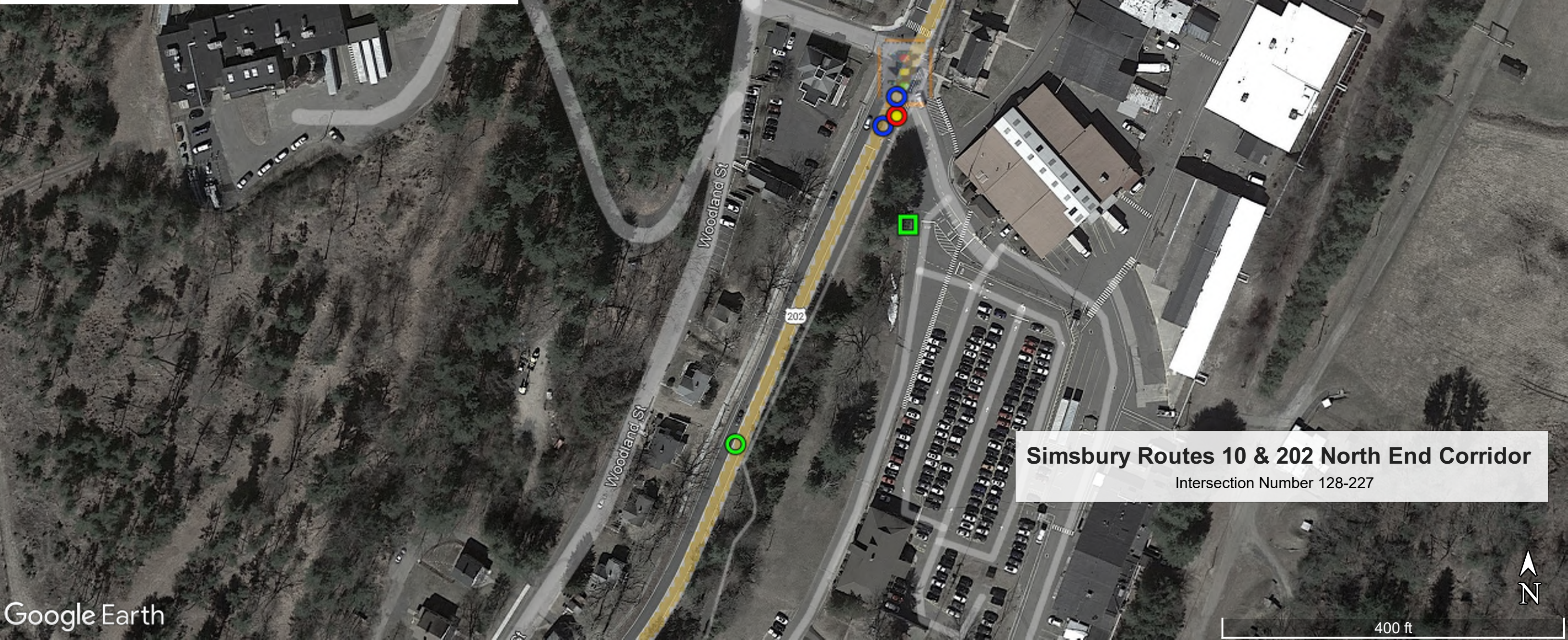
Intersection Number 128-243

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Simsbury Routes 10 & 202 North End Corridor

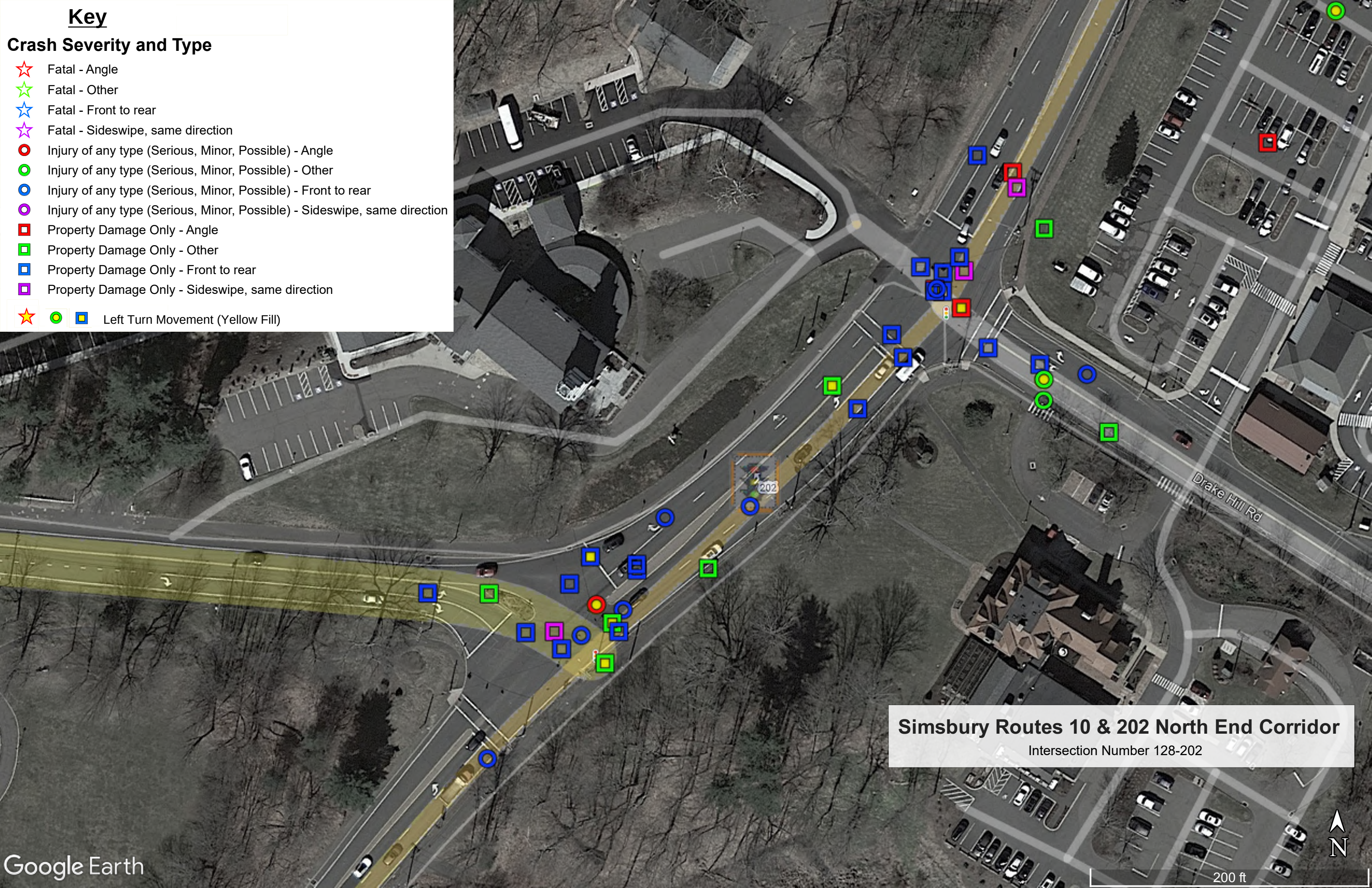
Intersection Number 128-215

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ Left Turn Movement (Yellow Fill)



Simsbury Routes 10 & 202 North End Corridor

Intersection Number 128-202

Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

○

□

Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

★

Fatal - Angle

★

Fatal - Other

★

Fatal - Front to rear

★

Fatal - Sideswipe, same direction

○

Injury of any type (Serious, Minor, Possible) - Angle

○

Injury of any type (Serious, Minor, Possible) - Other

○

Injury of any type (Serious, Minor, Possible) - Front to rear

○

Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣

Property Damage Only - Angle

▣

Property Damage Only - Other

▣

Property Damage Only - Front to rear

▣

Property Damage Only - Sideswipe, same direction

★

●

▣

Left Turn Movement (Yellow Fill)

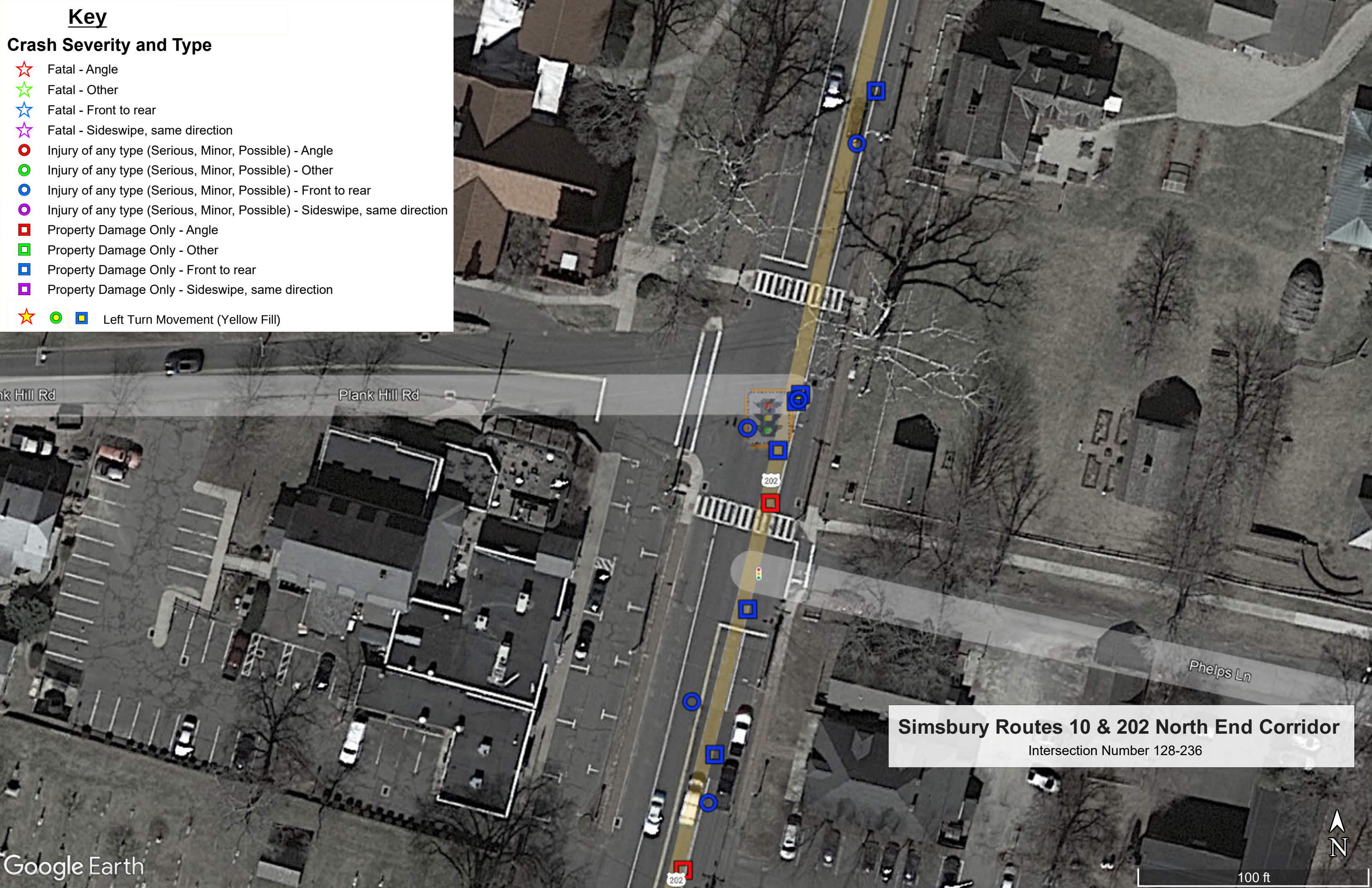


Key

Key

Crash Severity and Type

	Fatal - Angle
	Fatal - Other
	Fatal - Front to rear
	Fatal - Sideswipe, same direction
	Injury of any type (Serious, Minor, Possible) - Angle
	Injury of any type (Serious, Minor, Possible) - Other
	Injury of any type (Serious, Minor, Possible) - Front to rear
	Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
	Property Damage Only - Angle
	Property Damage Only - Other
	Property Damage Only - Front to rear
	Property Damage Only - Sideswipe, same direction
	Left Turn Movement (Yellow Fill)
	



Simsbury Routes 10 & 202 North End Corridor

Intersection Number 128-236

Intersection Number 128-236

Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

○ Injury of any type (Serious, Minor, Possible) - Angle

○ Injury of any type (Serious, Minor, Possible) - Other

○ Injury of any type (Serious, Minor, Possible) - Front to rear

○ Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

▣ Property Damage Only - Sideswipe, same direction

★ ○ ▣ Left Turn Movement (Yellow Fill)

This figure is an aerial map of the intersection of Seminary Rd and Route 202 in Simsbury. The map displays the road layout, including Seminary Rd running diagonally from the top-left to the bottom-right, and Route 202 running vertically through the center. A yellow highlight is placed on the northbound lane of Route 202. Various crash data points are plotted at the intersection and along the roads. A red square is located on Seminary Rd just north of the intersection. A cluster of blue squares and circles is at the intersection, with one blue circle containing a red star. Further south on Route 202, there are blue circles and squares, some of which contain red stars. The map also shows surrounding features like buildings, parking lots, and trees. A scale bar for 100 feet and a north arrow are located in the bottom right corner.

