

Item 2026-042

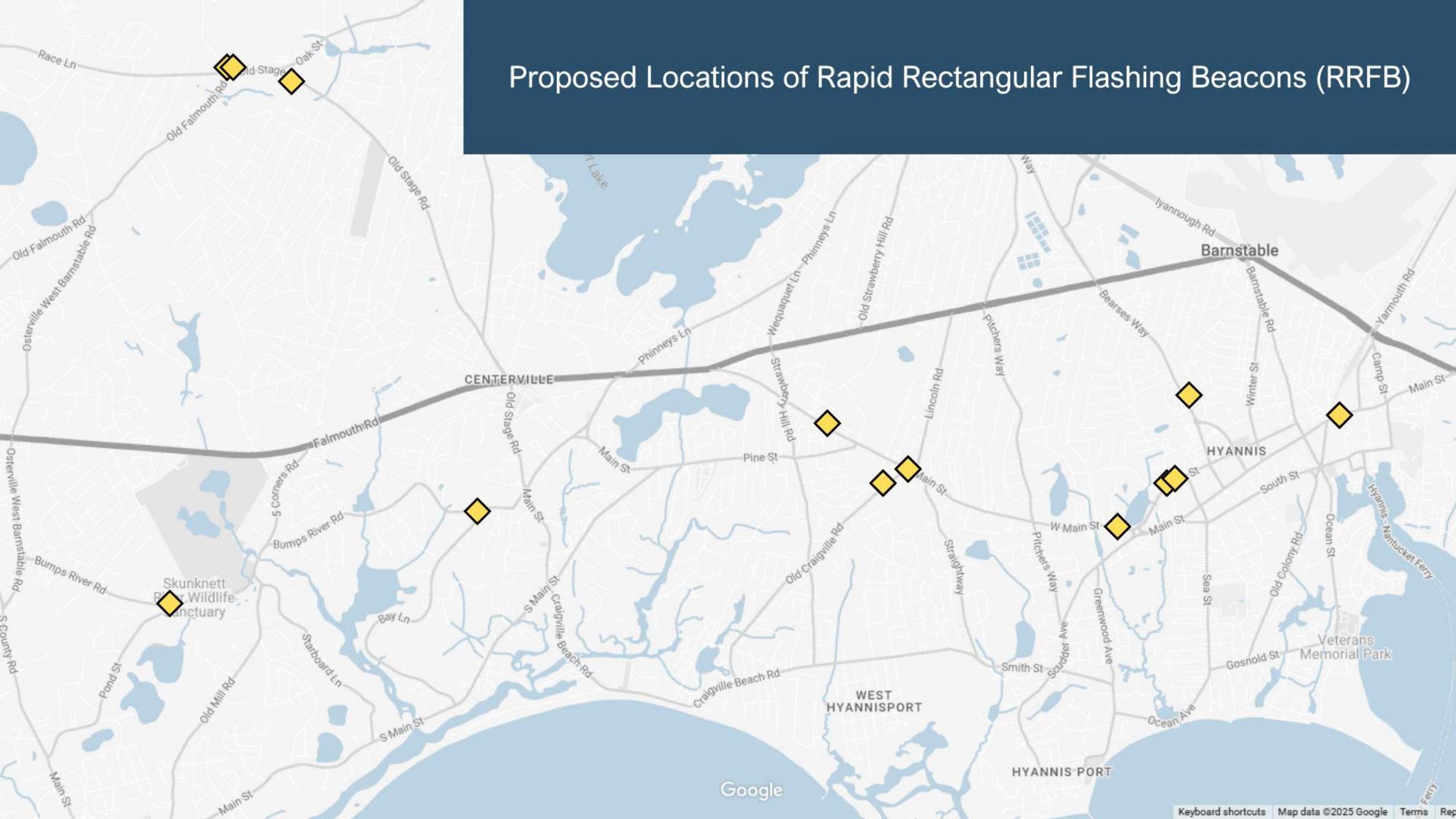
Supporting Materials

Dan Santos, P.E.

