CHAPTER 2 – EXISTING CONDITIONS

This Chapter summarizes the existing demographics, zoning, transportation characteristics and initial public input that, when considered collectively, establish the need for change at the Interchange and along the Arterials.

- The demographic analysis shows that a high percentage of households in the area do not have access to a vehicle or rely on other modes of travel to get around, such as walking, bicycling or transit.
- The zoning analysis shows that the Arterials separate residential areas from commercial areas requiring people to cross the Arterials to reach services and destinations.
- The traffic analysis shows that travel speeds are typically above the posted speed limit, that through traffic generally moves well, but there is recurring congestion at the Interchange.
- The crash analysis shows that many of the study area intersections and roadways experience crash rates above the statewide average for similar facilities. This includes the Interchange and sections of the westbound Arterial on Columbus Drive near Main Street, where weaving is a concern.
- The initial public input correlates well with the data showing concerns about traffic operations and safety. Although the majority of travelers at the Interchange and on the Arterials are drivers, initial public input has shown that the Arterials in their current configuration are often uncomfortable for pedestrians and there are documented concerns about safety, operations, and quality of life.

Pedestrian crossing westbound Arterial, west leg of Market Street / Civic Center Plaza intersection where there is no crosswalk or pedestrian signal

Demographics

Census block group data (2017 American Communities Survey 5-year estimates) was examined to identify geographic trends in the study area that can influence travel. Specifically, age, race, income and vehicle availability are several factors that were examined due to their unique influence on travel patterns and equity.

Different age groups tend to have different travel patterns. In terms of transportation mode choice, children under the age of 16 cannot drive and many seniors choose not to drive, increasing the tendency for these groups to walk, bike, rideshare or use transit. Figure 2.1 shows that west of Cherry Street, these populations account for approximately 20-30% of the total population in the area between the Arterials with slightly higher concentrations to the north and south. East of Cherry Street, this trend is reversed with a higher concentration of youth and seniors living between the Arterials.

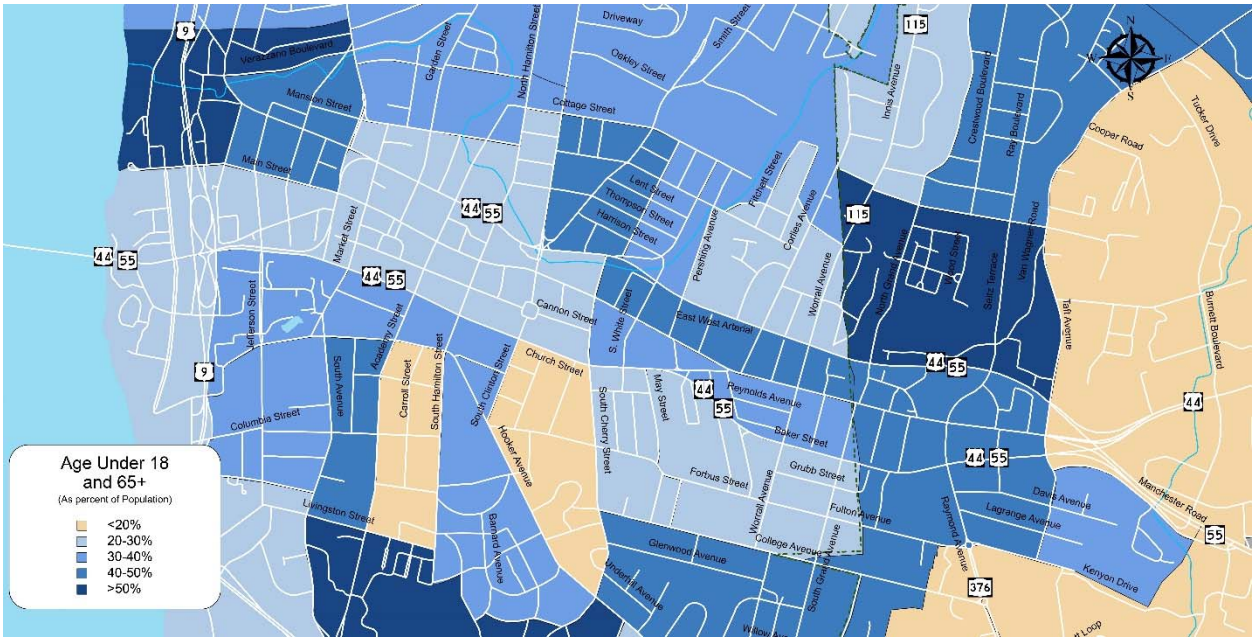


FIGURE 2.1: POPULATION UNDER 18 AND OVER 65

Figure 2.2 shows that in general, the block groups directly adjacent to the Arterials and Interchange are diverse with more than 70% minority populations located north and south of Arterials. In particular, the areas directly north and south of the Arterials have a higher minority concentration.

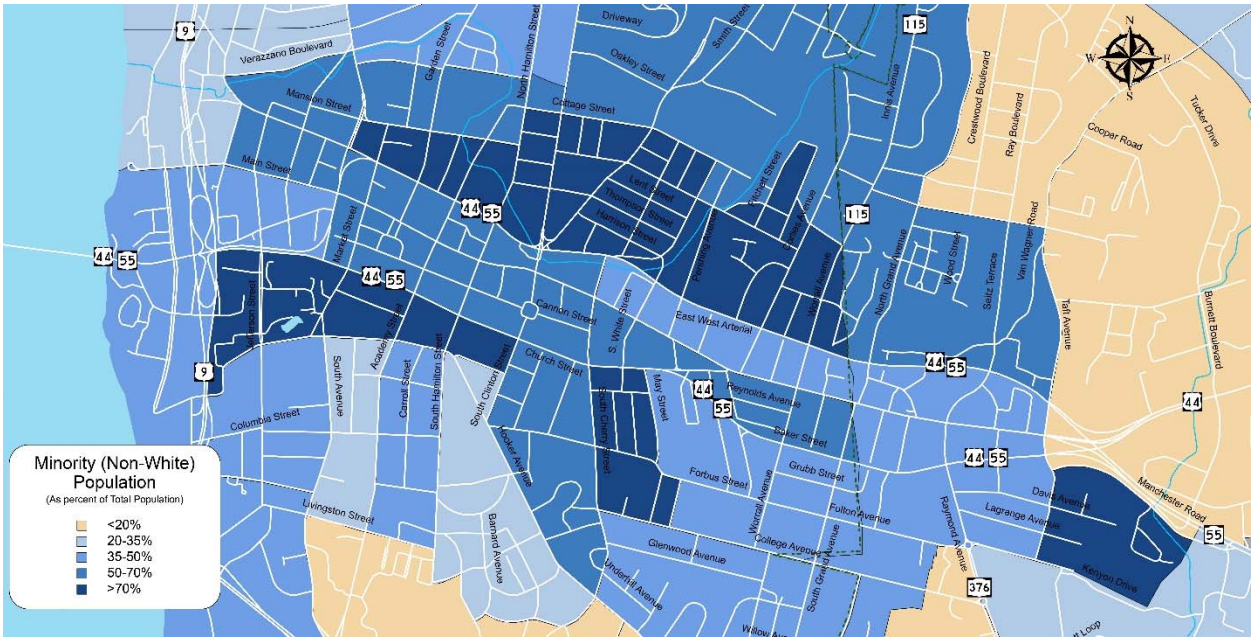


FIGURE 2.2 MINORITY POPULATION

Low income residents often use alternative modes of transportation including walking, biking, and riding transit because these modes are less costly than owning and maintaining a car. Figure 2.3 shows that the highest rates of poverty occur in the Main Street area between the westbound and eastbound Arterials and north of the westbound Arterial, especially the northeastern section of the City. The area south of the eastbound Arterial tends to experience lower poverty rates, although there are pockets of high poverty west of Hooker Avenue. Poverty is defined by the US Census Bureau as a household with income that falls below designated thresholds depending on size of family, number of related children and age of householder.

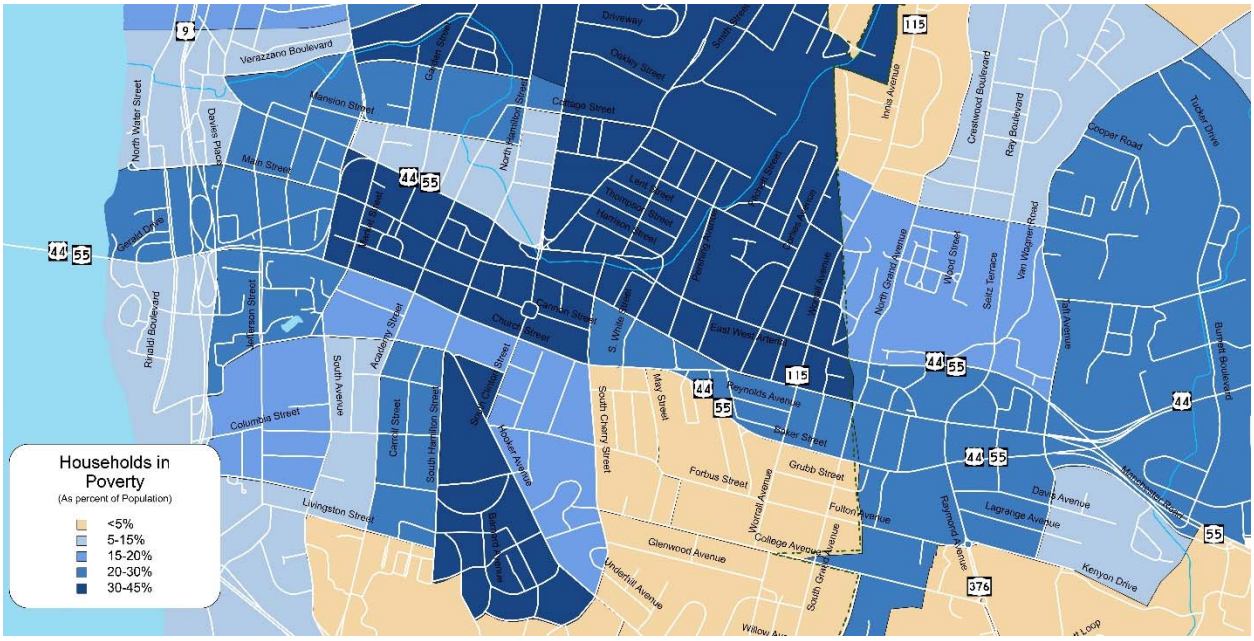


FIGURE 2.3: HOUSEHOLDS IN POVERTY

Figure 2.4 shows that most of the areas adjacent to the Arterials have lower rates of access to a vehicle, with several of the block groups adjacent to the Arterials and Interchange having 40% to 65% zero vehicle households. Specifically, over half of the households located in the block groups between Market Street and Cherry Street on the outside of the Arterials (outlined in yellow in Figure 2.4) do not have access to a vehicle. As such, these residents must rely on alternative modes of transportation including transit, bicycling, and walking. In order to connect these residents to goods and services, it is important that the Arterials provide safe, comfortable and convenient non-motorized facilities.

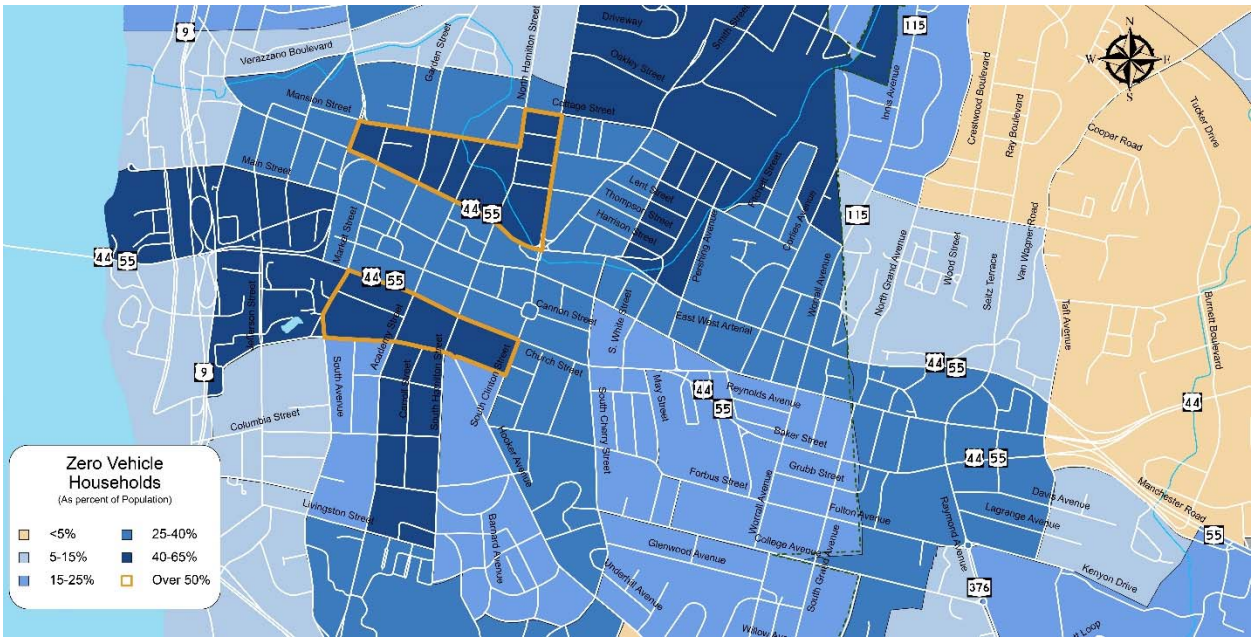


FIGURE 2.4: ZERO VEHICLE HOUSEHOLDS

Zoning

The purpose of zoning is to positively shape the community by regulating building dimensions, lot coverage, the placement of buildings, density, and land uses by type. Figure 2.5 shows zoning for the portions of the City and Town of Poughkeepsie within this study area.