Simsbury Routes 10 & 202 North End Corridor
Intersection Number 128-218

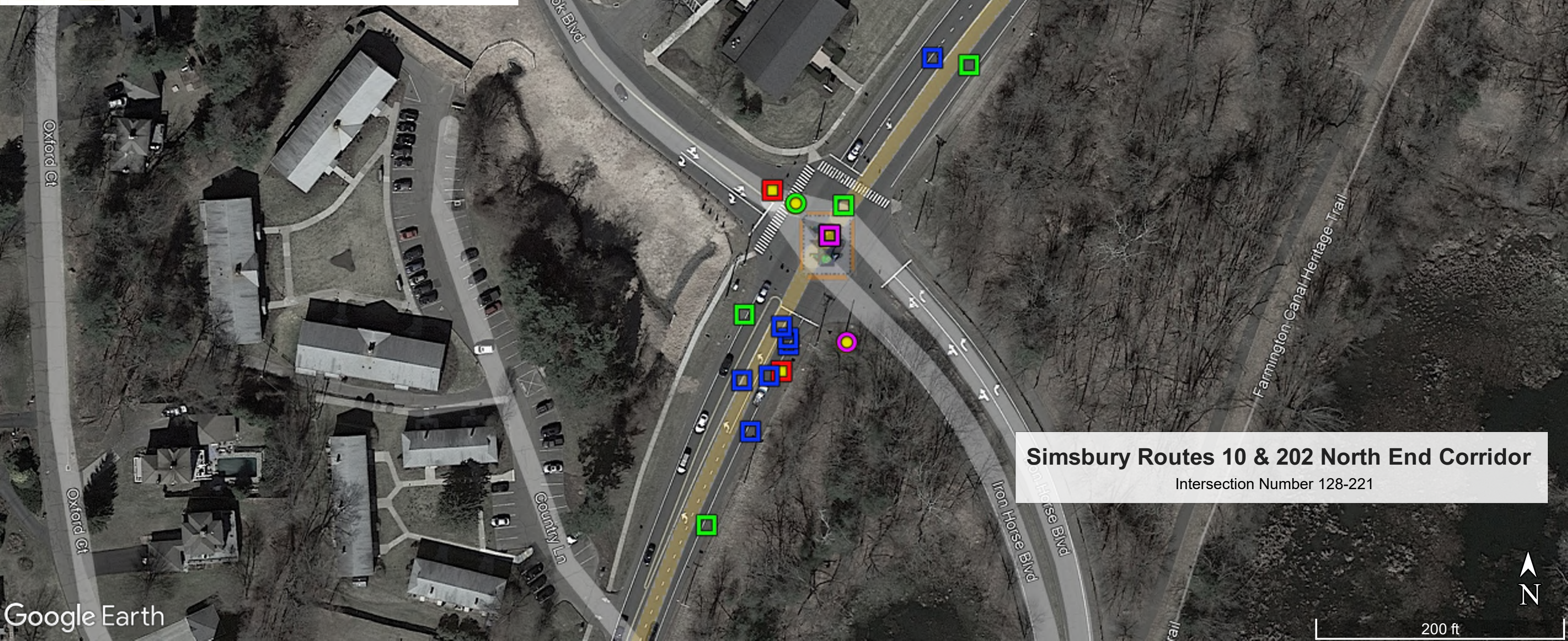
Google Earth

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

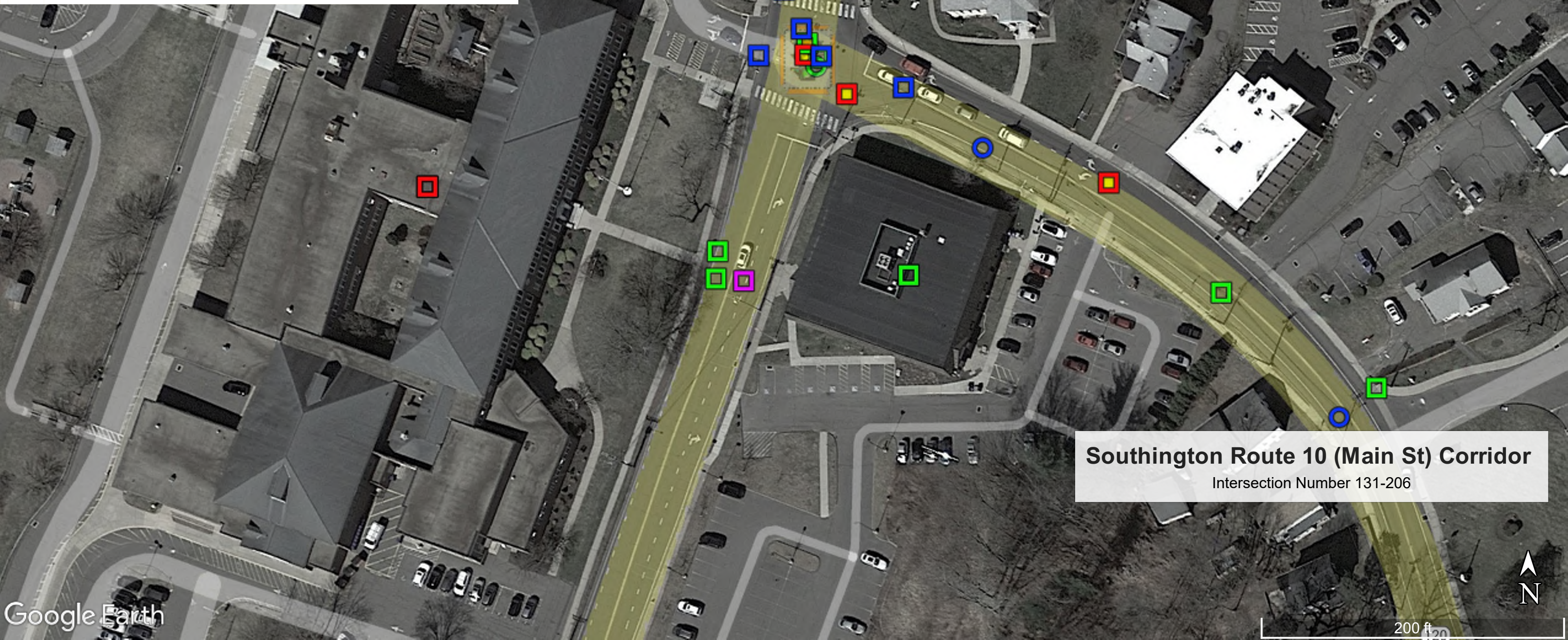
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction
- ★ ○ ▣ Left Turn Movement (Yellow Fill)



Southington Route 10 (Main St) Corridor

Intersection Number 131-206

Key

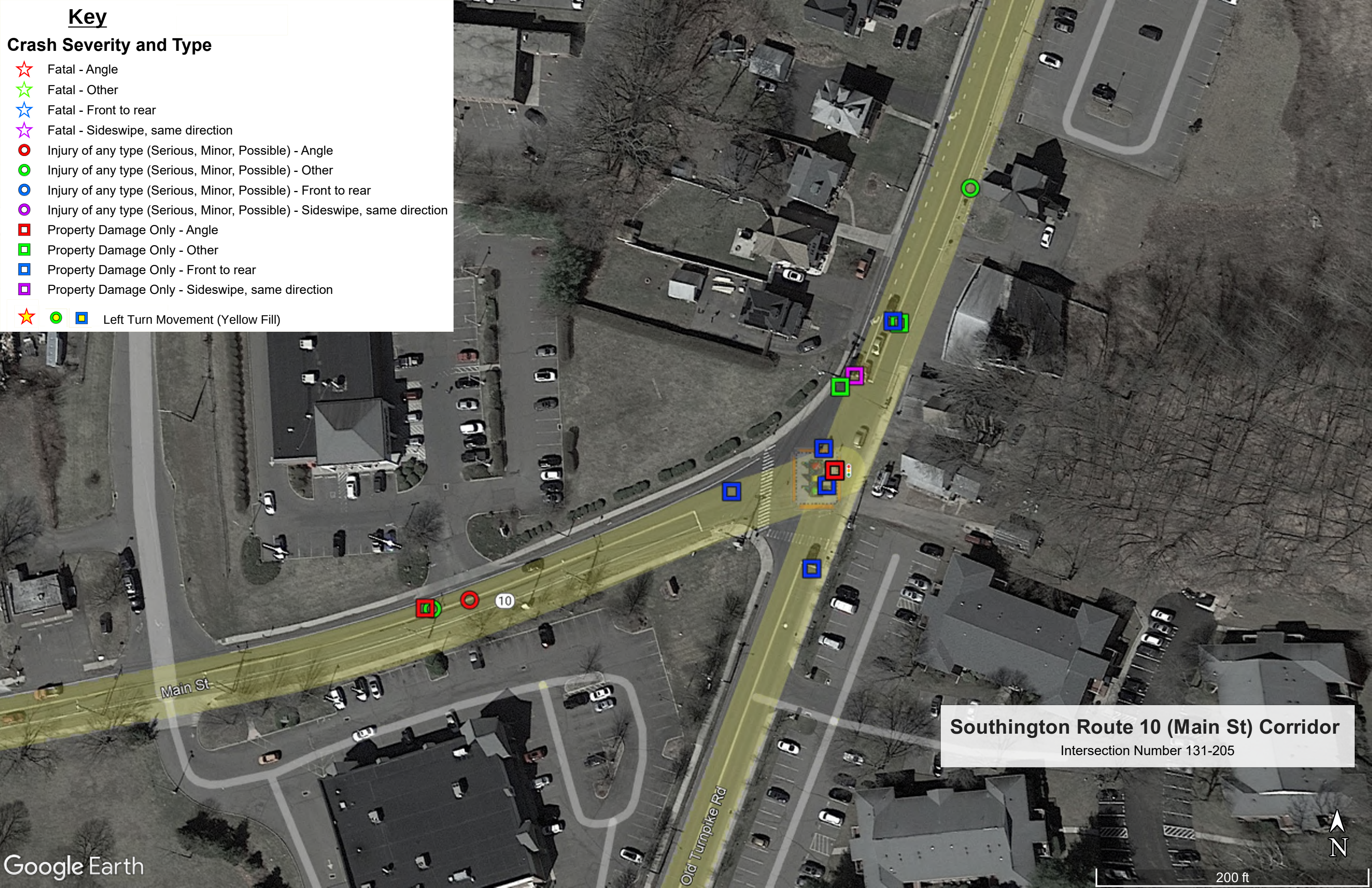
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



