

Main Street/Innis Avenue/Worrall Avenue Safety Assessment
City of Poughkeepsie

FINAL REPORT



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Acknowledgment

The preparation of this document has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this document do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

1. Background

The Dutchess County Transportation Council (DCTC) conducted a Safety Assessment (SA) of the intersection of Main St with Worrall Ave/Innis Ave in support of its goal to improve transportation safety in Dutchess County. The SA is intended to provide the facility owner, the City of Poughkeepsie, with a list of opportunities for low-cost, short-range safety improvements, and if warranted, more expensive and/or longer-range improvements. The DCTC, in consultation with the City, selected the assessment location based on an analysis of crash data from 2011-2015.

2. Intersection Characteristics

Main St in the City of Poughkeepsie runs east-west between Waryas Park at the Hudson River and the border with the Town of Poughkeepsie at Grand Avenue, where it continues east as a County Road. Worrall Ave runs north-south between College Ave to the south and Main St, changing names to Innis Ave at Main St. Innis Ave runs north-south between Main St and Salt Point Turnpike to the north, but becomes a County Road (CR 75) at the border with the Town of Poughkeepsie at Arnold Rd. At the intersection of Main St with Worrall Ave/Innis Ave, all three streets are City-owned,

maintained by the City’s Department of Public Works (DPW).

Main St is a very busy street, connecting the Poughkeepsie train station, downtown civic center area, and numerous restaurants, grocery stores, and other retail shops, as well as the Arlington neighborhood in the Town of Poughkeepsie and Routes 44 and 55 farther east. Worrall Ave connects the Poughkeepsie Middle



Figure 1. Study Intersection

School, neighborhoods, the eastbound arterial (Baker St), and Main St, while Innis Ave connects Main St, neighborhoods, the westbound arterial (Maple St) and Salt Point Turnpike. Businesses at the study intersection include Gino’s pizza restaurant, TD Bank, Rite Aid, and Kane Motors (a used car dealer). Adjacent businesses include a liquor store, furniture store, nail salon, Caribbean fast food restaurant, an Oaxacan service business, and a pub.

At the study intersection, Main St is an urban major collector with one through lane and a left turn pocket in each direction. Worrall Ave is an urban minor arterial with one lane in each direction, and Innis Ave is an urban minor arterial with one lane in each direction and a southbound left turn pocket. See Figure 1.

There is on-street parking on Main St and Worrall Ave, though there are some signed no parking areas near the intersection. These include the east side of Worrall Ave, a short segment on the west side of Worrall Ave, the north side of Main St east of the intersection, and short segments of the north and south sides of Main St west of the intersection (see Figure 3- Existing Intersection Layout). There is no on-street parking on Innis Ave.

At the intersection, all three streets are straight and level, though Innis Ave rises further north, past the intersection with the westbound arterial (Maple St). The pavement on Main St is in fair to poor condition, while the pavement on Worrall Ave and Innis Ave is in good to fair condition.

Intersection Measurements

Based on measurements at the intersection, Main St is 40 feet wide, Worrall Ave is 29 feet wide, and Innis Ave is 37 feet wide. The lane widths vary dramatically, from about 8 feet for the westbound through lane, to about 15 feet for the northbound through lane. While the Main St curbs are aligned across the intersection, there is a jog when crossing the intersection from the north to the south. Since Innis Ave near the intersection is 8 feet wider than Worrall Ave, the western curb moves in substantially, meaning that the southbound through lane is not aligned across the intersection.

Worrall Ave has no lane markings. Assuming 8 feet for parking on the west side, the two travel lanes are each about 10.5 feet wide. Innis Ave has a 15-foot northbound lane, 10-foot southbound left turn lane, and 12-foot southbound through lane. The west side of Main St has a 20-foot westbound lane (about 12 feet for traffic, assuming 8 feet for parking), a 10-foot eastbound left turn lane, and 10-foot eastbound through lane. The east side of Main St has a 23-foot eastbound lane (about 15 feet for traffic, assuming 8 feet for parking), 9-foot westbound left turn lane, and 8-foot westbound through lane. See existing lane configurations and widths in Figure 3.

Traffic Characteristics

Traffic volumes collected in 2014-2015 indicate that approximately 18,000 vehicles enter the intersection on an average day. About 11,500 vehicles enter the intersection on Main St, while close to 4,000 enter on Innis Ave and just over 2,000 enter on Worrall Ave. Almost 900 vehicles enter the intersection during the morning peak hour (8-9 a.m.), while close to 1,500 vehicles enter the intersection during the evening peak hour (5-6 p.m.). Overall peak hour volumes (5-6 p.m.) range from 227 vehicles on Worrall Ave to over 500 vehicles on Main St eastbound. Heavy trucks and buses account for about two percent of traffic. Both school buses and City of

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Poughkeepsie buses (the Main Street route) were observed traveling through and turning at the intersection.

Team members observed that compared to the late afternoon, the morning has less traffic and fewer parked vehicles, as well as less pedestrian activity, since many of the businesses are closed. Traffic tends to be heavier southbound and westbound in the morning, and heavier northbound and eastbound in the afternoon and evening.

The team observed many people walking through the intersection, as well as a significant number of people on bicycles (mainly on the sidewalks). Pedestrian and bicycle counts conducted at the intersection in September 2016 found over 100 pedestrians and 22 bicyclists per hour during a weekday early evening (4-6 p.m.), and 100 pedestrians and 13 bicyclists per hour during a Saturday afternoon (noon-2 p.m.).¹

All three streets have a 30 mph posted speed limit. Based on the 2014-15 traffic count data, 85th percentile speeds range between 27 and 29 miles per hour (meaning 85 percent of measured vehicles were traveling at or below those speeds). Table 1 shows recent traffic data for the study intersection.

Traffic Volumes: Main/Innis/Worral							
Location	Year	Traffic Count Station	Avg Daily Entering Volume	Peak Hour Volumes		85% speed	% heavy vehicles*
				8-9 AM	5-6 PM		
Main St- entering intersection eastbound	2015	8679- EB	6,235	272	506	27 mph	2.09%
Main St- entering intersection westbound	2014	8703- WB	5,290	235	422	28 mph	1.8%
Worral Ave- entering intersection northbound	2014	0001- NB	2,308	141	227	29 mph	2.0%
Innis Ave- entering intersection southbound	2015	0011- SB	3,879	232	324	no data	no data
Total			17,712	880	1479		

* includes buses and trucks but not pickups

Table 1. Main St/Worral Ave/Innis Ave Traffic Volumes & Speeds

The intersection is signalized. There are dedicated left turn arrows for eastbound, westbound, and southbound traffic that provide a protected left turn phase after the through phase (a “lagging left”). However, left turns are also permitted during the through phase (there is no red left turn arrow). There are loop detectors in the pavement, but it appeared that all three protected left turn phases were activated every signal cycle, regardless of whether there were vehicles in the left turn lane. This could be because vehicles in the through lane often encroach

¹ DCTC Pedestrian & Bicycle Counts webpage:
<http://www.co.dutchess.ny.us/CountyGov/Departments/TransportationCouncil/23984.htm>

on the turn lane (triggering the loop detectors), or could be due to a setting in the signal controller.

Based on observations, the signal cycle appeared to be about 100 seconds (1 minute 40 seconds). The north-south (Innis/Worrall) through phase appeared to be about 23 seconds, and the east-west (Main St) through phase appeared to be about 42 seconds. The timing of the left turn phases varied. At one point, the east-west (Main St) left turn phase was observed to be about 12 seconds. It appeared that the Main St left turns ran concurrently. Timing for the southbound (Innis Ave) left turn phase was not observed. Overall, the signal timing was somewhat difficult to understand in the field. Per DPW Commissioner Chris Gent, NYSDOT timed or recommended the timing for the intersection.

