

Commission Briefing Paper 4A-05

Implication of Rural/Urban Development Patterns on Passenger Travel Demand

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Introduction

This paper is part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU. The papers are intended to synthesize the state-of-the-practice consensus on the issues that are relevant to the Commission's charge outlined in Section 1909, and will serve as background material in developing the analyses to be presented in the final report of the Commission.

This paper reviews the prospective distribution of the population throughout the U.S. and seeks to describe, in part, the implications of that expected population distribution for travel demand. It examines broad regions and the metropolitan complexes that are the nation's productivity centers; and, further, examines trends in rural areas, which will be of rising importance.

The past 50 years has seen an unprecedented growth in travel due to several factors, one of which is demographic change. There are a myriad of unforeseeable influences that will shape the future of transportation planning and there are strong indications that the key factors (such as vehicle ownership) that have had a direct relationship on travel demand in the past may be less influential in the future. This paper uses current travel behavior to examine future potential travel demand based on demographic change alone and assumes all other factors are held constant.

Background and Key Findings

How future population is distributed across the national landscape will be critical to transportation demand and the services required to support that demand. Population location will have immense implications for national productivity and societal well-being. Location may be even more important than the size of the future population for future transportation.

America is a unique nation with both a large land area, and a large population; a population that is both technologically advanced and wealthy. No other nation on earth combines these four attributes, although several will approach it over the coming 50 years. These four attributes will define largely how the population will be distributed in the future, as land area remains constant and population, technological advances and wealth continue to grow. These attributes will further define how the nation will serve its people, how it will interact nationally and in the world economy. The defining characteristics are envisioned to be:

- A highly dispersed; high-value, globally-engaged, high-mobility society with sharp growth differences between regions and within metropolitan complexes.

- That long distance travel (e.g. exceeding 100 miles) for both business and personal purposes will grow dramatically.
- Connecting distant workers with jobs as a critical productivity function of transportation.
- Massive metropolitan regions resulting in approximately half the U.S. population living in metropolitan areas of over 5 million.
- Continued “suburbanization” of people and jobs; and declines in the densities at which people live should be expected, leading to a blurring or, in some areas, complete eradication of metropolitan and non-metropolitan boundaries.
- The possibility that community nodes will evolve with a greater emphasis on walking for some local trips. A world dominated by the personal vehicle and walking could evolve.
- The rural population will be more critical to the nation’s economy; and rural development will follow functional lines based on retirees and amenities seeking workers.
- The transportation result will be high frequency trip-making, of increasing lengths to and from increasingly dispersed origins and destinations. Transit-use to the cores of cities could rise, but in an overall trip-making context that will be difficult or impossible for traditional transit or carpooling to serve and in which overall transit and carpooling shares of travel are likely to continue to decline. Greater competition will arise between air and auto travel for intermediate trips between the usual ranges of each, roughly 250 to 500 miles.

Staff Comments

This paper assumes that the future society is an affluent one. The conclusions and policy implications minimally address the implications for this population shift on mobility for the non-affluent. The paper also assumes that the fundamental development pattern will be a “donut metro”. This perspective on urban development patterns is not universal.

National Population Distribution – Now and Future

America faces the prospect of extensive population growth over the next 50 years, estimated to reach 420 million by the most current Census projections. While significant, this growth can be considered relatively limited in contrast to the growth of the last 50 years when the U.S. experienced tremendous population growth. The levels of growth expected, on the order of one percent per year, should be relatively operable, roughly 25 to 30 millions per decade, contrasted to past challenges. Much of that growth will come about by the in-migration of adults of working age rather than births as in the previous half century, with therefore vastly different transportation demand attributes.

Table 1 – Historical and Projected Population Change in the U.S.