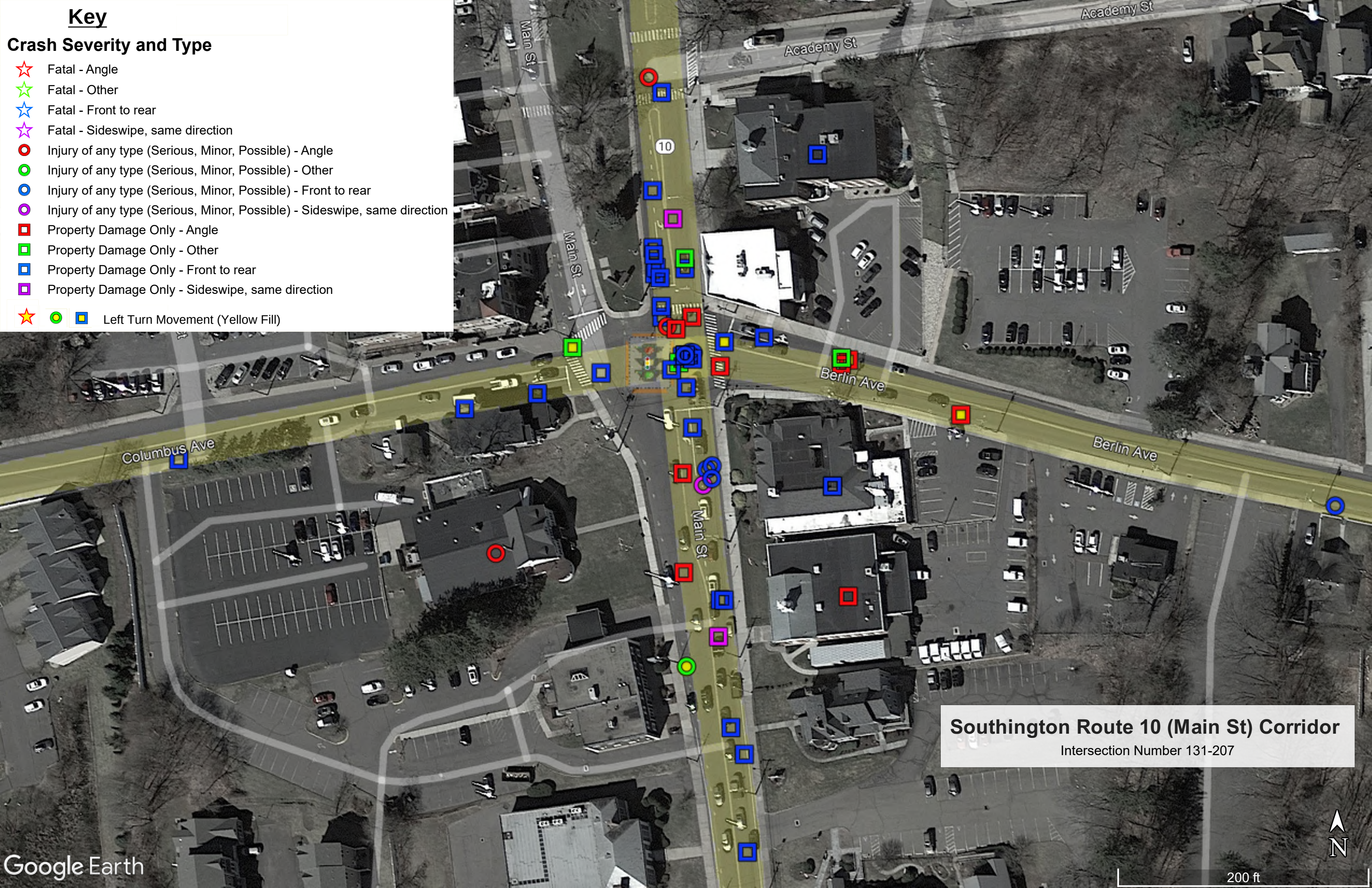
Southington Route 10 (Main St) Corridor

Intersection Number 131-205

Key

Crash Severity and Type

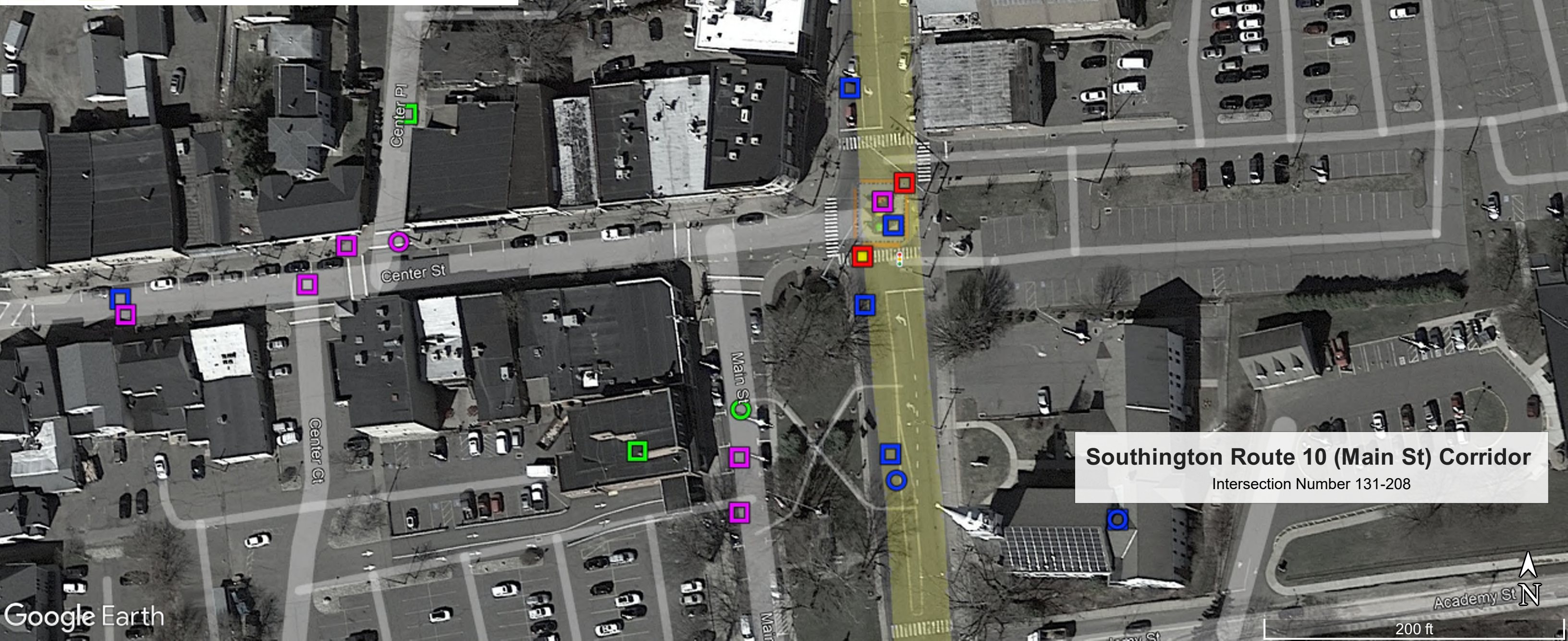
- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
 - ★ Fatal - Other
 - ★ Fatal - Front to rear
 - ★ Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



Southington Route 10 (Main St) Corridor

Intersection Number 131-208

Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

○ Injury of any type (Serious, Minor, Possible) - Angle

○ Injury of any type (Serious, Minor, Possible) - Other

○ Injury of any type (Serious, Minor, Possible) - Front to rear

○ Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

▣ Property Damage Only - Sideswipe, same direction

★

○

▣

Left Turn Movement (Yellow Fill)

The map displays an aerial view of a residential and commercial area. A yellow-shaded corridor runs vertically through the center, representing the main street. Various colored symbols are placed along this corridor and at intersections to indicate crash locations and severity. A key in the top-left corner defines these symbols: stars for fatal crashes and circles/squares for injury or property damage only, with colors indicating the type of crash (Angle, Other, Front to rear, Sideswipe). A title box in the bottom-right corner identifies the area as 'Southington Route 10 (Main St) Corridor' with 'Intersection Number 131-209'. A north arrow and a 100 ft scale bar are also present in the bottom-right corner. The text 'High St' is visible on the left side of the map, and '10' is visible on the yellow corridor.

Google Earth

Key

Crash Severity and Type

★

Fatal - Angle

★

Fatal - Other

★

Fatal - Front to rear

★

Fatal - Sideswipe, same direction

○

Injury of any type (Serious, Minor, Possible) - Angle

○

Injury of any type (Serious, Minor, Possible) - Other

○

Injury of any type (Serious, Minor, Possible) - Front to rear

○

Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

□

Property Damage Only - Angle

□

Property Damage Only - Other

□

Property Damage Only - Front to rear

□

Property Damage Only - Sideswipe, same direction

★

○

□

Left Turn Movement (Yellow Fill)



Key

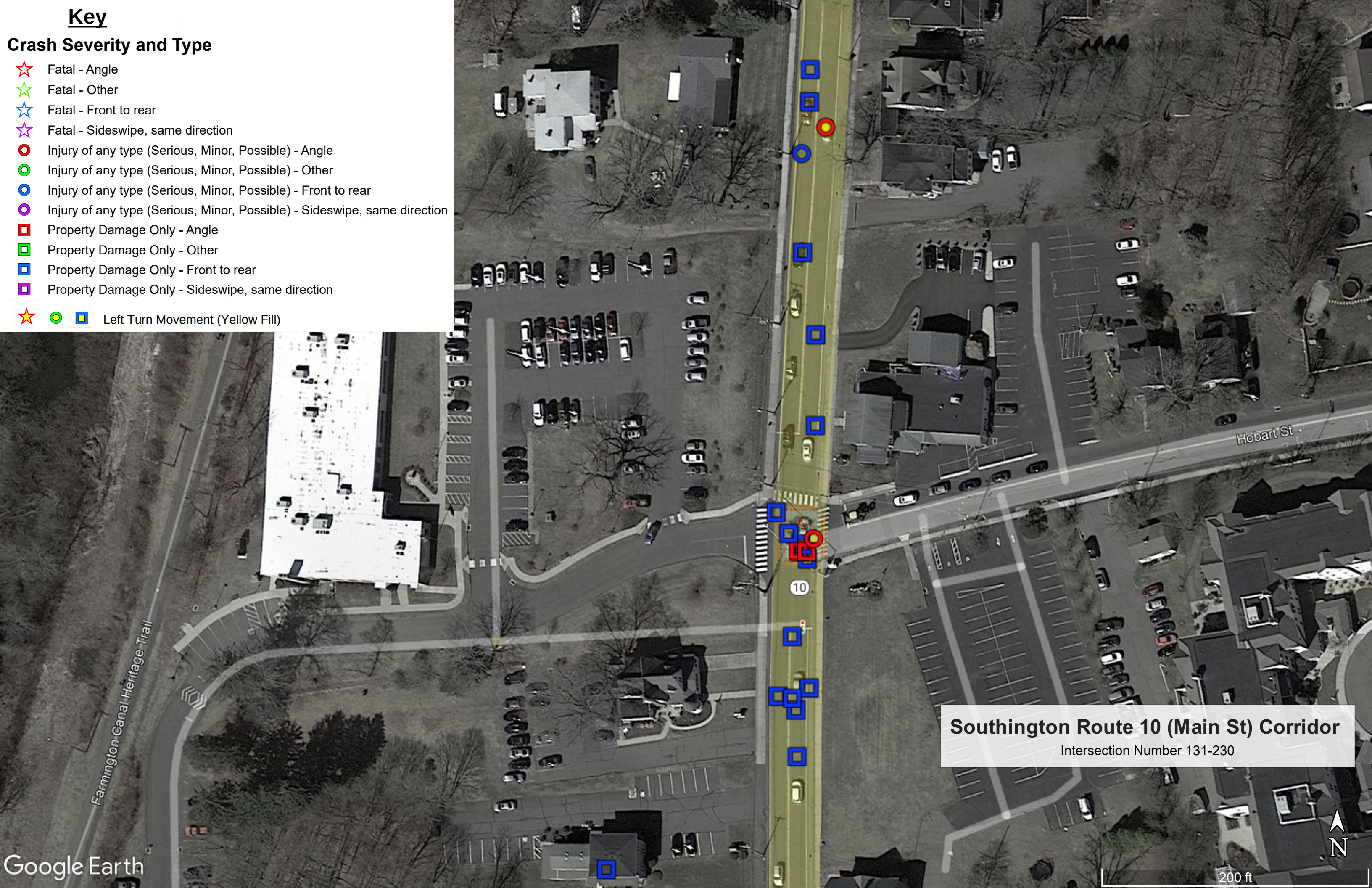
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)