Director, Department of Public Works



Proposed Locations of Rapid Rectangular Flashing Beacons (RRFB)



Rectangular Rapid Flashing Beacon (RRFB)

Location:

180 Ocean Avenue
Hyannis



13 Total Proposed RRFB Locations

Location	Village	Justification
1. Bearses Way at Chestnut Street	Hyannis	• Close proximity to residential, commercial, and school areas • Sidewalks line this area, along with streetlamps, allowing for pedestrian use • Based on 35 MPH along Bearses Way (measured), Average Annual Daily Traffic (AADT) between 9,000-15,000, and 2-lane cross section
2. Bumps River Road at Cape Cod Collaborative School	Osterville	• Close proximity to residential and school areas • Sidewalks line this area, along with streetlamps, allowing for pedestrian use • Based on 35 MPH along Bumps River Road (Measured), AADT less than 9,000, and 2-lane cross section
3. Bumps River Road at Bay Lane	Centerville	• Close proximity to residential and school areas • Portions of the area have sidewalks and streetlamps, allowing for pedestrian use • Based on 35 MPH along Bumps River Road (Measured), AADT less than 9,000, and 2-lane cross section
4. Main Street at Pleasant Street	Hyannis	• Close proximity to residential and commercial areas • Sidewalks line this area, along with streetlamps, allowing for pedestrian use • Based on <30 MPH along Main Street (Measured), AADT greater than 15,000, 2-lane cross section
5. North Street at Stevens Street	Hyannis	• Close proximity to commercial areas • Portions of the area have sidewalks and streetlamps, allowing for pedestrian use • Based on 35 MPH along North Street (Measured), AADT between 9,000-15,000, 2-lane cross section
6. North Street, West of Sea Street	Hyannis	• Close proximity to commercial areas • Sidewalks line this area, along with streetlamps, allowing for pedestrian use • Based on 35 MPH along North Street (Measured), AADT between 9,000-15,000, 2-lane cross section
7. Old Craigville Road at Hyannis West Elementary School	Hyannis	• Close proximity to residential, commercial, and school areas • Sidewalk present on North side of the street, providing access to Hyannis West Elementary School • Based on 35 MPH along Old Craigville Road (Measured), AADT less than 9,000, 2-lane cross section

Proposed RRFB Locations (Continued)

Location	Village	Justification
8. Old Stage Road at Race Lane/Old Falmouth Road	Centerville / Marstons Mills	• Close proximity to residential area • Sidewalk present on portions of the area, along with streetlamps, allowing pedestrian access • Based on >40 MPH along Old Stage Road (Measured), AADT less than 9,000, 2-lane cross section
9. Old Stage Road (Westbound) at Race Lane/Old Falmouth Road *Pedestrian Hybrid Beacon*	Centerville / Marstons Mills	• Close proximity to residential area • Sidewalk present on portions of the area, along with streetlamps, allowing pedestrian access • Based on >40 MPH along Old Stage Road (Measured), AADT greater than 15,000, 2-lane cross section • Due to High AADT and speeds, a Pedestrian Hybrid Beacon is recommended and included in this request.
10. Old Stage Road, South of Oak Street	Marstons Mills	• Close proximity to residential area • Sidewalk present on portions of the area, with no streetlamps near the crosswalk • Based on >40 MPH along Old Stage Road (Measured), AADT between 9,000-15,000, 2-lane cross section
11. West Main Street at Barnstable High School	Hyannis	• Close proximity to residential, commercial, and school areas • Sidewalk present in the area, with streetlamps, allowing for pedestrian access • Based on >40 MPH along West Main Street (Measured), AADT between 9,000-15,000, 2-lane cross section12.
12. West Main Street at Lincoln Road	Hyannis	• Close proximity to residential, commercial, and school areas • Sidewalk present in the area, with streetlamps, allowing for pedestrian access • Based on 40 MPH along West Main Street (Measured), AADT between 9,000-15,000, 2-lane cross section
13. West Main Street at Betty's Pond Road	Hyannis	• Close proximity to residential, commercial, and school areas • Sidewalk present in the area, with streetlamps, allowing for pedestrian access • Based on <30 MPH along West Main Street (Measured), AADT greater than 15,000, 2-lane cross section

Resources

Bearses Way at Chestnut Street



Bearses Way at Chestnut Street

Location: Bearses Way extends through a residential neighborhood and commercial areas, provides access to Barnstable Community Innovation School, and provides one travel lane in each direction.

