COUNCIL of GOVERNMENTS
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MEMORANDUM 080513

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From: Pat Gallagher, Regional Planner
Subject: Route 10 Signalized Intersection Safety Study

Introduction

COGCNV staff studied twelve signalized intersections on Route 10 in Cheshire to identify and address existing safety problems. Particular emphasis was given to short-term improvements such as improved signage, changes in traffic signal phasing, turning lanes, pedestrian improvements, and minor geometric improvements. For intersections with high accident rates, COGCNV staff recommended long-term safety improvements.

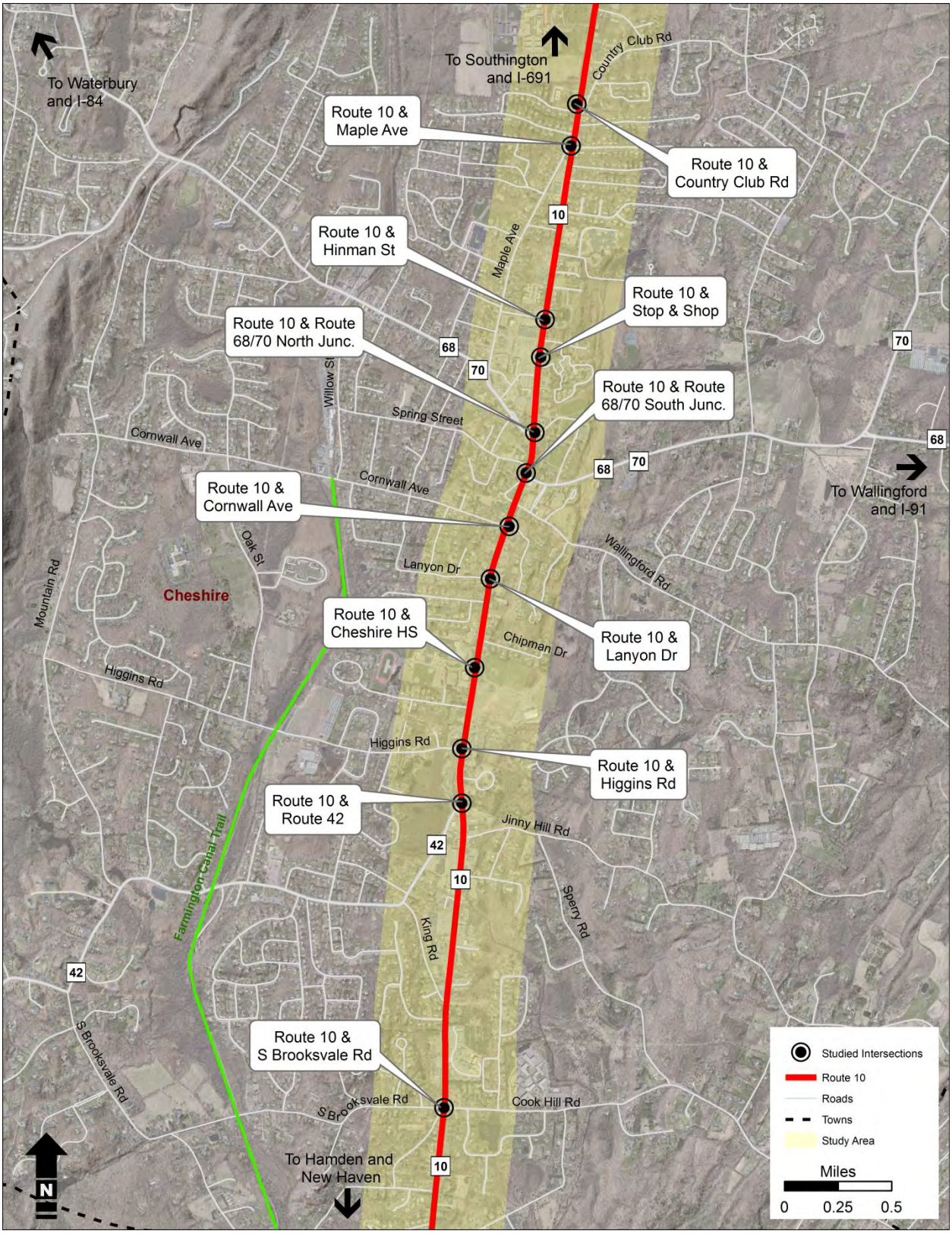
Study Area

This study analyses traffic operations and safety at twelve signalized intersections in the central and southern sections of Route 10 in Cheshire from Country Club Rd to the Hamden town line. The study area, including signalized intersections that are examined in detail, can be seen in Figure 1. Route 10 is functionally classified as an urban principal arterial that connects Cheshire with I-691 and I-84 in Southington to the north and Hamden and New Haven to the south. The northern part of the Route 10 corridor contains commercial and institutional land uses including Cheshire Industrial Park and two state correctional facilities. South of Country Club Rd, land use is a mix of low and medium density residential and commercial properties. The historic town center is located in the center of the study area between the northern and southern junctions of Route 10 and Route 68/70.

Traffic Volumes

Average daily traffic counts (ADTs) for Route 10 were obtained from CT DOT for the year 2011. North of Route 68/70, traffic volumes are between 13,000 and 15,000 vehicles per day (vpd). The concurrent stretch of Route 10 and Route 68/70 has the highest ADT in the corridor at 26,100 vpd. Traffic volumes decrease as Route 10 approaches the Hamden town line, where

Figure 1. Study Area



ADT decreases to 15,300 vpd. Average daily traffic counts for Route 10 can be seen in Table 2a. Cross street traffic volumes were obtained from CT DOT for the year 2010. Route 68/70 has the highest cross street traffic volume in the corridor, with an ADT of 16,900 vpd at the northern junction of Route 10 and 11,000 vpd at the southern junction of Route 10. With the exception of Spring St, which has light traffic volume, the remaining cross streets have ADTs between 2,200 and 6,100 vpd (Table 2b).

Table 2a. Average Daily Traffic Counts (ADT) on Route 10 in Cheshire: 2011

Route	From	To	From Mile	To Mile	ADT 2011
10	Creamery Rd	Maple Ave	19.05	18.09	14,600
10	Maple Ave	Route 68/70 (Northern)	18.09	17.09	13,900
10	Route 68/70 (Northern)	Route 68/70 (Southern)	17.09	16.94	26,100
10	Route 68/70 (Southern)	Route 42	16.94	15.78	22,100
10	Route 42	South Brooksvale Rd	15.78	14.72	19,200
10	South Brooksvale Rd	Cheshire Town Line	14.72	13.97	15,300

Source: CT Department of Transportation, Average Daily Traffic Counts 2011

Table 2b. Streets Intersection Route 10, Average Daily Traffic Counts (ADT): 2010

Route	From	To	ADT 2010
Country Club Rd	Club Lane	Applewood Dr	2,400
Maple Ave	Atwater Pl	Park Pl	6,100
Route 68/70 (Northern)	Maple Ave	Route 10	16,900
Spring St	Warren Street	Laurel Terrace	450
Route 68/70 (Southern)	Route 10	Elm Street	11,000
Cornwall Ave	Preston Rd	Route 10	2,200
Route 42	King Road	Route 10	4,300
South Brooksvale Rd	Bates Dr	Route 10	2,500
Cook Hill Rd	Route 10	Fenn Rd	4,100

Source: CT Department of Transportation, Average Daily Traffic Counts 2010

COGCNV staff performed Level-of-Service (LOS) analyses in Synchro based on turning movement counts for the AM (7:00 a.m. to 9:00 a.m.) and PM (4:00 p.m. to 6:00 p.m.) peak hours. Turning movement counts were conducted from 2011 to 2013. The northern part of the study area from Country Club Rd to the northern junction of Route 68/70 have minimal peak hour traffic congestion, with all intersections performing at LOS B or better. The most congested intersections are located in the southern part of the corridor between Cheshire High School and Route 42, where signalized intersections operated at LOS C or LOS D during peak

hours. The results of the LOS analysis for selected intersections in the study area can be seen in Table 3.

Table 3. Level of Service Analysis of Selected Signalized Intersections on Route 10: 2013

Intersection	Milepost	Level of Service	
		AM Peak	PM Peak
Country Club Rd	18.22	B	B
Hinman St	17.49	B	A
Stop & Shop Plaza	17.36	A	B
Route 68/70 North	17.09	B	B
Route 68/70 South	16.94	C	C
Cornwall Ave	16.75	B	B
Lanyon Dr	16.56	A	A
Cheshire High School	16.25	D	C
Higgins Dr	15.97	D	D
Route 42	15.77	C	D

Source: COGCNV staff analysis

Analysis of Existing Conditions

According to the CT Crash Data Depository, the twelve signalized intersections examined in this study saw a total of 238 accidents between 2009 and 2011. For each intersection, accidents were analyzed by collision type, contributing factor, injury severity, and vehicle type. In addition, collision diagrams were created to show the approximate accident locations and vehicle directions. A detailed examination of each intersection can be seen in Appendix A through Appendix L. Several locations in the study area are part of CT DOT's most recent Suggested List of Surveillance Study Sites (SLOSSS), which covers a period from 2006 to 2008. These locations experience an abnormally high accident rate relative to their traffic volume (Table 4). Two signalized intersections were included in the SLOSSS list.

