CAN MORE ROAD SPACE REDUCE CONGESTION GROWTH?

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 13 of the 101 intensively studied urban areas 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.

The analysis in this section (shown in Exhibit B-11) addresses the issue of whether or not roadway additions made significant differences in the delay experienced by drivers in urban areas. 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 Urban Mobility Report database, traffic volume grows faster than lane-miles.

Exhibit B-115 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.

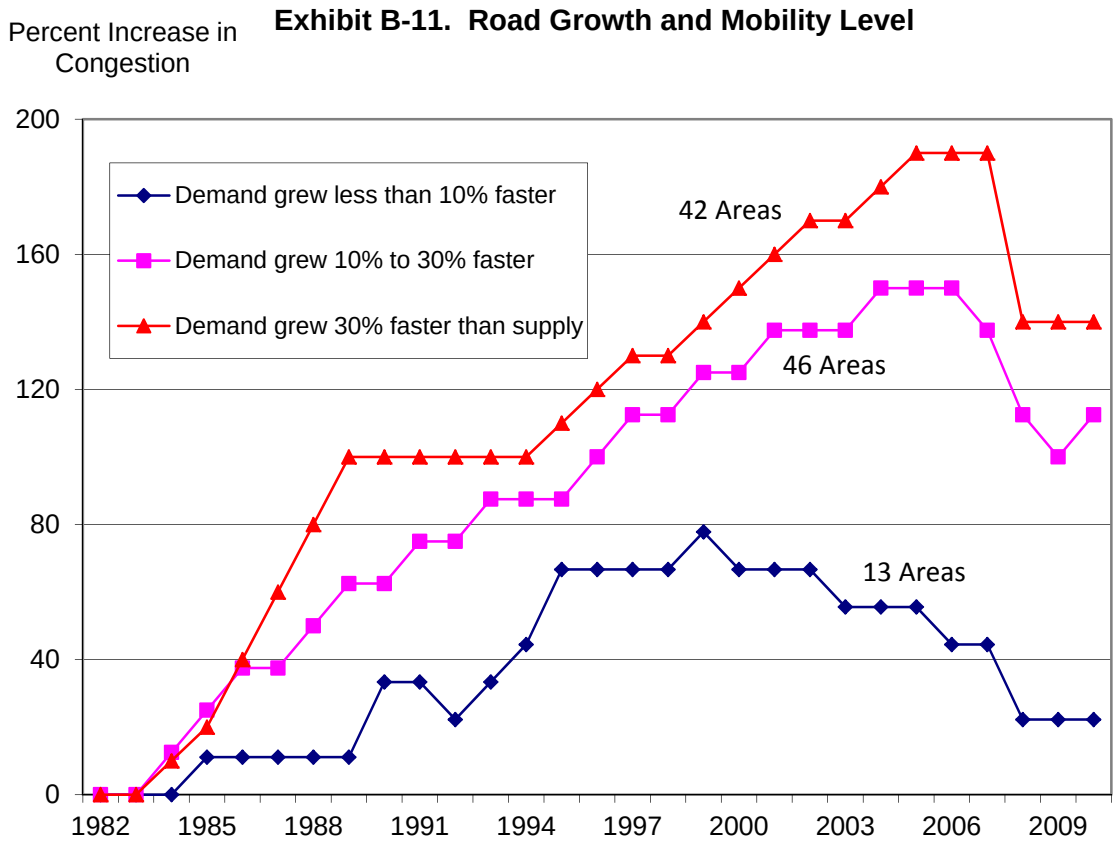
The 101 intensively studied urban areas were divided into three groups based on the differences between lane-mile growth and traffic growth. If an area's traffic volume grew relatively slowly, the road capacity would need to only grow slowly to maintain a balance. Faster traffic growth rates would require 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 four groups were arranged using data from 1982 to 2010:

- **Significant mismatch** – Traffic growth was more than 30 percent faster than the growth in road capacity for the 42 urban areas in this group.
- **Moderate mismatch** – Traffic growth was between 10 and 30 percent greater than road growth. There were 46 urban areas in this group.
- **Narrow gap** – Road growth was within 10 percent of traffic growth for the 13 urban areas in this group.