- Bituminous concrete sidewalks (separated by a grass buffer) are provided on both sides of Bearses Way, measuring approximately 6 to 8-feet wide.
- Curb Ramps (with detectable warning panels) are provided at both sides of the crosswalk and appear to be compliant with guidelines of the Americans with Disabilities Act (ADA) and the Architectural Access Board (AAB).
- Decorative roadway lighting is provided on both sides of Bearses Way at the crosswalk.
- Pedestrian related signage: Advance “School/Ahead” sign (MUTCD S1-1/W16-9P) along with “State Law Yield to Pedestrian” sign (MUTCD R1-6) signs in both directions and “School” sign with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk in both directions.
- Flashing school speed limit signs are provided in both directions along Bearses Way, indicating an established school zone.
- Data received from Town:
 - Location of data: Bearse’s Way at Chestnut Street
 - Date of data collection: October 21-25, 2024
 - AADT: 7,183 vehicles per day (vpd) (northbound), 5,861 vpd (southbound).
 - Posted speed: 20 miles per hour (mph) school zone
 - 85th percentile speed: 35 mph (northbound), 36 mph (southbound)
- Stopping sight distance appears to be greater than 600 feet in both directions, which exceeds AASHTO requirements of 295 feet (interpolated) for a speed of 36 mph.
- Based on a speed of 35 mph along Bearses Way, a vehicle AADT between 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “School” with diagonal arrow (MUTCD S1-1/W16-7P) sign assembly at the crosswalk in both directions, coinciding with the established school zone.
- Prior to the installation of the RRFB’s, the Town must trim existing vegetation to reduce possible solar obstructions.

Bumps River Road at Cape Cod Collaborative School



Bumps River Road at Cape Cod Collaborative School

Location: Bumps River Road extends through a residential neighborhood, provides access to Cape Cod Collaborative School and provides one travel lane in each direction.

- Bituminous concrete sidewalks are provided on the northern side of Bumps River Road (west of the crosswalk) and along the southern side of Bumps River Road (east of the crosswalk), measuring approximately 4 feet wide.
- Curb ramps (with detectable warning panels) are provided on both sides of Bumps River Road and appear to be compliant with ADA and AAB guidelines.
- Roadway lighting is not provided within the vicinity of the crosswalk.
- Pedestrian related signage: Advanced “School/Ahead” sign (MUTCD S1-1/W16-9P) in the eastbound direction and “School” sign with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk in both directions.
- School speed limit signs are provided in both directions along Bumps River Road, indicating an established school zone.
- Data received from Town:
 - Location of data: Bumps River Road at Bay Lane
 - Date of data collection: October 21-25, 2024
 - AADT: 1,044 vpd (eastbound), 1,152 vpd (westbound).
 - Posted speed: 30 mph, 20 mph school zone
 - 85th percentile speed: 35 mph (eastbound), 37 mph (westbound).
- Stopping sight distance appears to be approximately 400 feet in the westbound direction and greater than 600 feet in the eastbound direction, which exceeds AASHTO requirements of 300 feet (interpolated) for a speed of 37 mph.
- Based on a speed of 35 mph along Bumps River Road, a vehicle AADT less than 9,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “School” with diagonal arrow (MUTCD S1-1/W16-7P) sign assembly at the crosswalk in both directions, coinciding with the established school zone.
- Prior to the installation of the RRFB’s, the Town must trim existing vegetation to reduce possible solar obstructions.
- Additional recommendations for the Town to consider (outside the scope of this project):
 - Install an advance “School/Ahead” (MUTCD S1-1/W16-9P) sign assembly in the westbound direction (in advance of the school speed limit sign) to warn motorists of the upcoming crosswalk.

Bumps River Road at Bay Lane



Bumps River Road at Bay Lane

Location: Bumps River Road extends through a residential neighborhood, located within the vicinity of Centerville Elementary School and provides one travel lane in each direction.