	Base Year Population	Population added	% Population Change
1950-2000	150 million	130 million	86%
2000- 2050	280 million	140 million	50%

Source: U.S. Census Bureau

Perhaps more important for transportation than the size of the population, will be where that population locates within urban areas across the nation. This paper seeks to describe, in part, the implications of that expected population distribution. It will examine broad regions and the

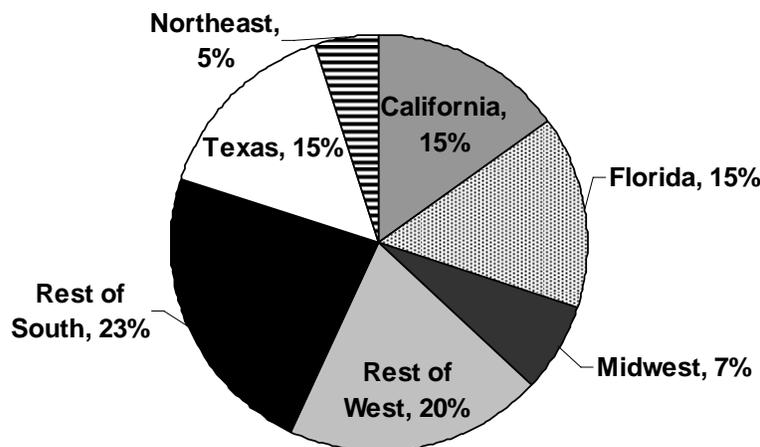
metropolitan complexes that are the nation's productivity centers; and will examine trends in rural areas which will be of rising importance.

Regions and States

The central reality of the Census projections through 2030¹ is that population growth will continue to be sharply skewed geographically with almost half of national growth going to three states: Texas, Florida, and California. In fact, this is somewhat of a decline in share from the eighties, partly as a result of Nevada and Arizona increasingly gaining population from California. This three-state emphasis is a major part of the national trend where the Census projection indicates that the South and West would gain 88 percent of national growth in the period. Again, this represents a small decline in share of growth from the eighties when the South and West garnered in the range of 90 percent of all growth. Figure 1 shows the proportions according to the Census. **Note that Texas, Florida and California each gain a greater share of national population than the Northeast and Midwest combined.** Current Census data support this trend with the fact that so far in this century about half the states have shown slow or stagnant growth.

Thus, the nation could be divided into states and regions with low growth or even population losses and a limited number of states with dramatic growth in the range of double the national rates. Another facet to these population projections is the inferred continuation of the emptying out of the Great Plains – West Texas to Montana – with extremely limited growth or continued population decline over a vast area. At a minimum, such a sharply skewed population distribution will make the defining of an equitable national transportation program difficult to achieve. Despite the population growth anticipated, we will still be a nation with great, relatively empty, distances to traverse.

Figure 1 – Share of Population Changes (2000-2030)



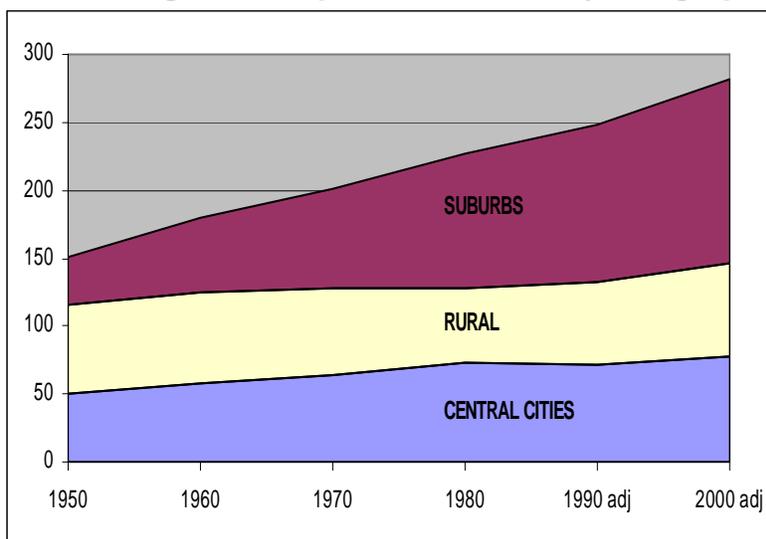
Source: author prepared from Census Interim Projections 2000-2030

Metro-Non-Metro Growth

¹ At this time the Census projections to 2050 do not include geographic detail. It would be expected that they would continue the observed trends out to 2050 if they were produced.

The Bureau of the Census does not provide detailed metropolitan population growth projections, but there is substantial evidence from the last 100 years, and certainly over the last 50, as to the almost inexorable nature of future trends. Figure 2 below shows the fifty year growth trend of central cities and suburbs, which together constitute metropolitan areas, and non-metro areas. Effectively all of the nation's growth has occurred in metropolitan suburbs and the suburbs today represent more than half the national population.

