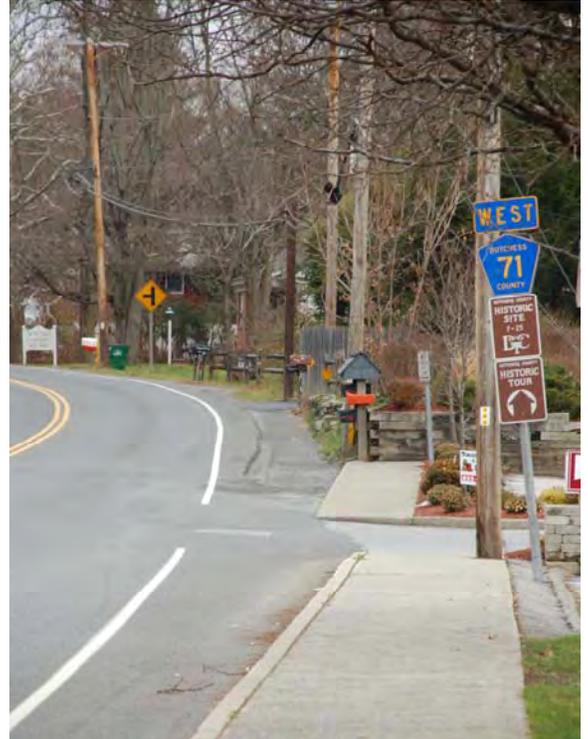


County Road 71 (West Road) Sidewalk Feasibility Study



October 2010

PDCTC

Poughkeepsie-Dutchess County Transportation Council (2010-2011)

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1. Introduction

The Pleasant Valley Town Board has requested the Dutchess County Department of Planning and Development to study the feasibility of installing sidewalks along County Road (CR) 71, known locally as West Road, in the Town. The Poughkeepsie-Dutchess County Transportation Council (PDCTC), which is hosted by the County Planning Department, allocated funding for the study in its 2010-2011 work program. The PDCTC is the federally-designated Metropolitan Planning Organization for the Poughkeepsie-Newburgh Urbanized Area, and coordinates transportation planning for Dutchess County.¹ PDCTC staff, which is shared with the Planning Department, completed the study in coordination with staff from the County Department of Public Works.

The Town of Pleasant Valley is located in the central-western portion of the county. The southwestern quarter of the Town is within the county's federally-designated urbanized area, and the Town has continued to urbanize over the last ten years. CR 71 (West Road) connects New York State Route 115 (Salt Point Turnpike) to the west and US Route 44 to the east. Both NY 115 and US 44 run diagonally from the southwest to the northeast (see Figure 1– Location Map).

The Hamlet of Pleasant Valley straddles US 44 and extends approximately between CR 71 (West Road) to the southwest and Quaker Hill Road to the northeast. The Hamlet has significant development in the form of small shopping centers, restaurants, government offices, places of worship, and local businesses. US 44 is also known as Main Street within the Hamlet.

Pleasant Valley Comprehensive Plan

The Town adopted an updated Comprehensive Plan in December 2009. Several sections of the plan support sidewalks. The plan's discussion of the Pleasant Valley Hamlet on page 35 states: "The perceived boundaries of the Pleasant Valley hamlet are difficult to define due to creeping strip commercial areas extending out along US 44, the angular road patterns, and the uneven patchwork of residential projects in the area. *In order to better connect the outlying sections of the hamlet, sidewalks should be extended on at least one side of West Road past the elementary school, on North Road to the apartments, and on South Road as any significant development occurs. Roadside shoulders could also be improved to encourage biking*" [italics added].

The Pleasant Valley Hamlet Illustrative Sketch Plan, described on page 36 of the Comprehensive Plan, calls for "improved sidewalks with additional street trees," though these improvements are shown primarily on US 44 and North Avenue/Maggiacomo Lane. Recommended changes to the US 44 streetscape described on page 36 include that "the existing sidewalks should be upgraded to include a buffer strip with street trees to make the pedestrian feel less vulnerable to passing cars..." The discussion of Hamlet Residential uses on page 39 of the Plan states that "Residential uses in this [Hamlet] category should be established next to the commercial core and connected to the hamlet by pedestrian and bicycle paths, in compact and well designed developments..." The Hamlet Residential District around the Pleasant Valley Hamlet extends along CR 71 (West Road) from US 44 about halfway to NY 115.

¹ For more information on the PDCTC, see <http://www.dutchessny.gov/pdctc.htm>

Pleasant Valley Town Code

Chapter 79 of the Pleasant Valley Town Code (Streets and Sidewalks), states that developers “shall construct sidewalks on both sides of streets for commercial and industrial highways.”² Based on the criteria outlined in the code, CR 71 (West Road) appears to be a Commercial/Industrial Highway. The chapter outlines specifications for sidewalks and refers to an appendix that includes a typical road section and curb and sidewalk details (figures 2 and 4 of the Town’s Highway Specifications). The chapter also outlines the duties of owners or occupants of lots adjacent to sidewalks.

PDCTC Bicycle and Pedestrian Plan

(<http://www.co.dutchess.ny.us/CountyGov/Departments/Planning/BPP.pdf>)

The Poughkeepsie-Dutchess County Transportation Council’s 1996 *Bicycle and Pedestrian Plan* identifies the Pleasant Valley Hamlet as a pedestrian zone, where formal accommodation of pedestrians is appropriate. The plan states that “in identified pedestrian zones, the goal is installation and maintenance of a complete sidewalk network connecting community uses, and crosswalks at all major intersections” (page 17). The plan outlines several pedestrian and bicycle-related strategies on pages 19-21.

The Plan proposes bicycle routes on both US 44 and NY 115. “Bicycle Route” is used to mean any bicycle facility, including a mixed-use (bicycle/pedestrian) path, a bicycle path, marked bike lane, road shoulder, wide curb lane, or combination. The proposed routes were identified based on their ability to connect residents to employment, shopping, community centers, and transit hubs.

The Plan encourages towns to develop their own bicycle and pedestrian plans and identify routes. The Town of Pleasant Valley has not to date developed such a plan, although the 2009 Comprehensive Plan includes recommendations related to pedestrian and bicycle facilities, as discussed above.

New Connections (PDCTC Metropolitan Transportation Plan)

(<http://www.co.dutchess.ny.us/CountyGov/Departments/TransportationCouncil/PLpdctcpublicati ons.htm>)

New Connections, the PDCTC’s 2007 Metropolitan Transportation Plan, outlines several priority actions related to pedestrian and bicycle travel in Chapter 5, Plan Recommendations. These are listed below under the Plan’s strategic goals.

- System Management and Preservation:
 - Cooperate with efforts to promote bicycling and walking as healthy and viable means of transportation.
 - Standardize the provision of crosswalks and pedestrian count-down signals at key intersections.
- Mobility and Accessibility:
 - Implement traffic calming measures to improve walking and bicycling in

2 See Town Code online at: <http://www.ecode360.com/?custId=PL0575>

- community and other activity centers.
 - Provide pedestrian and bicycle facilities as part of new construction, reconstruction and maintenance projects where practical.
- Land Use and Economic Growth:
 - Design pedestrian and bicycle facilities to connect related uses both internally and externally.
- Environment and Energy:
 - Continue to support public transit, ridesharing, walking and bicycling projects.

Based on this review, Pleasant Valley’s Comprehensive Plan and Town Code support pedestrian and bicycle facilities on CR 71 (West Road), and both the Town’s Comprehensive Plan and the County’s transportation plans support pedestrian and bicycle infrastructure within the Pleasant Valley Hamlet more generally.

2. Study Area

County Road 71 (West Road) is 1.24 miles long and runs roughly east-west, connecting US 44 (Main Street) to the east and NY 115 (Salt Point Turnpike) to the west. The road is classified by the New York State Department of Transportation (NYSDOT) and the Dutchess County Department of Public Works (DCDPW) as an Urban Minor Arterial, also known as Functional Class 16. Functional classification is the process by which roads are grouped into classes according to the character of the service they provide. The character of service depends on the type of traffic (e.g. local or long-distance) and the degree of access that the road provides to adjacent land. Aside from interstates, there are three main functional classes: arterial, collector, and local. Of these three classes, arterial roads provide for travel at the greatest speed for the longest uninterrupted distance, with limited access to adjacent land. Arterials are classified as urban or rural depending on where the road is located, and principal or minor. Urban Principal Arterials serve the major activity centers of a metropolitan area and the highest traffic volume corridors, while Urban Minor Arterials interconnect with the urban principal arterial system and serve trips of moderate length at somewhat lower speeds and with more access to adjacent land than principal arterials.

The designation of CR 71 (West Road) as an Urban Minor Arterial also means that the road is part of the federal-aid system and is therefore eligible for federal funding. All interstates and all roadways except for Local roads and Rural Minor Collectors are eligible for federal aid.

The study area is the entire length of CR 71 (West Road) in the Town. The study area was split into three segments based upon their distinct characteristics (see Figure 2– Study Area):

- 1) US 44 (Main Street) to Brookside Road (about 0.6 miles);
- 2) Brookside Road to Robert Lane (about 0.6 miles); and
- 3) Robert Lane to NY 115 (Salt Point Turnpike) (less than 0.1 mile).

3. Existing Conditions

The existing conditions along the roadway and in the vicinity were determined based on field visits, discussions with and data from DCDPW, a meeting with the principal of the West Road Intermediate School, and available roadway, traffic and environmental data.

Roadway

CR 71 (West Road) is striped with two lanes, one in each direction, except at its two ends, where it widens to three lanes to allow separate left and right turn lanes onto NY 115 and US 44. The travel lanes are approximately 11 feet wide. The shoulder width varies considerably along the road and between the north and south sides. Near NY 115, there are approximately five-foot shoulders on the south side of the road and approximately three-foot shoulders on the north side. Just west of Robert Lane, there is a rock wall on the north side of the road approximately six feet from the edge of the travel lane. The shoulder narrows to approximately three feet on both sides approaching the West Road Intermediate School. On the south side, the shoulder narrows to one foot or less east of the school to near US 44, while the north shoulder widens to approximately five feet approaching US 44. At its intersection with US 44, CR 71 (West Road) curves south, and US 44 runs roughly east-west.

Right-of-Way

CR 71 (West Road) is a Dutchess County roadway. The County maintains a right-of-way of up to 50 feet, measured as up to 25 feet from the center of the road on both sides. The County does not physically own the right-of-way, but has a legal right to up to 50 feet based on what has been historically used for travel lanes, shoulders, drainage, and other purposes. There are utilities and other infrastructure within the right-of-way that must be accommodated. Additionally, the County holds several permanent easements along the roadway, which are generally for drainage improvements. Any future work on CR 71 (West Road) would require surveying to specify the right-of-way and easement locations and any land acquisitions needed.

Environmental Considerations

There are two DEC-regulated wetlands in the study area. One is located south of CR 71 (West Road) between the school property and Charles Street, and extends south to Bower Road in the Town of Poughkeepsie. The other DEC wetland is located north of the road, and extends northeast to North Avenue at Wigsten Road. Part of this wetland approaches CR 71 (West Road) just west of Whiteford Drive. There are several National Wetland Inventory (NWI) wetlands in the study area, generally overlapping and sometimes extending the DEC wetlands. According to the NWI, the wetland south of CR 71 (West Road) comes close to the road near Charles Street, and the wetland north of CR 71 (West Road) comes close to the road near Charles Street and near Water Loop.

There are a series of streams within the wetland areas; the largest runs north-south and crosses CR 71 (West Road) between Whiteford Drive/Charles Street and Brookside Road. A small lake is located about 280 feet north of CR 71 (West Road) opposite the school. There are two culverts in the study area: one on the north side of CR 71 (West Road) where the stream crosses and one

on the south side of CR 71 (West Road) near the office buildings west of the school.

There are several steep slopes along CR 71 (West Road); these are concentrated primarily in Segment 1. At the intersection with NY 115, there are slopes of about 15 percent on the south side of the road, and east of Robert Lane, there are slopes of between 15 and 25 percent on the north side of the road. Between Charles Street/Whiteford Drive and US 44, there are slopes of between 15 and 25 percent on both sides of the road, with slopes greater than 25 percent along the south-western road edge between Teal Lane and the intersection with US 44 (see Figure 3– Environmental Conditions). From west to east, CR 71 (West Road) slopes steeply downhill from the intersection with NY 115, rises uphill approaching Charles Street, and slopes steeply downhill again approaching US 44.

Utilities

There are many utility poles along CR 71 (West Road); these carry primary and secondary electric lines, in addition to telephone and other utilities. From NY 115 to Robert Lane, the poles run along the south side of the road. At Robert Lane, they cross over to the north side of the road, where they continue until just east of Whiteford Drive, where they cross back to the south side of the road. The lines cross back to the north side just east of Teal Lane. The lines end at Station Road, where they connect with utility lines running along US 44. They are typically located approximately seven feet from the edge of the roadway. Future work on CR 71 (West Road) may require the relocation of a significant number of these poles.

Three electric lines run roughly north-south through the study area between the apartments east of the school (Pleasant Valley Estates) and Brookside Road, in land owned by the Niagara-Mohawk Power Company. Central Hudson Gas & Electric Corporation owns several parcels adjacent to the electric lines on both the north and south sides of CR 71 (West Road).

Traffic

Traffic counts were conducted in May 2010 at two locations on CR 71 (West Road), one on each side of the school: just east of the Conklin office building and the Country Commons apartments; and just west of the Pleasant Valley Estates apartments. Based on these counts, the average traffic volume is about 7,300 vehicles a day. Eastbound volumes are about seven percent higher than westbound volumes. Traffic is typically greatest between 3:00 pm and 6:00 pm, with a morning peak between 8:00 am and 9:00 am.

Traffic counts were also conducted on CR 71 (West Road) each year between 2004 and 2007. Volumes grew from about 7,000 daily vehicles in 2004 to 8,900 vehicles in 2006, then dropped to 8,250 in 2007, and continued to drop in 2010 (see Figure 4– Traffic Volumes). It should be noted that the 2004 count was taken near NY 115, while the 2005-2007 counts were taken near US 44.

Vehicle classification (vehicle type) data collected in 2010 shows that over 90 percent of the vehicles counted near the school are cars, pickup trucks and vans. Large trucks (excluding pickups) comprise about seven percent of vehicles, buses one percent, and motorcycles less than one percent. Pedestrians and bicyclists have not been counted, but based on field observations

are rare.

Vehicle speed data was also collected near the school in 2010. The 85th percentile speed (the speed which 85 percent of traffic is at or below) is about 49 miles per hour eastbound and 51 miles per hour westbound. This is fairly close to the posted speed limit in this location of 45 miles per hour. In the eastbound direction, about 60 percent of traffic was at or below 45 miles per hour, about 90 percent of traffic was at or below 50 miles per hour, and about 99 percent of traffic was at or below 55 miles per hour. In the westbound direction, about 48 percent of traffic was at or below 45 miles per hour, 83 percent of traffic was at or below 50 miles per hour, and 97 percent of traffic was at or below 55 miles per hour.