- A bituminous concrete sidewalk (separated by a grass buffer) is provided on the northern side of Bumps River Road, in addition to a bituminous concrete sidewalk along the eastern side of Bay Lane, measuring approximately 4 feet wide. No sidewalk is provided along the southern side of Bumps River Road.
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalk.
- Roadway lighting is provided on the southern side of the Bumps River Road at the crosswalk.
- Pedestrian related signage: Advance “School/Ahead” sign (MUTCD S1-1/W16-9P) in both directions and “School” sign with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk in both directions.
- There does not appear to be an established school zone as there are no speed limits pertaining to schools along this roadway. However, Bumps River Road is along a walking route to Centerville Elementary School.
- Data received from Town:
 - Location of data: Bumps River Road at Bay Lane
 - Date of data collection: October 21-25, 2024
 - AADT: 1044 vpd (eastbound), 1152 vpd (westbound).
 - Posted speed: 30 mph
 - 85th percentile speed: 35 mph (eastbound), 37 mph (westbound).
- Stopping sight distance appears to be approximately 520 feet in the westbound direction and greater than 600 feet in the eastbound direction, which exceeds AASHTO requirements of 300 feet (interpolated) for a speed of 37 mph.
- Based on a speed of 35 mph along Bumps River Road, a vehicle AADT less than 9,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “School” with diagonal arrow (MUTCD S1-1/W16-7P) sign assemblies at the crosswalk in both directions, as Bumps River Road is a walking route to Centerville Elementary School.
 - RRFB’s should be placed in front of utility poles or other obstructions for visibility.
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions.

Main Street at Pleasant Street



Main Street at Pleasant Street

Location: Main Street extends through a residential neighborhood and commercial area, provides access to the Hyannis Transportation Center and provides one travel lane in each direction.

- Brick and cement concrete sidewalks are provided on both sides of Main Street, measuring approximately 6 to 12 feet wide.
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalk.
- Roadway lighting is provided on the northern side of Main Street, approximately 20 feet west of the crosswalk.
- Pedestrian related signage: “Pedestrian” sign with diagonal arrow (MUTCD W11-2/W16-7P) at the crosswalk in both directions.
- Data received from Town:
 - Location of data: Main Street, west of Yarmouth Road
 - Date of data collection: June 13, 2022
 - AADT: 6,116 vpd (eastbound), 10,428 vpd (westbound).
 - Posted speed: 25 mph
 - 85th percentile speed: 27 mph.
- Stopping sight distance appears to be greater than 600 feet in both directions, which exceeds AASHTO requirements of 220 feet (interpolated) for a speed of 27 mph.
- Based on a speed ≤ 30 mph along Main Street, a vehicle AADT greater than 15,000 vpd and a two- lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “Pedestrian” with diagonal arrow
- (MUTCD W11-2/W16-7P) sign assembly at the crosswalk in both directions.
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions.

North Street at Stevens Street



North Street at Stevens Street

Location: North Street extends through primarily commercial areas and provides one travel lane in each direction.

- Bituminous concrete sidewalks are provided on both sides of North Street (east of Stevens Street), measuring approximately 6 feet wide. There are also sidewalks on both sides of Stevens Street (north of North Street), and smaller sections of sidewalk on the east side of Stevens Street (south of North Street) and the north side of North Street (west of Stevens Street up to Mitchell's Way).
- A curb ramp (without detectable warning panel) is provided on the south side of the crosswalk. A curb ramp (with detectable warning panel) is provided on the north side of the crosswalk and appears to be compliant with ADA and AAB guidelines. Both ramps are apex curb ramps (one ramp that serves two directions of pedestrian travel).
- Roadway lighting is provided on the northern side of North Street at the crosswalk.
- Pedestrian related signage: "Pedestrian" sign (MUTCD W11-2) at the crosswalk in the westbound direction.
- Data received from Town:
 - Location of data: North Street, west of Stevens Street
 - Date of data collection: June 17-20, 2024
 - AADT: 4,961 vpd (eastbound), 5,298 vpd (westbound).
 - 85th percentile speed: 35 mph.
- Stopping sight distance appears to be approximately 285 feet in the eastbound direction and greater than 600 feet in the westbound direction, which meets/exceeds AASHTO requirements of 285 feet (interpolated) for a speed of 35 mph.
- Based on a speed of 35 mph along North Street, a vehicle AADT between 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (3-post assembly) should be installed that includes:
 - "Pedestrian" with diagonal arrow (MUTCD W11-2/W16-7P) sign assemblies at the crosswalk in both directions.
 - An advance RRFB with "Pedestrian/Ahead" (MUTCD W11-2/W16-9p) sign assembly should be installed in the eastbound direction (approximately 220 feet in advance of the crosswalk) to warn drivers of pedestrians crossing due to insufficient sight distance. For the advance RRRB, the crosswalk lighting and pushbutton are not needed and should not be included.
 - Note this RRFB will be approximately 250 feet west of the pedestrian crossing at North Street west of Sea Street (described below).
- Prior to installation of the RRFB's, the Town must:
 - Construct ADA/AAB compliant curb ramps on the southern side of the crosswalk.
 - Restripe the existing crosswalk with high-visibility pavement markings, such that the entrance of the apex curb ramp on the northern side of the crosswalk is fully contained within the crosswalk with the appropriate clear area as defined in PROWAG R304.2.4 <https://www.access-board.gov/prowag/technical.html#r30424-clear-area>.

