

# Using United States Census Bureau Data to Develop a New Kentucky Statewide Traffic Model

In early 2003, the Kentucky Transportation Cabinet (KYTC) contracted with Wilbur Smith Associates (WSA) to undertake major efforts to develop a statewide automobile and truck forecasting model using the TransCAD software package. The main purposes of the Kentucky Statewide Traffic Model (KYSTM) are to support highway planning and investment decisions, to permit a consistent methodology in project evaluations, to allow testing of alternative land use strategies, and to develop a better understanding of changes occurring in statewide travel demand that may be related to larger national and international economic trends. During its development, the automobile model utilized many data sources including those provided by the United States Census Bureau.

## ★ DATA USED

The following Census Bureau data was used to develop the Kentucky Statewide Traffic Model (KYSTM):

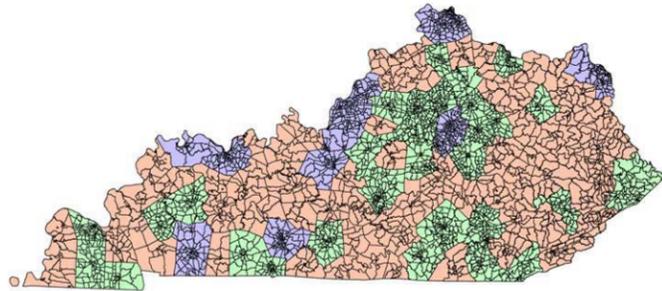
- Geography;
- Census Transportation Planning Package (CTPP) Part 3 data; and
- Census 2000 Summary File.

## ★ GEOGRAPHY

The traffic analysis zone (TAZ) system defined for the KYSTM utilizes various levels of Census geography. Initial efforts to establish a TAZ system included participation in the Census Bureau's TAZ-UP effort, a user-defined level of geography that would allow CTPP data to be easily used in transportation demand models. In 2002, the Census Bureau provided an option to define an additional level of geography in the metropolitan planning organization (MPO) and small urban area (SUA) counties called "Combined Zones". Kentucky was one of the few states to take advantage of the Combined Zones effort. As a result, zones were redefined in the 48 Kentucky counties that contain either an MPO or SUA. There were two (2) major goals for the Combined Zones project:

1. Refine TAZs for the KYSTM to provide more detail through Kentucky; and,
2. Re-define census geography for CTPP to match the KYSTM roadway network.

As part of the current update to the KYSTM, a much more detailed GIS network was created. In order to account for the improved detail, the previously identified Combined Zones were disaggregated, if needed, into smaller TAZs. This was most necessary in the transitional areas between an urban area and a rural area. In addition, zones within counties without an MPO or SUA were defined using Census Block Group and Census Place geography.



## ★ CTPP PART 3

Journey-to-work (JTW) data were acquired from the CTPP in order to establish a home-based work (HBW) trip table for the KYSTM. The difference between a statewide model and an urban model is that urban models often use HBW trip rates for trip generation. However, in the case of the KYSTM, all HBW trips were based on JTW trips provided from the CTPP data. Factors were applied to the JTW data to then convert it to a HBW format.

## ★ CENSUS 2000 SUMMARY FILE 1

Census level population and household data were obtained through use of 2000 Summary File 1 data at the CTPP TAZ or Census block level. These smaller levels of geography were then aggregated as necessary to obtain population and household totals for each of the new 3,644 KYSTM TAZs within Kentucky. Household data was used to estimate the number of home-based other (HBO) and non-home based (NHB) trips with Kentucky.

## ★ CTPP DATA REVIEW

As part of the update to the KYSTM, WSA conducted a review of CTPP 2000 *Part 1: Data by Place of Residence*, CTPP 2000 *Part 2: Data by Place of Work*, and CTPP 2000 *Part 3: Journey-to-Work Flows*. *Part 1* included information about the household end of a trip while CTPP *Part 2* included information at the workplace end of a trip. Reasonableness checks were conducted to identify errors in the data. *Part 3* data was also reviewed. The *Part 3* data was not available on a CD-ROM with a user interface like *Part 1* and *Part 2*; however, it was in a database format that could be viewed and queried in Microsoft Access.

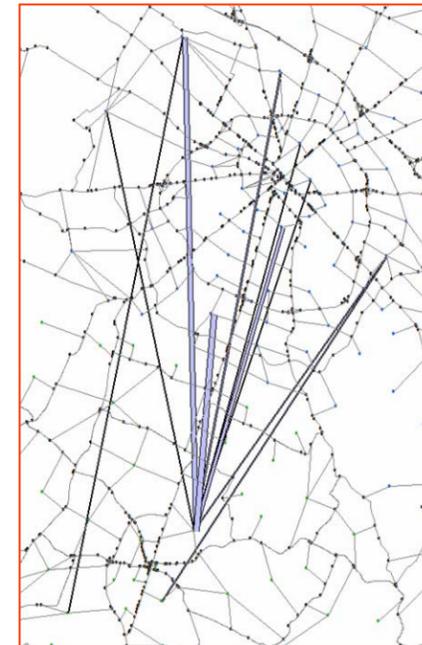
The JTW data is part of the *Part 3* data available for download from the Bureau of Transportation Statistics website. For the KYSTM, *Part 3* data was obtained for the entire state of Kentucky which includes all JTW trips that either originate or terminate in Kentucky, or both.

*Part 3* data was available in two database formats. The first format, Summary Level 140, included origin and destination flows between all census tracts in Kentucky. The second format, Summary Level 944, included origin and destination data at the Combined Zone geographic level. Geographic regions outside of the state were represented at the larger census tract level. Correspondence tables were created in order to match data from the CTPP Combined Zone geography level into the new zone system established for the KYSTM.

## ★ ISSUES

- Discuss issues, including:
- Incorrect Combined Zones coding on CTPP Part 3 data
- Issues found during calibration
- Tests (including desire lines)

## ★ DESIRE LINES



## ★ FINAL RESULTS

TEXT RELATED TO CALIBRATION AND VALIDATION WILL BE ENTERED HERE

Information provided by:

Scott Walker, Wilbur Smith Associates  
Amy Thomas, P.E. Kentucky Transportation Cabinet

Presented by:  
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Scott Walker  
(swalker@wilbursmith.com)  
(859) 254-5759  
465 East High Street, Suite 100  
Lexington, KY 40507

Amy Thomas  
(Amy.Thomas@ky.gov)  
(502) 564-7686  
200 Mero Street  
Frankfort, KY 40622

