Arcadia's First Flashing Yellow Arrow (FYA) for safety and efficiency

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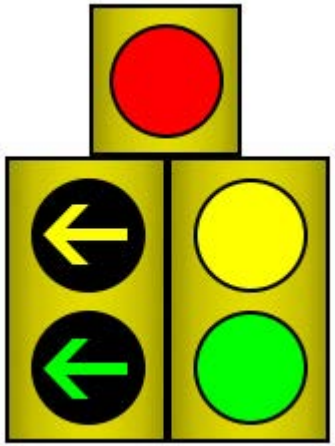
Software Engineer

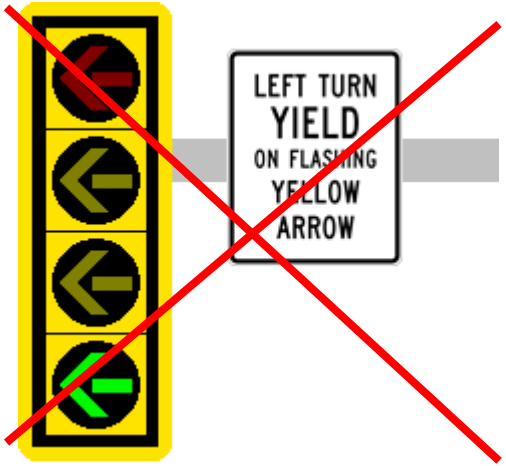
CITY OF ARCADIA

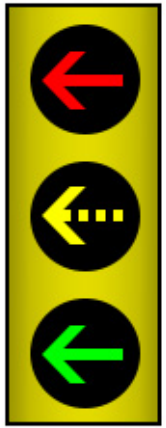
Advanced TRAFFIC SOLUTIONS

History of Protected/Permissive Left-Turns

PPLT 4-Section not in Arcadia







Steady Red:
Stop

Steady Yellow:
Prepare to Stop
Flashing Yellow:
Left turn after yielding to oncoming traffic/pedestrians

Steady Green:
Protected Left Turn

Protected

PPLT 5-Section

PPLT 3-Section

History of Protected/Permissive Left-Turns

- Protected Left-Turns installed in the 1970's or 80's in Arcadia
- Protected/Permissive Left-Turns (5-Section heads) installed starting in the early 2000's for almost a couple decades.
- Dual Protected Left-Turns installed around 2010
- Lead/Lag Left-turns for Protected Left-Turns implemented about 2015
- First Flashing Yellow Arrow (3-section head) installed in 2021
    1. Single Protected Left-turn Lane
    2. Short Left-Turn Pockets
    3. No U-turns (optional)
    4. Low Left-Turn Volumes
    5. Low Pedestrian Traffic except at certain times of day (i.e. school or events)

Interim Approval for 3-section FYA

U.S.Department of Transportation
Federal Highway Administration

Memorandum

Subject: **INFORMATION**: MUTCD – Interim Approval for Optional Use of Three-Section Flashing Yellow Arrow Signal Faces (IA-17)

Date: AUG 12 2014

From: Jeffrey A. Lindley
Associate Administrator for Operations

In Reply Refer To: HOTO-1

To: Federal Lands Highway Division Engineers
Division Administrators

Purpose: The purpose of this memorandum is to issue an Interim Approval for the optional use of three-section flashing yellow arrow (FYA) signal faces that use the middle section to show both the FYA and the steady yellow arrow. Interim Approval allows interim use, pending official rulemaking, of a new traffic control device, a revision to the application or manner of use of an existing traffic control device, or a provision not specifically described in the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD).

All numerical or alpha-numeric references to Figures, Groups, Paragraphs, Parts, or Sections herein refer to the 2009 edition of the MUTCD.

Background: At the current time, Item H of Paragraph 3 in Section 4D.20 requires that either a four-section FYA signal face with two sections containing yellow arrow indications (one for the steady display and one for the flashing display) or a three-section FYA signal face with the green arrow and the FYA being displayed in a dual-arrow signal section be used for a separate FYA left-turn signal face for protected/permissive left-turn phase operation. Also, Items I and J of Paragraph 3 in Section 4D.20 prohibit the yellow arrow indication that displays the steady change interval from being used for the FYA indication during steady mode operation, and require the yellow arrow indication that displays the steady change interval to be used for FYA the indication during flashing mode operation.

