

# STATE OF ALASKA

## DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES DIVISION  
*Design and Construction Standards*

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March 4, 2009

Mr. Robert Arnold, Director  
Federal Highway Administration  
Office of Transportation Operations  
1200 New Jersey Avenue, S.E., HOTO-1  
Washington D.C. 20590

Via Email

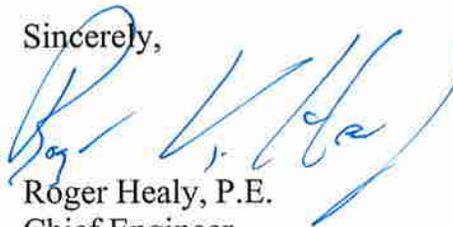
Re: Request for Permission for Experimental Use of HAWK Pedestrian Hybrid Signal

The Alaska Department of Transportation and Public Facilities (DOT&PF) requests permission for experimental use of the High Intensity Activated CrossWalk (HAWK) pedestrian hybrid signal for installation at one crosswalk location in Alaska.

We anticipate that the proposed HAWK will improve mobility and safety for middle school students on their way to and from school grounds. The enclosed document describes the location and provides our reasoning for the proposed HAWK installation.

We will comply with the guidelines set forth in the MUTCD Section 1A.10 Interpretations, Experimentations, Changes and Interim Approvals. This office will communicate to FHWA the results of studies performed by DOT&PF Southeast Region Traffic and Safety Engineering staff who will manage the project.

Sincerely,



Roger Healy, P.E.  
Chief Engineer

Enclosure

cc:

Frank Richards, P.E., Deputy Commissioner, DOT&PF  
David Miller, Division Administrator, FHWA, Alaska Division  
Mark Neidhold, P.E., Chief Design and Construction Standards

*"Providing for the safe movement of people and goods and the delivery of state services."*

Colleen Ackiss, P.E., Traffic & Safety Chief, Northern Region

Scott Thomas, P.E. Traffic & Safety Engineer, Central Region

Carolyn Morehouse, P.E., Traffic & Reconnaissance Engineering Manager, Southeast  
Region

Kurt Smith, P.E., State Traffic & Safety Engineer, D&C Standards

Jeff Jeffers, State Traffic & Safety Engineering Assistant, D&C Standards

February 5, 2009

Mr. Kurt Smith, State Traffic Engineer  
State of Alaska  
Department of Transportation & Public Facilities  
P.O. Box 112500  
Juneau, Alaska

Via email

Re: Request for Permission to Experiment - High Intensity Activated CrossWalk  
(HAWK) Hybrid Pedestrian Crossing Beacon Signal

Dear Kurt:

The State of Alaska, Department of Transportation and Public Facilities (DOT&PF), Southeast Region on **February 6, 2009**, formally requests, as outlined in Section 1A.10 of the Alaska Traffic Manual and the Manual on Uniform Traffic Control Devices (MUTCD), to experiment or interim approval to install s Hybrid Pedestrian Crossing Beacon signal (HAWK) at one pedestrian crossing location on urban, minor, arterial, street in Juneau, Alaska which serves as a school crosswalk.

EXISTING STANDARD: There is no existing standard for the HAWK but has been included in the proposed revised MUTCD.

PROPOSED STANDARD: The proposed text is available at [http://mutcd.fhwa.dot.gov/resources/proposed\\_amend/npa\\_text.pdf](http://mutcd.fhwa.dot.gov/resources/proposed_amend/npa_text.pdf) Section 4F.01 Application of Pedestrian Hybrid Signals.

The following A-F sections are response to guidance contained in the MUTCD Section 1A.10.A-F.

**A. Problem Statement** Floyd Dryden Middle School has been requesting safer pedestrian crossings of Mendenhall Loop Road at their school entrance. There is a traffic signal approximately 0.4 miles south of the school entrance and another 0.5 miles north of the school entrance. There is only one school bus that serves this school. The other 500 students walk, bike or are transported by personal vehicles.

Mendenhall Loop Road is a two-lane road with a center left turn lane. Each lane is 12 feet wide for a total of 36' with 8' shoulders on each side and a 2' drain pan. A pedestrian must walk 56' to cross the street. The speed limit in this area is 40 mph except when the school zone flashing lights are operational. The annual daily traffic is ~13,000 vehicles per day.

The school district provides crossing guards one half hour before school as well as one half hour after school. The crossing guards are present in conjunction with the flashing yellow school zone lights. However children come to school early and stay after for

activities. The Alaska daylight is short during the winter months making pedestrians harder to see even with the highway lighting. The long lines of traffic make it difficult for pedestrians to find a gap. We have had accidents where one car stops for the pedestrian and it is rear ended by the car behind not expecting the vehicle to stop.

Due to the proximity to other traffic signals and the overall congestion on Mendenhall Loop Road, another traffic signal at this location is not desirable. In 2003, DOT&PF replaced the 20 mph flashing beacons and the fluorescent school advance signs. We also installed overhead illuminated pedestrian signs and new highway lighting. Despite these improvements, complaints about drivers not yielding to students in the crosswalk have persisted especially during peak traffic.