Table 4. Suggested List of Surveillance Study Sites (SLOSSS) on Route 10 in Cheshire: 2006-2008

Route	From Mile	To Mile	Location
10	14.32	14.71	Between Bradford Dr and Cook Hill Rd
10	14.72	14.72	At Cook Hill Rd and South Brooksvale Rd
10	15.67	15.76	Between Jinny Hill Rd and Route 42
10	15.98	16.10	Between Higgins Rd and Elmwood Dr
10	16.57	16.74	Between Lanyon Dr and Cornwall Ave
10	16.76	16.83	Between Cornwall Ave and Church Dr
70	4.36	4.36	At Route 10 (Highland Ave)

Source: CT Department of Transportation

Route 10 and Country Club Rd

Country Club Rd is functionally classified as an urban collector that connects Cheshire to Route 70 and Wallingford. Land use at the intersection is a mix of institutional and low density residential. In the past, Country Club Rd followed a diagonal alignment that connected with Maple Ave to the south. The road was realigned and curves just before the intersection to form a four-way intersection with Route 10 and Curve Hill Road. The prevailing direction of traffic on Route 10 is NB in the AM, and SB in the PM. NB vehicles on Route 10 have a right turn lane. The remaining legs of the intersection have shared lanes for all movements. A vast majority of WB vehicles on Country Club Rd (84% of AM and 94% of PM traffic) turn left onto Route 10 SB.

The intersection of Route 10 and Country Club Rd saw 6 accidents between 2009 and 2011, 3 of which were rear-end collisions. All rear-end collisions occurred on Route 10 SB. The remaining accidents were turning-opposite direction, sideswipe-opposite direction, and fixed object accidents. The area adjacent to Country Club Rd is free of vegetation, and sightlines are good despite the horizontal curve. The curve on Country Club Rd slows down traffic which helps prevent high-speed collisions. COGCNV staff observed NB vehicles turning right onto Country Club Rd from Route 10 crossing the double yellow centerline into the oncoming lane. This maneuver resulted in a sideswipe-opposite direction collision in 2009. Vehicles turning right onto Country Club Rd may be making the turn too fast. A detailed examination of accidents occurring at the intersection of Route 10 and Country Club Rd can be seen in Appendix A.

Route 10 and Maple Ave

Maple Ave is functionally classified as an urban collector. Maple Ave connects Route 68/70 to Route 10. Land use surrounding the intersection is a mix of low density residential and commercial. Maple Ave curves just before Route 10 to form a four-way intersection with Pleasant Drive. Like Country Club Rd, Maple Ave used to follow a diagonal alignment until it was realigned to form a four-way signalized intersection. SB vehicles on Route 10 have a right turn lane. The remaining legs of the intersection have shared lanes for all turning movements.

The intersection of Route 10 and Maple Ave saw 13 accidents from 2009 to 2011, 12 of which occurred on Route 10. Rear-end accidents caused by drivers following too closely made up 61% of all accidents. 5 rear-end accidents occurred on Route 10 NB, 2 occurred on Maple Ave, and 1 occurred on Pleasant Dr. In addition, there were 2 turning-related accidents and 1 right angle collision. A detailed examination of accidents occurring at the intersection of Route 10 and Maple Ave can be seen in Appendix B.

Route 10 and Hinman St

Hinman St, which is classified as a local road, is one-tenth of a mile long and connects Maple Ave and Route 10. A commercial driveway intersects Route 10 opposite Hinman St. Commercial

land uses surround the intersection, with a large shopping plaza to the south. All approaches have shared lanes for all movements and have permitted left turns. Route 10 has a wide enough shoulder that thru-moving vehicles can pass vehicles making left turns.

The intersection of Route 10 and Hinman St saw 11 accidents from 2009 to 2011, 10 of which occurred on Route 10. 8 of the 10 accidents on Route 10 were rear-end collisions caused by vehicles following too closely. The remaining accidents were turning-intersecting path collisions caused by vehicles running red lights. A detailed examination of accidents occurring at the intersection of Route 10 and Hinman St can be seen in Appendix C.

Route 10, Stop & Shop and Maplecroft Plaza

The Stop & Shop and Maplecroft Plaza/Liberty Bank intersections are located approximately 300 feet from each other on Route 10. Land use in the vicinity of the intersections is medium density commercial. Right turns on red are prohibited for SB vehicles turning into both shopping plazas and for vehicles turning right out of Stop & Shop plaza.

The two intersections saw a combined 13 accidents from 2009 to 2011 with 6 occurring at the Stop & Shop plaza intersection and 7 occurring at the Maplecroft Plaza/Liberty Bank intersection. Rear-end accidents (46%) caused by vehicles following too closely were the most frequent type of accident. Turning related accidents made up an additional 23% of accidents. In 2009 an EB pedestrian was hit by a SB vehicle that violated the traffic control, resulting in an injury. A detailed examination of accidents occurring at the intersections of Route 10 and Stop & Shop and Maplecroft Plaza/Liberty Bank can be seen in Appendix D.

Route 10 and Route 68/70 Northern Junction

Route 68/70 is functionally classified as an urban principal arterial that connects Cheshire to Prospect, Waterbury, and I-84. The driveway of Cheshire Academy is located opposite the northern junction of Route 68/70. Route 10 has 2 thru lanes and a left turn lane. Cheshire Academy and Route 68/70 both have a right turn lane and a shared lane for thru and left turning vehicles. 98% of the peak hour traffic on Route 68/70 EB turns right onto Route 10 SB.

The northern junction of Route 10 and Route 68/70 is listed on CT DOT's SLOSS list, indicating that it experiences an abnormally high accident rate. From 2009 to 2011, 34 accidents occurred at the intersection with 18 occurring on Route 10 and 16 occurring on Route 68/70. The most common types of accidents were rear-end accidents (56%), turning-intersecting paths (18%) and fixed object (11.8%). 37.5% of accidents on Route 10 were turning-opposite direction accidents where turning vehicles failed to grant right-of-way. Vehicles following too closely made up half of the total accidents at the intersection and 72.2% of accidents on Route 68/70. Poor sightlines on the EB approach contribute to the frequency of rear-end collisions. Route 68/70 was realigned in the 1990s to line up with the Cheshire Academy Driveway. While it

improved safety at the intersection, it has also reduced sightlines on the EB approach. A detailed examination of the northern junction of Route 10 and Route 68/70 can be seen in Appendix E.

Route 10 and Route 68/70 Southern Junction and Spring St

The intersection of Route 10 and Spring St is located approximately 150 feet north of the southern junction of Route 10 and Route 68/70. Because of their close proximity to one another, these intersections were all examined together. Route 68/70 is functionally classified as urban principal arterial while Spring St is classified as an urban collector. The Spring St intersection is stop-controlled on the minor approach while the Route 68/70 intersection is signalized. There is a peak hour left turn prohibition for NB vehicles on Route 10 turning onto Spring St from 7-9 AM and 4-6 PM. EB on Spring St do not have a left turn prohibition. At the signalized intersection of Route 10 and Route 68/70, SB and WB vehicles have protected left turn phases.

The southern junction of Route 10 and Route 68/70 saw 30 accidents from 2009 to 2011 with an additional 11 occurring at the intersection of Route 10 and Spring Street. Rear-end collisions caused by vehicles following too closely made up 54% of accidents. 32% of accidents involved turning vehicles. Despite the peak hour left turn prohibition, 6 turning-related accidents occurred at the intersection of Route 10 and Spring Street, 5 of which were outside of peak hours, and 4 of which resulted in injury. A detailed examination of accidents at the southern junction of Route 10 and Route 68/70 and Spring St can be seen in Appendix F.

Route 10 and Cornwall Ave

Cornwall Ave is functionally classified as an urban collector. Old Towne Rd, a private road, intersects Route 10 across from Cornwall Ave. Land use surrounding the intersection is low density commercial. Both directions of Route 10 have left turn lanes with a protected left turn phase. Cornwall Ave and Old Towne Rd have shared lanes for all turning movements. A large, open curb cut with two driveways and a parking area is located just to the north of Old Towne Road in front of the 194 South Main St (Route 10). The first driveway is located just 30 feet from the edge line of Old Towne Rd. There are 5 marked parking spots in front of the building, each of which is perpendicular to the curb. The parking area extends into the Route 10 right-of-way which forces backing vehicles to enter the roadway. There is additional parking at the rear of the building. The curb cut also creates a gap of approximately 120 feet in the sidewalk system, creating safety concerns for pedestrians.

The Intersection of Route 10 and Cornwall Ave saw 22 accidents from 2009 to 2011. Out of the 22 total accidents, 17 were rear-end accidents, 3 were turning-related accidents, and 2 were right angle collisions. 11 rear-end accidents occurred on Route 10 SB, 5 on Route 10 NB, and 1

on Cornwall Ave. A detailed examination of accidents at the intersection of Route 10 and Cornwall Ave can be seen in Appendix G.

Route 10 and Lanyon Dr

Lanyon Dr is functionally classified as a local road. Land use on Lanyon Dr is single-family residential, while commercial properties line Route 10. A commercial driveway intersects Route 10 opposite Lanyon Dr. Route 10 NB has a left turn lane but no protected left turn phase. The remaining approaches have shared lanes for all movements.

The intersection saw 19 accidents from 2009 to 2011, all of which occurred on Route 10. Rear-end accidents were the most prevalent (58%) followed by Turning-Opposite Direction (16%) and Turning-Intersecting Paths (11%). Despite the presence of a left turn lane on Route 10 NB, vehicles turning left onto Lanyon Dr do not have a protected left turn. 3 of the 4 turning-related accidents involved vehicles on Route 10 trying to turn left. While conducting turning-movement counts, COGCNV staff observed several NB left turning vehicles fail to yield to oncoming traffic at the beginning and end of phases. A detailed examination of accidents at the intersection of Route 10 and Lanyon Dr can be seen in Appendix H.