Further east, near Teal Lane, where the speed limit is 35 miles per hour, the 85th percentile speed was about 44 miles per hour eastbound and 45 miles per hour westbound. At this location, 12 percent of westbound traffic and 14 percent of eastbound traffic was at or below the speed limit; 44 percent of westbound and 57 percent of eastbound traffic was no more than 5 miles per hour above the speed limit, and 84 percent of westbound and 94 percent of eastbound traffic was no more than ten miles per hour over the speed limit. Appendix A includes the volume, class, and speed data.

The downhill grade eastbound from NY 115 and westbound from Charles Street combined with the straight, flat segment near the school make this section of the road particularly likely for speeding. The school principal cited speeding as the most pressing issue related to CR 71 (West Road), and said that the school has requested that the Town pursue a school speed zone (see discussion below under *Current Policies*).

Crash Patterns

Crashes in the study area were analyzed using data from the Accident Location Information System (ALIS), which combines NYS DMV and State Police reports. Crashes from the most recent three-year period with complete data (2007 through 2009) were analyzed. The ALIS data provides a summary of crashes along the roadway. A more detailed analysis using DMV crash reports would provide more information about individual crashes.

There were a total of 64 crashes over the three-year period. Based on the traffic volumes on CR 71 (West Road), the overall crash rate is 5.71 crashes per million vehicle miles (mvm). This is over twice as high as the statewide average crash rate of 2.84 crashes/mvm for similar road types (two-lane, undivided urban roads). However, this rate includes crashes at NY 115 and US 44 but does not account for the higher traffic volume on those roadways. If crashes at NY 115 and US 44 are excluded, there are approximately 33 crashes on CR 71 (West Road) over the three-year period. This corresponds to a rate of 2.95/mvm, which is close to the statewide average.

Crashes seem to be increasing, as there were 12 in 2007, 23 in 2008, and 29 in 2009 (there were 11 crashes in 2006). Over 75 percent of crashes were with other motor vehicles, while 13 percent were with deer or other animals and 10 percent were with fixed objects (trees, sign posts, buildings/walls, and rocks/ditches). There were no pedestrian or bicycle-related crashes over the three-year period.

In terms of traffic control, the largest percentage of crashes occurred in no passing zones (35 percent). Over 28 percent of crashes occurred where there was no traffic control, while 21 percent were at a stop sign and 13 percent were at a traffic signal. Thirty-five percent of crashes occurred at an intersection; the remaining sixty-five percent were not at an intersection.

The most common crash type, aside from “other,” was right angle (21%), followed by rear-end (16%) (see Figure 5a– Crash Types). Right angle crashes are generally attributable to driver aggressiveness, usually due to congestion and a lack of gaps in traffic. Rear end collisions are generally due to signals and queues. Most crashes occurred during clear or cloudy weather (51% and 32%, respectively), in daylight (75%), and on dry roads (75%). Over 68 percent of crashes were on straight and level sections of the road; 14 percent were on straight grades, and 8 percent were on curving grades.

The crash data were summarized for the three study area segments. During the three year period, over sixty-five percent of crashes occurred in Segment 1 (US 44 to Brookside Road), while twenty-two percent occurred in Segment 3 (Robert Lane to NY 115). The remaining 13 percent of crashes occurred in Segment 2 (between Brookside Road and Robert Lane) (see Figure 5b– Crash Locations).

The most common day for crashes was Thursday (22 percent), followed by Tuesday and Friday, with 19 percent of crashes each. Weekends had relatively few crashes. One-third of all crashes occurred between 2:00 pm and 6:00 pm. In terms of contributing factors, the most common (aside from “not applicable” and “unknown”) were failure to yield right of way (17%) and driver inattention (16%). Prior to the crash, most vehicles were traveling straight (39%); others were making left turns (21%) or were stopped in traffic (14%). The 64 crashes resulted in 23 injuries and no deaths.

Land Use

Land use along CR 71 (West Road) is a mix of residential, commercial, and community facilities. There are two apartment complexes near NY 115 and a new townhome subdivision (Brookside Meadows) about halfway between NY 115 and US 44. There are single family homes east of Brookside Meadows, mainly on the north side of the road. The West Road Intermediate School is located on the south side of the road near NY 115. An office complex is located just west of the school, and a planned park (Redl Park) is located southwest of the office complex. Other offices are located near Charles Street, on the south side the road about halfway to US 44. A variety of offices and retail uses are located in the Hamlet at the intersection with US 44.

Pedestrian Activity

Pedestrians make up a vital part of any community and the environment and safety of those pedestrians was a major concern for this study. There is very little existing information about pedestrian activity in the study area. Using maps, fieldwork, and geographic information system (GIS) data, staff compiled information about likely pedestrian generators.

A pedestrian generator is an activity center that people may walk from or to, such as a library, school, post office, commercial center, or municipal office. Eight generators were identified. They are listed below from west to east and identified by number on Figure 6– Pedestrian Generators.

1. Future Redl Park (proposed entrance on CR 71 (West Road))
2. Country Commons (60 apartments and 20 condominiums)
3. Conklin office building (just east of the Redl Park site)
4. West Road Intermediate School and athletic fields (fields open to the public on evenings and weekends)
5. Pleasant Valley Estates (48 apartments)
6. Brookside Meadows (172 apartments and townhomes)
7. Charles Street area offices
8. Hamlet district, including A&P shopping center, post office, library, churches, Town offices, and local businesses

Pedestrian activity in the area is concentrated along US 44 (Main Street). Most of the pedestrian traffic is going to or coming from key points like the shopping center, post office, and library.

Based on GIS and local housing data, it was estimated that approximately 1,000 residents live within one-quarter mile of CR 71 (West Road) in apartments, condominiums, and single-family homes. Many of these residents could walk to the Hamlet and the other destinations listed above if a system of sidewalks was provided.

West Road Intermediate School

The West Road Intermediate School has 30 staff and approximately 400 students in the 3rd through 5th grades. According to the principal, most students live east of the school near the Pleasant Valley Hamlet. School hours are from 8:50 am to 3:10 pm. The school office opens at 7:30 am, and students are dropped off beginning at 8:30 am. School buses unload students in front of the school at 8:40 am. The school office closes at 4:00 pm.

The school has a loop driveway on CR 71 (West Road) with a rear parking lot used by parents and staff. The eastern end of the driveway is exit only; the western end accommodates two-way traffic. From 8:30 to 9:00 am and 2:30 to 3:00 pm, only buses are allowed to use the eastern exit; cars enter and exit at the western end. Ten full-size buses and several smaller buses drop students off and pick them up in front of the school. Three adults supervise the bus drop off/pick up activity. According to the principal, more students use the buses in the morning; in the evening, some students are picked up for after-school activities.

The principal stated that buses have difficulty exiting the school driveway, particularly in the afternoon, due to traffic on CR 71 (West Road). The principal also noted that crashes and other incidents block traffic on the road because there are only two lanes and minimal shoulders. A number of West Road Intermediate School students could potentially walk to school if sidewalks were provided between the school and surrounding residential areas. However, current school policies restrict walking (see discussion below under *Current Policies*).

Sidewalks and Pedestrian Infrastructure

The sidewalk inventory is based on 2004 aerial photographs that were digitized. The Pleasant Valley Hamlet has a fairly complete network of sidewalks. There are sidewalks on both sides of US 44 within the Hamlet and sidewalks into some of the major shopping centers along US 44. CR 72 (North Avenue) has sidewalks on both sides from the Hamlet approximately to Park Drive. On CR 71 (West Road), a sidewalk extends 400 feet from US 44 on the northern/eastern side of the roadway and just a few feet from US 44 on the southern/western side of the roadway. There are some sidewalks in the residential developments along CR 71 (West Road) but there are no other major sidewalks in the study area (see Figure 7– Existing Sidewalks).

There are two marked crosswalks within the study area, both at the CR 71/US 44 intersection: one across CR 71 (West Road) and one across the eastern leg of US 44. Pedestrian signals and pushbuttons are provided only for the crosswalk across US 44 (the eastern leg). There are no other marked crosswalks or pedestrian crossing signals on CR 71 (West Road). Lighting along the road consists of highway-style lights; there is no pedestrian-scale lighting.

Roadway Signage

The posted speed limit on CR 71 (West Road) is 45 miles per hour west of Charles Street and 35 miles per hour east of Charles Street (near the Hamlet). There is one pedestrian warning sign on CR 71 (West Road), approaching the school in the eastbound direction. No other school or pedestrian-related signage or markings were observed.

Summary

The CR 71 (West Road) corridor has several significant constraints. These include limited right-of-way, areas of steep slopes, nearby wetlands, curved segments with limited sight distance, and utilities along the roadway. These constraints will increase costs for right-of-way acquisition, earthwork, utility relocation, and other non-construction items.

The key existing conditions for the three study area segments can be summarized as follows:

- Segment 1, between US 44 (Main Street) and Brookside Road, is the most densely developed portion of CR 71 (West Road). It also has the most constrained right-of-way, with narrow shoulders, slopes, and curves. Construction on this segment would require significant earthwork.
- Segment 2, between Brookside Road and Robert Lane, is less densely developed than Segment 1, and is relatively straight and flat. There are utility poles along the north side of the road and wetland areas opposite and adjacent to the school that would increase the complexity and cost of a sidewalk project.
- Segment 3, between Robert Lane and NY 115, is sloped downhill from NY 115. The rock wall on the north side of the road at Robert Lane would make construction of a pedestrian facility in that location difficult.

4. Current Policies

Road Design and Maintenance

As County Road 71, West Road is maintained by the Dutchess County Department of Public Works (DCDPW). DCDPW maintains the roadway pavement, shoulders, and drainage ditches, clears trees and brush, cuts grass, installs and repairs signs and signals, and removes snow and ice from the roadway. Per the Pleasant Valley Town Code, adjacent property owners are responsible for maintenance of their frontage, including snow removal from driveways, parking lots, and any sidewalks. In terms of roadway design, DCDPW follows the New York State Department of Transportation's (NYSDOT) roadway design guidelines, which are based on national standards.

Walking and Bicycling to School

The Arlington School District, which covers all of the study area and most of the Town, has several policies related to transportation. The District's School Bus Scheduling and Routing Policy stipulates that "No child in grades K-5 shall be required to walk more than ½ mile and no child in grades 6-12 shall be required to walk more than one mile to reach a bus stop. However, if a bus is unable to enter a street and turn around the child shall not walk more than 2 and 3 miles respectively."³ The School District's website reinforces this policy and addresses students walking to school, stating that "Board of Education policy stipulates that an elementary school student can walk up to ½ mile to school or to a bus stop."⁴ The website also notes that State regulations allow an elementary student to walk up to 1 mile.

The District's policy on Student Bicycle Use states that "Students are permitted to ride bicycles to school. During the school day bicycles may be used on school grounds only for direct transportation between home, school, and work. Bicycles must be parked and locked in the designated rack areas."⁵

Based on these policies, elementary school students in the District are allowed to walk up to a half-mile to school, and could walk further than a half-mile, although bus service would also be provided. Students in the District are also allowed to bike to school. However, according to the West Road Intermediate School principal, students at the school are not allowed to walk to school unless accompanied by an adult, due to safety concerns, and the school currently provides bus transportation for all students. The principal noted that few students walk to school, and no students bicycle to school. No bicycle racks were observed on the school property.

While walking to the West Road Intermediate School is restricted, it appears that students are interested in walking. The principal explained that the school has a Walking Club with

3 See Section 8411 of the District's Policy Manual, available online at: http://policy.microscribepub.com/cgi-bin/om_isapi.dll?clientID=292284509&depth=2&infobase=arlington.nfo&record={E90}&softpage=PL_frame

4 See Frequently Asked Questions related to bus routes and bus stops, at: http://www.arlingtonschools.org/index.php?option=com_content&task=view&id=75&Itemid=137

5 See Section 5453 the District's Policy Manual, available online at: http://policy.microscribepub.com/cgi-bin/om_isapi.dll?clientID=590340&advquery=bicycle&depth=2&headingswithhits=on&hitsperheading=on&infobase=arlington.nfo&record={A71}&softpage=PL_frame

approximately 100 student members who walk on the school track two mornings a week and snowshoe in the winter.

School Speed Limits

The Town and West Road Intermediate School principal have expressed interest in implementing a school speed zone along CR 71 (West Road). Chapter 7 of the New York State Manual on Uniform Traffic Control Devices (MUTCD) Supplement includes a discussion of school speed limits.⁶ Lowering a speed limit on a County Road requires a Town Board resolution requesting the change. The resolution is forwarded to DCDPW's Engineering Division for a recommendation, and then forwarded to NYSDOT, which conducts an investigation and makes a final determination.

The Town adopted a resolution in 2003 requesting a 25 mile per hour speed zone in front of the West Road Intermediate School. The request was forwarded to DCDPW, which supported the request and forwarded it to NYSDOT. A letter to the PDCTC from NYSDOT on August 4th, 2010 stated that NYSDOT completed an investigation of a school speed zone on CR 71 (West Road) and found that "in the absence of walking children, this location fails to meet the criteria for establishing a school speed zone."

Based on a discussion with staff from NYSDOT's Region 8 Traffic Safety and Mobility Group, NYSDOT would likely support a school speed zone if a sidewalk or path were installed, the school did not bus all students, and children were walking to school. However, NYSDOT would not implement a school speed zone before a pedestrian facility is installed.⁷ Based on this, adding a sidewalk or path along CR 71 (West Road), changing the school's busing policy, and lifting the school's current restriction on walking (to allow students to walk to school unaccompanied) would likely encourage walking and assist in advocating for a school speed limit.

5. Planned Projects

There is currently one major project in the study area, based on the County's 2009 inventory. It is a follow-on phase to the Brookside Meadows project and will include 28 residential units north of the existing Brookside Meadows project on CR 71 (West Road). Construction is planned for the fall of 2010 and the project is expected to be complete by spring 2011. Additional units may be constructed based on market demand.

The Town is also reviewing a proposed 10,000 square foot office building just north of Bower Road and east of US 44 (the Gasparro Professional Building), as well as a proposed 252-unit Condominium/Townhome project east of the Taconic Parkway and just south of US 44 (Taconic Homes).

⁶ The New York State Supplement to the MUTCD is available online at:

<https://www.nysdot.gov/divisions/operating/oom/transportation-systems/traffic-operations-section/mutcd>

⁷ Staff from NYSDOT's Region 8 Traffic Safety and Mobility Group indicated that they would be happy to discuss school speed zone options with the Town.

