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# **Current Policies throughout the Nation for Pedestrian Hybrid Beacon (PHB) Installation**

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A report of the findings of  
**ICT PROJECT R27-SP39**  
**Current Policies throughout the Nation for  
Pedestrian Hybrid Beacon (PHB) Installation**

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| <b>16. Abstract</b><br>With increased interest in Pedestrian Hybrid Beacon (PHB) use across the United States, including in Illinois, it is necessary to provide a comprehensive analysis for PHB application nationwide, including current control standards, practice experience, and concerns in all states. Thus, using the official documents of each state and additional information obtained by reaching out to several state engineering staff, this study compiled laws applicable to dark signals and standards, practices, and transportation department concerns regarding PHBs in each state. It was determined that 37 out of 50 states specifically regulate the maneuvers of drivers at dark signals according to statements in law. Forty-one states have implemented PHB use, and three states have made a distinction between traffic signals and PHBs related to driver treatment during a dark condition. In addition, the impedances that prevent PHBs from larger-scale application were obtained. Based on this review, the PHB can be characterized as a widely used device that still poses substantial concerns due primarily to its unique nature. Illinois plans to utilize the information provided in this report to inform policy and focus PHB application in locations where they will be most effective and properly address existing safety concerns. |  |   |   |  |                         |
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The contents of this report reflect the view of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Illinois Center for Transportation, the Illinois Department of Transportation, or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

## EXECUTIVE SUMMARY

Since the Pedestrian Hybrid Beacon (PHB) was invented in the 1990s, it has gained the attention of many walking and bicycling advocacy parties and authorities in transportation engineering, especially after the Federal Highway Administration (FHWA) included it as an optional device in the National Standards for Traffic Control Devices—the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD 2009). This research was conducted to provide the Illinois Department of Transportation (IDOT) with comprehensive information regarding PHB policies in the United States to assist IDOT to determine whether their current policies on PHB use should be reviewed and potentially modified.

With literature review as the primary approach and contacting state department of transportation staff as the supplementary measure, this study obtained information on current policies and applications of PHBs and state laws related to dark signals.

In the common use of the term, a “dark signal” represents a situation in which a traffic signal is not functioning as it should be (i.e. all lighted indicators are dark). As a common but intractable situation, the dark signal has been well studied. However, PHBs rest in a dark condition and the clear intent of national (MUTCD) guidance is that drivers proceed through PHBs in this dark condition, albeit with caution given that these devices are placed at marked crosswalk locations. Still, state laws related to dark signals are relevant to PHB-equipped crosswalk locations, since the ways states have developed such laws could offer meaningful insights on PHB operations in non-activation periods. Thus, it was considered as a critical topic in this study.

By further organizing and analyzing the collected information, the results have been presented separately for the two study topics. It was found that 37 states have established laws on dark signals to regulate the response of people (drivers) when approaching signalized intersections without any lit indications, with 33 laws requiring drivers to stop and four laws enforcing that drivers slow down and prepare for yielding the right-of-way. Importantly, three states have instituted laws that specifically identify a difference between the treatment of a traffic signal and a PHB in a dark condition.

On the topic of application and installation of PHBs, this study summarized the statements in the *Manual on Uniform Traffic Control Devices* (MUTCD), considering both the national MUTCD and the different extensions in each state. Then, this study summarized current PHB practices. Forty-one states have installed PHB devices, seven additional states allow installation of PHBs but have none installed, and one state—Pennsylvania—prohibited PHB installation. We were not able to find any published data for West Virginia, and we did not get a response from our survey questions posed to their DOT personnel. In addition, this study gathered and summarized anecdotal concerns (related primarily to safety and operational efficiency) from state DOTs regarding PHB use.

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# CHAPTER 1: INTRODUCTION

## 1.1 BACKGROUND

A Pedestrian Hybrid Beacon (PHB, as shown in Figure 1), also known as a High-Intensity Activated Crosswalk (HAWK) signal, is a special traffic control device that assists pedestrians in crossing a roadway more safely at midblock crosswalks. The PHB was developed in Tucson, Arizona in the late 1990s (Fitzpatrick and Park 2010), and the Federal Highway Administration (FHWA) added PHB use as an optional device in the publication of the 2009 national *Manual on Uniform Traffic Control Devices* (national MUTCD). Today, PHBs are widely used in some areas of the United States (Arizona, California, and Texas, for example).



**Figure 1. A PHB in Phoenix, Arizona provides protection for pedestrians near a high school.**

***Photo Credit: Mike Cynecki***

## 1.2 MOTIVATION

The inclusion of a PHB as an option by the FHWA has attracted the attention of many groups and parties that advocate for walking and bicycling as major transportation modes. As a result, the Departments of Transportation (DOTs) in many states have received petitions and inquiries to increase the implementation of PHBs. This includes the Illinois Department of Transportation (IDOT). Illinois is seeking a comprehensive review of laws that regulate each party in the presence of a PHB in a dark condition. This, along with a national summary of use and experience, is desired to clarify the issues involved with the use of PHBs statewide in Illinois.

A PHB will not illuminate without activation, so drivers regularly approach a dark condition. Drivers' understanding of their responsibilities when approaching dark PHBs seems critical to ensure the efficiency and safety of PHBs. The national MUTCD 2009 version (Section 1A.13: Definitions of Headings, Words, and Phrases) defines the following: "Dark Mode—the lack of all signal indications at a signalized location. (The dark mode is most commonly associated with power failures, ramp meters, hybrid beacons, beacons, and some movable bridge signals.)," in addition "Traffic Control Signal

(Traffic Signal)—any highway traffic signal by which traffic is alternately directed to stop and permitted to proceed.” Note that PHBs are specifically included in the definition even though they are distinct from typical traffic signals.

Noted differences between a typical traffic signal and a PHB:

- PHBs must be activated for the signal indicators to be lit.
- Typical traffic signals are in operation (certain indicators are lit) continuously.

Therefore, in order to provide IDOT with comprehensive insights to understand potential issues involved with widespread PHB implementation, the state regulation of PHBs has been reviewed and the data compiled herein. One key issue is the identification of distinct laws for PHB use as part of broader dark-signal regulations.

## CHAPTER 2: DARK SIGNALS AND DARK PHBS

As mentioned previously, a dark signal describes the situation in which a traffic signal has no indications. For traffic signals at intersections, the dark signal can be caused by many reasons, such as equipment failure, power outage, or the manual intervention of the signal operation by the agency that controls the signal. The traffic control policies for dark signals are well established for the majority of the 50 states. Specific regulations for a dark signal at a PHB-controlled crosswalk were only found during research for three states. It is important that drivers understand their responsibilities when they approach an inactivated PHB. Thus, this report first focuses on the current control policy specific to both dark signals and dark PHBs in the 50 states.

### 2.1 DATA COLLECTION

The regulations on how motorists are to behave at a dark signal were investigated by accessing state DOT websites, state Secretary of State websites, state police websites, etc. If the information sought could not be located on any of these websites, the research team made an effort to contact staff at the state DOT. Data is presented for all states that responded to the contacts.

To determine if there was a specific reference to a “dark PHB,” a survey email/request was sent with the following question to DOTs:

- Are there applicable rules or laws for vehicles operating at “dark” Pedestrian Hybrid Beacons?

### 2.2 SUMMARY

Currently, 39 states have laws on dark signals, of which 34 states require vehicles to stop completely before entering an intersection with a dark signal, and the other five states require approaching vehicles to proceed with caution and yield the right-of-way to pedestrians and other vehicles that may already be at the intersection. The other 13 states have no policies indicating how drivers are required to behave in the presence of dark signals.

More specifically, within the 34 stop-enforced states, 30 states explicitly require drivers to treat the intersection with dark signals as an all-way stop intersection. The other four states require drivers to completely stop before entering the intersection when observing dark signals. The data for dark signals is located in Appendix A—Dark Signal.

The research found that only three states—Idaho, Indiana, and Rhode Island—have adopted specific regulations on how non-activated PHBs should be addressed by drivers. The data regarding dark PHB guidance and laws is located in Appendix B—Dark PHB Guidance and Laws.

## CHAPTER 3: PEDESTRIAN HYBRID BEACON PRACTICE

This chapter provides an outline of standards from MUTCD regarding PHB use and then summarizes the current PHB practice in the 50 states. See Figure 2 for the breakdown.

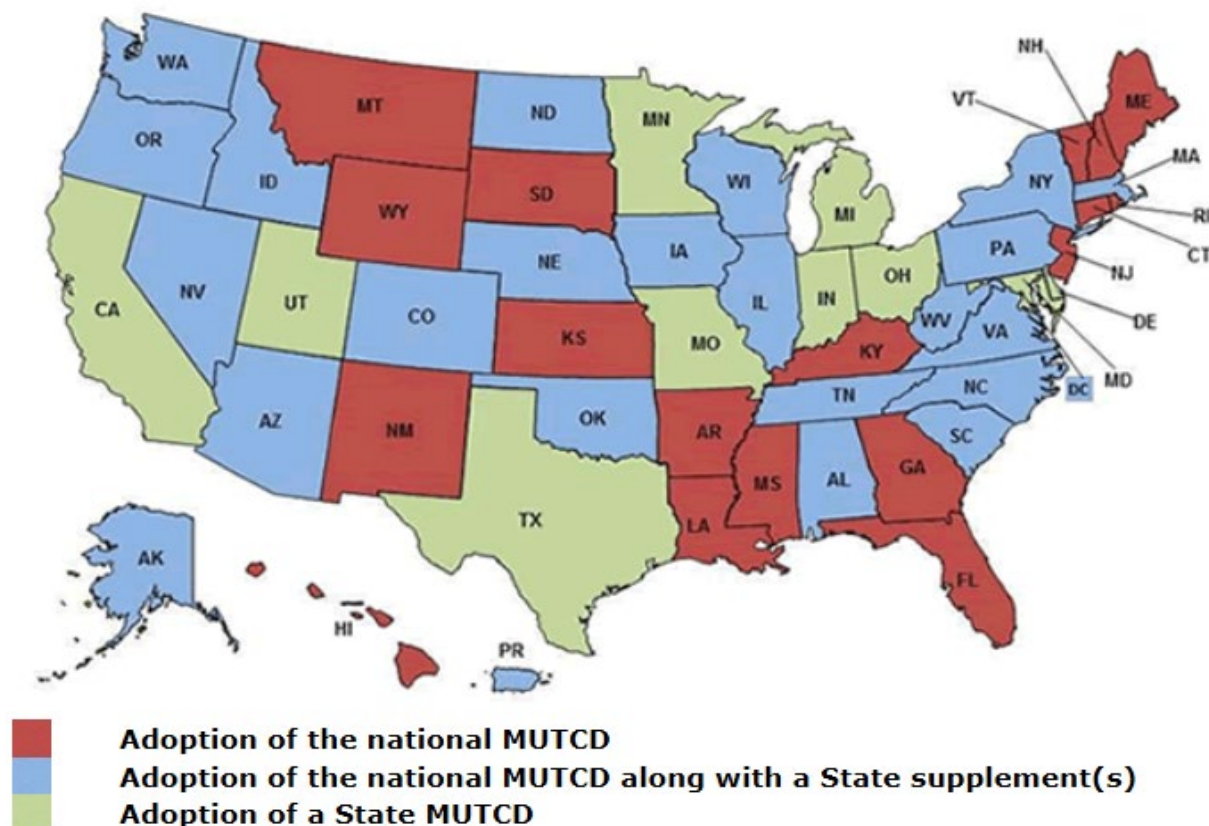


Figure 2. Adoption of MUTCD standards for PHBs.

Policies governing PHB use were investigated by accessing state DOT websites, searching various official state websites, etc., and, if the information could not be located on any website, contacting staff at each state DOT.

A survey email was sent with the following questions:

- How many have you installed?
- What limitations are placed on intersection offsets?

A specific focus was identification of any mention of PHBs in the regulations. This information is compiled in Appendix C—MUTCD by State.

### **3.1 STANDARDS IN MUTCD FOR PHBS**

Policy summary information is compiled in Appendix D—PHB Specifics.

The national MUTCD has developed three sections for PHBs, including application, design, and operation policy.

Most states (39) apply or have the same standards for PHB use as for the national MUTCD. Five states have differences in the application of PHBs, five states have differences in the design of PHBs, and five states have differences in the operation of PHBs.

#### **3.1.1 Application of PHBs**

There is one standard and five guidance items regarding PHB application, including the national MUTCD.

#### **3.1.2 Design of PHBs**

There are five standards describing the design requirements for PHBs in the national MUTCD.

#### **3.1.3 Operation of PHBs**

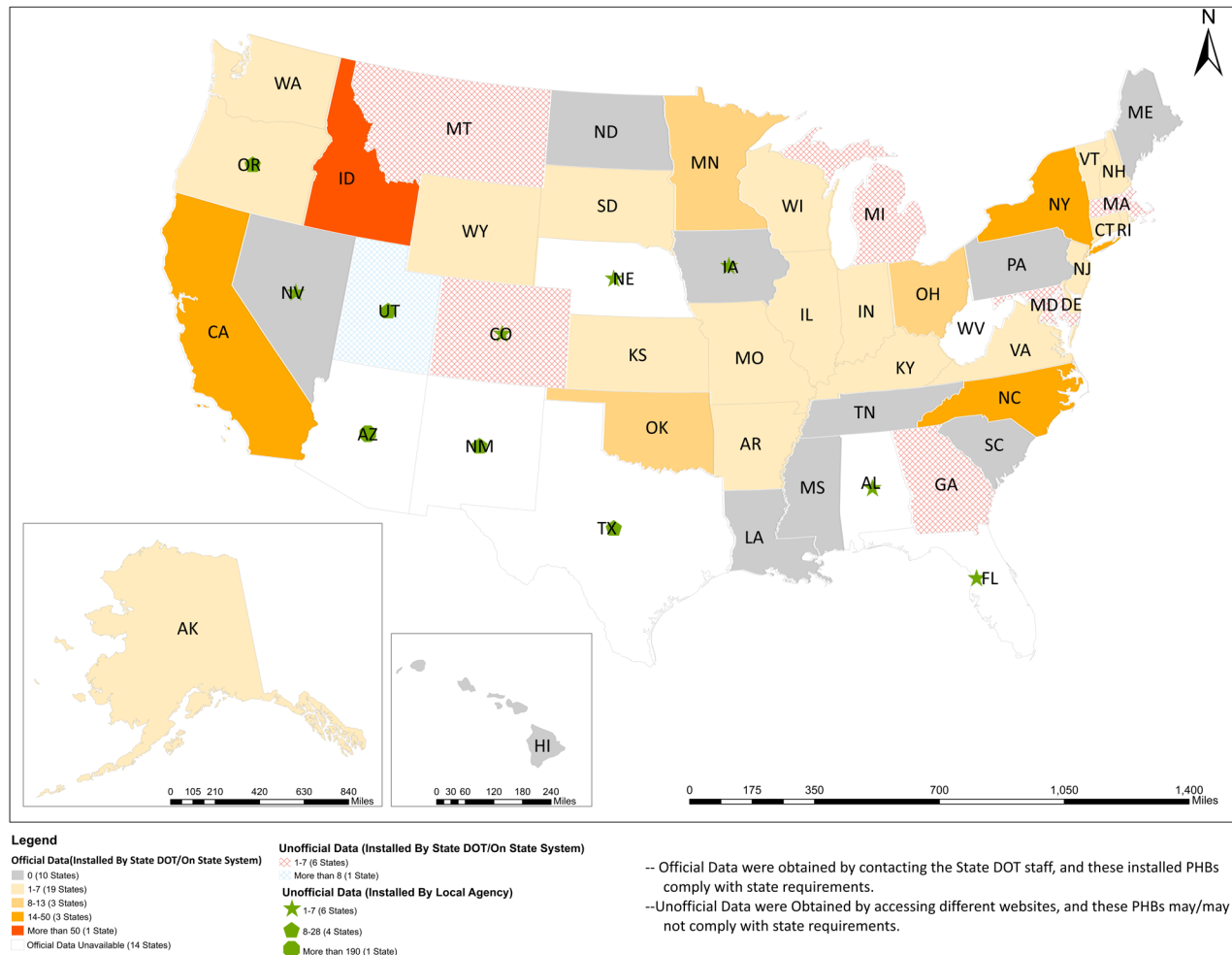
There are four MUTCD standards describing the operational requirements for PHBs.

