

Caltrans Directive 09-06

# **Bicycle Detection and Timing & Proposed Modifications**

*Presented By*

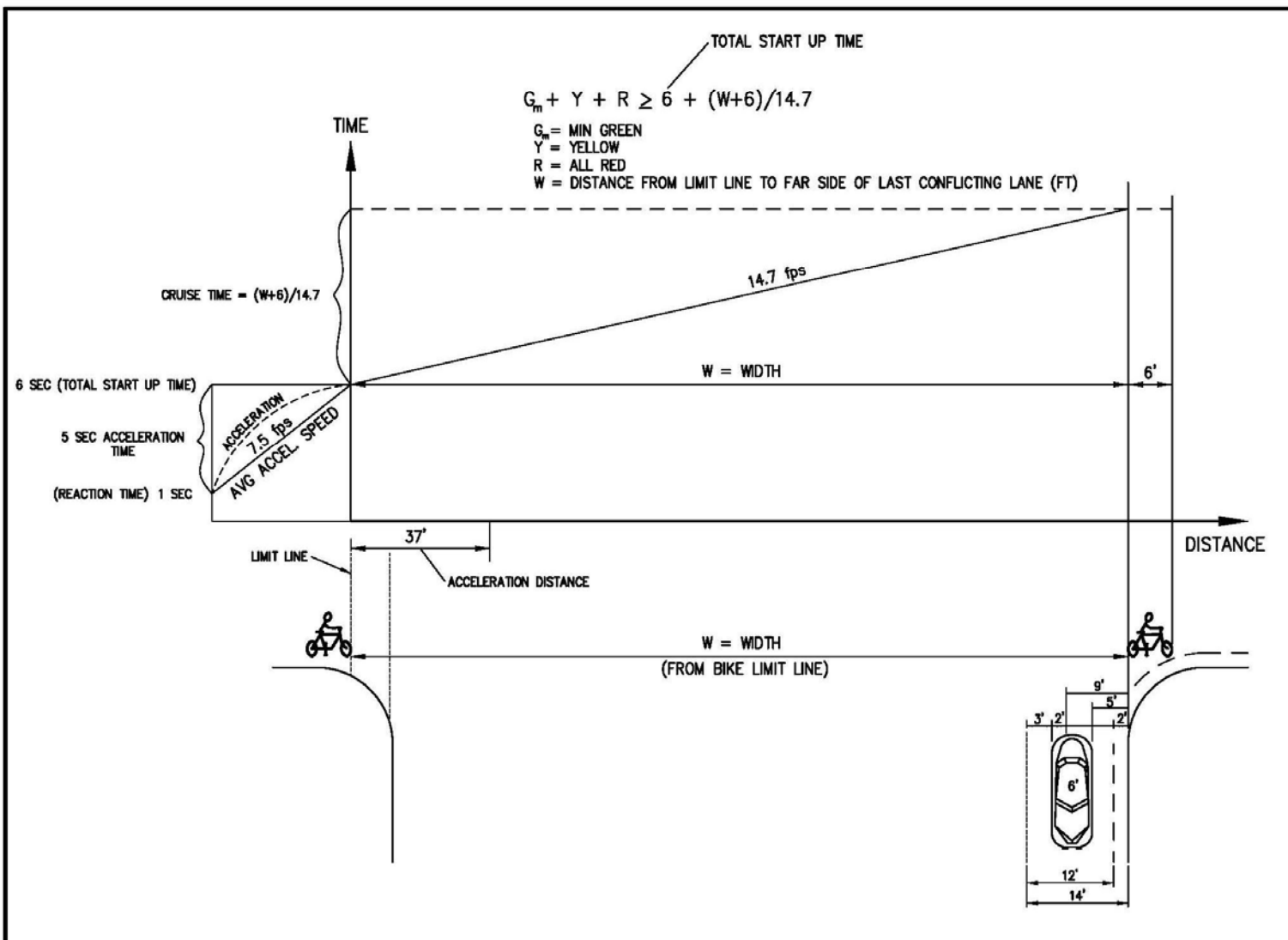
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**OCTEC**

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# **Caltrans Directive Bicycle Detection and Timing**

- **AB 1581 Required Bicycle Detection and Timing**
- **CTCDC Adopted AB 1581 Subcommittee Recommendation on May 14, 2009**
- **Caltrans Directive 09-06 Effective Sep 10, 2009**  
**Requires:**
  - **Bicycle & Motorcycle Detection at All New and Modified Traffic Signals**
  - **New Bicycle Timing with Minimum Green Times**



**Table 4D-109(CA) Signal Operations - Minimum Bicycle Timing (English Units)**

$G_{min} + Y + R_{clear} \geq 6 \text{ sec} + (w+6 \text{ ft})/14.7 \text{ ft/sec}$ , where

$G_{min}$  = Length of minimum green interval (sec)

$Y$  = Length of yellow interval (sec)

$R_{clear}$  = Length of red clearance interval (sec)

$W$  = Distance from limit line to far side of last conflicting lane (ft)

Distance from limit line to far side of last conflicting lane	Minimum phase length (minimum green plus yellow plus red clearance)
Feet	Seconds
40	9.1
50	9.8
60	10.5
70	11.2
80	11.9
90	12.5
100	13.2
110	13.9
120	14.6
130	15.3
140	15.9
150	16.6
160	17.3
170	18.0
180	18.7

