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Future Transportation Issues

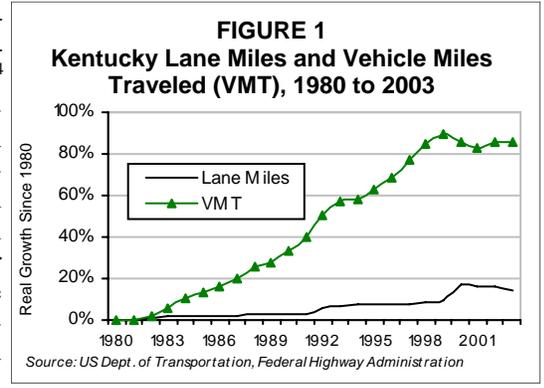
By Michael Childress (michael.childress@lrc.ky.gov)

An adequate transportation network is essential for ensuring economic growth and prosperity.

Ideas, innovation, and intellectual capital form the foundation of the evolving knowledge economy, but Kentucky, like most states, is still centered on making and growing things, extracting and transporting raw materials, and moving people and products to markets and workplaces. Thus, the traditional transportation infrastructure—the road system—is still an essential piece of the economic development puzzle. Around 46 percent of Kentucky's economy is in sectors like agriculture and manufacturing that are highly dependent on transportation, compared to about 36 percent nationally.¹ And even as the nation's economy evolves over the next few decades, the movement of freight along the country's highways, a quintessential "old economy" activity, will continue to grow. According to a 2003 report released by the National Academy of Sciences, "by 2020, the nation's total output of goods and services probably will increase by 70 percent, (and) highway travel and all domestic freight traffic will increase by about 40 percent ..."² The U.S. Department of Transportation estimates that truck-carried freight tonnage will increase by 84 percent in Kentucky between 1998 and 2020, about the same as the national average.³ An extensive and efficient transportation system, both now and in the future, can facilitate lower industry production costs and consumer prices, widen access to commodities for businesses and consumers, and broaden the pool of workers for business while creating more job opportunities.

Demands on Kentucky's transportation system have steadily increased.

Pressure on Kentucky's road system has been building for several years. Since 1980, Kentucky's lane miles have increased 14 percent while vehicle miles traveled have increased 85 percent (see Figure 1). An estimated 30 percent of Kentucky workers commute to their job outside their resident county,⁴ and travel time to work for the 1.7 million Kentuckians working outside the home increased by 7 percent from 1990 to 2000.⁵ Highway delays in Louisville have increased four-fold since 1990 and, at 42 hours per traveler each year, is 70 percent higher than the average for U.S. cities of similar size.⁶ In light of these trends and the importance of roads for economic development, we examine the extent and condition of the state's road system.



Assessing the extent and condition of the road system.

There are, of course, multiple ways to assess the adequacy of the road system, but we focus on two elements: *extent* and *condition*. First, using total lane miles as our gauge, we compare Kentucky to states with a similar demography, geography, and economy to ascertain whether Kentucky has a comparable number of lane miles. Second, we combine seven indicators of road quality into a single scale to compare the condition of Kentucky's roads to other states.⁷

Extent of the road system.

Kentucky's total lane miles, at 160,000, is comparable to other states with similar demographic, geographic, and economic characteristics.⁸ Using multiple regression analysis, we analyze the relationship between lane miles and many other factors, including, but not limited to, the amount of developed land, population density, land area, topography, and economic makeup. For example, states with a lot of land or more manu-



facturing tend to have more roads while those with higher population density or mountainous terrain tend to have fewer roads. With this approach we can predict a state's total lane mileage based on its characteristics. Our results suggest that Kentucky's actual lane mileage is just over 99 percent of the predicted or expected level given the state's demographic, geographic, and economic characteristics (see Figure 2). Indiana, on the other hand, has around 80 percent of the total lane miles expected while West Virginia, at 140 percent, has more lane miles than expected. Even though this analysis indicates that Kentucky's actual lane miles nearly equal the expected amount, there are important caveats. First, the statistical results are only suggestive despite their precision. Slightly different models yield slightly different results. Second, this approach is analogous to grading on a curve insofar as we are comparing Kentucky to other states. If the national infrastructure is inadequate, as some have asserted, then these results show that Kentucky is average when compared to a mediocre group. Third, this analysis does not assess whether the roads are in the "right" place, only that the statewide total is comparable to other states. Fourth, we do not address future adequacy, which is an important issue given the evolving global economy.

The condition of Kentucky's road system is average.

We use seven factors to assess the condition of Kentucky's road system: the percentage of rural and urban interstates and rural primary roads in poor condition; the percentage of congested urban interstate; the percentage of deficient bridges; the percentage of rural primary roads with narrow lanes; and the fatality rate.⁹ The percentage of Kentucky's rural and urban interstates and rural primary roads in poor condition is near zero. However, over 50 percent of urban interstate is estimated to be congested and nearly a third of bridges are classified as deficient, both of which exceed the regional average. And Kentucky's fatality rate and percentage of narrow lanes on primary roads is about the same as the regional average. When combined into a single index and compared to the region, Kentucky's roads are in average condition (Figure 3).¹⁰

Inflation and more fuel-efficient vehicles have eroded the motor-fuels tax.