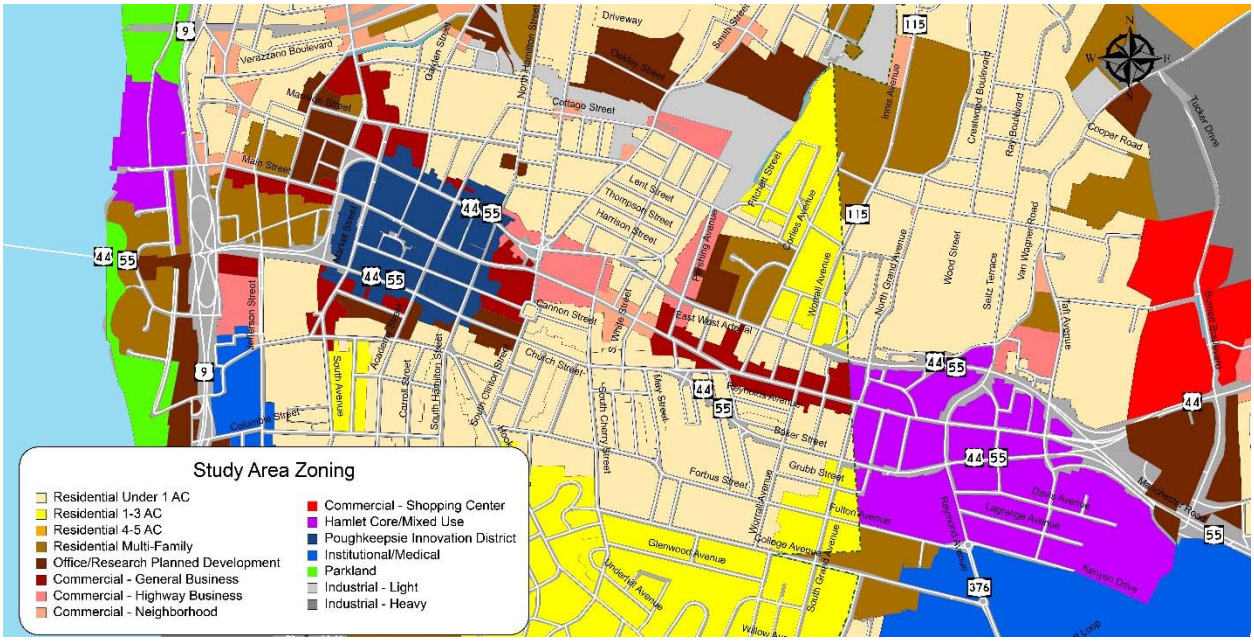


FIGURE 2.5: STUDY AREA ZONING

Figure 2.5 shows that zoning around the area of the Interchange contains a mix of residential and commercial uses, with residential uses focused to the north and west, and commercial to the southeast. Zoning along and between the Arterials is primarily commercial west of Clinton Street, with residential districts located to the north and south. East of Clinton Street, zoning along the arterials transitions to residential uses, with commercial uses concentrated in between the arterials on Main Street. The Interchange and Arterials play an important role in providing access to goods and services, and many individuals cross the Arterials, regardless of travel mode, in order to reach these commercial districts.

In 2019, the City of Poughkeepsie amended the zoning code to adopt the Poughkeepsie Innovation District. As shown in Figure 2.6, the Poughkeepsie Innovation District is composed of four subareas that utilize a form-based code to direct development and design. The Poughkeepsie Innovation District was adopted in order to enable high-density mixed-use developments, restore Main Street as the region's primary commercial corridor, and encourage walking trips in the area.

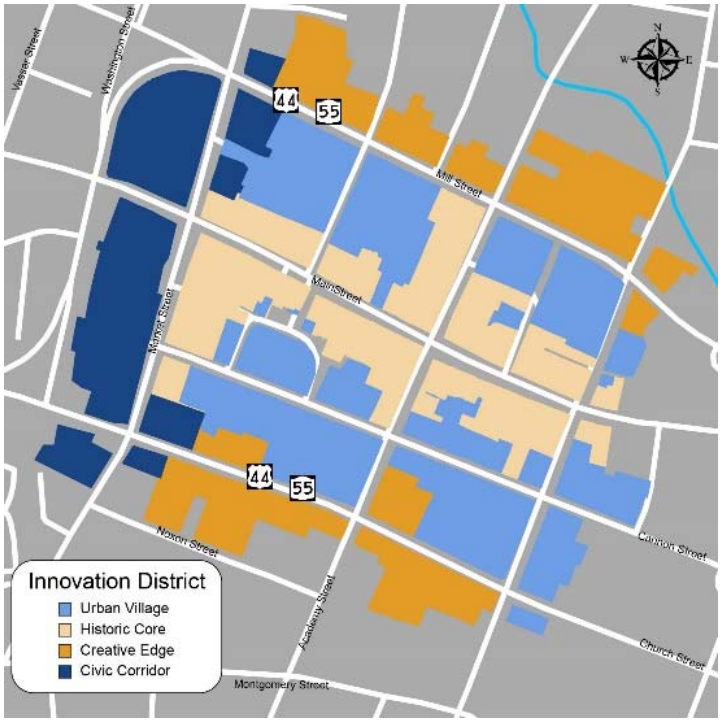


FIGURE 2.6: POUGHKEEPSIE INNOVATION DISTRICT

Transit

Dutchess County provides bus service throughout the County including in the City and Town of Poughkeepsie. There are twelve routes that serve the City of Poughkeepsie; all twelve use the Transit Hub, located on Market Street between Main Street and the westbound Arterial. Figure 2.7 shows Dutchess County Public Transit route coverage in the study area.

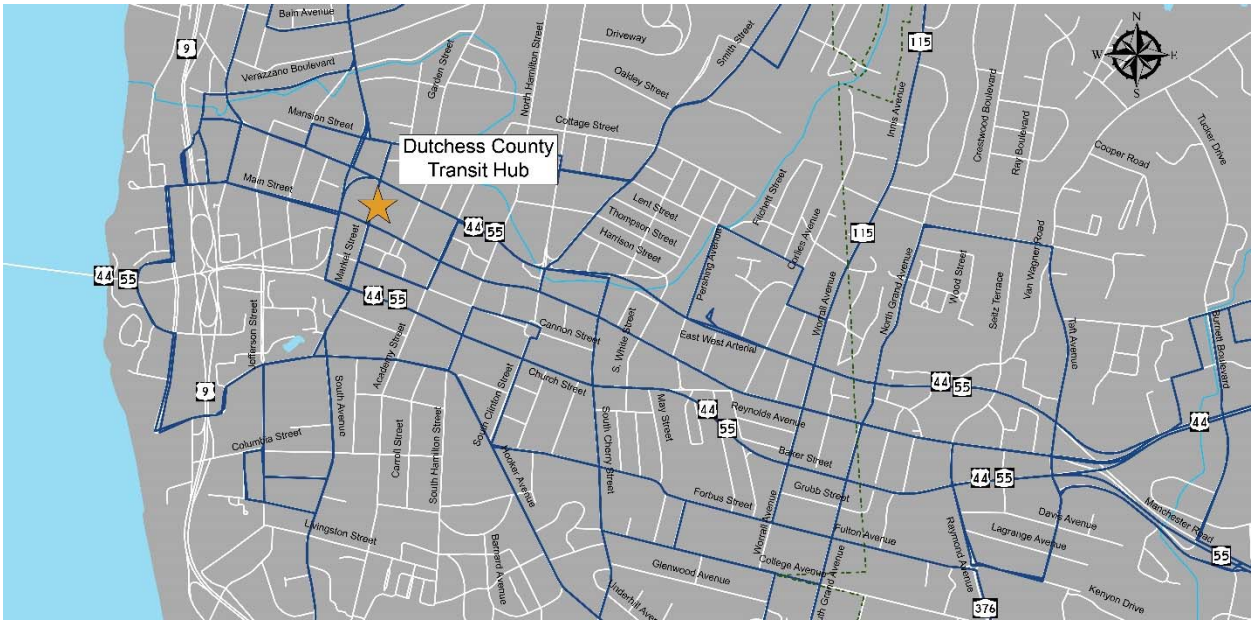


FIGURE 2.7 – DUTCHESS COUNTY TRANSIT ROUTES

Several routes provide east-west service along portions of the Arterials. Routes D and E serve the entire length of the Arterials in the study area. On most routes, service is approximately hourly. Route D provides eight buses per day in each direction; Route E provides 28 buses eastbound and 30 buses westbound per day[1]. There are two signed stops on the westbound Arterial and four signed stops on the eastbound Arterial. Flag stops are also allowed. Buses generally stop on the near side of intersections in the City and Town, though they tend to stop mid-block on the Arterials. Dutchess County is considering eliminating flag stops in the City due to the density of signed bus stops and safety issues related to flag stops at uncontrolled locations. Dutchess County Public Transit buses do not use the Interchange, due to the limited access, left-side exiting ramps, and acute view angles/difficult sight lines. In general, the study area has relatively good transit coverage and therefore it is important that the recommendations consider transit operations and avoid negative impacts to transit service.

[1] Route and schedule information is available at www.dutchessny.gov/PublicTransit.

Roadways

Roadway Characteristics

Roadways must balance the competing functions of access (the ability to reach a destination) and mobility (the ability to flow through an area). Roadways can serve these goals to varying extents. The "functional classification" of roadways is defined by the Federal Highway Administration (FHWA) based on the extent to which the road balances these needs. Figure 2.8 shows the general functional classification types and how they balance the competing needs of access and mobility. This section provides a general overview of the roadway characteristics for the Interchange and Arterials.

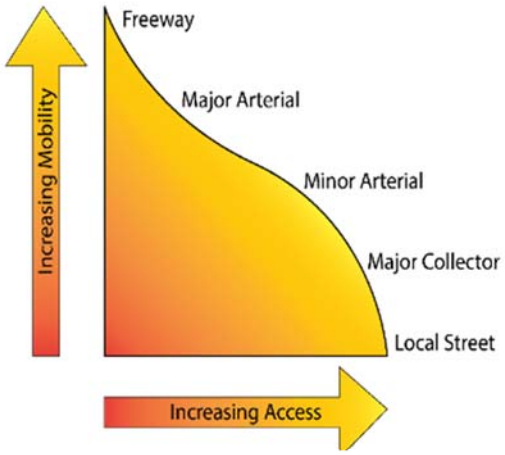


FIGURE 2.8: FUNCTIONAL CLASSIFICATION

In general, pavement conditions are good on both facilities. Data published by the New York State Department of Transportation (NYSDOT) in the *2017 Pavement Data Report* indicates that the pavement along the Arterials and US Route 9 is generally in good condition (Rated at 7/10).

The Interchange

US Route 9 extends in a north-south direction through the City and Town of Poughkeepsie. In the City, US Route 9 is a four-lane limited access highway, functionally classified as an Urban Principal Arterial (Expressway) that provides access into the City only at interchanges. North and south of the City in the Town of Poughkeepsie, US Route 9 is functionally classified as an Urban Principal Arterial (Other) and provides access to local streets at intersections. The posted speed limit in the vicinity of the Route 44/55 Interchange is 45 mph, although it increases to 55 mph immediately south of the Interchange. Both US Route 9 and Route 44/55 are owned and maintained by the New York State Department of Transportation (NYSDOT), and located on the National Highway System (NHS).

The Route 9/44/55 Interchange shown on Figure 2.9 is a complex system of closely spaced ramps connecting US Route 9 to Route 44/55 in a "Bow-Tie" configuration, designed this way to minimize its footprint and property impacts, and considered innovative at the time it was designed. The configuration is not a typical interchange. The Interchange is characterized by left side weaving areas on US Route 9 and closely spaced ramps at Main Street and Laurel Street.

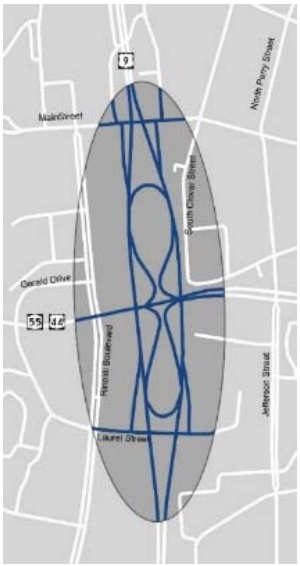
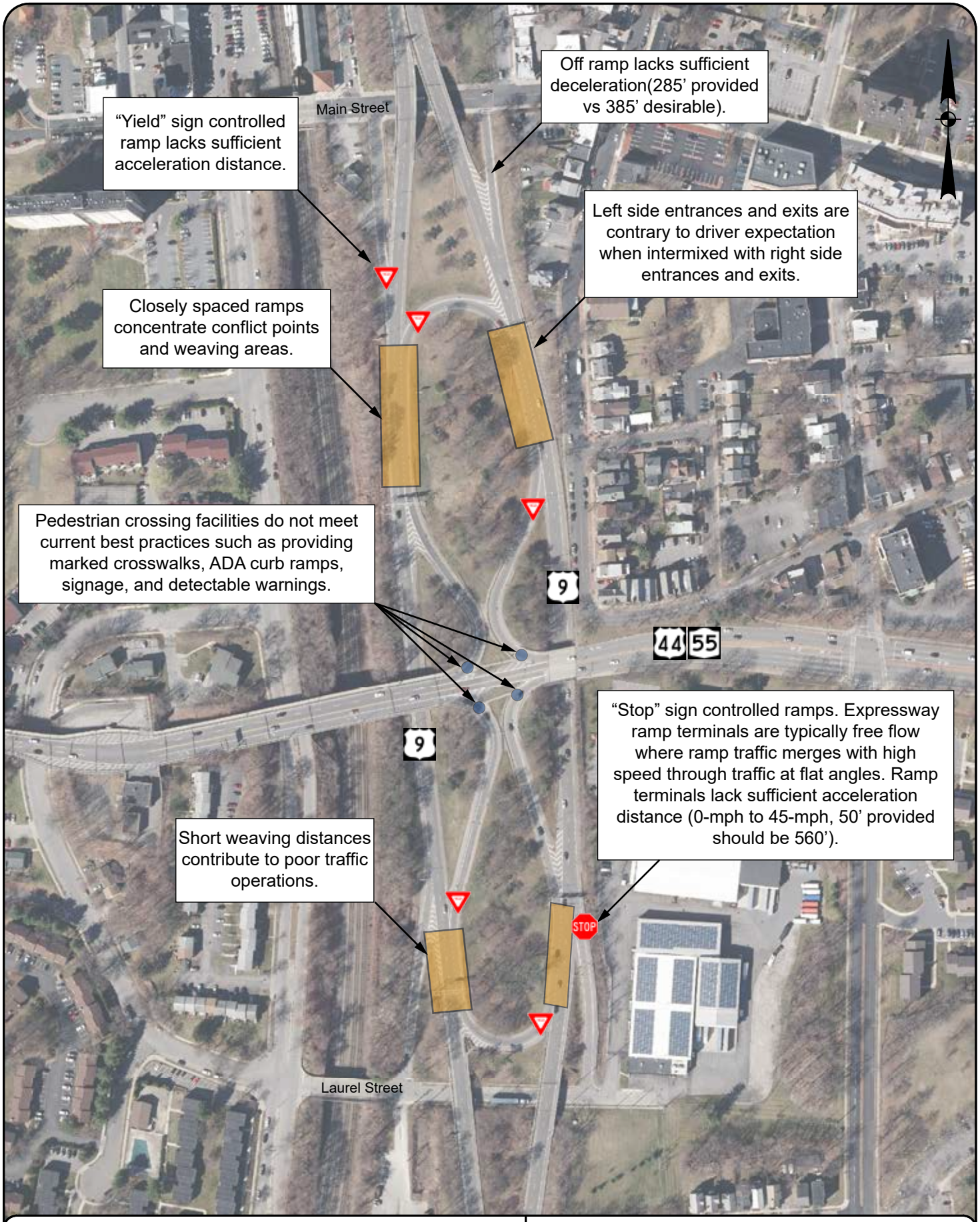


FIGURE 2.9: INTERCHANGE AREA

The image below shows typical congestion in the left side weaving area southbound on Route 9, south of Route 44/55. Figure 2.10 and the following page highlight some of the characteristics of the Interchange that make it problematic for drivers.