There was an incident on December 5, 2007 when a student was brushed in the crosswalk. The school district and parent site council asked if there was anything DOT&PF could provide to make this crossing safer. We believe a Hybrid (HAWK) Pedestrian Crossing Beacon be installed at this location in an attempt to provide better pedestrian service and safety.

#### **HAWK Pedestrian Crossing Beacon Guidelines**

While not yet approved, MUTCD proposed guidelines for the installation of the HAWK Hybrid Pedestrian Crossing Beacon, referred to as the pedestrian hybrid signal, are available and have been used to determine if the HAWK Pedestrian Crossing Beacon Signal may be an option at the Floyd Dryden Middle School crosswalk on Mendenhall Loop Road. These guidelines are divided between low-speed roadways (speeds of 35 mph or less) and high-speed roadways (speeds of more than 35 mph).

The posted speed on Mendenhall Loop Road near the Middle School crosswalk is 40 mph that is reduced to 20 mph when the yellow flashing school lights are operation. Regardless, with a 56 ft wide street crossing, and a peak crossing volume of 250 pedestrians per hour, this location clearly meets the proposed MUTCD warrant.

#### **B. Description of Proposed Change**

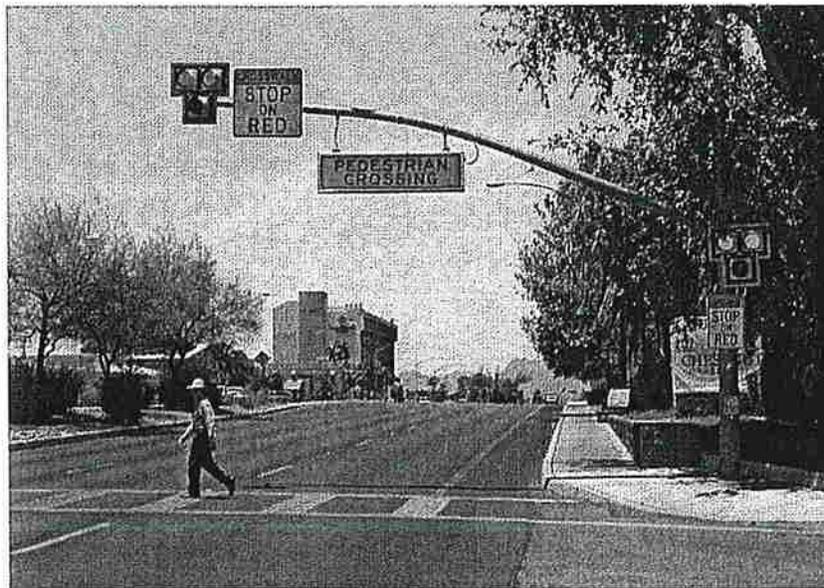
The DOT&PF Southeast Region would like to install the HAWK Hybrid Pedestrian Crossing Beacon signals at Floyd Dryden Middle School in a manner similar to the City of Tucson and other cities in the Phoenix metropolitan area have proposed. The HAWK Hybrid Pedestrian Crossing Beacon signal uses an atypical signal head configuration with two red signal indications being placed horizontal to one another and one yellow indication centered beneath the red signal indications. The signal indications are dark, and a solid DON'T WALK (raised hand) indication is displayed for pedestrians at the crosswalk until there is a pedestrian actuation. Once the pedestrian push button is pressed, the main street vehicle signal indication will flash yellow for several seconds and then will display a solid yellow for the standard length of time (consistent with ITE calculation for the vehicle clearance interval). After the solid yellow interval, the two main street red indications will go to solid red and the pedestrians will be given a WALK indication. When the WALK (walking person symbol) times out, the two red indications will be alternating flash (per the proposed MUTCD rulings) during the pedestrian clearance interval (flashing DON'T WALK.) Upon completion of the pedestrian clearance interval, the main street signal indications will go dark once again, and the

pedestrian signal indication will revert to the solid raised hand symbol until the next pedestrian actuation.

Countdown pedestrian signals will be used at the Floyd Dryden HAWK hybrid pedestrian signal location, and this crosswalk will have the high visibility design ladder markings.