Figure 2 – Long Term Population Trends by Geographic Area



Source: Commuting in America III, NAS, TRB

The nation never has been a city-based population. It shifted from a predominantly rural to a predominantly suburban population midway in the last century. A large part of the “suburban” growth has in fact been rural growth on the fringes of metropolitan areas which become incorporated into the metropolitan area as they reach certain population and commuting thresholds. More than 40 rural counties became metropolitan in the 2000 Census.

At present, the U.S. population can be roughly divided into four main population groups: the first two together comprise all areas over one million, 30 percent in metros over five million in population; 30 percent in metros between five million and one million. Then there is 20 percent in metros under a million; and 20 percent non-metro population. These percentages should hold roughly stable out into the future with significant shifts within the 60 percent over a million group into the 5 million plus category. Some trend information on these groupings follows:

- **Metropolitan Areas of more than a Million Population** – In 1960 America had 34 areas with populations over a million. Even with mergers as areas grew together, there were 50 such areas by 2000, rising to 53 in 2005. It can be estimated that there will be approximately 60 such areas by 2020. At least 60 percent of the nation's population can be expected to be in these areas.
- **Metropolitan Areas of more than Five Million Population** – Among the areas over a million in 1960, only four, New York, Philadelphia, Chicago and Los Angeles, were over 5 million. In 2005, 12 such areas reached that size containing close to one-third of the total U.S. population. By 2020 there could be an additional two or three areas; the candidates

would be Phoenix, and perhaps Seattle or Minneapolis. These great areas will be the economic engines of the nation.

- **Rural Growth, focused on the metropolitan fringes has been substantial** – As a result metro areas grow together (as Washington and Baltimore did in the 90’s) and more square miles of area are incorporated into these metropolitan agglomerations. This will continue for the foreseeable future as general population migration continues from the metropolitan areas to the rural fringes with households in search of residential amenities and affordable housing.
- **The results will be immense megalopolitan areas with spans of a hundred miles** – Importantly these areas will frequently grow together and so the ability to delineate discrete areas will come close to disappearing. We will need to invent new terminologies to describe the resulting population distributions.

About one-third of “metropolitan” growth since 1980 has been in rural counties that are incorporated from the fringe of metropolitan areas.

Central Cities/Suburbs/Rural Areas

The central reality of future metropolitan areas will be the dominance of the suburbs – not merely in population but in jobs and other measures such as retail sales. The “Donut Metro” will result whereas the predominant travel flows will be suburb to suburb. The worker dynamics operating in the new metropolitan complex will be these:

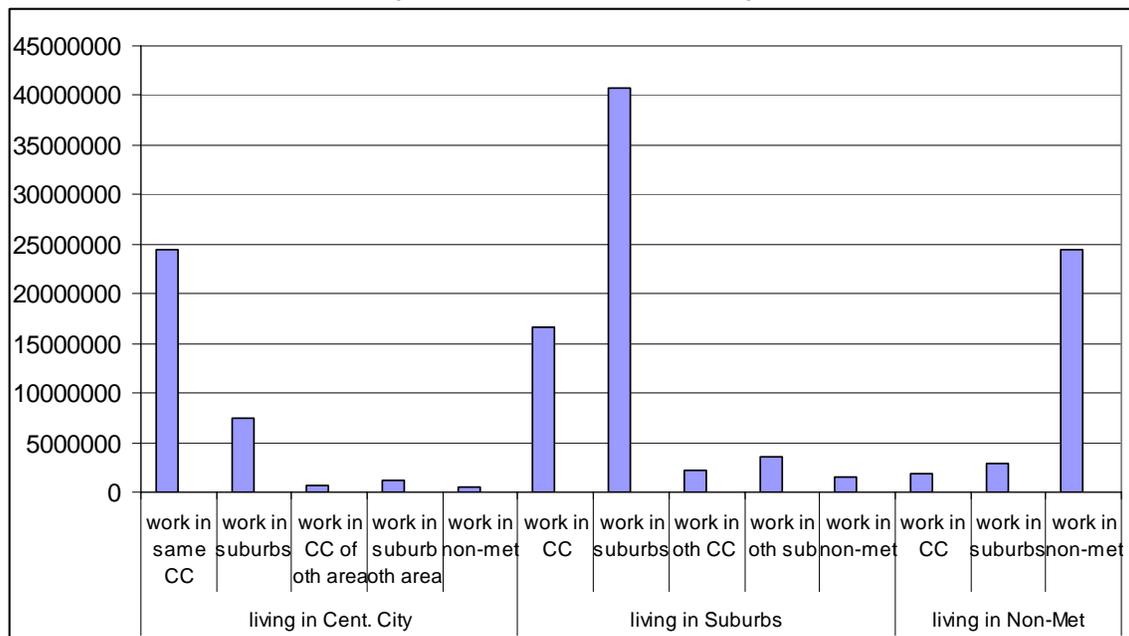
- A sellers market for workers resulting from decline of persons of working age. Employers will go where skilled employees are or want to be. Much of this will center around universities and research centers. This, coupled with more affluent, amenities-seeking workers will abet the shift to the South and West.
- Employers will be more forthcoming in providing flexibility regarding hours and days of work in order to retain/obtain workers.
- Employers will shift to suburbs to be near workers, permitting workers to shift even farther out in search of rural amenities and lower cost housing. The attachment of minorities to the center city will be broken.
- Both center cities and suburbs will move toward balance in jobs and workers (i.e. fewer jobs per worker in cities; more jobs per worker in suburbs) but this will not change the need to commute significantly due to persisting skills mix differences.
- Increases in specialization in the labor force will mean that workers will need to be drawn from larger and larger worker pools over greater distances.
- Multi-worker households, frequent job changes, housing preferences, and the general friction of changes in residence will generate very long work trips.
- The resulting pattern could be summarized as workers able to live where they want and work where they want but where they will have to accept the penalties associated with longer commutes.