North Street, West of Sea Street



North Street, West of Sea Street

Location: North Street extends through primarily commercial areas and provides one travel lane in each direction.

- Bituminous concrete sidewalks are provided on both sides of North Street, measuring approximately 4 feet wide.
- A curb ramp (without detectable warning panel) is provided on the south side of the crosswalk. No curb ramp is present on the north side of the crosswalk.
- Roadway lighting is provided on the northern side of North Street, approximately 65 feet west of the crosswalk.
- Pedestrian related signage: “Pedestrian” sign (MUTCD W11-2) at the crosswalk in both directions.
- Data received from Town:
 - Location of data: North Street, west of Stevens Street
 - Date of data collection: June 17-20, 2024
 - AADT: 4,961 vpd (eastbound), 5,298 vpd (westbound).
 - 85th percentile speed: 35 mph.
- Stopping sight distance appears to be approximately 350 feet in the eastbound direction and greater than 600 feet in the westbound direction, which exceeds AASHTO requirements of 285 feet (interpolated) for a speed of 35 mph.
- Based on a speed of 35 mph along North Street, a vehicle AADT between 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “Pedestrian” with diagonal arrow
- (MUTCD W11-2/W16-7P) sign assembly at the crosswalk in both directions.
 - Note this RRFB will be approximately 250 feet east of the proposed RRFB at North Street and Stevens Street (described above).
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions and to improve sight lines.

Old Craigville Road at Hyannis West Elementary School



Old Craigville Road at Hyannis West Elementary School

Location: Old Craigville Road extends through a residential neighborhood and commercial areas and provides access to Hyannis West Elementary School. One travel lane is provided in each direction.

- A bituminous concrete sidewalk is provided on the northern side of Old Craigville Road, measuring approximately 4 to 5 feet wide. No sidewalk is provided along the southern side.
- Curb ramps are not provided on either side of the crosswalk.
- Roadway lighting is provided on the northern side of Old Craigville Road, approximately 60 feet east of the crosswalk.
- Pedestrian related signage: Advance “School/Ahead” signs (MUTCD S1-1/W16-9P) in both directions and “School” signs with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk in both directions.
- Flashing school speed limit signs are provided in both directions along Old Craigville Road, indicating the presence of an established school zone.
- Data received from Town:
 - Location of data: Old Craigville Road, south of West Main Street
 - Date of data collection: October 21-25, 2024
 - AADT: 1,129 vpd (northbound), 1,264 vpd (southbound).
 - Posted speed: 20 mph (school zone)
 - 85th percentile speed: 34 mph (northbound), 32 mph (southbound).
- Stopping sight distance appears to be approximately 510 feet in the westbound direction and greater than 600 feet in the eastbound direction, which exceeds AASHTO requirements of 280 feet (interpolated) for a speed of 34 mph.
- Based on a speed of 35 mph along Old Craigville Road, a vehicle AADT less than 9,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “School” with diagonal arrow (MUTCD S1-1/W16-7P) sign assembly at the crosswalk in both directions, coinciding with the established school zone.
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions and to improve sight lines.

Old Stage Road at Race Lane/Old Falmouth Road



Old Stage Road at Race Lane/Old Falmouth Road

Location: Old Stage Road extends through a residential neighborhood and provides one travel lane in each direction separated by a landscaped median island.