In 2006-7, the Town proposed a park, known as Redl Park, on a 29-acre site just east of the intersection of CR 71 (West Road) and NY 115. The park project was defeated in a vote but may be developed in the future. The 2005 plans showed that the park would be accessed via a driveway off of CR 71 (West Road) and would include a gravel trail encircling playing fields and providing access to the West Road Intermediate School. The plans did not include a path or sidewalk along CR 71 (West Road) or a pedestrian connection between the road and the park. These should both be considered, particularly if a pedestrian facility along CR 71 (West Road) were planned. The County Planning Department, in its review of the plans in 2005, also recommended a crosswalk on CR 71 (West Road) to connect the park and the apartment building across the street.

In 1994, DCDPW proposed a project to reconstruct a portion of CR 71 between US 44 and 350 feet west of Whiteford Drive (a total length of 2,880 feet). The project was intended to improve sight distance and pavement conditions only and did not include sidewalks. However, the project, along with several others, has been removed from the PDCTC's 2011-2015 Transportation Improvement Program (TIP) due to financial constraints. According to DCDPW staff, a new project with an updated scope could be added back onto the TIP for construction if federal funding is available.

The Town has also proposed a Town-wide water supply study. The study has not been funded and is a long-term project. However, if water service were planned, it would likely involve road work on CR 71 (West Road). This could provide an opportunity to coordinate construction with pedestrian improvements on CR 71 (West Road).

6. Options and Strategies

There are several options for providing pedestrian access along CR 71 (West Road). These include a shared-use path, sidewalks, and shoulder improvements. The benefits and drawbacks of these options are outlined below. Crosswalks, signage, roadway markings, and speed reduction strategies are also discussed below.

According to the DCDPW Engineering Division, the ideal section for this type of road (Urban Minor Arterial) would include two eleven-foot lanes with four to six-foot shoulders, curbs, a five-foot landscaped buffer and a five-foot sidewalk on each side. This would require a minimum right-of-way width of 50 to 54 feet, plus any room needed for utilities. This "ideal" section would be modified based on the characteristics of an individual road and the surrounding context.

Shared-Use Path

A shared-use path provides access for pedestrians as well as bicyclists and other human-powered travelers (e.g. those using skateboards, rollerblades, and scooters). Shared-use paths may be installed on both sides of a roadway but are often installed on only one side. Per NYSDOT guidelines, paths must be set back from the edge of the road by at least five feet with a buffer (landscaped area, drainage swale, or other) between the path and the road. Unlike sidewalks, paths are often not immediately adjacent to the road and do not require a curb. However, they

must be accessible per Americans with Disabilities Act (ADA) standards.⁸ NYSDOT's Highway Design Manual outlines surface, slope, grade and width requirements for paths, and states that paths should be "hard surfaced, smooth, and durable."⁹

Paths serve two-way travel, as it is generally impractical to enforce one-way travel on a path. A wide path may be striped with a center line to separate each direction of travel, but this is generally not necessary except on very crowded paths. The recommended minimum width for a two-way shared-use path ranges from 10 to 12 feet, depending on the volume and mix of users expected and the available right-of-way.

The benefits of a shared-use path are that it serves many types of users and is often perceived as safer than a sidewalk, due to its separation from the roadway. However, paths with multiple intersections or driveways can be unsafe for bicyclists, as drivers exiting a driveway or intersecting road generally do not expect (and do not look for) bicyclists riding in the opposite direction of traffic. In addition, a path on only one side of the road does not provide access for people coming or going to locations on the other side. Shared-use paths typically work best when they are in their own right-of-way (such as along a former rail line) and have fewer than five intersections per mile.¹⁰

The current travel lanes on CR 71 (West Road) are approximately 11 feet wide with shoulders which vary in width from one foot or less to five feet. In order to create room for a path along one side of the road, additional right-of-way would likely have to be acquired, and existing utility poles may have to be relocated. In planning the right-of-way, wetland areas and areas with steep slopes should be avoided as much as possible. In addition, there are approximately 23 intersections and driveways along each side of CR 71 (West Road), including the endpoints. A shared-use path would have to be designed very carefully to reduce conflicts with vehicles at these points, particularly for bicyclists, but also for pedestrians.

Sidewalk

A sidewalk provides access primarily for pedestrians, although bicyclists and other human-powered travelers often use them. Some jurisdictions, though not the Town of Pleasant Valley, have ordinances barring bicyclists from sidewalks, but this is difficult to enforce. Sidewalks should be installed on both sides of a road wherever possible to provide access to multiple destinations. In some cases, a sidewalk may be installed on only one side of a road (such as if land on the other side of the road is vacant), but this is typically discouraged as it often results in pedestrians making multiple crossings to get to their destination, and it is more difficult to install a sidewalk after a parcel is developed. The Pleasant Valley Town Code recognizes this, stating that developers "shall construct sidewalks on both sides of streets for commercial and industrial highways" (see Chapter 79-34).

⁸ For more information about accessible shared-use paths, see FHWA's Designing Sidewalks and Trails for Access, Chapter 14- Shared Use Path Design: <http://www.fhwa.dot.gov/environment/sidewalk2/sidewalks214.htm#sha>

⁹ See NYSDOT Highway Design Manual, Chapter 17 (Bicycle Facility Design) and 18 (Pedestrian Facility Design), available online at <https://www.nysdot.gov/divisions/engineering/design/dqab/hdm>

¹⁰ <http://www.bicyclinginfo.org/engineering/paths-principles.cfm>

Sidewalks are installed along the edge of a roadway. NYSDOT guidelines recommend a minimum five-foot wide sidewalk with a four- to six-foot wide landscaped buffer between the sidewalk and the roadway.¹¹ A five-foot wide sidewalk allows pedestrians to travel comfortably side-by-side. A wider sidewalk may be appropriate based on the expected level of use. A wider buffer increases pedestrian comfort, particularly along high-speed or busy roads, and could provide room for utilities or other objects. Current DCDPW-Engineering Division guidelines require utility poles to be located 10 feet from the edge of the travel lane in most instances. NYSDOT policies require constructing a curb where a sidewalk is provided. This entails additional construction and maintenance costs. Per federal law, ADA-compliant curb ramps are necessary at all intersections and driveways.¹²

Compared to a shared-use path, a sidewalk would require less right-of-way, if it were installed on only one side of the road. A well-designed sidewalk with an adequate buffer between it and the roadway can be just as safe as a path. However, a sidewalk would have less capacity than a path and is typically not intended for use by bicyclists. As with a path, providing a sidewalk on only one side of the roadway limits accessibility and is generally discouraged.

To provide room for a sidewalk on CR 71 (West Road), additional right-of-way may have to be acquired and existing utility poles may have to be relocated. Wetland areas and steep slopes should be avoided as much as possible.

Shoulder Improvements

In areas where sidewalks or paths are not feasible, roadway shoulders can provide for pedestrian and bicycle access. Shoulders provide little protection from adjacent vehicle traffic, but are relatively inexpensive and require less right-of-way than a sidewalk or path. Pedestrians are required by State law to walk in the opposite direction of traffic when practicable to maximize their visibility of and by drivers.¹³ Shoulders are also used by bicyclists (traveling in the same direction as cars) when the shoulder is smoothly paved and four feet or wider.

As described above, the shoulder width along CR 71 (West Road) varies considerably. If a sidewalk or path is not feasible in the short-term, an interim improvement could include widening the shoulders along both sides of the road to at least four feet or along one side of the road to at least five feet, per NYSDOT Highway Design Manual guidance.¹⁴ However, this improvement would most likely not be sufficient for parents to feel safe allowing their children to walk along the road. In addition, it could require rock cutting on the south/west side of the road between Station Road and Martin Road, and may entail right-of-way acquisition and utility pole relocation.

11 See NYSDOT Highway Design Manual, Chapter 18.6: Pedestrian Facility Design, available online at https://www.nysdot.gov/divisions/engineering/design/dqab/hdm/hdm-repository/chapt_18.pdf

12 See http://www.access-board.gov/prowac/guide/PROWGuide.htm#3_4

13 New York State Vehicle and Traffic Law, Article 27, Section 1156.

14 See NYSDOT Highway Design Manual, Chapter 18.6.2, online at https://www.nysdot.gov/divisions/engineering/design/dqab/hdm/hdm-repository/chapt_18.pdf

Crosswalks

In addition to a path, sidewalk, or improved shoulder, marked crosswalks should be considered on CR 71 (West Road) to improve access to and from the pedestrian generators described under *Existing Conditions*. Crosswalks alert drivers to locations where pedestrians may cross and encourage pedestrians to cross in a consistent location. Crosswalks may be located at an intersection or a mid-block location. Crosswalks may be marked with standard striping, but DCDPW prefers a high-visibility pattern such as “ladder” striping (see Figure 8– Crosswalk Striping).

Raised crosswalks are sometimes used to reduce vehicle speeds at crosswalks. However, these are most effective at locations with consistent pedestrian activity, so that drivers see people crossing and understand why it is important to reduce their speed. At locations such as schools, with short periods of pedestrian activity, drivers are less likely to slow down because most of the time there are no pedestrians present. This reduces the effectiveness of a raised crosswalk.

The location of any crosswalk should be determined by balancing convenience for pedestrians (since if it is not convenient, it will not be used) with visibility to drivers, who must be able to see pedestrians in time to slow down and yield. A safety analysis would be needed to determine viable crosswalk locations.

At school-area crossings, adult crossing guards should be present to help children cross and to ensure that drivers yield to pedestrians in the crosswalk, as required by State law.¹⁵ Crossing guards are required in New York State in areas where a school speed limit is established and students must cross a road to get to the school (see *School Speed Limits* section above).

The MUTCD and the New York State supplement to the MUTCD outline standards and guidance for roadway signs, markings, signals and other devices. Part 7 of the MUTCD describes traffic controls for school areas. Those sections related to crosswalks are included below.¹⁶

National MUTCD

Section 7C.03, Crosswalk Markings: Crosswalks should be marked at all intersections on established routes to school where there is substantial conflict between motorists, bicyclists, and pedestrian movements, where students are encouraged to cross between intersections, or where students would not otherwise recognize the proper place to cross.

Chapter 7E. Crossing Supervision, Section 7E.02 Adult Crossing Guards:

Option: Adult crossing guards may be used to provide gaps in traffic at school crossings where an engineering study has shown that adequate gaps need to be created (see Section 7A.03), and where authorized by law.

15 New York State Vehicle and Traffic Law, Article 27, Section 1151; available online at [http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=\\$\\$VAT1151\\$\\$@TXVAT01151+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=49732663+&TARGET=VIEW](http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=$$VAT1151$$@TXVAT01151+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=49732663+&TARGET=VIEW)

16 The National MUTCD is available online at: http://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.htm

Signage and Striping

Supporting signage and roadway markings are often used to alert drivers that they are approaching a crosswalk or pedestrian area, particularly near schools and other locations with many pedestrians. According to the MUTCD, warning signs should be installed for all marked school crosswalks at non-intersection (mid-block) locations.

School area signs are outlined in Section 7 of the MUTCD and shown on Figure 9– School Area Signs. These include the school advance crossing, school crossing, and school zone signs. In-street signs are also an option to encourage drivers to yield at crosswalks, but these generally function best on slow-speed roads in areas with many pedestrians, and are prone to damage by vehicles. The MUTCD includes guidance on the placement and design of school-area signs.

A pedestrian crossing sign with a flashing light or “beacon” can be used to draw drivers’ attention to a crosswalk at an unsignalized location (see Figure 10– Pedestrian Crossing with Beacon). A “pedestrian hybrid beacon” or “HAWK” signal is another option to assist pedestrians at an unsignalized crosswalk. This is a pedestrian-actuated signal: when a pedestrian pushes the pushbutton, drivers see a flashing yellow, then a steady yellow, and then a red light, during which pedestrians are given a signal to walk. During the “flashing don’t walk” phase, drivers see a flashing red light, meaning they must stop first and only proceed if the crosswalk is clear. When not activated by a pedestrian, the signal is dark (see Figure 11– Pedestrian Hybrid Beacon). This is a new signal type, and is described in Section 4F of the MUTCD.¹⁷

An advance yield line may also be marked to encourage drivers to yield before a crosswalk (see MUTCD section 3B.16). The advance yield line can be supplemented with “Yield Here For Pedestrians” signs to tell drivers where to stop to let a pedestrian cross. These signs are detailed in MUTCD section 2B.11 (see Figure 12– Yield Lines and Signage).

Speed Reduction Strategies

A critical element of pedestrian safety is reducing vehicle speeds so that people feel safe walking along the roadway. Based on discussions with the West Road Intermediate School principal, speeds on CR 71 (West Road) are perceived to be too high. In addition to establishing a school speed zone (discussed above under *Current Policies*), there are several strategies for reducing speeds.

It is important to recognize that lowering a speed limit by itself is unlikely to reduce speeding. Drivers generally base their speed on what feels comfortable or safe given the design of the road. The width of the lanes, horizontal and vertical curvature, shoulder width, presence of street trees, sidewalks, and other features affect speeds much more than speed limit signs. A wide, straight, open road will have higher speeds than a narrow, curving road or an urban road with sidewalks, street trees and buildings close to the street. Therefore, reducing speeds requires changing the road’s characteristics to change drivers’ perception of a safe speed. For CR 71 (West Road), adding sidewalks, trees or other landscaping, and narrowing the lanes, if feasible, would help

¹⁷ HAWK signals were first used in Arizona and have been installed recently in Delaware, Georgia, Minnesota, Virginia, and Alaska.

create a slower-speed environment.

Another element to speed reduction is education. Signs that alert drivers to the presence of a school area, warn them of an approaching crosswalk, and remind them of their legal responsibility to yield to pedestrians can help create awareness about pedestrian safety and encourage slower speeds. Fixed or moveable speed trailers can be used to tell drivers their current speed and how it compares to the speed limit. There are also school-area speed limit signs that show drivers their current speed so they can clearly see if they are exceeding the limit (see Figure 13a– School Speed Limit Signs and Figure 13b– Radar-Based Speed Limit Signs). Similar signs have been used locally on US Route 9 near Marist College. Presentations, written materials, and other outreach can also be used to educate drivers about the dangers of speeding.

A final aspect of speed reduction is enforcement. While physical changes to the road naturally enforce slower speeds, a police presence can help, particularly when the road design itself does not adequately reduce speeds. Police can be effective at enforcing special conditions, such as a school speed limit during specific hours. A publicized “wave” of concentrated enforcement often gets public attention and can be effective if repeated or supplemented by regular patrols. The Town should work with the County Sherriff on speed enforcement strategies for CR 71 (West Road).