Route 10 and Cheshire High School

Cheshire High School has a signalized southern driveway located across from the entrance to Bartlem Park. The intersection operates at LOS D during the AM peak and LOS C during the PM peak. Traffic generated by the school at the beginning (7:20 AM) and the end (2:00 PM) of the school day contributes to congestion. The AM peak hour coincides with the beginning of the school day. Because it serves both the high school and Bartlem Park, the intersection has a very high volume of pedestrian traffic. COGCNV staff counted 121 pedestrians during the AM peak and 46 pedestrians during the PM peak. From 7:00 AM to 7:15 AM (just before school begins) staff counted 83 pedestrians. Students who live within 1.5 miles of Cheshire High School are not eligible for bus pickup. In addition, many students park across the street in the Bartlem Park lot and walk across the street to school.

The intersection of Route 10 and Cheshire High School is a high accident location that saw 25 accidents from 2009 to 2011. 80 percent of accidents were rear-end accidents caused by vehicles following too closely. The remaining accidents were turning-related (16%) and fixed object (4%). 15 of the 20 rear-end accidents occurred on Route 10 SB. The prevalence of rear-end accidents suggests that cars are accelerating through the intersection as the light is turning red, or that traffic is backed up downstream of the traffic signal. Congestion at the intersection increases driver frustration, and may encourage motorists to rush through the intersection at the end a traffic signal phase. A detailed examination of accidents at the intersection of Route 10 and Cheshire High School can be seen in Appendix I.

Route 10 and Higgins Rd

Higgins Rd is functionally classified as a local road. The intersection performed at LOS D in the AM and PM peaks, making it the most congested intersection in the study area. NB left turning vehicles on Route 10 have protected phase followed by a permitted phase while SB left turning vehicles only have a permitted phase. During the PM peak, NB vehicles queued from the Cheshire High School intersection all the way to Higgins Rd suggesting that there is a need for coordination between the two traffic signals.

The intersection of Route 10 and Higgins Rd saw 18 accidents from 2009 to 2011 with 16 occurring on Route 10 and 2 on Higgins Rd. 75% of accidents on Route 10 were rear-end collisions caused by vehicles following too closely. The remaining four accidents involved turning vehicles. A detailed examination of accidents at the intersection of Route 10 and Higgins Rd can be seen in Appendix J.

Route 10 and Route 42

Route 42 is functionally classified as an urban minor arterial and connects Cheshire to Bethany, Naugatuck, Beacon Falls, and Route 8. To the south of the intersection, land use is low to medium density commercial, while two condominium complexes are located to the north of the intersection. A residential driveway, located opposite of Route 42, is unsignalized. Route 10 NB has a left turn lane while Route 10 SB has a right turn lane. On Route 42 EB, 84% of vehicles during the AM peak and 78% of vehicles during the PM peak turn left onto Route 10.

The intersection of Route 10 and Route 42 saw 18 accidents between 2009 and 2011, with 15 accidents occurring on Route 10 and 3 accidents occurring on Route 42. Rear-end collisions (61%) and fixed object collisions (11%) were the most common. 3 fixed-object collisions resulted from vehicles hitting the raised median while turning from Route 10 onto Route 42. The stretch of road just to the south of the intersection between Route 42 and Jinny Hill Rd is listed on CT DOT's SLOSSS list. Several large curb cuts and a shared left turn lane contribute to the high frequency of accidents to the south of the intersection. The shared left turn lane is brief and is flanked by NB left turn lanes on either end which may cause confusion for drivers and lead to sudden stops or conflicts with oncoming vehicles. A detailed examination of accidents at the intersection of Route 10 and Route 42 can be seen in Appendix K.

Route 10 and South Brooksvale, Cook Hill, and Harrison Roads

The intersection of Route 10 and South Brooksvale, Cook Hill, and Harrison Roads is the southernmost signalized intersection in the town of Cheshire. Land use surrounding the intersection is low density residential. South Brooksvale Road and Cook Hill Road are functionally classified as urban collectors while Harrison Road is classified as a local road. South

Brooksvale Road connects to Route 42 and Bethany to the west while Cook Hill Road connects to Route 15 and Wallingford to the east. Harrison Road intersects South Brooksvale Road just to the west of Route 10. As a result, the stop bar for South Brooksvale Road is located 60 feet from Route 10, resulting in poor sightlines. Route 10 has left turn lanes and protected left turn phases.

The intersection is on CT DOT's SLOSSS list indicating that it has an abnormally high accident rate. From 2009 to 2011, the intersection saw 18 accidents. Rear-end accidents (72%) were the most common type of accident followed by right angle (11%) and fixed object (11%) collisions. All of the rear-end accidents were caused by vehicles following too closely suggesting that vehicles may be rushing through the intersection at the end of the cycle.

Recommended Safety Improvements

Route 10 and Country Club Road

While performing turning movement counts, COGCNV staff noticed that cars turning onto Country Club Rd from Route 10 were crossing over the double yellow line into the oncoming traffic lane and triggering the loop detector, causing the light to switch to the minor street phase even though no vehicles were present. The problem of vehicles crossing the double yellow line resulted in a sideswipe-opposite direction accident in 2009. The primary cause of the problem is that right turning vehicles are traveling too fast.

It is recommended that CT DOT re-examine the detector placement on Country Club Rd to see if there is a way to mitigate the unnecessary triggering of the detectors and subsequent delay. Another option would be to reduce the curb radius for vehicles turning right onto Country Club Rd. Reducing the turning radius is an effective way of slowing down right turning vehicles. A median island is not feasible on Country Club Rd because it would impede vehicles exiting the Campion Ambulance driveway, located just 40 feet from the intersection.

Route 10 and Maple Ave

There is no left turn lane or protected left turn phase on Route 10 NB. As a result, left turning vehicles cause delay to thru moving vehicles on Route 10 and may make unsafe turning maneuvers at the beginning or end of phases. CT DOT should investigate whether a left turn lane with or without a protected phase for NB vehicles on Route 10 turning onto Maple Ave is feasible.

Route 10 and Hinman St

While conducting turning movement counts during the PM peak hours, COGCNV staff observed numerous SB vehicles on Route 10 running red lights at the end phases. From 2009 to 2011, 2

turning-intersecting paths accidents occurred when SB vehicles on Route 10 ran a red light and collided with an EB or WB vehicle. One of these accidents resulted in injury. The all-red clearance phase is currently 1.8 seconds. It is recommended that CT DOT increase the all-red clearance interval to help prevent future collisions caused by vehicles running red lights.

Route 10 and Stop & Shop/Maplecroft Plaza

From 2009 to 2011, there were 3 turning-related and 1 right angle accidents at the intersections of Route 10, Stop & Shop and Maplecroft Plaza/Liberty Bank. The minor street phase at Stop & Shop Plaza has a 1.2 second all-red clearance interval while Maplecroft Plaza/Liberty Bank has a 2 second all-red clearance interval. It is recommended that the minor street phase all-red clearance interval at Stop & Shop plaza be increased from 1.2 seconds to 2 seconds to prevent future turning-related accidents. The Crash Modification Factor (CMF) Clearinghouse shows that increasing the all-red clearance interval reduced right angle, head on, and sideswipe collisions by up to 40%.

Route 10 and Route 68/70 Northern Junction

A short-term option involves improving signage and installing a flashing beacon on the EB leg of Route 68/70. The Manual on Uniform Traffic Control Devices (MUTCD) recommends that a traffic signal with an 85th percentile approach speed of 35 mph should have a minimum sight distance of 325 feet. The Route 68/70 EB approach does not meet the minimum sight distance requirement. MUTCD recommends that signals with inadequate sight distance be supplemented with warning signs and flashing beacons. The flashing beacon may be interconnected with the traffic signal controller to alert road users of a red light or queue ahead. The Crash Modification Factor (CMF) Clearinghouse found that dynamic flashing beacons can reduce rear-end collisions at signalized intersections by over 20%. Additional signage such as chevron signs may also help improve driver awareness around the horizontal curve and reduce speeds.

A long-term improvement option involves adding a channelized right turn to the EB approach of Route 68/70. A channelized right turn would straighten out the approach and dramatically improve traffic signal sight distance (Figure 2). 98% of peak hour vehicles using the EB approach of Route 68/70 turn right onto Route 10 SB. While this improvement option would reduce rear-end collisions, it may encourage motorists to drive faster through the intersection, resulting in higher-speed collisions, and creating a more hazardous environment for crossing pedestrians.

Figure 2. Improvement Option: Channelized Right-Turn on Route 68/70 EB

Existing Conditions

Improvement Option: Channelized right-turn on Route 68/70 EB

Route 10 and Route 68/70 Southern Junction and Spring St

Despite a peak hour left turn prohibition on Route 10 NB, there were still 6 turning-related crashes at the intersection of Route 10 and Spring St between 2009 and 2011. COGCNV staff recommends implementing a full time left turn prohibition for NB vehicles on Route 10 turning onto Spring St and for EB vehicles on Spring St turning onto Route 10 NB. Both of these turning movements have poor sightlines and have to cross over three lanes of SB traffic. "No Left Turn" signs should be installed on both Spring St and Route 10. The MUTCD recommends that signs should be installed above the roadway, at the far left hand corner of the intersection, or in conjunction with a stop sign. The "No Left Turn" sign on Spring St should be mounted on the stop sign, while the peak hour prohibition sign on Route 10 should be removed from below the "No Left Turn" sign that is positioned at the entrance to Spring St. Placing a "No Left Turn" sign over the left lane of Route 10 NB would be the most effective way of communicating the turning prohibition to drivers. To supplement the signs, a solid double yellow line should be painted on Route 10 to indicate the turning restriction. Preventing left turns onto Spring Street could also help reduce rear-end collisions on Route 10 NB.