Crosswalks are marked, though significantly faded, on three of the approaches. There was no visible crosswalk on Worrall Ave, though it had one in the past. There are also no pedestrian signals at the intersection. Given the complexity of the signal timing, it is difficult for pedestrians to know when it is safe to cross. The team observed people crossing based on when traffic was stopped and gaps in traffic. The crash data indicates several incidents of drivers failing to yield to people crossing in the crosswalk. Two curb ramps are provided at each corner, one for each crossing. The ramps include grooves in the pavement, which serve as a detectable warning, though they are not the current best practice.

3. Safety Assessment Process

This project represents the fourth application of the SA process in Dutchess County, building upon previous SAs in 2013 for CR 9 (Beekman Road) in the Town of Beekman, in 2013 for CR 16 (North Quaker Ln) in the Town of Hyde Park, and in 2014 for CR 19 (Slate Quarry Rd) in the Town of Rhinebeck. As before, the DCTC conducted this SA consistent with Road Safety Audit (RSA) guidance from the Federal Highway Administration (FHWA) and Safety Assessment Guidelines from the New York State Association of Metropolitan Planning Organizations (NYSAMPO). This SA relied on the participation of an interdisciplinary team of staff from the City of Poughkeepsie and DCTC, which included the following individuals:

- Chris Gent – Commissioner, City of Poughkeepsie DPW
- Todd King – Sergeant, City of Poughkeepsie Police
- Mark Johnson – Chief, City of Poughkeepsie Fire
- Joe Kane – Assistant Civil Engineer, City of Poughkeepsie Engineering
- Paul Hesse – Community Development Coordinator, City of Poughkeepsie



The Safety Assessment relied on a multi-disciplinary team to review existing conditions and identify potential solutions to improve safety.

- Mark Debold – Transportation Program Administrator, DCTC
- Emily Dozier – Senior Planner, DCTC
- Shelby Frangk – Junior Planner, DCTC

The SA took place on April 26-27, 2017, starting with a pre-assessment meeting on April 26th, followed by site visits that afternoon/early evening (approximately 4:30-6 pm) and on the morning of April 27th (approximately 8-9 am) The team used a prompt list developed by DCTC staff based on the FHWA detailed prompt list for existing roads and an intersection prompt list from the Delaware Valley Regional Planning Commission (DVRPC). A post assessment meeting was held at the City's Public Safety Building on April 27th to discuss the team's observations and possible safety improvements. The SA team used a variety of information to complete the SA, including crash and traffic data, aerial photography, and field work. The key issues identified included inadequate pedestrian features, lack of alignment across the intersection, confusing signal timing, and conflicts with parking, loading, and buses. The SA team strove to identify low-cost, high-impact improvements to address these issues.

4. Crash Analysis

The DCTC collected crash data from 2011-2015 from the NYS Accident Location Information System (ALIS) database, which is a multi-agency reporting system operated by the NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC), the NYS Department of Motor Vehicles (DMV) and the NYS Department of Transportation (NYSDOT). ALIS data originates from the Traffic and Criminal Software (TraCS) system used by police agencies and submitted via DMV accident report forms (Form MV-104).

The Main St/Worral Ave/Innis Ave intersection is one of the highest-crash local (not State-controlled) intersections in the county. Based on the ALIS data, the intersection experienced 44 crashes over the five-year period, resulting in no fatalities, but 15 reported injuries (from 12 crashes), two of which were classified as serious. 32 crashes were classified as property damage only. Based on observations at the site and experiences from some team members, we suspect that more crashes and many more 'near misses' have occurred at the intersection, but have not been reported. In particular, while only four reported crashes involved pedestrians and/or bicyclists, based on observations and documented trends, we suspect that more crashes and many more near misses involving people walking and bicycling have also occurred.

The crash analysis indicated that the majority of crashes (75 percent) occurred during daylight. However, 45 percent of the crashes occurred in the winter (December through February), and wet or snowy road surface conditions were present at 20 percent of the crashes. The winter months are more likely to have reduced visibility and slippery pavement due to snow, rain, or other poor weather.

While traffic volumes peak in the 5-6 p.m. hour, 45 percent of crashes occurred between 10 a.m. and 4 pm. The team noted that the mid-day lunch period is particularly busy, in part due to

the number of eateries near the intersection, and that there is congestion and numerous conflicts from lunchtime through the evening peak hour.

30 percent of the crashes involved vehicles traveling eastbound. As shown in Table 1 above, this is the highest-volume direction. In addition, the team observed significant queuing on this approach, as well as conflicts with vehicles exiting parking lots, stopped trucks and buses, and cars parked on the street.

The most frequent crash type was rear-ending (27 percent), followed by overtaking (16 percent), and then right angles (14 percent). The most prevalent collision factors were inattention, followed by failure to yield right of way and following too closely. Team members noted that it was common for drivers in the lead car at the intersection to not start right away after the green light and then get rear-ended. Based on the verbal crash descriptions from the ALIS TE 213 report, common themes included failure to yield when turning or changing lanes, including failure to yield to pedestrians; conflicts with parking, both on-street and entering/exiting parking lots; rear-ends due to driver inattention and following too closely; confusion about the left turn signal phasing and lane designations; and red light running.

Figure 3 is the TE 213 crash data summary (staff highlighted key items). Tables 2-3 summarize additional crash data for the intersection.

Figure 3. Crash Summary

Main/Worrall/Innis Crash Summary (all crashes)

Location:	<u>Main/Worrall/Innis</u>	City:	<u>Poughkeepsie</u>
Period Covered:	<u>2011-2015</u>	County:	<u>Dutchess</u>
Date:	<u>2/27/2017</u>		

Time of Day # % 0600-1000 7 16 1000-1600 20 45 1600-1900 9 20 1900-2400 6 14 2400-0600 2 5 Unknown 0 0 Total 44 100.00%			Weather # % Clear 23 52 Cloudy 11 25 Rain/Snow 7 16 Sleet/Hall/Freezing Rain 0 0 Fog/Smog/Smoke 0 0 Other/Unknown 3 7 Total 44 100.00%		
Light Condition # % Daylight 33 75 Dawn 1 2 Dusk 1 2 Dark Lighted 6 14 Dark Unlighted 0 0 Unknown 3 7 Total 44 100.00%			Time of Year # % Winter (Dec-Feb) 20 45 Spring (Mar-May) 8 18 Summer (Jun-Aug) 11 25 Fall (Sep-Nov) 5 11 Total 44 100.00%		
Accident Type # % Overtaking 7 16 Rear End 12 27 Right Angle 6 14 Left Turn 2 5 Sideswipe 1 2 Run Off Road 0 0 Fixed Object 4 9 Pedestrian 2 5 Bicycle 2 5 Animal 0 0 Right Turn 0 0 Head On 0 0 Other 8 18 Total 44 100.00%			Roadway Characteristics # % Straight & Level 40 91 Straight & Grade 0 0 Straight & Hillcrest 0 0 Curve & Level 0 0 Curve & Grade 0 0 Curve & Hillcrest 0 0 Unknown 4 9 Total 44 100.00%		
Accident Severity # % Fatal 0 0 Serious Injury 2 5 Other Injury 10 23 Prop damage Only 32 73 Unknown 0 0 Total 44 100.00%			Roadway Surface Condition # % Dry 32 73 Wet 5 11 Muddy 0 0 Snow/Ice 4 9 Slush 0 0 Unknown 3 7 Total 44 100.00%		

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Tables 2-3. Main St/Worrall Ave/Innis Ave Crash Data (2011-2015)

Direction of Travel: Main/Innis/Worrall (2011-2015)		
EAST	26	30%
WEST	16	19%
SOUTH	16	19%
NORTH	12	14%
UNKNOWN	8	9%
NORTH-EAST	2	2%
SOUTH-EAST	2	2%
SOUTH-WEST	1	1%
NOT APPLICABLE	3	3%
Total	86	

note: most crashes involved more than one direction of travel.