The resulting growth in congestion is charted in Exhibit B-11, and the cities in each group are listed in Exhibit B-12. The Travel Time Index values were compared to the 1982 values to examine the growth in extra travel time each year (in a manner similar to the Consumer Price Index).

Exhibit B-11. Road Growth and Mobility Level



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 nine 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 change in congestion levels during that time.
- The number of areas in each group is another significant finding. Only nine urban areas were in the Narrow Gap group. Three of those, St. Louis, Pittsburgh and New Orleans had populations greater than 1 million. Dayton, Palm Springs, Lancaster, Poughkeepsie, Wichita are in the Medium population group. Anchorage, Boulder, Greensboro, Madison, Provo is from the Small population group. Most of these areas had relatively low population growth rates, indicating that the low demand growth may have been responsible for their inclusion in this group, rather than rapid road construction.

Exhibit B-12. Urban Area Demand and Roadway Growth Trends

Less Than 10% Faster (13)	10% to 30% Faster (46)	10% to 30% Faster (cont.)	More Than 30% Faster (40)	More Than 30% Faster (cont.)
Anchorage AK	Allentown-Bethlehem PA-NJ	Memphis TN-MS-AR	Akron OH	Minneapolis-St. Paul MN
Boulder CO	Baton Rouge LA	Milwaukee WI	Albany-Schenectady NY	New Haven CT
Dayton OH	Beaumont TX	Nashville-Davidson TN	Albuquerque NM	New York-Newark NY-NJ-CT
Greensboro NC	Boston MA-NH-RI	Oklahoma City OK	Atlanta GA	Omaha NE-IA
Indio-Cath City-P Springs CA	Brownsville TX	Pensacola FL-AL	Austin TX	Orlando FL
Lancaster-Palmdale CA	Buffalo NY	Philadelphia PA-NJ-DE-MD	Bakersfield CA	Oxnard-Ventura CA
Madison WI	Cape Coral FL	Phoenix AZ	Baltimore MD	Providence RI-MA
New Orleans LA	Charleston-N Charleston SC	Portland OR-WA	Birmingham AL	Raleigh-Durham NC
Pittsburgh PA	Charlotte NC-SC	Richmond VA	Boise ID	Riverside-S Bernardino CA
Poughkeepsie-Newburgh NY	Cleveland OH	Rochester NY	Bridgeport-Stamford CT-NY	Sacramento CA
Provo UT	Corpus Christi TX	Salem OR	Chicago IL-IN	San Antonio TX
St. Louis MO-IL	Detroit MI	Salt Lake City UT	Cincinnati OH-KY-IN	San Diego CA
Wichita KS	El Paso TX-NM	San Jose CA	Colorado Springs CO	San Francisco-Oakland CA
	Eugene OR	Seattle WA	Columbia SC	San Juan PR
	Fresno CA	Spokane WA	Columbus OH	Sarasota-Bradenton FL
	Grand Rapids MI	Springfield MA-CT	Dallas-Ft Worth-Arlington TX	Stockton CA
	Honolulu HI	Tampa-St. Petersburg FL	Denver-Aurora CO	Washington DC-VA-MD
	Houston TX	Toledo OH-MI	Hartford CT	
	Indianapolis IN	Tucson AZ	Jacksonville FL	
	Jackson MS	Tulsa OK	Laredo TX	
	Kansas City MO-KS	Virginia Beach VA	Las Vegas NV	
	Knoxville TN	Winston-Salem NC	Little Rock AR	
	Louisville KY-IN	Worcester MA	Los Angeles-L Bch-S Ana CA	
	McAllen TX		Miami FL	