Congestion at the Route 9 weave south of Route 44/55



INTERCHANGE CHARACTERISTICS

POUGHKEEPSIE 9.44.55
CITY AND TOWN OF POUGHKEEPSIE
DUJTCHESS COUNTY, NEW YORK

Creighton Manning

PROJECT: 119-084	DATE: 01/2020	FIGURE: 2.10

Interchange Characteristics

A Policy on Geometric Design of Highways and Streets, published by the American Association of State Highway and Transportation Officials (AASHTO GB), 2011, and NYSDOT's *Highway Design Manual* provide guidance on a variety of critical and other design elements that must be considered when scoping and designing a project. A preliminary evaluation of the Route 9/44/55 interchange, the Main Street/Route 9 interchange, and the Laurel Street/Route 9 interchange identified several nonconforming features that make the area a challenge to navigate. These are highlighted below (not intended to be an exhaustive list):

- **Interchange spacing –** Spacing between the Main Street Interchange and the Route 9/44/55 Interchange is negligible and does not meet the minimum recommended spacing of 1 mile in urban areas as per AASHTO GB Section 10.9.5.
- **Speed change lane length –** There are taper type entrance ramps from Laurel Street onto northbound US Route 9 and Main Street onto southbound US Route 9 with stop and yield conditions, respectively. These stop and yield conditions are located prior to entering US Route 9. These entrance ramps do not provide sufficient acceleration distance and free-flow control to allow for proper single-lane entrance terminal operation. The decision to make these entrance terminals stop and yield controlled appears to be related to sight distance issues and lack of space available for appropriate acceleration lane length. There are also taper type exit ramps from northbound US Route 9 onto Main Street and southbound US Route 9 onto Laurel Street, which are 285 feet and 400 feet, respectively. The exit terminal onto Main Street does not meet the minimum deceleration length of 385 feet as per AASHTO GB 10.9.6.
- **Pedestrian facilities –**The pedestrian crossing locations at each quadrant of the Route 9/44/55 interchange lack crosswalk markings and pedestrian crossing signs as per MUTCD Chapter 2. Curb ramps located at each quadrant of the Route 9/44/55 interchange lack detectable warning surfaces. There are no curb ramps present on the east side of the interchange to accommodate the crossing

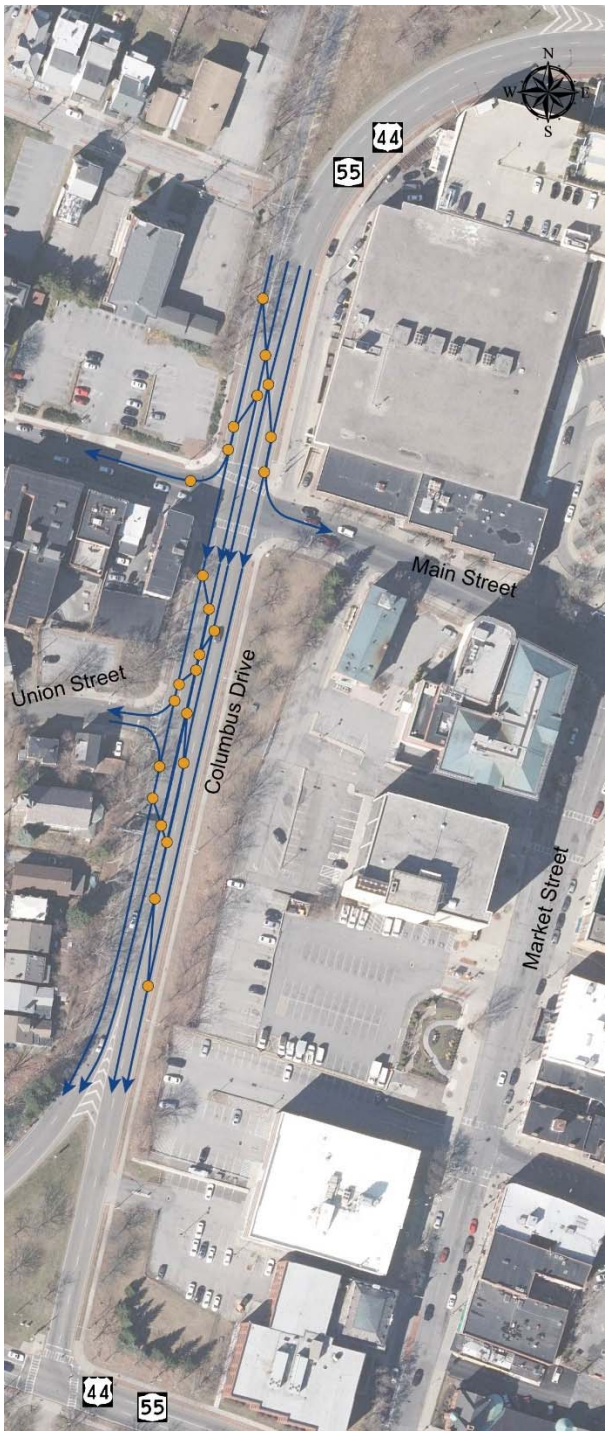
The Arterials

US Route 44 and NY Route 55 extend in an east-west direction and overlap (or run concurrently) for most of the study area, but split east of Taft Avenue / Fairmont Avenue, with Route 44 turning northeast and Route 55 southeast. Within the study area, Route 44/55 is functionally classified as an Urban Principal Arterial (Expressway) across the Mid-Hudson Bridge to Jefferson Street, then classified as an Urban Principal Arterial (Other) east of Jefferson Street. From Columbus Drive to Taft Avenue / Fairmont Avenue, Route 44/55 operates as parallel one-way Arterials through the City and Town of Poughkeepsie. The Arterials provide three travel lanes in each direction in this area as shown in the adjacent photos, increasing to four lanes westbound where the Arterial turns south onto Columbus Drive. Sidewalks are present on both sides of each Arterial between Jefferson Street and Taft Avenue. The posted speed limit on the Arterials is 30-mph in the City. The westbound Arterial is posted at 40-mph in the Town, and the eastbound Arterial increases to 45-mph east of Taft Avenue / Fairmont Avenue. Route 44/55 is part of the National Highway System and is owned and maintained by NYSDOT, except for the Mid-Hudson Bridge, which is maintained by the New York State Bridge Authority.

Eastbound Arterial east of Columbus Drive

Westbound Arterial east of Market Street / Civic Center Plaza)

There are numerous conflict points where the westbound Arterial turns south and Washington Avenue merges from the right. The westbound Arterial increases to four lanes for a short distance in this area and often requires lane changes by motorists depending on their destinations. The image to the right shows some of the merging, weaving and diverging points representing conflict points where vehicles often change lanes, which contribute to concerns about operations and safety.



Columbus Drive Conflict Points

Table 2.1 summarizes the typical existing roadway cross section and dimensions for the Arterials.

TABLE 2.1: TYPICAL ARTERIAL CROSS SECTIONS (WIDTHS IN FEET)

Segment	No. of Lanes	Lane Widths	Shoulder Width	Median Width	Pavement Width	Maintenance Width	Sidewalk Width	ROW Width
Route 9 to Jefferson St.	4-6	11-12	2±	2-12	54-76	5	5	100
Jefferson St to Columbia Drive	3-6	11	2±	4-14	76-38	5	5	62
Route 44/55 Eastbound								
Columbia Street to Market St	3	11-12	2±	0	38	5	5	62
Market St to Hamilton Street	3	11	2±	0	38	0	7-8	60
Hamilton St to S. White Street	3	11	2±	0	38	3	5	60
S. White St to Church St/Palmer Ave	3-4	11-12	2±	0	38-52	3	5	60-74
Church St/Palmer Ave to Lewis Ave	3	11-12	2±	0	40	3	5	60
Lewis Ave to Taft Ave	3	11-12	2±	0	40	0	8	60
Route 44/55 Westbound								
Taft Ave to Raymond Ave	3	12	2-14	0	58-40	3	5	Varies
Raymond Ave to Innis Ave	3	11-12	3±	0	40	3	5	60
Innis Ave to N. Cherry St	3	11	3±	0	40	3	5	60
N. Cherry St to N. Hamilton Street	3	11	2±	0	38-40	0	7-9	60
N. Hamilton St to Market St	3	11	2±	0	38	0	7-10	60
Market St to Main St	3-4	11-12	2±	0	38-52	5	5	76
Main St to Route 44/55 Eastbound	2-4	12	2±	0	52-28	5	5	76

XX (YY) = Pedestrians (Bicycles)

Table 2.1 shows that the Arterials typically provide three lanes one-way in each direction. Short sections increase to four lanes near Main Street, and where Church Street splits off from the eastbound Arterial near Palmer Ave. Originally designed with 13 or 14-foot wide outside lanes and a 12-foot wide center lane, the Arterials have been striped to provide 11-foot wide travel lanes with 2 to 3-foot shoulders on both sides. Overall pavement width is typically 38 to 40 feet depending on the location, with the right of way typically 60 feet wide extending 2 feet behind the sidewalk on both sides.

Intersections

The study area includes all 28 signalized intersections on the Route 44/55 Arterials from Jefferson Street located in the City of Poughkeepsie up to and including the two Burnett Boulevard intersections located in the Town of Poughkeepsie. While there are a number of unsignalized intersections along the Arterials, it is the traffic signals that dictate the overall traffic flow. All of the signalized intersections operate under an actuated, coordinated traffic signal system in the eastbound and westbound directions, except the two

Burnett Boulevard intersections, which are actuated uncoordinated. (Actuated means the signals detect and respond to traffic demand, and coordinated means that they are timed to operate with adjacent signals). The traffic signal timings are maintained by NYSDOT and have been optimized to provide a steady vehicular traffic progression in the eastbound and westbound directions in order to minimize delays to commuter traffic traveling through the City of Poughkeepsie. Figure 2.11 shows the signalized intersections along the Arterials.

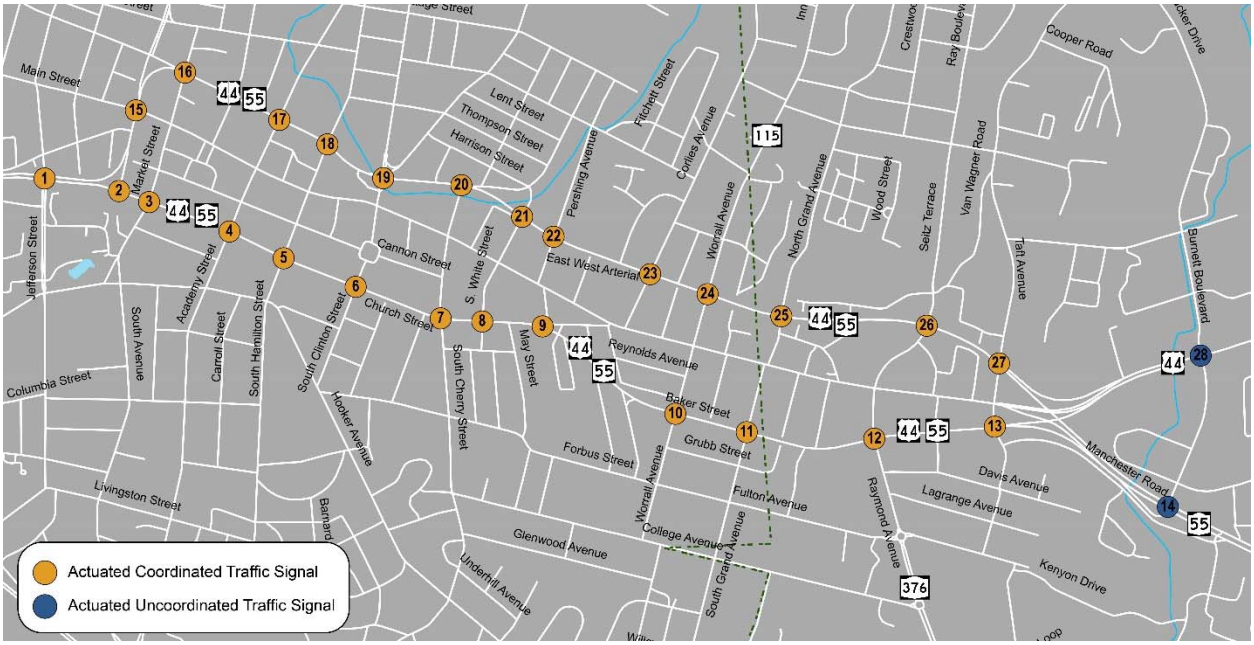


FIGURE 2.11: INTERSECTION CONTROL

Intersection geometry (travel lanes) and pedestrian accommodations were inventoried at all signalized intersections on the Route 44/55 Arterials. The pedestrian inventory included crosswalk type, pedestrian signals, push button type, and overall condition at each intersection. The inventory shows that overall pedestrian crossing accommodations at the existing traffic signals are good. In addition, crosswalk pavement markings are generally in fair to good condition. Most of the signalized intersections provide marked crosswalks and pedestrian signals with count-down timers to cross the Arterials. Pedestrian signals are lacking more often for crossing the side streets. Table 2.2 summarizes the locations where marked crosswalks and signalized pedestrian crossings are not provided. The table also shows the locations where some pedestrian improvements are pending as part of the NYSDOT Pedestrian Safety Action Plan project (NYSDOT# D264056).

TABLE 2.2: LOCATIONS LACKING MARKED CROSSWALK AND/OR PEDESTRIAN SIGNALS

Location #	Intersection	Accommodation	Intersection Leg			
			North	South	East	West
1*	Route 44/55 / Jefferson Street	Marked Crosswalk				
		Pedestrian Signal	×	×		
10*	Route 44/55 Eastbound/ Worrall Avenue	Marked Crosswalk	×			
		Pedestrian Signal	×	×		
11*	Route 44/55 Eastbound/ S. Grand Avenue	Marked Crosswalk				
		Pedestrian Signal	×	×		
14*	Route 55/Burnett Boulevard	Marked Crosswalk		×		×
		Pedestrian Signal		×		×
15	Route 44/55 Westbound/ Main Street/Columbus Drive	Marked Crosswalk			○	○
		Pedestrian Signal			×	×
16*	Route 44/55 Westbound/ Civic Center Plaza	Marked Crosswalk				×
		Pedestrian Signal				×
17	Route 44/55 Westbound/ Catharine Street	Marked Crosswalk		×		
		Pedestrian Signal	×	×		
20	Route 44/55 Westbound/ N. Cherry Street	Marked Crosswalk				×
		Pedestrian Signal		×		×
21	Route 44/55 Westbound/ N. White Street	Marked Crosswalk	○	○		×
		Pedestrian Signal	×	×	○	×
22*	Route 44/55 Westbound/ Pershing Avenue	Marked Crosswalk				
		Pedestrian Signal	×	×		
23*	Route 44/55 Westbound/ Corlies Avenue	Marked Crosswalk				×
		Pedestrian Signal	×	×		×
24	Route 44/55 Westbound/ Innis Avenue	Marked Crosswalk				
		Pedestrian Signal	×	×	×	
25	Route 44/55 Westbound/ N. Grand Avenue	Marked Crosswalk	×			
		Pedestrian Signal	×	×		
26	Route 44/55 Westbound/ Raymond Avenue	Marked Crosswalk				
		Pedestrian Signal	○			
28*	Route 44/Burnett Boulevard	Marked Crosswalk			×	
		Pedestrian Signal			×	○

× Indicates feature lacking

○ Indicates existing feature needs to be replaced

* Some Pedestrian Improvements are pending as part of the NYSDOT Pedestrian Safety Action Plan project (NYSDOT# D264056)

Traffic Characteristics

Traffic Volumes

Automatic traffic recorders (ATRs) were installed at six locations along the Arterials (three eastbound and three westbound) for three weekdays in October 2019 to document daily traffic volumes, peak travel times, and travel speed information. Turning movement counts (TMCs) were also conducted at each of the study area intersections on the Arterials and Interchange ramps. In addition, ATR data collected by NYSDOT in April 2019 on the Interchange ramps was used to supplement the data collection effort. The ATR and TMC locations are shown on Figure 2.12. The TMCs were conducted in October 2019 during the morning (7:00 to 9:00 a.m.) and afternoon (4:00 to 6:00 p.m.) peak commuter periods to capture the highest traffic volume time periods. The detailed turning movement volumes are shown on Figures 2.13 and 2.14. These Figures also show supplemental data collected along Main Street and south of the Interchange (Secondary Study Area) to assess the impact of alternatives on nearby routes later in this study. Table 2.3 summarizes the Average Daily Traffic (ADTs) volumes recorded on US Route 9 and the Arterials.