Collision Factor: Main/Innis/Worrall (2011-2015)		
DRIVER INATTENTION	11	6%
UNKNOWN	9	5%
FAILURE TO YIELD RIGHT OF WAY	6	3%
FOLLOWING TOO CLOSELY	6	3%
BACKING UNSAFELY	4	2%
PASSING OR LANE USAGE IMPROPERLY	4	2%
PAVEMENT SLIPPERY	4	2%
TRAFFIC CONTROL DEVICE DISREGARDED	4	2%
TRAFFIC CONTROL DEVICE IMPROPER/ NON-WORKING	3	2%
TURNING IMPROPER	3	2%
AGGRESSIVE DRIVING/ ROAD RAGE	2	1%
ALCOHOL INVOLVEMENT	2	1%
GLARE	2	1%
OTHER (VEHICLE)	2	1%
DRUGS (ILLEGAL)	1	1%
FAILURE TO KEEP RIGHT	1	1%
ILLNESS	1	1%
PHYSICAL DISABILITY	1	1%
UNSAFE SPEED	1	1%
UNSAFE LANE CHANGE	1	1%
NOT ENTERED	14	8%
NOT APPLICABLE	90	52%
TOTAL	172	

note: crashes involved more than one collision factor.

5. Findings

This assessment outlines the issues identified by the SA team as opportunities to improve overall safety at the intersection. For each safety issue, the safety concern, observations, suggestions for improvements, and priority for each improvement are included. The suggestions should not be viewed as design-level recommendations. They are intended to be illustrative of potential solutions to identified safety issues and are presented for consideration by the facility owner. The issues are organized by category, as follows:

- A. Alignment/Visibility
- B. Traffic Signals
- C. Pedestrians
- D. Bicyclists
- E. Signage & Pavement Markings
- F. Parking & Driveways
- G. General Issues

Some of the suggested improvements relate to the use of warning signs. Where possible, the sign number and name from the 2009 Manual on Uniform Traffic Control Devices (MUTCD) is included. In making its recommendations, the SA team attempted to inform drivers about conditions without over-saturating the intersection with signs. As per the MUTCD, regulatory and warning signs should be used conservatively because they lose their effectiveness if used to excess.

Unless noted otherwise, suggested improvements would be the responsible of the facility owner, the City of Poughkeepsie DPW. Table 4 summarizes all of the suggestions by category. Figure 4 shows proposed changes to the intersection layout.

A. Alignment/Visibility

Issue #1: Eastbound Alignment

Safety Concern: Swerving/weaving by eastbound drivers on Main St.

Observations: The team observed that eastbound through drivers often maneuver into the left turn lane to avoid parked cars, stopped buses, and loading trucks near the intersection, then back towards the curb as they approach the intersection, and then back towards the centerline on the far side of the intersection, to avoid parked cars. When traffic is heavy, this creates a fair amount of weaving in and out. The eastbound through lane jogs towards the curb to



Eastbound vehicles maneuver around a parked car and back towards the curb to enter the through lane.

accommodate the left turn pocket, but the area near the curb is often congested with parked or stopped vehicles.

Suggestions:

1. Shift the eastbound lanes up to 8 feet to the north to accommodate activity near the curb and to align the eastbound and westbound left turn lanes. Restrict on-street parking on the north side of Main St between the intersection and the TD Bank exit driveway to provide room for the shifted eastbound lanes. As part of the shift, adjust signal heads and overhead signs to align with the eastbound lanes.
2. Clarify and enforce parking restrictions on the south side of Main St near the intersection (*see Parking, Issue #3*).
3. Consider moving the furniture store's loading zone from Main St into the Gino's parking lot (the owner of the Gino's restaurant and parking lot also owns the furniture store parcel). The team discussed that this would be more difficult for customers and delivery trucks to navigate.

Priority for Consideration:

1. High
2. High
3. Low

Issue #2: Eastbound Left Turn Visibility

Safety Concern: Visibility for eastbound left turning drivers.

Observations: The team observed that eastbound drivers on Main St that want to turn left at the intersection may not be able to see oncoming westbound traffic due to vehicles stacked in the westbound left turn lane. This is because the east and westbound left turn lanes are offset, rather than aligned.

Suggestions:

1. Shift the westbound through and left turn lanes to the south (by widening each slightly), so that the eastbound and westbound left turn lanes are more closely aligned. This should be pursued in coordination with the eastbound lane shifts recommended under Issue #1 above.

Priority for Consideration: High

Issue #3: Eastbound Bus Stop Location

Safety Concern: Visibility and maneuverability on eastbound Main St is limited in part due to the location of a bus stop near the intersection.

Observations: When a bus is stopped near the intersection, it blocks the through travel lane and results in conflicts between left turning and through vehicles. Buses also limit visibility for drivers exiting the Gino's parking lot onto Main St.

Suggestions:

1. Relocate the eastbound bus stop to the far side of the intersection, near Kane Motors, where there is more room and fewer turning movement conflicts.

As part of the relocation, restrict parking on the south side of Main St between the intersection and the street light pole to the east.

Priority for Consideration: High



Eastbound buses stop on the south side of Main St just before the intersection.

B. Traffic Signals

Issue #1: Confusing/Inefficient Signal Operations

Safety Concern: The intersection's traffic signal timing is confusing and appears inefficient. False detection of left turning traffic contributes to inefficient signal timing and driver confusion.

Observations: Signal timing plans are not available, but the team observed the signal over several cycles. As described above, it appeared that the protected left turn phases are activated regardless of whether there are vehicles in the left turn lane. The loop detectors may falsely pick up through traffic due to the narrow travel lanes, as well as drivers' tendency to straddle the through and left-turn lanes, particularly on southbound Innis Ave and eastbound Main St.

Based on crash reports, it appears that some drivers are confused by the "lagging" left turns (activated after the through vehicle movement). The team debated the pros and cons of the lagging left turn phasing. According to the FHWA, "one disadvantage of lagging left-turn phases is that drivers tend not to react as quickly to the green arrow indication. Another disadvantage is that, if a left-turn bay does not exist or is relatively short, then queued left-turn vehicles may block the inside through lane during the initial through movement phase."² As noted above, team members stated that often drivers in the lead car waiting at the signal don't start right away, resulting in rear-end crashes.

² FHWA Traffic Signal Timing Manual, Chapter 4:
<https://ops.fhwa.dot.gov/publications/fhwahop08024/chapter4.htm>

Another summary states that motorists prefer leading left turns, but that lagging left turns tend to result in fewer pedestrian conflicts, fewer left versus opposing through vehicle conflicts, and less red light running.³

The team also discussed the limitations of the embedded loop detectors. They must be removed for street paving and then re-installed (which is expensive), and some loops throughout the city are known to no longer function.

Suggestions:

1. Conduct a traffic signal evaluation and develop a refined signal timing plan to improve safety and operations at the intersection. This would require a consultant.
2. Widen left turn and/or through travel lanes slightly (to 10-11 feet) to accommodate traffic and reduce false detection. This should be pursued in coordination with the lane shifts recommended under Alignment/Visibility, Issues #1 and 2.
3. Install radar, video, or another detection system to replace the loop detectors.⁴ This could be a citywide or corridor-wide initiative. It would require substantial upfront costs, but would result in lower ongoing maintenance costs and could reduce false calls.
4. As a longer-term project, update and coordinate traffic signal timing along the Main St corridor.

Priority for Consideration:

1. High
2. High
3. Medium
4. Low

Issue #2: Lack of a Red Clearance Phase

Safety Concern: The signal timing does not appear to include a red clearance phase. This can contribute to crashes due to red light running.

Observations: Based on observations in the field, it appeared that the green signal for east-west traffic begins as soon as the red signal for north-south traffic ends, and vice versa. Based on crash reports, red light running occurs in about 5 percent of the intersection crashes. According to FHWA, research indicates that a red clearance interval can substantially reduce red-light running, but this reduction may be temporary.⁵

Suggestions:

1. Add a short (0.5 to 1 second) red clearance phase to the updated signal timing (see Issue #1 above).

Priority for Consideration: High

³ Leading and Lagging Left Turn Signals Compared, <https://midimagic.sgc-hosting.com/ledorlag.htm>

⁴ See FHWA's Traffic Control Systems Handbook, Chapter 6: Detectors, for more information. https://ops.fhwa.dot.gov/publications/fhwahop06006/chapter_6.htm

⁵ FHWA Traffic Signal Timing Manual, Chapter 5: <https://ops.fhwa.dot.gov/publications/fhwahop08024/chapter5.htm#5.3>

Issue #3: Dim Left Turn Signals

Safety Concern: Dim traffic signals could contribute to crashes if drivers cannot adequately see the signal indication.

