TRAFFIC AND SAFETY MANUAL

Chapter 7 – Traffic Engineering Studies
7I – Traffic Volume Studies

Traffic Volume Studies

Originally Issued: 02-19-07, Last Revised: 02-19-07

Traffic Count Program

The Office of Transportation Data counts traffic on the highways in each quadrant of Iowa at four-year intervals and prepares an on-line traffic volume report, Volume of Traffic on the Primary Road System, available at Iowadotmaps.com. For this report all primary roads are considered open to normal traffic flow, that is, the traffic on roads that were under construction or carried detour routes have been estimated to reflect normal conditions. Each primary route is subdivided into sections that are listed in order from west to east or from south to north. Other useful reports, such as Hourly Distribution of Daily Traffic, are also available at that web site. Volumes for innerlegs, ramps, loops, and connections at interchanges or at grade intersections are not shown in the report but may be obtained from the Office of Transportation Data.

Traffic volumes at a number of intersections are counted manually by trained observers in the quadrant of the state being counted. The intersections are counted from 7:00 A.M. to 10:00 A.M., 11:00 A.M. to 1:00 P.M. and 3:00 P.M. to 6:00 P.M. on normal weekdays. The raw data (actual counts) and factored information are available from the Office of Transportation Data by the end of May in the year following the traffic study.

Special Counts

Traffic volume information may be needed that is not available from the regular Iowa Dept. of Transportation traffic count program. In this case it is necessary to perform a special count to obtain the required information. It may also be desirable to update available information because of changes in traffic patterns due to factors such as opening or closing of major traffic generators in the area. The type of count used will depend on the information needed. If turning movements are not needed the use of portable automatic counters may be appropriate. It is likely, however, that intersection turning movements, vehicle classification or pedestrian usage will be needed, and in that case manual counting is appropriate.

Intersection Counts

The field survey portion of the study must be done insofar as possible under normal conditions involving the weather, nearby traffic generator schedule, etc. The observer must be strategically positioned so as to be able to see all approaches and turning movements. The observer's location and actions must not distract motorists or influence their behavior. The observer must arrive at the study site early enough to evaluate conditions, choose a location from which to gather the data, and practice the study technique long enough to be comfortable in the knowledge that the gathered data will be accurate. One observer can count turning movements at low to moderate volume intersections but two or more are needed at high volume intersections, especially for classification counts.

Turning movement counts should be done in 15-minute intervals to provide the needed information for several possible uses. The same eight hours counted in the regular traffic count program should be counted, as it may be possible for the Office of Transportation Data to utilize the

count as a part of the program. It may also be necessary to count other hours to ensure that the eight highest volume hours at that particular location are available for evaluation of signal warrants. For Iowa Dept. of Transportation traffic volume purposes, motor vehicles fall into three classifications as follows:

- Cars, Vans and Pickups: includes sport utility vehicles, motorcycles and small trucks with single rear wheels. Vehicles in this class may be pulling trailers.
- Single Unit Trucks: includes buses, motor homes and pickups that have dual rear wheels. Vehicles in this class are not pulling trailers.
- Combination Trucks: includes semi-tractor trailers and single unit trucks that are pulling trailers.

One method of obtaining data is to record each vehicle with a tick mark on Form 1, Vehicle Turning Movement Count, with a new sheet used for each interval. Separate spaces are provided on the form for cars, vans and pickups (Cars), single unit trucks (SUT) and combination trucks (CT). If needed, pedestrians can be included on any convenient location on the form. The raw counts are later tallied and summarized on Form 2, Tabular Summary of Vehicle Movements, or by use of another tool.

Another method is to use a mechanical count board that has the appropriate number and type of accumulating push button counters mounted on a sturdy board. The most common configuration is four, three-button devices mounted to simulate four intersection approaches. This set-up is used for through and turning movements but not for vehicle classification. When mechanical count boards are used provisions must be made to record the accumulated counts at the end of each interval. One way to manage this is for the observer to take a short break of one to three minutes following each interval to record the counts and reset the counters. Later, back in the office, the volume for the short break time period is estimated by extrapolating the actual count over the break time and including it in the volume of the next interval. Another way is to record the accumulated counts at the end of each interval while still counting, but not reset the counters, and compute the intervals back in the office.

The preferred method of intersection counting is to use an electronic count board or computer. There is no need to deal with data at the end of each count interval because the internal clock separates the data by the chosen interval. Vehicle classification is also accomplished, pedestrians are counted if desired and data reduction is done automatically.

Safe, efficient and effective data collection requires skill, attention to detail and common sense. The observer must concentrate his or her attention on accurately recording each count in the proper place or with the proper button. Special care must be taken to ensure proper orientation to the geographic and geometric layout of the intersection. Observers should also look for and note any temporary traffic events such as maintenance activities, funeral processions or crashes that may lead to unusual traffic patterns, causing the data for that period of time to be unusable.

Section Counts

It may be necessary to count traffic for a highway section for a special purpose such as determining the storage length for a temporary closure, or the appropriate time to allow a lane closure. The concepts and procedures for counting traffic at an intersection also apply to counting traffic on a highway section.