# Proposed Approach to Bicycle Timing

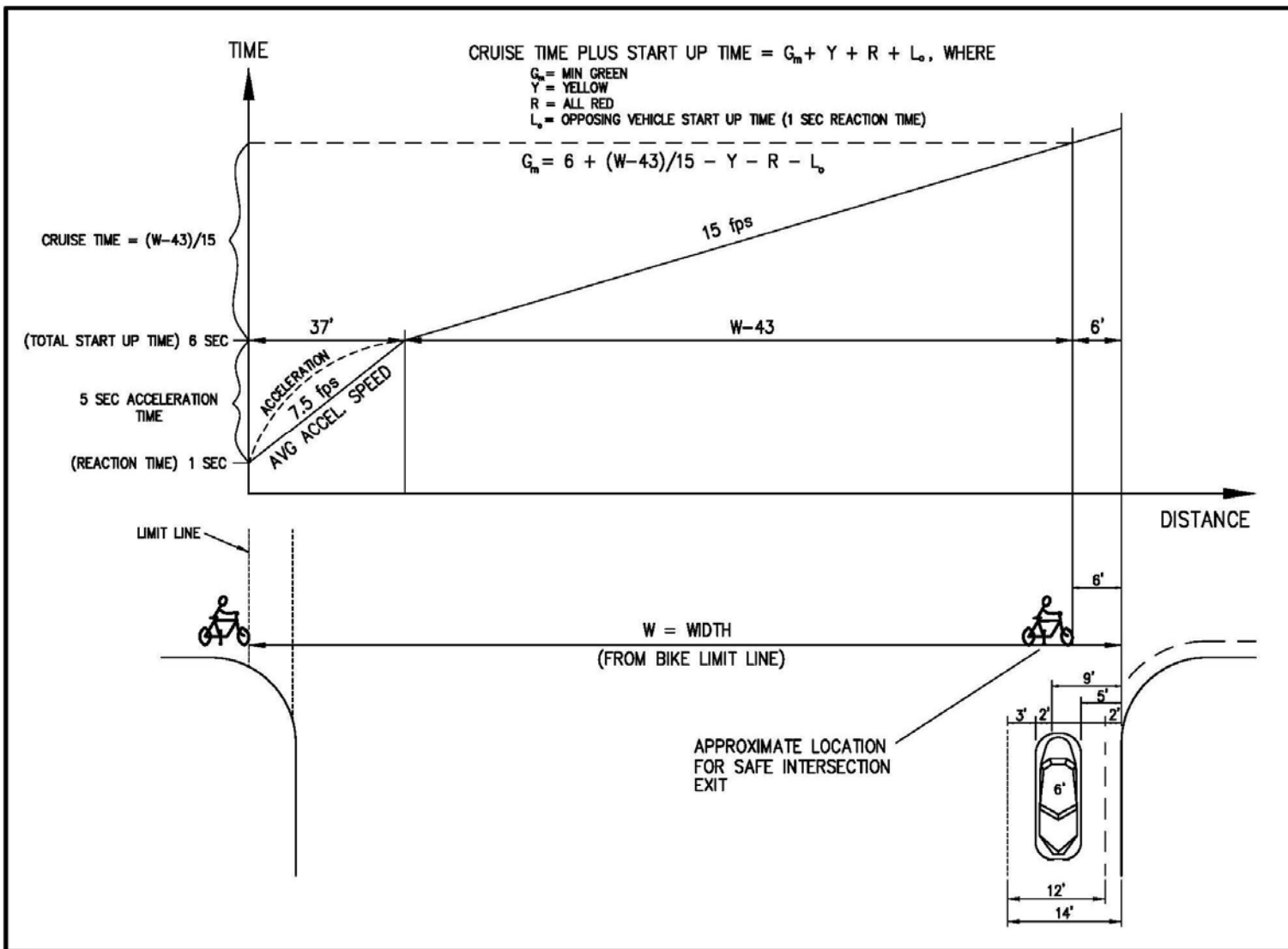
## ● Criteria:

- Simplified Bicycle Speed of 15 fps (10.2 mph)
- Recognizes Bicycle Travel Distance During Acceleration
- Timing for Bicycle to be 6 feet from curb extension
- Capitalizes on 1 Second of Opposing Vehicles Start-up Time

Proposed Table 4D-109 (CA) Signal Operations – Minimum Bicycle Timing (English Units)

$$G_m = 6 + [(W - 43) / 15] - Y - R - L_o$$

$G_m$	Length of minimum green interval (seconds)
$Y$	Length of yellow interval (seconds)
$R$	Length of red clearance interval (seconds)
$L_o$	Opposing vehicle start-up lost time (1 second reaction time)
$W$	Distance from limit line to far side of last conflicting lane (ft)





Proposed Table 4D-109 (CA) Signal Operations – Minimum Bicycle Timing (English Units)

$$G_m = 6 + [(W - 43) / 15] - Y - R - L_o$$

- $G_m$  Length of minimum green interval (seconds)  
 $Y$  Length of yellow interval (seconds)  
 $R$  Length of red clearance interval (seconds)  
 $L_o$  Opposing vehicle start-up lost time (1 second reaction time)  
 $W$  Distance from limit line to far side of last conflicting lane (ft)

Distance, W (Feet)	Minimum Green Phase Length (Seconds) *			
	if 3 seconds yellow:	if 4 seconds yellow:	if 5 seconds yellow:	if 6 seconds yellow:
85	4	–	–	–
100	5	4	–	–
115	6	5	4	–
130	7	6	5	4
145	8	7	6	5
160	9	8	7	6
175	10	9	8	7
190	11	10	9	8

Use  $G_m$  for closest distance value.

\* Table assumes 1 second all red (for each additional second of all red, reduce  $G_m$  by 1 second).