#### **3.1.4 Offsets of PHBs**

Intersection Offset in MUTCD and state practice were also assessed. See Appendix E—PHB Offset data for more details. There are 43 states where the official regulation is 100' offset (the national MUTCD requirement) “from side streets or driveways that are controlled by STOP or YIELD signs.” There are six states that have a no offset (0') requirement, and one state (Illinois) has a requirement of “100 feet from side streets or driveways and at least 300 feet from traffic signals or railroad grade crossings with active warning devices.” A summary of the offset for PHBs is shown in Appendix E.1—Offset.

### **3.2 CURRENT STATUS OF PHB PRACTICE AND QUANTITY INSTALLED**

Currently, 41 states have installed PHBs. Another seven states allow PHB application but have not installed PHBs. Four of these states have proposed a plan for PHB installation or are in the process of installing at least one PHB. The remaining three states have no plans to install PHBs. In one state, Pennsylvania, PHB use is prohibited by state law. West Virginia has no online information on PHBs, and their DOT has not responded to requests for information. The number of PHB installations were determined as accurately as possible given the constraints that the research team experienced in accessing state data. This information is compiled in Appendix F—PHB Installed Quantity and shown in Figure 3.



**Figure 3. Quantity of PHBs in each state.**

### 3.3 EVALUATION MATRIX/FORM, GUIDELINES

Although PHBs signals are widely used in the US, this traffic control device is still somewhat controversial due to lack of widespread use in many parts of the country. Exposure to these devices has been limited for the majority of US drivers, and there are also questions regarding the adequacy of driver education so that state laws and policies for the devices can be understood. Some specific concerns have been identified by several states. Some issues and feedback that have come up during the investigation are provided in Appendix G—Feedback on Installations.

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## APPENDIX A—DARK SIGNAL

| State | Methods                                      | Description of “Dark Signal”        | Law  | Source  |
|-------|--|-------------------------------------|--|---|
| AL    | Treat it as an all-way stop intersection     | Inoperative                         | If the traffic light is inoperative, treat the intersection as you would a <b>four-way</b> stop.   | <a href="#">Alabama Driver Manual 2016</a> , Chapter 6. Accessed April 9, 2019.                           |
| AK    | Stop   | Not functioning or not in operation | If a signal does not have any of its bulbs functioning and there is no other signal head in operation for your direction and there is no one directing traffic, the intersection is uncontrolled. You <b>must stop. Yield</b> to traffic approaching the intersection on your right.   | <a href="#">Alaska Driver Manual</a> , Traffic Signals Section. Accessed April 9, 2019.                   |
| AZ    | Treat it as an all-way stop intersection     | Inoperative                         | When approaching an intersection with an inoperative traffic control signal, treat it as you would a <b>4-way</b> stop.  | <a href="#">Arizona Driver License Manual</a> , Section 3. Accessed April 9, 2019.                        |
| AR    | Slowing down or stopping if need be to yield | Not in operation                    | Where traffic control signals are not in place or in operation, the driver of a vehicle shall yield the right-of-way, slowing down or stopping if need be, to yield to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as otherwise provided in this subchapter. | <a href="#">AR Code § 27-51-1202 (2017)</a> , Rules of the Road Section. Accessed June 4, 2019.           |
| CA    | Treat it as an all-way stop intersection     | Not working or no lights            | The traffic signal light is not working and/or no lights are showing on the signal. Proceed cautiously as if the intersection is controlled by “ <b>STOP</b> ” signs in all directions.  | <a href="#">California Driver Handbook</a> , Traffic Control Section. Accessed April 9, 2019.             |
| CO    | Treat it as an all-way stop intersection     | Not operating or malfunctioning     | If the traffic signal is not operating or is malfunctioning, treat the intersection as a <b>four-way</b> stop.   | <a href="#">Colorado Driver Handbook</a> , Section 4. Accessed April 9, 2019.                             |
| CT    | Silence                                      |                                     | At an intersection where there is no stop sign, yield sign, or oncoming traffic signal, drivers must yield to vehicles coming from the right.  | <a href="#">Connecticut Driver’s Manual</a> , Chapter 4. Accessed April 9, 2019.                          |
| DE    | Yield the right-of-way                       | No lighted indication               | In the event that traffic signals are in place and no lighted indication is visible to an approaching driver, the approaching driver shall reduce speed and prepare to <b>yield to other vehicles</b> that are in or approaching the intersection.   | <a href="#">Delaware Driver’s Manual</a> , Section 4. Accessed April 9, 2019.                             |
| FL    | Treat it as an all-way stop intersection     | Out of order                        | If a traffic signal is out of order, treat the light/intersection as a <b>four-way</b> stop sign.  | <a href="#">Florida Driver License Handbook</a> , Traffic Control Signal Section. Accessed April 9, 2019. |
| GA    | Treat it as an all-way stop intersection     | Not functioning                     | If a traffic signal is not functioning at all at an intersection, all drivers must treat the intersection as if a <b>stop sign</b> is posted for all directions.   | <a href="#">Georgia Drivers Manual</a> , Section 7. Accessed April 9, 2019.                               |
| HI    | Silence                                      |                                     |  | <a href="#">Hawaii Driver’s Manual</a> . Accessed April 10, 2019.   |
| ID    | Treat it as an all-way stop intersection     | Not functioning                     | Whenever a traffic signal is not functioning, treat the intersection as a <b>four-way</b> stop.  | <a href="#">Idaho Driver’s Manual</a> , Chapter 3. Accessed April 10, 2019.                               |
| IL    | Treat it as an all-way stop intersection     | Not working                         | When traffic control signals are not working, a driver must always treat the intersection as an <b>all-way stop</b> , by coming to a complete stop, unless directed otherwise by law enforcement.  | <a href="#">Illinois DMV Handbook (2019)</a> , Chapter 10   |



| State | Methods  | Description of "Dark Signal"    | Law   | Source   |
|-------|--|---------------------------------|---|--|
| IN    | Treat it as an all-way stop intersection                         | Non-operating                   | If you are approaching an intersection with a non-operating signal, you should <b>stop before entering</b> the intersection.  | <a href="#">Indiana Driver's Manual</a> , Chapter 4. Accessed April 10, 2019.  |
| IO    | <b>Silence (code), An all-way stop (News article—see source)</b> |                                 | At an intersection where there is no stop sign or traffic signal, drivers must yield to vehicles coming from the right.<br><br>"To my knowledge, the Iowa Code is silent on driver's action at dark signals. From my experience, I drive through one of the PHBs on a local street on my way to and from work, I have not seen anyone stop at the dark signals. The biggest problem I have seen is no one will move after stopping until the signal goes dark."<br>—Timothy D. Crouch (State Traffic Engineer)<br>Tim.Crouch@iowadot.us | <a href="#">Iowa DOT News Release from March 2, 2015</a>   |
| KS    | Silence  |                                 | At an uncontrolled intersection, such as in a residential area, where there is no stop sign, yield sign, or traffic signal, you must yield to vehicles in the intersection and those coming from the right. When entering an intersection with no traffic controls, you must yield to the vehicle on your right.  | <a href="#">Kansas Driving Handbook</a> . Accessed April 10, 2019.   |
| KY    | Yield the right-of-way   | Not in operation                | When traffic control signals are not in place or in operation, the operator of a vehicle shall <b>yield the right-of-way</b> , slowing down or stopping if need be to yield, to a pedestrian crossing the roadway upon which the vehicle is traveling, or when the pedestrian is approaching so closely from the opposite half of the roadway as to be in danger.   | <a href="#">Kentucky Driver Manual</a> . Accessed April 10, 2019.  |
| LA    | Treat it as an all-way stop intersection                         | Not functioning                 | When a traffic-control signal is not functioning at an intersection, the intersection shall revert to an all-way or <b>four-way</b> stop.   | <a href="#">Louisiana Driver License Manual</a> , Chapter 6. Accessed April 10, 2019.                                  |
| ME    | Yield to pedestrians   | Not in operation                | When traffic-control devices are not in operation, an operator must yield the right-of-way to a pedestrian crossing within a marked crosswalk.  | <a href="#">Maine Motorist Handbook and Study Guide</a> . Accessed April 10, 2019.                                     |
| MD    | Stop   | Not working                     | When a traffic signal is not working, you are now required to <b>stop</b> at a clearly marked stop line; or if there is no clearly marked stop line, before entering any crosswalk; or if there is no clearly marked stop line or crosswalk, before entering the intersection, and yield to any vehicle or pedestrian in the intersection; and remain stopped until it is safe to enter and continue through the intersection.  | <a href="#">Maryland Driver's Manual</a> , Section 4. Accessed April 10, 2019.   |
| MA    | Treat it as an all-way stop intersection                         | Blacked out and not functioning | If signals are blacked out and not functioning, be cautious and proceed as though there is <b>a stop sign in all directions</b> . Go when it is safe.   | <a href="#">Commonwealth of Massachusetts Driver's Manual Passenger Vehicles</a> , Chapter 4. Accessed April 10, 2019. |
| MI    | Completely stop, yield to vehicles approaching from the right    | Not working                     | If a traffic signal is not working, and there are no law enforcement officers or other traffic signal devices present to control the flow of traffic, come to <b>a complete stop</b> and <b>yield</b> to vehicles already at the intersection. Yield to vehicles on your right if you both reach the intersection at the same time.   | <a href="#">What Every Driver Must Know</a> , Chapter 5. Accessed April 10, 2019.                                      |

| State | Methods                                  | Description of "Dark Signal"                   | Law   | Source   |
|-------|--|--|---|--|
| MN    | Uncontrolled                             | Not functioning                                | If a traffic signal is not functioning, treat the intersection as you would an <b>uncontrolled intersection</b> . <i>When two vehicles reach an intersection at the same time, and there is no traffic light or signal, the driver of the vehicle on the left must yield to the vehicle on the right. When two vehicles approach an uncontrolled "T" intersection, the driver of the vehicle that is turning must yield to all cross traffic.</i>   | <a href="#">Minnesota Driver's Manual</a> , Chapter 5. Accessed April 10, 2019.                                |
| MS    | Silence                                  |  | If there are no signs or signals at an intersection which you are approaching and another vehicle arrives at the same time, remember that the driver on the left must yield to the driver on the right.   | <a href="#">Mississippi Driver's Manual</a> . Accessed April 10, 2019.   |
| MO    | Treat it as an all-way stop intersection | Not working                                    | Dark signals, or traffic signals that aren't working operate as a <b>four-way stop</b> .  | <a href="#">Missouri Driver Guide</a> , Chapter 7. Accessed April 10, 2019.                                    |
| MT    | Treat it as an all-way stop intersection | Not working                                    | If a signal is not working, stop as you would if there were <b>stop signs</b> in all directions.  | <a href="#">Montana Driver Manual</a> , Chapter 3. Accessed April 10, 2019.                                    |
| ME    | Treat it as an all-way stop intersection | Not operational (dark)                         | If a traffic signal is not operational (dark) because of a power failure or other cause and no peace officer, flagger or other traffic control is in place, the intersection shall be treated as an <b>all-way stop</b> .   | <a href="#">Nebraska Driver's Manual</a> , Section 3. Accessed April 10, 2019.                                 |
| NV    | Treat it as an all-way stop intersection | Inoperative                                    | When a vehicle enters an intersection controlled by a traffic-control signal which is installed and has its vehicular signals uncovered, but is inoperative at the time the vehicle enters the intersection, the driver of the vehicle shall proceed as if a <b>stop sign</b> had been erected at each entrance to the intersection and shall stop at a clearly marked stop line or, if there is none, before entering the crosswalk on the near side of the intersection or, if there is none, at the point nearest the intersection where the driver has a view of approaching traffic on the through highway. After making such a stop, the driver shall proceed cautiously, yielding to vehicles which have previously completed a stop or are within the intersection. | <a href="#">NRS 484B—Rules of the Road</a> , NRS 484B.250. Accessed April 15, 2019.                            |
| NH    | Treat it as an all-way stop intersection | Not operational                                | When a traffic control device is not operational, the driver shall obey the rules of the road applicable to intersections without traffic control devices or intersections with <b>4-way stop signs</b> .   | <a href="#">New Hampshire Statutes Chapter 265 Rules of the Road</a> , Section 265:9. Accessed April 15, 2019. |
| NJ    | Treat it as an all-way stop intersection | Not illuminated (power failure/ malfunction)   | When a traffic signal is not illuminated because of a power failure or other malfunction, the traffic signal is observed as a 4-way stop signal.  | <a href="#">The New Jersey Driver Manual</a> , Section 4. Accessed April 15, 2019.                             |
| NM    | Silence                                  |  | At an intersection where there is no stop sign, yield sign or traffic signal, drivers must yield to vehicles coming from the right.   | <a href="#">New Mexico Driver Manual</a> . Accessed April 15, 2019.  |
| NY    | Treat it as an all-way stop intersection | Out of service or do not operate correctly     | State law requires that if the traffic lights or controls are out of service or do not operate correctly when you approach an intersection, you must come to a stop as you would for a <b>stop sign</b> .   | <a href="#">New York Driver's Manual</a> , Part 2. Accessed April 15, 2019.                                    |
| NC    | Treat it as an all-way stop intersection | Malfunctioned (power outage or other problems) | When approaching an intersection with a traffic light that has malfunctioned due to a power outage or some other problem, you should approach the intersection and proceed as though the intersection is controlled by a <b>stop sign</b> on all approaches to the intersection.  | <a href="#">North Carolina Driver Handbook</a> , Chapter 5. Accessed April 15, 2019.                           |

