CAN MORE ROAD SPACE REDUCE CONGESTION GROWTH?

The analysis in this section (shown in Exhibit 17) addresses the issue of whether or not roadway additions made significant differences in the delay experienced by drivers in urban areas between 1982 and 2002. These years saw a range of economic conditions but a relatively consistent pattern between demand or population growth and increase in congestion. Rapid population growth was usually accompanied by significant congestion growth, while slow growth saw less congestion growth. The length of time needed to plan and construct major transportation improvements, however, means that very few areas see a rapid increase in economic activity and population without a significant growth in congestion. It also reinforces the idea that congestion is not a problem that can be addressed and then ignored for a decade.

Two measures are used to answer this question.

1. The Travel Time Index (TTI) is a mobility measure that shows the additional time required to complete a trip during congested times versus other times of the day. The TTI accounts for both recurrent delay and delay caused by roadway incidents.
2. The difference between lane-mile increases and traffic growth compares the change in supply and demand. If roadway capacity has been added at the same rate as travel, the deficit will be zero. The two changes are expressed in percentage terms to make them easily comparable. The changes are oriented toward road supply because transportation agencies have more control over changes in roadway supply than over demand changes. In most cases in the UMS database, traffic volume grows faster than lane-miles.

Conclusions

The analysis shows that **changes** in roadway supply have an effect on the **change** in delay. Additional roadways reduce the rate of increase in the amount of time it takes travelers to make congested period trips. In general, as the lane-mile "deficit" gets smaller, meaning that urban areas come closer to matching capacity growth and travel growth, the travel time increase is smaller. It appears that the growth in facilities has to be at a rate slightly greater than travel growth in order to maintain constant travel times, if additional roads are the only solution used to address mobility concerns. It is clear that adding roadway at about the same rate as traffic grows will slow the growth of congestion.

It is equally clear, however, that only five of the 85 areas studied were able to accomplish that rate. There must be a broader set of solutions applied to the problem, as well as more of each solution than has been implemented in the past, if more areas are to move into the "maintaining conditions or making progress on mobility" category.

Analyses that only examine comparisons such as travel growth vs. delay change or roadway growth vs. delay change are missing the point. The only comparison relevant to the question of road, traffic volume and congestion growth is the relationship between all three factors. Comparisons of only two of these elements will provide misleading answers.

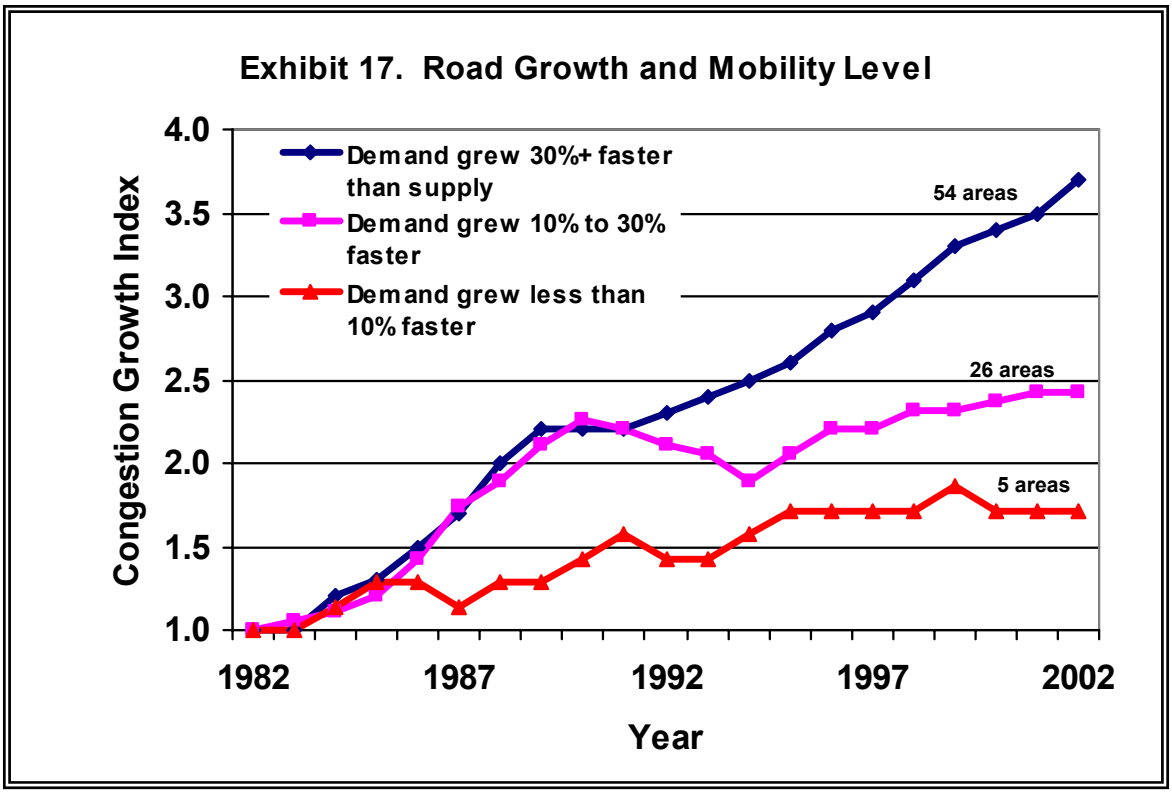
Exhibit 17 shows the ratio of changes in demand (miles traveled) and supply (roadway) and the resulting change in the mobility level measured by the Travel Time Index. If road growth is a useful strategy for reducing the growth of congestion, lane-mileage increases that are faster than the traffic growth should improve conditions. If adding roads is not an effective strategy, the relationship between added roads and added demand will not indicate lower congestion growth for a demand-supply balance.

The 85 urban areas were divided into three groups based on the differences between lane-mile growth and traffic growth. If an area's traffic volume grew relatively slowly, the road capacity would need to only grow slowly to maintain a balance. Faster traffic growth rates would require more road capacity growth. The key analysis point is to examine the **change** in demand, the **change** in supply and the **change** in congestion levels. This allows fast growth cities that have built roads in approximately the same rate that demand has grown to be judged against other areas where demand and supply changes have been balanced.

The three groups were arranged using data from 1982 to 2002:

- Significant mismatch—Traffic growth was 30 percent or more greater than the growth in road capacity for the 54 urban areas in this group.
- Closer match—Traffic growth was between 10 percent and 30 percent more than road capacity growth. There were 26 urban areas in this group.
- Narrow gap—Road growth was within 10 percent of traffic growth for the five urban areas in this group.

The resulting growth in the average Travel Time Index values is charted in Exhibit 17. The average 1982 values were assigned a value of 1.0 so that the increases could be compared (in a manner similar to the Consumer Price Index).



Note: Legend represents difference between traffic growth and road additions.

- A general trend appears to hold—the more that travel growth outpaced roadway expansion, the more the overall mobility level declined.
- The five urban areas with a demand-supply growth balance had their congestion levels increase at a much lower rate than those areas where travel increased at a much higher rate than capacity expansion. The demand increases in some of these areas was also relatively low compared to other areas in the study, which made it easier to add roads at the needed rate.
- The recession in California in the early 1990s and the combination of the economy and increased road construction efforts in Texas in the late 1980s and early 1990s affects the "middle" line congestion levels.
- The number of areas in each group is another significant finding. Only five urban areas were in the Narrow Gap group. Two of those, New Orleans and Pittsburgh, had populations greater than 1 million. Charleston, SC and Anchorage were the other two areas. Tulsa was in the Medium population group, and Charleston and Anchorage were from the Small group.