FIGURE 2.12 TMC AND ATR LOCATIONS

TABLE 2.3: EXISTING DAILY TRAFFIC VOLUMES

Location	Average Daily Traffic Volume (Vehicles Per Day)		
US Route 9	Northbound	Southbound	Total
Approx. 165-feet south of Main St near the Interchange	19,920	11,370	31,290
US Route 44/NY Route 55 (Arterials)	Eastbound	Westbound	Total
Approx. 275-feet east of Catharine St / Academy St	15,290	24,800	40,090
Approx. 170-feet east of Jewett Ave / Lexington Ave	19,710	19,970	39,680
Approx. 350-feet west of Raymond Ave	13,730	20,280	34,010

The table shows that ADT volumes range from approximately 31,000 to 40,000 vehicles per day (vpd) depending on the location. Directionally, the eastbound Arterial ranges from approximately 14,000 vpd to 20,000 vpd, while the westbound Arterial ranges from 20,000 vpd to 25,000 vpd. A review of the ATR data and turning movement counts indicates that peak volumes generally occur from 8:00 to 9:00 a.m. and 4:00 to 5:00 p.m., which coincides with peak commuter traffic. Charts 2.1 and 2.2 summarize the typical hourly traffic variations on the Arterials and on US Route 9. During the AM peak, northbound volumes on US Route 9 are approximately 50% higher than southbound volumes, while during the PM peak, northbound and southbound volumes are fairly evenly distributed. The Arterials exhibit a similar pattern with westbound volumes higher than eastbound volumes during the AM peak hour, and east and westbound volumes fairly evenly distributed during the PM peak hour, although this trend is less pronounced on segments of the Arterials further east. This suggests that travel patterns are predominantly into the City in the morning and exiting the City in the afternoon in all directions.

CHART 2.1 TYPICAL HOURLY TRAFFIC VARIATIONS – US ROUTE 9

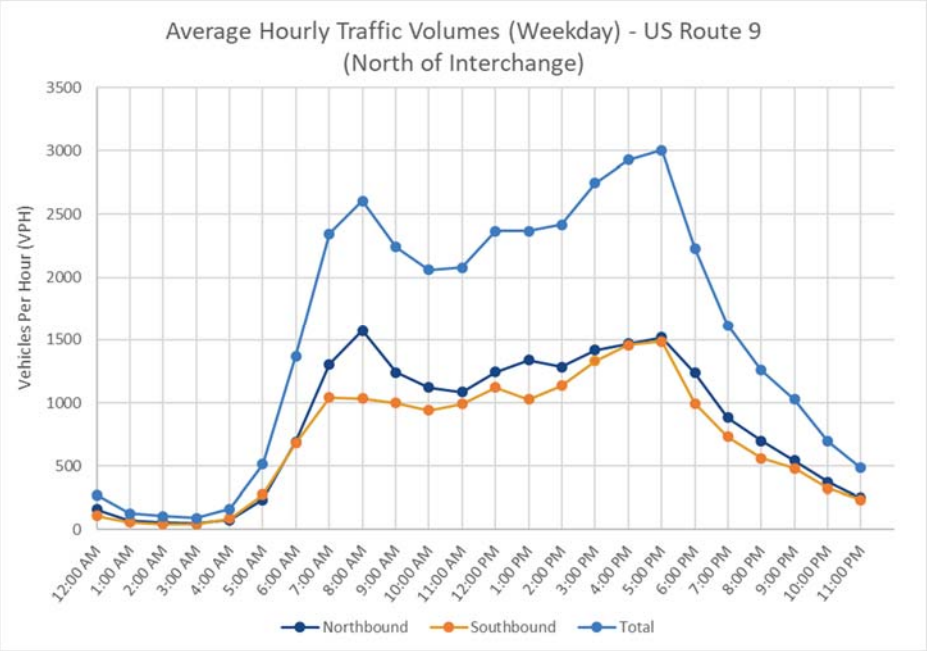


CHART 2.2 TYPICAL HOURLY TRAFFIC VARIATIONS – THE ARTERIALS EAST OF ACADEMY STREET/CATHARINE STREET

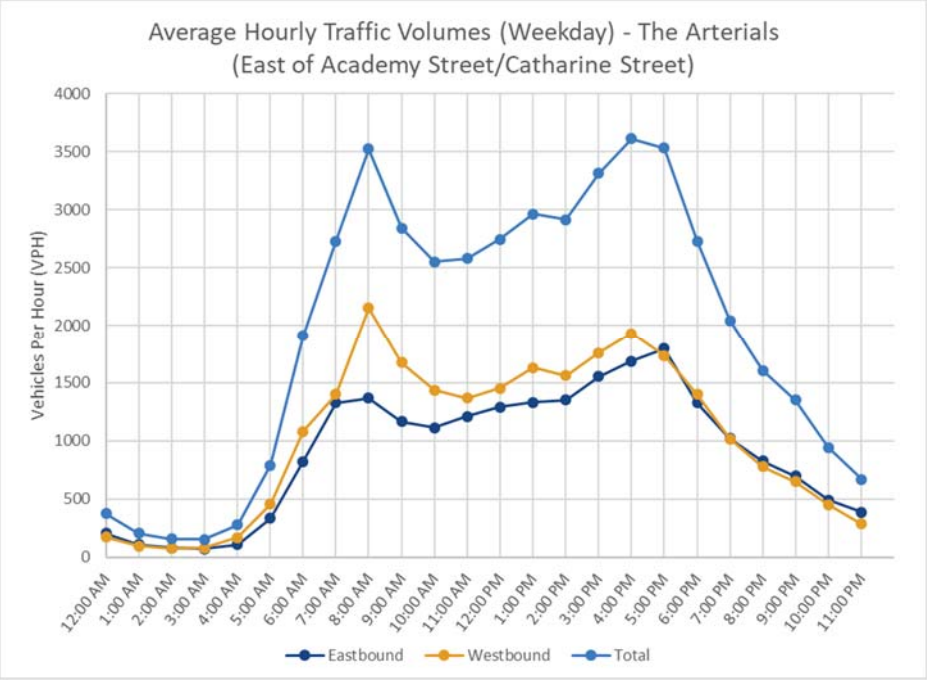


CHART 2.3 TYPICAL HOURLY TRAFFIC VARIATIONS – THE ARTERIALS EAST OF LEXINGTON AVE

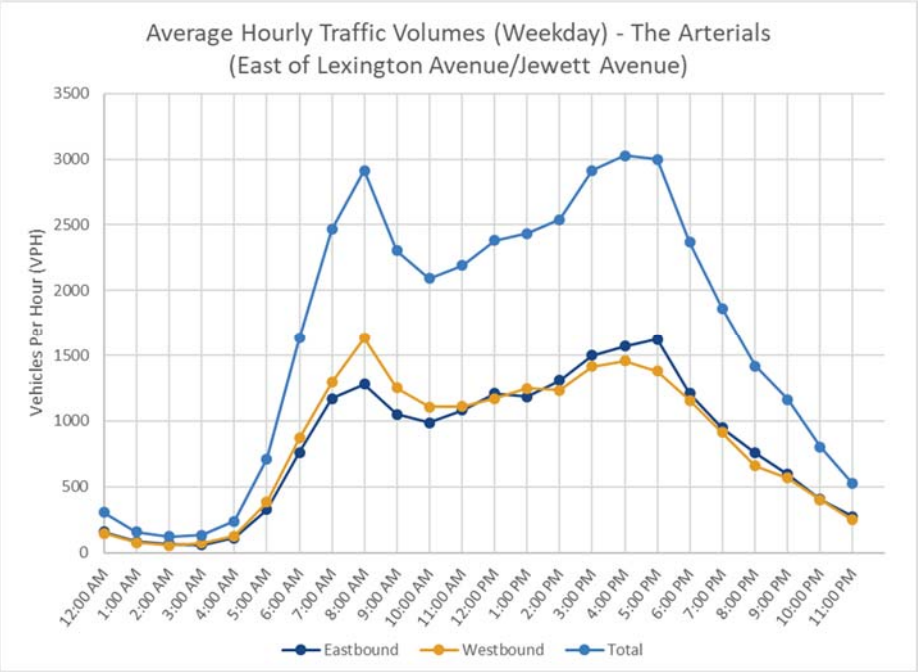
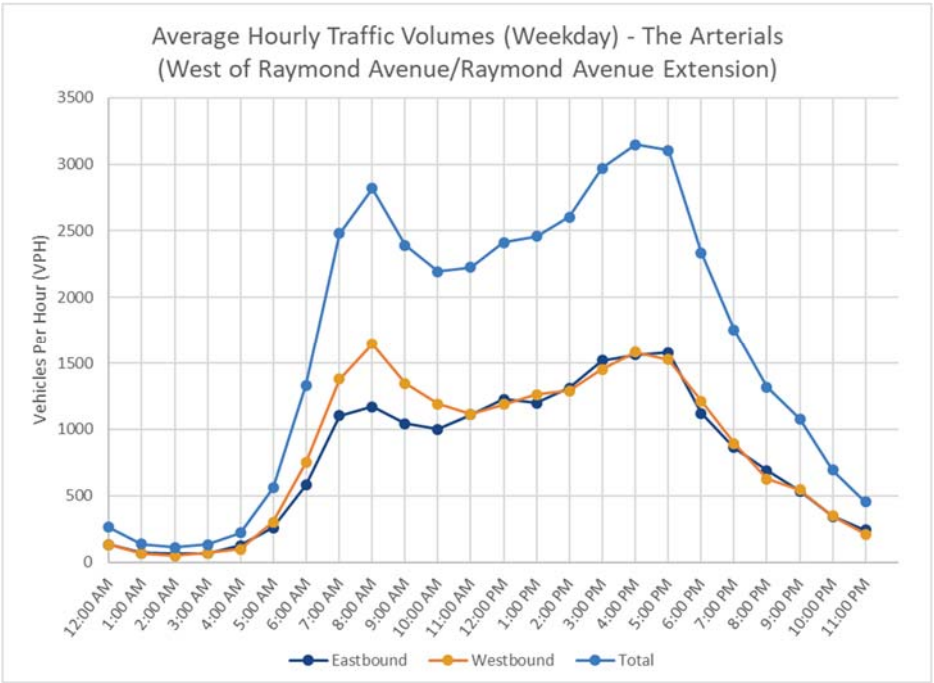
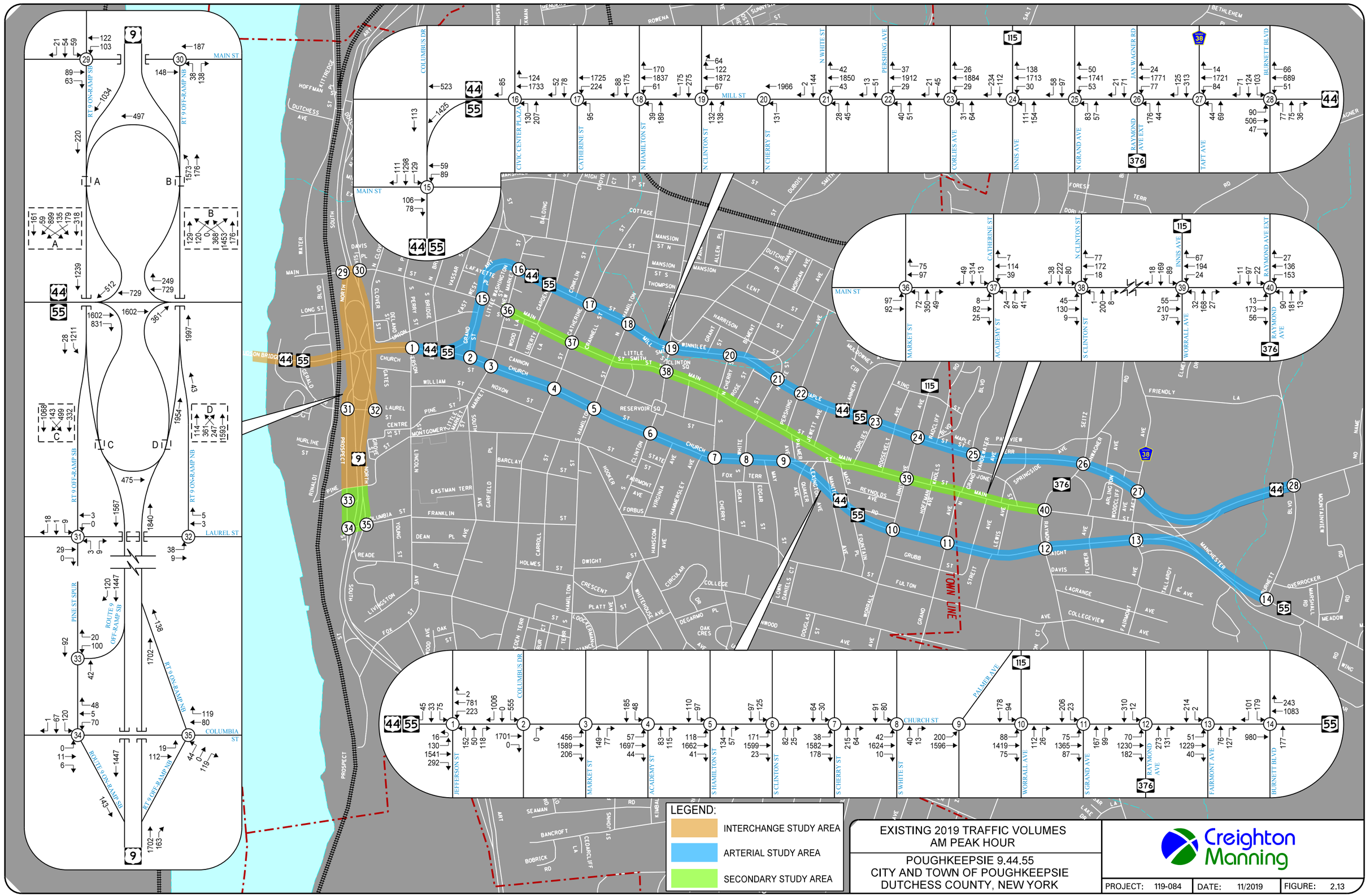