Pedestrian Amenities

A walkable environment involves more than providing a sidewalk or path– it requires creating a place where people feel comfortable and safe walking. Pedestrian-scale lighting along the route adds to pedestrians’ sense of security. Street trees provide shade, which increases pedestrians’ comfort, and have also been shown to help slow traffic. Other amenities such as benches, landscaping and trash cans are also important in creating a welcoming place to walk. Most importantly, land use and development patterns should support walking by providing many destinations easily accessible by foot.

The Dutchess County Planning Department’s *Greenway Guides* on Walkable Communities, Lighting, and Street Trees provide specific guidance. These are available online at <http://www.co.dutchess.ny.us/CountyGov/Departments/Planning/17331.htm>.

7. Recommendations

There are key pedestrian generators on both sides of CR 71 (West Road). The north side has substantially more housing than the south side, including three multi-family residential complexes with a total of 300 units and a number of single-family homes. However, the south side has the West Road Intermediate School (with 400 students), the school’s playing fields, and the potential future Redl Park. A complete pedestrian network with sidewalks or paths on both sides of the road connected by multiple crosswalks would provide the highest level of pedestrian access. However, given the constraints of right-of-way, slopes and wetlands, utilities, and cost, it is prudent to consider a range of options.

Additionally, any improvement would have to consider bicycle accommodation, such as shoulder widening, a shared-use path, or a wide outside travel lane on the roadway. Per the American Association of State Highway and Transportation Officials' (AASHTO) *Guide for the Development of Bicycle Facilities*, a shoulder for bicycling should be at least 5 feet if curbed and 4 feet if uncurbed.¹⁸

Different treatments may also be possible for different segments of the road. Recommendations for each of the three study area segments are discussed below. A detailed engineering analysis will be necessary to determine the appropriate treatment, preferred alignment, best crosswalk locations, and total cost. Ultimately, the Town must determine its vision for the roadway and how a project on CR 71 (West Road) fits within its other priorities.

Segment 1: US 44 to Brookside Road

Segment 1 is likely to have the highest amount of continuous pedestrian activity, given the Hamlet center and number of housing units on this part of CR 71 (West Road). However, this segment also has the most severe constraints, including steep slopes, limited right-of-way, curves, and limited visibility. Given these constraints, a shared use path is likely infeasible on this segment. Shoulder improvements, while potentially useful for bicyclists, are not recommended for pedestrian access given the limited visibility due to the road curvature. Sidewalks, which provide more safety than shoulders and require less right-of-way than a path, would be the most appropriate treatment on this segment. Bicyclists could be accommodated on a wide outside travel lane or possibly widened shoulders.

A 400-foot long sidewalk currently exists along the north-east side of CR 71 (West Road) between US 44 and the commercial buildings. This should be extended, but would likely require right-of-way from the adjacent property owners and relocation of utility poles. A sidewalk extension to Martin Road, Whiteford Drive (east and west), and Brookside Road would connect a large number of residents to the Hamlet and should be a long-term goal. The existing sidewalk on the south-west side of the road at US 44 could possibly be extended, but would require extensive rock cutting, right-of-way acquisition, and utility pole relocation, which may make a sidewalk on the south side of this segment impractical.

Depending on the location of a sidewalk, crosswalks should be marked to provide access to the sidewalk from pedestrian generators. For example, a crosswalk at Charles Street would provide access between the offices and a sidewalk on the north side of CR 71 (West Road), enabling workers to walk between the Hamlet and the offices.

At the CR 71/US 44 intersection, a third high-visibility crosswalk could be considered across the western leg (eastbound approach) to improve pedestrian access. However, this would have to be coordinated with NYSDOT, which controls the intersection. Pedestrian signals and push buttons should be provided for all crossings at the intersection.

¹⁸ The AASHTO Guide for the Development of Bicycle Facilities is available online at <http://www.communitymobility.org/pdf/aashto.pdf>

Segment 2: Brookside Road to Robert Lane

Segment 2 has many pedestrian generators, but activity is likely more concentrated at specific times of day compared to Segment 1. School-related activity peaks around 8:30 am and 3:00 pm, while the school playfields and planned park will be busiest in the afternoon, evening, and on weekends. This segment of CR 71 (West Road) is relatively flat and straight, with less limited right-of-way than Segment 1. While shoulder improvements may be feasible, they are unlikely to provide sufficient safety for parents to feel comfortable letting their children walk to school. Sidewalks on both sides of the road would provide the highest level of pedestrian access; however, a sidewalk or shared-use path on one side should also be considered.

All three multi-family residential buildings on CR 71 (West Road) are located on the north side of the road. In addition, there are four intersections or driveways on the north side of this segment (excluding the two endpoints), compared to eight intersections or driveways on the south side. The north side also has more room available and a flatter grade than the south side. For these reasons, the north side of the road would be preferred for a one-sided facility. However, the north side has many more utility poles than the south side, and these would likely have to be relocated.¹⁹ Alternatively, a sidewalk or path may be able to be located behind the utility poles. The final decision as to whether to install a north-side only path, north-side only sidewalk, or sidewalks on both sides of this segment will depend on a detailed engineering analysis and available funding. Bicyclists could be accommodated on a shared use path or widened shoulders.

Regardless of which facility is selected, crosswalks should be marked to connect the pedestrian generators on both sides of the road. A crosswalk should be provided between the Country Commons apartments and the future park site, as well as between the housing on the north side of the road and the school. A crosswalk at the west end of the school's loop driveway would be more visible to drivers than one at the east end due to the grade of the road. A west-end crosswalk would also entail fewer conflicts with buses, since the buses exit at the east end. However, buses and cars enter and cars exit at the west end of the driveway. A crosswalk in between the two driveways could also be considered, although buses exiting left (from the east driveway) and cars exiting right (from the west driveway) would need to slow immediately after exiting, which could be a safety issue. The Town should work with the West Road Intermediate School principal, Arlington School District staff, and DCDPW to determine the best location for the school crossing. Signage, striping, and lighting should also be considered to draw attention to the crosswalk, as described under *Options and Strategies*.

There is an existing sidewalk along the east side of the school driveway. This should be extended to connect to any future crosswalk and sidewalk or path. A sidewalk or path from CR 71 (West Road) into Redl Park should also be incorporated into any future park plans. Finally, the Town should ensure that the facility planned for this segment connects to the facility planned for Segment 1, even if they are not constructed at the same time.

¹⁹ It appears that the utility poles on the north side are transmission poles, while those on the south side are primarily service poles.

Segment 3: Robert Lane to NY 115

Segment 3 is the shortest segment of the three and has the least pedestrian activity. It would be best to continue the facility type that is selected for Segment 2 to provide continuity for pedestrians, but this may not be feasible. The stone wall on the north side of the road just west of Robert Lane would make a sidewalk or path on that side difficult. The shoulders on the north side are moderately wide, but given the significant grade of the road (sloping steeply down from west to east), a wider buffer would be preferred. Shoulder improvements would likely not provide enough separation from traffic for pedestrians to feel safe. The south side of the road has more room available for a sidewalk or path, but there are several utility poles that would have to be relocated. Regardless of what facility is selected, it should connect to the facility along Segment 2 to provide a continuous pedestrian network. Bicyclists could be accommodated on a shared use path (if it were continuous) or widened shoulders.

8. Generalized Costs

Unit Costs

The costs outlined below are unit prices or estimates provided by DCDPW unless otherwise noted. They are intended to be used for planning purposes only. A more precise cost estimate should be developed once the project scope is defined.

Item	Unit	Unit Cost	Notes
<i>Sidewalk/Path Related Construction Costs</i>			
Clearing & Grubbing	Lump Sum (LS)	\$35,000 for 5' one-side sidewalk; \$55,000 for two-side 5' sidewalk; \$60,000 for 10' one-side path	For entire length of road
Excavation & Disposal	Cubic Yard (CY)	\$35	Estimated 1,800 CY for one 5' sidewalk
Embankment in Place	CY	\$40	Estimated 2,200 CY for one 5' sidewalk
Sub-Base	CY	\$25	Estimated 550 CY per 5' facility
Sawcut Concrete/Asphalt	Linear Foot (LF)	\$4.50	Estimated 7,100 LF for one-side facility
Remove/Reset Existing Stone Wall	LF	\$100	Estimated 200 LF (at Robert Lane and near 20 West Road)
Retaining Wall	Square Foot (SF)	\$32	Estimated 1,200 SF for one-side facility
Reinforced Concrete Sidewalk or Path	SF	\$10	Estimated 29,540 SF per 5' facility
Sidewalk/Path Ramps (new or retrofitted)	Each	\$1,200	Estimated 44 ramps on north side of road; 48 on south side

Item	Unit	Unit Cost	Notes
Driveways (remove, restore or replace)	Each	\$1,000	Estimated 16 on north side of road; 22 on south side
Concrete Curb	LF	\$12	Estimated 6,000 LF for one-side facility
Drainage Pipes & Catch Basins	LS	\$200,000 for one-side facility; \$400,000 for two-side facility	
Landscaped Buffer (5 feet wide)	SF	\$3.00	Estimated 29,540 SF per 5' facility
Existing Drainage Pipe Extension	LS	\$30,000 for 5' one-side sidewalk; \$60,000 for two-side 5' sidewalk; \$35,000 for 10' one-side path	Located west of West Road Intermediate School
Pedestrian Bridge	LS	\$200,000 (or \$400,000 for culvert extension on both sides of road)	Across creek near Charles Street
Guide Rail (for bridge & drop-offs)	LF	\$40	Estimated 500 LF for one-side facility
Paved Shoulder (6 feet wide)	SF	\$9.00	Estimated 34,850 SF for one side of road; 69,700 SF for both sides of road
Crosswalks & Pavement Markings	LS	\$25,000 for 5' one-side sidewalk; \$50,000 for two-side 5' sidewalk; \$40,000 for 10' one-side path	
Signage	Each	\$500	Estimated 20 signs for one 5' sidewalk
<i>Pedestrian Amenities</i>			
Street Trees	Each	\$400	Estimated 60 trees per side of street
Pedestrian-Scale Lighting	Each	\$4,000	Estimated 30 lights per side of street
<i>Signals</i>			
Pedestrian Signals and Push Buttons	LS	\$30,000	Modify existing signals at intersection with US 44
Hybrid Pedestrian Beacon (HAWK)	LS	\$45,000	
<i>Maintenance</i>			
Lighting and Snow Removal	Annual	\$18,000 if sidewalk on one side; \$36,000 if sidewalk on both sides	Includes 4 months of snow removal
<i>Additional Construction-Related Costs</i>			
Maintenance and Protection of Traffic	Percentage	4% of subtotal cost	
Construction Staking	Percentage	1% of subtotal cost	

Item	Unit	Unit Cost	Notes
Mobilization	Percentage	4% of subtotal cost	
Engineering	Percentage	12% of subtotal cost	
Contingency	Percentage	10% of subtotal cost	

Comparative Costs

Based on the unit costs above, the following estimates were developed for comparison purposes. Each assumes a facility along the entire length of CR 71 (West Road) – approximately 6,000 feet. The sidewalk and path estimates include drainage, a landscaped buffer, six foot shoulder, curb (for sidewalk only) ramps, crosswalks, and signage, as well as maintenance and protection of traffic, staking, mobilization, engineering, and contingency. The shoulder estimate includes only shoulder paving. The estimates do not include right-of-way acquisition, utility relocation, or earthwork costs outside of the sidewalk or path area.

Item	Estimated Cost	Notes
<i>5 foot wide sidewalk - one side of the road</i>		
Sidewalk-related construction costs	\$1,614,000 (or approximately \$270/linear foot)	
Additional construction-related costs	\$500,000 (or approximately \$83/linear foot)	
Total	\$2,114,000 (or approximately \$352/linear foot)	
<i>5 foot wide sidewalk - both sides of the road</i>		
Sidewalk-related construction costs	\$3,318,000 (or approximately \$277/linear foot)	Includes excavation of rocks on southwest side of road near US 44 (estimated at \$200/CY or \$140,000 total) and culvert extension on both sides of road
Additional construction-related costs	\$1,029,000 (or approximately \$86/linear foot)	
Total	\$4,347,000 (or approximately \$362/linear foot)	
<i>10 foot wide path - one side of the road</i>		
Path-related construction costs	\$2,142,000 (or approximately \$357/linear foot)	Does not include curb.
Additional construction-related costs	\$664,000 (or approximately \$111/linear foot)	
Total	\$2,806,000 (or approximately \$468/linear foot)	
<i>6 foot wide improved shoulder</i>		
One side of road	\$313,600	Does not include drainage.
Both sides of road	\$627,300	Does not include drainage.

Based on the existing conditions described above, there are likely to be substantial right-of-way acquisition, utility relocation, and earthwork costs that cannot be estimated without a detailed engineering analysis. Relocating utilities that are currently within the public right-of-way to outside of the public right-of-way (onto private property) will entail substantial costs. If the utilities can be moved within the public right-of-way, this will reduce the cost. These factors should be considered when evaluating the feasibility of any option.

9. Funding Mechanisms

There are a variety of funding sources available for pedestrian projects, ranging from local municipal funds to federal transportation funds. These are described below.

Local Funds

We understand that local resources are extremely limited. However, local funds are generally more flexible and require less reporting and administrative work than federal funds, so many municipalities find that it is actually be less expensive to use local funds than federal funds. Local funding mechanisms include the following:

- *General Fund/Discretionary Funds:* Local general funds may be the most flexible funding source; however they are also the most limited. The Town would have to weigh the project against other local priorities.
- *Local Bond:* Town residents could be asked to approve a local bond to construct the project. However, given the status of Town projects such as Redl Park and the water supply study, it may be difficult, at least in the short term, to gain voter approval for bond financing.
- *Development Condition of Approval:* Depending on the level of development expected in the area, the project could be implemented by adding a condition of approval on proposed development projects. Prospective developers would have to construct or provide funding for construction of the pedestrian project as part of their project. The Town Code already requires developers to construct sidewalks on both sides of the road, but it appears that this has not been enforced. The Town should enforce this requirement and could include additional conditions requiring construction of or funding for signage, crosswalks, lighting, landscaping, and pedestrian amenities.
- *Foundation Grants:* Foundations may have funding for pedestrian and/or school-related projects. The Foundation Center website has a national database of grant-makers and grants, as well as other tools for grant-seekers; see <http://foundationcenter.org>.

Federal Funds

All federal transportation funding sources are included in the federal transportation bill. The most recent bill, the [Safe, Accountable, Flexible, Efficient Transportation Equity Act—a Legacy for Users \(SAFETEA-LU\)](#), expired in 2009. As of the date of this report, Congress has not yet

passed a new transportation funding bill, making the status of current funding programs uncertain. Current funding programs may end or be re-organized. However, the Administration's focus on "livability" and "smart growth" implies that funding for pedestrian improvements would be included in federal programs.

To use federal funds (except for CDBG funds), a project must be consistent with an overall long-range plan, such as [New Connections](#) (PDCTC, 2007) and be included in the PDCTC's [Transportation Improvement Program](#) (TIP).