The intersection of Route 10 and Route 68/70 saw 31 accidents from 2009 to 2011. Route 10 NB and Route 68/70 WB each saw 7 rear-end collisions. A dynamic flashing beacon could be installed on Route 68/70 WB at the location of the existing "Signal Ahead" sign to give drivers advance warnings of red lights or queues. Flashing beacons have been shown to reduce rear-end collisions by giving drivers advance warning of red lights and queues. In addition, there were 6 turning-related accidents, 4 of which involved right turning vehicles. Preventing right turns on red for vehicles on Route 68/70 WB could help prevent future turning-related crashes and vehicle-pedestrian conflicts. However, the restriction would also increase delay on the WB approach.

Route 10 and Cornwall Ave

Install crosswalks across Cornwall Ave and Old Towne Rd. COGCNV staff observed 1 NB and 7 SB pedestrians during the AM peak (on a rainy day) and 9 NB and 9 SB pedestrians in the PM peak, all of which were crossing the street without a crosswalk. In 2008, a pedestrian crossing Cornwall Ave was hit by a vehicle turning right on red, resulting in an injury. Crosswalk markings provide guidance to pedestrians crossing roadways and increase driver awareness of pedestrians.

CT DOT and the Town of Cheshire should examine the driveways and parking area in front of 194 South Main St. The southern driveway for 194 South Main St is located 30 feet from Old Town Road and leads to a parking area at the rear of the building. To decrease potential conflicts at the intersection, the driveway could be relocated from Route 10 to Old Towne Rd. The existing parking configuration also poses safety issues. There is approximately a 6 foot

buffer between the parking spaces and the edge line of Route 10 NB. The 6 foot buffer is not adequate for backing vehicles, forcing them to back into the roadway. Reconfiguring the parking angle from 90 degrees (perpendicular to the curb) to 0 degrees (parallel to the curb) would help reduce the likelihood of backing collisions. The CMF Clearinghouse found that converting angled parking to parallel parking can reduce parking-related accidents by up to 65%. Parallel parking stalls would also leave adequate room for a sidewalk, eliminate the 120 foot gap in the sidewalk system, and reduce pedestrian conflicts. Suggested improvement options can be seen in Figure 3.

Route 10 and Lanyon Dr

COGCNV staff counted 26 vehicles in the AM peak hour, and 41 vehicles in the PM peak hour turning left onto Lanyon Dr from Route 10. Because there is no protected left turn, staff observed many left-turning vehicles failing to yield to oncoming traffic, or turning after the signal turned red. It is recommended that CT DOT add a leading left turn phase in the Route 10 NB left turn lane to prevent future turning-related accidents.

Figure 3. Improvement Option: Route 10 and Cornwall Ave Improvement Options

Existing Conditions

Improvement Option: Install crosswalks and reconfigure parking in front of 194 South Main St.

Route 10 and Cheshire High School

Prohibit right turns on red for all legs of the intersection. The right turn prohibition could be implemented full-time, or part-time to coincide with school hours. The intersection of Route 10 and Cheshire High School has a very high level of pedestrian traffic (121 in the AM peak and 46 in the PM peak). Prohibiting right turns on red minimizes pedestrian-vehicle conflicts. The MUTCD recommends that "No Turn on Red" signs be installed near the appropriate signal head. Because there are no right turn lanes on Route 10, the effect on traffic congestion should be minimal. Pedestrian safety can also be improved by installing new pedestrian signals. The existing signals contain the text "Walk" and "Don't Walk" rather than the "Walking Person" and "Upraised Hand" symbols that are required for new signals. In addition, the signals are not lit by LEDs, resulting in poor visibility. The MUTCD recommends that pedestrian signals with pedestrian change intervals greater than 7 seconds use a countdown display to inform pedestrians of the number of seconds remaining in the change interval. The pedestrian phase at the intersection has a 17 second pedestrian change interval. Finally, detectable warning surfaces, as specified in the *Americans with Disabilities Act Accessibility Guidelines*, should be placed on all curb ramps at the intersection. Detectable warning surfaces are textured surface indicators that assist pedestrians who are visually impaired.

A long term improvement option would involve adding additional storage capacity to the intersection. The *Connecticut Route 10 Land Use & Traffic Study*, conducted in 1996, recommended that Route 10 be widened to two lanes in each direction plus turning lanes in the vicinity of Cheshire High School. While this would improve traffic operations, it may have detrimental impacts on pedestrians and bicyclists.

Route 10 and Higgins Road

Allow for a leading protected left turn phase on the NB and SB approaches of Route 10. Both approaches have left turn lanes, but no protected left turn.

While conducting turning movement counts during the PM peak, staff observed cars on Route 10 NB queuing from Cheshire High School all the way to Higgins Rd. Coordinating the two traffic signals may help reduce congestion. In addition, the stretch of Route 10 between Higgins Rd and Elmwood Dr has a very narrow shoulder. Vehicles trying to make left turns into driveways along this stretch of roadway often block thru vehicles while waiting for a gap in traffic, resulting in an increased likelihood of rear-end collisions. Installing a 4 to 6 foot shoulder would allow thru traffic to pass left turning vehicles safely and help reduce congestion and rear-end collisions.

Route 10 and Route 42

The intersection of Route 10 and Route 42 has a high rate of fixed-object collisions. Three fixed-object collisions involved turning vehicles hitting the raised median on Route 42, two of which occurred at night. The raised median contains retroreflective pavement markers. However, increasing the retroreflectivity could result in additional safety improvements. COGCNV staff recommends that CT DOT increase the retroreflectivity of the markers and paint the median with retroreflective paint. The CMF Clearinghouse found that increasing pavement marking retroreflectivity helped reduce fixed-object collisions. In addition, the median object marker (which is currently facing WB) should be re-oriented towards NB and SB traffic to improve visibility to drivers.

Reducing congestion may also result in safety improvements. The intersection of Route 10 and Route 42 operates at LOS C in the AM and LOS D in the PM. Driver frustration caused by congestion may contribute to the high frequency of rear-end collisions. A traffic signal analysis performed using Synchro revealed that optimizing signal timing would improve operations to LOS B in the AM and LOS C in the PM. Signal optimization would increase the green time for thru vehicles on Route 10 and decrease green time for vehicles on Route 42 and left turning vehicles on Route 10 NB.

Route 10 and South Brooksvale, Cook Hill, and Harrison Roads

The intersection of Route 10 and South Brooksvale, Cook Hill, and Harrison roads is on CT DOT's SLOSSS list indicating that it has an abnormally high accident rate. Two EB vehicles were involved in right angle crashes from 2009 to 2011. South Brooksvale Road is plagued by poor sightlines and a large clearance distance. The clearance distance (from the stop bar to the far end of the intersection) for EB vehicles on South Brooksvale Rd is 105 feet. According to the signal timing plan, there is a 2.5 second all-red clearance time after the EB and WB phases. An EB vehicle traveling 20 mph would need 3.6 seconds to clear the intersection. A short term improvement option would be to adjust the all-red clearance time to account for the large clearance distance. The Crash Modification Factor (CMF) Clearinghouse found that increasing the all-red clearance interval reduced right angle, head on, and sideswipe collisions by up to 40%.

A long term improvement option involves simplifying the intersection geometry by converting Harrison Rd to a cul-de-sac, as indicated in Figure 5. This configuration would simplify turning movements and move the South Brooksvale stop bar much closer to the intersection, resulting in improved sightlines and a decreased clearance distance. The *Town of Cheshire Zoning Regulations* allows for hammerhead or circle cul-de-sacs. Harrison Rd residents would still be able to access Route 10 via Rising Trail Rd. Traffic volume counts would need to be conducted on Harrison Rd before the cul-de-sac option is explored further.

Figure 5. Improvement Option: Converting Harrison Road to a Cul-de-Sac

Existing Conditions

Improvement Option: Convert Harrison Road to a cul-de-sac

Appendix A. Route 10 and Country Club Road

Table A1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Country Club Rd	
	Count	Percent	Count	Percent
Rear-End	3	60.0%	-	-
Turning - Opposite Direction	1	20.0%	-	-
Fixed Object	1	20.0%	-	-
Sideswipe - Opposite Direction	-	-	1	100.0%
Total	**5**	**100.0%**	**1**	**100.0%**

Table A2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Country Club Rd	
	Count	Percent	Count	Percent
Following Too Closely	3	60.0%	-	-
Improper Turning Maneuver	1	20.0%	-	-
Slippery Surface	1	20.0%	-	-
Driver Lost Control	-	-	1	100.0%
Total	**5**	**100.0%**	**1**	**100.0%**

Table A3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Country Club Rd	
	Count	Percent	Count	Percent
Property Damage Only	10	83.3%	2	100.0%
A-Injuries	-	-	-	-
B-Injuries	-	-	-	-
C-Injuries	2	16.7%	-	-
Total	**12**	**100.0%**	**2**	**100.0%**

Table A4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Country Club Rd	
	Count	Percent	Count	Percent
Automobile	7	77.8%	1	50.0%
Truck-Semi Trailer	1	11.1%	-	-
Passenger Van	1	11.1%	-	-
Truck-Trailer Combination	-	-	1	50.0%
Total	**9**	**100.0%**	**2**	**100.0%**

Figure A1. Intersection Collision Diagram: 2009-2011

Source: CT Crash Data Repository: 2009-2011, Route 10 and Country Club Road, Cheshire

Appendix B. Route 10 and Maple Ave

Table B1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Maple Ave	
	Count	Percent	Count	Percent
Rear-End	7	58.3%	1	100.0%
Turning - Opposite Direction	2	16.7%	-	-
Backing	1	8.3%	-	-
Sideswipe - Same Direction	1	8.3%	-	-
Angle	1	8.3%	-	-
Total	**12**	**100.0%**	**1**	**100.0%**