Observations: The eastbound left turn arrow was dim compared to the other signal indications. The southbound left turn arrow may also be less bright than other indications.

Suggestion:

1. Check the lenses and lights in the eastbound left turn indication, as well as the other signal heads at the intersection. Replace as needed.

Priority for Consideration: Medium

Issue #4: Westbound Signal Head Alignment

Safety Concern: Drivers may be confused if the traffic signal for their lane is not aligned with the travel lane.

Observations: The traffic signal head for the westbound left turn lane is not aligned with the left turn lane. Instead, it is aligned with the eastbound left turn lane, because the two signals share hardware on the diagonal span wire.

Suggestions:

1. Align the eastbound and westbound left turn lanes by shifting the westbound lanes south and the eastbound lanes north as needed (*see Alignment/Visibility, Issues #1 and #2*).

Priority for Consideration: High

C. Pedestrians

Issue #1: Lack of Pedestrian Signals

Safety Concern: There is no information to help people know when to cross the street. Given the complex signal timing, it is difficult for pedestrians to cross the intersection safely.

Observations: The lack of pedestrian signals contributes to people crossing at various times, based on gaps in traffic.

Suggestions:

1. Install pedestrian signals with countdown timers for each crossing.
2. Incorporate pedestrian signal timing in the recommended signal timing evaluation and optimization (see Issue #1 under Traffic Signals).
3. Consider automatic pedestrian signals, which activate every signal cycle without the



A mother and child cross the east leg of the intersection, as a driver turns right in front of them.

need to push a button. This would likely increase pedestrian compliance, resulting in more people crossing with the signal. This could be a pilot for a systemic treatment along the Main St corridor. (If pushbuttons are used, they should be located on separate poles adjacent to each ramp, per best practice. See MUTCD Figure 4E-4).⁶

4. Evaluate the need to incorporate Accessible Pedestrian Signals (APS), which provide an audible tone and vibrating surface (a tactile arrow on the pushbutton) during the 'walk' interval. This would provide information to visually impaired pedestrians. See MUTCD sections 4E.09-13 for guidance.⁷

Priority for Consideration:

1. High
2. High
3. Medium
4. Medium

Issue #2: Lack of Yielding to Pedestrians in Crosswalks

Safety Concern: Based on the crash analysis, drivers failing to yield to people in crosswalks represents between 5 and 10 percent of crashes at the intersection. This appears to occur mainly when drivers turn left across a crosswalk. Faded crosswalks may contribute to drivers failing to yield at crosswalks.

Observations: Right turns on red are prohibited at all approaches on weekdays between 8 am and 4 pm (based on signs observed in the field). To address conflicts with left turns, pedestrian signals would not be activated during the protected left turn phases. However, this intersection does not have pedestrian signals, so people desiring to cross may not know when it is safe to do so. Even with pedestrian signals, conflicts would still occur during the permitted left turn phases, as well as between drivers making right turns on green and people in the parallel crosswalk, and drivers making right turns on red outside of the restricted hours. Crosswalks were barely visible, and there was no marked crosswalk on the south leg of the intersection (Worral Ave).

Suggestions:

1. Re-stripe crosswalks on all four legs of the intersection with a high visibility ladder-style marking. Use a durable material such as thermoplastic (for rougher pavement), inlay tape (for resurfaced pavement) or epoxy to prolong the life of the markings. This could be part of a corridor-wide treatment along Main St.
2. Install Turning Vehicles Yield to Pedestrians signs at each approach (MUTCD sign R10-15; see MUTCD section 2B.53 for guidance).⁸

Priority for Consideration:

1. High
2. Low



MUTCD sign R10-15

⁶ Available online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf> (see page 502).

⁷ Available online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf> (see pages 504-508).

⁸ Available online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part2b.pdf>; see pages 95 and 96.

Issue #3: Snow Storage

Safety Concern: Plowed snow restricts pedestrian access on the sidewalks.

Observations: The team discussed that during snow events, snow is plowed onto the sidewalks. Near the intersection, the north side of Main St, east side of Innis Ave, and both sides of Worrall Ave have grass buffers that can accommodate some snow. However, the buffers on Main St and the east side of Worrall Ave are relatively narrow (4-5 feet), and there are no buffers on the south side of Main St and west side of Innis Ave. People walking through the intersection can face impassable curbs and/or sidewalks. Piled snow can also restrict drivers' visibility.

Suggestions:

1. Continue to investigate alternate snow storage areas or methods.
2. Extend grass buffers on the south side of Main St where feasible (note that this would reduce sidewalk width, but these sidewalks are about 10 feet wide).

Priority for Consideration:

1. Low
2. Low

D. Bicyclists

Issue #1: Lack of Bicycle Facilities or Signage

Safety Concern: There is no bicycle facility on Main St, Innis Ave, or Worrall Ave, and no signage to encourage safe sharing of the street between bicyclists and other vehicles.

Observations: The team observed a significant number of people on bicycles, and recent bicycle counts indicate a fairly high level of bicycle activity (13-22 bicyclists per hour). However, most bicyclists were riding on the sidewalk. Bicycle counts at the intersection indicate that 85-90% of bicyclists ride on the sidewalk, and almost none wear helmets. Per the City Code,⁹ Worrall Ave/Innis Ave is part of the 'School Connector Route' in the City's designated bicycle route system, but these routes are not signed or marked in any way.

⁹ City Code Chapter 15, Article V, online at <http://www.ecode360.com/27014092>

Suggestions:

1. Install Bike Route wayfinding signs along the School Connector bicycle route.¹⁰ This should be part of a city-wide bicycle route signage program.
2. Install 'Bike In Lane' signs on Main St, and consider on Worrall Ave and Innis Ave.¹¹
3. Mark sharrows (shared lane markings) along the School Connector bicycle route on Worrall Ave and Innis Ave, and consider on Main St.¹² (Per [Walk Bike Dutchess](#) Appendix K, these streets are too narrow for bicycle lanes unless on-street parking were removed).



NYS DOT recommends using this 'Narrow Lane Assembly' on streets with narrow lanes used by bicyclists.

Priority for Consideration:

1. Medium
2. Medium
3. Low

Issue #2: Drainage Grates

Safety Concern: Drainage grates with long longitudinal openings can catch a bicycle tire and cause the rider to crash.

Observations: The team observed that the drainage grate on the westbound Main St approach (near the intersection) had relatively long openings. The other grates appeared more 'bicycle safe'.

Suggestions:

1. Replace the drainage grate on the westbound Main St approach with a bicycle-safe (reticuline or other) grate, in coordination with repaving.

Priority for Consideration: Low



This drainage grate should be replaced with one with smaller openings.

E. Signage & Pavement Markings

Issue #1: Faded Pavement Markings (see also Pedestrians, Issue #2)

Safety Concern: Pavement markings may not be visible to drivers. This could contribute to drivers failing to yield at crosswalks and confusion about where to position their vehicles. This is especially an issue at night and for older drivers and others with limited vision.

Observations: Pavement markings (stop bars, lane markings, and some right turn only text and arrows) were faded, and crosswalks were barely visible. There was no marked crosswalk on the south leg of the intersection (Worrall Ave).

Suggestions:

¹⁰ See MUTCD Section 9B.20, online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part9.pdf> (see pages 798-804).

¹¹ See NYS DOT's Shared Lane Marking Policy for guidance, online at <https://www.dot.ny.gov/programs/completestreets/repository/TSMI13-07final.pdf>.

¹² See MUTCD section 9C.07, online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part9.pdf> (see pages 810 and 815).