CHART 2.4 TYPICAL HOURLY TRAFFIC VARIATIONS – THE ARTERIALS WEST OF RAYMOND AVE





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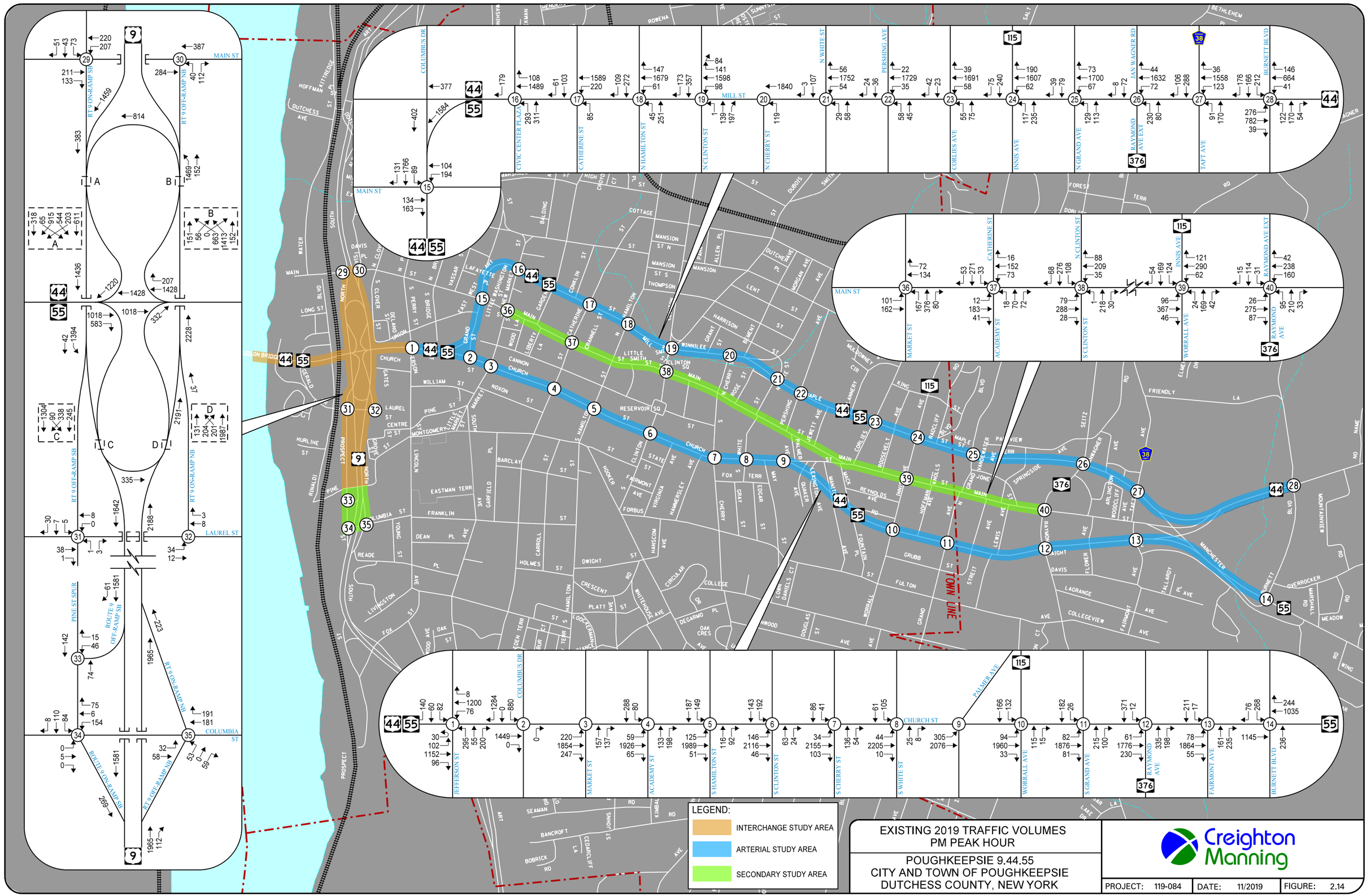

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Speeds

Table 2.4 summarizes the existing speed data recorded on US Route 9 and the Route 44/55 Arterials. The data shows that the 85th-percentile speeds range from at least 7 mph to 14 mph above the posted speed limits on the eastbound and westbound Arterials, and in general, are about 10 mph above the posted speed limit. US Route 9 also has high 85th-percentile speeds, which are about 10 mph above the posted speed limit. The 85th-percentile speed is the speed, at or below, that which 85 percent of drivers travel and is often used as the operating speed of a facility. The speed data confirms public comments about speeds being higher than the posted speed limit and alternatives in this study should address the speed issue.

TABLE 2.4: EXISTING SPEED DATA

Location	Existing Speeds	
US Route 9	Northbound	Southbound
North of Interchange		
Posted	45-mph	45-mph
Average	51-mph	49-mph
85th	56-mph	54-mph
The Arterials	Eastbound	Westbound
East of Academy Street		
Posted	30-mph	30-mph
Average	31-mph	32-mph
85th	37-mph	37-mph
East of Jewett Avenue / Lexington Avenue		
Posted	30-mph	30-mph
Average	39-mph	35-mph
85th	44-mph	39-mph
West of Raymond Avenue		
Posted	30-mph	40-mph
Average	32-mph	46-mph
85th	39-mph	51-mph

Pedestrian/Bicycle Traffic Volumes

Pedestrians were generally observed using the available sidewalks at all locations in the study area while bicyclists either use the sidewalk or shared the roadway with vehicles. Table 2.5 summarizes pedestrians crossing intersection approaches and bicycle activity observed on either the roadways or crosswalks during the AM and PM peak hours (generally 7:30 to 8:30 a.m. and 4:30 to 5:30 p.m.) at the study area intersections on the Arterials and near the Interchange.

TABLE 2.5: PEDESTRIAN/BICYCLE ACTIVITY

Intersection	AM Peak Hour					PM Peak Hour				
	East Leg	West Leg	North Leg	South Leg	Total	East Leg	West Leg	North Leg	South Leg	Total
1. Rt. 44/55 / Jefferson	2 (0/0)	7 (0/0)	0 (0/0)	0 (0/1)	9 (0/1)	3 (1/0)	1 (0/1)	0 (0/0)	1 (0/0)	5 (1/1)
Route 44/55 Eastbound										
2. Columbus Dr.	1 (0/0)	2 (0/0)	2 (0/0)	-	5 (0/)	1 (0/0)	6 (0/0)	1 (0/0)	-	8 (0/0)
3. Market St.	30 (2/0)	66 (0/0)	69 (0/1)	1 (0/0)	169	58 (0/1)	59 (0/0)	25 (0/0)	2 (1/2)	144
4. Academy St.	5 (1/0)	7 (0/0)	13 (0/1)	3 (0/0)	28 (1/1)	11 (0/0)	27 (1/0)	7 (0/0)	9 (0/0)	54 (1/0)
5. S. Hamilton St.	9 (0/0)	16 (0/1)	6 (0/0)	3 (0/0)	34 (0/1)	29 (2/0)	25 (2/0)	3 (0/2)	9 (0/0)	66 (4/2)
6. S. Clinton St.	8 (0/0)	9 (0/0)	9 (1/0)	11	37 (1/0)	2 (2/0)	13 (1/0)	4 (1/1)	8 (0/0)	27 (4/1)
7. S. Cherry St.	25 (0/0)	27 (0/3)	16 (0/0)	10	78 (0/3)	17 (1/0)	1 (0/1)	2 (0/0)	21 (0/0)	41 (1/1)
8. S. White St.	54 (3/0)	38 (1/2)	7 (0/0)	12	111	10 (2/0)	8 (1/0)	7 (0/0)	8 (0/0)	33 (3/0)
9. Church St./Palmer	5 (0/0)	15 (0/0)	22 (0/0)	-	42 (0/0)	1 (0/0)	7 (0/0)	7 (0/0)	-	15 (0/0)
10. Worrall Ave.	4 (0/0)	33 (0/0)	0 (1/0)	0 (0/0)	37 (1/0)	3 (0/0)	15 (0/0)	4 (0/0)	5 (0/0)	27 (0/0)
11. S. Grand Ave.	0 (0/0)	10 (0/0)	1 (0/0)	1 (0/0)	12 (0/0)	2 (0/0)	21 (2/0)	2 (1/0)	2 (0/0)	27 (3/0)
12. Raymond Ave.	1 (0/0)	1 (0/0)	0 (1/1)	0 (0/0)	2 (1/1)	8 (2/0)	16 (2/0)	0 (0/1)	4 (0/0)	28 (4/1)
13. Fairmont Ave.	1 (0/0)	1 (0/0)	0 (0/0)	1 (0/0)	3 (0/0)	0 (0/0)	2 (0/0)	0 (0/0)	1 (0/0)	3 (0/0)
14. Burnett Blvd.	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	1 (1/0)	0 (0/0)	0 (0/0)	0 (0/0)	1 (1/0)
Route 44/55 Westbound										
15. Main St/Columbus	23 (0/0)	7 (0/0)	55 (1/0)	18	103	13 (1/0)	1 (0/0)	65 (2/0)	36 (0/0)	115
16. Civic Center Plaza	67 (0/0)	25 (1/0)*	16 (0/0)	5 (0/0)	113	75 (6/0)	12 (2/0)*	20 (6/0)	5 (0/0)	112
17. Catharine St	14 (1/0)	12 (0/0)	31 (0/0)	20	77 (1/0)	19 (3/0)	15 (1/0)	10 (1/0)	17 (00/)	61 (5/0)
18. N. Hamilton St.	29 (1/0)	14 (2/0)	20 (1/0)	12	75 (4/0)	46 (4/0)	23 (1/0)	13 (0/0)	11 (1/0)	93 (6/0)
19. N. Clinton St.	13 (0/0)	16 (2/0)	11 (0/0)	14	54 (2/0)	39 (5/0)	22 (3/0)	9 (0/0)	11 (3/0)	81
20. N. Cherry St.	1 (0/0)	3 (0/0)	-	14	18 (1/0)	5 (1/0)	5 (0/0)	-	8 (1/0)	18 (2/0)
21. N. White St.	31 (2/0)	12 (0/0)	9 (0/0)	10	62 (2/0)	26 (1/0)	8 (1/0)	11 (2/0)	5 (1/0)	50 (5/0)
22. Pershing Ave.	20 (0/0)	17 (0/0)	15 (0/0)	8 (0/0)	60 (0/0)	9 (5/0)	8 (1/0)	14 (3/0)	7 (0/0)	38 (9/0)
23. Corlies Ave.	6 (0/0)	7 (0/0)	0 (0/0)	3 (0/0)	16 (0/0)	6 (0/0)	6 (1/0)	10 (1/0)	10 (3/0)	32 (5/0)
24. Innis Ave.	4 (1/0)	3 (0/0)	0 (0/0)	0 (0/0)	7 (1/0)	10 (0/0)	6 (0/0)	2 (1/0)	4 (0/0)	22 (1/0)
25. N. Grand Ave.	2 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	2 (0/0)	2 (0/0)	2 (0/0)	2 (0/0)	2 (0/0)	8 (0/0)
26. Raymond Ave.	1 (0/0)	2 (0/0)	0 (1/0)	1 (0/0)	4 (1/0)	5 (1/0)	0 (0/0)	2 (0/0)	0 (0/0)	7 (1/0)
27. Taft Ave.	0 (0/0)	2 (0/0)	3 (0/0)	0 (0/0)	5 (0/0)	0 (0/1)	0 (0/0)	6 (0/0)	0 (0/0)	6 (0/1)
28. Burnett Blvd	0 (0/0)	0 (0/0)	1 (0/0)	3 (0/0)	4 (0/0)	0 (0/0)	2 (0/0)	1 (1/0)	0 (0/0)	3 (1/0)
Interchange Ramps										
34. Main St./SB On-	0 (0/0)	2 (1/0)	17 (1/0)	9 (0/0)	28 (2/0)	0 (0/0)	5 (0/1)	33 (0/2)	16 (0/0)	54 (0/3)
35. Main St./NB Off-	0 (0/0)	0 (0/0)	-	8 (0/0)	8 (0/0)	0 (0/2)	0 (0/0)	-	15 (0/0)	15 (0/2)
36. Laurel St./SB Off-	0 (0/0)	0 (0/0)	0 (0/0)	-	0 (0/0)	0 (0/0)	0 (0/2)	0 (0/0)	-	0 (0/2)
37. Laurel St./NB On-	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/2)	0 (0/0)	0 (0/0)	0 (0/2)

XX (YY) = Pedestrians (Bicycles at Crosswalk/Bicycles on Road)
- = No leg/approach at 3-way intersection
*= "No Pedestrian" signs provided on this leg of the intersection

Table 2.5 indicates that pedestrian activity is heaviest on the western half of the study area (west of the Church Street/Palmer Street intersection for the Eastbound Arterial and west of the Corlies Avenue intersection for the Westbound Arterial). Pedestrian activity observed at crosswalks on the western half of the Arterials generally range from approximately 30 to 150 pedestrians per hour during the AM and PM peak hours while pedestrian activity observed at crosswalks on the eastern half generally range from 2 to 20 pedestrians per hour during the AM and PM peak hours. The highest concentration of pedestrians was observed at the Market Street/Eastbound Arterial and Civic Center Plaza/Westbound Arterial intersections. Bicycle traffic is more consistent throughout the Arterials, ranging from zero to 15 bicyclists per hour. The unsignalized intersections associated with the Interchange ramps on Laurel Street experienced lower pedestrian and bicycle activity while the unsignalized Interchange ramp intersections on Main Street experienced higher pedestrian and bicycle activity, which is likely associated with the train station located northwest of the Interchange. The traffic counts do not include pedestrians walking along the arterials, or crossing midblock.

Traffic Operations

Traffic operations are represented by "Level-of-Service" (LOS), which relate traffic volumes to the physical characteristics of an intersection or roadway. Levels of service range from A to F, with LOS A considered excellent, while LOS F represents long delays or poor operations near or over capacity. The NYSDOT *Highway Design Manual* (HDM) establishes eleven critical design criteria for highways. Level of Service is not listed as a critical design element, but is described as an "other" design element that must be considered when scoping and designing a project.[2] According to the HDM, "*During the project development process, design element trade-offs are routinely considered… When the Department evaluates such trade-offs in the course of considering transportation needs and community needs, public safety (whether driving, riding, walking, or bicycling) remains the foremost issue to consider."* Chapter 5 of the HDM establishes Level-of-service D as the minimum Design Year level of service for Urban facilities, and notes that any decisions to vary from recommended values need to be explained and documented as nonconforming features in the scoping and design approval documents.[3] Accordingly, any LOS below LOS D will be documented in this planning study and may set the stage for an acceptable trade-off as alternatives are considered later in this study. In other words, some additional travel time may be acceptable for improved safety.

Eastbound Arterial Ramp to US Route 9 North

[2] NYS HDM pg. 2-2
[3] NYS HDM pg. 5-1

Interchange Level of Service

The Interchange was evaluated for level of service at each of the unsignalized ramp intersections and weaving areas. Table 2.6 highlights the level of service criteria for unsignalized intersections and weaving areas. Level of service calculations were completed using the Synchro 10 software and VISSIM 11 software. Table 2.7 and Figure 2.15 show the results of the analysis.

