TABLE I

COMPARISON OF OBSERVED AND CALCULATED AMBER-PHASE DURATIONS

Street	Cross street	Speed limit (mi/hr)	Approximate effective width of intersection	Duration of amber phase	Theoretical $\tau_{\min}$: eq. (5)[a]			
					$a_2^* = 10.7$ ft/sec²		$a_2^* = 16$ ft/sec²	
					$\delta_2 =$ 1.14 sec	$\delta_2 =$ 0.75 sec	$\delta_2 =$ 1.14 sec	$\delta_2 =$ 0.75 sec
South of Main	Catalpa	25	60	2.7[b]	4.91	4.52	4.33	3.94
North on Mound	Chicago	30	75	3.4	5.25	4.86	4.56	4.17
East on Chicago	Van Dyke	30	80	4.0	5.36	4.97	4.67	4.28
North on Woodward	Calvert	30	—	3.6	—	—	—	—
East on 11 Mile	Van Dyke	35	55	3.4	4.90	4.51	4.10	3.71
West on 14 Mile	Southfield	35	60	6.8	5.00	4.61	4.20	3.81
South on Woodward	9 Mile	35	80 to	4.5	5.39	5.00	4.59	4.20
			120		6.16	5.77	5.36	4.97
North on Woodward	Savannah	35	65	3.85	5.10	4.71	4.30	3.91
North on Mound	13 Mile	40	50	3.6	5.00	4.61	4.09	3.70
West on Chicago	Van Dyke	40	80	4.0	5.51	5.12	4.60	4.21
West on 8 Mile	Ryan	40	70	3.9	5.34	4.95	4.43	4.04
North on Van Dyke	12 Mile	40	80	4.1	5.51	5.12	4.60	4.21
East on 12 Mile	Van Dyke	45	65	4.0	5.44	5.05	4.41	4.02
North on Woodward	11 Mile	45	80	3.44	5.67	5.28	4.64	4.25
North on Woodward	Lincoln	45	75	3.75	5.59	5.20	4.56	4.17
South on Van Dyke	Chicago	50	70	3.8	5.74	5.35	4.60	4.21

[a] Two values of the time lag δ_2 were assumed. One of them is the observed average 1.14 sec and the other a lag of 0.75 sec frequency assumed as a minimum. A car length was taken as 15 ft to be conservative. Two values for the maximum deceleration a_2^* were assumed. One of them is equal to ⅓ g which is feasible but is a fairly high deceleration not desirable in normal driving. The other one is equal to ½ g, which corresponds to a very hard stop. (Note that 0.6 g is about the absolute maximum deceleration under ideal conditions.)

[b] The amber phase here was measured at about 2.1 sec prior to a modification in the signal cycle. We have been informed of an even shorter amber phase of only about 1.5-sec duration at an intersection in California where an individual received a ticket for being in this intersection on the red signal.

amber-light duration, denoted by $\tau_{\min}$, which guarantees the safe execution of either one of the alternatives of stopping or going through the intersection without accelerating, corresponds to $x_0 = x_c$. Hence

$$\tau_{\min} = (x + w + L)/v_0, \tag{8}$$

and, using equation (4),

$$\tau_{\min} = \delta_2 + \tfrac{1}{2}\, v_0/a_2^* + (w + L)/v_0. \tag{9}$$