1. Re-stripe pavement markings with a durable material such as thermoplastic, inlay tape, or epoxy to prolong the life of the markings.

Priority for Consideration: Medium

Issue #2: Worrall Ave -- Lack of Lane Striping

Safety Concern: Lane striping can help drivers position their vehicles correctly on the street.

Observations: Worrall Ave has no marked centerline or any other pavement markings, but is intended to have one lane in each direction.

Because there are two sets of traffic signals at the northbound approach to the intersection (as required by the federal MUTCD) and no lane markings, some drivers may believe there are two northbound lanes rather than one. The team discussed the pros and cons of a centerline. It would increase costs for striping/maintenance, but may clarify the intended layout and improve operations on the Worrall Ave approach. Worrall Ave has the lowest volume of the four approaches to the intersection, but does back up, particularly in the morning and afternoon with school and bus traffic.



Northbound Worrall Ave has two traffic signal heads and no lane markings.

The team also discussed the possibility of creating a left turn pocket. The team observed some drivers creating their own left turn lane by moving out towards the center of the street. Drivers may be confused by the dual signal heads, may be attempting to give through traffic more space, or trying to get out of the northbound queue. Given the limited pavement width (29 feet) and on-street parking on the west side (about 8 feet), a left turn pocket could only be accommodated if on-street parking was removed near the intersection. The team also noted that Worrall Ave is used by school and local buses, so ideally the lanes should be 10.5-11 feet wide. This would leave at most 8 feet for a left turn pocket, which is quite narrow.



A driver on northbound Worrall Ave uses the undefined space to create a left turn lane.

Suggestions:

1. Stripe a centerline on Worrall Ave. This could be done only for a portion of the street approaching the intersection. If the City desires to maintain on-street parking on the west side near the intersection, adjust the centerline to allow 7-8 feet for parking.
2. Remove on-street parking on the west side of Worrall Ave near the intersection and create a left turn pocket for a short distance approaching the intersection. Adjust the signal phasing and timing as needed to accommodate this movement.

Priority for Consideration:

1. Medium
2. Low

Issue #3: Inadequate Left Turn Signs and Pavement Markings

Safety Concern: Drivers may not understand where to position their vehicle for left turns versus through travel until very close to the intersection.

Observations: The overhead left turn signs were only visible fairly close to the intersection. The left turn arrow markings were close to the intersection, especially on the eastbound Main St approach, and to a slightly lesser degree on the southbound Innis Ave approach. Finally, the southbound “left turn only” overhead sign was not hanging straight down- it was slightly askew.

Suggestions:

1. Extend the left turn pockets and mark the “left turn only” arrows further back from the intersection, especially on eastbound Main St and southbound Innis Ave.
2. Provide overhead left turn only lane designation signs further back from the intersection (this would require additional span wires).
3. Re-hang the southbound “left turn only” overhead sign so it hangs straight.

Priority for Consideration:

1. Medium
2. Low
3. Low

Issue #4: Old Street Name Signs

Safety Concern: Street name signs may be difficult for older drivers to read. Lack of clear signage increases the risk of last minute decision making and maneuvers, which may increase the risk of a collision. This would affect unfamiliar motorists more than locals.

Observations: The street name signs are an older style with ‘all-caps’ lettering, and do not meet the new MUTCD standard, which includes upper and lower case (mixed-case) letters.¹³ The FHWA has determined that the new style is better suited for older drivers. Although there is no deadline for adherence, the new standard should be used when replacing street signs in the future.

Suggestion:

1. Upgrade street name signs to meet the larger, mixed-case sign standard as per the 2009 MUTCD. This could be part of a corridor or citywide street sign upgrade.

Priority for Consideration: Low



The street name signs at the intersection use the old lettering style that has been superseded by a mixed-case style (above).

¹³ See MUTCD section 2A.13, online at <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part2a.pdf> (see page 35).

Issue #5: Old Bus Stop Sign

Safety Concern: Inconsistent or outdated signage can add to driver confusion.

Observations: The team observed what appeared to be an old bus stop sign (“No Standing/Parking: Bus Stop”) east of the bus stop shelter by the TD Bank.

Suggestions:

1. Replace the bus stop sign when new Dutchess County Public Transit bus routes and stops in the area are finalized.
Continue to restrict parking in the bus stop area.

Priority for Consideration: Low



This sign could be replaced when new bus stop signs are installed.

F. Parking & Driveways

Issue #1: TD Bank – Multiple Driveways

Safety Concern: Each driveway represents a potential conflict point. Multiple driveways, particularly when near an intersection, increase the number of conflicts between entering/exiting vehicles and vehicles on the street, as well as pedestrians and bicyclists.

Observations: The bank entrance driveway is close to the intersection, and a bus stop shelter is located between it and the exit driveway. The combination of the two driveways, buses, and on-street parking near the intersection (east of the entrance driveway) limits visibility and creates additional conflicts.

Suggestions:

1. Combine the two TD Bank driveways into one shared (entrance/exit) driveway west of the bus stop shelter. This would require widening the exit driveway curb cut. This may require a site plan amendment.

Priority for Consideration: Medium

Issue #2: Poughkeepsie Wines & Liquor/TD Bank Exit Driveways

Safety Concern: Each driveway represents a potential conflict point between entering/exiting vehicles and vehicles on the street, as well as pedestrians and bicyclists.

Observations: The liquor store driveway is very close to the TD Bank exit driveway. The team observed conflicts between vehicles turning into and out of the liquor store driveway and vehicles exiting the bank driveway, as well as with vehicles on Main St. This was particularly an issue with vehicles turning left from the driveways onto Main St when eastbound Main St was backed up.

Suggestions:

1. Restrict left turns out of the liquor store and TD Bank driveways during peak periods.
2. Encourage TD Bank and the liquor store to consolidate their driveways into one shared driveway. This would likely require a cross-parcel easement between the two

properties. This may require a site plan amendment.

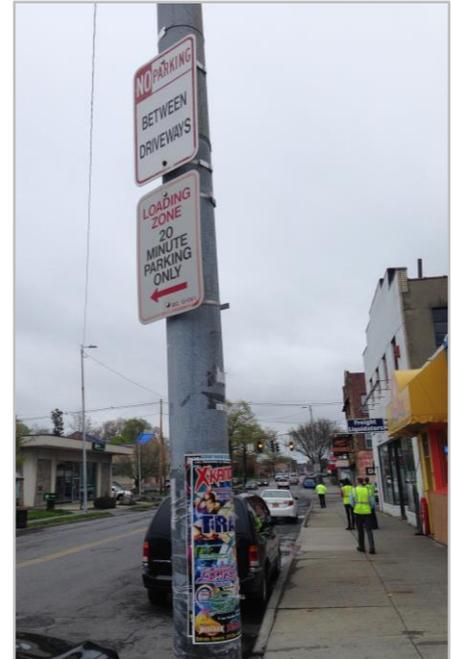
Priority for Consideration:

1. Low
2. Low

Issue #3: Main St On-Street Parking- South Side (west of intersection)

Safety Concern: Unclear on-street parking restrictions; limited visibility and congestion due to parked vehicles near the intersection.

Observations: There are three signs regarding on-street parking on the south side of Main St west of the intersection. A pole just east of the Pickwick Pub has two signs: “No Parking Between Driveways” and “Loading Zone: 20 Minute Parking Only” with an arrow pointing east. Just east of the Gino’s parking lot is a “No Parking Any Time” sign with an arrow pointing towards the intersection. It was somewhat unclear what area the “No Parking Between Driveways” sign covered, as there was not a second sign or any markings to indicate the area between the driveways. In addition, the two signs on that pole seemed contradictory. Was the intent no parking, or 20 minute parking? Were the signs referring to the same area, or different areas along the curb? Was the entire area between the driveways a loading zone?



Parking-related signage on the south side of Main St, west of the intersection.