TABLE 2.6: UNSIGNALIZED INTERSECTIONS AND WEAVE LEVELS OF SERVICE CRITERIA

Level of Service	Unsignalized Intersections	Weaving Segments
	Control Delay per Vehicle (seconds)	Density (pc/mi/ln)
A	≤10	0-12
B	>10 and ≤10	>12 – 24
C	>15 and ≤25	>24 – 32
D	>25 and ≤35	>32 – 36
E	>35 and ≤50	>36 – 40
F	>50	>40

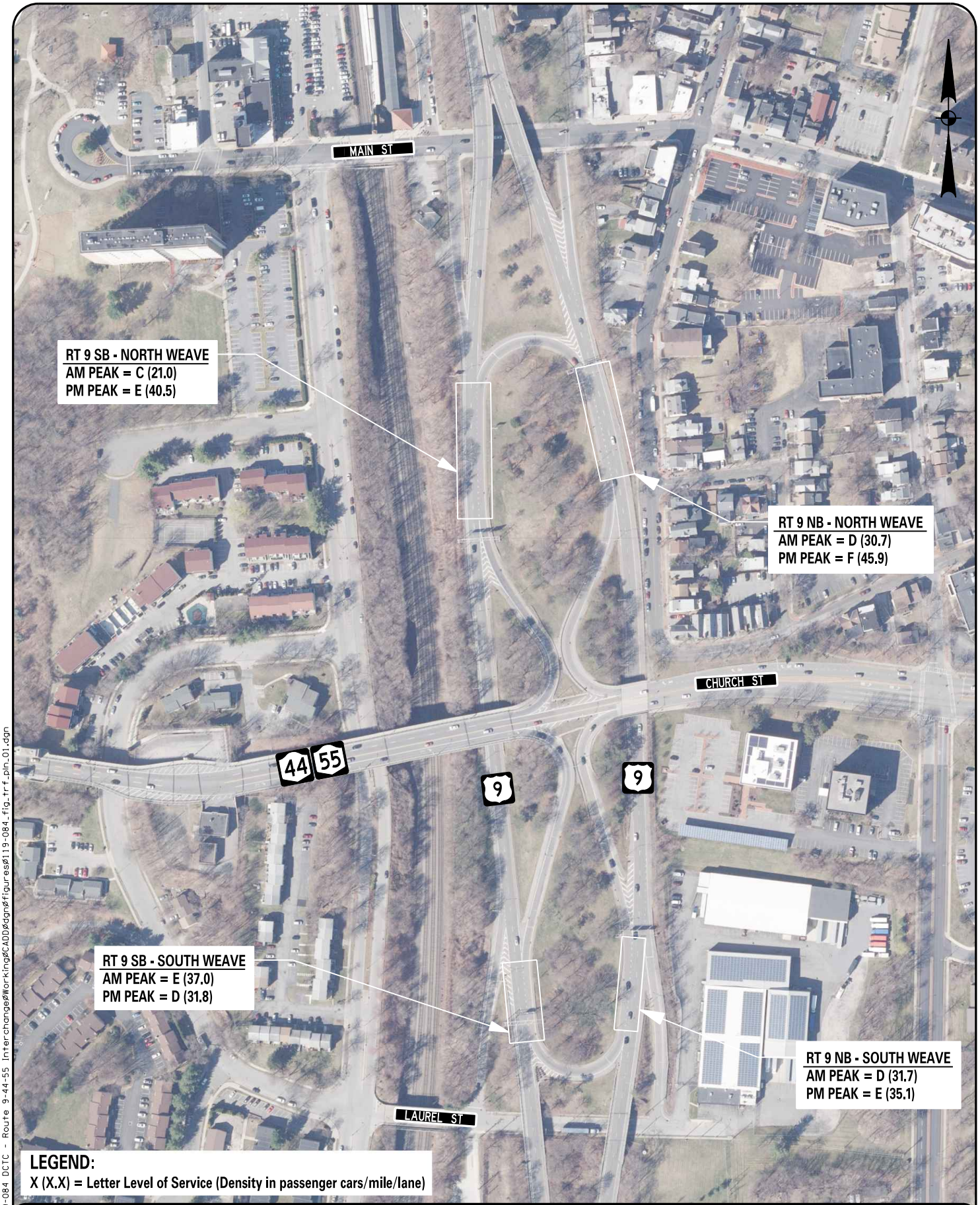
Operations analysis shows that the weaving areas on the southbound side of the Interchange operate poorly (Level of Service F) at peak times

The analysis shows that all movements at the unsignalized ramp termini at Main Street and Laurel Street operate at LOS B or better during the AM and PM peak hours. The merge from Laurel Street onto US Route 9 northbound operates at LOS B during the AM and PM peak hours while the merge from Main Street onto US Route 9 southbound operates at LOS A during the AM peak hour and LOS B during the PM peak hour. The weaving areas located on southbound US Route 9 in the northwest and southwest quadrants of the Interchange operate at LOS C/E and LOS E/D during the AM and PM peak hours, respectively, while the weaving areas located on northbound US Route 9 in the northeast and southeast quadrants of the Interchange operate at LOS D/F and LOS D/E during the AM and PM peak hours, respectively. This indicates that operations are near or over capacity during peak periods.

TABLE 2.7 INTERCHANGE AREA LEVEL OF SERVICE SUMMARY

Intersection/Merge/Weave		Control	Existing 2019	
			AM Peak Hour	PM Peak Hour
34. Main Street/US 9 SB On-Ramp		U		
Main Street WB	LT		A (4.1)	A (5.9)
35. Main Street/US 9 NB Off-Ramp		U		
US Route 9 NB Off-Ramp NB	LR		B (10.8)	B (13.7)
36. Laurel Street/US 9 SB Off-Ramp		U		
Water Club Driveway NB	LR		A (8.6)	A (8.6)
US Route 9 SB Off-Ramp SB	LTR		A (8.8)	A (8.7)
37. Laurel Street/US 9 NB On-Ramp		U		
Laurel Street EB	LT		A (6.0)	A (5.4)
Main Street Ramp to US Route 9 Southbound		U		
Ramp SB	T		A (5.9)	B (10.9)
Laurel Street Ramp to US Route 9 NB		U		
Ramp NB	T		B (11.4)	B (14.0)
US Route 9 SB – North Interchange Weave		Weave		
Route 9 SB	T,T,T		*C (21.0)*	***E (40.5)***
US Route 9 SB – South Interchange Weave		Weave		
Route 9 SB	T,T,T		***E (37.0)***	*D (31.8)*
US Route 9 NB – North Interchange Weave		Weave		
Route 9 NB	T,T,T		*D (30.7)*	***F (45.9)***
US Route 9 NB – South Interchange Weave		Weave		
Route 9 NB	T,T,T		*D (31.7)*	***E (35.1)***

U = Unsignalized intersection, Weave = Weave Area
EB, WB, NB, SB = Eastbound, Westbound, Northbound, and Southbound intersection approaches
L, T, R = Left-turn, Through, and/or Right-turn movements
X (Y.Y) = Unsignalized Level of service (Average delay in seconds per vehicle)
X (Y.Y) = Weave Level of Service (passenger cars/mile/lane)



INTERCHANGE 9.44.55
EXISTING 2019
WEAVING ANALYSIS

POUGHKEEPSIE 9.44.55
CITY AND TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK

Creighton Manning

PROJECT:	119-084	DATE:	01/2020	FIGURE: 2.15

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Intersection Level of Service (Arterials)

Intersection evaluations were made using the Synchro 10 software, which automates the procedures contained in the *Highway Capacity Manual (HCM) 6th Edition* published by the Transportation Research Board (TRB). Table 2.8 highlights the level of service criteria for signalized intersections while Table 2.9 and Figure 2.16 show the results of the analysis. The detailed level of service reports are included under Appendix A.

TABLE 2.8: SIGNALIZED LEVEL OF SERVICE CRITERIA

Level of Service	Control Delay per Vehicle (seconds)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Intersection of Columbus Drive and Main Street

TABLE 2.9: OVERALL EXISTING SIGNALIZED INTERSECTION LEVELS OF SERVICE

Intersection	AM Peak Hour	PM Peak Hour
1. Rt. 44/55 / Jefferson St.	C (32.0)	C (34.8)
Route 44/55 Eastbound		
2. Columbus Dr.	A (9.9)	B (18.4)
3. Market St.	C (28.3)	C (29.0)
4. Academy St.	C (25.7)	C (32.4)
5. S. Hamilton St.	C (26.7)	C (32.7)
6. S. Clinton St.	C (27.4)	C (33.3)
7. S. Cherry St.	C (25.7)	C (27.3)
8. S. White St.	C (23.9)	C (26.6)
9. Church St./Palmer Ave.	A (1.4)	A (0.9)
10. Worrall Ave.	B (16.2)	C (21.6)
11. S. Grand Ave.	B (15.8)	B (18.0)
12. Raymond Ave.	B (17.3)	B (19.1)
13. Fairmont Ave.	B (13.6)	B (16.8)
14. Burnett Blvd.	B (19.8)	C (21.2)
Route 44/55 Westbound		
15. Main St/Columbus Dr.	B (15.3)	C (20.7)
16. Civic Center Plaza	D (40.6)	D (38.6)
17. Catharine St	A (9.0)	A (6.2)
18. N. Hamilton St.	C (31.3)	C (25.0)
19. N. Clinton St.	B (12.5)	B (14.5)
20. N. Cherry St.	B (19.8)	B (18.1)
21. N. White St.	D (36.5)	D (35.7)
22. Pershing Ave.	D (37.0)	C (32.9)
23. Corlies Ave.	C (34.9)	C (32.6)
24. Innis Ave.	D (45.4)	D (43.0)
25. N. Grand Ave.	C (22.9)	C (22.0)
26. Raymond Ave.	C (33.8)	C (31.8)
27. Taft Ave.	C (22.8)	C (21.1)
28. Burnett Blvd	C (24.9)	D (37.1)

X (Y.Y) = Level of service (Average delay (sec/veh))

The level of service in the table is a weighted average of all intersection movements during normal weekday conditions. This assessment does not reflect delay during atypical conditions associated with traffic crashes or incidents on the Interchange or Arterials. The analysis indicates that all intersections on Route 44/55 operate at an **overall** LOS D or better. It is noted that many of the side street movements operate at LOS D conditions during the peak hours even though the overall intersection may operate at

LOS B/C (i.e. southbound Civic Center Plaza, northbound Raymond Avenue, etc.). The analysis also indicates that the following individual movements operate at LOS E/F during the peak hours:

- Route 44/55/Jefferson Street – The eastbound left-turn movement operates at LOS E during both peak hours
- Route 44/55/Jefferson Street – The westbound left-turn movement operates at LOS E/D during the AM and PM peak hours.
- Route 44/55/Jefferson Street – The southbound approach operates at LOS D/F during the AM and PM peak hours.

Field observations indicate that vehicle delay and queuing associated with the Route 9/44/55 Interchange can extend back during the PM peak hour and impacts operations on the westbound Arterial. In addition, a review of typical traffic conditions in the project area recorded by Google Maps, indicates that the westbound Arterial experiences above average delay from approximately 5:15 to 5:45 p.m. at the following locations:

- Near the Jefferson Street intersection due to overall traffic congestion
- Extending back from the Main Street intersection through the Civic Center Plaza intersection up to the Catharine Street intersection due to merging/diverging areas associated with Mill Street and Columbus Drive.


Bain Avenue
Verazzano Boulevard
Mansion Street
Garden Street
Driveway
Oakley Street
Smith Street
Cottage Street
North Hamilton Street
Main Street
Market Street
Lent Street
Thompson Street
Harrison Street
Fitchett Street
Pershing Avenue
Corlies Avenue
Innis Avenue
Crestwood Boulevard
Ray Boulevard
Cooper Road
Tucker Drive
Van Wagner Road
Seitz Terrace
Wood Street
North Grand Avenue
Worrall Avenue
Cannon Street
White Street
East West Arteria
Jefferson Street
Academy Street
South Avenue
Carroll Street
South Hamilton Street
South Clinton Street
Church Street
South Cherry Street
May Street
Reynolds Avenue
Baker Street
Grubb Street
Forbus Street
Hooker Avenue
Barnard Avenue
Underhill Avenue
Glenwood Avenue
College Avenue
Fulton Avenue
South Grand Avenue
Willow Avenue
Columbia Street
Davis Avenue
Lagrange Avenue
Manchester Road
Raymond Avenue
Kenyon Drive
Burnett Boulevard
9
44
55
115
376
N
S
E
W
Level of Service
LOS D or Better
AM Peak Hour
PM Peak Hour
LEVEL OF SERVICE
POUGHKEEPSIE 9.44.55
CITY AND TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK
Creighton Manning
PROJECT: 119-084
DATE: 03/2022
FIGURE: 2.16

Crash Analysis

A crash analysis was performed for the Interchange and Arterials in accordance with NYS *Highway Design Manual Chapter 5*. Crash data was requested from NYSDOT to quantify the number of crashes, determine a crash rate, and identify any crash patterns or concentrations in the study area. Safety Information Management System (SIMS) and Accident Location Information System (ALIS) data was provided by NYSDOT for a three-year period from January 1, 2016 through December 31, 2018. The crash analysis is summarized in the following sections. Overall, there were 1,373 crashes over the three-year period as summarized by type in Table 2.10. Table 2.11 summarizes the severity of crashes by year, with the predominant contributing factors summarized in Figure 2.17. It is noted that the two fatal crashes resulted in two deaths, while the 421 injury crashes resulted in 571 injured persons.

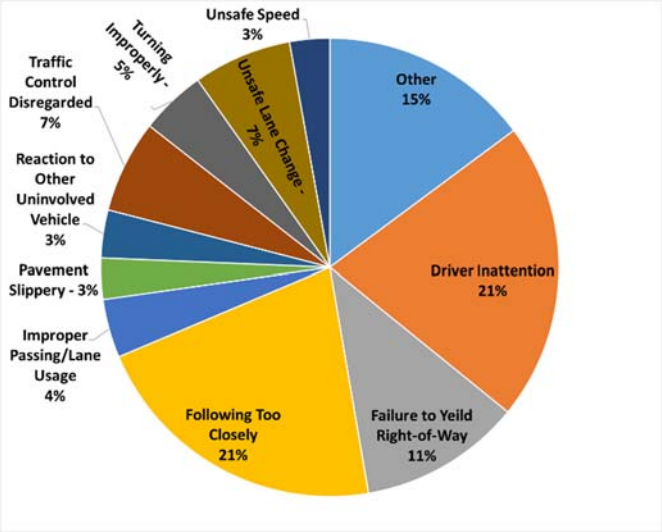
TABLE 2.10: SUMMARY OF CRASHES BY TYPE (JANUARY 1, 2016 TO DECEMBER 31, 2018)

Type	Interchange	Intersection	Segment	Total Crashes
Vehicle	407	628	290	1,325
Pedestrian	0	24	6	30
Bicycle	0	13	5	18
Total	407	665	301	1,373

TABLE 2.11: SUMMARY OF CRASH SEVERITY (JANUARY 1, 2016 TO DECEMBER 31, 2018)

LOCATION/YEAR	Severity				
	Fatality	Injury	Property Damage	Non-Reportable	Total
Interchange	**1**	**93**	**172**	**141**	**407**
2016	0	21	63	26	110
2017	1	35	52	57	145
2018	0	37	57	58	152
Intersection	**1**	**245**	**271**	**148**	**665**
2016	0	96	113	44	253
2017	1	77	85	53	216
2018	0	72	73	51	196
Segment	**0**	**83**	**135**	**83**	**301**
2016	0	32	54	23	109
2017	0	24	43	26	93
2018	0	27	38	34	99
Total	**2**	**421**	**578**	**372**	**1,373**

FIGURE 2.17: PREDOMINANT CONTRIBUTING FACTORS



Interchange Area Crashes

During the three-year period analyzed, there were a total of 407 crashes associated with the Interchange on US Route 9 and on the ramps to/from Route 44/55, Main Street, and Laurel Street. Table 2.12 compares the segment crash rates on US Route 9 to the statewide crash rate for similar facilities. Crash rates are calculated based on the number of crashes that occur on US Route 9 and at the ramp junctions for the three year period and compared to the number of vehicle miles traveled. A detailed assessment of crashes located in the weaving areas and the on/off ramps near US Route 9 is included below.

TABLE 2.12: INTERCHANGE CRASH RATES (CRASHES/MVM)

Segment	Segment Length	Number of Crashes	Calculated Rate	NYSDOT Rate
US Route 9 – Northbound (Laurel Street to Main Street)	0.40	132	**9.00**	1.08
US Route 9 – Southbound (Main Street to Laurel Street)	0.40	210	**14.32**	1.08

Crashes/MVM = Crashes per million vehicle miles
BOLD = Rates above the statewide average

The crash rate for the northbound and southbound segments of US Route 9 at the Interchange is 9.00 and 14.32 Crashes/MVM, respectively. These rates are approximately 10 times higher than the statewide rate for similar segments. Table 2.13 summarizes the predominant crash types at the Interchange on US Route 9 and on the ramps. The following locations on the Interchange experienced the highest number of crashes:

- US Route 9 southbound weave area near the southbound on-ramp from Route 44/55 (122 rear-end and sideswipe crashes)
- US Route 9 northbound weave area near the northbound on-ramp from Route 44/55 (49 rear-end and sideswipe crashes)

TABLE 2.13: INTERCHANGE CRASH SUMMARY

Interchange	Crash Severity				Crash Type					
	Fatal	Injury	Non-Reportable	Property Damage	Overtaking	Rear-End	Fixed Object	Animal	Others	Total
9SB. US Route 9 Southbound	1	50	77	82	23	183	2	0	2	210
9NB. US Route 9 Northbound	0	36	40	56	29	97	2	1	3	132
E1. SB On-Ramp from Main St	0	0	0	1	0	0	1	0	0	1
E4. NB Off-Ramp to Main St	0	1	1	0	0	2	0	0	0	2
E8. SB Off-Ramp to 44/55	0	0	4	3	0	2	4	0	1	7
E12. SB On-Ramp from 44/55	0	2	6	6	0	3	11	0	0	14
E13. NB Off-Ramp to 44/55	0	0	0	1	0	1	0	0	0	1
E20. NB On-Ramp from Laurel St	0	1	2	0	0	3	0	0	0	3
44/55. Route 44/55	0	3	11	23	20	10	4	0	3	37
TOTALS	1	93	141	172	72	301	24	1	9	407

The most frequently occurring types of collisions at the Route 9/44/55 Interchange were rear-end (almost 75% of the total) and overtaking collisions. A review of the TE-213 reports indicates that these collisions were mainly due to driver inattention, following too closely, or drivers reacting to other uninvolved vehicles (e.g. avoiding a vehicle/crash). None of the crashes reported at the Interchange involved a pedestrian or a bicycle. One fatality was reported near the Interchange and involved a driver traveling southbound on US Route 9 near the Laurel Street ramp; however, it appears that this was caused by a medical condition.

Figure 2.18 summarizes the total crashes reported in the Interchange area and shows the concentration of crashes in each of the four weaving areas. A more detailed Interchange crash analysis including crash summaries and collision diagrams is included in Appendix B.

Arterial Intersection Crashes

Crash analysis shows that crash rates on the Arterials and at the Interchange are typically above the statewide average for similar facilities

During the three-year period, there were a total of 665 crashes at the 28 signalized intersections located on the Route 44/55 arterials. Table 2.14 compares the intersection crash rates to the statewide crash rate for similar intersections. Intersection and segment crash rates are calculated based on the number of crashes that occur at an intersection or on a segment for the three year period and compared to the amount of vehicles that either enter the intersection or the number of miles traveled on the segment, respectively. In order to be consistent with statewide average rates, a crash is considered an "intersection crash" if it is within 33-feet of the intersection; otherwise, it is considered a "segment crash."

TABLE 2.14: INTERSECTION CRASH RATES (CRASHES/MEV)

Intersection	Number of Crashes	Calculated Rate	NYSDOT Rate
I1. Route 44/55 & Jefferson Street	76	**1.58**	0.52
Route 44/55 Eastbound			
I2. Columbus Drive	27	**0.85**	0.32
I3. Market Street	40	**1.12**	0.52
I4. Academy Street	22	**0.58**	0.52
I5. S. Hamilton Street	24	**0.65**	0.52
I6. S. Clinton Street	16	0.43	0.52
I7. S. Cherry Street	13	0.38	0.52
I8. S. White Street	23	**0.68**	0.52
I9. Church Street/Palmer Avenue	0	0.00	0.52
I10. Worrall Avenue	10	0.29	0.52
I11. S. Grand Avenue	31	**0.96**	0.52
I12. Raymond Avenue	25	**0.67**	0.52
I13. Fairmont Avenue	16	0.50	0.52
I14. Burnett Boulevard	3	0.09	0.52
Route 44/55 Westbound			
I15. Main Street	73	**2.07**	0.52
I16. Civic Center Plaza	23	**0.71**	0.52
I17. Catharine Street	11	0.37	0.52
I18. N. Hamilton Street	23	**0.66**	0.52
I19. N. Clinton Street	40	**1.03**	0.52
I20. N. Cherry Street	6	0.21	0.32
I21. N. White Street	20	**0.68**	0.52
I22. Pershing Avenue	11	0.38	0.52
I23. Corlies Avenue	10	0.35	0.52
I24. Innis Avenue	30	**0.87**	0.52
I25. N. Grand Avenue	15	0.50	0.52
I26. Raymond Avenue	13	0.44	0.52
I27. Taft Avenue	29	**1.00**	0.52
I28. Burnett Boulevard	35	**1.01**	0.52

Crashes/MEV = Crashes per million entering vehicles
BOLD = Rates above the statewide average

Table 2.14 shows that 16 of the 28 intersections located on the Arterials have a crash rate above the statewide rate for similar intersections while nine intersections are 1.5 times (0.78 Crashes/MEV) above the average. The intersections with the three highest crash rates include the following:

- Route 44/55/Jefferson Street
- Route 44/55 Eastbound/Market Street
- Route 44/55 Westbound/Main Street

The predominant crash types are summarized on Table 2.15.

TABLE 2.15: INTERSECTION CRASH SUMMARY

Intersection	Crash Severity				Crash Type												
	Fatal	Injury	Non-Reportable	Property Damage Only	Overtaking	Rear-End	Right-Angle	Left-Turn	Sideswipe	Fixed Object	Pedestrian	Bicycle	Animal	Right-Turn	Head-On	Other	Total
I1. Rt 44/55/Jefferson St.	0	28	22	26	17	22	23	7	1	2	1	1	0	1	0	1	76
Rt 44/55 Eastbound																	
I2. Columbus Drive	0	7	5	15	5	6	14	0	0	1	1	0	0	0	0	0	27
I3. Market Street	0	17	4	19	17	7	10	0	0	0	3	0	0	1	1	1	40
I4. Academy Street	0	7	7	8	4	5	8	1	0	1	1	1	0	0	0	1	22
I5. Hamilton Street	0	10	5	9	7	6	7	2	1	0	0	0	0	0	0	1	24
I6. S. Clinton Street	1	5	6	4	2	3	7	0	0	1	1	1	1	0	0	0	16
I7. S. Cherry Street	0	4	3	6	5	3	2	1	0	0	1	0	0	0	0	1	13
I8. S. White Street	0	10	2	11	3	8	10	0	0	1	0	1	0	0	0	0	23
I9. Church St/Palmer Ave	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I10. Worrall Avenue	0	3	2	5	1	5	3	0	0	1	0	0	0	0	0	0	10
I11. S. Grand Avenue	0	9	10	12	6	8	14	1	0	2	0	0	0	0	0	0	31
I12. Raymond Avenue	0	13	6	6	3	7	12	0	0	1	1	0	0	0	0	1	25
I13. Fairmont Avenue	0	11	1	4	1	5	7	1	0	1	0	0	0	0	0	1	16
I14. Burnett Boulevard	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
Rt 44/55 Westbound																	
I15. Main Street	0	13	23	37	32	15	8	3	0	0	6	1	0	4	0	4	73
I16. Market Street	0	9	8	6	3	14	3	0	0	0	3	0	0	0	0	0	23
I17. Catharine Street	0	5	0	6	3	3	2	0	0	0	0	1	0	0	1	1	11
I18. N. Hamilton Street	0	9	4	10	6	6	8	0	0	1	0	1	0	0	0	1	23
I19. N. Clinton Street	0	18	8	14	10	12	10	2	0	1	2	2	0	0	0	1	40
I20. N. Cherry Street	0	1	4	1	0	1	2	0	0	1	0	2	0	0	0	0	6
I21. N. White Street	0	7	4	9	3	8	7	0	0	0	1	1	0	0	0	0	20
I22. Pershing Avenue	0	3	3	5	5	2	2	0	0	1	0	0	0	0	0	1	11
I23. Corlies Avenue	0	4	2	4	3	3	1	1	0	0	0	0	0	0	1	1	10
I24. Innis Avenue	0	14	7	9	8	7	7	3	0	2	1	0	0	2	0	0	30
I25. N. Grand Avenue	0	8	2	5	3	7	2	2	0	0	0	1	0	0	0	0	15
I26. Raymond Avenue	0	4	0	9	5	2	0	2	0	0	1	0	0	0	0	3	13
I27. Taft Avenue	0	10	4	15	10	10	4	1	0	0	0	0	1	0	1	2	29
I28. Burnett Boulevard	0	13	6	16	3	18	3	6	0	1	1	0	0	0	0	3	35
Total	1	245	148	271	165	193	179	33	2	18	24	13	2	8	4	24	665

The most frequently occurring types of collisions at the study intersections were rear end, right angle, and overtaking collisions. A review of MV-104 reports indicate that rear end collisions were mainly due to driver inattention and following too closely. Speed is also often a factor in this kind of crash. Research conducted by the TRB indicates that an increase in 85th-percentile speed is associated with an increase in the frequency

of rear-end collisions.[4] The right angle and left turn collisions were generally caused by failure to yield the right of way, driver inattention, and a disregard for the traffic control. The overtaking collisions were generally due to unsafe lane changes or usage and improper turning. There was one fatality at the Arterial intersections.

Twenty-four of the 665 reported crashes at the existing signalized intersections involved pedestrians. Seven of the 24 pedestrian collisions were the result of driver inattention and failing to yield the right-of-way to the pedestrian. One of these crashes resulted in a pedestrian dying as a result of their injuries. The police report notes that the pedestrian was not crossing at an available crosswalk near Clinton Street; however, sun glare contributed to poor visibility for the driver who was speeding when they struck the pedestrian. Fourteen (14) collisions were the result of pedestrians not using a crosswalk, disregarding the pedestrian signal indicators, or other pedestrian error. It is unclear from the crash descriptions who was at fault for the remaining three crashes. In addition, 13 of the 665 reported crashes involved bicycles, two of which were caused directly by a vehicle not yielding to the bicyclist.

Arterial Segment Crashes

During the three-year period analyzed, there were 301 crashes on the Arterial segments. Table 2.16 compares the segment crash rates to the statewide crash rate for similar facilities. Intersection crashes are included in this assessment for comparison to the statewide rates. In order to identify potential issues on the Arterials, each segment was broken up into smaller sub-segments to provide crash rates for specific areas in addition to the crash rates for the entire segment.

[4] Investigating the Speed and Rear-End Collision Relationship at Urban Signalized Intersections, Transportation Research Record: Journal of the Transportation Research Board. Washington D.C., 2016.

TABLE 2.16: SEGMENT CRASH RATES (CRASHES/MVM)

Segment	Segment Length	Number of Crashes	Calculated Rate	NYSDOT Rate
Route 44/55 – Route 9 Interchange to Columbus Drive	0.26	97	**11.24**	4.63
Route 44/55 Eastbound				
Total (Columbus Drive to Fairmont Avenue)	1.88	356	**8.28**	5.31
Columbus Drive to Worrall Avenue	1.22	244	**7.29**	5.31
Worrall Avenue to Raymond Avenue	0.41	77	**8.84**	5.31
Raymond Avenue to Fairmont Avenue	0.25	35	**7.04**	5.31
Route 44/55 Westbound				
Total (Main Street to Taft Avenue)	2.12	448	**9.66**	5.31
Taft Avenue to Raymond Avenue	0.17	32	**9.06**	5.31
Raymond Avenue to Innis Avenue	0.45	34	3.38	5.31
Innis Avenue to Main Street	1.5	382	**11.31**	5.31

Crashes/MVM = Crashes per million vehicle miles
BOLD = Rates above the statewide average

The crash rate for the eastbound Arterial is 8.28 crashes per million vehicle miles (Crashes/MVM) while the crash rate for the westbound Arterial is 9.66 Crashes/MVM. These rates are approximately two times the statewide rate for similar segments, which is 5.31 Crashes/MVM. The segments that had the two highest crash rates are located on:

- Route 44/55 (US Route 9 Interchange to Columbus Drive) – The rate is the result of a high number of crashes at the Jefferson Street intersection (2nd highest) and the short segment length.
- Route 44/55 Westbound Arterial (Innis Avenue to Main Street) – This segment includes the Route 44/55/Main Street intersection which had the highest number of intersection crashes.

Only one of the sub-segments evaluated (the westbound Arterial segment between Raymond Avenue and Innis Avenue) has a crash rate below the statewide average for a similar facility; however, this segment has very few intersections, which minimizes the number of decision points for motorists. Table 2.17 summarizes the predominant segment crash types.