The Road Fund, at \$1.1 billion, is the main source of funding for Kentucky's roads. However, since 1990, the Road Fund has grown at half the rate of the General Fund. More fuel efficient vehicles as well as inflation have diminished the value of the motor-fuels tax, a large component of the Road Fund. In 2003 the motor-fuels tax comprised 40 percent of the Road Fund, down from 50 percent in 1990. The revenue produced by Kentucky's motor-fuels taxes and related receipts per vehicle mile traveled declined 28 percent in real terms from 1990 to 2003 (Figure 4).

Funding is related to the condition of the road system.

From 1993 to 2002, Kentucky's cumulative highway expenditures per state-controlled lane mile were \$188,000, about half as much as states with the best roads. In general, the higher the cumulative spending during this period, the better the road condition at the end of the period (see Figure 5).

Conclusion and future actions.

The extent of Kentucky's road system is comparable to other states, but we cannot determine whether the roads are in the "right" location or whether the current system will be adequate in the future. The condition of Kentucky's roads is about average when compared to states in our region, but transportation funding will be a crucial future issue. Given the importance of transportation for economic development, Kentucky needs an adequate road system as well as the revenue to support it.

FIGURE 2
Actual Lane Miles as a % of Predicted, Kentucky and Selected States

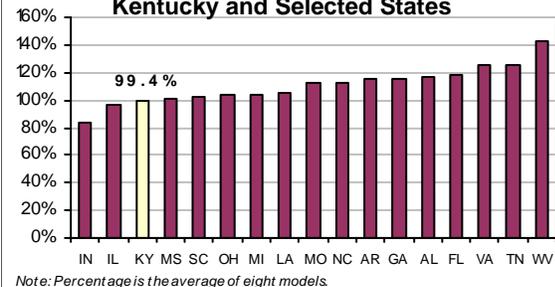


FIGURE 3
Road Condition Index, Kentucky and Selected States

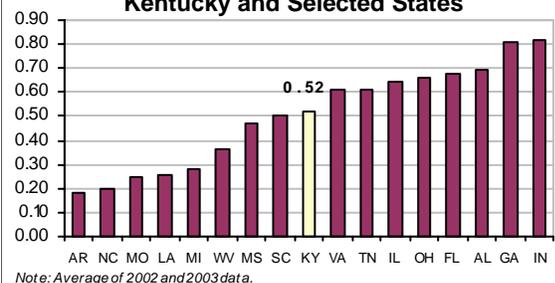


FIGURE 4
Motor-Fuel Taxes and Related Receipts per Vehicle Mile Traveled, 1980 to 2003

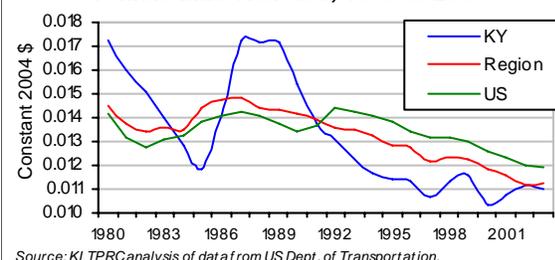
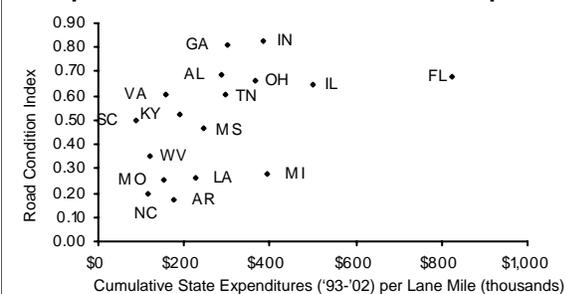


FIGURE 5
Expenditures & Road Condition Scatterplot



¹These economic sectors are assumed to be more transportation dependent: agriculture, forestry, fishing, and hunting; mining; construction; manufacturing; transportation and warehousing; wholesale and retail trade. ²"Freight capacity for the 21st Century," Special Report 271, 2003, Transportation Research Board of the National Academies, online: <<http://gulliver.trb.org/publications/sr/sr271.pdf>>. ³U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework Tonnage Origin-Destination Database, Final 2002, online: <http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/fafstate2state.htm>. ⁴2000 Census County-To-County Worker Flow Files, online: <<http://www.census.gov/population/www/cen2000/commuting.htm>>. ⁵For information about the methodology refer to <http://www.kltprc.net/policynotes/pn0019_techinfo.pdf>. ⁶Texas Transportation Institute, 2005 Urban Mobility Study, online: <<http://mobility.tamu.edu/ums/>>. ^{7,8}See note 5. ⁹Refer to David T. Hartgen, "TEA-21's Impact: Performance of State Highway Systems 1984-2003," Feb. 2005, online: <http://www.johnlocke.org/acrobat/policyReports/2005_highway_performance_report.pdf>. ¹⁰See note 5 for the methodology.