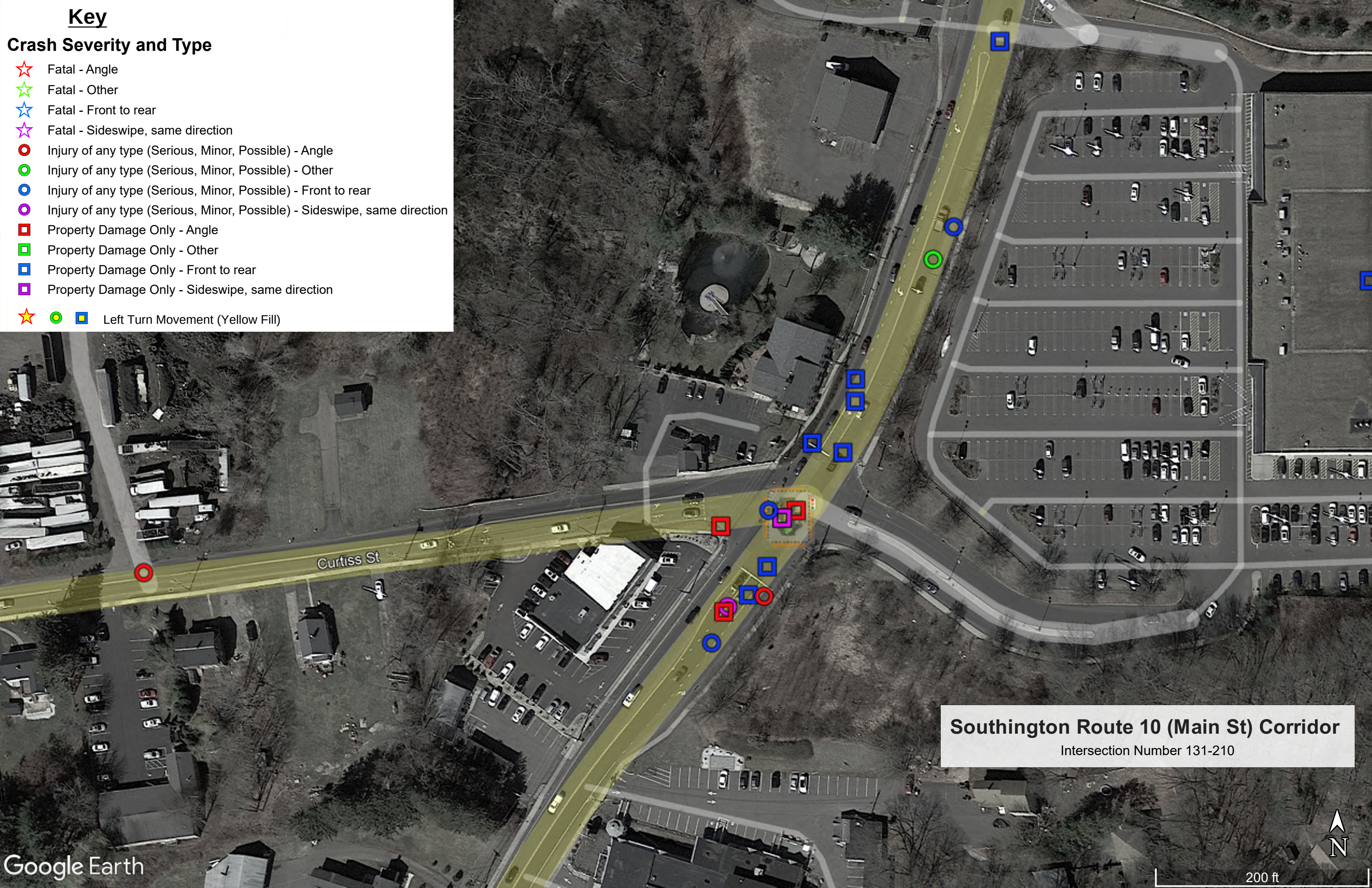


Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- ★ ○ □ Left Turn Movement (Yellow Fill)

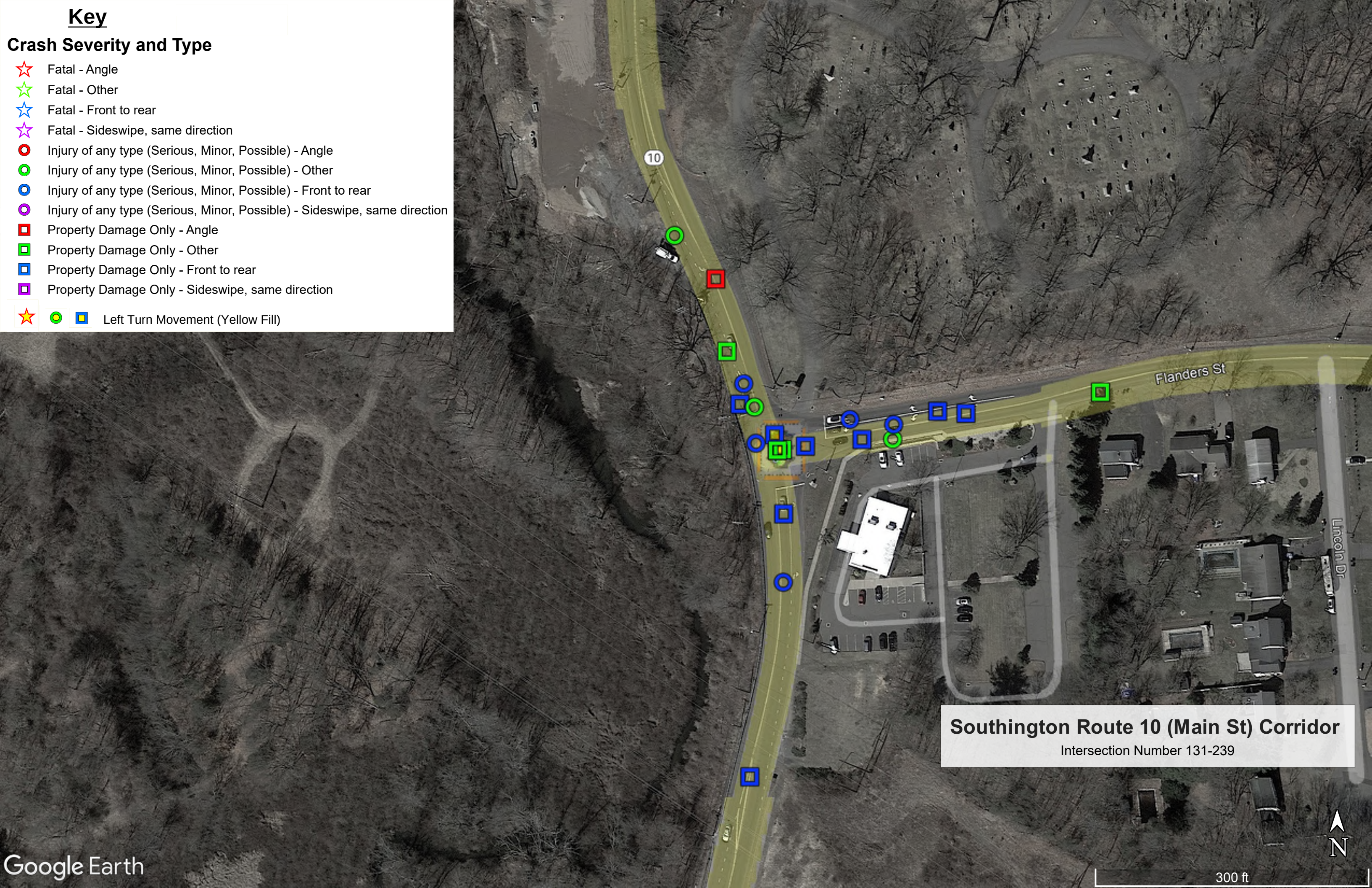


Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



Southington Route 10 (Main St) Corridor
Intersection Number 131-239

Key

Crash Severity and Type

☆

Fatal - Angle

☆

Fatal - Other

☆

Fatal - Front to rear

☆

Fatal - Sideswipe, same direction

○

Injury of any type (Serious, Minor, Possible) - Angle

○

Injury of any type (Serious, Minor, Possible) - Other

○

Injury of any type (Serious, Minor, Possible) - Front to rear

○

Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

□

Property Damage Only - Angle

□

Property Damage Only - Other

□

Property Damage Only - Front to rear

□

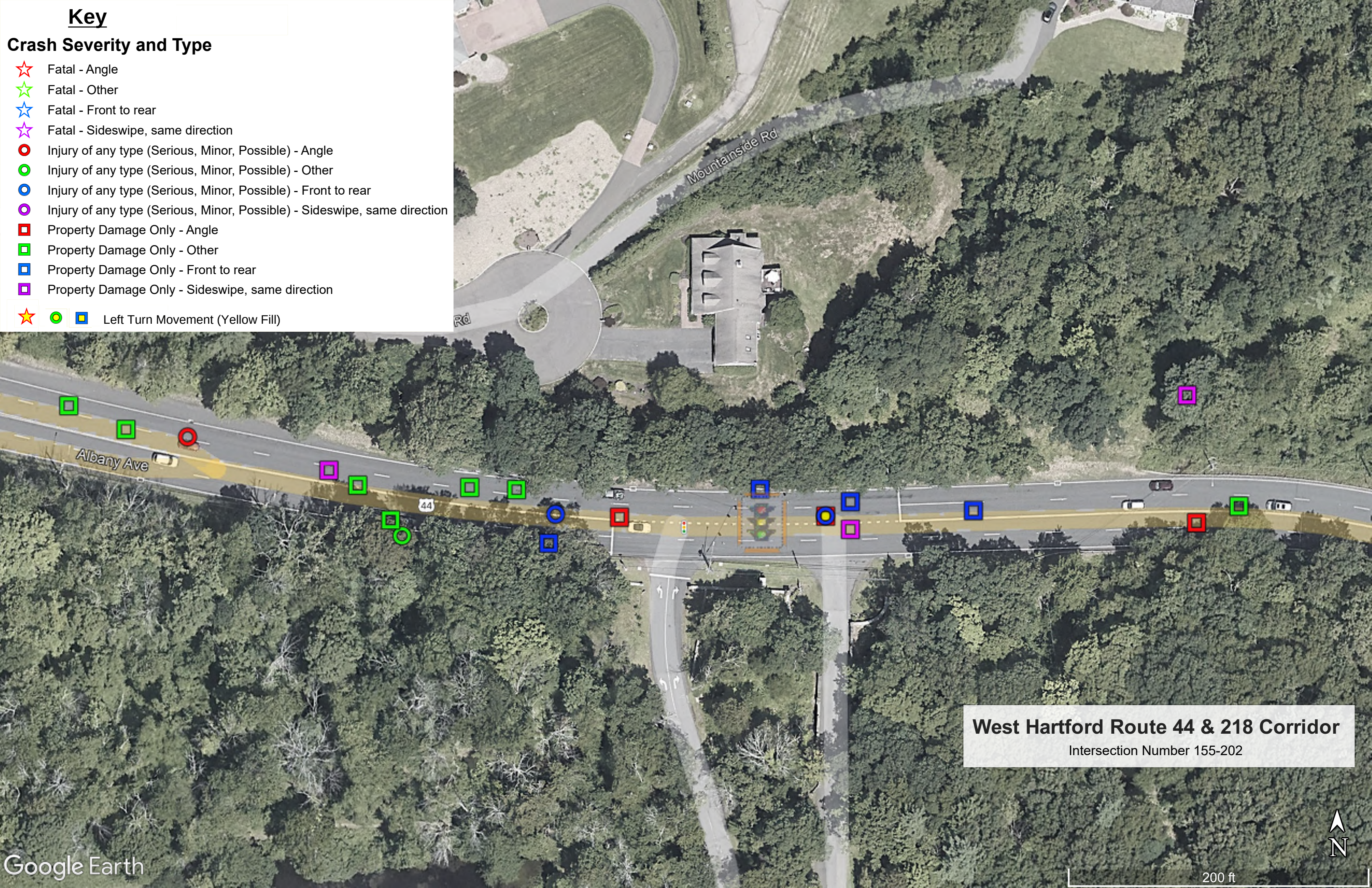
Property Damage Only - Sideswipe, same direction

