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Metro Measured

Transportation •

Housing •

Regional Growth •

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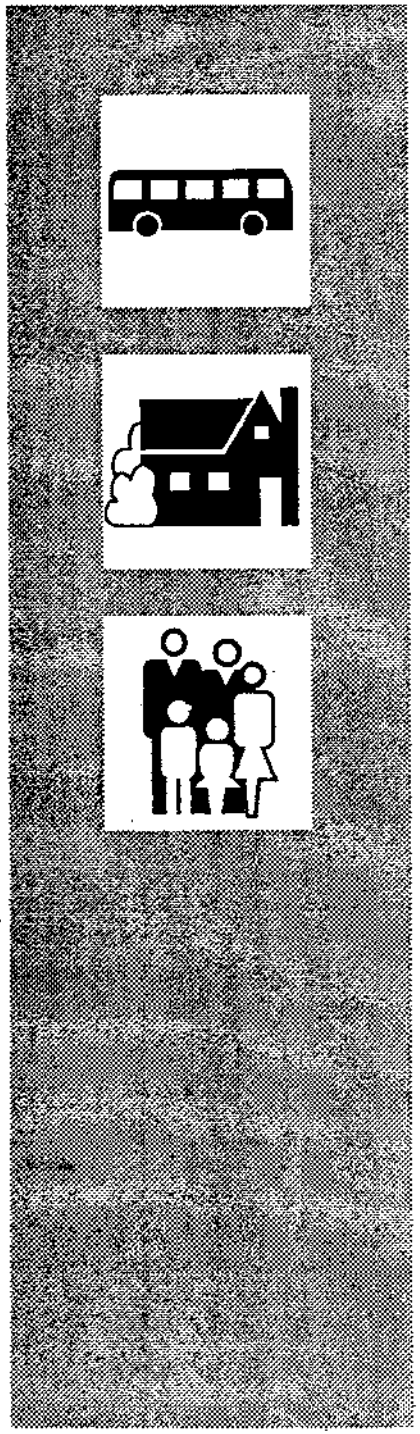

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rithmic scale to minimize the impact of outliers. Figure 10 reinforces the general rule of most transportation investment: if you build it, they will come. As far as transportation level of service goes, once we move beyond 4.5 miles of road per 1,000 population, 90% plus of commuting trips will be by auto.

Figure 11 satisfies our logical expectations. We note from Figure 11 that the more miles of road per 1,000 population, the lower the density. This is consistent with our findings on the relationships between density, VMT, road miles and percent nonauto commuting.

Also significant from Figure 11 is the cost implications for urban growth. Clearly, higher density development requires less input of road miles per unit of population added.

Figures 12, 13 and **14** present miles of road per 1,000 population for freeways, arterials and local roads respectively. In these figures, miles of road are compared to population density.

The figures for arterials and local roads essentially repeat the pattern shown for total road mileage in Figure 11. The data for freeways depicted in Figure 12 display only a very weak relationship between freeway mileage per 1,000 population and density. Los Angeles, Phoenix and Tucson all have about the same freeway mileage per capita, though Los Angeles has almost three times the density.

Despite the large variance of data displayed in Figure 12, there still remains substantial information. We note that only one region (Columbus Ohio) with freeway mileage above .125 miles per 1,000 people has densities exceeding 3,000 people per square mile. Similarly, of the eight regions with densities in excess of 4,000 people per square mile, six have freeway mileage per 1,000 population of less than .1.

Speculative, but nevertheless worthy of consideration, is the observation that the effect of freeway construction on density has not been fully realized. Regions with a relatively large amount of freeway mileage per capita may still be decreasing in density.[7] Unlike arterials and local roads, freeways are not constructed at the time urban development occurs. They are usually built before or after development; consequently, freeways are not linked to urban development in the fairly strict way that arterials and local roads are. Lack of a strict linkage with urban development means that the impact of freeway building is distributed in time with the level of impact variable depending on the degree to which an area is already developed.

Comparison of Figure 12 with Figures 13 and 14 support the above argument. Both arterial and local road per capita mileage is consistently related to regional density. Freeways, on the other hand, display a much more diverse pattern.

We could not depart Figures 12 through 14 without pointing out some apparent disparities between perception and measurement, namely, Los Angeles. When we measure the LA region, we find high densities and low per capita road and freeway mileage and travel times only slightly higher than average. By way of contrast, common perceptions of Los Angeles suggest low density, high per capita road mileage and intolerable congestion. In public discussions we gather the general impression that Los Angeles represents a future to be avoided. By the same token, with respect to density and road per capita mileage it displays an investment pattern we desire to replicate.[8]

To sum up this section, our reported data support the idea that median travel time varies little between regions despite enormous variations in regional population, size, density and transportation investment levels. In contrast, the data demonstrate that regional density, per capita

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7 We do not expect regions with low freeway mileage per capita to necessarily increase density over time since the impacted areas are already developed. For densities to measurably increase would require substantial redevelopment of existing real estate. Consequently, we hypothesize that the impact of freeway building on density is mainly one way. Freeway building will act to decrease regional densities but lack of freeway building will not necessarily increase densities.

8 Looking at Figure 12 can you determine the home state of the losing 1964 presidential candidate? The home state of the winning candidate?