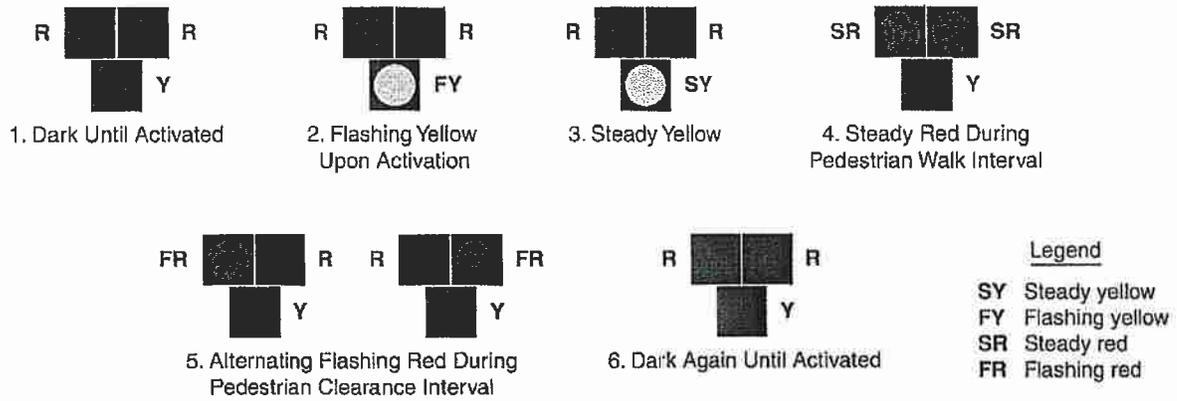
### **C. Illustration of Use**

A photo of a typical City of Tucson HAWK Hybrid Pedestrian Crossing Beacon signal installation and a diagram of the phasing sequence of the Hybrid Pedestrian Crossing Beacon Signal are included in the figures below.



*Figure 1. City of Tucson HAWK Hybrid Pedestrian Crossing Beacon Signal*

**Figure 4F-3. Sequence for a Pedestrian Hybrid Signal**



#### **D. Supporting Data for Traffic Control Device**

The Texas Transportation Institute, funded by the Transit Cooperative Research Program (TCRP D-08) and the National Cooperative Highway Research Program (NCHRP 3-71), conducted a study to evaluate the safety of pedestrians using various crossing treatments. The HAWK Hybrid Pedestrian Crossing Beacon signal, along with the half signal, experienced 97% motorist compliance – the highest of all the evaluated treatments.

Additionally, staff will be taking a tour of the Tucson HAWK applications and meet with (former) Tucson City Traffic Engineer, Dr. Richard Nassi and electrician to obtain first-hand information in the cost, operation, equipment, and application of the device. At the time of this application, the State of Alaska understands that the City of Tucson has seventy-four HAWK Hybrid Pedestrian Crossing Beacon signals and has experienced three non-fatal pedestrian-vehicle collisions since the first installation in 1999. All three collisions were due to motorists running the red light.

#### **E. Patent**

The HAWK Hybrid Pedestrian Crossing Beacon Signal concept is not protected by a patent or copyright. All elements (signal heads, mounting brackets, signal controller, mast arms, etc.) that are used to construct a HAWK Hybrid Pedestrian Crossing Beacon signal can be obtained from multiple vendors.

#### **F. Agreement to Restore**

DOT&PF agrees to restore the site of the experiment to a condition that complies with the provisions of the Manual on Uniform Traffic Control Devices within three months following the end of the time period of the experiment.

In the event that FHWA becomes concerned with the safety of the HAWK Hybrid Pedestrian Crossing Beacon signal, DOT&PF agrees to terminate the experiment.

#### **G. Time Period and Location of the Experiment**

Funding is available to install a HAWK Hybrid Pedestrian Crossing Beacon signal using a Safe Routes to Schools Grant, with activation expected by no later than September 2009. DOT&PF Southeast Region would like to obtain three years of traffic count, conflict, behavior and collision data after the installation of the HAWK Hybrid Pedestrian Crossing Beacon signals. Data provided by the State of Alaska Department of Transportation is typically provided a year to two years following a collision, so a five year experiment time period is requested. This additional time will ensure that we have access to a complete set of collision records.

#### **H. Evaluation Plan**

DOT&PF Southeast region will collect and evaluate the following data regarding safety, as well as user and motorist compliance and pedestrian usage:

##### **Before Studies:**

- Collision data for three years prior to HAWK implementation
- ADT counts

- Twelve hours of video data collection to provide the following information at the crossing on a typical school day from 6 a.m. to 6 p.m.:
  - Pedestrian counts - total crossings by age group (student vs. adult vs. senior citizen) and by time of day
  - Number of pedestrians crossing outside the crosswalk
  - Number of conflicts observed and pedestrian behavior (stopping and looking for traffic before crossing)
  - Count of number of occurrences of vehicles failing to yield to pedestrians in the crosswalk

**After Studies:**

- Collision analysis each year following implementation up to three full years
- ADT counts
- The following 12-hours of video data will be collected one month, four to six months, and at one year intervals (for year two and three) after HAWK implementation:
  - Pedestrian crossing counts by age (student, adult, and senior citizen) and by hour
  - The number of pedestrians crossing outside the crosswalk
  - Pedestrian crossing behavior, including compliance to the pedestrian signal and push button use to activate the HAWK signal
  - Vehicle compliance to the HAWK signal indications
  - Pedestrian/Vehicle conflicts

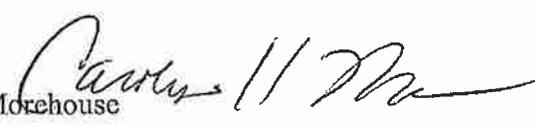
**I. Reporting**

DOT&PF will provide semi-annual progress reports during the course of the experiment and will provide a copy of the final results within three months following the conclusion of the experiment.

**J. Project Administration**

The DOT&PF Southeast Region is responsible for all project administration. The project manager will be:

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 Traffic and Reconnaissance Engineering Manager  
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Sincerely,   
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