| State | Methods   | Description of "Dark Signal"                 | Law   | Source   |
|-------|---|--|---|--|
| ND    | Treat it as an all-way stop intersection                      | Not lit                                      | If a vehicle approaches an intersection that has traffic-control signals that usually exhibit different colored lights and the signals are not lit, the driver of the vehicle shall <b>stop and yield</b> as required under subsection 2 of section 39-10-24.   | <a href="#">North Dakota Century Code 39-10-22 &amp; 39-10-24(2)</a> . Accessed April 15, 2019.  |
| OH    | Treat it as an all-way stop intersection                      | Non-working                                  | By law, except when a law enforcement officer is present to direct traffic, drivers must treat the non-working traffic signal as a four-way stop intersection.  | <a href="#">Digest of Ohio—Motor Vehicle Laws</a> . Accessed April 15, 2019.   |
| OK    | Silence   |  |   | <a href="#">Oklahoma Driver's Manual</a> . Accessed April 15, 2019.  |
| OR    | Treat it as an all-way stop intersection                      | Dark   | If a signal appears dark, such as during a power failure, you should stop as if there are stop signs in all directions.   | <a href="#">Oregon Driver Manual</a> , Chapter 1. Accessed April 15, 2019.   |
| PA    | Treat it as an all-way stop intersection                      | Non-functioning                              | A non-functioning traffic signal should be treated as though it were a four-way STOP sign   | <a href="#">Pennsylvania Driver's Manual</a> , Chapter 2. Accessed April 15, 2019.   |
| RI    | Silence   |  |   | <a href="#">Rhode Island Driver's Manual</a> . Accessed April 15, 2019.  |
| SC    | <b>Silence (code),<br/>An all-way stop (news)</b>             |  | No signal lights: lights should be treated as a four-way stop.  | <a href="#">WMBF News—What to do if a traffic light isn't working</a> . WMBF News; article October 11, 2016  |
| SD    | Treat it as an all-way stop intersection                      | Out of operation or not functioning properly | If a traffic control signal is out of operation or is not functioning properly, the vehicle facing a Red or completely unlighted signal stop shall stop in the same manner as if the vehicle is at a <b>stop sign</b> .   | <a href="#">South Dakota Driver License Manual</a> , Rules of the Road Section. Accessed April 15, 2019.   |
| TN    | Treat it as an all-way stop intersection                      | Not working                                  | Tennessee state law requires that if a signal is not working, the intersection is to be treated as if it were a four-way stop intersection.   | <a href="#">Tennessee Driver License Manual</a> , Section 2. Accessed April 15, 2019.  |
| TX    | Treat it as an all-way stop intersection                      | Does not display an indication               | An operator of a vehicle facing a traffic-control signal, other than a freeway entrance ramp control signal or a <b>pedestrian hybrid beacon</b> , that does not display an indication in any of the signal heads shall stop as provided by Section 544.010 as if the intersection had a <b>stop sign</b> . | <a href="#">Texas Statutes TRANSPORTATION CODE Title 7. VEHICLES AND TRAFFIC Subtitle C. RULES OF THE ROAD, Sec. 544.007. (i)</a> . Accessed April 15, 2019. |
| UT    | Completely stop, yield to vehicles approaching from the right | Not working                                  | If you approach an intersection where the traffic lights are not working, you must first come to a <b>complete stop</b> before entering the intersection and <b>yield the right-of-way</b> to any vehicle on the right unless otherwise directed by a peace officer.  | <a href="#">Utah Driver Handbook</a> . Accessed April 15, 2019.  |
| VT    | Treat it as an all-way stop intersection                      | Dark (power failure)                         | Traffic signals control the right-of-way and provide for a smooth, orderly flow of traffic. If a signal light is dark, as in a power failure, stop as if there are stop signs in all directions. When a traffic signal is out of order and flashes yellow or red, you must obey that signal.                | <a href="#">Vermont Driver's Manual</a> . Accessed June 7, 2019.   |
| VA    | Treat it as an all-way stop intersection                      | Dark (power failure)                         | If a signal light is dark, as in a power failure, stop as if there are stop signs in all directions.  | <a href="#">Vermont Driver's Manual</a> . Accessed April 15, 2019.   |

| State | Methods                                  | Description of "Dark Signal" | Law   | Source   |
|-------|--|------------------------------|---|--|
| WA    | Treat it as an all-way stop intersection | Not working                  | If a traffic signal is not working, come to a complete stop, then yield to traffic as if it were a <b>four-way stop</b> . | <a href="#">Washington Driver Guide</a> . Accessed April 15, 2019.                       |
| WV    | Silence                                  |                              |   | <a href="#">West Virginia Driver's Licensing Handbook</a> . Accessed April 15, 2019.     |
| WI    | Treat it as an all-way stop intersection | Lose power and malfunctions  | If a traffic signal loses power and malfunctions, proceed as if the signal were a stop sign.                              | <a href="#">Wisconsin Motorists' Handbook</a> . Accessed April 15, 2019.                 |
| WY    | Silence                                  |                              |   | <a href="#">The 2016 State of Wyoming Driver License Manual</a> . Accessed June 7, 2019. |

## APPENDIX B—DARK PHB GUIDANCE AND LAWS

| State | Dark PHB in Law?  | Email | Contact Info.   |
|-------|---|-------|---|
| AL    |   |       |   |
| AK    | There isn't any specific reference to PHBs in the Alaska Driver's Manual. Vehicle operators are expected to follow commonly understood "rules of the road" and obey posted traffic control devices. To that end, Alaska DOT&PF was recently granted approval from the Alaska Division FHWA to add the CROSSWALK, STOP ON RED, PROCEED ON FLASHING RED WHEN CLEAR (R10-23a) word message sign to the ATM, as allowed under Official MUTCD Interpretation Issued by FHWA 4(09)-61 (I).  |       | Matt Walker, PE<br>State Traffic & Safety Engineer<br>matthew.walker@alaska.gov |
| AZ    | Please open the links below to get more information about PHBs in AZ and the Traffic Engineering Guidelines and Procedures:<br><a href="https://www.azdot.gov/about/transportation-safety/pedestrian-hybrid-beacon">https://www.azdot.gov/about/transportation-safety/pedestrian-hybrid-beacon</a><br><a href="https://www.azdot.gov/docs/default-source/traffic-library/tgp0640-2015-06.pdf?sfvrsn=4">https://www.azdot.gov/docs/default-source/traffic-library/tgp0640-2015-06.pdf?sfvrsn=4</a><br><br>I don't have the number of PHBs installed in AZ, as they are mostly installed within the local jurisdictions.          |       | Maysa Hanna, PE<br>State Traffic Engineer<br>MHanna@azdot.gov                   |
| AR    | ARDOT is working on a database system to track all intersections on the state highway system. This database will eventually house useful information such as this. Until then, though, I don't have an exact number of PHBs in use. I recall that there are less than five, that I am aware of, on our state highway system. There may be more on city or county roads, but we have even less information on those.<br>We follow MUTCD on offsets.<br>No special law(s) has been passed governing the use of PHBs.  |       | Joseph Hawkins<br>Staff Traffic Engineer<br>Joseph.Hawkins@ahtd.ar.gov          |
| CA    | – How many have you installed? Less than 50 locations on State Highway (not including local road).<br>– What limitations are placed on intersection offsets? Please see Section 4F.02 in CA MUTCD.<br>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? There are no special rules or laws for any dark beacon.  |       | Duper Tong<br>Chief, Office of Traffic Engineering<br>duper.tong@dot.ca.gov     |
| CO    |   |       |   |
| CT    | – How many have you installed? 3.<br>– What limitations are placed on intersection offsets? None. We don't have any written policies or practices.  |       | Joseph P. Ouellette<br>State Safety Engineer<br>joseph.ouellette@ct.gov         |
| DE    | Delaware currently has five operational pedestrian hybrid beacons. Four are referenced in the attached report and we have since installed one more. There are no specific offset requirements ( <a href="https://deldot.gov/Programs/DSHSP/pdfs/OtherPedProjects/HAWK_Study_Report_December2017.pdf">https://deldot.gov/Programs/DSHSP/pdfs/OtherPedProjects/HAWK_Study_Report_December2017.pdf</a> ). Each location is individually studied and analyzed related to traffic flow, speed, pedestrians, bicycles, geometry, etc., and case-by-case decisions are made as to the type of traffic control, location, islands, etc. |       | Mark Luszczyk, PE<br>PTOE Chief Traffic Engineer<br>Mark.Luszczyk@delaware.gov  |
| FL    |   |       |   |
| GA    |   |       |   |
| HI    |   |       |   |
| ID    | – How many have you installed? Approximately 100. Most have been installed by the Ada County Highway District (ACHD) in the Boise area. <a href="http://achdidaho.org/">http://achdidaho.org/</a><br>– What limitations are placed on intersection offsets? We adopt the PHB Chapter of the MUTCD as is, but in effect there are no limitations on intersection offsets.<br>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? As is typical, Idaho law says to approach a dark signal as a stop-controlled intersection. In practice, that law is ignored for PHBs.                |       | Ryan D. Lancaster<br>Standards Engineer<br>Ryan.Lancaster@itd.idaho.gov         |

| State | Dark PHB?                      | Email  | Contact Info.  |
|-------|--------------------------------|--|--|
| IL    |                                | <p>We are aware of four PHBs in operation in Illinois. The below section of Illinois law addresses requirements at dark signal. Dark signals – 625 ILCS 5/11-305 (e) states that “The driver of a vehicle approaching a traffic control signal on which no signal light facing such vehicle is illuminated shall stop before entering the intersection in accordance with rules applicable in making a stop at a stop sign.” A PHB is an electric device that controls traffic. Therefore, if it is at an intersection, vehicles are compelled to stop at a dark PHB. Consequently, the ILMUTCD (Section 4F.02) was written to require a PHB to be at least 100 ft from side streets or driveways, and at least 300 ft from traffic signals or railroad grade crossings with active warning devices.</p>   | <p>Kyle D. Armstrong, PE<br/>PTOE Engineer of<br/>Traffic Operations<br/>Kyle.Armstrong@illinois.gov</p> |
| IN    | Proceed without stopping (law) | <p>– INDOT has installed two PHBs and two more have been or will be installed on the state highway system by local public agencies.</p> <p>– INDOT does not have any separate guidance on the intersection offset distance; it seems that the MUTCD guidance statement in Section 4F.02, ¶14A is generally met for trail crossings but is more difficult to attain for crosswalks.</p> <p>– In 2011, Indiana law was changed to recognize pedestrian hybrid beacons. See Indiana Code Sections 9-21-3-0.5, 9-21-3-7(b)(4)(C), and 9-21-8-36: <a href="http://iga.in.gov/legislative/laws/2018/ic/titles/009#9-21-3-7">http://iga.in.gov/legislative/laws/2018/ic/titles/009#9-21-3-7</a></p>   | <p>Dave Boruff<br/>Traffic Administration<br/>Section Supervisor<br/>DBORUFF@indot.IN.gov</p>            |
| IA    |                                | <p>To my knowledge, we do not have a pedestrian hybrid beacon installed on a state highway. I know some of the cities have installed a few on the city street system, but I don't have information on the installations. We do not have any policies on their installation, we would just follow the MUTCD for guidance.</p> <p>To my knowledge, the Iowa Code is silent on driver's action at dark signals. From my experience, I drive through one of the PHBs on a local street on my way to and from work, I have not seen anyone stop at the dark signals. The biggest problem I have seen is no one will move after stopping until the signal goes dark.</p>   | <p>Timothy D. Crouch<br/>State Traffic Engineer<br/>Tim.Crouch@iowadot.us</p>                            |
| KS    |                                | <p>To my knowledge, KDOT has allowed two Hybrid Beacon Systems along the Kansas State Highway System (K, US, I routes). In Kansas, the local entity is responsible for funding, maintaining, and installing pedestrian devices. Because of the expense of the hybrid beacon system, it generally has not been recommended as an option to pursue. Options involving the rectangular rapid flashing beacon (RRFB) are more likely to be recommended.</p> <p>However, there are communities that have hybrid beacons installed which are not on the state highway system. The city of Lawrence, KS has anywhere from 20–30 hybrid beacons installed within its city limits.</p> <p>– How many have you installed? KDOT has allowed two on the state highway system.</p> <p>– What limitations are placed on intersection offsets? We follow guidance provided in the 2009 MUTCD. I have seen some hybrid beacons installed at intersections with one-way streets. These locations are off the state highway system.</p>  | <p>Brian D. Gower<br/>KDOT – Transportation<br/>Safety and Technology<br/>Brian.gower@ks.gov</p>         |
| KY    |                                | <p>To the best of my knowledge, Metro Louisville is the only agency in Kentucky to install a PHB. It is located at an intersection on River Road. Lexington has kicked the concept around at a few locations, but I don't believe they have installed any yet. To date, the Kentucky Transportation Cabinet has not installed any pedestrian hybrid beacons. For the most part, we feel that a traditional signal would be a better option for controlling traffic since the public already understands the indications in a traditional traffic signal, whereas the pedestrian hybrid beacon would require education efforts. We were prepared to approve a pedestrian hybrid beacon for a heavily used pedestrian crossing on the campus of Transylvania University. This crossing has significant pedestrian traffic throughout the day (including peak periods of traffic flow) and crosses a major roadway entering into downtown Lexington. Mainline traffic is heavy enough that we felt the additional capacity/throughput provided by a pedestrian hybrid beacon was worth dealing with the problems associated with educating the public on the operation of a PHB. However, at the last-minute local officials were not comfortable with installing a pedestrian hybrid beacon, and we ultimately selected a RRFB for that location. If we ever install a pedestrian hybrid beacon, it will be at a location with heavy pedestrian traffic (likely satisfying a warrant) and/or pedestrian safety issues. As with the Transylvania location referenced above, it will likely be a location with significant enough mainline traffic that would necessitate the additional capacity provided by a PHB. Otherwise, our Cabinet would likely select a traditional traffic signal for the crossing.</p> | <p>Jeff J. Wolfe /<br/>Troy T. Hearn, (KYTC)<br/>Troy.Hearn@ky.gov</p>                                   |
| LA    |                                | <p>We have had a few be accepted into our Safe Routes to Public Places Program, though as of now, none have been installed. The programmed PHBs are undergoing feasibility before final determination after which a specification will be developed.</p>   | <p>Jessica DeVille<br/>Jessica.DeVille@LA.GOV</p>  |