☆

○

□

Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



West Hartford Route 44 & 218 Corridor
Intersection Number 155-242

Key

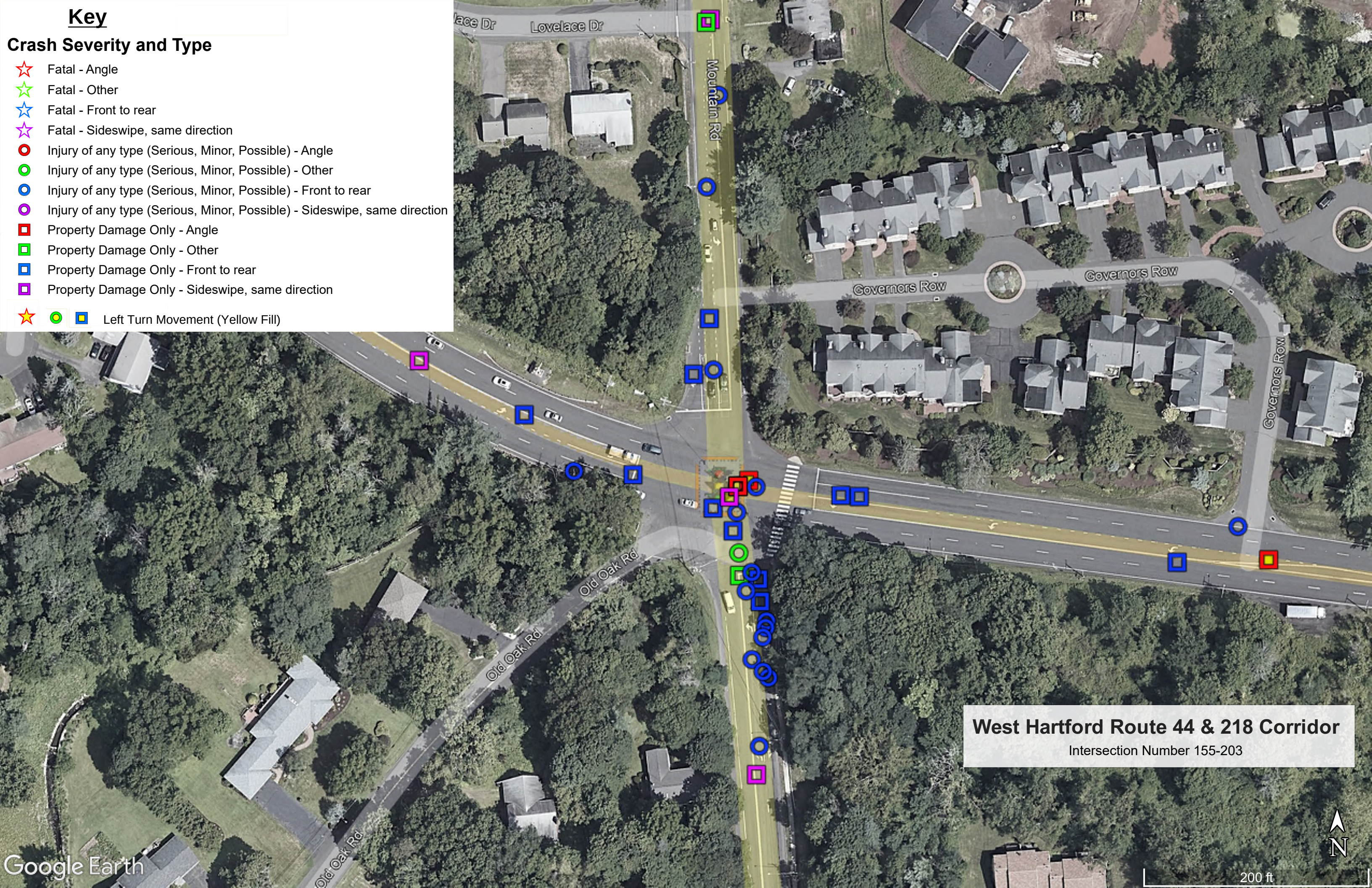
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

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Left Turn Movement (Yellow Fill)



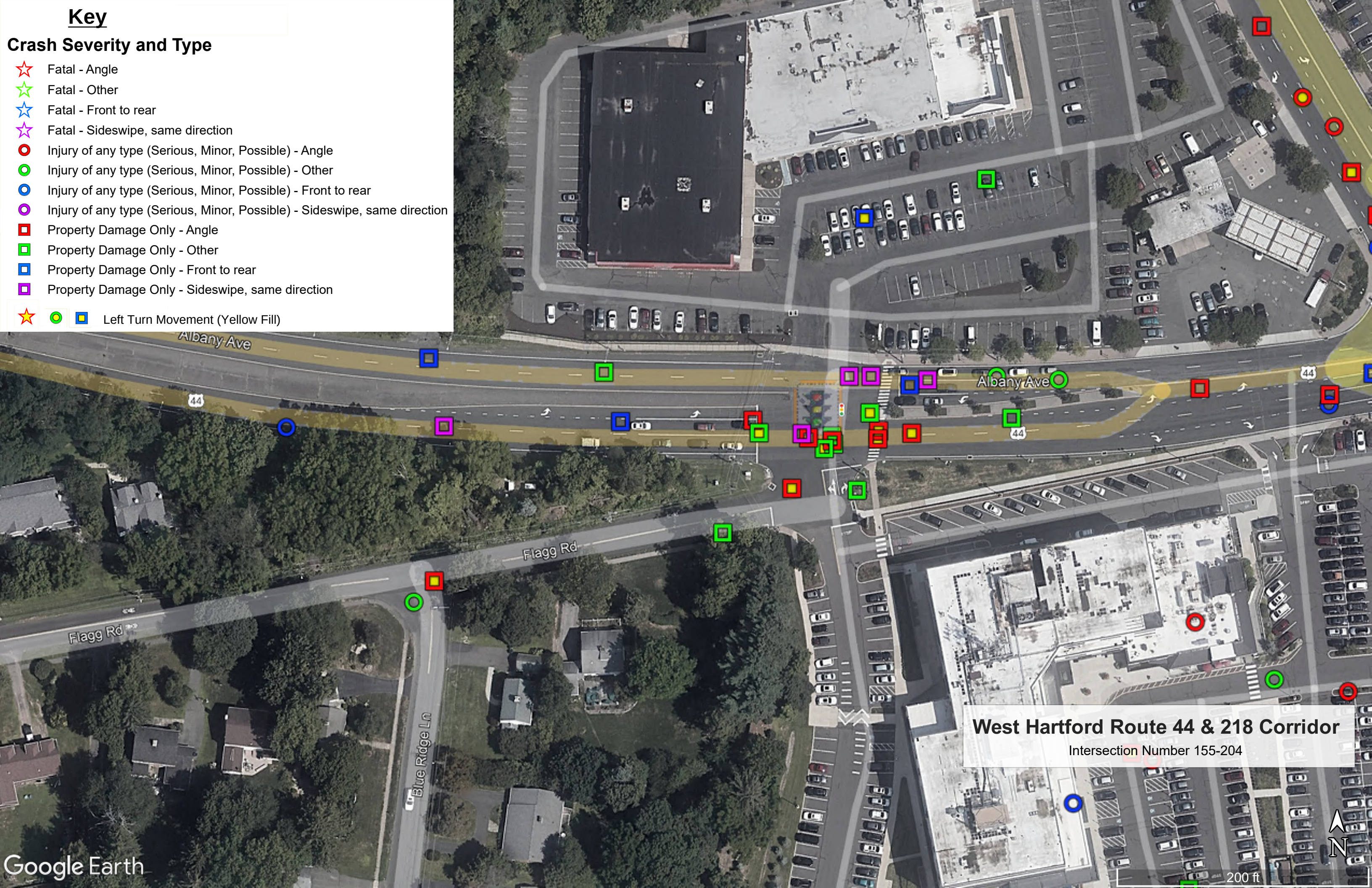
West Hartford Route 44 & 218 Corridor
Intersection Number 155-203

Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- ▣ Property Damage Only - Angle
- ▣ Property Damage Only - Other
- ▣ Property Damage Only - Front to rear
- ▣ Property Damage Only - Sideswipe, same direction

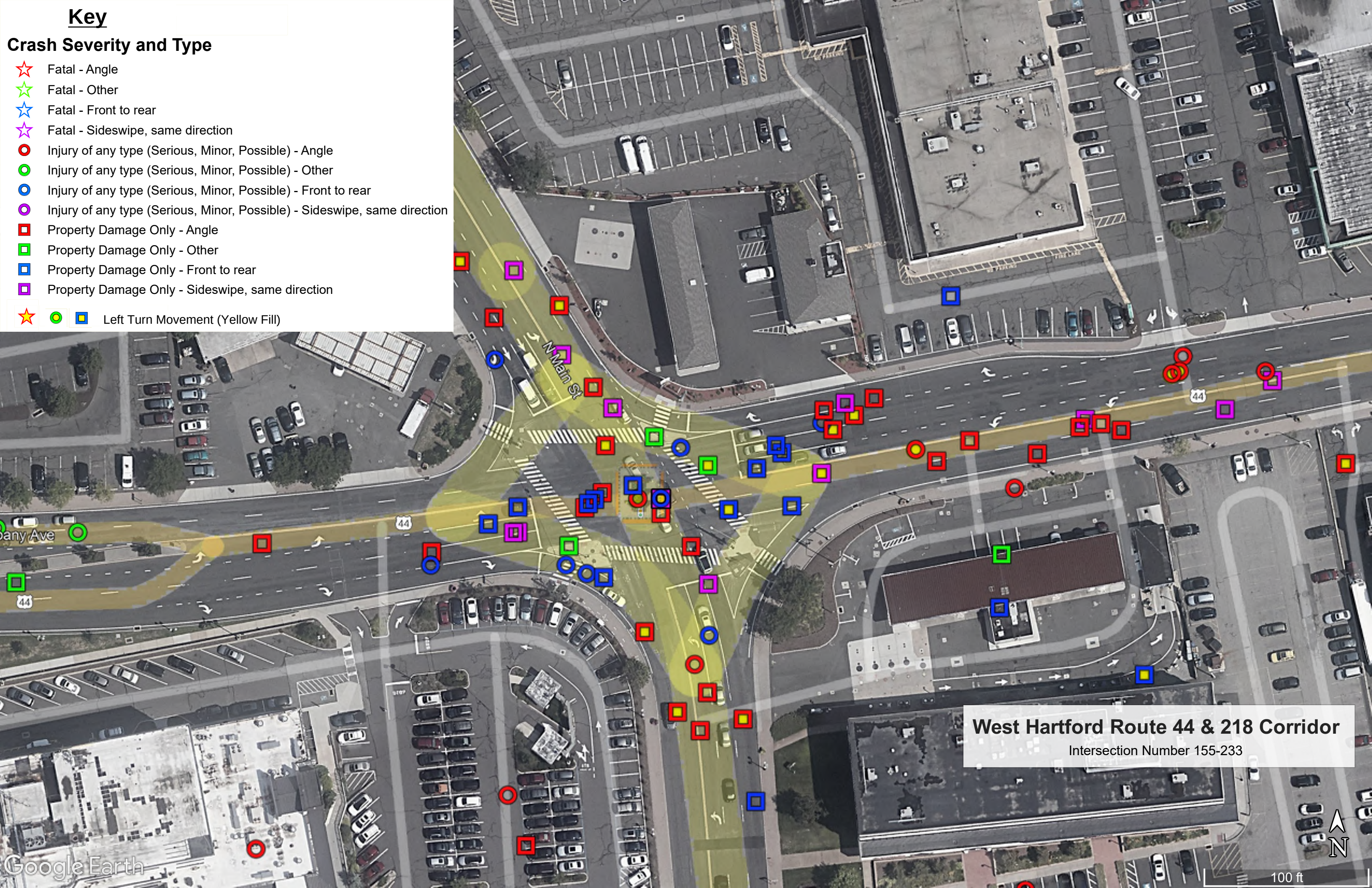
- ★ Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ ○ □ Left Turn Movement (Yellow Fill)



