

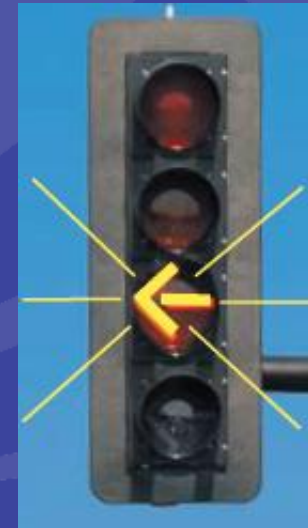
# Flashing Yellow Arrow

The Missouri Department  
of Transportation

May 11, 2011

# What and Who?

- **WHAT** is the Flashing Yellow Arrow?
  - It is the new left turn signal indication for permissive left turns that is proven to be better understood and provide more versatility than the circular green
- **WHO** is currently using it across MoDOT?
  - Districts 4, 5, 6, and 9
  - At approximately 85 signalized intersections
- **WHO** is using it across the US?
  - 40 Cities
  - 6 Counties
  - 7 DOT's
  - 12 DOT's that also have all local highway agencies included



# Why, When, and Where?

- **WHY** is MoDOT using the Flashing Yellow Arrow?
  - MoDOT's design philosophy is to place a signal head per lane
  - 2009 MUTCD requires the use of the FYA for separate left turn signal faces. It states...

**If a separate left-turn signal face is being operated in a permissive only left-turns mode, a CIRCULAR GREEN signal indication shall not be used in that face.**

**If a separate left-turn signal face is being operated in a protected/permissive left-turn mode, a CIRCULAR GREEN signal indication shall not be used in that face.**

- **WHEN** and **WHERE** is MoDOT using it?
  - First installation was in 2006, on MO 340 (Olive Blvd) at 3 intersections
  - Next installation wasn't until September 2009 in District 4
  - Districts 5 and 6 have been hitting it hard this past year
  - On new and retrofitted state highway signals you will see the FYA replacing the circular green for permissive left turns
    - No compliance date at this time
    - Districts 5 and 6 already have transition plans in place

# MoDOT Implementation

- EPG
- 24 hour Capacity Warrant Worksheets
- Signage
- Controller upgrade to be FYA compatible
- Conflict Monitor setup

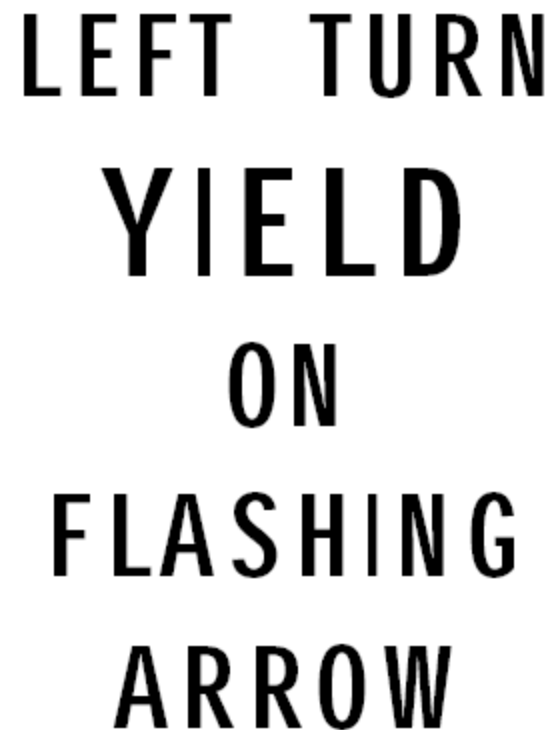
## 902.11.28 Guidelines for Optional Use of the Flashing Yellow Arrow at Signalized Intersections

The flashing yellow arrow (FYA) display for the left-turn movement offers improved safety and versatility. The FYA has high levels of understanding and correct responses by left-turn drivers and a lower fail-critical rate than the circular green. It is capable of being operated in any of the various modes of left

Video

Flashing Yellow Arrow animation

Procedure



LEFT TURN  
YIELD  
ON  
FLASHING  
ARROW

# Public Education

- Brochure
- [Video](#)
- Public Meetings
- Frequently Asked Questions
- Press Releases



## Frequently Asked Questions

**Yield on Flashing Yellow Arrow**  
U.S. Route 50, Route 5 and Route B in Tipton  
Public Informational Meeting  
July 15, 2009, 4:30 – 6:30 p.m.

**Q. What is the purpose of this project?**

**A.** The purpose of the project is to upgrade the current traffic signal system at the intersection of U.S. Route 50, Route 5 and Route B in Tipton as part of MoDOT's maintenance schedule and implement a new "Yield on Flashing Yellow Arrow" traffic display to provide safer left turns for motorists.

**Q. What is a "Yield on Flashing Yellow Arrow?"**

**A.** "Yield on Flashing Yellow Arrow" is a new signal indication being introduced to the public. A flashing yellow arrow means left turns are allowed, but you must first yield to oncoming traffic and pedestrians and then proceed with caution. It will replace the traditional "Left Turn Yield On Green" indication currently used for dedicated left-turn lanes at the intersection of U.S. Route 50 and Route 5. When no dedicated left-turn lane is available (for southbound Route B motorists turning left onto Route 50), drivers will still be required to yield on a green ball.

**Q. What is the reason for the change?**

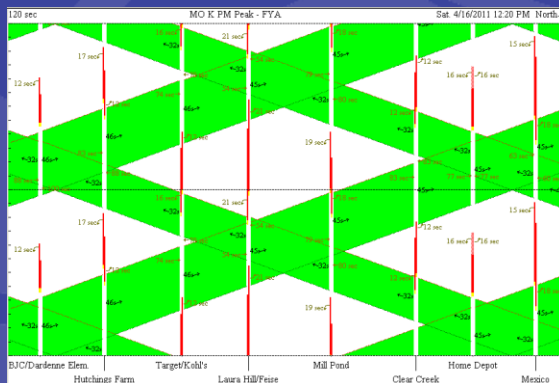
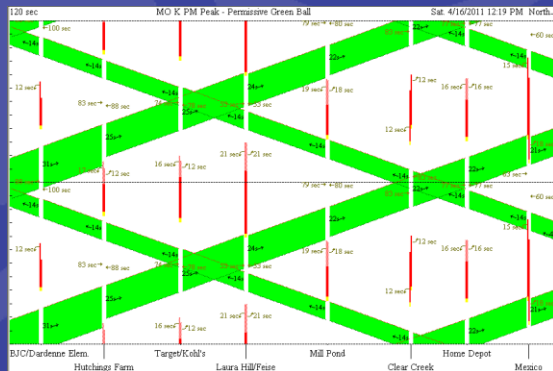
**A.** MoDOT is moving toward installing the "Yield on Flashing Yellow Arrow" display at some locations to reduce possible confusion experienced when the left-turn lane display appears the same as the green indication for the adjacent through lanes. Several states, including Missouri are using this type of signal. We expect the new signals to become the preferred signal display for left turns.

# MoDOT's Experience

- No in depth crash study has been completed yet since we are only about 1 year into the installation
  - National studies have shown that crashes may increase initially but will do down over time
  - From a 1 year after study at the 3 signals on MO 340
    - Protected went up
    - Protected/permissive decreased
- The public is asking for more FYA
  - District 5 gets requests for new FYAs on average once every week or two
- In District 5, 17 calls at one intersection went to 0
- Every intersection is different
- There are several retrofit problems MoDOT has had to overcome and are still overcoming

# MoDOT's Experience

- District 6 has done some before and after comparisons to show improved mobility, delay, emissions, fuel, etc.
  - Route K, St. Charles County (6 intersections)



PM Peak	BEFORE	AFTER	Change
Cycle Length (Sec)	120	120	
Total Delay (Sec/Veh)	28	28	0.0%
Total Delay (Hr)	502	496	-1.2%
Stops/Veh	0.46	0.44	-4.3%
Stops (#)	29264	28025	-4.2%
Average Speed (MPH)	17	17	0.0%
Total Travel Time (Hr)	875	868	-0.8%
Fuel Consumed (Gal)	1189	1172	-1.4%
Fuel Economy (MPG)	12.5	12.7	1.6%
CO Emissions (kg)	83.11	81.93	-1.4%
NOx Emissions (kg)	16.17	15.94	-1.4%
VOC Emissions (kg)	19.26	18.99	-1.4%
Unservd Vehicles	893	893	0.0%
Veh in Dilemma Zone	1616	1497	-7.4%

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**For More Information:**  
[www.modot.org](http://www.modot.org)

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