- Bituminous concrete sidewalks (separated by a grass buffer) are provided on the west side of Old Stage Road (north of the crosswalk) and along the northern side of Old Stage Road (east of the crosswalk), measuring approximately 6 feet wide.
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalk and median island.
- Roadway lighting is provided on the eastern side of Old Stage Road at the crosswalk.
- Pedestrian related signage: Advance “Pedestrian/200 FT” sign (MUTCD W11-2/W16-2aP) in the southbound direction and “Pedestrian” sign with diagonal arrow (MUTCD W11-2/W16-7P) at the crosswalk in both directions.
- The crosswalk is located approximately 40 feet north of the “Stop” controlled southbound approach to Race Lane.
- Data received from Town:
 - Location of data: Old Stage Road, north of Race Lane
 - Date of data collection: October 25, 2024
 - AADT: 1,700 vpd (northbound), 2,122 vpd (southbound).
 - Posted speed: 35 mph
 - 85th percentile speed: 43 mph (northbound), 40 mph (southbound).
- Stopping sight distance appears to be approximately 165 feet in the southbound direction, which fails to meet AASHTO requirements of 350 feet (interpolated) for a speed of 43 mph.
- Based on a speed ≥ 40 mph along Old Stage Road, a vehicle AADT less than 9,000 vpd, and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “Pedestrian” with diagonal arrow (MUTCD W11-2/W16-7P) sign assembly at the eastern crosswalk in the northbound direction.
- An RRFB (3-post assembly) should be installed that includes:
 - “Pedestrian” with diagonal arrow (MUTCD W11-2/W16-7P) sign assemblies at the western crosswalk in the southbound direction.
 - An advance RRFB with “Pedestrian/Ahead” (MUTCD W11-2/W16-9p) sign assembly should be installed in the southbound direction (approximately 165 feet in advance of the crosswalk) to warn drivers of pedestrians crossing due to insufficient sight distance due to the horizontal roadway curve. For the advance RRFB, the crosswalk lighting and pushbutton are not needed and should not be included.
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalks.
 - Trim existing vegetation to reduce possible solar obstructions and to improve sight lines.

Old Stage Road (Westbound) at Race Lane / Old Falmouth Road



Old Stage Road (Westbound) at Race Lane / Old Falmouth Road

Location: Old Stage Road extends through a residential neighborhood and provides one travel lane in the eastbound direction and 3 travel lanes (one left turn lane, one through lane and one right-turn lane) in the westbound direction.

- Bituminous concrete sidewalks (separated by a grass buffer) are provided on the northern side of Old Stage Road (east of the crosswalk), on the western edge of Old Stage Road (north of the intersection), and on the eastern edge of Old Falmouth Road (south of the intersection), measuring approximately 6 feet wide. No sidewalk is provided along the southern side of Old Stage Road (east of the crosswalk).
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalk.
- Roadway lighting is provided on the southern side of Old Stage Road, approximately 40 feet west of the crosswalk.
- Pedestrian related signage: Advance “Pedestrian/500 FT” sign (MUTCD W11-2/W16-2aP) and
- “Pedestrian” sign with diagonal arrow (MUTCD W11-2/W16-7P) at the crosswalk in both directions.
- Data received from Town:
 - Location of data: Old Stage Road, west of Oak Street
 - Date of data collection: June 5-7, 2023
 - AADT: 8,868 vpd (eastbound), 7,815 vpd (westbound).
 - Posted speed: 40 mph (eastbound), 35 mph (westbound)
 - 85th percentile speed: 40 mph.
- The posted speed of 40 mph on the eastbound approach is located on Race Lane just east of Osterville West Barnstable Road (approximately 0.6 miles west of the crosswalk).
- Based on the approximate operating speed of ≥ 40 mph along Old Stage Road, a vehicle AADT greater than 15,000 vpd, and a four-lane cross section (without median island), the location does not satisfy criteria in Table 1.
 - Please refer to the attached *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* for additional potential countermeasures for this location.
- **Due to the high AADT and operating speed, the Town should consider installation of a Pedestrian Hybrid Beacon (PHB).**
 - Prior to installation of a PHB, the Town must install curb ramps compliant with ADA/AAB guidelines.
- Additional recommendations for the Town to consider (outside the scope of this project):
 - Consider reviewing the vehicular turning movements and existing lane configuration for the Old Stage Road westbound approach to Race Lane/Falmouth Road to determine if the exclusive turn lanes are required. Eliminating a turn lane in the westbound direction would reduce pedestrian crossing distance.

Old Stage Road, South of Oak Street



Old Stage Road, South of Oak Street

Location: Old Stage Road extends through a residential neighborhood and provides one lane in each direction.