Federal transportation funding sources that could be used include the following:

- *National Highway System (NHS)*: These funds may be used to construct pedestrian facilities on land adjacent to any highway on the National Highway System. US 44 is the only roadway that would be eligible in the study area.
- *Surface Transportation Program (STP)*: These funds may be used either for the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as brochures, public service announcements, and route maps) related to safety. A portion of each State's STP funds must be used for Transportation Enhancement Activities (see below for more information).
- *Congestion Mitigation Air Quality Program (CMAQ)*: These funds may be used either for the construction of bicycle transportation facilities and pedestrian walkways or non-construction projects (such as brochures, public service announcements, and route maps) intended to increase bicycle and pedestrian use. These projects must be primarily for transportation rather than recreation, and must have a demonstrated impact on improving existing congestion or air quality. Funding is available for areas that do not meet the National Ambient Air Quality Standards (nonattainment areas) as well as former nonattainment areas that are now in compliance (known as maintenance areas). Because Dutchess County is part of a nonattainment area for ozone, CMAQ funds are available for local projects. More information is available on [FHWA's CMAQ webpage](#).
- *Safe Routes to School (SRTS)*: This is a federal reimbursement program that provides funding for engineering as well as enforcement, education, and encouragement activities that support walking and bicycling to school by elementary and middle school students. SRTS funds can be used for projects that will improve safety and reduce vehicular traffic, fuel consumption and air pollution within a two-mile vicinity of primary and middle schools (grades K-8). In New York State, the program is managed by NYSDOT. NYSDOT will reimburse up to 100 percent of eligible project costs, which include planning, design, construction, outreach, education and enforcement. Right-of-way acquisition, relocation of utilities, and wetland remediation are not eligible costs. Applicants can be a County, City, Village, Town, public school district, individual public, charter, private or parochial school, or a non-profit organization. More information is available on [NYSDOT's SRTS website](#).

- *Transportation Enhancement Program (TEP)*: This is a reimbursement program that provides funding for pedestrian and/or bicycle infrastructure, as well as scenic easements, landscaping, historic preservation, and other projects. The program is funded by a set-aside under the federal Surface Transportation Program. Projects must have a municipal sponsor, a minimum total cost of \$200,000, and include a minimum twenty percent non-federal match. Eligible costs include studies, design, construction, and right-of-way acquisition. Administrative and maintenance costs are not eligible. For more information on the program, see www.dot.state.ny.us/progs/tep.html.
- *Community Development Block Grants*: These are federal funds from the U.S. Department of Housing and Urban Development and are administered by the Dutchess County Department of Planning and Development. Eligible activities include economic development and infrastructure improvements (such as sidewalk construction, road work, and drainage) in areas defined as low and moderate income. CDBG could fund construction and engineering work, but not an engineering study or administrative costs. The south side of CR 71 (West Road) abuts an economically distressed Census block group and therefore qualifies for CDBG funds. However, the Town could conduct an income survey to determine eligibility for a project on the north side of the road. CDBG applications are typically issued in July and due back in October. For more information, see <http://www.co.dutchess.ny.us/CountyGov/Departments/Planning/16690.htm>.

The federal share of the costs of projects under the NHS, STP, CMAQ and TEP programs is generally 80 percent. If these funds were used, the project sponsor would be responsible for the required local match and any costs that are not covered by the federal funds.

An engineering study could be funded by local funds, TEP, or SRTS funds. Design and construction of a pedestrian facility could be funded by any of the sources above, and could be a stand-alone project or combined with a roadway project. A large project could also be split into several smaller pieces with funding from different programs.

Local Sidewalk Project Examples

The following pedestrian projects from other areas in the county could serve as useful models for the Town. In addition, the Town of Pleasant Valley received CDBG funds in 2010 to construct sidewalks on CR 72 (North Avenue).

- *Village and Town of Red Hook - (various)*: The Village and Town of Red Hook have recently received funding for three sidewalk projects. In 2008, the Town received \$150,000 in CDBG funds to install approximately 1,300 feet of new sidewalks along NYS Route 9. This project improved pedestrian safety and access to the many businesses located within the Town center. In 2009, the Town and Village received a total of \$230,000 in CDBG funds for a sidewalk extension project on Linden Avenue from Park Avenue to the Town Recreation Park. D.F. Wheeler Engineers did the engineering work. In 2010, the Village received approximately \$220,000 in State funds to construct approximately 2,100 feet of sidewalks on Park Avenue, Firehouse Lane, and West Market Street (Route 199) as well as to install new crosswalks and curb ramps. The

Village's engineer from M.A. Day Engineering completed the analysis and design work.

- Town of Poughkeepsie- Violet Avenue Elementary Sidewalks (SRTS): The Town of Poughkeepsie received \$423,500 in SRTS funds in 2008 to support the construction of 4,000 linear feet of sidewalk near Violet Avenue Elementary School and to include an education effort and expanded enforcement.
- Village of Wappingers Falls- Spring Street (ARRA): The Village of Wappingers Falls received approximately \$240,000 in ARRA funds to reconfigure the Route 9D/Spring Street intersection, including expanding sidewalks and adding new crosswalks. The Village's consulting engineer completed the analysis and design work.
- Town of Poughkeepsie- Main Street (CDBG): The Town received approximately \$63,000 in CDBG funds in 2007 to replace 935 feet of badly damaged and deteriorated sidewalks on Main Street in the Arlington Business District, which included new curbs, lighting and street trees. The project ties in with the Town's plan to promote a pedestrian friendly community by improving pedestrian safety and access for the residents and business owners in the Arlington area.
- Village of Pawling- East Main Street (CDBG): The Village received \$150,000 in CDBG funds in 2007 to install approximately 1600 feet of sidewalks and curbing along East Main Street to connect South Road to the Village's existing sidewalk system. For residents, the project has improved pedestrian safety and access to the Village business district and churches located within the Village center.
- City of Beacon- South Avenue (STP): The City of Beacon used federal Surface Transportation Program (STP) funds for the reconstruction of South Avenue, which included sidewalk improvements.
- Village of Pawling- Village Green (various): The Village Green project will include pedestrian improvements in and around the Veterans Memorial Park. The \$3.5 million project is funded through a combination of federal and state grants, including \$2.5 million in private donations.
- Dutchess Rail Trail- (CMAQ): DCDPW used CMAQ funds through the PDCTC TIP process to fund construction of several phases of the Dutchess Rail Trail, a shared-use path. County funds were used for the local match. Engineering and design work was done in-house by DCDPW staff.
- Town of Amenia- Wassaic Trail to the Train (TEP): The Town received a \$480,000 TEP grant to extend the Harlem Valley Rail Trail 0.6 miles south from the Wassaic Metro-North Station to the Hamlet of Wassaic. Local funds were used for the 20 percent match. The Town received a Hudson River Greenway Conservancy Small Grant of \$10,000 to assist with consultant design services. Engineering work will be done by a consultant.

10. Summary

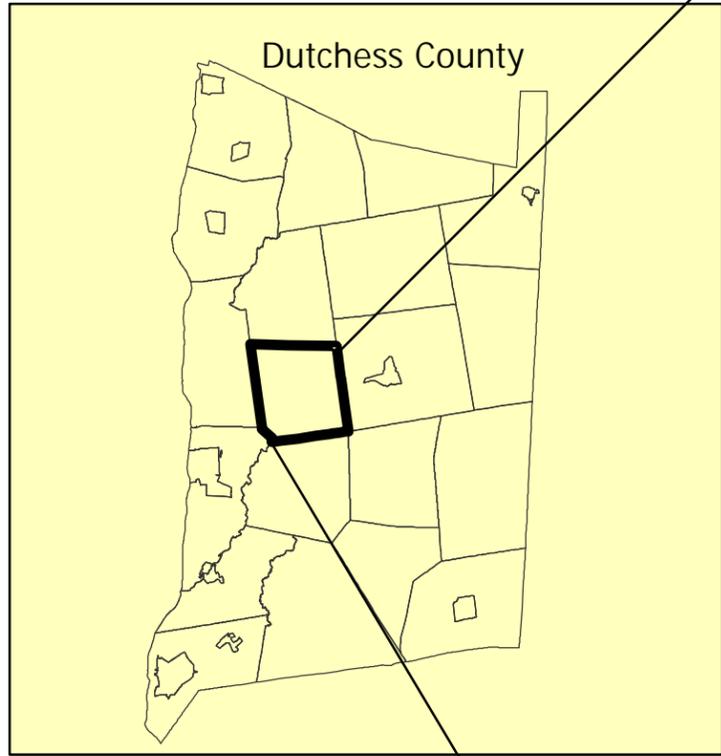
The study area has significant pedestrian generators that justify consideration of pedestrian facilities. These include three multi-family residential complexes and a number of single-family homes, the West Road Intermediate School and playing fields, the potential future Redl Park, and the Pleasant Valley Hamlet. A complete pedestrian network with sidewalks or paths on both sides of the road connected by multiple crosswalks would provide the highest level of pedestrian access. However, given the constraints of right-of-way, slopes, wetlands, and utilities, as well as limited resources, a range of options should be considered, including different treatments for various segments of the road. A detailed engineering analysis will be necessary to determine the appropriate facility and costs.

If the Town decides to move forward, the following next steps should be considered:

- Discuss the options and strategies outlined in this report and determine priorities, in consultation with DCDPW.
- Once the Town determines its priorities, complete an engineering analysis and preliminary right-of-way needs assessment to determine the conceptual facility type, alignment, and right-of-way needed. DCDPW may be able to assist the Town with some elements of the analysis.
- Develop a project scope, including necessary elements such as signage, crosswalks and other striping, and any utility work, project limits, phasing, and cost estimates. The scope should not preclude future pedestrian access along the entire road.
- Create a list of priority projects based on the scope. The projects could be phased over a period of several years.
- Identify appropriate project sponsors
- Identify and pursue funding sources for implementation
- Coordinate project(s) with future DCDPW projects, Redl Park construction, or water service-related roadwork, if possible.
- In coordination with DCDPW, NYSDOT, and the Arlington School District, pursue a school speed zone in conjunction with the installation of a pedestrian facility and revision of the West Road Intermediate School's busing and walking policies.

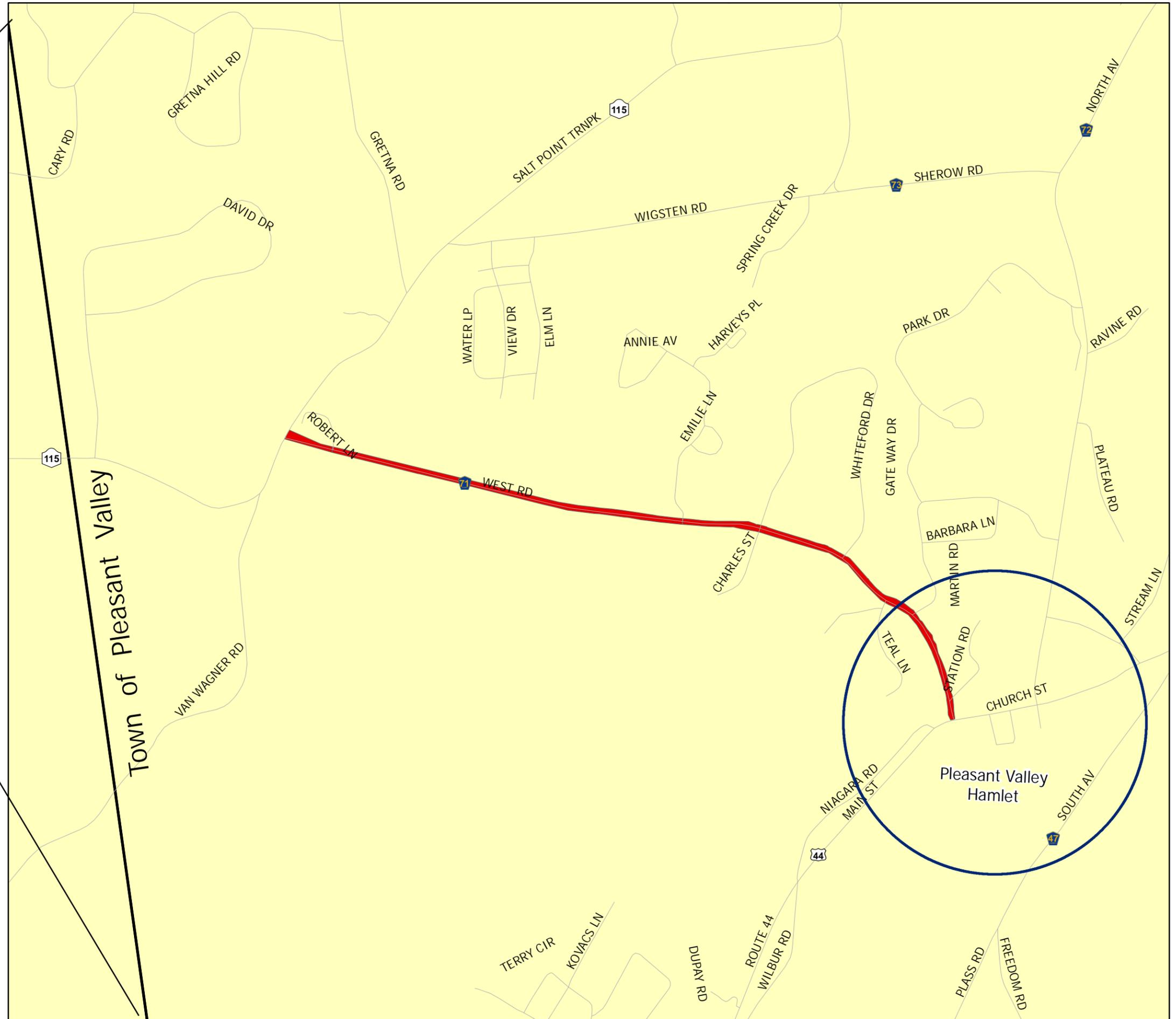
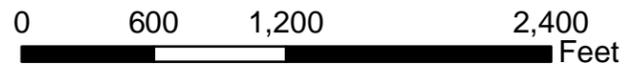
The following steps could begin immediately:

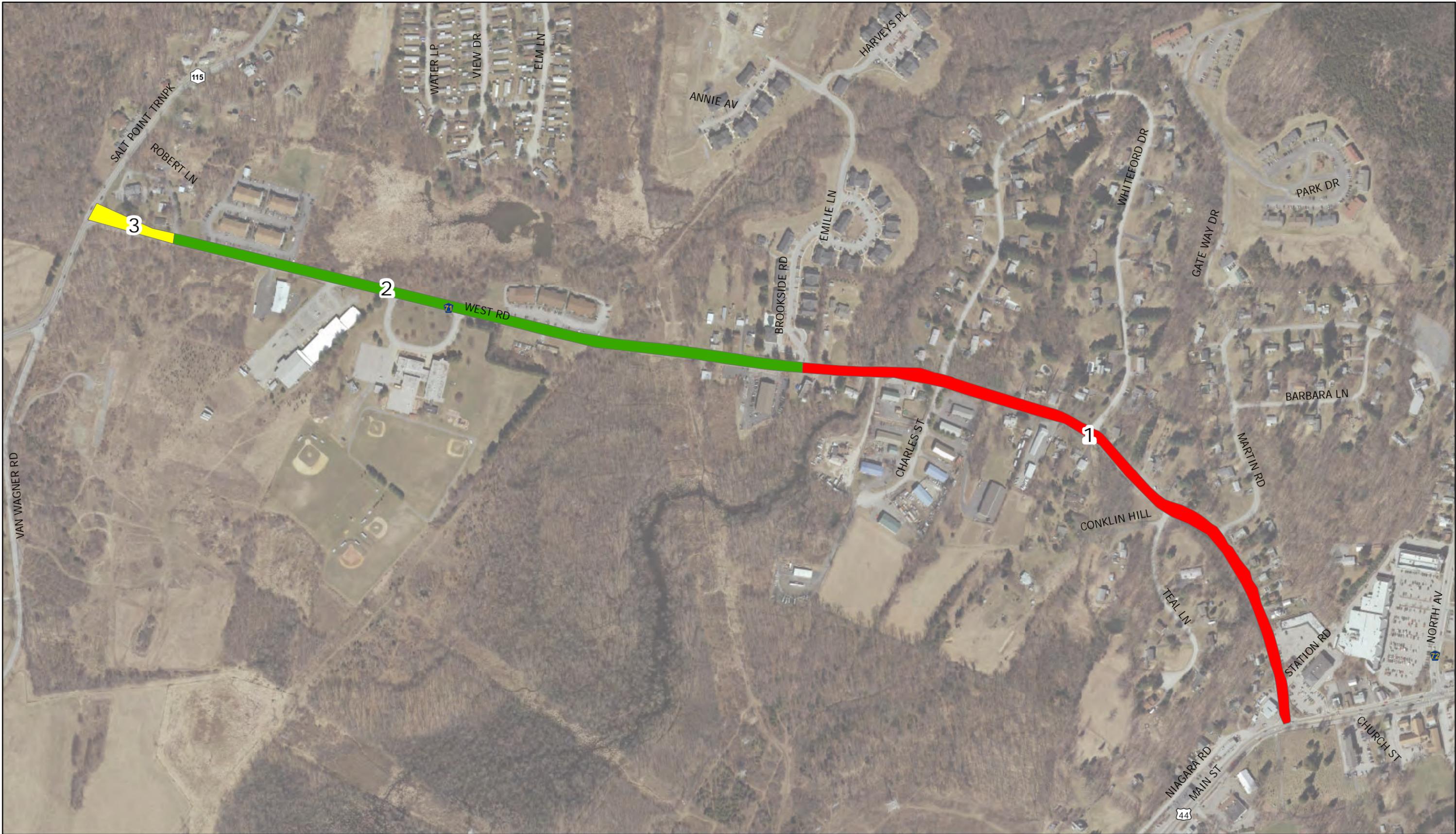
- Enforce the existing Town Code requirement that developers construct sidewalks on both sides of the street, or create a Town sidewalk fund that developers contribute to.
- Incorporate conditions of approval to ensure that appropriate pedestrian facilities and enhancements are included in every site plan.
- Develop a speed limit enforcement plan and other speed-reduction policies as needed, in coordination with the County Sherriff and State Police.



Pleasant Valley
CR 71 (West Road)
Sidewalk Feasibility Study

Location Map
Figure 1





CR 71 (West Road)
Study Area
Figure 2

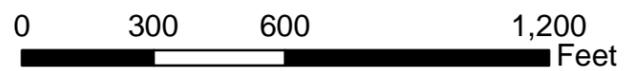
Study Area Segments

- 1 Main Street to Brookside Lane
- 2 Brookside Lane to Robert Lane
- 3 Robert Lane to Salt Point Turnpike





CR 71 (West Road)
Environmental Conditions
Figure 3



 Streams

 Waterbodies

 DEC (State) Wetlands

 NWI (Federal) Wetlands

Steep Slopes
 15 - 24.9%

 25% and greater

Figure 4 - West Road Traffic Volumes

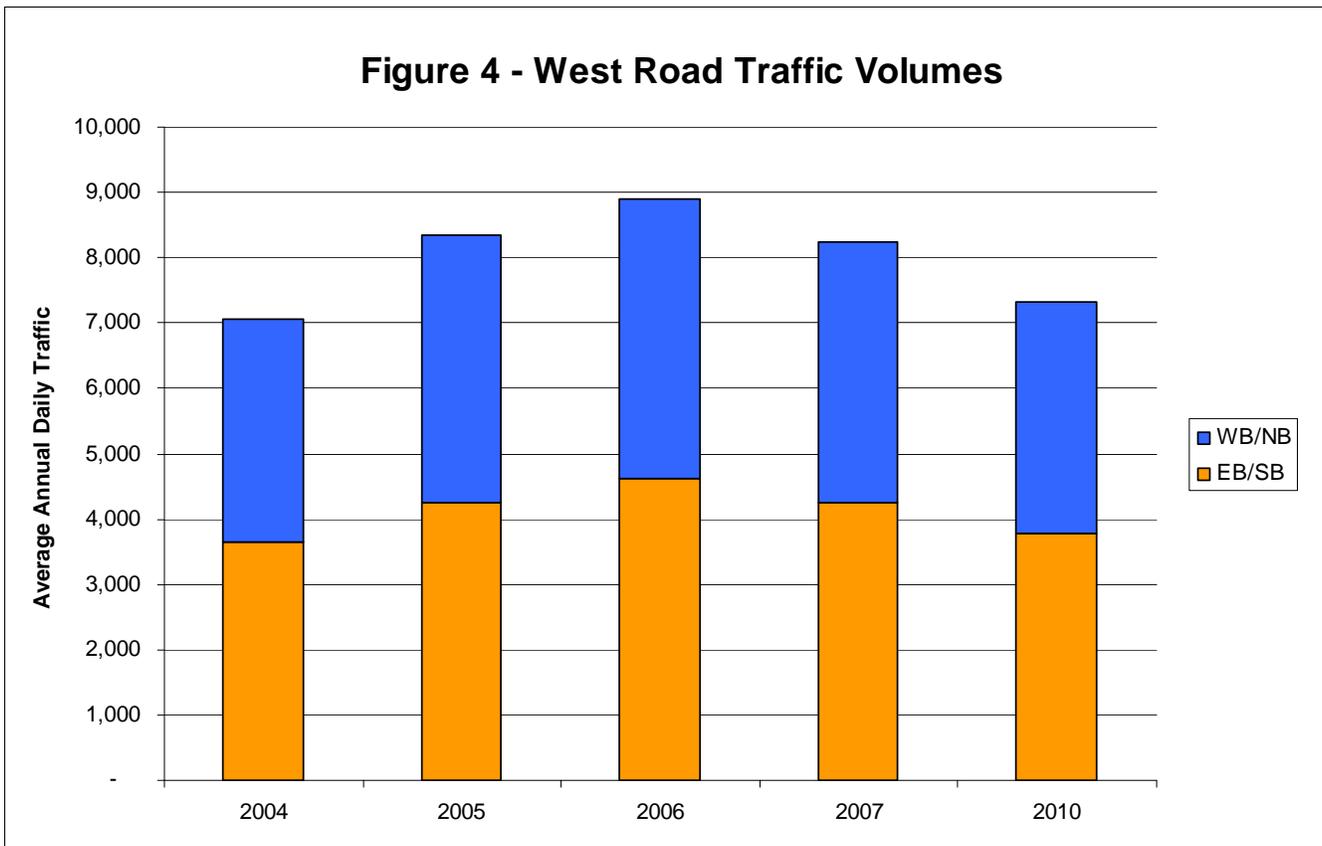
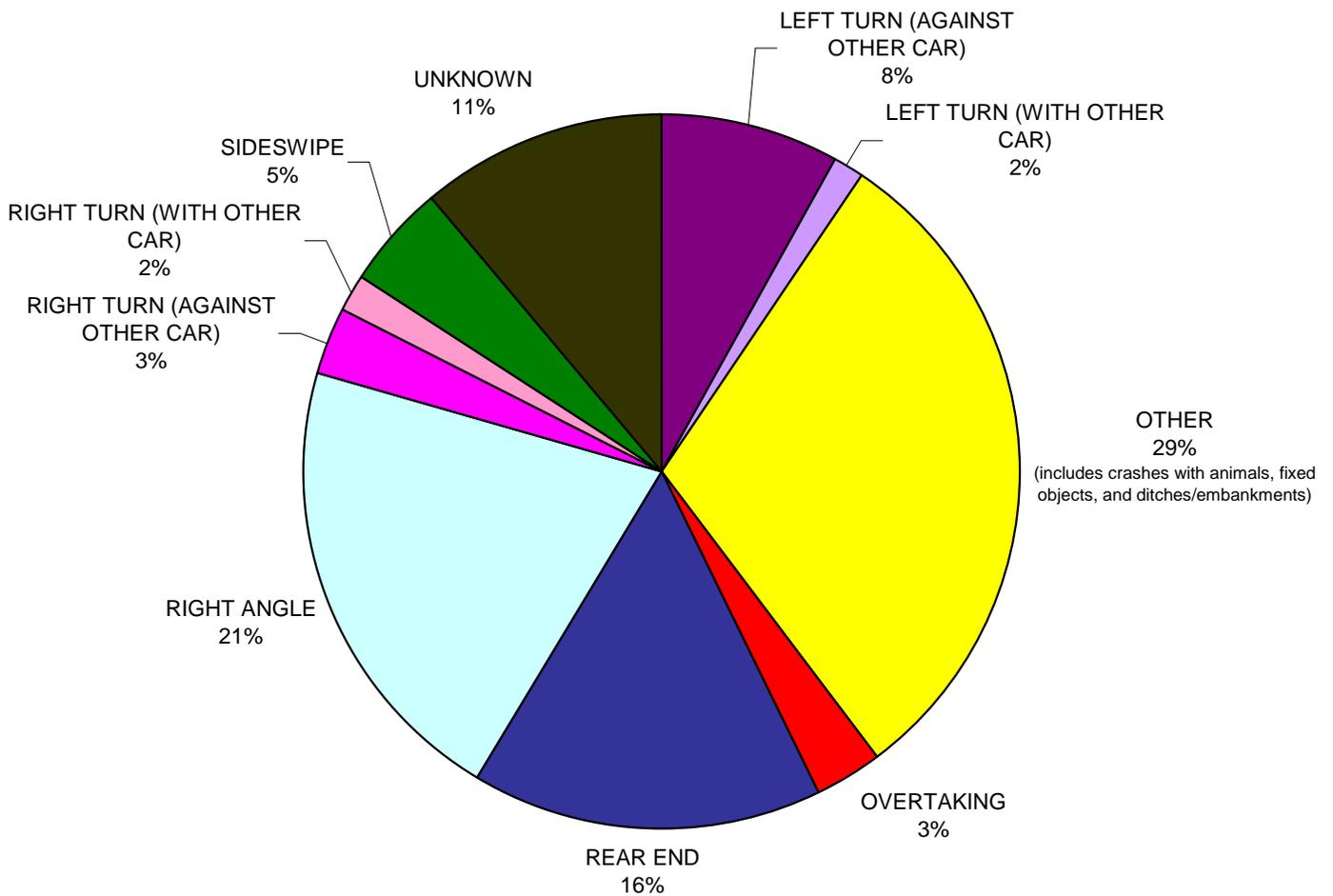
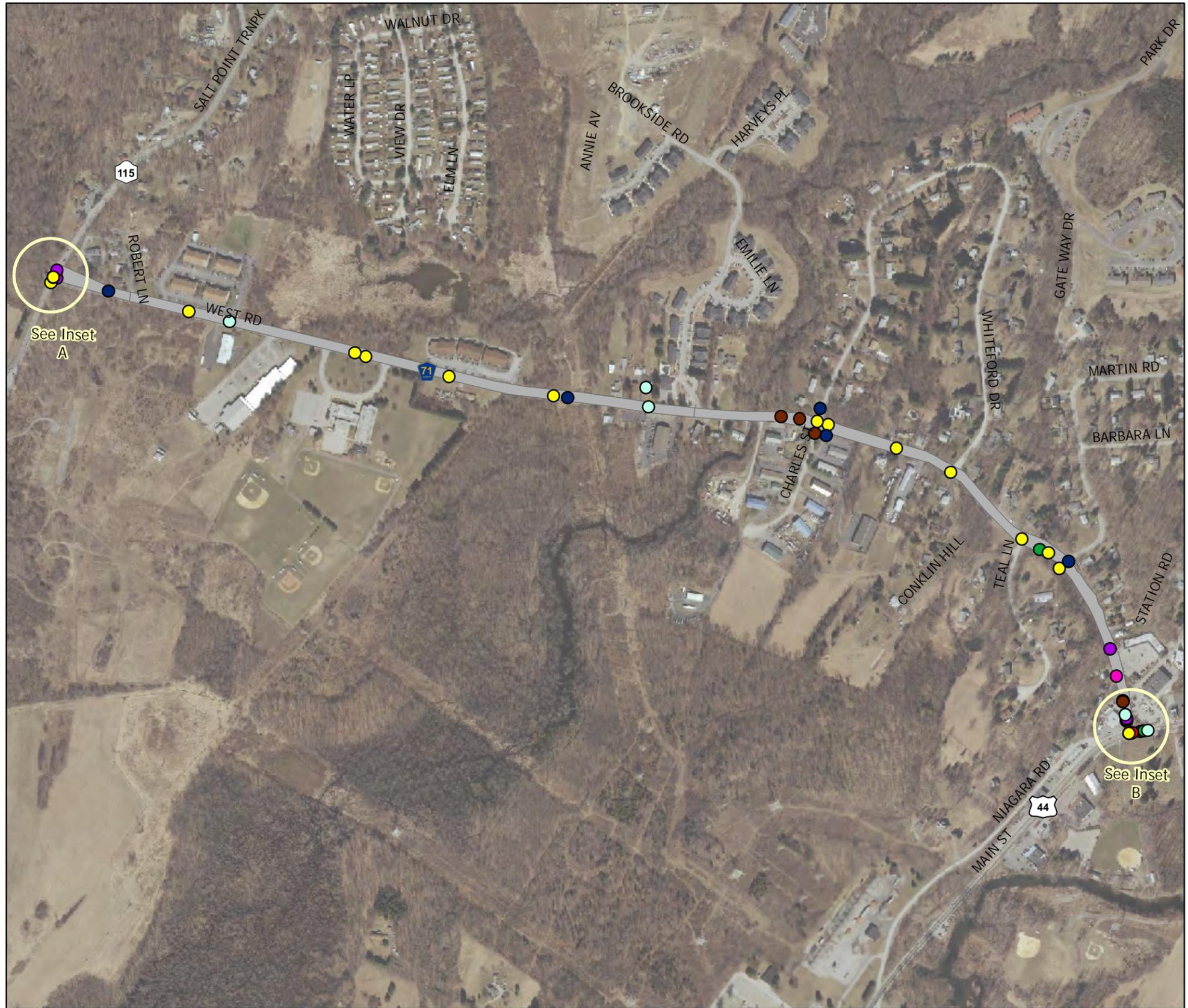
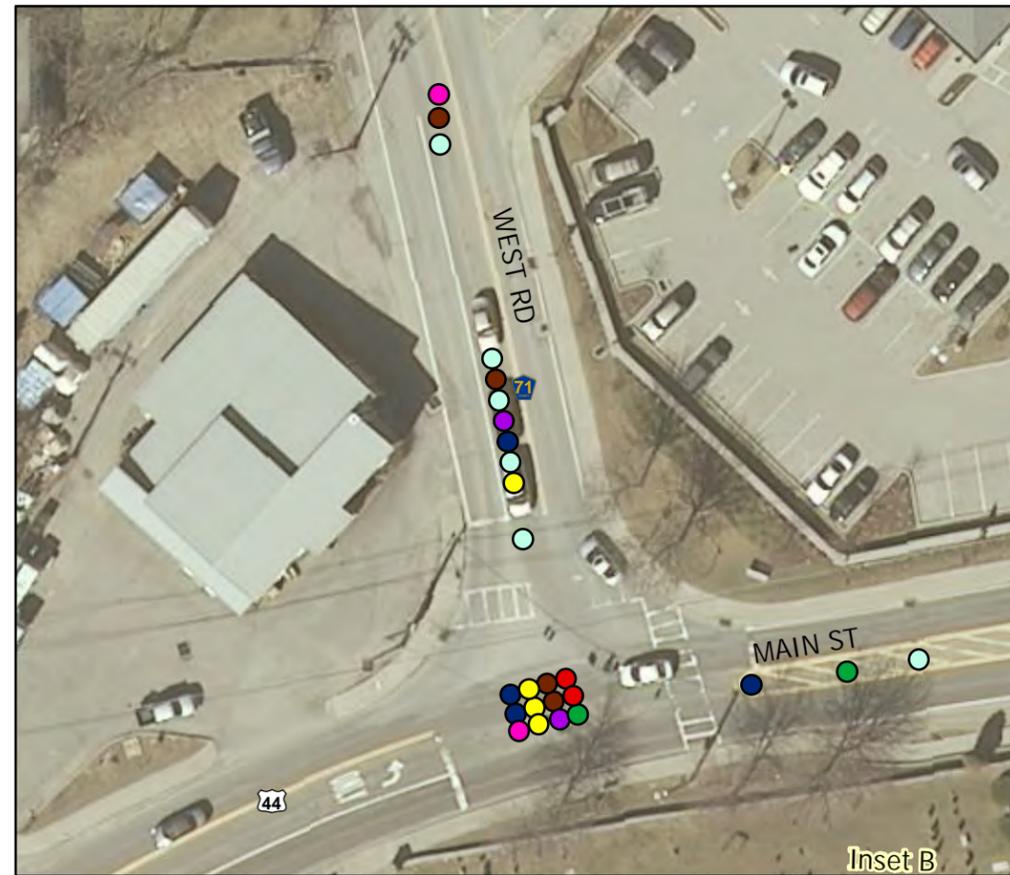


