Guidelines* for Traffic Counts Used for Forecasts Certified for Roadway Design
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These guidelines are intended to address count quantity, quality, and form for traffic forecasting. This document does not address agreement on counts between project stakeholders.

Basic Requirements:

1) Turning movement counts for intersections:
   a) Summarize by car and truck in 15 minute intervals, should be counted for a minimum of 8 hours and capture the peak hour (4 hours, typically 6-10 AM and 2-6 PM).
   b) Forty eight (48) hour machine counts (see 2) are recommended, one (1) on each of the intersecting roads (outside of the intersection queuing area if possible). So, a 4 legged intersection would have up to two machine counters to capture the mainline and cross street, though adjacent intersections might utilize the same machine count if there are no major traffic generators between them.
   c) Where the traffic peak is midday, 12 hour turn movement counts are required, 6 AM - 6 PM.
   d) For routes estimated to carry less than 1000 annual average vehicles per day, b) may be waived.
   e) Preferred format for submittals is shown in the Appendices.

2) Machine Counts:
   a) Machine counts are defined as traffic counts made by anything other than a human.
   b) For locations already counted within the previous two years in relatively stable areas, the existing machine counts may be used.
   c) At a minimum, machine counts are hourly, directional (cover both directions), classification (car/truck) counts covering a contiguous 24 to 48 hour period where applicable.
   d) In addition to the machine counts recommended to supplement turning movement counts as described under item 1 above, machine counts should be conducted at other critical locations within the project area.
   e) For path 3, 4, &5 projects, permanent automatic traffic recorder (ATR) installations may be discussed at early coordination meetings and if determined feasible, will be installed through ODOT Traffic Monitoring Section of Office of Technical Services contracts. ATRs collect traffic data continuously and indefinitely.
   f) In addition to count summaries in Excel readable format, electronic count data files should be submitted for ODOT traffic monitoring section’s use and therefore should be submitted in the count equipment format per Appendix B.

3) When forecast requests include truck factors, truck counts must be summarized at a minimum by hour, preferably by 15 minute periods.

4) Conduct counts during typical weekdays (Tuesday-Thursday) unless designing to accommodate unique, area specific, conditions such as weekend or amusement park traffic.

5) If the request is for design designations on local roads (non-state), then include machine counts.

6) Provide a Map showing count location(s).

7) Queue counts are recommended if it is known that the queue backs up beyond the previous intersection.
Other Notes:

1) Slip ramps are not usually included in counts obtained thru TIMS. So, for projects including slip ramps, please include counts on the slip ramps.

2) Age of Count - In general, up to date counts should be used (counted in the same year as the request for forecast and same day for multiple adjacent locations). If counts are more than 3 years old new counts are recommended. Although there could be exceptions in very stable rural areas, rule of thumb is to get new counts.

3) When counting for TIS’s it is recommended that 8 hour minimums are followed so that ADT may be more accurately estimated from the count.

4) It is recommended that counts be reviewed and checked before submissions to avoid delays caused by re-counting.

5) For each forecast time period requested, include one or more “plates”\(^1\) containing the period counts and AADT for the entire project area (see Plates below). Include in accompanied documentation details on how the AADT was estimated including references to existing documents and specific factors used such as TD and Seasonal factors other counts, data from routes with similar characteristics, etc.

6) Interstate counts are usually estimated by adding and subtracting ramp counts from nearby ATRs, particularly at high volume locations where laying counters is difficult.

7) For areas within Metropolitan Planning Organizations (MPO) planning areas, MPOs often have counts available. So, check with the MPO.

8) Unless otherwise approved for purposes of accommodating unique traffic patterns (recreational route, tourist attraction, etc.), special event traffic dates must be avoided.
   a) Examples of events or dates to avoid:
      - weekends,
      - Fridays,
      - holiday travel days,
      - the week before Christmas,
      - the week after Christmas,
      - the week of thanksgiving,
      - the day of a snowstorm,
      - roadway construction,
      - designated construction detour route,
      - Routes affected by County or State Fair traffic

* Guideline definition:
A general rule, principle, or piece of advice.

**synonyms:** recommendation, instruction, direction, suggestion, advice; regulation, rule, principle, guiding principle; standard, criterion, measure, gauge, yardstick, benchmark, touchstone; procedure, parameter

\(^1\) Plates:

Plates are diagrams or drawings (not to scale) that show the requested peak period and ADT counted traffic. An example of a plate is shown in figure 1 on the next page. See website for Microstation standard template.
Traffic Count Guidelines for Design Traffic Forecasts

Purpose

The purpose of these guidelines is to facilitate traffic forecasts for roadway construction planning and design, reduce delays caused by count discrepancies, and provide for more accurate estimates of average annual daily traffic.