- Bituminous concrete sidewalks (separated by a grass buffer) are provided on the western side of Old Stage Road (south of the crosswalk) and along the eastern side of Old Stage Road (north of the crosswalk), measuring approximately 4 feet wide.
- Curb ramps are not provided on either side of the crosswalk.
- Roadway lighting is not provided within the vicinity of the crosswalk.
- Pedestrian related signage: Advance “Pedestrian” (MUTCD W11-2) sign in both directions.
- Data received from Town:
 - Location of data: Old Stage Road, west of Oak Street
 - Date of data collection: June 5-7, 2023
- AADT: 8,868 vpd (eastbound), 7,815 vpd (westbound).
- Posted speed: 35 mph
 - 85th percentile speed: 40 mph.
- Location of data: Old Stage Road, north of Skunknet Road
 - Date of data collection: June 13, 2022
 - AADT: 6,496 vpd (northbound), 6,303 vpd (southbound).
 - Posted speed: 35 mph
 - 85th percentile speed: 45 mph.
- Stopping sight distance appears to be approximately 350 feet in the southbound direction and greater than 600 feet in the northbound direction, which fails to meet the AASHTO requirements of 365 feet (interpolated) for a speed of 45 mph.
- Based on the traffic data provided, Old Stage Road (west of Oak Street) is closer to the study location; however, in order to provide a conservative analysis, the Old Stage Road (north of Skunknet Road) traffic data was used for this location.
- Based on a speed ≥ 40 mph along Old Stage Road, a vehicle AADT between than 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (3-post assembly) should be installed that includes:
 - “Pedestrian” with diagonal arrow (MUTCD W11-2/W16-7P) sign assemblies at the crosswalk in both directions.
 - An advance RRFB with “Pedestrian /Ahead” sign (MUTCD W11-2/W16-9P) should be placed in the southbound direction approximately 220 feet in advance of the crosswalk to warn drivers of pedestrian crossing due to insufficient sight distance. For the advance RRRB, the crosswalk lighting and pushbutton are not needed and should not be included.
- Prior to installation of the RRFB’s, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions and to improve sight lines.

West Main Street at Barnstable High School



West Main Street at Barnstable High School

Location: Main Street extends through a residential neighborhood and commercial areas and provides access to Barnstable High School. One travel lane is provided in each direction.

- Bituminous concrete sidewalks (separated by a grass buffer) are provided on both sides of West Main Street, measuring approximately 4 feet wide.
- Curb ramps (with detectable warning panels) are provided on both sides of the crosswalk and appear to be compliant with ADA and AAB guidelines.
- Roadway lighting is provided on the southern side of West Main Street, approximately 35 feet west of the crosswalk.
- Pedestrian related signage: Advance “School/Ahead” signs (MUTCD S1-1/W16-9P) and “School” sign with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk in both directions.
- Flashing school speed limit signs are provided in both directions along West Main Street, indicating the presence of an established school zone.
- Data received from Town:
 - Location of data: West Main Street, east of Pine Street
 - Date of data collection: June 13, 2022
 - AADT: 7,455 vpd (eastbound), 6,901 vpd (westbound).
 - Posted speed: 30 mph (eastbound), 20 mph (school zone)
 - 85th percentile speed: 40 mph.
- Stopping sight distance appears to be greater than 600 feet in both directions, which exceeds AASHTO requirements of 325 feet for a speed of 40 mph.
- Based on a speed ≥ 40 mph along West Main Street, a vehicle AADT between 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalk**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes “School” with diagonal arrow (MUTCD S1-1/W16-7P) sign assembly at the crosswalk in both directions coinciding with the established school zone.

West Main Street at Lincoln Road



West Main Street at Lincoln Road

Location: West Main Street extends through a residential neighborhood and commercial areas and provides access to Barnstable High School and Hyannis West Elementary School. One travel lane is provided in each direction.

- Marked crosswalks are located across both sides of West Main Street at the intersection with Lincoln Road.
- Bituminous concrete sidewalks are provided on both sides of West Main Street and Lincoln Road, measuring approximately 5 feet wide. The sidewalks on the northern side of West Main Street and the eastern side of Lincoln Road are separated by a grass buffer.
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalks. The ramp on the northern side of the crosswalk is an apex ramp.
- Roadway lighting is provided on the southern side of West Main Street at the crosswalk.
- Pedestrian related signage: Advance “School/Ahead” signs (MUTCD S1-1W16-9P) in both directions and “School” sign with diagonal arrow (MUTCD S1-1/W16-7P) at the crosswalk on the southern side of the western crosswalk and on the northern side of the eastern crosswalk.
- Flashing school speed limit signs are provided in both directions along West Main Street, indicating the presence of an established school zone.
- Data received from Town:
 - Location of data: West Main Street, east of Pine Street
 - Date of data collection: June 13, 2022
 - AADT: 7,455 vpd (eastbound), 6,901 vpd (westbound).
 - Posted speed: 30 mph (eastbound)
 - 85th percentile speed: 40 mph
- Stopping sight distance appears to be greater than 600 feet in both directions, which exceeds AASHTO requirements of 325 feet (interpolated) for a speed of 40 mph.
- Based on a speed of 40 mph along West Main Street, a vehicle AADT between 9,000-15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalks**, per FHWA Table 1 criteria.
- Two RRFB’s (2-post assembly) should be installed on both sides of the intersection with Lincoln Road (one RRFB at each crosswalk) that include “School” with diagonal arrow (MUTCD S1-1/W16- 7P) sign assemblies at the crosswalks in both directions, coinciding with the established school zone.
 - The RRFB’s should be programmed so that an activation at either crosswalk causes the RRFB’s at both crosswalks to flash simultaneously, timed to accommodate the longest crossing.
- Prior to installation of the RRFB’s, the Town must:
 - Construct an ADA/AAB compliant curb ramp on the northern side of the crosswalk.
 - Restripe the existing crosswalk with high-visibility pavement markings, such that the entrance of the apex curb ramp on the northern side of the crosswalk is fully contained within the crosswalk with the appropriate clear area as defined in PROWAG R304.2.4 <https://www.access-board.gov/prowag/technical.html#r30424-clear-area>.

West Main Street at Betty's Pond Road



West Main Street at Betty's Pond Road

Location: West Main Street extends through a residential neighborhood and commercial areas and provides access to Sturgis Charter Public School West Campus and the Cape Cod Melody Tent. One travel lane is provided in each direction.

- Bituminous concrete sidewalks are provided on both sides of West Main Street, measuring approximately 4 feet wide.
- Curb ramps (without detectable warning panels) are provided on both sides of the crosswalk.
- Roadway lighting is provided on the southern side of West Main Street at the crosswalk.
- Pedestrian related signage: Advance "Pedestrian/Ahead" with "State Law Yield to Pedestrians" (MUTCD W11-2/W16-9P/R1-6) sign assemblies in both directions, "Pedestrian" sign with diagonal arrow (MUTCD W11-2/W16-7P) at the crosswalk in both directions, and "School" sign (MUTCD S1- 1) in the westbound direction west of Betty's Pond Road.
- There is an established school zone west of Betty's Pond Road, with school speed limit signs and markings present on West Main Street, which is along a walking route to Sturgis Charter Public School West Campus.
- Data received from Town:
 - Location of data: West Main Street, west of West End Rotary
 - Date of data collection: August 6-9, 2018
 - AADT: 10,192 vpd (eastbound), 9,579 vpd (westbound).
 - Posted speed: 30 mph
- Stopping sight distance appears to be approximately 360 feet in the eastbound direction and approximately 460 feet in the westbound direction, which exceeds AASHTO requirements of 245 feet for a posted speed of 30 mph.
- Based on a speed ≤ 30 mph along West Main Street, a vehicle AADT greater than 15,000 vpd and a two-lane cross section, **an RRFB is a viable treatment option at the marked crosswalks**, per FHWA Table 1 criteria.
- An RRFB (2-post assembly) should be installed that includes "School" with diagonal arrow (MUTCD S1-1/W16-7P) sign assembly at the crosswalk in both directions as West Main Street is a walking route to Sturgis Charter Public School West Campus.
- Prior to installation of the RRFB's, the Town must:
 - Construct ADA/AAB compliant curb ramps on both sides of the crosswalk.
 - Trim existing vegetation to reduce possible solar obstructions and to improve sight lines.
- Additional recommendations for the Town to consider (outside the scope of this project):
 - The Town should consider replacing the existing advance "Pedestrian/Ahead" with "State Law Yield to Pedestrians" (MUTCD W11-2/W16-9P/R1-6) sign assemblies in both directions with an advance "School/Ahead" sign assembly (MUTCD S1-1/W16-9P) as West Main Street is a walking route to Sturgis Charter Public School West Campus.