Documentation

For many studies, the findings, conclusions and recommendations must be clearly conveyed to those who are responsible for acting on the results. This is done through the use of a memo, letter or more formal report. Documentation for a traffic volume count should include when, where and by whom the count was conducted, and that it was done in conformance with established guidelines. The data can be presented through the use of Form 2, Tabular Summary of Vehicle Movements, or forms generated by the use of an electronic count board or computer.

Form 1

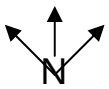
Vehicle Turning Movement Count

Date _____Location_____

N-S Street _____ E-W Street_____

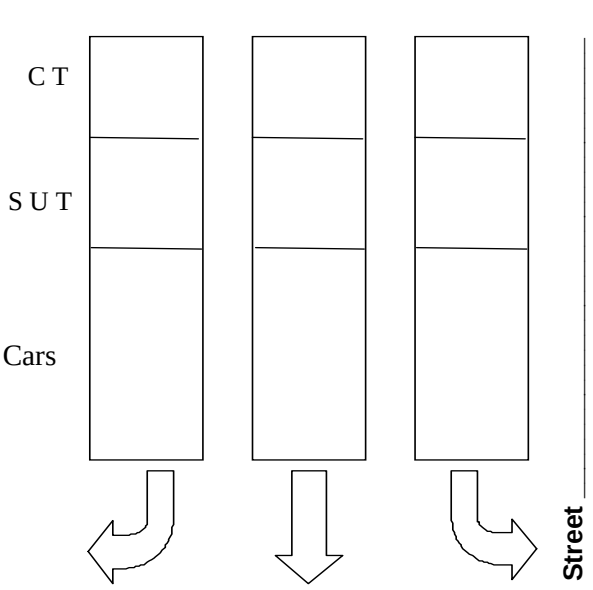
Start Time _____End Time _____

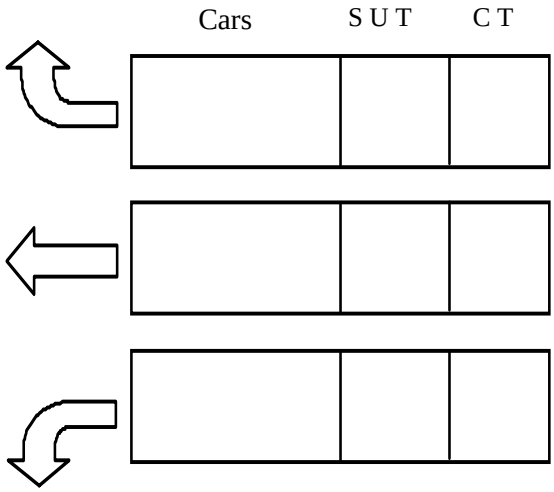
Observer _____



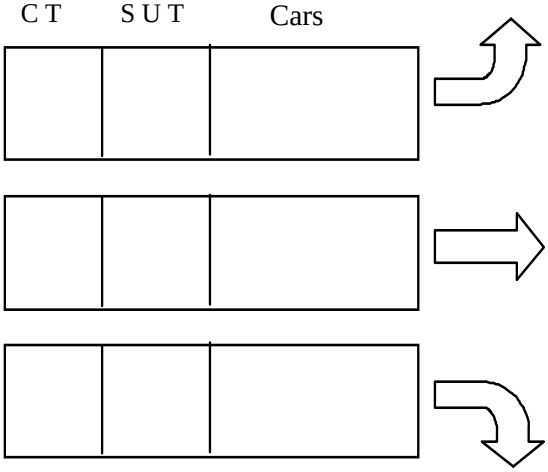
Circle Arrow Head for North

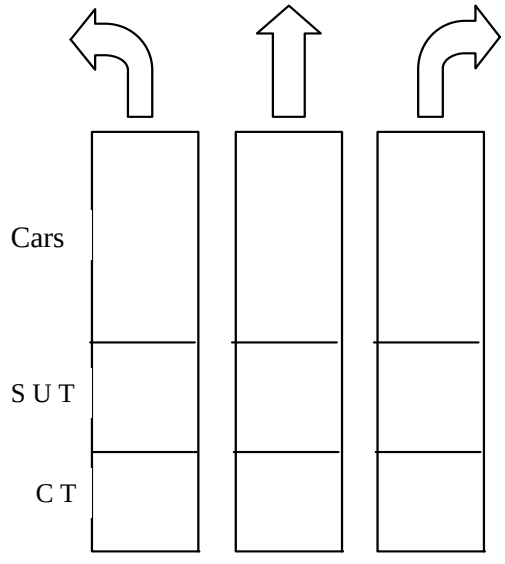
Refer to Traffic and Safety Manual Section 7I-1
Page 2 for vehicle classification descriptions





Street _____





Form 2
TABULAR SUMMARY OF VEHICLE COUNTS

Observer _____ Date _____ Day _____ City _____

INTERSECTION OF _____ AND _____

R = Right turn
S = Straight
L = Left turn

TIME BEGINS	from NORTH				from SOUTH				TOTAL North South	from EAST				from WEST				TOTAL East West	TOTAL ALL
	R	S	L	Total	R	S	L	Total		R	S	L	Total	R	S	L	Total		