The team also discussed the pros and cons of relocating the loading zone, which serves the Freight Liquidators furniture store (see *Alignment/Visibility, Issue #1, Eastbound Alignment*). Parked cars and trucks limit the visibility of drivers approaching the intersection, and also contribute to weaving and congestion on the eastbound approach.

Suggestions:

1. Simplify and clarify the Main St parking signage. Keep the “Loading Zone: 20 Minute Parking Only” sign if the loading zone is desired to be maintained. Replace the other two signs (“No Parking Between Driveways” and “No Parking Anytime”) with one “No Parking Anytime” sign just east of the loading zone with an arrow pointing to the intersection.
2. Consider pavement hatching or curb painting to demarcate the Main St loading zone area.

Priority for Consideration:

1. High
2. Medium

Issue #4: Main St On-Street Parking- South Side (east of intersection)

Safety Concern: On-street parking near the intersection restricts visibility, can limit the ability of larger vehicles (trucks and buses) to make turns, and can contribute to conflicts near the intersection, as drivers entering and exiting parking spaces interact with through and turning vehicles.

Observations: The team observed vehicles parked just east of the intersection, in front of Kane Motors. Based on discussions with Police Dept staff, it appeared that a “No Parking” sign had been removed from a street light pole approximately 120 feet east of the intersection. The team determined that removing on-street parking for this portion of Main Street would enable the eastbound bus stop to be relocated to this area from the congested location west of the intersection. This would improve operations at the intersection.

Suggestions:

1. Replace/install a “No Parking Any Time” sign on the south side of Main St approximately 120 feet east of the intersection.

Priority for Consideration: Medium



On-street parking east of the intersection on eastbound Main St.

Issue #5: Gino’s Main Street Driveway

Safety Concern: Each driveway represents a potential conflict point between entering/exiting vehicles and vehicles on the street, as well as pedestrians and bicyclists.

Observations: The Gino’s Main St driveway is very close to the intersection. The team observed conflicts between vehicles turning into and out of the driveway and vehicles on Main St. This was particularly an issue with vehicles turning left from the driveway onto Main St when eastbound Main St was backed up.

Suggestions:

1. Restrict left turns out of Gino’s Main St driveway, at least during peak periods.

Priority for Consideration: Low

Issue #6: Worrall Ave On-Street Parking- West Side

Safety Concern: On-street parking near the intersection restricts visibility, can limit the ability of larger vehicles (trucks and buses) to make turns, and can contribute to conflicts near the intersection, as drivers entering and exiting parking spaces interact with through and turning vehicles. As noted above, the curbs on the west side of Innis Ave and Worrall Ave are not aligned. The Innis Ave curb widens to the west to accommodate the southbound left turn pocket. Therefore, drivers traveling southbound through the intersection on Innis Ave must shift towards the curb to avoid the left turn pocket, and

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then back to the left to avoid the on-street parking on Worrall Ave.

Observations: The mis-alignment of the curbs is exacerbated by on-street parking on the west side of Worrall Ave near the intersection, causing additional weaving and potential conflicts. Currently, on-street parking is restricted only for about 20 feet from the intersection. The team observed that southbound through drivers straddle the left turn and through lanes to avoid weaving back around parked cars on Worrall Ave. In addition, team members stated that some drivers change lanes at the last minute, from the left turn to the through lane and vice versa. At times, parked vehicles made it difficult for traffic to navigate Worrall Ave—particularly trucks and buses turning south onto Worrall Ave. Based on discussions with Police Dept staff, people often park there to pick up to-go orders from the restaurant, and restaurant delivery vehicles also use that space. However, the restaurant has a parking lot accessible from Main St and Worrall Ave. The team determined that restricting on-street parking between the parking lot driveway and the intersection would improve operations and safety on Worrall Ave.



On-street parking is allowed for much of the west side of Worrall Ave.

Suggestions:

1. Relocate the “No Parking Any Time” sign on the west side of Worrall Ave to just north of the Gino’s driveway, to restrict parking within about 80 feet of the intersection.
2. Create a shared loading zone for Gino’s and Freight Liquidators at the existing loading zone area on the south side of Main St, west of the intersection.

Priority for Consideration:

1. High
2. Low

G. General Issues

Issue #1: Truck & Bus Access

Safety Concern: Buses and trucks may have difficulty navigating through the intersection.

Observations: The team observed that the intersection was tight for trucks and buses, particularly southbound on Worrall Ave near Gino’s restaurant and eastbound approaching the intersection. The team observed a westbound truck turning left onto southbound Worrall Ave that had difficulty making the turn due to a vehicle waiting at



A school bus makes the tight left turn from Main St onto Worrall Ave.

the signal on Worrall Ave. Team members also mentioned that buses often hit car mirrors.

Suggestions:

1. Mark a stop bar on northbound Worrall Ave a distance back from the intersection to help vehicles turn onto Worrall Ave. Based on aerial photos, it appears that a stop bar may have existed fairly close to the intersection in the past, but there was no indication of it in the field. (See also *Parking, Issues #3, 4, and 6*).

Priority for Consideration: High

Issue #2: Deteriorating Pavement

Safety Concern: Poor quality pavement can contribute to crashes if drivers (or bicyclists) swerve to avoid potholes and damaged pavement.

Observations: The team observed damaged pavement and potholes, particularly on eastbound Main St, as well as cracking and deterioration in the center of the intersection and along the street edges. The team also observed ponding at the northwest corner, and several items that were not flush with the pavement surface (a water valve on the west leg of Main St and a loop detector cover on the eastbound left turn).

Suggestions:

1. Repave Main St. Note that resurfacing is considered an alteration, which triggers ADA upgrades to curb ramps. The ramps at the intersection may be compliant based on the standard at the time they were constructed, but best practice would encourage installing the current standard detectable warnings (contrasting color domes).
2. Repave Worrall Ave and Innis Ave.
3. Address ponding at the northwest corner through repaving.

Priority for Consideration:

1. High
2. Medium
3. Medium



Significant cracking, potholes, and ponding on eastbound Main St approaching the intersection.

Issue #3: Extra Pole

Safety Concern: Poles that are no longer being used constitute an unnecessary fixed object and could restrict visibility.

Observations: The team observed an extra wood utility pole on Innis Ave near the northeast corner of the intersection. City staff said they would contact Central Hudson to have to pole removed.

Suggestions:

1. Remove the unused pole on Innis Ave near the northeast corner of the intersection.

Priority for Consideration: Low



An extra pole was observed on Innis Ave between the metal pole and new utility pole.

6. Next Steps

The DCTC, through the work of the SA Team, has prepared this report to assist the City of Poughkeepsie with prioritizing opportunities to improve safety at the study intersection. A draft was circulated to the SA Team for review in June, and comments were incorporated into the final draft. The suggestions are for consideration only and are in no way intended to serve as design or operational recommendations. The City documented its responses to the issues and suggestions in a formal response, which is attached to the final report. The SA Team believes it has been thorough and diligent in its work, given the information available and its field reviews. This report does not preclude the identification of additional issues pertaining to safety or the emergence of new issues over time. It is recommended that the City track progress towards the implementation of safety improvements prompted by this assessment.

While pedestrian safety issues were not the primary focus of this assessment, NYSDOT has identified the City of Poughkeepsie as a “focus community” for pedestrian safety, based on the number of pedestrian crashes compared to other municipalities across the state.¹⁴ In addition, the DCTC has identified the Main St corridor as the highest pedestrian-crash corridor in Dutchess County, based on the total number of pedestrian crashes.¹⁵ NYSDOT intends to support pedestrian safety improvements in focus communities by funding systemic treatments along high-crash corridors. To that end, this assessment can serve as a starting point for identifying treatments that could be applied along Main St. These items could include upgrades to pedestrian signals, including pushbuttons and MUTCD-compliant signage, or automatic (non-actuated) signals; countdown timers; high-visibility crosswalk markings; and warning signs.

¹⁴ See NYSDOT’s Pedestrian Safety Action Plan, online at <https://www.ny.gov/pedestrian-safety-action-plan/pedestrian-safety-action-plan#action-plan>

¹⁵ See Walk Bike Dutchess, Chapter 4, online at <http://www.co.dutchess.ny.us/CountyGov/Departments/TransportationCouncil/bppchapterfour.pdf> (see pages 25-26 of the pdf)

Table 4. Suggested Actions and Priority by Category

Issue	Suggested Action	Priority
Alignment/Visibility		
1-1	Shift the eastbound lanes up to 8 feet to the north to accommodate activity near the curb and to align the eastbound and westbound left turn lanes.	High
1-2	Clarify and enforce parking restrictions on the south side of Main St (<i>see Parking, 3-1 and 3-2</i>).	Medium
1-3	Move the furniture store's loading zone from Main St into the Gino's parking lot.	Low
2-1	Shift the westbound through and left turn lanes to the south (by widening each slightly), so that the eastbound and westbound left turn lanes are more closely aligned.	High
3-1	Relocate the eastbound bus stop to the far side of the intersection.	High
Traffic Signals		
1-1	Conduct a traffic signal evaluation and develop a refined signal timing plan.	High
1-2	Widen left turn and/or through travel lanes slightly to accommodate traffic and reduce false detection.	High
1-3	Install radar, video, or another detection system to replace the loop detectors.	Medium
1-4	Update and coordinate traffic signal timing along the Main St corridor.	Low
2-1	Add a short red clearance phase to the updated signal timing.	High
3-1	Check the lenses and lights in the eastbound left turn indication, as well as the other signal heads at the intersection, and replace as needed.	Medium
4-1	Align the eastbound and westbound left turn lanes by shifting the westbound lanes south and the eastbound lanes north (<i>see Alignment/Visibility, 1-1 and 2-1</i>).	High
Pedestrians		
1-1	Install pedestrian signals with countdown timers for each crossing.	High
1-2	Incorporate pedestrian signal timing in the recommended signal timing evaluation and optimization.	High
1-3	Consider automatic pedestrian signals.	Medium
1-4	Evaluate the need to incorporate Accessible Pedestrian Signals.	Medium
2-1	Re-mark crosswalks with a high-visibility ladder style marking and durable material.	High

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2-2	Install Turning Vehicles Yield to Pedestrians signs at each approach.	Low
3-1	Continue to investigate alternate snow storage areas or methods.	Low
3-2	Extend grass buffers on the south side of Main St where feasible.	Low

Bicyclists

1-1	Install Bike Route wayfinding signs along the School Connector bicycle route.	Medium
1-3	Install 'Bike In Lane' signs on Main St, and consider on Worrall Ave and Innis Ave.	Medium
1-2	Mark sharrows (shared lane markings) along the School Connector bicycle route on Worrall Ave and Innis Ave, and consider on Main St.	Low
2-1	Replace the drainage grate on the westbound Main St approach with a bicycle-safe grate.	Low

Signage & Pavement Markings

1-1	Re-stripe pavement markings with a durable material.	Medium
2-1	Stripe a centerline on Worrall Ave.	Medium
2-2	Remove on-street parking on the west side of Worrall Ave near the intersection and create a left turn pocket for a short distance approaching the intersection.	Low
3-1	Extend the left turn pockets and mark the "left turn only" arrows further back from the intersection, especially on eastbound Main St and southbound Innis Ave.	Medium
3-2	Provide overhead left turn only lane designation signs further back from the intersection.	Low
3-3	Re-hang the southbound "left turn only" overhead sign so it hangs straight.	Low
4-1	Upgrade street name signs to meet the larger, mixed-case sign standard.	Low
5-1	Replace the bus stop sign when new Dutchess County Public Transit bus routes and stops in the area are finalized.	Low

Parking & Driveways

1-1	Combine the two TD Bank driveways into one shared (entrance/exit) driveway west of the bus stop shelter.	Medium
2-1	Restrict left turns out of the liquor store and TD Bank driveways during peak periods.	Low
2-2	Encourage TD Bank and the liquor store to consolidate their driveways into one shared driveway.	Low
3-1	Simplify and clarify the Main St parking signage.	High

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3-2	Consider pavement hatching or curb painting to demarcate the Main St loading zone area.	Medium
4-1	Replace/install a “No Parking Any Time” sign on the south side of Main St approximately 120 feet east of the intersection.	Medium
5-1	Restrict left turns out of Gino’s Main St driveway, at least during peak periods.	Low
6-1	Relocate the “No Parking Any Time” sign on the west side of Worrall Ave to just north of the Gino’s driveway, to restrict parking within about 80 feet of the intersection.	High
6-2	Create a shared loading zone for Gino’s and Freight Liquidators at the existing loading zone area on the south side of Main St, west of the intersection.	Low

General Issues

1-1	Mark a stop bar on northbound Worrall Ave a distance back from the intersection to help eastbound vehicles turning right onto Worrall Ave.	High
2-1	Repave Main St.	High
2-2	Repave Worrall Ave and Innis Ave.	Medium
2-3	Address ponding at the northwest corner through repaving.	Medium
3-1	Remove the unused pole on Innis Ave near the northeast corner of the intersection.	Low

The City of Poughkeepsie New York



Chris Gent
Commissioner of Public Works

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7/28/17

Background:

The Dutchess County Transportation Council (DCTC) conducted a Safety Assessment (SA) of the intersection of Main St. with Worrall Ave/Innis Ave in support of its goal to improve transportation safety in Dutchess County. The SA is intended to provide the facility owner, the City of Poughkeepsie, with a list of opportunities for low-cost, short range safety improvements, and if warranted, more expensive and/or longer-range improvements. The DCTC, in consultation with the City, selected the assessment location based on an analysis of crash data from 2011 – 2015.

Introduction:

The SA was carried out by team from Dutchess County and the City of Poughkeepsie. We met 4/26/17 from 2:30 PM to 6:15 PM and 4/27/17 from 8:00 AM to 9:30 AM so we could observe the two rush hour times of the day.

The team members are as follows:

- Chris Gent – Commissioner, City of Poughkeepsie DPW
- Todd King – Sergeant, City of Poughkeepsie Police
- Mark Johnson – Chief, City of Poughkeepsie Fire
- Joe Kane – Assistant Civil engineer, City of Poughkeepsie Engineering
- Paul Hesse – Community Development Coordinator, City of Poughkeepsie
- Mark Debald – Transportation Program Administrator, DCTC
- Emily Dozier – Senior Planner, DCTC
- Shelby Frangk – Junior Planner, DCTC

Owner's Response

Alignment/Visibility

- 1-1 *Shift the eastbound lanes up to 8 feet to the north to accommodate activity near the curb and to align the eastbound and westbound left turn lanes.*

As funding will allow, the City will consider shifting the striping of the eastbound lanes up to 8 feet to the north in order to align the eastbound and westbound turn pockets. As noted in the recommendation, parking on the north side of Main Street between the intersection and the TD Bank exit will need to be restricted. This will require Common Council approval, as the Council has authority over changes to on street parking.

- 1-2 *Clarify and enforce parking restrictions on the south side of Main St (see Parking, 3-1 and 3-2).*

Regarding clarifying parking on the south side of Main Street, see the response to Parking issue #3.

1-3 *Move the furniture store's loading zone from Main St into the Gino's parking lot.*

It may be possible to request the furniture store and Gino's share the driveway for deliveries, but the lot may be inadequate to provide the necessary space for both operations.

2-1 *Shift the westbound through and left turn lanes to the south (by widening each slightly), so that the eastbound and westbound left turn lanes are more closely aligned.*

As discussed in response 1-1, as funding and manpower allows, the City will consider shifting the striping of the eastbound lanes to the north so that the eastbound and westbound turning lanes are more closely aligned. This will require Common Council action to restrict parking on the north side of Main Street west of the intersection to accommodate the lane shift and traffic.

3-1 *Relocate the eastbound bus stop to the far side of the intersection.*

Dutchess County has recently expanded service into the City. As part of their ongoing modifications to the system, the shelters will be studied for the best locations. It is possible this issue can be corrected.

Traffic Signals

1-1 *Conduct a traffic signal evaluation and develop a refined signal timing plan.*

A traffic signal evaluation should be conducted by a traffic engineer to determine the best timing for that particular intersection. Due to the proximity of the West Bound Arterial and the location on Main Street, this study would have to incorporate a much larger area.

1-2 *Widen left turn and/or through travel lanes slightly to accommodate traffic and reduce false detection.*

As incorporated in the suggestion, the solution to false detection on the eastbound left turn lane should be coordinated with a shift in lanes, as discussed in Alignment/Visibility 1-1.

1-3 *Install radar, video, or another detection system to replace the loop detectors.*

A traffic loop study is currently being performed in the City to see which loops are operational. Once the study is complete it will be possible to see which detection method would be best suited for each intersection.

1-4 *Update and coordinate traffic signal timing along the Main St corridor.*

A traffic signal evaluation should be conducted by a traffic engineer to determine the best timing for that particular intersection. Due to the proximity of the West Bound Arterial and the location on Main Street, this study would have to incorporate a much larger area.

2-1 *Add a short red clearance phase to the updated signal timing.*

As stated above, a traffic signal evaluation should be conducted by a traffic engineer to determine the proper signal timing, including a red clearance phase.

3-1 *Check the lenses and lights in the eastbound left turn indication, as well as the other signal heads at the intersection, and replace as needed.*

All heads are being replaced by LED lighting. The lenses at that intersection will be checked and cleaned if necessary

- 4-1 *Align the eastbound and westbound left turn lanes by shifting the westbound lanes south and the eastbound lanes north (see Alignment/Visibility, 1-1 and 2-1).*

Related to our response on Alignment/Visibility 1-1 and 2-1, as funding allows and pending Common Council approval to remove on-street parking on the north side of Main Street west of the intersection, the City will consider shifting the striping of the eastbound and westbound lanes as appropriate in order to improve alignment. Along with the lane shift, the signal heads would be shifted accordingly.

Pedestrians

- 1-1 *Install pedestrian signals with countdown timers for each crossing.*

As funding allows, the City will look to add pedestrian signals at this intersection and other intersections that lack ped signals.

- 1-2 *Incorporate pedestrian signal timing in the recommended signal timing evaluation and optimization.*

A traffic signal evaluation should be conducted by a traffic engineer to determine the best timing for that particular intersection. Due to the proximity of the West Bound Arterial and the location on Main Street, this study would have to incorporate a much larger area.

- 1-3 *Consider automatic pedestrian signals.*

As funding allows, the City will consider adding ped signals at this intersection, using best practices and guidance from MUTCD, possibly including automatic ped signals.

- 1-4 *Evaluate the need to incorporate Accessible Pedestrian Signals.*

As funding allows and the City makes improvements to accommodate ped signals, the City will comply with the latest accessibility standards, including audio and tactile features.

- 2-1 *Re-mark crosswalks with a high-visibility ladder style marking and durable material.*

As funding allows, the intersection will be re-striped using the most durable materials available.

- 2-2 *Install Turning Vehicles Yield to Pedestrians signs at each approach.*

Along with re-striping the intersection, MUTCD sign R10-15 will be installed warning motorists to yield to pedestrians in the intersection.

- 3-1 *Continue to investigate alternate snow storage areas or methods.*

During significant snow events, snow can be removed from the major intersections, in particular on Main St. If a realignment project were to be planned, snow storage area would be incorporated into the design.

- 3-2 *Extend grass buffers on the south side of Main St where feasible.*

If a redesign of the intersection were planned, extended grass buffers would be considered in the final design.

Bicyclists

- 1-1 *Install Bike Route wayfinding signs along the School Connector bicycle route.*

Bike Route wayfinding signage, per the City's established bicycle route network, will be considered for this intersection.

- 1-2 *Install 'Bike In Lane' signs on Main St, and consider on Worrall Ave and Innis Ave.*

Bike in Lane signs, per MUTCD standards, will be considered for this intersection.

- 1-3 *Mark sharrows (shared lane markings) along the School Connector bicycle route on Worrall Ave and Innis Ave, and consider on Main St.*

Sharrows, where appropriate and as funding allows, will be considered along the roads feeding this intersection.

- 2-1 *Replace the drainage grate on the westbound Main St approach with a bicycle-safe grate.*

New drainage grates that are installed on city roadways will be bicycle safe.

Signage and Pavement Markings

- 1-1 *Re-stripe pavement markings with a durable material.*

As funding allows, the intersection will be restriped with the most durable materials available.

- 2-1 *Stripe a centerline on Worrall Ave.*

As funding allows, the City will consider adding a double yellow strip on Worrall Avenue. If and when that happens, on-street parking will be considered, in coordination with Common Council, as part of the improvements.

- 2-2 *Remove on-street parking on the west side of Worrall Ave near the intersection and create a left turn pocket for a short distance approaching the intersection.*

As part of the overall re-striping plan, the City will consider adding a left turn pocket for northbound Worrall Avenue traffic. This would require Common Council action due to the suggested and necessary removal of on-street parking on the west side of Worrall Ave near the intersection in order to accommodate an additional turning lane.

- 3-1 *Extend the left turn pockets and mark the "left turn only" arrows further back from the intersection, especially on eastbound Main St and southbound Innis Ave.*

As part of the overall re-striping plan, the City will consider extending the left turn pockets farther back from the intersection, with a focus on eastbound Main Street and southbound Innis Ave.

- 3-2 *Provide overhead left turn only lane designation signs further back from the intersection.*

Additional overhead signage farther back from the intersection would require additional mounting infrastructure, which will not be considered at this time.

- 3-3 *Re-hang the southbound "left turn only" overhead sign so it hangs straight.*

The southbound left turn only overhead sign will be straightened.

- 4-1 *Upgrade street name signs to meet the larger, mixed-case sign standard.*

New 2009 MUTCD standard signs will be installed at this intersection.

- 5-1 *Replace the bus stop sign when new Dutchess County Public Transit bus routes and stops in the area are finalized.*

The bus contractor obtained permits in early July and intends to have all signs installed in the summer of 2017.

Parking and Driveways

- 1-1 *Combine the two TD Bank driveways into one shared (entrance/exit) driveway west of the bus stop shelter.*

In order for TD Bank and Poughkeepsie Wines to combine their driveways they would need a site plan amendment and approval of zoning and/or planning boards. In addition, limiting access to the parking lots could be seen as limiting business and thereby may not be supported by the property owners. These are two separate parcels which would make the change even more complex.

- 2-1 *Restrict left turns out of the liquor store and TD Bank driveways during peak periods.*

A restricted left turn lane could be considered by the Planning Board as part of any site plan amendment for a shared ingress/egress.

- 2-2 *Encourage TD Bank and the liquor store to consolidate their driveways into one shared driveway.*

That these are separate parcels and separate owners, this would be a complex undertaking.

- 3-1 *Simplify and clarify the Main St parking signage.*

The signage will be simplified to a “no parking anytime” sign

- 3-2 *Consider pavement hatching or curb painting to demarcate the Main St loading zone area.*

As funding allows, and as part of a restriping plan for the intersection, a striped loading zone area will be considered.

- 4-1 *Replace/install a “No Parking Any Time” sign on the south side of Main St approximately 120 feet east of the intersection.*

The missing “No Parking” sign has been replaced.

- 5-1 *Restrict left turns out of Gino’s Main St driveway, at least during peak periods.*

A restricted left turn could be considered as part of overall improvements to the site. This would be done in consultation with the property owner.

- 6-1 *Relocate the “No Parking Any Time” sign on the west side of Worrall Ave to just north of the Gino’s driveway, to restrict parking within about 80 feet of the intersection.*

A “No Parking Any Time” sign could be considered to restrict parking within 80 feet of the intersection. This would require action from the Common Council.

- 6-2 *Create a shared loading zone for Gino’s and Freight Liquidators at the existing loading zone area on the south side of Main St, west of the intersection.*