| State | Dark PHB? | Email  | Contact Info.  |
|-------|-----------|--|--|
| ME    |           | Maine does not currently have any PHB installations, nor does it have any scheduled. The department may look at them in the near future, however.  | Pamela D. Shofner, Librarian,<br>Maine DOT Library<br>Pamela.shofner@maine.gov                                       |
| MD    |           |  |  |
| MA    |           |  |  |
| MI    |           |  |  |
| MN    |           | <p>MnDOT has about 10 Hawks on the state highway system.</p> <p>We have installed some of our HAWKS at intersections, but we now discourage this. We follow the 100' rule.</p> <p>Minnesota does have laws that you must yield to pedestrians at crosswalks, even if the lights are not flashing.</p>  | <p>Jerry Kotzenmacher<br/>Signals Section – Office of<br/>Traffic Engineering<br/>jerry.kotzenmacher@state.mn.us</p> |
| MS    |           | MDOT does not have any Pedestrian Hybrid Beacon installations at this time. We are currently looking to have one installed on a road that is in the process of being “turned over” from the state to a local agency as part of a construction project; but aside from this one, there are no others installed by MDOT.   | Mississippi Department of<br>Transportation  |
| MO    |           | We have installed the pedestrian hybrid beacon (PHB) on MoDOTs highway system in approximately seven locations. PBHs have also been installed on the local system, but the quantity is unknown. Please refer to our Engineering Policy Guide section 902.7 for additional information.   | <p>Ashley Buechter<br/>Traffic Liaison Engineer<br/>Ashley.Buechter@modot.mo.gov</p>                                 |
| MT    |           |  |  |
| NE    |           |  |  |
| NV    |           | The High Intensity Activated crosswalk (HAWK) is not the typical PHB for the Nevada Department of Transportation (NDOT), and we have not installed any that I am aware of.   | <p>Seth Daniels, PE<br/>Assistant Chief Traffic<br/>Operations Engineer<br/>sdaniels@dot.nv.gov</p>                  |
| NH    |           | <p>In New Hampshire, we currently have five PHBs installed, two each in Goffstown (rail trail crossings) and Meredith (Lakes Region tourist town), and one in Epping (rail trail crossing). One of the two in Meredith was required in order to secure approval for a new crosswalk. The crosswalk was requested by the town as part of the site plan approval for a new senior housing apartment complex across the street from a convenience store. In hindsight it is seldom used and could likely be removed. We do not have any specific intersection offset criteria and would consider locations on a case-by-case basis. Where three of the four active locations are for rail trail crossings, it is not an issue. The fourth location is removed from a signalized intersection by a few hundred feet and is coordinated with the signal.</p> <p>NJ has three pedestrian hybrid beacons.</p> | <p>William R. Lambert<br/>Traffic Engineer/Administrator<br/>William.Lambert@dot.nh.gov</p>                          |
| NJ    |           | NJDOT tries to follow the should guidance of installing the pedestrian hybrid beacon at least 100 ft from an intersection for installations on roadways under state jurisdiction. However, one of our installations is at an intersection (see below aerial) but all traffic on Magnolia Rd must turn right, away from the crosswalk. For local roadways not under the jurisdiction of NJDOT, the installation of pedestrian hybrid beacons is up to the discretion of the local engineer. NJ does not have specific guidance for vehicles when the PHB is dark. NJ uses the R10-23 sign as the MUTCD indicates in a shall condition.  | <p>Jaime Oplinger<br/>Executive Manager<br/>Jaime.Oplinger@dot.nj.gov</p>  |
| NM    |           | The state has not installed any PHBs, but the locals have. I am not aware of the number. But I estimate between 10 to 15. We have not established any parameters.  | <p>Jian, Afshin<br/>State Traffic Engineer<br/>Afshin.Jian@state.nm.us</p>   |

| State | Dark PHB? | Email   | Contact Info.  |
|-------|-----------|---|--|
| NY    |           | <ul style="list-style-type: none"> <li>– How many have you installed? Likely less than 20 statewide between both us and local highway authorities.</li> <li>– What limitations are placed on intersection offsets? We follow the MUTCD guidance; we have not developed any of our own guidance on HAWKS.</li> <li>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? No. NY's dark signal law applies to a traffic control signal which is out of service or otherwise malfunctioning. The HAWK is not a traffic signal, and it's not malfunctioning in its dark mode.</li> </ul>   | Barbara S. Abrahamer<br>Senior Civil Engineer<br>barbara.abrahamer@dot.ny.gov  |
| NC    |           | North Carolina has 40 +/- hybrid beacons installed on the state system. The vast majority adhere to the current MUTCD restrictions on placement. And our general statute is attached. It is very clear on what to do at a dark traffic signal at an intersection, less so at mid-block locations.   | Jason Galloway<br>State Signals Engineer<br>jgalloway@ncdot.gov  |
| ND    |           |   |  |
| OH    |           | <ul style="list-style-type: none"> <li>– How many have you installed? ODOT has none on our system. However, I know of at least a dozen statewide. They are mostly located in downtown business district type area, or on college campuses.</li> <li>– What limitations are placed on intersection offsets? When reviewing, we stress the OMUTCD recommendations/guidance, which mirrors the MUTCD, to give the minimum 100' offset from any side street.</li> <li>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? The only current legislation regarding PHBs under yellow and red beacons can be found in Ohio Revised Code (ORC) Section E4 and F3 of 4511.13 (<a href="http://codes.ohio.gov/orc/4511">http://codes.ohio.gov/orc/4511</a>). As long as PHBs are always referred to as Beacons, this suffices. If a PHB is recognized as a signal, Ohio would have to revise our laws since a dark signal needs to stop at stop line, yield to vehicles/peds, and act as a 4-way stop. This is outlined in ORC 4511.132 (<a href="http://codes.ohio.gov/orc/4511">http://codes.ohio.gov/orc/4511</a>).</li> </ul>  | Charlie Fisher<br>Statewide Traffic<br>Operations Engineer<br>Charles.Fisher@dot.ohio.gov  |
| OK    |           | <ul style="list-style-type: none"> <li>– How many have you installed? So far, we installed about eight HAWK systems on the highway system.</li> <li>– What limitations are placed on intersection offsets? The link below shows the limitations: <a href="http://www.okladot.state.ok.us/traffic/collision_analysis/pdf/PHB-Policy2016-09-02.pdf">http://www.okladot.state.ok.us/traffic/collision_analysis/pdf/PHB-Policy2016-09-02.pdf</a></li> </ul>   | Tarek A. Maarouf<br>Engineering Manager,<br>Traffic Engineering Division,<br>tmaarouf@odot.org   |
| OR    |           | <p>Here are the PHB installations on state highways in Oregon:</p> <ul style="list-style-type: none"> <li>– OR 126 between 66th and 67th streets, Springfield (approved for installation, not yet built)</li> <li>– OR 39 at Portland St, Klamath Falls</li> </ul> <p>Others we know of in Oregon off the State Highway System (not a complete list of PHBs in Oregon):</p> <ul style="list-style-type: none"> <li>– Franklin Blvd between I-5 and Glenwood Blvd, Springfield</li> <li>– Gateway St near USPS office, Springfield</li> <li>– Harlow Rd between Pheasant Blvd and Lindale Dr, Springfield</li> <li>– E. Broadway between Patterson and Coburg Rd, Eugene</li> <li>– S Columbus Ave and Diamond St, Medford</li> <li>– Burnside at 41st, Portland</li> </ul> <p>Note: The City of Springfield has converted most/all of their PHBs to standard signal heads in recent years (you can see most of them on street view) and are operating them in a unique way. Brian Barnett (City Traffic Engineer) at the City of Springfield can provide more information if you want. Placement criteria for Oregon's State Highway System matches federal MUTCD—recommended not within 100 feet of side street or driveway controlled by STOP or YIELD signs. we found a few more locations on local roads to add to the Oregon list:</p> <ul style="list-style-type: none"> <li>– Hall Blvd at Fanno Creek Trail, Beaverton</li> <li>– Farmington Rd and 138th, Beaverton</li> <li>– Burnside Rd and 30th, Portland</li> <li>– Sandy Blvd and 18th St, Portland</li> </ul> | Eric Leaming<br>State Traffic Investigations Engineer<br>eric.s.leaning@odot.state.or.us<br><br>Gary R. Obery.<br>Active Modes Traffic Engineer<br>Gary.R.OBERY@odot.state.or.us |



| State | Dark PHB? | Email  | Contact Info.  |
|-------|-----------|--|--|
|       |           | <p>We currently do not have any HAWK signals installed, as they are not permitted under the Pennsylvania Vehicle Code.</p> <p>This is from our Statewide Traffic Signal Operations Engineer, Steve Gault: "To my knowledge, the language in the PA Vehicle Code hasn't been updated since the HAWK signal was 'invented' and added to the MUTCD. I don't think there was a specific intent to prohibit it, but there hasn't been a push to pass legislation that would specifically allow it. My understanding is the interpretation is a dark signal in PA Vehicle Code means it should be treated as an all-way stop. The intended operation for a HAWK signal is that it is dark whenever not actuated by pedestrians, in which case vehicles would be expected to proceed freely."</p> <p>So, we at PennDOT wouldn't even be able to test the HAWK signal until legislation allows for its use in PA.</p>  |  |
| PA    |           | <p>One more response from Dan Farley who is the chief of our Operations and Performance section: "Other issues with the HAWK (PHB) signal include:</p> <ul style="list-style-type: none"> <li>– Not clear clarification as to how to navigate a flashing red indication. The MUTCD contradicts itself-regarding when to navigate through a flashing red for a HAWK versus at a traffic signal or even a railroad crossing.</li> <li>– The device was put into the last manual with little research outside of the Southwest where it originated from. Based on results we are seeing our concerns are now becoming problems in other areas of the country.</li> <li>– Driver understanding of the concept is questionable. Many individuals don't understand a dark signal and now we are flashing the devices and developing new meanings.</li> <li>– Many states have been forced to put it in due to political pressure.</li> <li>– The clarification signs are not clearly understandable, and the Official Traffic Control Device team hasn't found an effective sign yet for the operation.</li> <li>– Overall the effectiveness of the unit has been questionable and has created an issue with bikes/pedestrians that arrive at the end of the HAWK phase which has led to additional crashes."</li> </ul> | <p>Anthony Chiodo Civil Engineer,<br/>Traffic Signals<br/>anchiodo@pa.gov</p>  |
| RI    |           | <p>We have one PHB installed with several more in design.</p> <ul style="list-style-type: none"> <li>– At installed location, intersections are not offset. For proposed locations, they are at midblock crossings and not intersections. The one installed is at an intersection and we have no limitations at this time in regard to being offset from intersections. The locations are governed by where the pedestrians are located.</li> </ul> <p>When the PHB is not activated and dark, motorists should treat it as if it weren't there and it was just an unsignalized midblock crossing. It could be possible that motorists who assume it's a full traffic signal and stop at the stop bars thinking that it is malfunctioning (ex. loss of power), but we haven't had any record of this issue coming up.</p>  | <p>Lindsey M. Sasso<br/>Senior Information and Public<br/>Relations Specialist<br/>Office of Customer Service<br/>dot.customerservice@dot.ri.gov</p> |
| SC    |           | <p>Our Traffic Engineering office has developed a guideline for pedestrian hybrid beacons in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). I have attached a copy of this guideline for your use.</p> <p>SCDOT has not installed any PHBs but has allowed a few to be installed on state-maintained roads under encroachment permit.</p>  | <p>Ashley Johnson<br/>Traffic Operations Engineer<br/>JohnsonHA@scdot.org</p>  |
| SD    |           | <p>We currently have one Hawk system operating in the state. I am working on the plans for a second installation.</p> <p>SDDOT currently does a policy or practice for offset of the HAWK systems. The one installed is mid-block and the one being designed will be at an intersection.</p>   | <p>Dan Martell<br/>South Dakota Department of<br/>Transportation<br/>Aberdeen Region Traffic<br/>Engineer</p>  |
| TN    |           | <p>TDOT has not used PHBs much (at all?) I believe and does not plan to use them. I am copying Jessica Wilson who has a longer history with TDOT bike ped than I. She will correct me if I am mistaken. We prefer pedestrian-activated yellow-ball beacons for overhead assemblies and RRFBS.</p>  | <p>Whitney Mason, TDOT Bicycle<br/>and Pedestrian Coordinator<br/>Whitney.Mason@tn.gov</p>   |
| TX    |           | <p>The Texas Department of Transportation has specific requirements for PHB installations in our Traffic Signals Manual (Chapter 5, Section 7) but these requirements apply to state roads only. We currently have only two PHB systems operating on state highways in Texas. Some cities in Texas, however, have installed more PHBs on city streets.</p>   | <p>Douglas A. Skowronek<br/>Transportation Engineer<br/>Doug.Skowronek@txdot.gov</p>   |
| UT    |           |  |  |

| State | Dark PHB? | Email   | Contact Info.   |
|-------|-----------|---|---|
| VT    |           | <p>We currently have one HAWK Signal on the state highway system in Vermont. It was installed in 2013. We do not have any documented limitations on intersection offsets. However, our one HAWK Signal does have an offset of approximately 30' with a median on a divided highway. We use the latest edition of the MUTCD as law and therefore there are no specific requirements for the dark signal heads at the HAWK. We utilize retroreflective backplates to draw attention to the signal heads during low light conditions. Attached is our plan sheet showing the layout of our HAWK.</p>   | <p>Derek Lyman, PE<br/>Traffic Signal Operations Engineer<br/>derek.lyman@vermont.gov</p> |
| VA    |           | <p>Q1 how many have we installed: To date VDOT has only installed one Pedestrian Hybrid Beacon on our system of roads, on Backlick Road near Lynbrook Elementary School.</p> <p>However many of Virginia's traffic signals are maintained by localities (including all signals in cities, large towns, and Arlington County; plus some signals in Henrico County). We don't have an inventory of exactly how many locally maintained PHBs are out there, but we are aware of several in various localities including Arlington, Alexandria, and Vienna.</p> <p>Q2 limitations on intersection offsets: VDOT policies on unsignalized pedestrian crossings is contained in this document. That document also addresses PHBs. Currently that document does not have much Virginia-specific policy beyond what is stated in the MUTCD; however, we are currently developing updates to that policy.</p> <p>Q3 applicable rules or laws for vehicles: There are no Virginia-specific laws that explicitly address PHBs; however, we have been of the opinion that the Code of Virginia adequately addresses required driver behavior at PHBs, whether the PHB is displaying a dark, flashing yellow, steady yellow, steady red, or alternating flashing red indication.</p> | <p>Marc Lipschultz<br/>Senior Traffic Engineer<br/>marc.lipschultz@vdot.virginia.gov</p>  |
| WA    |           | <ul style="list-style-type: none"> <li>– WSDOT does not have a formal policy or position on PHB/HAWK signals.</li> <li>– There are maybe five installed within WSDOT jurisdiction (there are many more installed by local jurisdictions).</li> <li>– Intersection offsets follow the MUTCD, Section 4F.02, with additional distance to signalized intersections.</li> <li>– Washington State only has a law for nonfunctioning traffic signals at an intersection (<a href="https://app.leg.wa.gov/RCW/default.aspx?cite=46.61.183">https://app.leg.wa.gov/RCW/default.aspx?cite=46.61.183</a>) and does not specifically address special signal systems (emergency vehicle, pedestrian crossing, ramp meter, or PHB/HAWK).</li> </ul>  | <p>Angel Dziedzic<br/>Traffic Operations Office<br/>DziedzA@wsdot.wa.gov</p>              |
| WI    |           | <p>The Wisconsin Department of Transportation (WisDOT) currently maintains five PHBs across the state. There are more than five PHBs currently in the state of Wisconsin, but those PHBs were either installed by a local municipality or county; or the PHB was installed as part of a WisDOT project and ownership of the PHB was transferred to the municipality or county after the completion of the project. WisDOT typically follows the standards set in MUTCD 4F.02 when deciding on the placement of PHBs—"The pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs." However, three of the PHBs are in a tourist area with a high concentration of commercial driveways and it was not possible to get 100' of separation between the PHB and driveways. In those cases, engineering judgement was used to determine the best locations to place the PHBs. I do not believe we have any laws specifically addressing PHBs. Some of our PHBs have a variation of the R10-23 sign to assist with drivers unfamiliar with the PHBs.</p>   | <p>Jeremy R. Iwen<br/>Statewide Traffic Signal Engineer<br/>Jeremy.Iwen@dot.wi.gov</p>    |
| WY    |           | <p>WYDOT has four PHBs. No limit on intersection offsets. No laws or rules on dark beacons that I am aware of.</p>  | <p>Joel A. Meena<br/>State Traffic Engineer<br/>joel.meena@wyo.gov</p>                    |