Table B2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Maple Ave	
	Count	Percent	Count	Percent
Following Too Closely	7	58.3%	1	100.0%
Failed to Grant Right of Way	1	8.3%	-	-
Unsafe Backing	1	8.3%	-	-
Slippery Surface	1	8.3%	-	-
Improper Lane Change	1	8.3%	-	-
Vehicle Without Lights	1	8.3%	-	-
Total	**12**	**100.0%**	**1**	**100.0%**

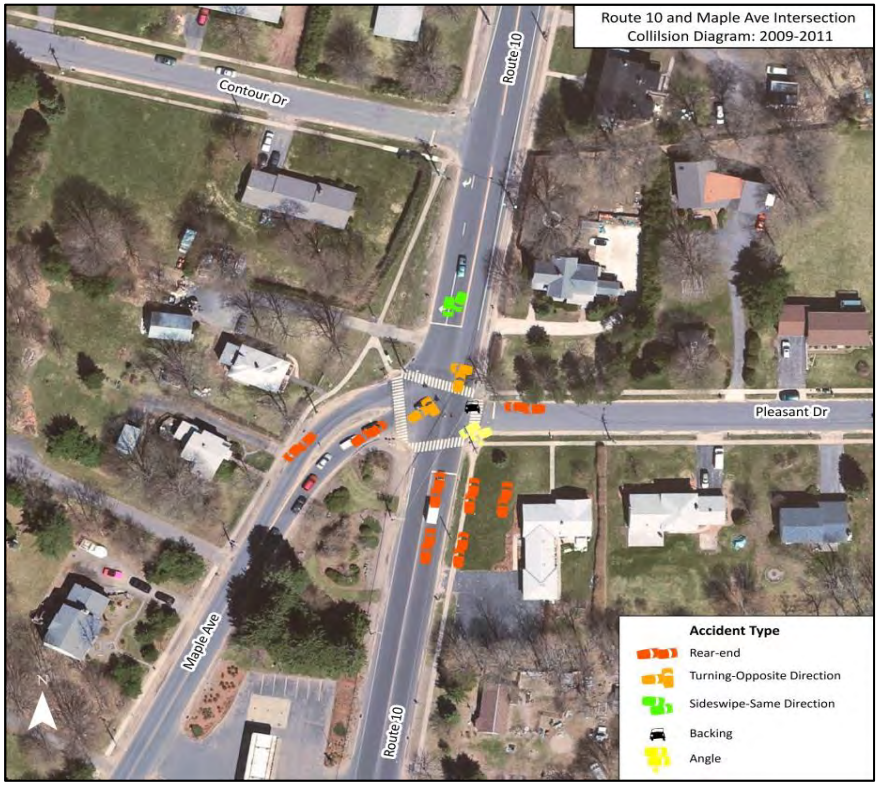
Table B3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Maple Ave	
	Count	Percent	Count	Percent
Property Damage Only	29	96.7%	1	33.3%
A-Injuries	-	-	-	-
B-Injuries	1	3.3%	-	-
C-Injuries	-	-	2	66.7%
Total	**30**	**100.0%**	**3**	**100.0%**

Table B4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Maple Ave	
	Count	Percent	Count	Percent
Automobile	21	87.5%	2	100.0%
Truck-Trailer Combination	2	8.3%	-	-
Unkown	1	4.2%	-	-
Total	**24**	**100.0%**	**2**	**100.0%**

Figure B1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Maple Ave, Cheshire

Appendix C. Route 10 and Hinman Street

Table C1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Hinman Street	
	Count	Percent	Count	Percent
Rear-End	8	80.0%	-	-
Turning - Intersecting Paths	2	20.0%	1	100.0%
Total	**10**	**100.0%**	**1**	**100.0%**

Table C2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Hinman Street	
	Count	Percent	Count	Percent
Following Too Closely	8	80.0%	-	-
Failed to Grant Right of Way	2	20.0%	1	100.0%
Total	**10**	**100.0%**	**1**	**100.0%**

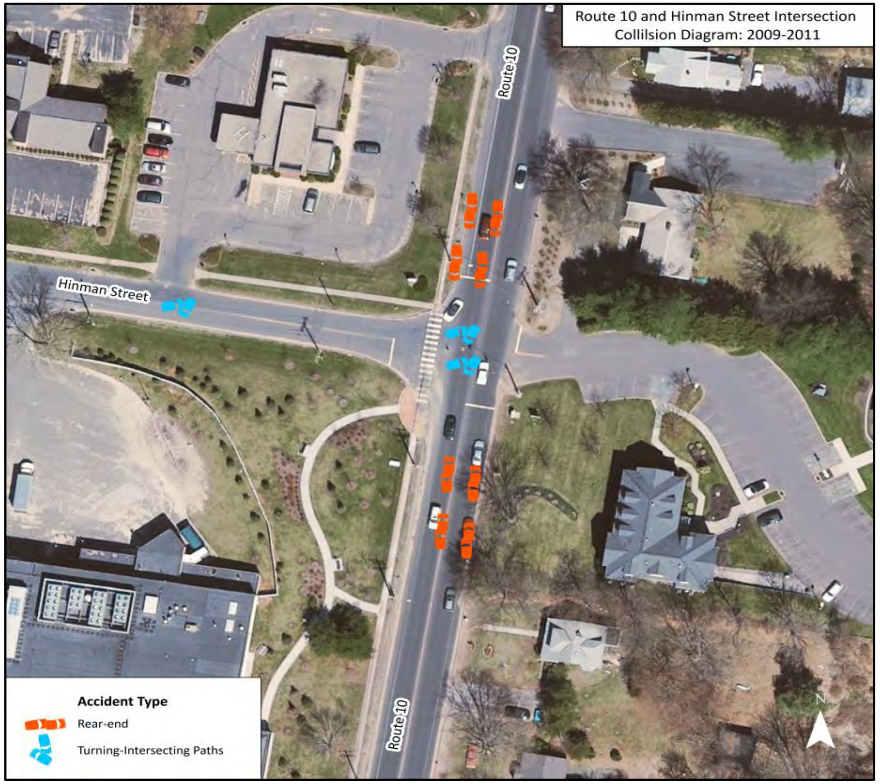
Table C3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Hinman Street	
	Count	Percent	Count	Percent
Property Damage Only	19	86.4%	2	100.0%
A-Injuries	-	-	-	-
B-Injuries	-	-	-	-
C-Injuries	3	13.6%	-	-
Total	**22**	**100.0%**	**2**	**100.0%**

Table C4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Hinman Street	
	Count	Percent	Count	Percent
Automobile	18	85.7%	1	50.0%
Single Unit Truck	3	14.3%	1	50.0%
Total	**21**	**100.0%**	**2**	**100.0%**

Figure C1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Hinman Street, Cheshire

Appendix D. Route 10 and Stop & Shop/Maplecroft Plaza

Table D1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Rt 10 (Stop & Shop)		Rt 10 (Maplecroft)	
	Count	Percent	Count	Percent
Rear-End	4	66.7%	2	28.6%
Turning - Opposite Direction	1	16.7%	-	-
Fixed Object	1	16.7%	-	-
Turning - Intersecting Paths		-	2	28.6%
Sideswipe - Same Direction	-	-	1	14.3%
Angle	-	-	1	14.3%
Pedestrian	-	-	1	14.3%
Total	**6**	**100.0%**	**7**	**100.0%**

Table D2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Rt 10 (Stop & Shop)		Rt 10 (Maplecroft)	
	Count	Percent	Count	Percent
Following Too Closely	4	66.7%	2	28.6%
Failed to Grant Right of Way	1	16.7%	1	14.3%
Defective Equipment	1	16.7%	-	-
Violated Traffic Control	-	-	2	28.6%
Improper Passing Maneuver	-	-	1	14.3%
Speed too Fast for Conditions	-	-	1	14.3%
Total	**6**	**100.0%**	**7**	**100.0%**

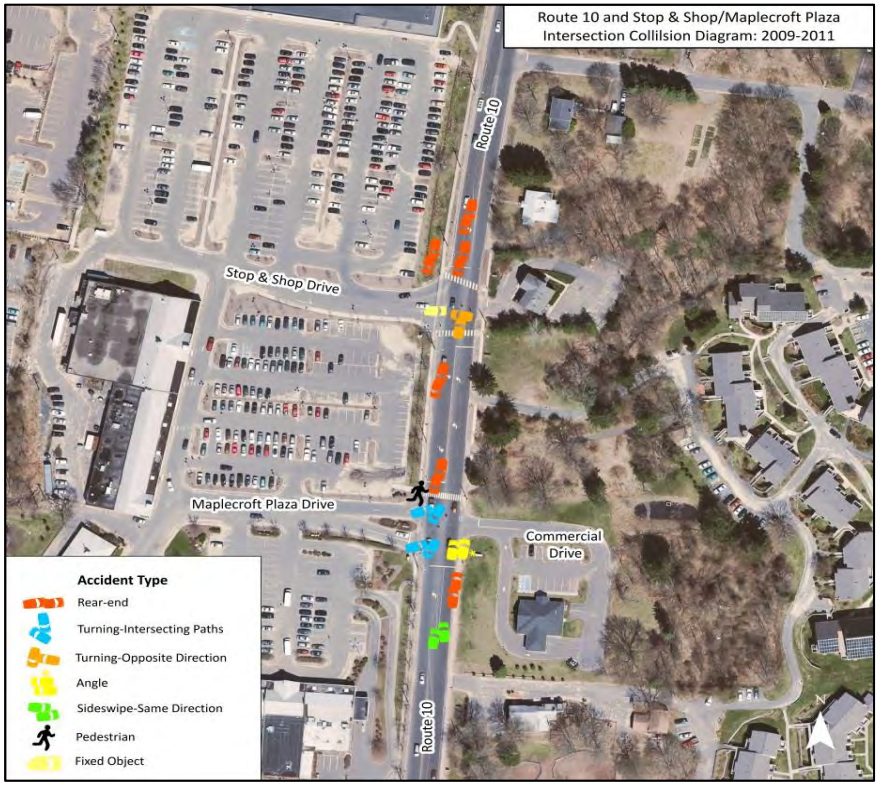
Table D3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Rt 10 (Stop & Shop)		Rt 10 (Maplecroft)	
	Count	Percent	Count	Percent
Property Damage Only	15	88.2%	13	92.9%
A-Injuries	-	-	-	-
B-Injuries	-	-	-	-
C-Injuries	2	11.8%	1	7.1%
Total	**17**	**100.0%**	**14**	**100.0%**

