Chapter 7

INTERSECTION DELAY STUDY

7.1 PURPOSE

The ***Intersection Delay Study (Form No. 750-020-07)*** is used to evaluate the performance of intersections in allowing traffic to enter and pass through, or to enter and turn onto another route. This study will effectively provide a detailed evaluation of stopped time delay at the intersection. This study is generally used in conjunction with ***Warrant 2 (Interruption of Continuous Traffic)*** and ***Warrant 10 (Peak Hour Delay)*** and can be equally applicable in the evaluation of pedestrian delays at an intersection by substituting "pedestrian" for "vehicle" counts.

7.2 INTERSECTION DELAY STUDY *(FIGURE 7-1)*

(1) The heading on the ***Intersection Delay Study*** should be filled out completely prior to beginning the field review. The remainder of the form will include the data collection and calculations. Calculations should be completed by computing the *Total Delay, Average Delay Per Stopped Vehicle, Average Delay Per Approach Vehicle,* and *Percent of Vehicles Stopped*. When conducting this study at an intersection with stop sign control, the number of vehicles stopping (*Number Stopped* sub-column) should only be those vehicles that stopped completely. Vehicles which "roll" through the stop should be counted in the *Number Not Stopped* sub-column.

(2) The study involves counting vehicles stopped in the intersection approach at successive intervals. A typical duration for these intervals is 15-seconds, although other interval lengths can be selected. The sampling interval should be selected so that it will not be a multiple of the traffic signal cycle length. For example, if cycles conform to a cycle length of 45, 60, 75, 90, 105, 120, 135, or 150-seconds, a 13-second interval between samples is used. If not, a 15-second interval is used. ***Figure 7-1*** is arranged for a 15-second time interval, but other durations can be substituted.

7.3 FIELD OBSERVATION

(1) To perform the study, the first observer counts and records the number of vehicles stopped on the approach for each sampling interval. A stop watch can be used to provide the observer with the proper intervals for counting the stopped vehicles. A vehicle is counted more than once in the delay determination if it is stopped during more than one sampling time. That is, a particular vehicle

will continue to be counted in all sample time periods during which it remains stopped on the intersection approach.

(2) The second observer performs a separate tabulation of the approach volume for each time period by classifying the vehicles as either stopped or not stopping. This period is also applicable for the evaluation of delays to pedestrian traffic at an intersection or any other location. Pedestrians rather then vehicles are counted in accordance with the previously detailed instructions.

(3) Alternatively, by accumulating the amount of time spent by each vehicle in the queue and counting all vehicles (moving and stationary), a true measurement of delay can be achieved.

7.4 FORM ACCESS

A reproducible copy of the ***Intersection Delay Study (Form No. 750-020-07)*** is in the ***Appendix***. This form is also available in the Department's Forms Library.

Figure 7-1. Intersection Delay Study

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

INTERSECTION DELAY STUDY

TRAFFIC ENGINEERING

LOCATION: Henry Street	CITY: Shamrock	COUNTY: Dixie
APPROACH: East	MOVEMENT: All	DATE: 2-2-1999
WEATHER: Clear and Dry	STUDY NO.: 2	OBSERVER: S. James

TIME (MINUTE STARTING) AT	TOTAL NUMBER OF VEHICLES STOPPED IN THE APPROACH AT TIME				APPROACH VOLUME	
	- 0 sec	+ 15 sec	+ 30 sec	+ 45 sec	NUMBER STOPPED	NUMBER NOT STOPPED
0800	0	0	2	6	8	13
0801	2	0	4	4	10	9
0802	3	3	5	0	12	15
0803	1	4	0	5	10	8
0804	0	5	0	1	5	11
0805	9	1	2	6	15	12
0806	3	0	7	2	10	7
0807	1	2	6	0	9	8
0808	5	7	5	4	16	13
0809	1	3	0	0	8	16
0810	3	0	6	5	10	10
SUBTOTAL	28	25	38	33	113	119
TOTAL	124					232

TOTAL DELAY = TOTAL NUMBER STOPPED X SAMPLING INTERVAL

= 124 X 15 = 1,860 VEHICLE-SECONDS

AVERAGE DELAY PER STOPPED VEHICLE = TOTAL DELAY / NUMBER OF STOPPED VEHICLES

= 1,860 / 113 = 16.5 SECONDS

AVERAGE DELAY PER APPROACH VEHICLE = TOTAL DELAY / APPROACH VOLUME

= 1,860 / 232 = 8.0 SECONDS

PERCENT OF VEHICLES STOPPED = NUMBER OF STOPPED VEHICLES / APPROACH VOLUME

= 113 / 232 = 49 PERCENT

RECYCLED PAPER