

# TECH NEWS

## TECHNOLOGY NEWS

November-December 2004

## Traffic data collection methods you can count on

Traffic volume studies can help agencies make sound traffic safety-related decisions based on data about critical times of traffic flow, the influence of large vehicles or pedestrians on traffic flow, or trends in traffic volume at particular locations.

Traffic volume studies determine the number, movements, and classifications of vehicles (and/or bicycles and pedestrians) at specific roadway locations at specific times. Some examples of traffic volume studies include “rush-hour” vehicle counts at intersections, pedestrian counts, average daily traffic, and annual average daily traffic.

### Count periods

Determining the appropriate count period is critical for traffic studies.

The count period should represent the time of day, day of month, and month of year to be studied. It should avoid Mondays and Fridays (which may not represent typical weekday traffic), times of special events, or compromising weather conditions, unless, of course, the study is focusing on their effects on traffic volume.

Count periods can range from 5 minutes to 1 year. Typical count periods are 15-minute intervals for 2-, 4-, 6-, or 12-hour periods. For example if you were conducting a 2-hour peak period count, eight 15-minute counts would be required.

### Counting methods

There are two methods for collecting traffic volume data: manual and automatic.

#### Manual counts

With manual counting methods, observers go to the site and collect data on location for a specific time interval (generally measured with a stopwatch).

Manual counts are typically used when

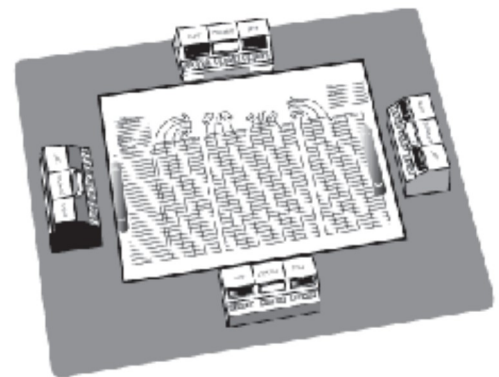
- small data samples are required.
- automatic equipment is not available, or the effort and expense of

### Editor’s note

This article is the second in a series of summaries of traffic studies described in the Handbook of Simplified Practice for Traffic Studies: (1) spot speeds, (2) traffic volumes, (3) sight distances, (4) crash analyses, and (5) school zone programs. The handbook was developed by CTRE and funded by the Iowa Highway Research Board (TR-455).

The handbook describes straightforward traffic study procedures to help local agencies “get their arms around” specific traffic-related questions or potential problems. Data collected from these studies can be critical to decision making and can help agencies communicate more effectively with community members and local officials.

All procedures outlined in the handbook and described in this article follow national standards.



Mechanical counting board

using automated equipment are not justified.

- the count period is less than a day.



Electronic counting board

Manual counts are typically used to gather data about the following:

- vehicle classifications
- turning movements
- direction of travel
- pedestrian movements
- vehicle occupancy

The number of people needed to collect data depends on the length of the count period, type(s) of data being collected, number of lanes or crosswalks being observed, and traffic volume.

Observers can manually record data using any of three methods. From least to most expensive, they are tally sheets, mechanical counting boards, and electronic counting boards.

**Tally sheets** are the simplest, least expensive tool for manual data collection. Researchers simply record data with tick marks on a pre-prepared form.

**Mechanical counting boards** consist of board-mounted, mechanical counters, one for each direction of travel. After data have been mechanically collected for an interval, the researcher records the totals on a data sheet. Mechanical boards are convenient for pedestrian, bicycle, vehicle classification, and traffic volume counts.

**Electronic counting boards** are battery-operated, hand-held devices that are light, compact, and easy to handle compared to tally sheets and mechanical boards. Electronic boards have counting buttons on their faces and an internal clock that automatically separates data by time intervals. Recorded data can be downloaded to a computer.

There are three steps to a manual traffic volume count:

1. Prepare. Determine the type of equipment to use, the field procedures to follow, and the number of observers required.  
Label and organize tally sheets. Each sheet should include information about the location, time and date of observation, and weather conditions.
2. Select observer location(s). Observers (data collectors) should be positioned where they have a clear view of traffic and are safely away from the edge of the roadway.
3. Record observations on site.

## Automatic counts

Automatic counting methods are used to gather large amounts of traffic data over an extended period of time. Counts are generally collected for 1-hour intervals in 24-hour periods.

Automatic counting methods are generally used to determine traffic patterns and trends.

The following information can be determined using automatic counts:

- hourly traffic patterns
- daily or seasonal variations
- growth trends
- annual traffic estimates

Observers can use portable or permanent automatic counters.

**Portable counters** consist of automatic recorders connected to pneumatic road tubes. They are typically used to collect the

same kind of data collected in manual counts, but for longer periods, usually 24 hours.

**Permanent counters** are sometimes built into the pavement and used for long-term counts. The equipment is expensive, and relatively few jurisdictions have access to it.

There are three steps to a traffic volume study using automatic counting equipment:

1. Prepare. Coordinate data activities with appropriate state and local officials. For example, you may need to coordinate traffic control activities.

Assemble and inspect tools, supplies, and equipment. Test all equipment.

2. Deploy and calibrate data collection equipment. Provide traffic control to protect workers in lanes of traffic.

After the equipment is placed, make sure it is functioning properly. Secure it in place.

3. Check data and retrieve equipment.

## Using outside services

---

Every year, the Iowa DOT conducts traffic volume studies on one quarter of the state highways. According to Ron Bunting, Iowa DOT traffic monitoring coordinator, counties and cities over 5,000 are given advance notice when Iowa DOT staff will be in their area, and local agencies can request studies at specific locations in their jurisdictions.

The Iowa DOT loans traffic counting equipment to local agencies on an as-available basis. The Iowa DOT can also provide data processing services, but will want to verify the data collection methods.

Many consulting firms also offer traffic volume counting services. If you engage an outside resource to conduct a traffic volume study, be prepared to have the following information available:

- specific need or issue at hand
- historic volume counts
- existing zoning
- proposed future land use changes
- traffic impact statements if available
- citizen input
- location map
- appropriate contact information

## For more information

---

For information about services available through the Iowa DOT, contact Bunting, 515-239-1323, [ronald.bunting@dot.iowa.gov](mailto:ronald.bunting@dot.iowa.gov).

You can find additional general information, plus sample data collection forms and other helpful tools, in the complete, [online version of the handbook](#).

Or contact Duane Smith, LTAP director, 515-294-8817, [desmith@iastate.edu](mailto:desmith@iastate.edu).

---