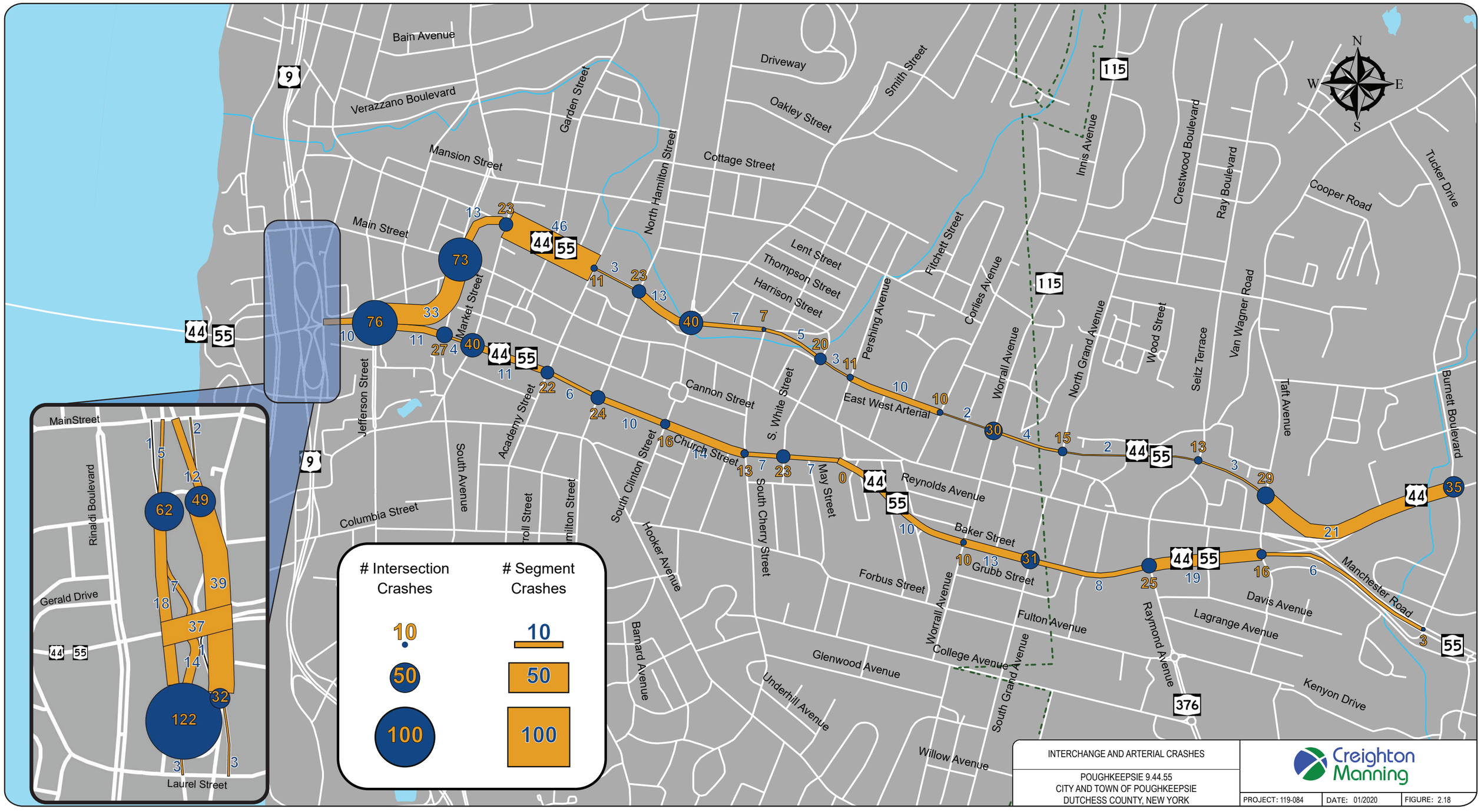
TABLE 2.17: SEGMENT CRASH SUMMARY

Segment	Crash Severity				Crash Type										
	Fatal	Injury	Non-Reportable	Property Damage Only	Overtaking	Rear-End	Right-Angle	Sideswipe	Fixed Object	Pedestrian	Bicycle	Animal	Right-Turn	Head-On	Other	Total
S28. Interchange to Jefferson St	0	2	5	3	4	4	0	0	2	0	0	0	0	0	0	10
S1. Jefferson St - 44/55 SB	0	3	4	4	5	5	0	0	0	0	0	0	0	1	0	11
Route 44/55 Eastbound																
S2. 44/55 SB - Market St	0	1	1	2	1	2	0	0	1	0	0	0	0	0	0	4
S3. Market St - Academy St	0	3	3	5	5	2	0	1	0	2	0	0	0	0	1	11
S4. Academy St - S. Hamilton St	0	0	3	3	2	3	0	0	0	0	0	0	0	0	1	6
S5. S. Hamilton St - S. Clinton St	0	1	3	6	4	5	1	0	0	0	0	0	0	0	0	10
S6. S. Clinton St - S. Cherry St	0	4	4	6	5	7	0	0	0	1	0	0	0	0	1	14
S7. S. Cherry St - S. White St	0	1	4	2	3	3	0	0	1	0	0	0	0	0	0	7
S8. S. White St - Church St/ Palmer Ave	0	2	1	4	2	3	0	0	1	0	0	0	0	0	1	7
S9. Church St/ Palmer Ave - Worrall Ave	0	4	3	3	5	1	0	0	4	0	0	0	0	0	0	10
S10. Worrall Ave - S. Grand Ave	0	2	3	8	3	9	0	0	1	0	0	0	0	0	0	13
S11. S. Grand Ave - Raymond Ave	0	3	1	4	3	4	0	0	0	0	0	0	0	0	1	8
S12. Raymond Ave - Fairmont Ave	0	10	2	7	7	6	4	0	0	0	0	0	0	0	2	19
S13. Fairmont Ave - Burnett Blvd	0	5	0	1	2	3	0	0	0	0	0	0	0	0	1	6
Route 44/55 Westbound																
S14. 44/55 EB - Main St	0	5	7	21	7	19	0	0	2	0	0	0	3	0	2	33
S15. Main St - Market St	0	1	8	4	8	5	0	0	0	0	0	0	0	0	0	13
S16. Market St - Catharine St	0	12	12	22	17	20	4	0	1	1	0	1	0	0	2	46
S17. Catharine St - N. Hamilton St	0	1	1	1	2	1	0	0	0	0	0	0	0	0	0	3
S18. N. Hamilton St - N. Clinton St	0	3	4	6	4	5	2	0	1	0	1	0	0	0	0	13
S19. N. Clinton St - N. Cherry St	0	3	1	3	0	5	0	0	1	1	0	0	0	0	0	7
S20. N. Cherry St - N. White St	0	0	1	4	2	1	0	1	1	0	0	0	0	0	0	5
S21. N. White St - Pershing Ave	0	0	2	1	1	2	0	0	0	0	0	0	0	0	0	3
S22. Pershing Ave - Corlies Ave	0	4	4	2	0	6	0	0	0	1	1	2	0	0	0	10
S23. Corlies Ave - Innis Ave	0	0	2	0	0	1	0	0	0	0	0	0	1	0	0	2
S24. Innis Ave - N. Grand Ave	0	0	1	3	0	4	0	0	0	0	0	0	0	0	0	4
S25. N. Grand Ave - Raymond Ave	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	2
S26. Raymond Ave - Taft Ave	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	3
S27. Taft Ave - Burnett Blvd	0	10	3	8	2	10	1	1	1	0	3	1	0	0	2	21
Totals	0	83	83	135	95	138	12	3	17	6	5	5	4	1	15	301

The most frequently occurring types of collisions on these segments of Route 44/55 were rear-end and overtaking collisions. A review of the TE-213 reports indicates that these collisions were mainly due to driver inattention, following too closely, or slippery pavement. Six of the crashes involved a pedestrian

while five involved a bicycle. The apparent contributing factors for the six pedestrian collisions typically included the pedestrian not using a crosswalk or other pedestrian error. Of the five bicycle related crashes, two were the result of the vehicle not yielding to a bicyclist on the road or sidewalk, while the three remaining collisions were the result of the bicyclist not stopping at a stop sign or failing to yield the right-of-way. There were no fatalities on the Arterial segments.

Figure 2.18 summarizes the total intersection and segment crashes reported on the Arterials and interchange. The diagram shows the concentration of crashes on the westbound Arterial from Catharine Street to Jefferson Street. This area is congested during peak times and requires weaving and lane changes. Rear-end crashes are also a high percentage of the total in this area. The intersection and segment crash analysis including crash summaries and collision diagrams are included in Appendix B.


Bain Avenue
Verazzano Boulevard
Mansion Street
Garden Street
Driveway
Oakley Street
Smith Street
Cottage Street
North Hamilton Street
Main Street
Lent Street
Thompson Street
Harrison Street
Fitchett Street
Pershing Avenue
Cortles Avenue
Innis Avenue
Crestwood Boulevard
Ray Boulevard
Cooper Road
Tucker Drive
Van Wagner Road
Wood Street
Seitz Terrace
Taft Avenue
Burnett Boulevard
Market Street
Jefferson Street
Academy Street
Cannon Street
S. White Street
East West Arterial
Worrall Avenue
North Grand Avenue
South Clinton Street
Church Street
South Cherry Street
May Street
Reynolds Avenue
Baker Street
Grubb Street
Manchester Road
Columbia Street
South Avenue
Hooker Avenue
Forbus Street
Fulton Avenue
Davis Avenue
Lagrange Avenue
Kenyon Drive
Raymond Avenue
College Avenue
Glenwood Avenue
Underhill Avenue
Willow Avenue
Barnard Avenue
South Grand Avenue
Worrall Avenue
9
115
44
55
376
MainStreet
Rinaldi Boulevard
Gerald Drive
Laurel Street
Intersection Crashes
Segment Crashes
10
50
100
INTERCHANGE AND ARTERIAL CRASHES
POUGHKEEPSIE 9.44.55
CITY AND TOWN OF POUGHKEEPSIE
DUTCHESS COUNTY, NEW YORK
Creighton Manning
PROJECT: 119-084
DATE: 01/2020
FIGURE: 2.18

Public Input on Existing Conditions

Public concerns align with the technical analysis in this Chapter pointing to concerns about traffic operations and safety at the Interchange and on the Arterials. The timeline to the right shows the initial public engagement activities used to solicit input on existing conditions, including two Advisory Committee meetings, a pop-up event at the October 2019 First Friday, the website launch, interactive mapping tool, and stakeholder interviews. Common themes from this initial public involvement support the Study Goals and are summarized below. Detailed meeting summaries are on the project website (www.poughkeepsie94455.com).

Make it Easier to Walk and Bike Between Neighborhoods and Downtown

According to pop-up participants and stakeholders, the Arterials can feel isolating to walkers and bikers – the long blocks, distance between signalized pedestrian crossings, and lack of dedicated bicycle facilities seem to prioritize drivers. Sidewalks are often located close to the travel lanes and make it uncomfortable for pedestrians. Moreover, Poughkeepsie is a walking school district, so children often must cross the Arterials between school and home. The public and key constituencies agree that creating an environment that is safer and friendlier for walking and bicycling would be beneficial.

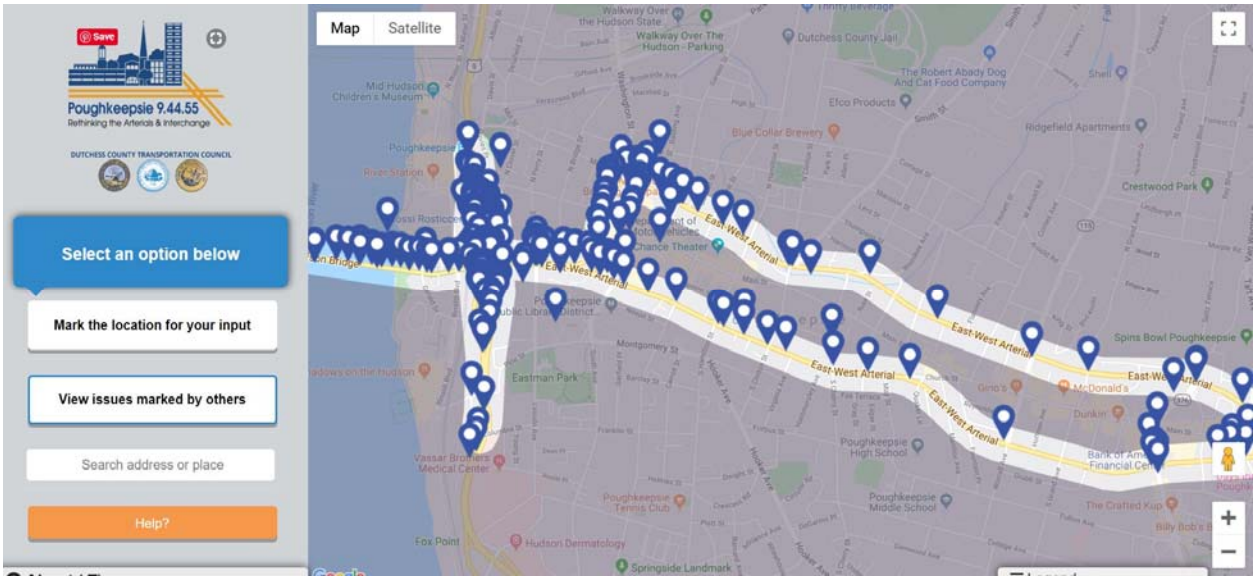
Improve Safety at the Interchange and Arterials

The need for safety improvements was reiterated repeatedly during the information-gathering phase of this project. The stakeholders interviewed mentioned several notable crash locations. Moreover, concerns about speeds and weaving movements were raised. Safety related concerns dominated the discussion at the First Friday pop-up – specifically, reducing crashes, reducing speeds, and simplifying confusing travel patterns at the Interchange. Along the Arterials, safety concerns were related to pedestrian and bicyclist access, in addition to driver behavior.

Recommend Design Concepts That Improve the Form and Function of the Arterials and Interchange

Members of the public, stakeholders, and the Advisory Committee expressed the unique challenges of navigating these facilities (one-way facilities often require circuitous travel, closely spaced ramps and weaving areas cause operational concerns). Universal among various constituencies was a concern over the character that the existing Arterials convey today, that of being a highway through the City. There was agreement that the functionality of both the Arterials and Interchange is not optimal today, again related to pedestrian and vehicle safety, and that transformative improvements could be made. When driving on the Arterials, in a matter of minutes motorists pass through downtown and into Arlington, and there is a lack of wayfinding to guide drivers. Stakeholders want to see concepts that balance the need to move regional traffic with the need to provide good local circulation and multi-modal accommodations.

Improve Traffic Flow Through the Interchange and Address Congestion



The Interchange is widely seen as dangerous. The project team heard that many people actively avoid the Route 9/44/55 Interchange if possible. Online comment map participants noted that switching lanes at the last minute is necessary today, due to some short weaving distances, leading to unsafe weaving. Congestion at the Interchange spills back onto Route 44/55 during peak hours and is also a concern.

Anticipate Future Travel Patterns and Needs

Stakeholder groups and the Advisory Committee noted the importance of making improvements to the Arterials and Interchange to support local business, future development, and sustainable growth. The Advisory Committee and many stakeholders considered that physical changes to the Arterials and Interchange were important for the future of the region.

Identify Costs

Members of the public engaged thus far in the process have been quick to note that this study is long overdue and asked about construction and fiscal realities. Members of the project's Advisory Committee and stakeholders interviewed have all suggested the need for a range of solutions that can be implemented in the short- and long-term. Many groups identified this study as the important first step to identify possible solutions, to develop support for a future improvement project or projects, and to obtain funding.