## APPENDIX C—MUTCD BY STATE

“[Part 4—Highway Traffic Signals](#)—2009 Edition”—Refers to the FHWA MUTCD

| State | Applicable MUTCD Source  | Applicable MUTCD          | PHB Specifics in Applicable MUTCD   | Applicable Section  |
|-------|--|---------------------------|---|---------------------|
| AL    | <a href="#">Traffic Signal Design Guide &amp; Timing Manual</a> —June 2015                             |                           |   |                     |
| AK    | <a href="#">AK Part 4—Highway Traffic Signals</a> —2016 Edition  | AK MUTCD                  | <a href="#">AK Part 4—Highway Traffic Signals</a> —2016 Edition                                       | 4A.100              |
| AZ    | <a href="#">Arizona Supplement to the 2009 Manual on Uniform Traffic Control Devices</a> —2009 Edition | Evaluation form           | <a href="#">ADOT Traffic Engineering Guidelines and Processes—Pedestrian Hybrid Beacon</a> —June 2015 | 640                 |
| AR    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   | MUTCD                     |   |                     |
| CA    | <a href="#">CA Manual on Uniform Traffic Control Devices</a> —2014, Revision 4                         |                           |   |                     |
| CO    | <a href="#">MUTCD 2009 Colorado Supplement Issued 12-06-11 Revised 04-16-18</a>                        | Lanes/speed/volume/median | <a href="#">CDOT Chapter 14 Bicycle and Pedestrian Facilities</a>                                     | 14.3.9.2 & 14.3.9.3 |
| CT    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |                           | <a href="#">Connecticut DOT General Files</a>   |                     |
| DE    | <a href="#">DE Part 4—Highway Traffic Signals</a> —2018 Revision                                       |                           | <a href="#">2015 Traffic Design Manual—IV Traffic Signals</a>   |                     |
| FL    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   | Offset/lanes/median       | <a href="#">Traffic Engineering Manual—Chapter 3—Signals</a> —2017 Revision                           | 3.8.7               |
| GA    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   | Speed (45mph or less)     | <a href="#">GDOT Pedestrian and Streetscape Guide</a> —April 2019                                     | 5.3.2               |
| HI    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |                           | <a href="#">Hawaii Pedestrian Toolbox</a> —May 2013   |                     |
| ID    | <a href="#">Traffic Manual: Idaho Supplementary Guidance to the MUTCD</a>                              | MUTCD                     |   |                     |
| IL    | <a href="#">IDOT Manual on Uniform Traffic Control Devices</a> —June 2014                              | MUTCD                     | TRA-23 (Not online yet)   |                     |
| IN    | <a href="#">2011 Indiana Manual on Uniform Traffic Control Devices—Revision 3</a>                      | MUTCD                     |   |                     |
| IA    | <a href="#">IAC Chapter 130, Pg. 1</a>   | MUTCD                     |   |                     |
| KS    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   | MUTCD                     |   |                     |
| KY    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   | MUTCD                     |   |                     |
| LA    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |                           | <a href="#">LADOTD Traffic Signal Manual V2.0</a> —May 2015   |                     |

| State | Applicable MUTCD Source  | Applicable MUTCD                      | PHB Specifics in Applicable MUTCD  | Applicable Section |
|-------|--|---------------------------------------|--|--------------------|
| ME    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  |                                       |  |                    |
| MD    | <a href="#">Maryland Manual on Uniform Traffic Control Devices—2011 Edition</a>  |                                       |  |                    |
| MA    | <a href="#">MassDOT Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code—January 2012</a> |                                       |  |                    |
| MI    | <a href="#">MDOT MMUTCD Documents</a>  |                                       |  |                    |
| MN    | <a href="#">Minnesota Manual on Uniform Traffic Control Devices</a>  |                                       | <a href="#">Traffic Control Signal Design Manual—June 2016</a>   | 1.6                |
| MS    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  |                                       |  |                    |
| MO    | <a href="#">MoDOT 900 Traffic Control</a>  | MUTCD                                 |  |                    |
| MT    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  |                                       | <a href="#">MDT Road Design Manual—Chapter 7: Multimodal Design Considerations—September 2016</a>        |                    |
| NE    | <a href="#">Nebraska MUTCD 2011</a>  |                                       |  |                    |
| NV    | <a href="#">NDOT Highway Sign Supplement—2006</a>  | ADT/lanes/median                      | <a href="#">Pedestrian Safety Improvement Evaluation Guideline for Uncontrolled Crossings—April 2018</a> | Page 5             |
| NH    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  |                                       |  |                    |
| NJ    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  | MUTCD                                 |  |                    |
| NM    | <a href="#">Part 4—Highway Traffic Signals—2009 Edition</a>  | MUTCD                                 |  |                    |
| NY    | <a href="#">NYSDOT MUTCD</a>   |                                       |  |                    |
| NC    | <a href="#">2009 North Carolina Supplement to the MUTCD</a>  | General principles and considerations | <a href="#">North Carolina Pedestrian Crossing Guidance—July 2015</a>                                    | 4                  |
| ND    | <a href="#">NDDOT Traffic Operations</a>   |                                       |  |                    |
| OH    | <a href="#">Ohio MUTCD—2012 Edition</a>  | Evaluation form                       | <a href="#">Traffic Engineering Manual—400 Traffic Signals</a>   |                    |
| OK    | <a href="#">Oklahoma Supplement to the 2009 MUTCD—2009 Edition</a>   | Evaluation form                       | <a href="#">ODOT Collision Analysis – PHB Policy—September 2016</a>                                      |                    |
| OR    | <a href="#">Oregon Supplement to the 2009 MUTCD for Streets and Highways</a>   | Offset/lanes/speed/median             | <a href="#">2017 Traffic Signal Design Manual—Chapter 12: Flashing Beacon Plan</a>                       | 12.9               |
| PA    | <a href="#">Notices Department of Transportation 2009 MUTCD</a>  |                                       |  |                    |

| State | Applicable MUTCD Source   | Applicable MUTCD        | PHB Specifics in Applicable MUTCD   | Applicable Section |
|-------|---|-------------------------|---|--------------------|
| RI    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |                         |   |                    |
| SC    | <a href="#">SCDOT Supplement to the MUTCD</a>   |                         | TG-26 (not available online)  |                    |
| SD    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |                         |   |                    |
| TN    | <a href="#">Adoption of the Tennessee Manual on Uniform Traffic Control Devices for Streets and Highways</a> —Revised July 2012 |                         | <a href="#">TDOT Multimodal Project Scoping Manual</a> —April 2018  |                    |
| TX    | <a href="#">Texas Manual on Uniform Traffic Control Devices (TMUTCD)</a>  |                         | <a href="#">Pedestrian Hybrid Beacons</a>   |                    |
| UT    | <a href="#">Utah Manual on Uniform Traffic Control Devices for Streets and Highways</a> —December 2011                          |                         | <a href="#">UDOT Standard Drawings for Road and Bridge Construction</a> —August 2018                                      |                    |
| VT    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  | Lanes/speed/median/AADT | <a href="#">VTrans Guidelines for Pedestrian Crossing Treatments</a> —January 2015  | 5.3                |
| VA    | <a href="#">Virginia Supplement to the MUTCD</a>  | PED volume              | <a href="#">I&amp;I Memorandum 384.0—Pedestrian Crossing Accommodations at Unsignalized Locations</a> —July 2016          | 7.3                |
| WA    | <a href="#">Manual on Uniform Traffic Control Devices (MUTCD)</a>   | Lanes/speed/median/AADT | <a href="#">Action Plan for Implementing Pedestrian Crossing Countermeasures at Uncontrolled Locations</a> —November 2018 | 5                  |
| WV    | <a href="#">Manual on Temporary Traffic Control for Streets and Highways</a> —2006 Edition                                      |                         |   |                    |
| WI    | <a href="#">Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)</a>  | MUTCD                   |   |                    |
| WY    | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |                         | <a href="#">WYDOT Pedestrian and School Traffic Control Manual</a> —January 2014  |                    |

## APPENDIX D—PHB SPECIFICS

Blue underline means added text

Red italic underline means text deleted

| State   | [Section 4F.01] Application of PHB  | [Section 4F.02] Design of PHB  | [Section 4F.03] Operation of PHB | PHB Specifics Data Source(s)                              |
|---------|---|--|----------------------------------|---|
| Alabama |   |  |                                  |   |
| AK      | <p>Guidance:</p> <p><u>05A Installation of pedestrian hybrid beacons should be limited to uncontrolled locations evaluated according to Figure 3B-101 as “M – marginal” or “N – should not be installed.” Locations evaluated according to Figure 3B-101 as “C – candidate” for marked crosswalks at uncontrolled locations typically should not be considered for pedestrian hybrid beacons.</u></p> <p><u>07A Meeting or exceeding minimum pedestrian volume guidelines indicated in Figure 4F-1 or Figure 4F-2 at a proposed location should not be the sole criterion used for installing a pedestrian hybrid beacon.</u></p> <p><u>08A Pedestrian hybrid beacons are best used on higher volume multiple lane approaches and roads where other methods have not provided adequate improvement in pedestrian crossing opportunities or safety. Lower cost treatments can be employed at most locations with low to moderate volumes and/or shorter crossing distances to alert motorists of the presence of pedestrians, slow traffic, shorten the crossing distance, or create adequate gaps for crossing.</u></p> | <p><u>E. If a pedestrian hybrid beacon is installed at or immediately adjacent to an intersection with a side road or driveway, vehicular traffic on that side road or driveway shall be controlled by STOP signs.</u></p> <p><u>11A. If installed at a midblock location, a pedestrian hybrid beacon should not be installed less than 300 feet from the nearest location that provides a controlled crossing of the major street or an intersection where pedestrians are permitted to cross the major street.</u></p> | N/A                              | <u>AK Part 4—Highway Traffic Signals—</u><br>2016 Edition |

| State | [Section 4F.01] Application of PHB   | [Section 4F.02] Design of PHB   | [Section 4F.03] Operation of PHB  | PHB Specifics Data Source(s)  |
|-------|--|---|---|---|
| AZ    | <p>Option:<br/>02 ... Agencies may develop warrants or guidelines for the installation of Pedestrian Hybrid Beacons on roadways under their jurisdiction.</p> <p>Guidance:<br/>05..., the need for a pedestrian hybrid beacon should be considered on the basis of an engineering study that considers <a href="#">one or more of the following</a>: major-street volumes, speeds, widths, and gaps in conjunction with pedestrian volumes, walking speeds, and delay. The engineering study should be based <a href="#">on guidelines established by the agency for installation of pedestrian hybrid beacon</a>.</p> | <p>Guidance:<br/>04 When an engineering study finds that installation of a pedestrian hybrid beacon is justified, then:<br/>A. <a href="#">The pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs</a>.</p> <p>C.D. <a href="#">If installed within a signal system, Consideration should be given to coordination of the pedestrian hybrid beacon within a signal system. should be coordinated</a>.</p> <p>Option:<br/>09 A Pedestrian (W11-2) warning sign (see Section 2C.50) with an AHEAD (W16- 9P) supplemental plaque may be placed in advance of a pedestrian hybrid beacon. A warning beacon may be installed to supplement the W11-2 sign. <a href="#">The Bicycle (W11-1), Bicycle/Pedestrian (W11-15), or Trail Crossing (W11-15a) warning signs may be used when appropriate</a>.</p> <p>Guidance:<br/>10 If a warning beacon supplements a <a href="#">W11-1, W11-2, W11-15, or W11-15a</a> warning sign in advance of a pedestrian hybrid beacon, it should be programmed to flash only when the pedestrian hybrid beacon is not in the dark mode.</p> | <p>Guidance:<br/><a href="#">08 If used with a pedestrian signal head that does not have a concurrent vehicular phase, the pedestrian change interval (flashing UPRAISED HAND) should be set to be approximately 4 seconds less than the required pedestrian clearance time (see Section 4E.06) and an additional clearance interval (during which a steady UPRAISED HAND is displayed) should be provided prior to the start of the conflicting vehicular phase</a>.</p> | <p><a href="#">ADOT Traffic Engineering Guidelines and Processes—Pedestrian Hybrid Beacon—June 2015</a></p> |
| AK    |  |   |   |   |
| CA    | <p>Support:<br/><a href="#">01a A conventional traffic control signal operation with a standard signal face displaying green, yellow and red (steady and/or flashing red) indications, at a mid-block crosswalk is an alternative to the pedestrian hybrid beacon</a>.</p>   | <p>Guidance:<br/>04 When an engineering study finds that installation of a pedestrian hybrid beacon is justified, then:<br/>A. The pedestrian hybrid beacon should be installed <a href="#">at an intersection, or at the junction of a roadway with a driveway</a>, or at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs,</p>  | <p>Standard:<br/>during the pedestrian <a href="#">clearance</a> change interval (see Figure 4F-3).</p>   |   |
| CO    |  |   |   | <a href="#">CDOT Chapter 14 Bicycle and Pedestrian Facilities</a>   |
| CT    |  |   |   | <a href="#">Connecticut DOT General Files</a>   |
| DE    |  |   |   | <a href="#">2015 Traffic Design Manual—IV Traffic Signals</a>   |
| FL    |  |   |   | <a href="#">Traffic Engineering Manual—Chapter 3—Signals—2017 Revision</a>                                  |

| State | [Section 4F.01] Application of PHB  | [Section 4F.02] Design of PHB  | [Section 4F.03] Operation of PHB  | PHB Specifics Data Source(s)                                      |
|-------|---|--|---|---|
| GA    |   |  |   | <a href="#">GDOT Pedestrian and Streetscape Guide</a> —April 2019 |
| HI    |   |  |   | <a href="#">Hawaii Pedestrian Toolbox</a> —May 2013               |
| ID    |   |  |   |   |
| IL    | <p>Standard: <a href="#">Pedestrian Hybrid Beacons shall not be installed at locations where any signal warrants of Chapter 4C are met.</a></p> <p>Guidance: <a href="#">The need for a pedestrian hybrid beacon should be considered on the basis of an engineering study that includes a queue analysis for vehicular traffic and that considers major-street volumes, speeds, widths, and gaps in conjunction with pedestrian volumes, walking speeds, and delay.</a></p>  | <p>Standard: If used, pedestrian hybrid beacons shall be installed at least 100 feet from side streets or driveways and at least 300 feet from traffic signals or railroad grade crossings with active warning devices. If backplates are used for pedestrian hybrid beacons, retroreflective material shall not be applied to the face of the backplates.</p> | N/A   | TRA-23 (Not Online Yet)   |
| IN    |   |  |   |   |
| IA    |   |  |   |   |
| KS    |   |  |   |   |
| KY    |   |  |   |   |
| LA    |   |  |   | <a href="#">LADOTD Traffic Signal Manual V2.0</a> —May 2015       |
| ME    |   |  |   |   |
| MD    |   |  |   |   |
| MA    |   |  |   |   |
| MI    |   |  |   |   |
| MN    | N/A   | <p>Guidance: 04 A The pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs <a href="#">when not installed at an intersection</a> 04 E If installed at an intersection, appropriate side street traffic control should be considered</p>                                    | <p>Standard: during the pedestrian <a href="#">clearance</a> <a href="#">change</a> interval (see Figure 4F-3).</p> | <a href="#">Traffic Control Signal Design Manual</a> —June 2016   |
| MS    |   |  |   |   |
| MO    | <p>Standard: 03 If used, pedestrian hybrid beacons shall be used in conjunction with signs and pavement markings to warn and control traffic at locations where pedestrians enter or cross a street or highway. <a href="#">A pedestrian hybrid beacon shall only be installed at a marked crosswalk. A pedestrian hybrid beacon shall meet one of the subsequently defined guidance in order to be installed, unless an engineering study justifying installation is submitted and approved by the State Traffic Engineer.</a></p> | N/A  | N/A   |   |



| State | [Section 4F.01] Application of PHB | [Section 4F.02] Design of PHB | [Section 4F.03] Operation of PHB   | PHB Specifics Data Source(s)  |
|-------|------------------------------------|-------------------------------|--|---|
| MT    |                                    |                               |  | <a href="#">MDT Road Design Manual—Chapter 7: Multimodal Design Considerations</a> —September 2016        |
| NE    |                                    |                               |  |   |
| NV    |                                    |                               |  | <a href="#">Pedestrian Safety Improvement Evaluation Guideline for Uncontrolled Crossings</a> —April 2018 |
| NH    |                                    |                               |  |   |
| NJ    |                                    |                               |  |   |
| NM    |                                    |                               |  |   |
| NY    |                                    |                               |  |   |
| NC    |                                    |                               |  | <a href="#">North Carolina Pedestrian Crossing Guidance</a> —July 2015                                    |
| ND    |                                    |                               |  |   |
| OH    |                                    |                               |  | <a href="#">Traffic Engineering Manual—400 Traffic Signals</a>  |
| OK    |                                    |                               |  | <a href="#">ODOT Collision Analysis—PHB Policy</a> —September 2016  |
| OR    |                                    |                               |  | <a href="#">2017 Traffic Signal Design Manual—Chapter 12: Flashing Beacon Plan</a>                        |
| PA    |                                    |                               |  |   |
| RI    |                                    |                               |  |   |
| SC    |                                    |                               |  | TG-26 (not available online)  |
| SD    |                                    |                               |  |   |
| TN    |                                    |                               |  | <a href="#">TDOT Multimodal Project Scoping Manual</a> —April 2018  |
| TX    | N/A                                | N/A                           | Standard: during the pedestrian <a href="#">clearance change</a> interval (see Figure 4F-3). | <a href="#">Pedestrian Hybrid Beacons</a>   |
| UT    |                                    |                               |  | <a href="#">UDOT Standard Drawings for Road and Bridge Construction</a> —August 2018                      |
| VT    |                                    |                               |  | <a href="#">VTrans Guidelines for Pedestrian Crossing Treatments</a> —January 2015                        |

| State | [Section 4F.01] Application of PHB   |  | [Section 4F.02] Design of PHB | [Section 4F.03] Operation of PHB   | PHB Specifics Data Source(s)  |
|-------|--|--|-------------------------------|--|---|
| VA    |  |  |                               |  | <a href="#">I&amp;I Memorandum 384.0—Pedestrian Crossing Accommodations at Unsignalized Locations</a> —July 2016          |
| WA    |  |  |                               |  | <a href="#">Action Plan for Implementing Pedestrian Crossing Countermeasures at Uncontrolled Locations</a> —November 2018 |
| WV    |  |  |                               |  |   |
| WI    | N/A  |  | N/A                           | Standard: during the pedestrian <a href="#">clearance change</a> interval (see Figure 4F-3). |   |
| WY    | Wyoming adopted National MUTCD but they have another doc with different parameters regarding PHB. Per <b>WYDOT Pedestrian and School Traffic Control Manual</b> : Pedestrian hybrid beacons should not be installed at locations where the distance to the nearest traffic control signal along the major road is less than 300 feet, nor should they be installed where the posted speed limit on the major street is 45 mph or higher. |  |                               |  | <a href="#">WYDOT Pedestrian and School Traffic Control Manual</a> —January 2014  |

## APPENDIX E—PHB OFFSET

| State | Offset (FT)    | Installed Location<br>Additional Information                       | MUTCD—Offset Source  |
|-------|----------------|--|--|
| AL    | MUTCD<br>(100) |  | <a href="#">Traffic Signal Design Guide &amp; Timing Manual</a> —June 2015   |
| AK    | 0              |  | <a href="#">AK Part 4—Highway Traffic Signals</a> —2016 Edition  |
| AZ    | 0              |  | <a href="#">Arizona Supplement to the Manual on Uniform Traffic Control Devices for Streets and Highways</a> —2009 Edition |
| AR    | MUTCD<br>(100) | 100'   | <a href="#">Part 4 – Highway Traffic Signals</a> —2009 Edition   |
| CA    | 0              |  | <a href="#">CA Manual on Uniform Traffic Control Devices</a> —2014, Revision 4   |
| CO    | MUTCD<br>(100) |  | <a href="#">MUTCD 2009 Colorado Supplement Issued 12-06-11 Revised 04-16-18</a>  |
| CT    | MUTCD<br>(100) | 100'   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| DE    | MUTCD<br>(100) | At least 4 at the intersection                                     | <a href="#">DE Part 4—Highway Traffic Signals</a> —2018 Revision   |
| FL    | MUTCD<br>(100) |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| GA    | MUTCD<br>(100) |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| HI    | MUTCD<br>(100) |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| ID    | MUTCD<br>(100) | Adopt the PHB Chapter of the MUTCD, but no limitations in practice | <a href="#">Traffic Manual: Idaho Supplementary Guidance to the MUTCD</a>  |
| IL    | 300            |  | <a href="#">IDOT Manual on Uniform Traffic Control Devices</a> —June 2014  |
| IN    | MUTCD<br>(100) | 100'   | <a href="#">2011 Indiana Manual on Uniform Traffic Control Devices—Revision 3</a>  |
| IA    | MUTCD<br>(100) | 100'   | <a href="#">IAC Chapter 130, Pg. 1</a>   |
| KS    | MUTCD<br>(100) | 100' but some local PHB has been installed in the intersection     | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| KY    | MUTCD<br>(100) | 100', the installed one is close to the parking lot entrance       | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| LA    | MUTCD<br>(100) |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| ME    | MUTCD<br>(100) |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition   |
| MD    | MUTCD<br>(100) |  | <a href="#">Maryland Manual on Uniform Traffic Control Devices—2011 Edition</a>  |

| State | Offset (FT)    | Installed Location<br>Additional Information  | MUTCD—Offset Source   |
|-------|----------------|---|---|
| MA    | MUTCD<br>(100) |   | <a href="#">MassDOT Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code</a> —January 2012 |
| MI    | MUTCD<br>(100) |   | <a href="#">MDOT MMUTCD Documents</a>   |
| MN    | MUTCD<br>(100) |   | <a href="#">Minnesota Manual on Uniform Traffic Control Devices</a>   |
| MS    | MUTCD<br>(100) |   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| MO    | MUTCD<br>(100) | 100'  | <a href="#">MoDOT 900 Traffic Control</a>   |
| MT    | MUTCD<br>(100) |   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| NE    | MUTCD<br>(100) |   | <a href="#">Nebraska MUTCD 2011</a>   |
| NV    | MUTCD<br>(100) |   | <a href="#">NDOT Highway Sign Supplement</a> —2006  |
| NH    | MUTCD<br>(100) | 3 PHB for rail trail crossings, 1 PHB a few hundred feet away from intersection   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| NJ    | MUTCD<br>(100) | 100', one installed is at the intersection but it was discouraged as a practice   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| NM    | MUTCD<br>(100) | 100'  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| NY    | MUTCD<br>(100) |   | <a href="#">NYSDOT MUTCD</a>  |
| NC    | MUTCD<br>(100) |   | <a href="#">2009 North Carolina Supplement to the MUTCD</a>   |
| ND    | MUTCD<br>(100) |   | <a href="#">NDDOT Traffic Operations</a>  |
| OH    | MUTCD<br>(100) | 100'  | <a href="#">Ohio MUTCD</a> —2012 Edition  |
| OK    | MUTCD<br>(100) | These pedestrian-based warrants shall not be applied at locations where the distance to the nearest traffic control signal is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic (for one Oklahoma City PHB). | <a href="#">Oklahoma Supplement to the 2009 MUTCD</a> —2009 Edition   |
| OR    | MUTCD<br>(100) |   | <a href="#">Oregon Supplement to the 2009 MUTCD for Streets and Highways</a>  |
| PA    |                |   | <a href="#">Notices Department of Transportation 2009 MUTCD</a>   |
| RI    | MUTCD<br>(100) | 100', one installed is at the intersection but discourage   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |

| State | Offset (FT) | Installed Location<br>Additional Information   | MUTCD—Offset Source   |
|-------|-------------|--|---|
| SC    | 0           |  | <a href="#">SCDOT Supplement to the MUTCD</a>   |
| SD    | MUTCD (100) | The one installed is mid-block and the one being designed will be at an intersection | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| TN    | MUTCD (100) |  | <a href="#">Adoption of the Tennessee Manual on Uniform Traffic Control Devices for Streets and Highways</a> —Revised July 2012 |
| TX    | MUTCD (100) |  | <a href="#">Texas Manual on Uniform Traffic Control Devices (TMUTCD)</a>  |
| UT    | MUTCD (100) |  | <a href="#">Utah Manual on Uniform Traffic Control Devices for Streets and Highways</a> —December 2011                          |
| VT    | MUTCD (100) | 100'   | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |
| VA    | MUTCD (100) |  | <a href="#">Virginia Supplement to the MUTCD</a>  |
| WA    | MUTCD (100) | 100'   | <a href="#">Manual on Uniform Traffic Control Devices (MUTCD)</a>   |
| WV    | MUTCD (100) |  | <a href="#">Manual on Temporary Traffic Control for Streets and Highways</a> —2006 Edition                                      |
| WI    | 0           | 100' in MUTCD, but in practice 3 less than 100'                                      | <a href="#">Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)</a>  |
| WY    | 0           |  | <a href="#">Part 4—Highway Traffic Signals</a> —2009 Edition  |

## APPENDIX E.1—OFFSET

| Offset              | States  |
|---------------------|---|
| <b>MUTCD (100')</b> | Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia |
| <b>0'</b>           | Alaska, Arizona, California, South Carolina, Wisconsin, Wyoming   |
| <b>300'</b>         | Illinois  |

## APPENDIX F—PHB Installed Quantity

| State | Installed Qty  | Installed QTY Source of Information   | Email Details of Installed QTY Information   | Installed QTY Contact Info.   |
|-------|--|---|--|---|
| AL    | 2 knows (city of Huntsville)                           | <a href="#">City of Huntsville Crews to Activate New Pedestrian Crossing at Alabama A&amp;M University</a> —May 23, 2019<br><br><a href="#">Google Map image—Holmes Ave NW</a>  | <p>We currently have three installations. Two of them will be removed soon. A new installation is also planned.</p> <p>PHBs are installed according to Chapter 4F of the Alaska Traffic Manual (ATM). The ATM is comprised of the MUTCD and the Alaska Traffic Manual Supplement (ATMS). See attached. The ATMS does not add to or change any MUTCD language regarding intersection offsets.</p>   |   |
| AK    | 3  | Email   | <p>There isn't any specific reference to PHBs in the Alaska Driver's Manual. Vehicle operators are expected to follow commonly understood "rules of the road" and obey posted traffic control devices. To that end, Alaska DOT&amp;PF was recently granted approval from the Alaska Division FHWA to add the CROSSWALK, STOP ON RED, PROCEED ON FLASHING RED WHEN CLEAR (R10-23a) word message sign to the ATM, as allowed under Official MUTCD Interpretation Issued by FHWA 4(09)-61 (I).</p>  | Matt Walker, PE<br>State Traffic & Safety Engineer<br>matthew.walker@alaska.gov |
| AZ    | 50 (the Phoenix areas)+ more than 140 (city of Tucson) | <a href="#">Pedestrian Safety Efforts Gain Momentum as Mayor Gallego Activates 50th HAWK</a> —Posted June 7, 2019<br><br><a href="#">Road Runner: City of Tucson installing more HAWK signals for pedestrian safety</a> —Posted March 3, 2019           | <p>Please open the links below to get more information about PHB in AZ and the Traffic Engineering Guidelines and Procedures.<br/><a href="https://www.azdot.gov/about/transportation-safety/pedestrian-hybrid-beacon">https://www.azdot.gov/about/transportation-safety/pedestrian-hybrid-beacon</a><br/><a href="https://www.azdot.gov/docs/default-source/traffic-library/tgp0640-2015-06.pdf?sfvrsn=4">https://www.azdot.gov/docs/default-source/traffic-library/tgp0640-2015-06.pdf?sfvrsn=4</a></p> <p>I don't have the number of PHB installed in AZ as they are mostly installed within the local jurisdictions.</p> | Maysa Hanna, PE,<br>State Traffic Engineer<br>MHanna@azdot.gov                  |
| AR    | Less than 5  | Email   | <p>ARDOT is working on a database system to track all intersections on state highway system. This dB will eventually house useful information such as this.</p> <p>Until then, though, I don't have an exact number of PHBs in use. I recall that there are less than five, that I am aware of, on our state highway system. There may be more on city or county roads but we have even less information on those.</p> <p>We follow MUTCD on offsets.</p> <p>No special law(s) has been passed governing the use of PHBs.</p>  | Joseph Hawkins<br>Staff Traffic Engineer<br>Joseph.Hawkins@ahdtd.ar.gov         |
| CA    | Less than 50   | Email   | <p>— How many have you installed?<br/>Answer: Less than 50 locations on State Highway (not including local road).</p> <p>— What limitations are placed on intersection offsets?<br/>Answer: Please see Section 4F.02 in CA MUTCD</p> <p>— Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons?<br/>Answer: There are no special rules or laws for any dark beacon.</p>   | Duper Tong<br>Chief, Office of<br>Traffic Engineering<br>duper.tong@dot.ca.gov  |
| CO    | 2 knows (ONE CTDOT, ONE city of Pueblo)                | <a href="#">Eyes on the Street: "HAWK" Signals Installed in Stapleton, More to Come in Westwood, Green Valley Ranch</a> —Posted June 2, 2017<br><br><a href="#">High Intensity Activated Crosswalk (HAWK) Beacon Comes to Pueblo Neighborhood</a> —2018 |  |   |