West Hartford Route 44 & 218 Corridor

Intersection Number 155-233

Key

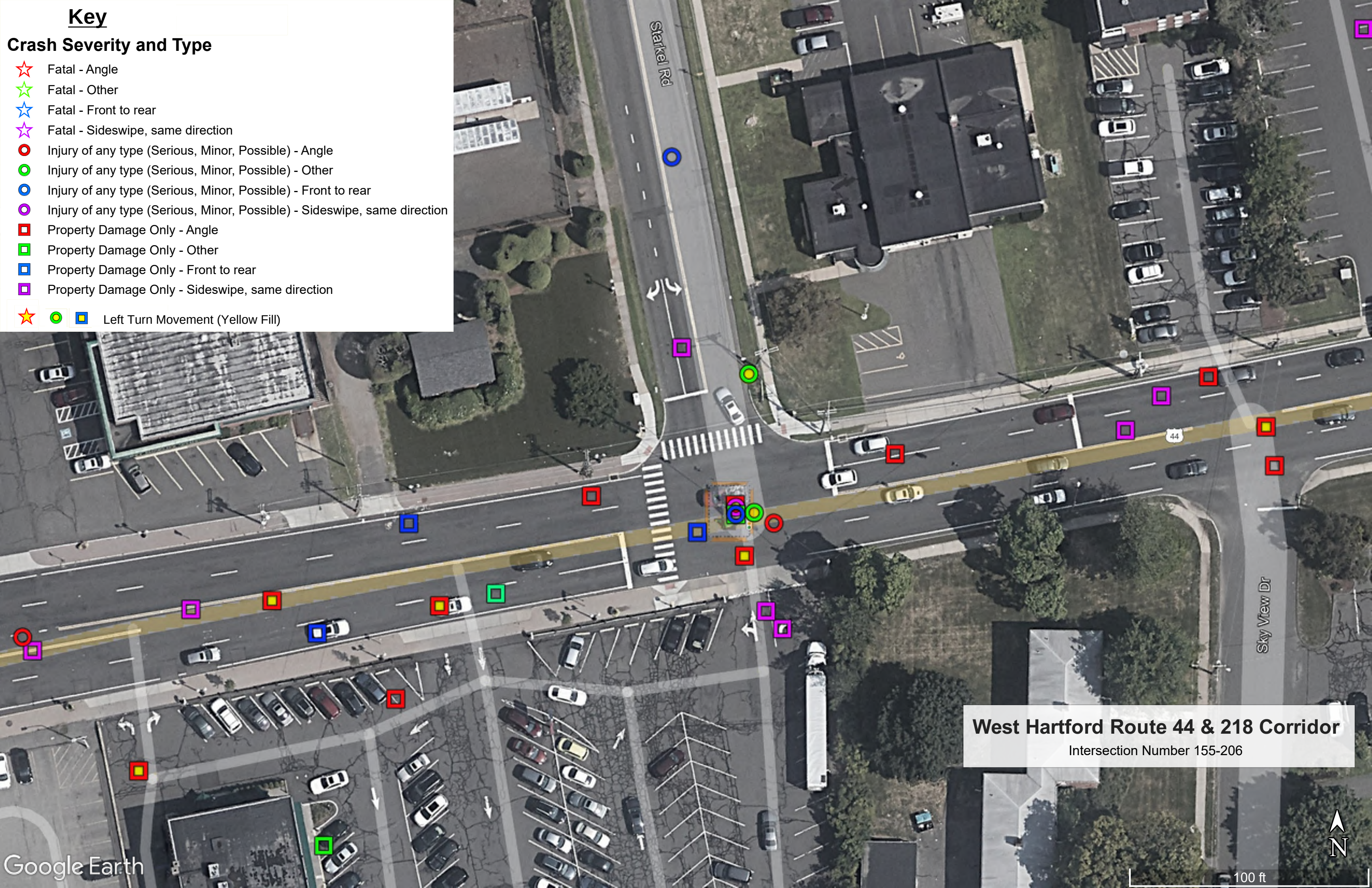
Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

● Injury of any type (Serious, Minor, Possible) - Angle

● Injury of any type (Serious, Minor, Possible) - Other

● Injury of any type (Serious, Minor, Possible) - Front to rear

● Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

▣ Property Damage Only - Sideswipe, same direction

★

●

▣

Left Turn Movement (Yellow Fill)

The map displays an aerial view of the West Hartford Route 44 & 218 Corridor. A yellow overlay highlights the corridor, which runs horizontally across the middle of the image. The corridor is labeled '44' on the left and '218' on the right. The intersection of King Philip Dr and Trout Brook is visible. Crash data points are marked with colored stars and squares. A key in the top left explains the symbols. A title box in the bottom right identifies the area as 'West Hartford Route 44 & 218 Corridor' with 'Intersection Number 155-207'. A scale bar and north arrow are in the bottom right corner.

Symbol	Crash Severity and Type
★	Fatal - Angle
★	Fatal - Other
★	Fatal - Front to rear
★	Fatal - Sideswipe, same direction
●	Injury of any type (Serious, Minor, Possible) - Angle
●	Injury of any type (Serious, Minor, Possible) - Other
●	Injury of any type (Serious, Minor, Possible) - Front to rear
●	Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
▣	Property Damage Only - Angle
▣	Property Damage Only - Other
▣	Property Damage Only - Front to rear
▣	Property Damage Only - Sideswipe, same direction

West Hartford Route 44 & 218 Corridor
Intersection Number 155-207

200 ft

Google Earth

Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

● Injury of any type (Serious, Minor, Possible) - Angle

● Injury of any type (Serious, Minor, Possible) - Other

● Injury of any type (Serious, Minor, Possible) - Front to rear

● Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

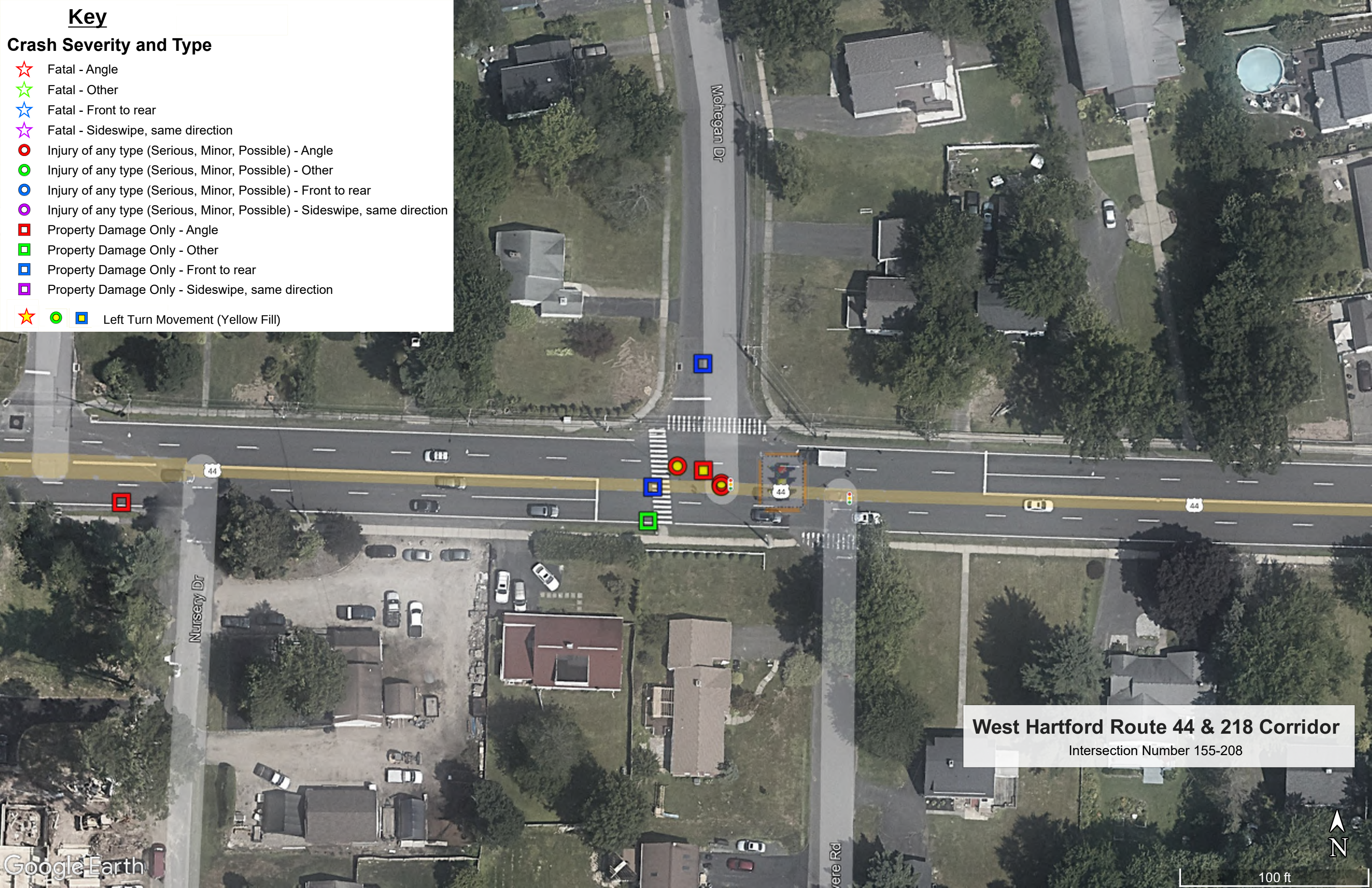
▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

▣ Property Damage Only - Sideswipe, same direction

★ ● ▣

Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

★ Fatal - Angle

★ Fatal - Other

★ Fatal - Front to rear

★ Fatal - Sideswipe, same direction

● Injury of any type (Serious, Minor, Possible) - Angle

● Injury of any type (Serious, Minor, Possible) - Other

● Injury of any type (Serious, Minor, Possible) - Front to rear

● Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction

▣ Property Damage Only - Angle

▣ Property Damage Only - Other

▣ Property Damage Only - Front to rear

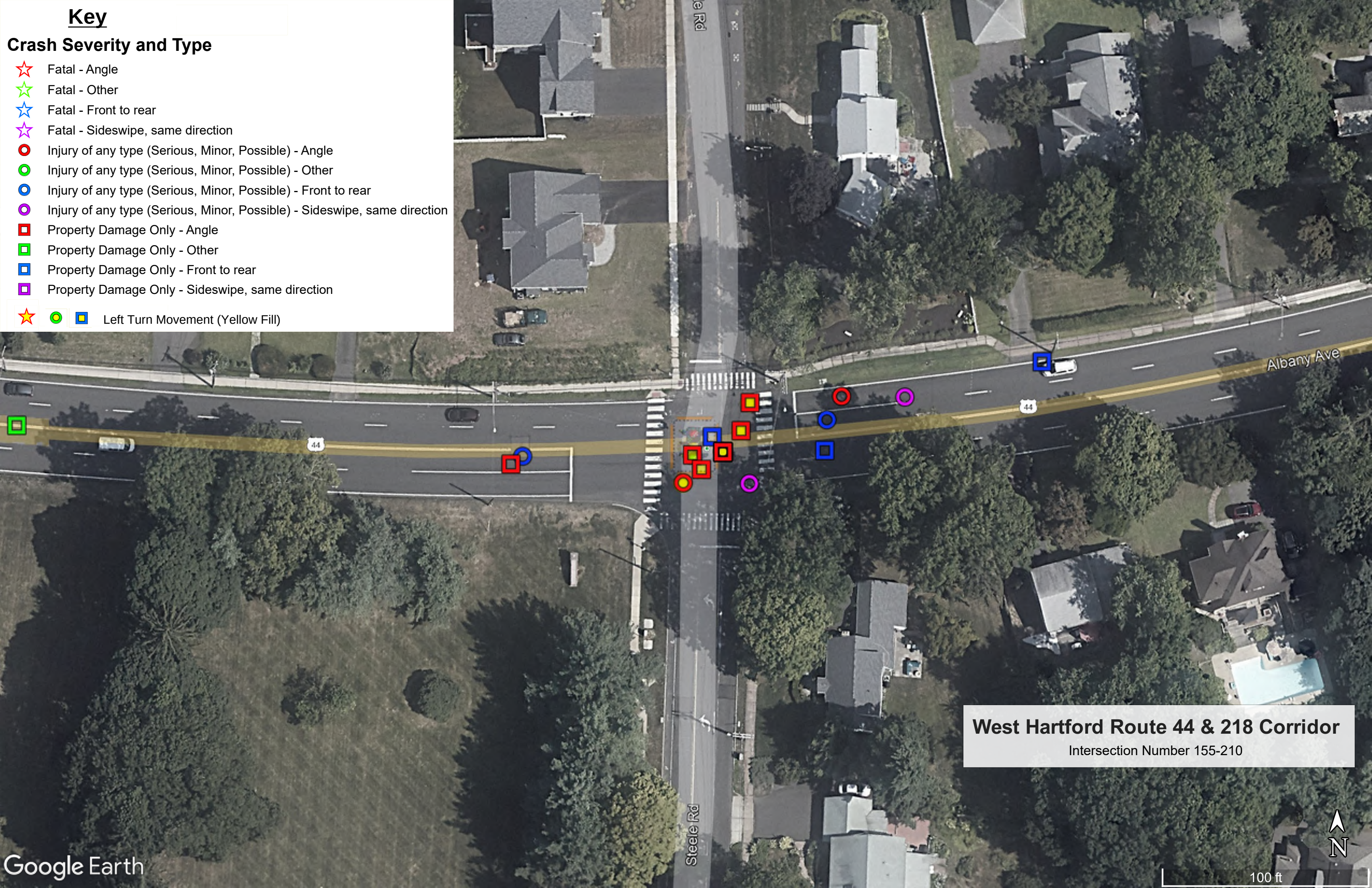
▣ Property Damage Only - Sideswipe, same direction