Table D4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Rt 10 (Stop & Shop)		Rt 10 (Maplecroft)	
	Count	Percent	Count	Percent
Automobile	10	90.9%	13	100.0%
Single Unit Truck	1	9.1%	-	-
Total	**11**	**100.0%**	**13**	**100.0%**

Figure D1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Stop & Shop/Maplecroft Plaza, Cheshire

Appendix E. Route 10 and Route 68/70, Northern Junction

Table E1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Rear-End	8	44.4%	11	68.8%
Turning - Same Direction	2	11.1%	-	-
Turning - Intersecting Paths	2	11.1%	4	25.0%
Sideswipe - Same Direction	2	11.1%	-	-
Turning - Opposite Direction	1	5.6%	1	6.3%
Angle	1	5.6%	-	-
Fixed Object	1	5.6%	-	-
Unknown	1	5.6%	-	-
Total	**18**	**100.0%**	**16**	**100.0%**

Table E2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Following Too Closely	8	44.4%	11	68.8%
Improper Turning Maneuver	4	22.2%	2	12.5%
Violated Traffic Control	2	11.1%	1	6.3%
Improper Lane Change	2	11.1%	-	-
Failed to Grant Right of Way	1	5.6%	1	6.3%
Unknown	1	5.6%	-	-
Unsafe Right Turn on Red	-	-	1	6.3%
Total	**18**	**100.0%**	**16**	**100.0%**

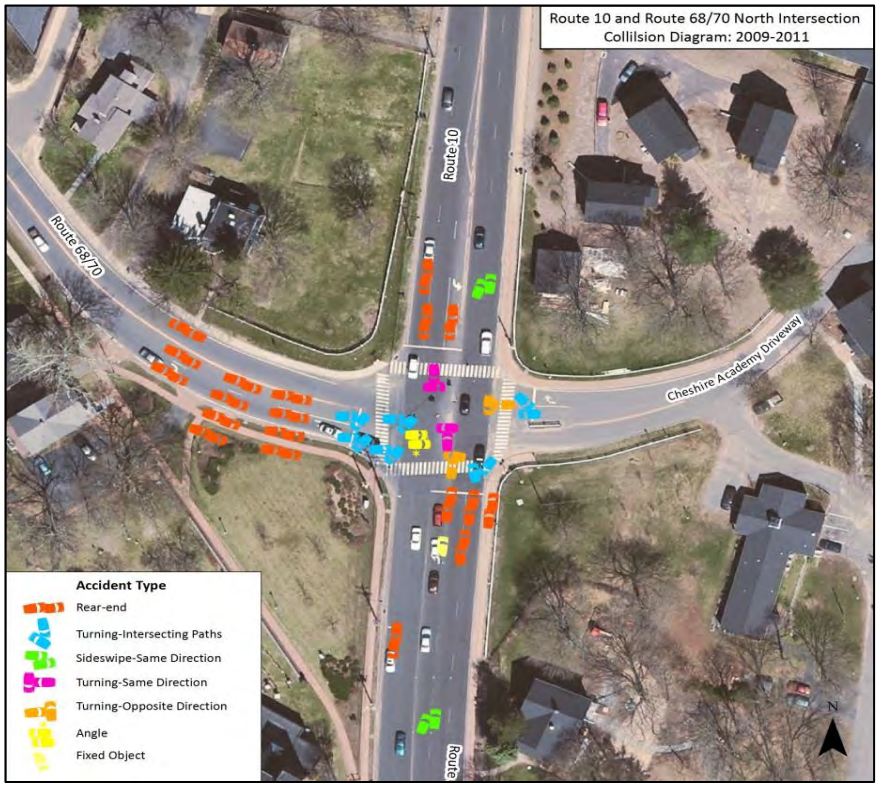
Table E3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Property Damage Only	40	95.2%	35	92.1%
A-Injuries	1	2.4%	0	0.0%
B-Injuries	0	0.0%	0	0.0%
C-Injuries	1	2.4%	3	7.9%
Total	**42**	**100.0%**	**38**	**100.0%**

Table E4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Automobile	22	75.9%	30	90.9%
Single Unit Truck	4	13.8%		0.0%
School Bus	1	3.4%	1	3.0%
Passenger Van	1	3.4%	1	3.0%
Tractor Semi-Trailer	1	3.4%	1	3.0%
Total	**29**	**100.0%**	**33**	**100.0%**

Figure E1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Route 68/70 North Intersection, Cheshire

Appendix F. Route 10 and Route 68/70, Southern Junction (Including Spring Street)

Table F1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Rear-End	15	48.4%	7	70.0%
Turning - Intersecting Paths	6	19.4%	2	20.0%
Turning - Opposite Direction	5	16.1%	-	-
Sideswipe - Same Direction	3	9.7%	1	10.0%
Sideswipe - Opposite Direction	1	3.2%	-	-
Pedestrian	1	3.2%	-	-
Total	**31**	**100.0%**	**10**	**100.0%**

Table F2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Following Too Closely	14	45.2%	8	80.0%
Failed to Grant Right of Way	7	22.6%	-	-
Speed Too Fast For Conditions	4	12.9%	-	-
Violated Traffic Control	1	3.2%	-	-
Unsafe Use of Hwy by Ped	1	3.2%	-	-
Improper Lane Change	1	3.2%	-	-
Fell Asleep	1	3.2%	-	-
Driver's View Obstructed	1	3.2%		
Driver Lost Control	1	3.2%	-	-
Unsafe Right Turn on Red	-	-	2	20.0%
Total	**31**	**100.0%**	**8**	**80.0%**

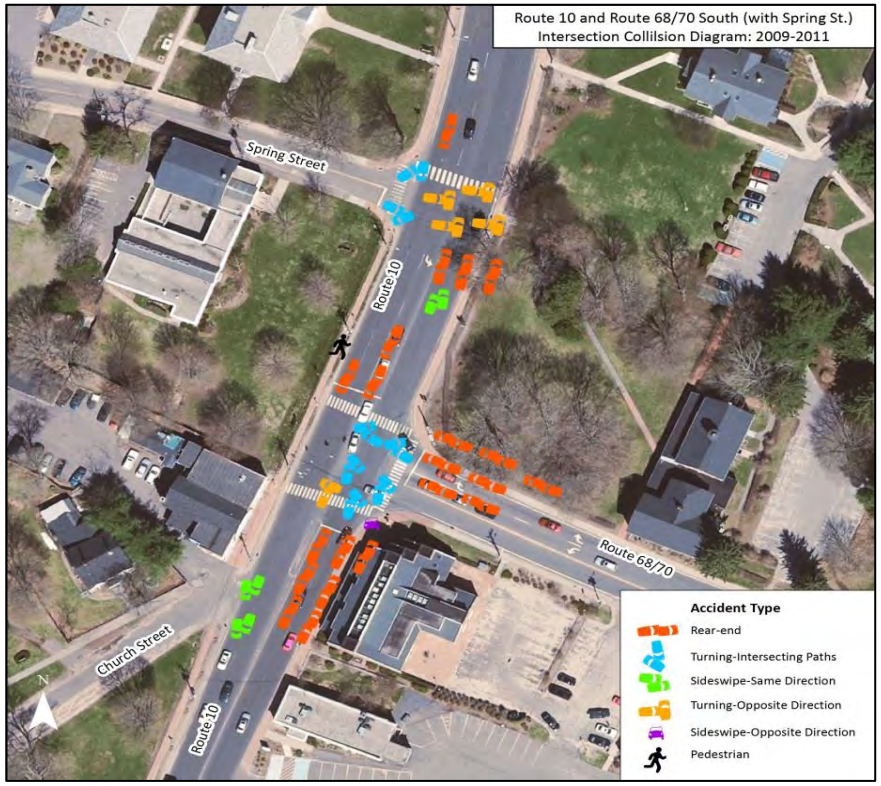
Table F3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Property Damage Only	70	84.3%	24	96.0%
A-Injuries	2	2.4%	-	-
B-Injuries	3	3.6%	-	-
C-Injuries	8	9.6%	1	4.0%
Total	**83**	**100.0%**	**25**	**100.0%**

Table F4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Route 68/70	
	Count	Percent	Count	Percent
Automobile	52	80.0%	19	95.0%
Single Unit Truck	6	9.2%	-	-
Passenger Van	5	7.7%	1	5.0%
School Bus	1	1.5%	-	-
Tractor Semi-Trailer	1	1.5%	-	-
Total	**65**	**100.0%**	**20**	**100.0%**

Figure F1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Route 68/70 South Intersection, Cheshire

Appendix G. Route 10 and Cornwall Ave

Table G1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Cornwall Ave	
	Count	Percent	Count	Percent
Rear-End	16	76.2%	1	100.0%
Turning - Intersecting Paths	2	9.5%	-	-
Angle	2	9.5%	-	-
Turning - Same Direction	1	4.8%	-	-
Total	**21**	**100.0%**	**1**	**100.0%**

