

Can you explain some of the technical terms?

- **ADT:** Average Daily Traffic is the amount of traffic volume going past a point in one day. The data comes from many sources and is factored based on monthly, weekly, and axle factors to represent the average day in a year. It should be noted that the only "true" ADT is one that comes from an automatic traffic recorder (ATR) that records data continuously.
- **DHV:** The Design Hour Volume is the volume unit that designers and planners most frequently use. It is based on the 30th highest hourly volume on a road in the year. It has been deemed by traffic theory, that the 30th highest hourly volume is a good cutoff point at which to design highways.
- **ESAL:** Equivalent Single Axleloads are also known as ESALs. This ratio value is a measure of pavement damage and is used for pavement design. Kentucky uses its own ESAL procedures developed in a research study in 1984 and refined annually. It is based on the concept that a semi-trailer with one axle (of the normal two tandem axles) is limited legally to a weight of 18,000 pounds. Therefore 18,000 pounds on one axle equals 1.0 ESALs/per truck axle.
- **VMT:** Vehicles Miles Traveled represents all of the vehicle trips on the highway system. This parameter is very important for air quality conformity analysis. One vehicle traveling one mile equals one VMT.

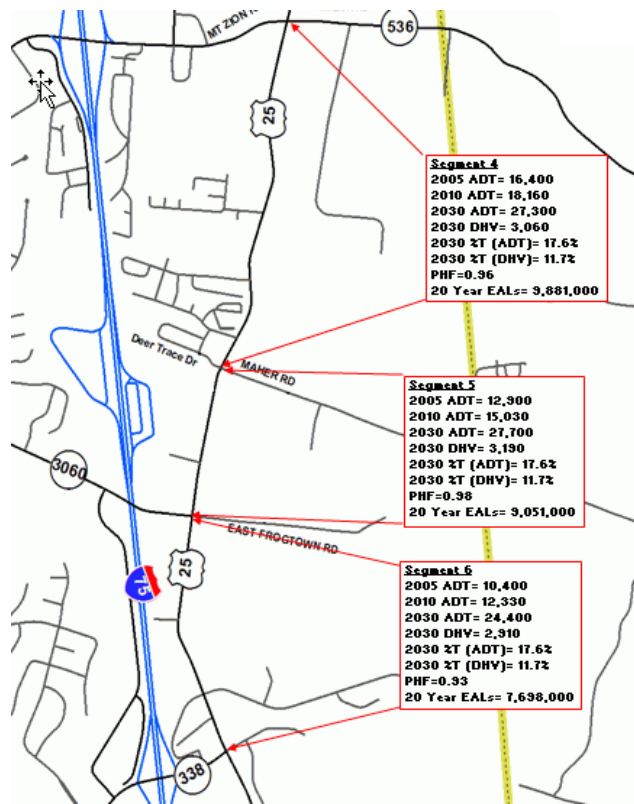
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Division of Planning

TRAFFIC FORECASTING FAQ



TRAFFIC FORECASTING

Frequently Asked Questions

Why are traffic forecasts needed?

The main purpose of traffic forecasting is to facilitate the Cabinet's Six Year Plan. Virtually every highway project needs a traffic forecast to help define the scope, the geometry of the project and sometimes even help determine if a project is needed. Examples of what forecasts help determine:

- the number of lanes;
- the length or number of turning lanes;
- the depth and type of pavement.

Highway design and planning are usually based on estimates of traffic 20 years beyond the construction date. While no one knows the future, trained traffic forecasters and modelers use special tools and experience to estimate these numbers. Typical data items provided by forecasters include:

- current and future average daily traffic;
- current and future design hour volumes;
- estimated axle loads;
- truck percentages;

Traffic forecasts are also used for many other purposes including corridor planning, systems planning, air quality analysis, and many special projects.



How do I request a traffic forecast?

Fill out the traffic forecast form and either mail or email to Lynn Soporowski, Attention Scott Thomson, Division of Planning (Mail Code W5-05-01), 200 Mero Street, Frankfort, KY 40622. Please attach a map and specify the date needed.

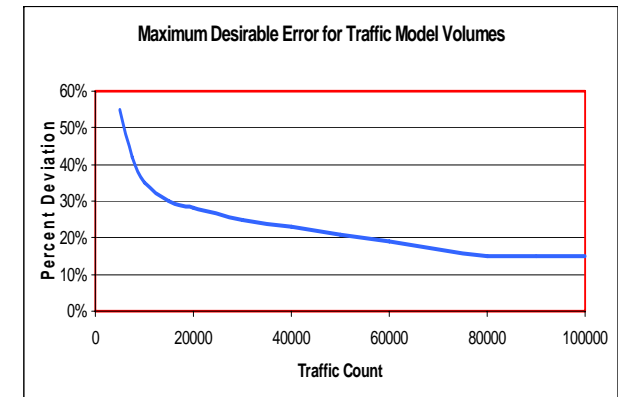
How long will it take?

The average forecast takes about eight to ten weeks, which includes time for special counts when needed. The Division of Planning typically does 100-180 traffic forecasts per year including those forecasts done by outside entities (Metropolitan Planning Organizations and Statewide Traffic Forecasting consultants). Forecasts range in complexity from bridge replacement projects to statewide corridors such as I-66.

How accurate are traffic forecasts?