Figure 5a - CR 71/West Road Crashes by Type (2007-2009)



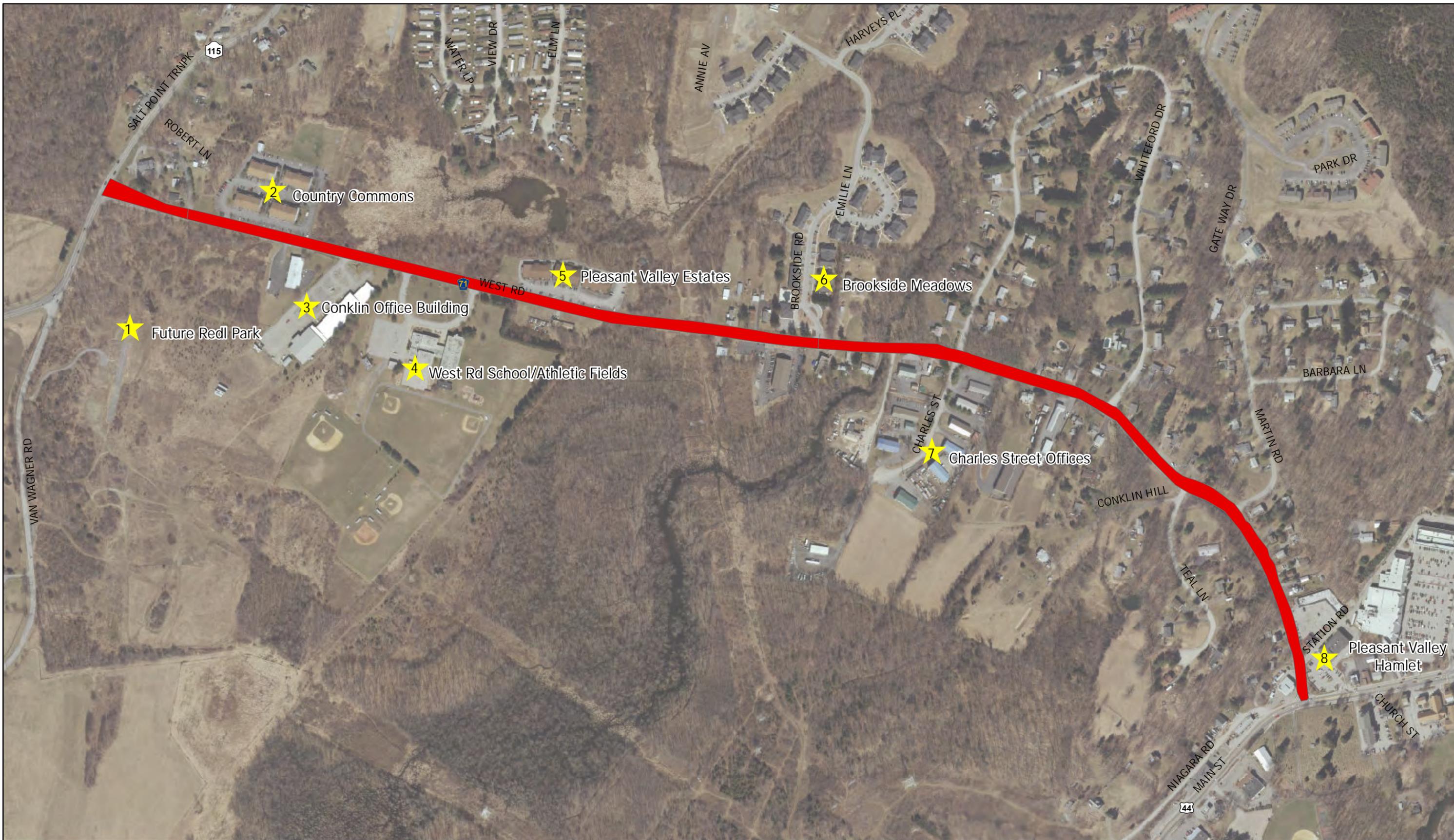


CR 71 (West Road)
Crash Locations
Figure 5b

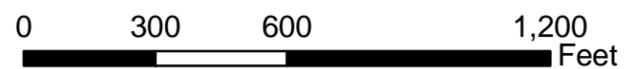
Crash Types

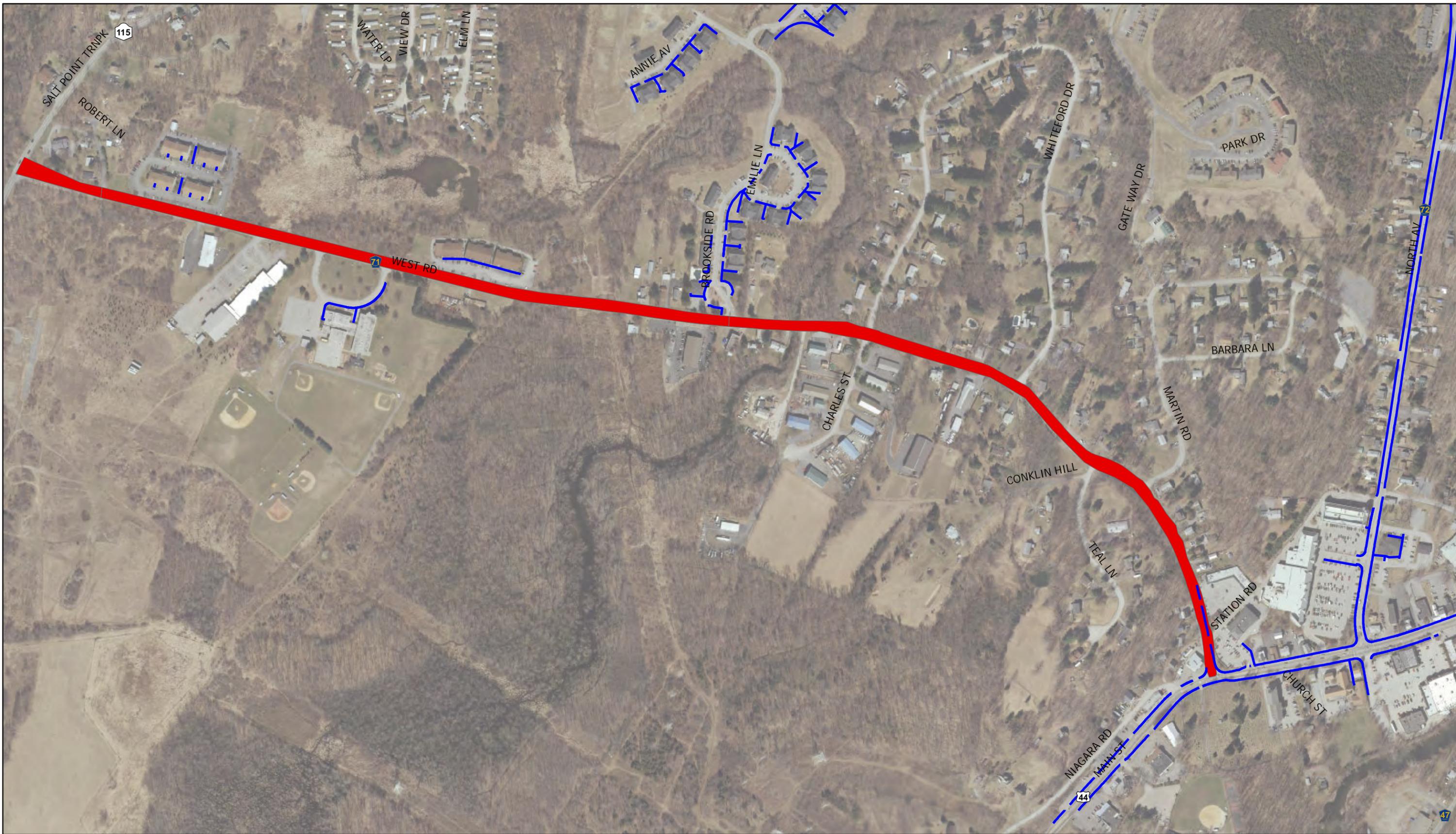
- LEFT TURN
- OVERTAKING
- RIGHT ANGLE
- SIDESWIPE
- OTHER
- REAR END
- RIGHT TURN
- UNKNOWN





CR 71 (West Road)
 Pedestrian Generators
 Figure 6

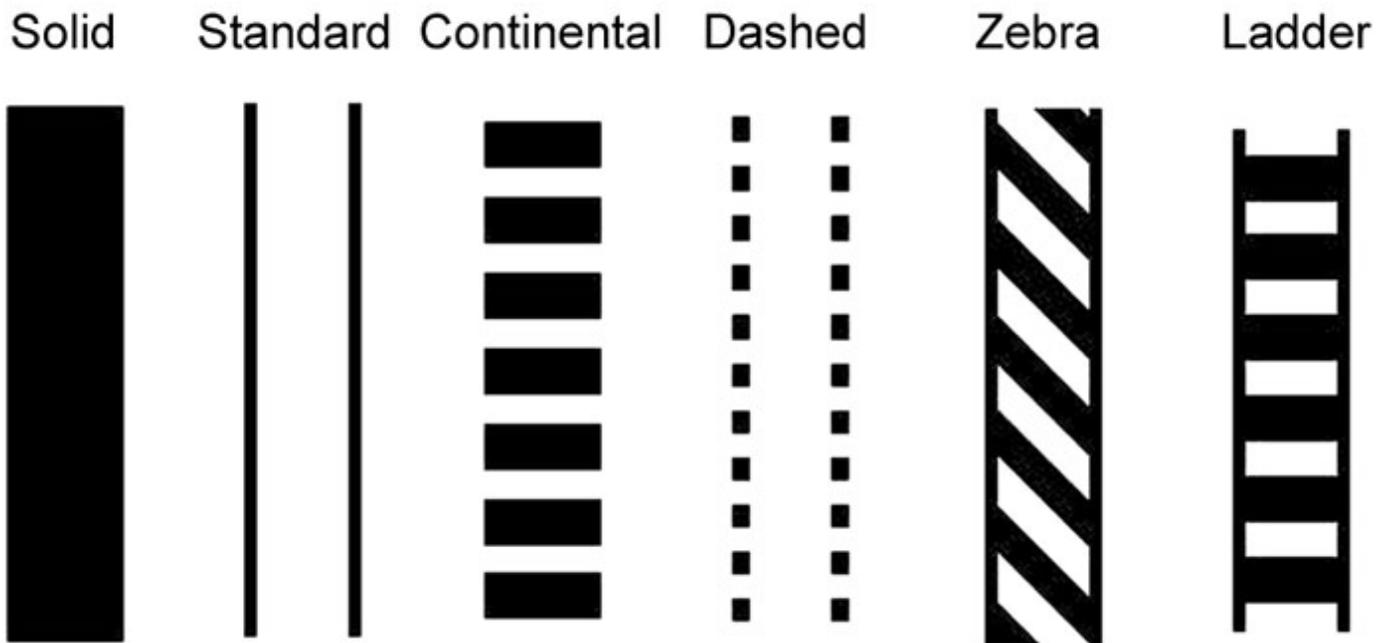




CR 71 (West Road)
Existing Sidewalks
Figure 7

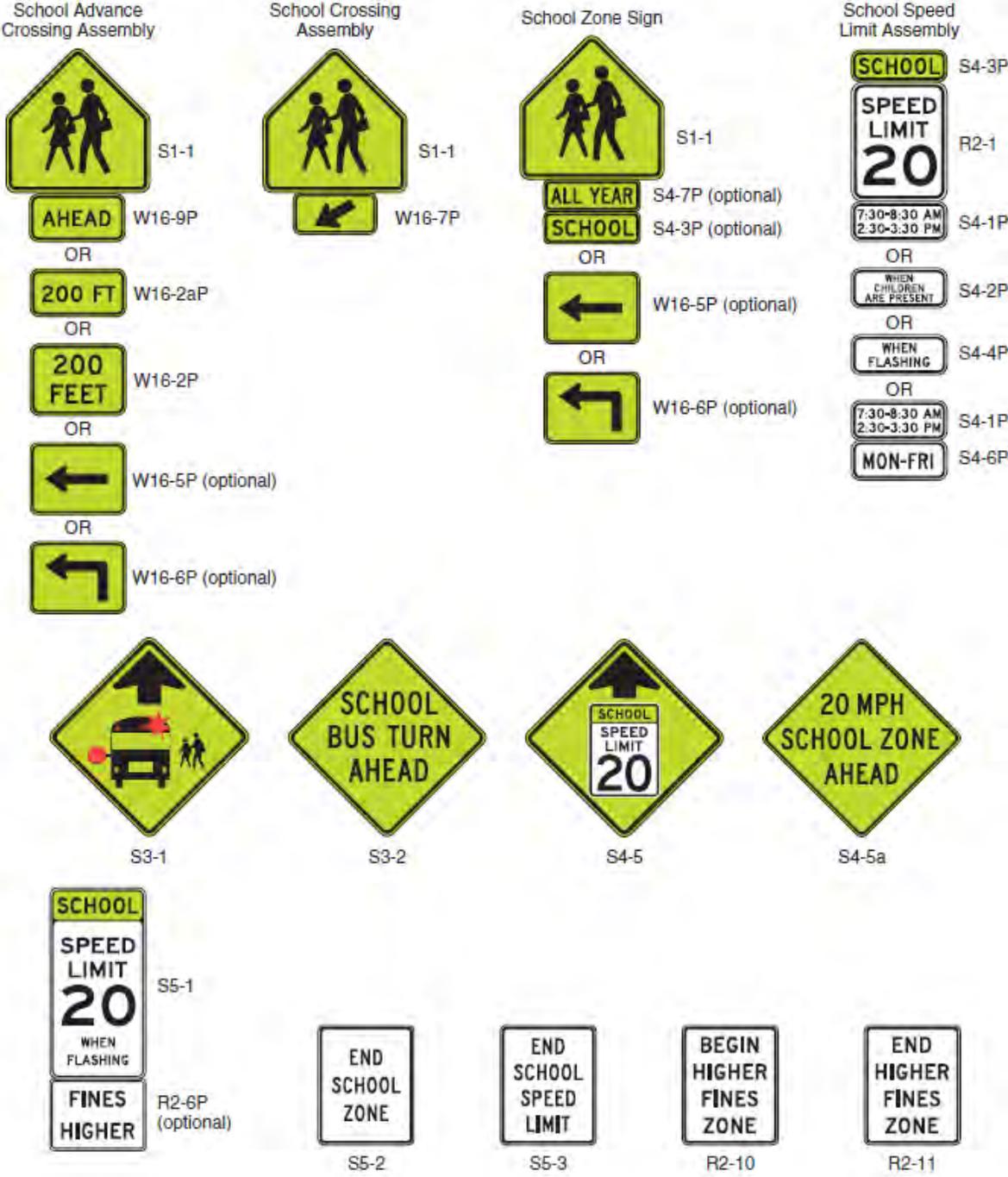


Figure 8 – Crosswalk Striping



Source: http://safety.transportation.org/htmlguides/peds/ex_images/ex_V-24.jpg

Figure 9 - School Area Signs



Source: 2009 MUTCD, Figure 7B-1

Figure 10- Pedestrian Crossing with Beacon



Source: http://tti.tamu.edu/publications/researcher/v43n3/images/ped_crossing_ca.jpg

Figure 11- Pedestrian Hybrid Beacon (HAWK)

Figure 4F-3. Sequence for a Pedestrian Hybrid Beacon

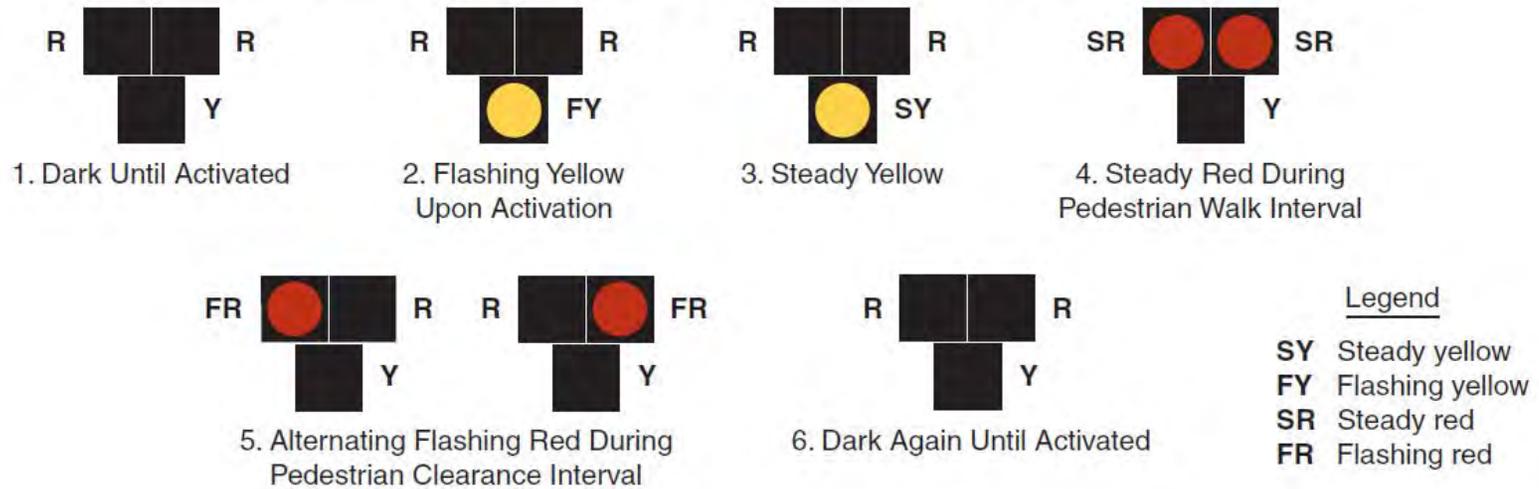
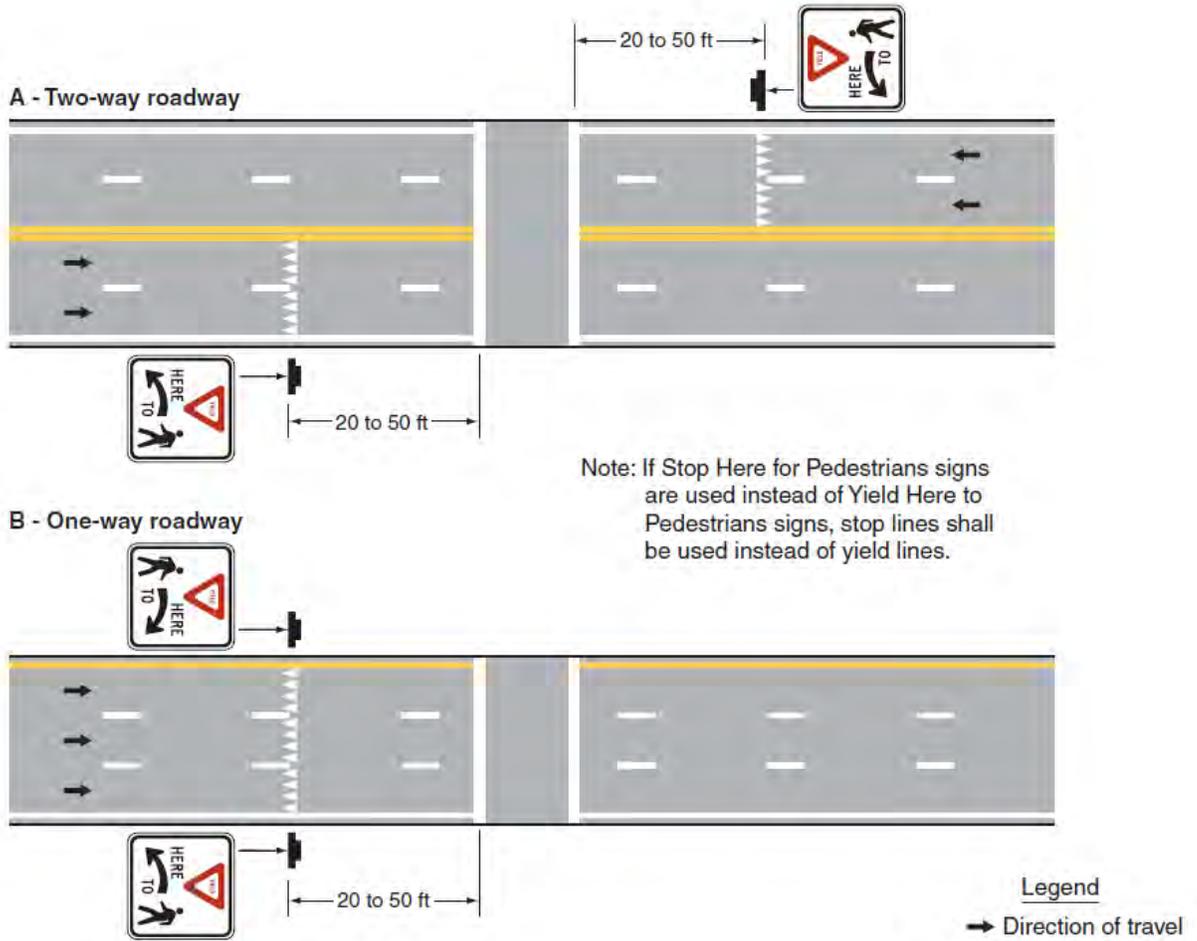


Figure 12- Yield Lines and Signage



Source: 2009 MUTCD, Figure 3B-17

Ladder Crosswalk with Advance Stop Bar



Source: <http://www.walkinginfo.org/engineering/crossings-crosswalks.cfm>

Figure 13a- School Speed Limit Signs

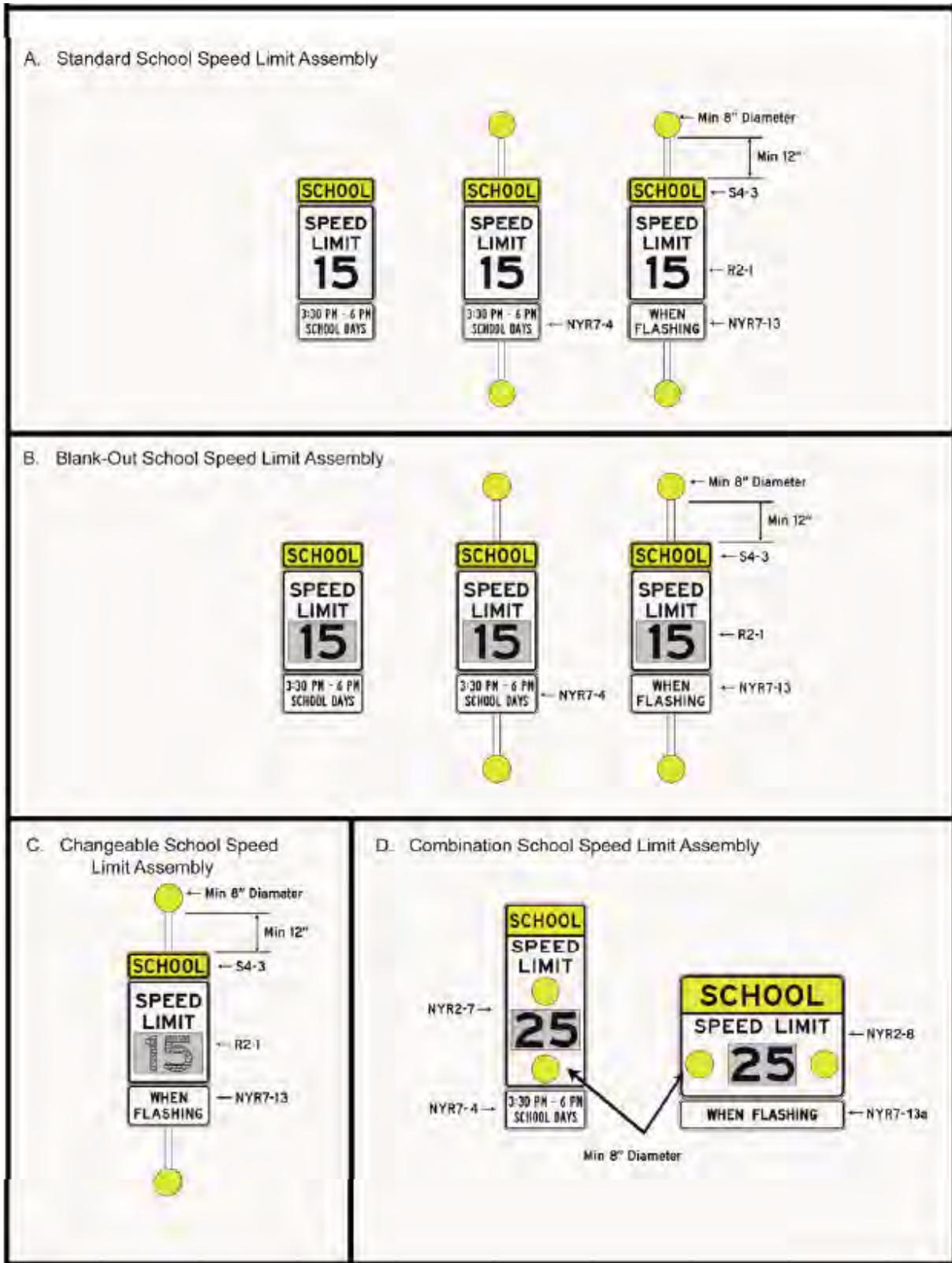


Figure 13b- Radar-Based Speed Limit Signs



Source: http://www.kenilworthpd.org/images/speed_trailer1.gif



Source: http://www.speedradarsigns.com/index_files/radarsignschoolzone8.JPG