★

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▣

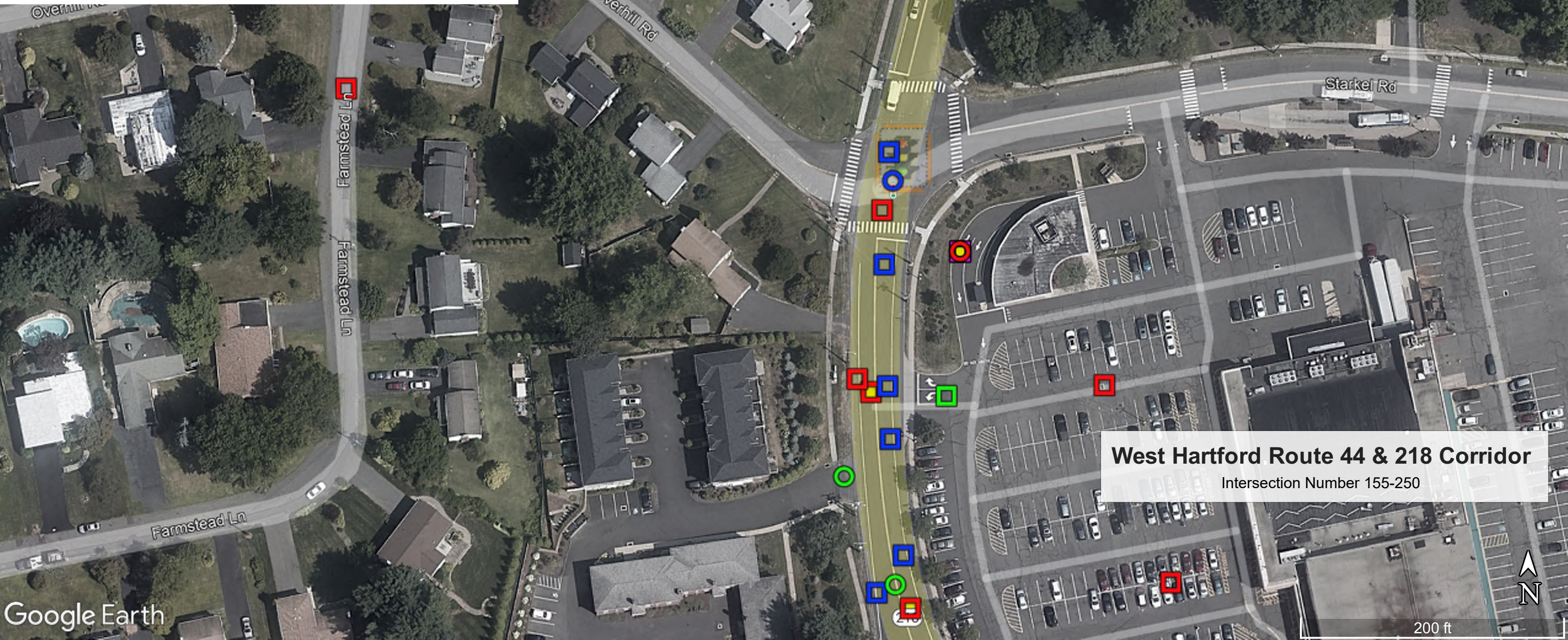
Left Turn Movement (Yellow Fill)



Key

Crash Severity and Type

- ★ Fatal - Angle
- ★ Fatal - Other
- ★ Fatal - Front to rear
- ★ Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction
- ★ Left Turn Movement (Yellow Fill)

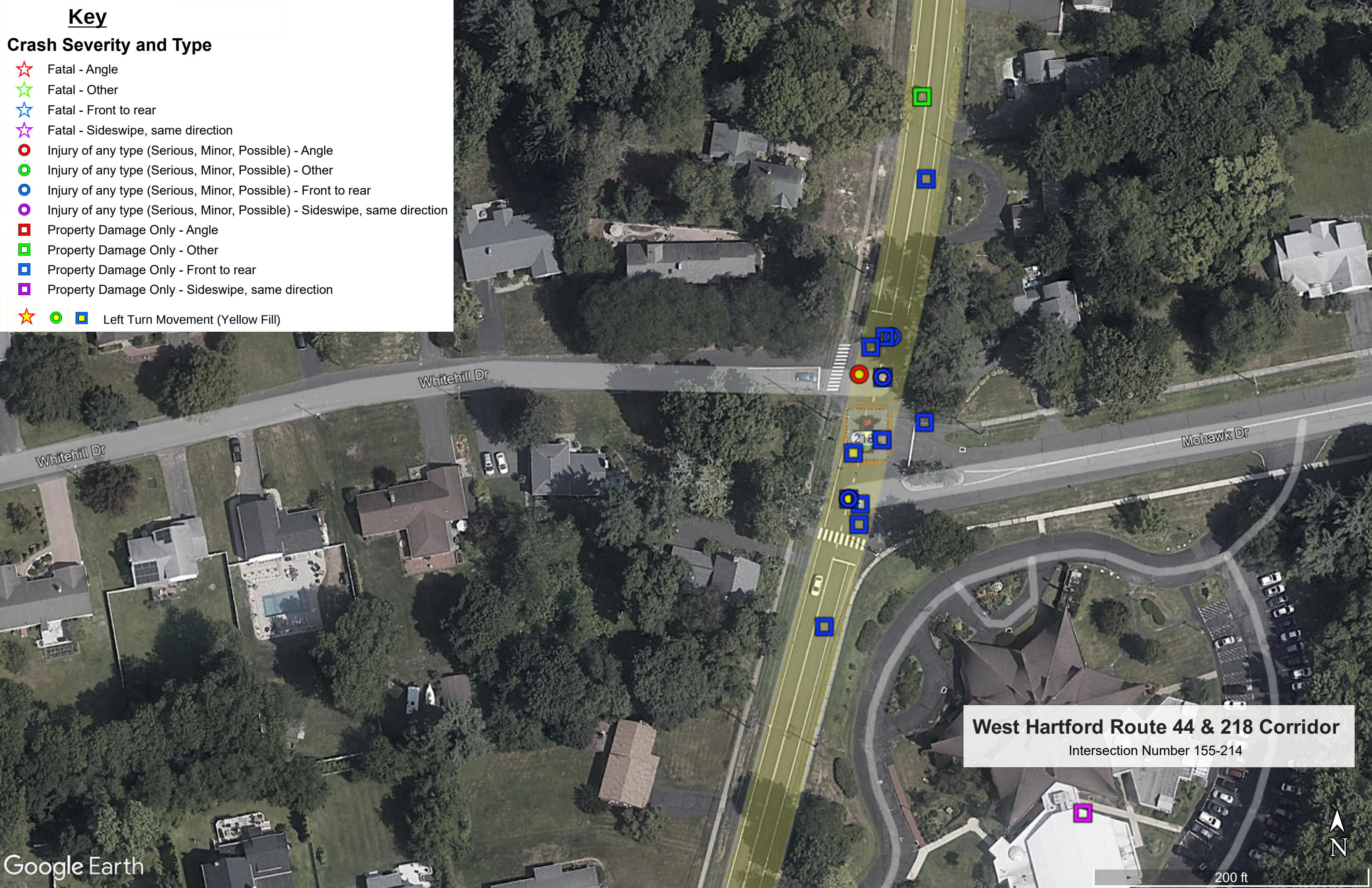


Key

Crash Severity and Type

- Fatal - Angle
- Fatal - Other
- Fatal - Front to rear
- Fatal - Sideswipe, same direction
- Injury of any type (Serious, Minor, Possible) - Angle
- Injury of any type (Serious, Minor, Possible) - Other
- Injury of any type (Serious, Minor, Possible) - Front to rear
- Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
- Property Damage Only - Angle
- Property Damage Only - Other
- Property Damage Only - Front to rear
- Property Damage Only - Sideswipe, same direction

- Left Turn Movement (Yellow Fill)



West Hartford Route 44 & 218 Corridor

Intersection Number 155-214

Key

Crash Severity and Type

- Fatal - Angle
 - Fatal - Other
 - Fatal - Front to rear
 - Fatal - Sideswipe, same direction
 - Injury of any type (Serious, Minor, Possible) - Angle
 - Injury of any type (Serious, Minor, Possible) - Other
 - Injury of any type (Serious, Minor, Possible) - Front to rear
 - Injury of any type (Serious, Minor, Possible) - Sideswipe, same direction
 - Property Damage Only - Angle
 - Property Damage Only - Other
 - Property Damage Only - Front to rear
 - Property Damage Only - Sideswipe, same direction
- ★

●

■

Left Turn Movement (Yellow Fill)



West Hartford Route 44 & 218 Corridor
Intersection Number 155-228

Appendix E

Phase 4 User Costs

Analysis

Project Number 0171-0421 - Route 5 (King Street), Enfield (Naztec System 49) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-18	0.00	327	3%	97%	1.14	1.5	-1.64	\$ 1.57	\$ 44.48	1.422	12.5	0
	WB	-12	-0.30	521	3%	97%	1.14	1.5	-1.74	\$ 1.67	\$ 47.24	1.511	13.3	156
MID	EB	-22	-1.10	343	3%	97%	1.14	1.5	-2.10	\$ 2.02	\$ 57.02	1.824	16.1	377
	WB	21	-0.40	381	3%	97%	1.14	1.5	2.22	\$ (2.14)	\$ (60.46)	-1.934	-17.0	152
PM	EB	-22	0.00	636	3%	97%	1.14	1.5	-3.89	\$ 3.74	\$ 105.73	3.381	29.8	0
	WB	-26	-1.00	556	3%	97%	1.14	1.5	-4.02	\$ 3.87	\$ 109.24	3.494	30.7	556
TOTALS PER DAY:									-11.17	\$ 10.73	\$ 303.25	9.698	85.4	1241

ΔTT= Change in Travel Time

Yearly Totals		
2,904	Delay Savings (Vehicle Hours)	(say 2900)
\$ 2,790	Travel Time Savings (Truck)	
\$ 78,845	Travel Time Savings (Car)	
+ \$ 8,850	Fuel Savings	
\$ 90,485	Combined Savings	(say 90000)
2,521	Reduction in Fuel Use (Gallons)	(say 2500)
22,204	Reduction in CO ₂ Emission (kg)	(say 22000)
322,660	Savings Number of Stops	(say 320000)

$$\Delta TT = TT_{Base(section)} - TT_{Objective(section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 71 (Hartford Rd., SE Rd., New Britain Ave.), Farmington, New Britain, West
Hartford (Cubic System 20) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-16	0.40	604	3%	97%	1.14	1.5	-2.68	\$ 2.58	\$ 73.03	2.335	20.5	-242
	WB	11	1.00	499	3%	97%	1.14	1.5	1.52	\$ (1.47)	\$ (41.48)	-1.327	-11.7	-499
MID	EB	-39	-0.40	1061	3%	97%	1.14	1.5	-11.49	\$ 11.07	\$ 312.68	10.000	88.0	424
	WB	-89	0.60	999	3%	97%	1.14	1.5	-24.70	\$ 23.78	\$ 671.86	21.487	189.1	-599
PM	EB	-27	-1.50	1100	3%	97%	1.14	1.5	-8.25	\$ 7.94	\$ 224.43	7.178	63.2	1650
	WB	-14	-0.50	1133	3%	97%	1.14	1.5	-4.41	\$ 4.24	\$ 119.86	3.833	33.7	567
TOTALS PER DAY:									-50.01	\$ 48.14	\$ 1,360.38	43.506	382.8	1301

ΔTT= Change in Travel Time

Yearly Totals		
13,003	Delay Savings (Vehicle Hours)	(say 13000)
\$ 12,516	Travel Time Savings (Truck)	
\$ 353,699	Travel Time Savings (Car)	
+ \$ 39,704	Fuel Savings	
\$ 405,919	Combined Savings	(say 406000)
11,312	Reduction in Fuel Use (Gallons)	(say 11300)
99,528	Reduction in CO ₂ Emission (kg)	(say 100000)
338,260	Savings Number of Stops	(say 340000)

$$\Delta TT = TT_{\text{Base(Section)}} - TT_{\text{Objective(Section)}}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{\text{hr}}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{\text{hr}}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{\text{hr}}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 3 (Cromwell Avenue) Inwood Road to New Britain Avenue, Rocky Hill (Cubic System)
7) Corridor

Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVT	PPVC	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	NB	-3	0.33	800	3%	97%	1.14	1.5	-0.67	\$ 0.64	\$ 18.14	0.580	5.1	-264
	SB	-27	0	1400	3%	97%	1.14	1.5	-10.50	\$ 10.11	\$ 285.64	9.135	80.4	0
MID	NB	17	0	900	3%	97%	1.14	1.5	4.25	\$ (4.09)	\$ (115.61)	-3.698	-32.5	0
	SB	-28	-0.33	1700	3%	97%	1.14	1.5	-13.22	\$ 12.73	\$ 359.69	11.503	101.2	561
PM	NB	-70	-1.67	1100	3%	97%	1.14	1.5	-21.39	\$ 20.59	\$ 581.85	18.608	163.7	1837
	SB	-6	-1	1900	3%	97%	1.14	1.5	-3.17	\$ 3.05	\$ 86.14	2.755	24.2	1900
TOTALS PER DAY:									-44.70	\$ 43.03	\$ 1,215.85	38.883	342.1	4034

ΔTT= Change in Travel Time

Yearly Totals		
11,622	Delay Savings (Vehicle Hours)	(say 11600)
\$ 11,188	Travel Time Savings (Truck)	
\$ 316,121	Travel Time Savings (Car)	
+ \$ 35,485	Fuel Savings	
\$ 362,793	Combined Savings	(say 363000)
10,110	Reduction in Fuel Use (Gallons)	(say 10100)
88,946	Reduction in CO ₂ Emission (kg)	(say 89000)
1,048,840	Savings Number of Stops	(say 1050000)

$$\Delta TT = TT_{Base(Section)} - TT_{Objective(Section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

* Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

* Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

* Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

* Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

* Annual Calculations based on 260 commuter days per year.

* Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - SR411 (West Street), Rocky Hill (Cubic System 7) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-28	-0.33	800	3%	97%	1.14	1.5	-6.22	\$ 5.99	\$ 169.27	5.413	47.6	264
	WB	-39	0	900	3%	97%	1.14	1.5	-9.75	\$ 9.39	\$ 265.23	8.483	74.6	0
MID	EB	5	0.5	750	3%	97%	1.14	1.5	1.04	\$ (1.00)	\$ (28.34)	-0.906	-8.0	-375
	WB	-5	0.33	600	3%	97%	1.14	1.5	-0.83	\$ 0.80	\$ 22.67	0.725	6.4	-198
PM	EB	-30	-0.67	1050	3%	97%	1.14	1.5	-8.75	\$ 8.42	\$ 238.03	7.613	67.0	704
	WB	-11	-0.33	850	3%	97%	1.14	1.5	-2.60	\$ 2.50	\$ 70.65	2.260	19.9	281
TOTALS PER DAY:									-27.11	\$ 26.10	\$ 737.51	23.588	207.5	676

ΔTT= Change in Travel Time

Yearly Totals	
7,049	Delay Savings (Vehicle Hours) (say 7000)
\$ 6,786	Travel Time Savings (Truck)
\$ 191,753	Travel Time Savings (Car)
\$ 21,526	Fuel Savings
\$ 220,065	Combined Savings (say 220000)
6,133	Reduction in Fuel Use (Gallons) (say 6100)
53,950	Reduction in CO ₂ Emission (kg) (say 54000)
175,760	Savings Number of Stops (say 180000)

$$\Delta TT = TT_{Base(Section)} - TT_{Objective(Section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 99 (Main Street) Old Forge Road to Elm Street, Rocky Hill (Cubic System 7) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	NB	-32	-0.67	1400	3%	97%	1.14	1.5	-12.44	\$ 11.98	\$ 338.53	10.827	95.3	938
	SB	-48	-0.67	900	3%	97%	1.14	1.5	-12.00	\$ 11.55	\$ 326.44	10.440	91.9	603
MID	NB	-37	-1	1000	3%	97%	1.14	1.5	-10.28	\$ 9.90	\$ 279.59	8.942	78.7	1000
	SB	-3	0	600	3%	97%	1.14	1.5	-0.50	\$ 0.48	\$ 13.60	0.435	3.8	0
PM	NB	-1	0	1400	3%	97%	1.14	1.5	-0.39	\$ 0.37	\$ 10.58	0.338	3.0	0
	SB	36	1.33	700	3%	97%	1.14	1.5	7.00	\$ (6.74)	\$ (190.42)	-6.090	-53.6	-931
TOTALS PER DAY:									-28.61	\$ 27.54	\$ 778.32	24.892	219.1	1610

ΔTT= Change in Travel Time

Yearly Totals		
7,439	Delay Savings (Vehicle Hours)	(say 7400)
\$ 7,160	Travel Time Savings (Truck)	
\$ 202,363	Travel Time Savings (Car)	
\$ 22,716	Fuel Savings	
\$ 232,240	Combined Savings	(say 232000)
6,472	Reduction in Fuel Use (Gallons)	(say 6500)
56,966	Reduction in CO ₂ Emission (kg)	(say 57000)
418,600	Savings Number of Stops	(say 420000)

$$\Delta TT = TT_{Base(Section)} - TT_{Objective(Section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 10 / 202 (Hopmeadow Street), Simsbury South End (Naztec System 55) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVT	PPVC	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-24	-0.70	459	3%	97%	1.14	1.5	-3.06	\$ 2.95	\$ 83.24	2.662	23.4	321
	WB	-176	-2.70	750	3%	97%	1.14	1.5	-36.67	\$ 35.30	\$ 997.46	31.900	280.7	2025
MID	EB	-9	0.00	452	3%	97%	1.14	1.5	-1.13	\$ 1.09	\$ 30.74	0.983	8.7	0
	WB	18	0.80	697	3%	97%	1.14	1.5	3.49	\$ (3.36)	\$ (94.80)	-3.032	-26.7	-558
PM	EB	-6	-0.40	525	3%	97%	1.14	1.5	-0.88	\$ 0.84	\$ 23.80	0.761	6.7	210
	WB	-14	-0.60	665	3%	97%	1.14	1.5	-2.59	\$ 2.49	\$ 70.35	2.250	19.8	399
TOTALS PER DAY:									-40.84	\$ 39.31	\$ 1,110.79	35.524	312.6	2397

ΔTT= Change in Travel Time

Yearly Totals		
10,618	Delay Savings (Vehicle Hours)	(say 10600)
\$ 10,221	Travel Time Savings (Truck)	
\$ 288,805	Travel Time Savings (Car)	
\$ 32,419	Fuel Savings	
\$ 331,445	Combined Savings	(say 331000)
9,236	Reduction in Fuel Use (Gallons)	(say 9200)
81,276	Reduction in CO ₂ Emission (kg)	(say 81000)
623,220	Savings Number of Stops	(say 620000)

$$\Delta TT = TT_{\text{Base}(section)} - TT_{\text{Objective}(section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{\text{hr}}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{\text{hr}}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{\text{hr}}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

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*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 10 / 202 (Hopmeadow Street), Simsbury North End (Naztec System 56) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	NB	-22	0.00	610	3%	97%	1.14	1.5	-3.73	\$ 3.59	\$ 101.41	3.243	28.5	0
	SB	-23	-0.70	625	3%	97%	1.14	1.5	-3.99	\$ 3.84	\$ 108.62	3.474	30.6	438
TOTALS PER DAY:									-7.72	\$ 7.43	\$ 210.03	6.717	59.1	438

ΔTT= Change in Travel Time

Yearly Totals		
2,007	Delay Savings (Vehicle Hours)	(say 2000)
\$ 1,932	Travel Time Savings (Truck)	
\$ 54,608	Travel Time Savings (Car)	
\$ 6,130	Fuel Savings	
\$ 62,670	Combined Savings	(say 63000)
1,746	Reduction in Fuel Use (Gallons)	(say 1700)
15,366	Reduction in CO ₂ Emission (kg)	(say 15000)
113,880	Savings Number of Stops	(say 110000)

$$\Delta TT = TT_{Base(section)} - TT_{Objective(section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

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*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 10 (Main Street), Southington (Cubic System 40) Corridor
Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVt	PPVc	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-18	-1	603	3%	97%	1.14	1.5	-3.02	\$ 2.90	\$ 82.02	2.623	23.1	603
	WB	-29	-1.33	403	3%	97%	1.14	1.5	-3.25	\$ 3.13	\$ 88.31	2.824	24.9	536
MID	EB	-80	-1.33	607	3%	97%	1.14	1.5	-13.49	\$ 12.99	\$ 366.94	11.735	103.3	807
	WB	-12	-0.97	582	3%	97%	1.14	1.5	-1.94	\$ 1.87	\$ 52.77	1.688	14.9	565
PM	EB	-48	-0.97	661	3%	97%	1.14	1.5	-8.81	\$ 8.49	\$ 239.75	7.668	67.5	641
	WB	38	-0.33	698	3%	97%	1.14	1.5	7.37	\$ (7.09)	\$ (200.43)	-6.410	-56.4	230
TOTALS PER DAY:									-23.14	\$ 22.29	\$ 629.36	20.128	177.3	3382

ΔTT= Change in Travel Time

Yearly Totals		
6,016	Delay Savings (Vehicle Hours)	(say 6000)
\$ 5,795	Travel Time Savings (Truck)	
\$ 163,634	Travel Time Savings (Car)	
+ \$ 18,369	Fuel Savings	
\$ 187,798	Combined Savings	(say 188000)
5,233	Reduction in Fuel Use (Gallons)	(say 5200)
46,098	Reduction in CO ₂ Emission (kg)	(say 46000)
879,320	Savings Number of Stops	(say 880000)

$$\Delta TT = TT_{Base(section)} - TT_{Objective(section)}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{hr}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{hr}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{hr}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>

*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

Table 1 on Page 2 (2018)

*Vehicle percentages from : <https://tminfo-dot.ct.gov/TMINFO/top?year=2015,town=131,station=216,dataset=0>

*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>

Project Number 0171-0421 - Route 44 (Albany Ave.) / Route 218 (North Main St.), West Hartford (Naztec System 46)

Corridor

Travel Time Run System Evaluation - Comparison of Before and After Travel Time Run

Period	Direction	ΔTT (sec)	Δ Stops per vehicle	Total Traffic Volumes (veh/hour)	% Trucks	% Passenger Vehicles	PPVT	PPVC	Daily Δ Delay (veh-hours)	Daily Truck Travel Time Savings	Daily Car Travel Time Savings	Daily Fuel Consumption Savings (gallons)	Daily CO ₂ Emission (kg)	Daily Reduced # Stops
AM	EB	-59	-0.33	1510	3%	97%	1.14	1.5	-24.75	\$ 23.83	\$ 673.21	21.530	189.5	498
	WB	-61	-1	556	3%	97%	1.14	1.5	-9.42	\$ 9.07	\$ 256.29	8.196	72.1	556
MID	EB	-92	-1.33	692	3%	97%	1.14	1.5	-17.68	\$ 17.03	\$ 481.08	15.385	135.4	920
	WB	86	0.33	552	3%	97%	1.14	1.5	13.19	\$ (12.70)	\$ (358.72)	-11.472	-100.9	-182
PM	EB	-69	-1.67	845	3%	97%	1.14	1.5	-16.20	\$ 15.59	\$ 440.58	14.090	124.0	1411
	WB	-6	1.67	927	3%	97%	1.14	1.5	-1.55	\$ 1.49	\$ 42.03	1.344	11.8	-1548
TOTALS PER DAY:									-56.41	\$ 54.31	\$ 1,534.47	49.073	431.9	1655

ΔTT= Change in Travel Time

Yearly Totals		
14,667	Delay Savings (Vehicle Hours)	(say 14700)
\$ 14,121	Travel Time Savings (Truck)	
\$ 398,962	Travel Time Savings (Car)	
\$ 44,784	Fuel Savings	
\$ 457,867	Combined Savings	(say 458000)
12,759	Reduction in Fuel Use (Gallons)	(say 12800)
112,294	Reduction in CO ₂ Emission (kg)	(say 112000)
430,300	Savings Number of Stops	(say 430000)

$$\Delta TT = TT_{\text{Before(Section)}} - TT_{\text{Objective(Section)}}$$

$$USER_c = \Delta TT * Vol * \%C * PPV_c * \frac{\$18.71}{\text{hr}}$$

$$USER_t = \Delta TT * Vol * \%T * PPV_t * \frac{\$27.51}{\text{hr}}$$

$$FUEL = \Delta TT * Vol * \frac{0.87 \text{ gal}}{\text{hr}}$$

$$CO_2 = FUEL * \frac{19.4 \text{ lbs}}{\text{gal}}$$

Notes and References:

*Formulas from : <https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=2598&context=jtrp>*Cost Reference: <https://ftp.dot.state.tx.us/pub/txdot-info/cst/ruc-methodology-memo.pdf>

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*Total savings represent annual savings during the periods of travel time run data collection only. Savings outside these times are not reported.

*Annual Calculations based on 260 commuter days per year.

*Average price per gallon for gasoline in CT = \$3.51 (December 2021) <https://gasprices.aaa.com/?state=CT>