Table G2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Cornwall Ave	
	Count	Percent	Count	Percent
Following Too Closely	15	71.4%	1	100.0%
Violated Traffic Control	3	14.3%	-	-
Failed to Grant Right of Way	1	4.8%	-	-
Unknown	1	4.8%	-	-
Driver Lost Control	1	4.8%	-	-
Total	**21**	**100.0%**	**1**	**100.0%**

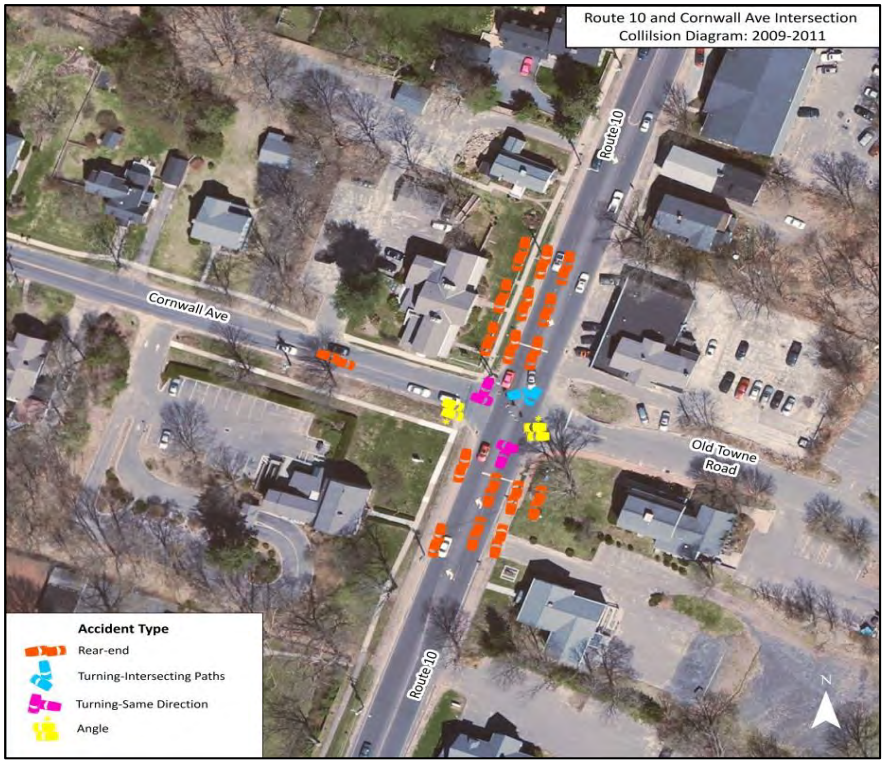
Table G3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Cornwall Ave	
	Count	Percent	Count	Percent
Property Damage Only	54	91.5%	1	50.0%
A-Injuries	0	0.0%	-	-
B-Injuries	0	0.0%	-	-
C-Injuries	5	8.5%	1	50.0%
Total	**59**	**100.0%**	**2**	**100.0%**

Table G4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Cornwall Ave	
	Count	Percent	Count	Percent
Automobile	39	86.7%	2	100.0%
Single Unit Truck	4	8.9%	-	-
Passenger Van	2	4.4%	-	-
Total	**45**	**100.0%**	**2**	**100.0%**

Figure G1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Cornwall Ave/Old Towne Road, Cheshire

Appendix H. Route 10 and Lanyon Drive

Table H1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10	
	Count	Percent
Rear-End	11	57.9%
Turning - Opposite Direction	3	15.8%
Turning - Intersecting Paths	2	10.5%
Angle	1	5.3%
Fixed Object	1	5.3%
Moving Object	1	5.3%
Total	**19**	**100.0%**

Table H2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10	
	Count	Percent
Following Too Closely	10	52.6%
Failed to Grant Right of Way	5	26.3%
Driving on Wrong Side of Road	1	5.3%
Speed too Fast for Conditions	1	5.3%
Foreign Object in Road	1	5.3%
Driver Lost Control	1	5.3%
Total	**19**	**100.0%**

Table H3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10	
	Count	Percent
Property Damage Only	48	90.6%
A-Injuries	-	-
B-Injuries	-	-
C-Injuries	5	9.4%
Total	**53**	**100.0%**

Table H4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10	
	Count	Percent
Automobile	37	92.5%
Single Unit Truck	1	2.5%
Passenger Van	1	2.5%
Bicycle	1	2.5%
Total	**40**	**100.0%**

Figure H1. Intersection Collision Diagram: 2009-2011

Source: CT Crash Data Repository: 2009-2011, Route 10 and Lanyon Drive, Cheshire

Appendix I. Route 10 at Cheshire High School

Table I1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10	
	Count	Percent
Rear-End	20	80.0%
Turning - Opposite Direction	3	12.0%
Turning - Intersecting Paths	1	4.0%
Fixed Object	1	4.0%
Total	**25**	**100.0%**

Table I2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10	
	Count	Percent
Following Too Closely	20	80.0%
Failed to Grant Right of Way	2	8.0%
Violated Traffic Control	1	4.0%
Slippery Surface	1	4.0%
Driver Lost Control	1	4.0%
Total	**25**	**100.0%**

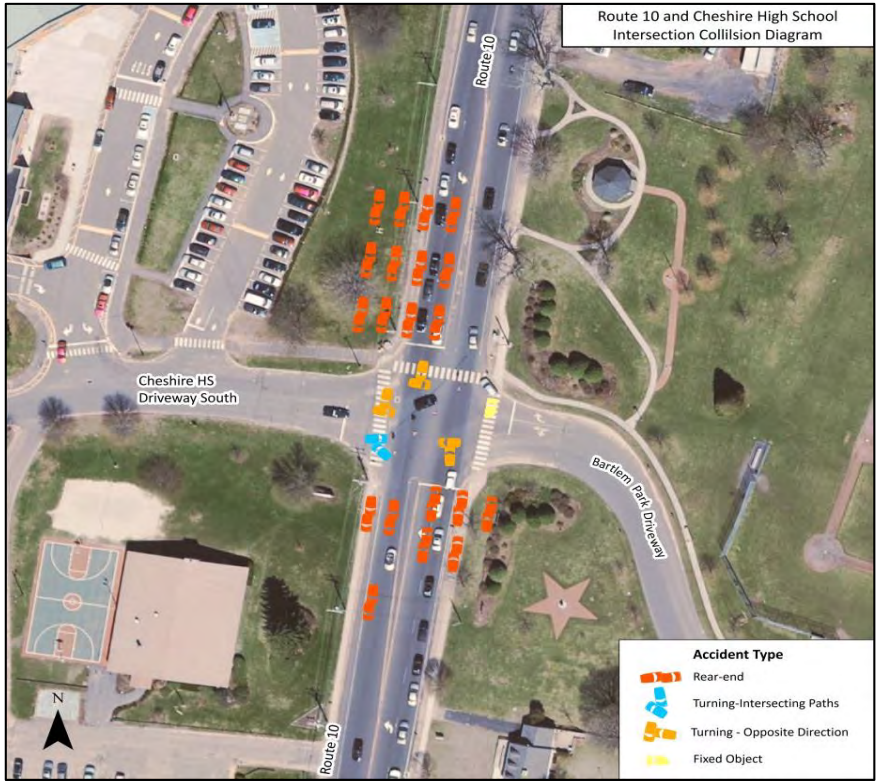
Table I3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10	
	Count	Percent
Property Damage Only	65	90.3%
A-Injuries	0	0.0%
B-Injuries	1	1.4%
C-Injuries	6	8.3%
Total	**72**	**100.0%**

Table I4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10	
	Count	Percent
Automobile	48	87.3%
Passenger Van	4	7.3%
Single Unit Truck	3	5.5%
Total	**55**	**100.0%**

Figure I1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 at Cheshire High School, Cheshire

Appendix J. Route 10 and Higgins Road

Table J1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Higgins Road	
	Count	Percent	Count	Percent
Rear-End	12	75.0%	-	-
Turning - Intersecting Paths	2	12.5%	-	-
Turning - Opposite Direction	1	6.3%	-	-
Turning - Same Direction	1	6.3%	1	**50.0%**
Fixed Object	-	-	1	**50.0%**
Total	**16**	**100.0%**	**2**	**100.0%**

Table J2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Higgins Road	
	Count	Percent	Count	Percent
Following Too Closely	12	75.0%	-	-
Failed to Grant Right of Way	1	6.3%	-	-
Unsafe Right Turn on Red	1	6.3%	-	-
Violated Traffic Control	1	6.3%	-	-
Improper Turning Maneuver	1	6.3%	-	-
Improper Passing Maneuver	-	-	**1**	**50.0%**
Driver Lost Control	-	-	**1**	**50.0%**
Total	**16**	**100.0%**	**2**	**100.0%**