| State | Installed Qty              | Installed QTY Source of Information   | Email Details of Installed QTY Information   | Installed QTY Contact Info.   |
|-------|----------------------------|---|--|---|
| CT    | 3                          | Email   | <ul style="list-style-type: none"> <li>– How many have you installed? 3.</li> <li>– What limitations are placed on intersection offsets? None. We don't have any written policies or practices.</li> </ul>   | Joseph P. Ouellette<br>State Safety Engineer<br>joseph.ouellette@ct.gov                         |
| DE    | 5                          | Email   | <p>Delaware currently has 5 operational pedestrian hybrid beacons. Four are referenced in the attached report and we have since installed one more. There are no specific offset requirements (<a href="https://deldot.gov/Programs/DSHSP/pdfs/OtherPedProjects/HA_WK_Study_Report_December2017.pdf">https://deldot.gov/Programs/DSHSP/pdfs/OtherPedProjects/HA_WK_Study_Report_December2017.pdf</a>). Each location is individually studied and analyzed related to traffic flow, speed, pedestrians, bicycles, geometry, etc., and case-by-case decisions are made as to the type of traffic control, location, islands, etc.</p>  | Mark Luszczyk, PE,<br>PTOE Chief<br>Traffic Engineer<br>Mark.Luszczyk@delaware.gov              |
| FL    | 1 knows (city of Sarasota) | <a href="#">HAWK crosswalk signal now active at U.S. 41 and First Street</a> —Posted June 28, 2018  |  |   |
| GA    | 1 knows                    | <a href="#">Georgia Department of Transportation to Utilize Pedestrian Hybrid Beacon on Whitlock Avenue at Cheatham Hill</a> —Posted March 30, 2016 |  |   |
| HI    | 0                          |   |  |   |
| ID    | Approx. 100                | Email   | <ul style="list-style-type: none"> <li>– How many have you installed? Approximately 100. Most have been installed by the Ada County Highway District (ACHD) in the Boise area. <a href="http://achdidaho.org/">http://achdidaho.org/</a></li> <li>– What limitations are placed on intersection offsets? We adopt the PHB Chapter of the MUTCD as is, but in effect there are no limitations on intersection offsets.</li> <li>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? As is typical, Idaho law says to approach a dark signal as a stop-controlled intersection. In practice, that law is ignored for PHBs.</li> </ul>   | Ryan D. Lancaster<br>Standards Engineer<br>Ryan.Lancaster@itd.idaho.gov                         |
| IL    | 4                          | Email   | <p>We are aware of 4 PHBs in operation in Illinois. The below section of Illinois law addresses requirements at dark signal.</p> <p>Dark signals – 625 ILCS 5/11-305 (e) states that “The driver of a vehicle approaching a traffic control signal on which no signal light facing such vehicle is illuminated shall stop before entering the intersection in accordance with rules applicable in making a stop at a stop sign.” A PHB is an electric device that controls traffic. Therefore, if it is at an intersection, vehicles are compelled to stop at a dark PHB. Consequently, the ILMUTCD (Section 4F.02) was written to require a PHB to be at least 100 ft from side streets or driveways, and at least 300 ft from traffic signals or railroad grade crossings with active warning devices.</p> | Kyle D. Armstrong, PE,<br>PTOE Engineer of<br>Traffic Operations<br>Kyle.Armstrong@illinois.gov |
| IN    | 2                          | Email   | <ul style="list-style-type: none"> <li>– INDOT has installed two PHBs and two more have been or will be installed on the state highway system by local public agencies.</li> <li>– INDOT does not have any separate guidance on the intersection offset distance; it seems that the MUTCD guidance statement in Section 4F.02, ¶4A is generally met for trail crossings but is more difficult to attain for crosswalks</li> <li>– In 2011, Indiana law was changed to recognize pedestrian hybrid beacons. See Indiana Code Sections 9-21-3-0.5, 9-21-3-7(b)(4)(C), and 9-21-8-36:<br/><a href="http://iga.in.gov/legislative/laws/2018/ic/titles/009#9-21-3-7">http://iga.in.gov/legislative/laws/2018/ic/titles/009#9-21-3-7</a></li> </ul>  | Dave Boruff<br>Traffic Administration<br>Section Supervisor<br>DBORUFF@indot.IN.gov             |



| State | Installed Qty   | Installed QTY Source of Information                            | Email Details of Installed QTY Information   | Installed QTY Contact Info.   |
|-------|---|--|--|---|
| IA    | 0 (state highway)+<br>3 knows<br>(city of Cedar Rapids) | Email<br><a href="#">Cedar Rapids—Traffic Engineering News</a> | <p>To my knowledge we do not have a pedestrian hybrid beacon installed on a state highway. I know some of the cities have installed a few on the city street system, but I don't have information on the installations. We do not have any policies on their installation, we would just follow the MUTCD for guidance. To my knowledge, the Iowa Code is silent on driver's action at dark signals. From my experience, I drive through one of the PHBs on a local street on my way to and from work, I have not seen anyone stop at the dark signals. The biggest problem I have seen is no one will move after stopping until the signal goes dark.</p>   | Timothy D. Crouch<br>State Traffic Engineer<br>Tim.Crouch@iowadot.us              |
| KS    | 2 (KDOT)+<br>Local                                      | Email  | <p>To my knowledge, KDOT has allowed two Hybrid Beacon Systems along the Kansas State Highway System (K, US, I routes). In Kansas, the local entity is responsible for funding, maintaining, and installing pedestrian devices. Because of the expense of the hybrid beacon system, it generally has not been recommended as an option to pursue. Options involving the rectangular rapid flashing beacon (RRFB) are more likely to be recommended.</p> <p>However, there are communities that have hybrid beacons installed which are not on the state highway system. The city of Lawrence, KS has anywhere from 20–30 hybrid beacons installed within its city limits.</p> <p>– How many have you installed? KDOT has allowed two on the state highway system.</p> <p>– What limitations are placed on intersection offsets? We follow guidance provided in the 2009 MUTCD. I have seen some hybrid beacons installed at intersections with one-way streets. These locations are off the state highway system.</p>  | Brian D. Gower<br>KDOT—Transportation Safety and Technology<br>Brian.gower@ks.gov |
| KY    | 1   | Email  | <p>To the best of my knowledge, Metro Louisville is the only agency in Kentucky to install a PHB. It is located at an intersection on River Road. Link: <a href="https://goo.gl/maps/82JfLjzgzExzN3FA">https://goo.gl/maps/82JfLjzgzExzN3FA</a> Lexington has kicked the concept around at a few locations, but I don't believe they have installed any yet. To date, the Kentucky Transportation Cabinet has not installed any pedestrian hybrid beacons. For the most part, we feel that a traditional signal would be a better option for controlling traffic since the public already understands the indications in a traditional traffic signal, whereas the pedestrian hybrid beacon would require education efforts. We were prepared to approve a pedestrian hybrid beacon for a heavily used pedestrian crossing on the campus of Transylvania University. This crossing has significant pedestrian traffic throughout the day (including peak periods of traffic flow) and crosses a major roadway entering into downtown Lexington. Mainline traffic is heavy enough that we felt the additional capacity/throughput provided by a pedestrian hybrid beacon was worth dealing with the problems associated with educating the public on the operation of a PHB. However, at the last minute local officials were not comfortable with installing a pedestrian hybrid beacon, and we ultimately selected and RRFB for that location. If we ever install a pedestrian hybrid beacon, it will be at a location with heavy pedestrian traffic (likely satisfying a warrant) and/or pedestrian safety issues. As with the Transylvania location referenced above, it will likely be a location with significant enough mainline traffic that would necessitate the additional capacity provided by a PHB. Otherwise, our Cabinet would likely select a traditional traffic signal for the crossing.</p> | Jeff J. Wolfe /<br>Troy T. Hearn, (KYTC)<br>Troy.Hearn@ky.gov                     |
| LA    | 0   | Email  | <p>We have had a few be accepted into our Safe Routes to Public Places Program, though as of now, none have been installed. The programmed PHBs are undergoing feasibility before final determination after which a specification will be developed.</p>   | Jessica DeVille<br>Jessica.DeVille@LA.GOV   |

| State | Installed Qty                  | Installed QTY Source of Information  | Email Details of Installed QTY Information   | Installed QTY Contact Info.  |
|-------|--------------------------------|--|--|--|
| ME    | 0                              | Email  | Maine does not currently have any PHB installations, nor does it have any scheduled. The department may look at them in the near future, however.  | Pamela D. Shofner<br>Librarian,<br>Maine DOT Library<br>Pamela.shofner@maine.gov   |
| MD    | 1 knows                        | <a href="#">MDOT SHA improves pedestrian safety with new HAWK crosswalk beacon on MD 410 in Montgomery County</a> —Posted September 21, 2017 |  |  |
| MA    | 3 knows                        | <a href="#">MassDOT Blog: Search results for Pedestrian Hybrid Beacon</a>  |  |  |
| MI    | 4 knows                        | <a href="#">Pedestrian safety improved with new HAWK signals crossing M-3 (Gratiot Avenue) in Macomb County</a> —Posted January 28, 2015     |  |  |
| MN    | About 10                       | Email  | MnDOT has about 10 Hawks on the State highway system. We have installed some of our HAWKS at intersection, but we now discourage this. We follow the 100' rule. Minnesota does have laws that you must yield to pedestrians at crosswalks, even if the lights are not flashing.  | Jerry Kotzenmacher<br>Signals Section—Office of<br>Traffic Engineering<br>jerry.kotzenmacher@state.mn.us   |
| MS    | 0                              |  | MDOT does not have any Pedestrian Hybrid Beacon installations at this time. We are currently looking to have one installed on a road that is in the process of being “turned over” from the State to a local agency as part of a construction project; but aside from this one, there are no others installed by MDOT.   | Mississippi Department of<br>Transportation  |
| MO    | 7                              | Email  | We have installed the pedestrian hybrid beacon (PHB) on MoDOTs highway system in approximately seven locations. PBHs are also been installed on the local system, but the quantity is unknown. Please refer to our Engineering Policy Guide section 902.7 for additional information.  | Ashley Buechter<br>Traffic Liaison Engineer<br>Ashley.Buechter@modot.mo.gov  |
| MT    | 2 knows                        | <a href="#">MDT Pedestrian Hybrid Beacons</a>  |  |  |
| NE    | 1 knows (city of Omaha)        | <a href="#">City of Omaha: Pedestrian Hybrid Beacon Signals</a>  |  |  |
| NV    | 0 (NDOT) + 1 knows (Las Vegas) | Email<br><a href="#">Google Map: 1500 NV-589, Las Vegas, NV 89104</a>  | The High Intensity Activated crosswalk (HAWK) is not the typical PHB for the Nevada Department of Transportation (NDOT) and we have not installed any that I am aware of.  | Signals, Lighting & ITS /<br>Traffic Operations<br>Technology Services (TOTS)<br>Seth Daniels, PE<br>Assistant Chief Traffic<br>Operations Engineer<br>sdaniels@dot.nv.gov |
| NH    | 5 (only 4 active locations)    | Email  | In New Hampshire, we currently have five PHBs installed, two each in Goffstown (rail trail crossings) and Meredith (Lakes Region tourist town), and one in Epping (rail trail crossing). One of the two in Meredith was required in order to secure approval for a new crosswalk. The crosswalk was requested by the town as part of the site plan approval for a new senior housing apartment complex across the street from a convenience store. In hindsight it is seldom used and could likely be removed. We do not have any specific intersection offset criteria and would consider locations on a case-by-case basis. Where three of the four active locations are for rail trail crossings, it is not an issue. The fourth location is removed from a signalized intersection by a few hundred feet and is coordinated with the signal. | William R. Lambert<br>Traffic Engineer/<br>Administrator<br>William.Lambert@dot.nh.gov   |

| State | Installed Qty                 | Installed QTY Source of Information   | Email Details of Installed QTY Information   | Installed QTY Contact Info.   |
|-------|-------------------------------|---|--|---|
| NJ    | 3                             | Email   | NJ has 3 pedestrian hybrid beacons. NJDOT tries to follow the should guidance of installing the pedestrian hybrid beacon at least 100 ft from an intersection for installations on roadways under state jurisdiction. However, one of our installations is at an intersection (see below aerial) but all traffic on Magnolia Rd must turn right, away from the crosswalk. For local roadways not under the jurisdiction of NJDOT, the installation of pedestrian hybrid beacons is up to the discretion of the local engineer. NJ does not have specific guidance for vehicles when the PHB is dark. NJ uses the R10-23 sign as the MUTCD indicates in a shall condition.  | Jaime Oplinger<br>Executive Manager<br>Jaime.Oplinger@dot.nj.gov                            |
| NM    | 10–15 (local)                 | Email   | The state has not installed any PHFs, but the locals have. I am not aware of the number. But I estimate between 10 to 15. We have not established any parameters.  | Jian, Afshin<br>State Traffic Engineer<br>Afshin.Jian@state.nm.us                           |
| NY    | Less than 20                  | <a href="#">First High-Intensity Activated Crosswalk (HAWK) Signal on a State Highway is installed in Tonawanda</a> —Posted June 16, 2016 | <ul style="list-style-type: none"> <li>– How many have you installed? Likely less than 20 statewide between both us and local highway authorities.</li> <li>– What limitations are placed on intersection offsets? We follow the MUTCD guidance; we have not developed any of our own guidance on HAWKS.</li> <li>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? No. NY's dark signal law applies to a traffic control signal which is out of service or otherwise malfunctioning. The HAWK is not a traffic signal, and it's not malfunctioning in its dark mode.</li> </ul>  | Barbara S. Abrahamer<br>Senior Civil Engineer<br>barbara.abrahamer@dot.ny.gov               |
| NC    | 40+/-                         | Email   | North Carolina has 40 +/- hybrid beacons installed on the state system. The vast majority adhere to the current MUTCD restrictions on placement. And our general statute is attached. It is very clear on what to do at a dark traffic signal at an intersection, less so at mid-block locations.  | Jason Galloway<br>State Signals Engineer<br>jgalloway@ncdot.gov                             |
| ND    | Study 1 Location (Grand Fork) | <a href="#">City of Grand Forks Staff Report—Final Report for City Project No. 7728</a> —March 5, 2018                                    |  |   |
| OH    | At least 12                   | Email   | <ul style="list-style-type: none"> <li>– How many have you installed? ODOT has none on our system. However, I know of at least a dozen Statewide. They are mostly located in downtown business district type area, or on college campuses.</li> <li>– What limitations are placed on intersection offsets? When reviewing, we stress the OMUTCD recommendations/guidance, which mirrors the MUTCD, to give the minimum 100' offset from any side street.</li> <li>– Are there applicable rules or laws for vehicles operating at Dark Pedestrian Hybrid Beacons? The only current legislation regarding PHBs under yellow and red beacons can be found in Ohio Revised Code (ORC) Section E4 and F3 of 4511.13 (<a href="http://codes.ohio.gov/orc/4511">http://codes.ohio.gov/orc/4511</a>). As long as PHBs are always referred to as Beacons, this suffices. If a PHB is recognized as a signal, Ohio would have to revise our laws since a dark signal needs to stop at stop line, yield to vehicles/peds, and act as a 4-way stop. This is outlined in ORC 4511.132 (<a href="http://codes.ohio.gov/orc/4511">http://codes.ohio.gov/orc/4511</a>).</li> </ul> | Charlie Fisher<br>Statewide Traffic Operations Engineer<br>Charles.Fisher@dot.ohio.gov      |
| OK    | 8                             | Email   | <ul style="list-style-type: none"> <li>– How many have you installed? So far we installed about 8 HAWK systems on the Highway system.</li> <li>– What limitations are placed on intersection offsets? The link below shows the limitations: <a href="http://www.okladot.state.ok.us/traffic/collision_analysis/pdf/PHB-Policy2016-09-02.pdf">http://www.okladot.state.ok.us/traffic/collision_analysis/pdf/PHB-Policy2016-09-02.pdf</a></li> </ul>   | Tarek A. Maarouf<br>Engineering Manager, Traffic Engineering Division,<br>tmaarouf@odot.org |