A three-section FYA signal face that uses the middle section to show both the FYA and the steady yellow arrow was not included in the 2009 MUTCD because no research supporting this type of signal face had been conducted at that time.

Research on FYA Signal Faces: A research project was performed under National Cooperative Highway Research Program (NCHRP) Project 20-07/Task 283 by the Traffic Operations and Safety (TOPS) Laboratory at the University of Wisconsin-Madison in association with the University of Massachusetts, Amherst. The title of the project was

U.S.Department of Transportation
Federal Highway Administration

1200 New Jersey Avenue, SE
Washington, D.C. 20590

APR 10 2017

In Reply Refer to: HOTO-1

Mr. Duper Tong
Chief, Office of Traffic Engineering
California Department of Transportation
P.O. Box 942873, MS-36
Sacramento, CA 94273-0001

Dear Mr. Tong:

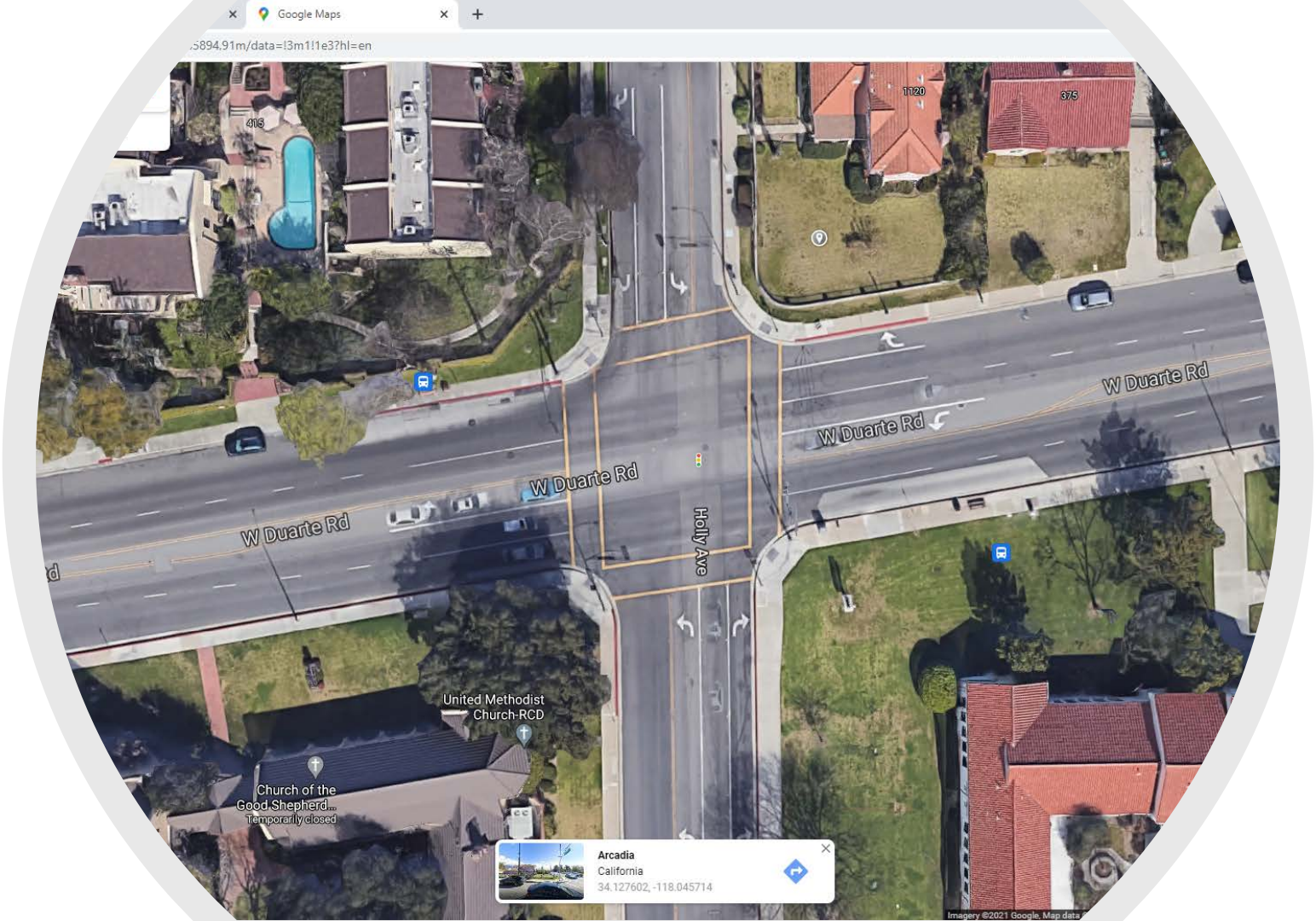
Thank you for your letter of March 7 requesting approval to use 3-section flashing yellow arrow (FYA) signal faces (that use the middle section to show both the FYA and the steady yellow arrow) statewide in California, including State highways and all local jurisdictions' roadways. Your request is made under the provisions of Section 1A.10 of the 2009 edition of the Manual on Uniform Traffic Control Devices (MUTCD) and our Interim Approval Memorandum IA-17 dated August 12, 2014.

Your request is approved. Please maintain and periodically update a list of all locations where 3-section flashing yellow arrow (FYA) signal faces (that use the middle section to show both the FYA and the steady yellow arrow) are installed in California. Your specific approval has been numbered "IA-17.18 – Three-Section Flashing Yellow Arrow Signal Faces – California DOT Statewide." Please reference this number in any future correspondence.

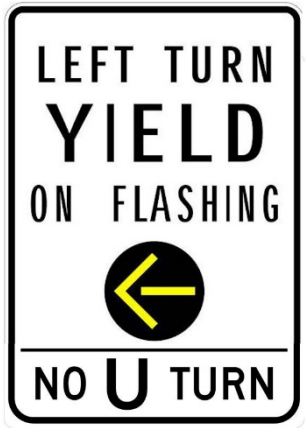
Thank you for your interest in improving highway safety. If we can be of further assistance on this matter, please contact Mr. Bruce Friedman at bruce.friedman@dot.gov.

Sincerely yours,

Mark R. Kehrli
Director, Office of Transportation Operations


Google Maps
.5894,91m/data=!3m1!1e3?hl=en
415
1120
375
W Duarte Rd
W Duarte Rd
W Duarte Rd
W Duarte Rd
Holly Ave
United Methodist Church-RCD
Church of the Good Shepherd...
Temporarily closed
Arcadia
California
34.127602, -118.045714
Imagery ©2021 Google, Map data

Duarte Rd @ Holly Ave – Pilot Project



- Separated & respliced loops for advance and lane by lane detection
- Removed and Installed new signs (see pics above)
- Landed conductors and used Auxiliary inputs for Monitoring FYA.
- Upgraded D4 firmware, timing and programmed new CMU data key


Holly Ave

Flashing Yellow Arrow for safety & efficiency

- In the interest of improved safety and efficiency, as a pilot project, a Flashing Yellow Arrow (FYA) for the left turns on Duarte Road at the Holly Avenue traffic signal will be installed.
- A FYA allows waiting motorists to make a left-hand turn after yielding to oncoming traffic.
- It tends to be more eye-catching and is a constant reminder to the driver to use caution in yielding to oncoming traffic, as opposed to the solid green light.
- A new FYA will provide more efficiency for left turners with the permissive left turns allowed in the off-peak hours but could also be turned off for more safety during heavy pedestrian activity periods where there is a greater potential interaction with permissive left turners.
- FYA was installed on April 8th at Duarte Rd & Holly Ave intersection in the eastbound and westbound directions. Holly Ave Elementary School started with in person school on April 12th. FYA is scheduled to be turned off during school drop off and pick up times.


Duarte Rd
Holly Ave

D4 Upgrade & FYA Schedule

- Ability to remotely change TOD Function to turn on/off FYA
- Bonus Feature: Safety for Pedestrians. Called “Conditional Ped Early Walk Inhibit”. Ability to turn Early Walk on/off for Coordinated Phases. During school hours we activate ped recall by TOD, which overrides CPEWI

Future

- The City of Arcadia plans to install more FYAs at traffic signals throughout town!
    1. Select existing 3-Section head Protected Left-Turn intersections (no new equipment required).
    2. New installations where PPLT 5-Section heads were previously planned (new poles & mast arms required).
    3. Possibly upgrade existing PPLT 5-Section heads (new poles & mast arms may be required)