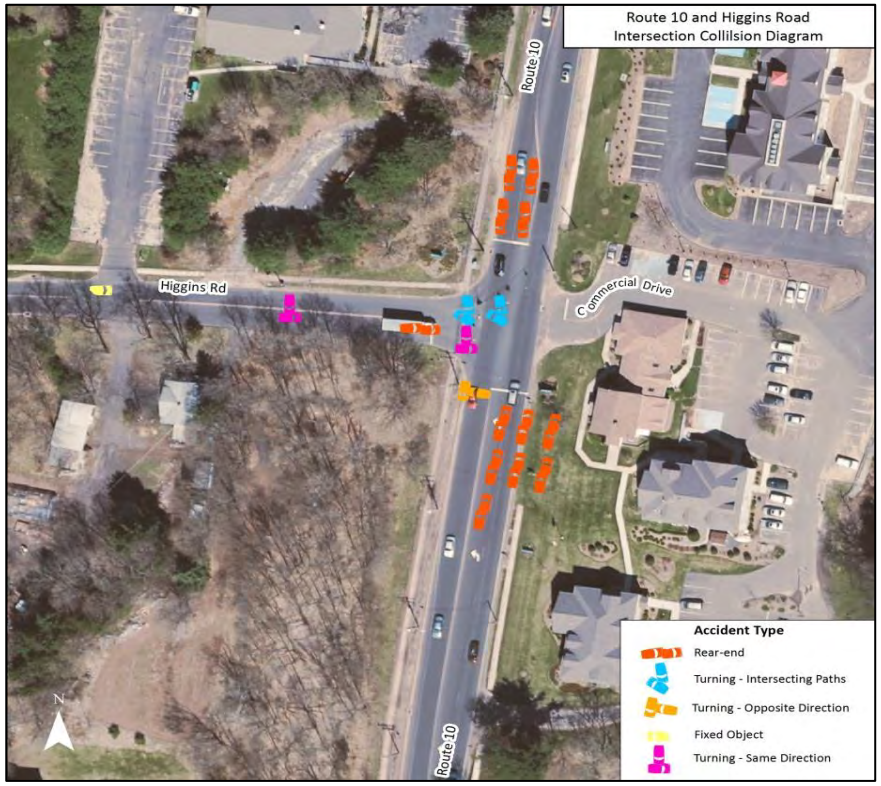
Table J3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Higgins Road	
	Count	Percent	Count	Percent
Property Damage Only	52	96.3%	3	**100.0%**
A-Injuries	-	-	-	-
B-Injuries	-	-	-	-
C-Injuries	2	3.7%	-	-
Total	**54**	**100.0%**	**3**	**100.0%**

Table J4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Higgins Road	
	Count	Percent	Count	Percent
Automobile	33	94.3%	3	**100.0%**
Single Unit Truck	2	5.7%	-	-
Total	**35**	**100.0%**	**3**	**100.0%**

Figure J1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Higgins Road, Cheshire

Appendix K. Route 10 and Route 42

Table K1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10		Route 42	
	Count	Percent	Count	Percent
Rear-End	9	60.0%	2	**66.7%**
Fixed Object	4	26.7%	-	-
Turning - Intersecting Paths	2	13.3%	-	-
Turning - Same Direction	-	-	1	**33.3%**
Total	**15**	**100.0%**	**3**	**100.0%**

Table K2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10		Route 42	
	Count	Percent	Count	Percent
Following Too Closely	9	60.0%	2	**66.7%**
Failed to Grant Right of Way	2	13.3%	-	-
Improper Turning Maneuver	2	13.3%	-	-
Speed too Fast for Conditions	1	6.7%	-	-
Driver Lost Control	1	6.7%	-	-
Improper Passing Maneuver	-	-	**1**	**33.3%**
Total	**15**	**100.0%**	**3**	**100.0%**

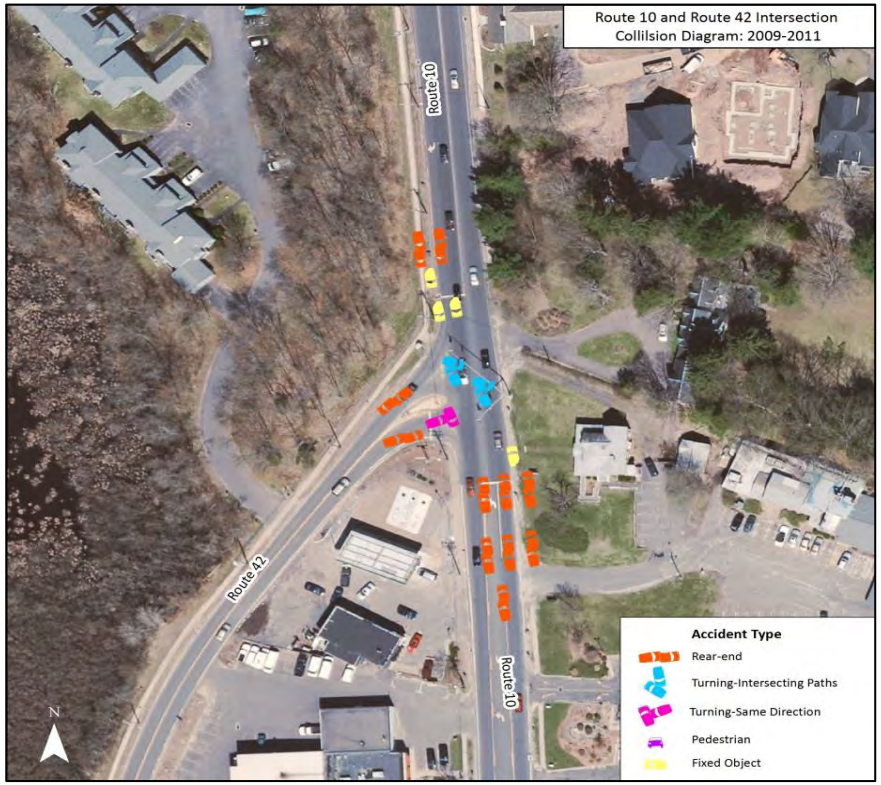
Table K3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10		Route 42	
	Count	Percent	Count	Percent
Property Damage Only	29	87.9%	7	**100.0%**
A-Injuries	-	-	-	-
B-Injuries	1	3.0%	-	-
C-Injuries	3	9.1%	-	-
Total	**33**	**100.0%**	**7**	**100.0%**

Table K4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10		Route 42	
	Count	Percent	Count	Percent
Automobile	20	74.1%	6	**100.0%**
Single Unit Truck	3	11.1%	-	-
Passenger Van	1	3.7%	-	-
Tractor Semi-Trailor	1	3.7%	-	-
Motorcycle	1	3.7%	-	-
Pedalcycle	1	3.7%	-	-
Total	**27**	**100.0%**	**6**	**100.0%**

Figure K1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and Route 42 Cheshire

Appendix L. Route 10 and S. Brooksvale/Cook Hill Road

Table L1. Traffic Accidents by Collision Type: 2009-2011

Collision Type	Route 10	
	Count	Percent
Rear-End	13	72.2%
Angle	2	11.1%
Fixed Object	2	11.1%
Turning - Opposite Direction	1	5.6%
Total	**18**	**100.0%**

Table L2. Traffic Accidents by Contributing Factor: 2009-2011

Contributing Factor	Route 10	
	Count	Percent
Following Too Closely	13	72.2%
Violated Traffic Control	2	11.1%
Driver Lost Control	2	11.1%
Failed to Grant Right of Way	1	5.6%
Total	**18**	**100.0%**

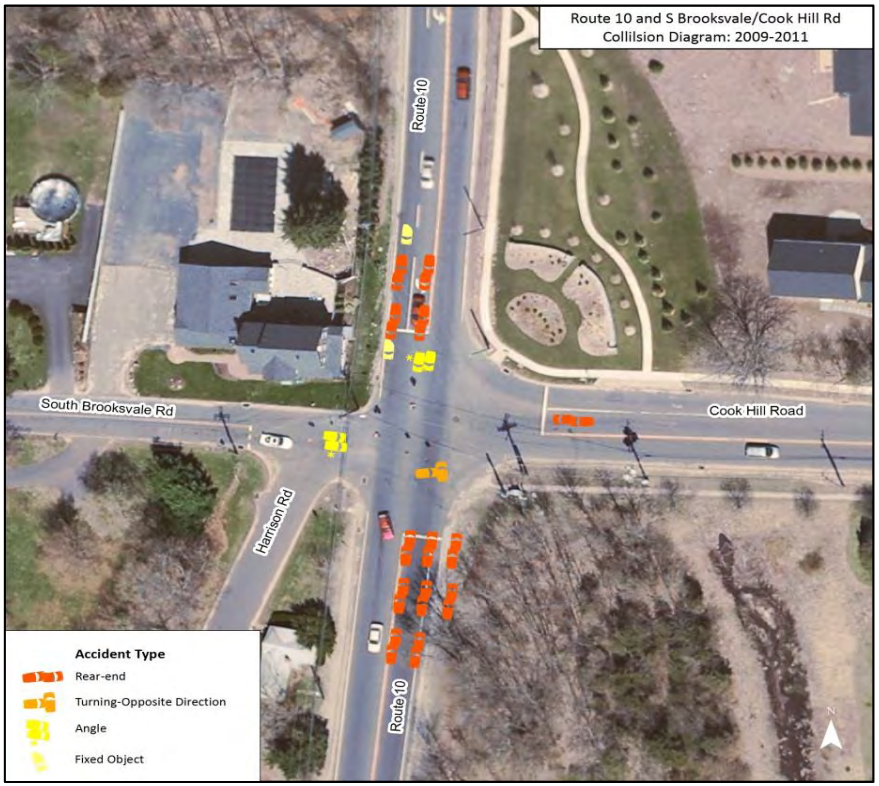
Table L3. Traffic Accidents by Injury Severity: 2009-2011

Injury Severity	Route 10	
	Count	Percent
Property Damage Only	40	87.0%
A-Injuries	-	-
B-Injuries	-	-
C-Injuries	6	13.0%
Total	**46**	**100.0%**

Table L4. Traffic Accidents by Vehicle Type: 2009-2011

Vehicle Type	Route 10	
	Count	Percent
Automobile	31	86.1%
Passenger Van	3	8.3%
Single Unit Truck	1	2.8%
Unkown	1	2.8%
Total	**36**	**100.0%**

Figure L1. Intersection Collision Diagram: 2009-2011



Source: CT Crash Data Repository: 2009-2011, Route 10 and S Brooksvale/Cook Hill Rd, Cheshire