| State | Installed Qty | Installed QTY Source of Information | Email Details of Installed QTY Information   | Installed QTY Contact Info.   |
|-------|---------------|-------------------------------------|--|---|
| OR    | 1             | Email                               | <p>Here are the PHB installations on state highways in Oregon:• OR 126 between 66th and 67th streets, Springfield (approved for installation, not yet built)• OR 39 at Portland St, Klamath FallsOthers we know of in Oregon off the State Highway System (not a complete list of PHBs in Oregon):• Franklin Blvd between I-5 and Glenwood Blvd, Springfield• Gateway St near USPS office, Springfield• Harlow Rd between Pheasant Blvd and Lindale Dr, Springfield• E. Broadway between Patterson and Coburg Rd, Eugene• S Columbus Ave and Diamond St, Medford• Burnside at 41st, Portland Note: the City of Springfield has converted most/all of their PHBs to standard signal heads in recent years (you can see most of them on street view) and are operating them in a unique way. Brian Barnett (City Traffic Engineer) at the City of Springfield can provide more information if you want. Placement criteria for Oregon's State Highway System matches federal MUTCD—recommended not within 100 feet of side street or driveway controlled by STOP or YIELD signs.we found a few more locations on local roads to add to the Oregon list:• Hall Blvd at Fanno Creek Trail, Beaverton• Farmington Rd and 138th, Beaverton• Burnside Rd and 30th, Portland• Sandy Blvd and 18th St, Portland</p>   | <p>Eric Leaming<br/>State Traffic Investigations<br/>Engineereric.s.leming@odot.state.or.us</p> <p>Gary R. Obery<br/>Active Modes Traffic EngineerGary.R.OBERY@odot.state.or.us</p> |
| PA    | 0             | Email                               | <p>We currently do not have any HAWK signals installed as they are not permitted under the Pennsylvania Vehicle Code.This is from our Statewide Traffic Signal Operations Engineer, Steve Gault: "To my knowledge, the language in the PA Vehicle Code hasn't been updated since the HAWK signal was 'invented' and added to the MUTCD. I don't think there was a specific intent to prohibit it, but there hasn't been a push to pass legislation that would specifically allow it. My understanding is the interpretation is a dark signal in PA Vehicle Code means it should be treated as an all-way stop. The intended operation for a HAWK signal is that it is dark whenever not actuated by pedestrians, in which case vehicles would be expected to proceed freely." So we at PennDOT wouldn't even be able to test the HAWK signal until legislation allows for its use in PA. One more response from Dan Farley who is the chief of our Operations and Performance section: "Other issues with the HAWK (PHB) signal include:• Not clear clarification as to how to navigate a flashing red indication. The MUTCD contradicts itself regarding when to navigate through a flashing red for a HAWK versus at a traffic signal or even a railroad crossing.• The device was put into the last manual with little research outside of the Southwest where it originated from. Based on results we are now seeing our concerns are now becoming problems in other areas of the country.• Driver understanding of the concept is questionable. Many individuals don't understand a dark signal and now we are flashing the devices and developing new meanings.• Many states have been forced to put it in due to political pressure.• The clarification signs are not clearly understandable and the Official Traffic Control Device team hasn't found an effective sign yet for the operation.• Overall the effectiveness of the unit has been questionable and has created an issue with bikes/pedestrians that arrive at the end of the HAWK phase which has led to additional crashes."</p> | <p>Anthony Chiodo Civil Engineer, Traffic Signals<br/>anchiodo@pa.gov</p>   |

| State | Installed Qty                      | Installed QTY Source of Information                                       | Email Details of Installed QTY Information   | Installed QTY Contact Info.  |
|-------|------------------------------------|---|--|--|
| RI    | 1                                  | Email   | <p>We have one PHB installed with several more in design. At installed location, intersections are not offset. For proposed locations, they are at midblock crossings and not intersections. The one installed is at an intersection and we have no limitations at this time in regard to being offset from intersections. The locations are governed by where the pedestrians are located. When the PHB is not activated and dark, motorists should treat it as if it weren't there and it was just an unsignalized midblock crossing. It could be possible that motorists who assume it's a full traffic signal and stop at the stop bars thinking that it is malfunctioning (ex. loss of power), but we haven't had any record of this issue coming up.</p> | <p>Lindsey M. Sasso<br/>Senior Information and Public Relations Specialist<br/>Office of Customer Service<br/>dot.customerservice@dot.ri.gov</p> |
| SC    | 0                                  | Email   | <p>Our Traffic Engineering office has developed a guideline for pedestrian hybrid beacons in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). I have attached a copy of this guideline for your use.</p> <p>SCDOT has not installed any PHBs but has allowed a few to be installed on state-maintained roads under encroachment permit.</p>  | <p>Ashley Johnson<br/>Traffic Operations Engineer<br/>JohnsonHA@scdot.org</p>  |
| SD    | 1                                  | Email   | <p>We currently have one Hawk system operating in the state. I am working on the plans for a second installation. SDDOT currently does a policy or practice for offset of the HAWK systems. The one installed is mid-block and the one being designed will be at an intersection.</p>  | <p>Dan Martell<br/>South Dakota Department of Transportation<br/>Aberdeen Region Traffic Engineer</p>  |
| TN    | 0                                  | Email   | <p>TDOT has not used PHBs much (at all?) I believe and does not plan to use them. I am copying Jessica Wilson who has a longer history with TDOT bike ped than I. She will correct me if I am mistaken. We prefer pedestrian-activated yellow-ball beacons for overhead assemblies and RFBs.</p>   | <p>Whitney Mason<br/>TDOT Bicycle and Pedestrian Coordinator<br/>Whitney.Mason@tn.gov</p>  |
| TX    | 28 (Austin)                        | <a href="#">ArcGIS Map of Austin, TX for Signals</a>                      | <p>The Texas Department of Transportation has specific requirements for PHB installations in our Traffic Signals Manual (Chapter 5, Section 7) but these requirements apply to state roads only. We currently have only two PHB systems operating on state highways in Texas. Some cities in Texas, however, have installed more PHBs on city streets.</p>   | <p>Douglas A. Skowronek<br/>Transportation Engineer<br/>Doug.Skowronek@txdot.gov</p>   |
| UT    | 10 (2016 UDOT)+<br>28 (2016 local) | <a href="#">UDOT Traffic Signal Management Plan</a> —<br>February 5, 2016 |  |  |
| VT    | 1                                  | Email   | <p>We currently have one HAWK Signal on the state highway system in Vermont. It was installed in 2013. We do not have any documented limitations on intersection offsets. However, our one HAWK Signal does have an offset of approximately 30' with a median on a divided highway. We use the latest edition of the MUTCD as law and therefore there are no specific requirements for the dark signal heads at the HAWK. We utilize retroreflective backplates to draw attention to the signal heads during low light conditions. Attached is our plan sheet showing the layout of our HAWK.</p>  | <p>Derek Lyman, PE<br/>Traffic Signal Operations Engineer<br/>derek.lyman@vermont.gov</p>  |

| State | Installed Qty            | Installed QTY Source of Information   | Email Details of Installed QTY Information  | Installed QTY Contact Info.   |
|-------|--------------------------|---|---|---|
| VA    | 1 knows (Fairfax County) | Email<br>Installed Location: <a href="#">Google map image of the crossing on the Backlick Rd in Springfield, VA</a> | <p>Q1 how many have we installed: To date VDOT has only installed one Pedestrian Hybrid Beacon on our system of roads, on Backlick Road near Lynbrook Elementary School.</p> <p>However many of Virginia's traffic signals are maintained by localities (including all signals in cities, large towns, and Arlington County; plus some signals in Henrico County). We don't know have an inventory of exactly how many locality maintained PHBs are out there, but we are aware of several in various localities including Arlington, Alexandria, and Vienna.</p> <p>Q2 limitations on intersection offsets: VDOT policies on unsignalized pedestrian crossings is contained in this document. That document also addresses PHBs. Currently that document does not have much Virginia-specific policy beyond what is stated in the MUTCD, however we are currently developing updates to that policy.</p> <p>Q3 applicable rules or laws for vehicles: There are no Virginia-specific laws that explicitly address PHBs, however we have been of the opinion that the Code of Virginia adequately addresses required driver behavior at PHBs, whether the PHB is displaying a dark, flashing yellow, steady yellow, steady red, or alternating flashing red indication.</p> | Marc Lipschultz<br>Senior Traffic Engineer<br>Marc.Lipschultz@VDOT.Virginia.gov |
| WA    | 5+local                  | Email   | <p>– WSDOT does not have a formal policy or position on PHB/HAWK signals.</p> <p>– There are maybe five installed within WSDOT jurisdiction (there are many more installed by local jurisdictions).</p> <p>– Intersection offsets follow the MUTCD, Section 4F.02, with additional distance to signalized intersections.</p> <p>– Washington State only has a law for nonfunctioning traffic signals at an intersection (<a href="https://app.leg.wa.gov/RCW/default.aspx?cite=46.61.183">https://app.leg.wa.gov/RCW/default.aspx?cite=46.61.183</a>) and does not specifically address special signal systems (emergency vehicle, pedestrian crossing, ramp meter, or PHB/HAWK).</p>   | Angel Dziedzic<br>Traffic Operations Office<br>DziedzA@wsdot.wa.gov             |
| WV    | 0                        |   |   |   |
| WI    | 5 (DOT) +Local           | Email   | <p>The Wisconsin Department of Transportation (WisDOT) currently maintains five PHBs across the state. There are more than five PHBs currently in the state of Wisconsin, but those PHBs were either installed by a local municipality or county; or the PHB was installed as part of a WisDOT project and ownership of the PHB was transferred to the municipality or county after the completion of the project. WisDOT typically follows the standards set in MUTCD 4F.02 when deciding on the placement of PHBs—"The pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs." However, three of the PHBs are in a tourist area with a high concentration of commercial driveways and it was not possible to get 100' of separation between the PHB and driveways. In those cases, engineering judgement was used to determine the best locations to place the PHBs. I do not believe we have any laws specifically addressing PHBs. Some of our PHBs have a variation of the R10-23 sign to assist with drivers unfamiliar with the PHBs.</p>   | Jeremy R. Iwen<br>Statewide Traffic Signal Engineer<br>Jeremy.Iwen@dot.wi.gov   |
| WY    | 4                        | Email   | WYDOT has 4 PHBs. No limit on intersection offsets. No laws or rules on dark beacons that I am aware of.  | Joel A. Meena<br>State Traffic Engineer<br>joel.meena@wyo.gov                   |

## APPENDIX G—FEEDBACK ON INSTALLATIONS

Currently, 43 states have installed PHBs, within which there are three states worth extra attention, Kentucky, Maryland, and Colorado. Kentucky only has one PHB installation, and it was erected by a private party. Maryland first banned the use of PHBs then permitted it at a later time, and Colorado replaced an installed PHB signal with a conventional signal. Some detailed feedback from these three states is noted below.

- Kentucky: Kentucky has only one installed PHB on 1237 River Road, which was developed by a local agency (Metro Louisville). While Kentucky Transportation Cabinet was ready to approve PHB installation on the Transylvania University campus, it ultimately decided to use the Rectangular Rapid Flash Beacon (RRFB) at that location. Lexington City has approved the application of the PHB at several locations but has not installed yet.
- Maryland: The 2011 Maryland MUTCD prohibited the use of PHBs, as well as the R10-25 signs (used along with PHBs). These traffic control devices have Interim Approval for use in Maryland since November 1, 2017.
- Colorado: [In 2017] the city of Boulder removed the “High-Intensity Activated CrossWalk” (HAWK) signal light that was at the crosswalk on Regent Drive that connects the Engineering Center with Regent Autopark. The light has been replaced by a traditional traffic signal light. The HAWK signal originally was installed by the city to try to minimize traffic interruptions. But many drivers actually found the light confusing, which is the main reason the city decided to make the switch back to a traditional signal.  
<https://www.colorado.edu/today/2017/04/06/city-removes-hawk-light-regent-drive>

Although PHB signals are widely used in the US, this technique is still controversial and poses concerns in some states. This part provides a few of the noteworthy concerns expressed, especially by the one state that does not allow them.

- Kentucky:  
The Kentucky Transportation Cabinet prefers traditional traffic signals that are well known to the public, since PHB signals would require more education for drivers and pedestrians.
- Pennsylvania:
  - “Not clear clarification as to how to navigate a flashing red indication. The MUTCD contradicts itself regarding when to navigate through a flashing red for a HAWK versus at a traffic signal or even a railroad crossing.
  - The device was put into the last manual with little research outside of the Southwest where it originated from. Based on results we are seeing our concerns are now becoming problems in other areas of the country.
  - Driver understanding of the concept is questionable. Many individuals don’t understand a dark signal and now we are flashing the devices and developing new meanings.
  - Many states have been forced to put it in due to political pressure.

- The clarification signs are not clearly understandable, and the Official Traffic Control Device team hasn't found an effective sign yet for the operation.
- Overall the effectiveness of the unit has been questionable and has created an issue with bikes/pedestrians that arrive at the end of the HAWK phase which has led to additional crashes."





**I** ILLINOIS