In general, the smaller the average daily traffic, the larger the error of the traffic forecast. The graph shown below gives a good idea of typical predicted errors from traffic models and can also be used for traffic forecasting accuracy.

Model Assignment



% Deviation = Model Assignment – Count
From: NCHRP 255: Highway Traffic Data for Urbanized Area Project Planning and Design

Errors associated with predicting traffic volumes may include future changing traffic patterns, traffic impacts due to development, unforeseen socioeconomic conditions, changing economy, new roads and diversion, etc. Some errors may be introduced through counting traffic as it varies due to the day of the week, the month of the year, and other reasons. Therefore, it is critical that the current traffic counts be as accurate as possible since the error will only be compounded in the future. The process of quality assurance of current traffic data is one of the most important tasks of the traffic forecaster's job.

What if we don't agree with your forecasts?

The Division of Planning welcomes feedback (depends on it actually!) at every stage of the traffic forecasting process. Traffic forecasting is a cooperative process predicting a dynamic variable. With all of the uncertainty involved in the process, it is very understandable that project stakeholders will have different points of view. We attempt to gain the input of project shareholders up front. However, these forecasts are not etched in stone and we will make changes or give more detailed explanation upon request. Don't hesitate to give us your comments!

How do you do traffic forecasting?

Traffic forecasting is a complex process using many different tools. Some are listed below:

- Trend line analysis: extrapolation of current traffic patterns into the future. Past behavior predicts future performance.
- Diversion analysis: many tools other than models are used including the California Diversion curve for new roads, manual gravity and the Modlin equations to calculate traffic demand between two points.
- Trip generation: the use of standard trip rates based on land use studies.

- Turning movement calculation: software turning movements based on incomplete data.
- Traffic models are used for diversion analysis and select link analysis.

For more information on the traffic forecasting process, see the latest Traffic Forecasting Report: http://transportation.ky.gov/planning/traffic/traffic_forecasting.asp

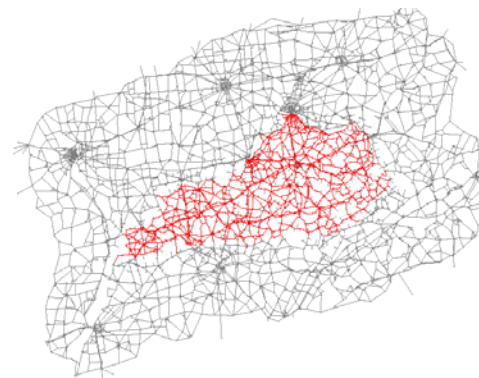
What is a traffic model?

A traffic demand model is a tool used to test alternative transportation concepts and to evaluate transportation systems. Models are built using a specialized process based on mathematical equations and intensive data collection. Traffic demand models use special software such as TransCAD or MinUTP.

The Kentucky Transportation Cabinet has many types of models that are used for traffic forecasting including:

- County Level Models for areas that have questions about air quality conformity.
- MPO models for Louisville, Northern KY and Lexington areas, which are owned and operated by the MPOs.
- The Kentucky Statewide Traffic Model (See network graphic below) includes parts of 7 other states, Kentucky highlighted in red.

Statewide Model Network Map



- Small Urban Area models are areas with population between 5,000 and 49,999. See more information: <http://transportation.ky.gov/planning/traffic/sua.asp>

Pikeville Model Network Map



What data is needed for traffic forecasts?

There are several types of data needed including:

- Traffic monitoring data, traffic volume counts, vehicle classification data, and weigh-in-motion data.
- Traffic volume data are obtained primarily from the Division of Planning's web site.
- Special counts: An example is a peak hour turning count made to get the individual data movements at an intersection during the peak travel period.
- ESAL tables are produced by the Kentucky Transportation Center from weigh-in-motion data.
- Coal haul data is used because of the enormous impact of coal trucks on pavement.
- Socioeconomic data is primarily obtained from the UL Urban Study Center: <http://ksdc.louisville.edu/> (population data) and from the Woods and Poole database: (income and employment data).
- Trip data is obtained from special household surveys and from the Bureau of Transportation Statistics: www.bts.gov.

- Land use data is obtained from county comprehensive plans, the Area Development Districts, and the Highway District offices.
- Highway Data such as lane width, number of lanes, and other geometric data is obtained primarily from the Highway Information System database.

What is new in traffic forecasting?

Some highlights:

- The Cabinet is expanding the use of modeling software (TransCAD) that has GIS incorporated into it, which provides greater modeling capability.
- KTC research studies are helping improve the state-of-the-art:
- **Traffic Growth Rate Analysis:** Better forecast local road vehicle miles traveled (VMT).
- **Development of Load Spectra:** Develop a new performance measure for pavement damage. It is expected that load spectra will replace the use of equivalent axleloads (ESALs).
- **Highway Bypasses:** Review patterns from existing bypasses in an effort to understand the long term impact of new bypasses on communities.
- **Vehicle Classification Analysis:** Looks at the number of each type of vehicle on our roads. This allows engineers to analyze their impacts.
- **Evaluation of Interstate Volume Count Factoring from Adjacent Index Stations:** Develop methodology to factor interstate count locations where there is not much data variability.
- The Traffic Model Users Group is a constant source of new information and technology sharing. More information can be found on our website.
- Trans Modeling, CORISM, and other microsimulation models, networks are being developed from demand models for urban highway analysis.