



CAPE COD
COMMISSION

Memorandum

DATE: June 18, 2021

TO: Jarrod Cabal, Truro DPW Director

**FROM: Steven Tupper, PE, Cape Cod Commission Transportation
Program Manager**

RE: Pedestrian Hybrid Beacon - Route 6 at Castle Road

This memorandum presents my initial thoughts on the potential for a pedestrian hybrid beacon (often referred to as a HAWK signal) on Route 6 at Castle Road. These opinions are based on Cape Cod Commission (CCC) staff's analysis to date and may be modified based on further investigation.

While relatively new in this area, pedestrian hybrid beacons are a proven safety countermeasure that can be suitable for pedestrian crossings of high-speed roadways. A pedestrian hybrid beacon would improve the ability of bicyclists (walking their bicycle as a pedestrian) to safely cross Route 6, but there are site constraints and permitting challenges to consider before pursuing the installation.

The location is unlikely meet the recommended minimum threshold of 20 crossing per hour and sight distance to the location from vehicles travelling northbound on Route 6 should be carefully examined given the horizontal curve present.

It should also be noted that the design and permitting for this installation would be substantial given the engineer analysis that would be required and the permit requirements of MassDOT.

Additional discussion of the CCC staff analysis is presented in the following sections.

Context

As part of the Claire Saltonstall Bikeway, cyclists frequently use Castle Road as an alternative route to Route 6. At the northern terminus of Castle Road, cyclists must cross Route 6 to enter the northbound bike lane. There is currently no marked crossing of Route 6 at Castle Road for those following the Claire Saltonstall Bikeway or others looking to cross Route 6 in this area.

The Outer Cape Bicycle and Pedestrian Master Plan (2017) identified this location as a priority for a crossing improvement. The Truro Bike and Walkway's Committee is actively pursuing the idea pedestrian hybrid beacon (in their communications referred to as a HAWK signal) at this location.

Pedestrian Hybrid Beacon Basics

A pedestrian hybrid beacon is a traffic control device used to stop road traffic on an as-needed basis to allow pedestrians and bicyclists to safely cross. The beacon remains black until activated by a bicyclist or pedestrian. When activated, the beacon requires motorists to stop to allow the cyclist or pedestrian to safely cross. Bicyclists and pedestrians must use caution when crossing the roadway. The signal progression of a Pedestrian Hybrid Beacon is summarized graphically on the last page of this memorandum.

The applicable standards and guidance for the installation of a Pedestrian Hybrid Beacon are found in Section 4F.01¹ of the Federal Highway Administration's 2009 Edition of the *Manual on Uniform Traffic Control Devices (MUTCD)*. Additional MassDOT guidance², including the most recent edition of the *Project Development & Design Guide* and various engineering directives, would also apply.

The MUTCD includes guidance that states: "*the need for a pedestrian hybrid beacon should be considered on the basis of an engineering study that considers major-street volumes, speeds, widths, and gaps in conjunction with pedestrian volumes, walking speeds, and delay.*"¹

Data Collection and Analysis

CCC staff collected vehicle volume and speed data in early June. Additional summer, and potentially fall, data collection would be required to fully access this potential installation. Summer data collection should include counts of bicyclists and pedestrians.

From Monday, June 7, 2021, through Friday, June 11, 2021, the average daily traffic on Route 6 was approximately 13,500 (total of both directions). The volume was slightly higher on the weekend with roughly 15,000 vehicles record on Saturday, June 5, 2021, and roughly 14,000 vehicles recorded on Sunday, June 6, 2021. During the weekend data collection period (6/7/21-6/11/21), the 85th percentile speed,³ a key variable in assessing sight distance, was 52 mph in both directions.

¹ <https://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm>

² <https://www.mass.gov/lists/design-guides-and-manuals>

³ The speed at or below which 85% of vehicles were travelling

The minimum sight distance required for signal visibility at 55 mph (conservative rounding of the overserved 85th percentile speed of 52 mph) is 625 feet⁴. The recommended sight distance for this installation may be higher depending on the results of queuing analysis of the signal operation. This would require summer traffic data and a preliminary analysis of signal timing to assess.

Site Visit Observations

CCC staff visited the site on three occasions to set up and download data from traffic counting equipment, measure available sight distance, and observe vehicle, bicyclist, and pedestrian activity.

In a relatively short time at the site, CCC staff observed bicyclist activity on Route 6 and Castle Road including a bicyclist crossing Route 6 at just north of Castle Road.

CCC staff observed sufficient sight distance for southbound vehicles on Route 6. The sight distance was a bit more challenging for northbound vehicles given the curvature of the roadway. With some trimming/clearing on the east side of Route 6 it is likely that sufficient sight distance could be provided, but additional analysis would be required to confirm.

Implementation Considerations

It is unlikely that this location would meet the recommended minimum threshold of 20 crossing per hour presented in the MUTCD.⁵ While other locations, including the installation on Route 6 in Eastham, have been permitting within meeting this threshold, it would require a strong case to be made to justify the installation. The justification for the installation may also be challenging as the pedestrian hybrid beacon would not be providing a connection to a separated facility such as a sidewalk or shared-use path.

As you are aware, a MassDOT repaving project for Route 6 in Truro and Provincetown is being planned for federal fiscal year 2026. I understand that you have conveyed the safety concerns related to this bicycle crossing with MassDOT staff for their consideration. It would be good for the town to advocate for whatever safety improvements can be accommodated within the scope of that repaving project.

Next Steps

If requested, CCC staff could collect additional traffic data on vehicle volumes and speeds this summer. CCC staff could also conduct in-person traffic counts to record vehicle, bicyclist, and pedestrian movements over the summer. CCC staff could refine the analysis presented in the memorandum based on the updated data.

CCC staff will also share the results of summer counts planned for the pedestrian hybrid beacon that was recently installed on Route 6 in Eastham and share any insight from those observations.

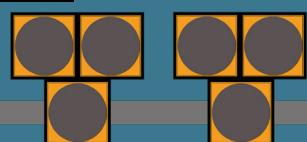
⁴ MUTCD Table 4D-2 Minimum Sight Distance for Signal Visibility

⁵ MUTCD Figure 4F-2 Guidelines for the installation of Pedestrian Hybrid Beacons on High-Speed Roadways

HOW TO USE A PEDESTRIAN HYBRID BEACON

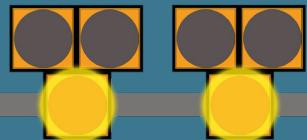
DRIVERS SEE → DO

DARK



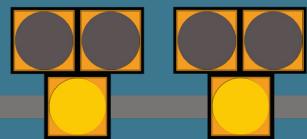
PROCEED
WITH
CAUTION

FLASHING YELLOW



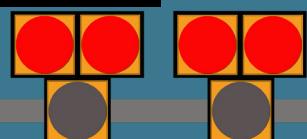
SLOW
DOWN
Someone activated the signal with the push button.

SOLID YELLOW



PREPARE
TO
STOP

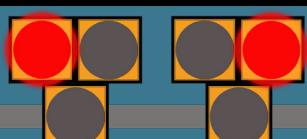
SOLID RED



STOP

Someone is crossing.

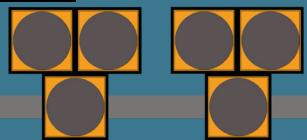
ALTERNATING FLASHING RED



STOP

Proceed with caution when clear.

DARK



PROCEED
WITH
CAUTION

PEDESTRIANS & CYCLISTS SEE → DO

PUSH
BUTTON
TO CROSS



WAIT



KEEP
WAITING



START
CROSSING



FINISH
CROSSING



Do not start crossing during countdown.

PROCEED
WITH
CAUTION