Commuting flows already reflect this, as shown in Figure 3, but will increasingly follow this pattern as very different growth rates continue. The increasingly crucial nature of the interaction of rural areas with metropolitan areas and between metropolitan areas is shown in the figure. Note that the

Although the process of getting to and from work everyday would seem rather mundane, experience has shown that the patterns continue to change, challenging both commuters and public policy.

- dominant national work flow pattern is suburb to suburb commuting – increasing in dominance as metropolitan areas increase in scale;
- other major flows are the internal flows within central cities and within non-metro areas – these tend to be among the low growth flows;
- “traditional commute” from suburbs to central city has exhibited limited growth, whereas;
- other rapidly growing flows are from central cities out to jobs in the suburbs, which represented a greater share of growth than the traditional inbound commute in the nineties, and;
- flows from rural areas or from other metro areas into suburbs.

**Figure 3 – Metropolitan Commuting Flows 2000
(in millions of commuters)**



Source: Commuting in America III, NAS, TRB

The extraordinary increases in commuters leaving their residence counties to work will continue to expand with substantial shares of the population crossing both metro and rural areas to reach their job sites. This will not just affect commuting but other travel purposes also. As doctors, restaurants, and recreation activities become more specialized, their market sheds will expand and the average trip lengths to these attractions will increase. Particularly the commuting and other interactions between rural and metropolitan fringe areas will expand in importance.

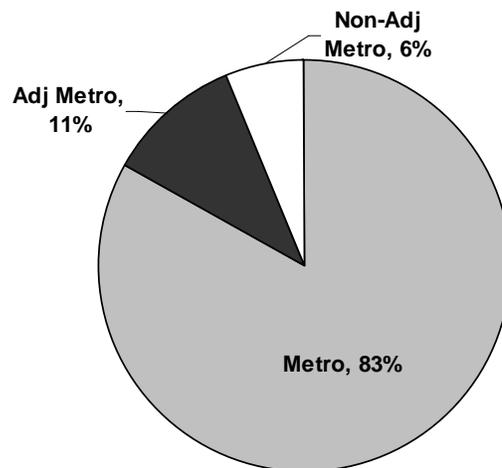
A New View of Rural Areas

The central reality of the retirement of the baby boom population and the consequent lack of working age population will sharply affect the character of rural areas. Part of the reality as discussed above will be the need to provide access for underutilized rural labor forces to reach suburban job opportunities. Additional important changes will be the expansion and success of new retirement-based communities in attractive areas with good weather; and the expansion of amenity-based communities as work sites. As a result, the U.S. rural population, which is

already better connected to the national economy than ever via modern technologies such as the internet, cellular technology and satellites, will be even further integrated into the society. It will be a high mobility rural population with high percentages of income spent on transportation. As noted in the Economic Research Service rural research: “They are now a population group that works in one town, shops in another, and lives in neither!”

The nation’s 3000+ counties are divided roughly equally three ways between counties within metro areas; rural counties adjacent to those areas, and those truly rural counties not adjacent to any metropolitan area. The population distribution in those groups is vastly different. The metropolitan third of counties has around 83 percent of the nation’s population; the adjacent third of counties has on the order of 11 percent of the nation’s population and the truly rural third of counties has the remainder.

Figure 4 – Population Shares of Nation’s Counties (2000)



Source: Economic Research Service; USDA

From a population and transportation standpoint the interest in rural areas is clearly separable into two parts: (1) those rural counties soon-to-be-metropolitan; and (2) the group of counties that are truly rural in nature. The counties on the metropolitan fringes are often the location of rapid growth, housing development, and long commutes. Given the orientation to suburban job opportunities, many of these areas have only a limited connection to the metropolitan center. They will be the sites of much of our future congestion.

The Economic Research Service of the USDA categorizes the 2,300 rural counties in the nation into 12 groupings based on their predominant functions and attributes ranging from resource extraction and farming, to manufacturing and government. Those particularly pertinent to future national development patterns are those classified as retirement counties (190) and recreation counties (327). These interact in some cases with the 269 federal land counties. All three of these county groups enjoyed levels of growth of 20 percent or higher in the nineties, more than double the non-metro average rate and above the average metropolitan growth rate. They grow because of high rates of people moving into these areas rather than high birth rates.

As the first of the baby boomers reach 65 in 2010 and the last of them in 2030 the growth in these areas will be a function of retirees attracted by amenities, trees, water and terrain, and also workers attracted by the job opportunities. Some of these areas have grown to metropolitan status and are no longer considered rural such as Bend, Oregon; Prescott, Arizona; and Coeur d'Alene, Idaho. This trend will be a major factor in national population distribution in the future as more baby boomers reach retirement, adding to national dispersal.

Conclusions and Policy Implications

Many of the transportation implications derivable from the trends described here have already been identified as part of the discussion, but several need further delineation.

- **Community and Neighborhood Design** – There is nothing in the foregoing discussion that indicates that development must take the form of widely dispersed housing. There will be interest in and pressures for more clustered development that create walking opportunities. Given that much work will be addressed by those working at home or working on flexible schedules the opportunities will exist for more responsive patterns of development at the neighborhood level while the entire metropolitan area is more widely dispersed.
- **Transportation and Productivity** – As employers and suppliers reach out farther and farther to obtain the needed skills and supporting goods and services they require the ability to sustain the mobility of people and goods will be crucial to our economic effectiveness. Communities of interaction (based on communication, not proximity) will grow up encompassing the entire nation that will be served by communications advancements but will further the needs for transportation as well.
- **Time and cost of travel** – Affluent societies, such as described here, tend to travel more frequently, at longer distances, and on modes more responsive to their needs for timely, rapid service. The further dispersal of the population described here will add to those demands. Designing for a society with a value of time of \$50 per hour and which spends roughly 20 percent of its income on transportation would be a useful way to examine future needs. The same transportation system next year will be less acceptable to a society whose value of time has increased. The system will be judged more harshly in the future in these terms. Such a society will insist on superior service.
- **Safety** – The safety implications of these changes will be immense. A high mobility society, that is aging and that is increasingly operating over deficient rural roads will be a major national challenge. There are substantial opportunities for changes that can ameliorate these effects – some technological, some in facility design but also in land use arrangements that will welcome more walking in safe surroundings with limited interactions with vehicles.
- **Long Distance Intercity Travel** – Tourism, including both leisure and business travel, has grown dramatically throughout the world and particularly in the U.S., and will play a substantial future role in defining transportation needs. The pace of international markets and the ability of an affluent society with increasing amounts of discretionary time and incomes to travel for leisure suggests continued dramatic growth. The advent of new light, low cost jet aircraft and eventually the Vertical Take-Off and Landing (VTOL) aircraft will

make inroads into the land based auto-oriented travel markets in the less than 300 mile ranges. The American Travel Survey of 1995 indicated that about 25 percent of travel occurred in trips over 100 miles and about half of those trips under 500 miles were in personal vehicles for both work and recreation/leisure activities. It is this market that can be expected to expand dramatically and that will require response.