It was deemed necessary to provide traffic count guidelines to eliminate the submission of counts which are found to be unusable for developing traffic forecasts for design. It is not always clear from initial inspection that submitted counts are unusable. Unusable counts create delays and frequently puts analysts in the position of making judgement calls that adversely affect design just to maintain a timeline. Designers almost always require that ODOT forecasters provide AADT along with peak hour estimates. That means that partial day counts submitted must be used as the basis for AADT estimates when no other count source exists for the roadway in question. In the absence of any other count data at the same location, estimates of AADT from a few hours count in the morning and in the evening is unreliable and frequently poor results have been obtained from attempts to use these submittals. Please note that these are “guidelines”, not absolute rules or standards. They are not meant to cover every situation and therefore readers are encouraged to let common sense prevail in circumstances where following these guidelines doesn’t make sense. If data collection costs make planning a roadway improvement cost prohibitive, then it doesn’t make sense. Use common sense and document rationale in cases where the guidelines are not followed.

Mainline Segment Counts

Typically, roadways would be designed to meet 30th highest hour of the year traffic conditions. Without continuous traffic data collection over the course of a year, 30th highest hour will be estimated based on statewide traffic count statistics. It is recognized that some locations do not fit statewide averages such as at roadways located at or near theme parks or other recreational areas.

For more complex projects considering large investment such as those covering a corridor with multiple intersections or a grid of streets, when feasible, automatic traffic recorders should be installed at key locations a year in advance for use in forecasts certified for design in coordination with the ODOT Office of Technical Services Traffic Monitoring Section.

Mainline roadway counts should be at least 24 contiguous hours. 48 hours is preferred. The count should be vehicle classification counts following FHWA Traffic Monitoring Guide. AADT is estimated from the count using seasonal and day of week adjustment factors derived using averages from permanent automatic traffic recorders from all over the state.

In addition to using the counts for design decisions, guidelines have been extended to make the counts usable for other purposes such as to augment the department’s traffic monitoring program and evaluate forecast accuracy, update travel demand models, etc.

Intersection Classification Counts

Intersection classification counts provide turning movements at the intersection and include the vehicle classifications: cars and trucks but could also include pedestrians and bicycles depending on the location.
and purpose of the count. Cars include the 13 FHWA classes, 1-3. Trucks include FHWA vehicle classes 4-13. FHWA classes are defined in ODOT’s “FHWA Vehicle Classification Scheme F report” or in the traffic monitoring guide (TMG) published by Federal Highway Administration.

When counting for a project which involves only a single intersection, it is important to obtain at least a contiguous 24 hour classification count on each leg of the intersection. This is often done using tube counters. Since the cost of 48 hours is virtually the same as for 24 hours, 48 hours is recommended. However, it is recognized that at high volume locations or high truck volume locations, tubes sometimes break before 48 hours. Therefore, to reduce the cost of re-counting, 24 hour counts are considered acceptable. This provides a daily traffic profile that can then be used to expand the partial day turn movement counts to estimate average daily traffic.

For higher volume, larger intersections, or projects involving multiple intersections, video based or other automated methods which capture all of the intersection turn movements on the same dates are highly recommended. However, when same day counts are impractical, counts within the same week may be useable. If multiple intersections are counted and the counts do not match up where no or few driveways exist to account for the differences between intersections, submitted counts may be rejected and the entire study area may have to be recounted.
Appendix A – Preferred format for manual turning movement count summaries

At the time of preparing this document, the preferred computer format is Excel spreadsheet. In addition, whenever possible provide an electronic file in the format shown in appendix B. Please note that technology may change this before this document is updated again so check with ODOT periodically to make sure this has not changed.

It is recognized that not all traffic count vendor’s software will support this but it should be easy to put the summary data into an Excel compatible format.

Figure 2 below is an example showing the preferred Excel format.
Appendix B – Machine Count Electronic File Format

At the time of preparing this document, Petra is the software used for processing traffic count data. It is advised that people following these guidelines periodically verify that this has not changed.

In order to make the counts usable by the department for other purposes, machine counts should be submitted in one of the formats supported by the Petra software. As of the date these guidelines were created, the following formats are supported: