

## ***A LOOK AT THE FUTURE OF GROUND TRANSPORTATION***

Seattle – Department of Transportation Conference

“Transportation Vision 2050”

1. My assignment today is to look at the future of ground transportation, mainly in the U.S. Given the rapid speed of social change in our world, I will focus upon the period up to about 2020, with a few comments on a the longer period out to 2050. My remarks can be downloaded from my web site at [www.AnthonyDowns.com](http://www.AnthonyDowns.com).
  - A. I am guilty of doing something that futurist Glen Hiemstra said was not true futurist thinking. That is, I am predicting what I believe will actually happen in the future, rather than visualizing what I would like to see happen. Also, what I believe will actually happen looks a lot like the recent past, which he also thought was a bad idea. But I try to be realistic in my thinking, rather than entirely visionary.
- II. ***The first crucial consideration is the likely future growth of U.S. population. The Census Bureau estimates that, from 2000 to 2020, the total population of the U.S. will rise by 48.2 million persons, or by about 12 million every five years. That is a 17.6 percent increase in 20 years. Somehow, U.S. ground transportation systems must expand their capacity to cope with this large increase in persons and households and goods.***
  1. This significant growth will occur mostly in the West and South, and in a small percentage of our metropolitan areas. Average MSA growth will be 1% per year, but many will grow faster because of domestic immigration from other parts of the U.S. From 1990-1998, average net domestic immigration into our largest 22 metro areas was about one tenth of 1% per year. But it was 2.2 % in Phoenix and 1.2% in Atlanta.
  2. From 1980 to 1997, we added more than one car or truck to our nation's vehicle population for every additional person in our human population. That implies that, from 2000 to 2020, there will be 48 to 62 million more vehicles in the U.S. That would be a 24-28 percent rise in vehicles over the current total of 214 million.
  3. Many existing residents facing greater congestion want to “limit future growth.” But these sentiments are delusions. Existing residents in any region cannot stop immigration into it by adopting anti-growth policies. A region's growth rate is determined by such basic traits as its climate, its location in the nation, its topography, its natural resources, its demography, and past investments made in it by governments and businesses. These traits cannot be changed by local or even state-wide policies. ***Our problem is to accommodate growth, not prevent it.***

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\* The views in this article are solely those of the author, and not necessarily those of the Brookings Institution, its Trustees, or its other staff members.

1. Residents of a specific locality can limit future growth within its own boundaries, but that merely moves the region's growth to other localities therein – farther out or in overcrowded city slums. So local anti-sprawl policies make sprawl worse.

- D. ***Over a longer period, future U.S. population growth will be even more enormous. The Census Bureau projects a mid-sized estimate of 393.9 million residents by 2050 – a gain of about 119 million over 2000, or 43.4%.*** Imagine the road traffic if we keep adding more than one vehicle for each added person in our population!
- III. My second key point is that ***the use of privately-owned automotive vehicles will remain the dominant form of ground transportation for at least the near future. Attempts to cope with rising traffic congestion by luring more people to public transit will not work well enough to change this situation.*** During the next 20 years, the automobile will remain a preferred form of movement for most people in spite of congestion. Cars are faster, safer, more comfortable, more flexible in timing and in linking scattered origins and destinations, and often cheaper, even though have large social costs in deaths, injuries, and pollution.
1. Improving the quality, quantity, or service frequency of transit would not attract any notable proportion of auto-driving persons into using transit. Only 3.5 percent of work trips in 1995 were on transit, compared to 90.7 percent in private vehicles. Thus, even if the total percentage of persons commuting by public transit ***tripled***, that would reduce the percentage using automotive vehicles by only 11.6 percent. That reduction would be overcome by sheer population growth.
  2. ***The only way to substantially increase the percentage of trips done on public transit would be to make use of automotive vehicles far less convenient or far more costly.*** But greatly raising gas taxes as in Europe, or escalating license fees, would be strongly opposed by most Americans. So they will not happen. Eventually, rising congestion may require such steps, but probably not by 2020.
  3. Transit proponents complain that automotive vehicles get large public subsidies. But transit now receives over 20 percent of all public transportation spending, but provides under 2 percent of all person trips per year, and only 10 percent in large urban areas. So transit is even more heavily subsidized per trip or per capita than private vehicles.
- IV. My third point concerns traffic congestion. ***Traffic congestion is widely perceived as a worsening problem across the nation, especially in fast-growth suburban areas, and it surely is getting worse. But there is no way to prevent congestion from intensifying. This is a problem without a solution – at least no solution the American people will accept.***
- A. ***In some respects, perception is worse than reality.*** The actual average time spent commuting on each trip has not increased much over the past 12 years, except in a few large metropolitan areas. Average commuting time was 18.2 minutes in 1983, 19.7 in 1990, and 20.7 in 1995 -- a rise of only 2.5 minutes, or 13.7 percent, in 12 years. But average distance rose from 8.5 miles to 10.6 in 1990 and 11.6 in 1995.
1. We hear horrifying estimates of how much time commuters waste in traffic. The Texas Transportation Institute says that Los Angeles area drivers wasted 82 hours per person in 1997 – the most in the nation. Spreading those 82 hours over 240 working days and 2 trips per day amounts to losing 10 1/4 min. each way each day. The ***average loss*** in 68 areas was 4 1/4 min. per trip. A similar analysis of the \$72 billion “excess” cost of

delay in those areas per trip shows it is 21 cents in cash and \$24.56 per hour imputed cost of the 4 1/4 min.

- B. Yet there is no doubt that congestion is impeding movement during much of the day in regions like the San Francisco Bay Area, affecting the efficiency and cost of living there. But there is no feasible cure that the American people will accept.
- C. In my opinion, ***traffic congestion is essentially a balancing mechanism that enables people to pursue certain key objectives besides minimizing commuting or driving time.*** Employers want to (1) have most firms use similar work periods during each day for efficient operation of the economy, which causes rush hours, and (2) operate mainly in low-density workplaces, widely scattered across each metro area.
  - 1. Most households want to (1) have access to a wide range of choices of where to work and live, especially in multi-earner households, (2) combine multiple purposes into individual trips, (3) live in relatively low-density communities, and (4) separate one's own dwelling spatially -- and within public school districts -- from families with lesser incomes and lower social status.
  - 2. ***It is not possible to pursue all of these objectives effectively without generating a lot of traffic congestion, especially during peak travel times.*** Yet most of us will endure a lot of congestion rather than give up any of these objectives. The congestion we encounter is bad enough to make us bitch, but not bad enough to make us change our behavior.
- D. ***Thus, rising traffic congestion is an inescapable part of living in modern metropolitan areas anywhere in the world.*** It is a mark of rising prosperity the world over. ***If congestion gets bad enough, more people will react by relocating their homes or jobs closer to each other, or moving to smaller metropolitan areas.*** To believe that congestion will be remedied by adopting more public transit is a myth.
  - 1. On the other hand, if congestion gridlock gets back enough, that may be the type of crisis that will stimulate change in future urban forms and more substitution of communications for travel. It will take some type of crisis to generate the political will to alter present institutional arrangement, as I will discuss later.
  - 2. Meanwhile, get used to being stuck in traffic. Get a climate-controlled car with a stereo radio, tape deck, player, telephone, fax machine and even a micro-wave oven, and commute each day with someone you really like.
- V. My fourth point concerns changing land-use patterns to improve accessibility and ease of movement. Two basic approaches to changing existing patterns are being promoted as means of reducing infrastructure costs, reducing congestion, and increasing accessibility.
  - A. Before I discuss these two approaches, I want to point out that the Department of Transportation speaker said at the outset of this meeting that the purpose of transportation was enhancing mobility – moving people and goods more rapidly and more safely from one place to another. I believe this definition of purpose is far too narrow.

1. ***Transportation systems are not just mobility devices, but also form the basic skeleton and framework for all land-use activities and settlement patterns.*** Thus, the relationship between land uses and transportation should be a key part of all planning for both elements. I have been trying to get the Department of Transportation to adopt this broader perspective for decades, but without success!
- B. ***The New Urbanists and others claim that adopting pedestrian-friendly and transit-oriented residential development can help remedy regional traffic congestion by causing much higher percentages of future residents to walk or use public transit.***  
I have no quarrel with their pedestrian-friendly design concepts, or grid street patterns. But their predictions of much higher future transit use are not justified.
1. For one thing, ***85 percent of the developed portions of the nation that will exist in 2020 will already be in place as of 2000. Even if radical changes in the form of the to-be-added 15 percent could be achieved – which is not likely – that would not substantially change the patterns already in place today, which will necessarily dominate the overall picture in 2020.*** Even in fast-growing regions, well over half of all settlements in 2020 are already here today.
  2. Picture a metro area initially containing one million residents, 5 percent of whom commute by transit, and growing 1.5 percent per year in population from all sources. Assume ***half of its new residents*** are housed in circular Pedestrian Oriented Developments, each one-half mile in radius, at a density of 10 units per net acre. Further assume that 50 percent of those POD residents commuted by public transit. Then at the end of 10 years, total commuting by public transit would have risen from 5.0 percent of all workers to 8.1 percent. If all the rest commuted by private vehicles, that would leave 91.9 percent still doing so. Even if 100% of circle residents commuted by transit, total transit use would be 11.6%.
  3. Over a longer run, existing settlements comprise a smaller percentage of the total built environment, so more change can be achieved. By 2050, 30% of the population will live in settlements built after 2000; 70% is already here.
- C. ***The second basic approach to changing land-use patterns is using urban growth boundaries to encourage higher-density new development.*** This would presumably make use of public transit more feasible in new-growth areas. It would also reduce the costs of building infrastructures to service large low-density areas, and rely heavily on in-fill development to slow future sprawl. But it has three major problems.
1. First, in this scenario too, 85% of all 2020 settlements already exist now, although present settlements will comprise only 70% or a bit less by 2050.
  2. Second, ***the only rational way to limit outward sprawl is through regional growth boundaries.*** But American political allegiance to the sovereignty of local governments over land use policies is rooted in the desire of the home-owning majority in each suburb to insure that their property values keep rising, or at least do not fall. This

pressures politicians at all levels both to reject regional land-use planning, and to permit exclusionary zoning that hurts renters and the poor. We now have regional planning only as a last resort in a few areas where crises have arisen. Everywhere else low-density zoning and sprawl prevail.

1. *Sentiment regarding some regional arrangements are likely to change over the next two decades and beyond* when the need for area-wide planning becomes more evident to everyone. Traffic gridlock will create pressures for more rational planning.
  3. Third, the concept of limiting outward expansion to some degree requires raising densities in existing built-up areas. Yet *residents of almost every existing neighborhood resist any increases in density*, even near mass transit stations. It seems that Americans are opposed to both sprawl and higher density.
    - a. In the previous model MSA that was growing 1.5 percent per year, the total gain in population over 10 years would be 16 percent. If all that gain settled within the territory of the original urban fringe, which had a density of 2,500 persons per square mile, that density would increase to 3,412 persons per square mile – a rise of 36 percent over the entire urban fringe. If the new settlers were concentrated in only half of the fringe, the density in that half would rise to 4,324 – an increase of 73% to above the central city level. It is hard to believe this would be politically accepted by residents today. Yet intensity of transit use rises sharply only at densities over 10,000 per square mile. Thus, at least some further low-density peripheral expansion is inescapable, and it may include the majority of all growth in most areas.
  - C. In areas where future growth threatens popular environmentally sensitive open spaces, such as the Florida Everglades, politicians are willing to impose regional goals on local government planning. But this is relatively rare because America has so much land available for future urban growth – in spite of alarmist cries from farmland preservationists. So the political will to adopt regional coordination agencies and raise densities in existing areas is extremely weak. Without it, sprawl will rule at least until traffic congestion becomes almost unbearable. That is a ways off.
  4. Over the very long run, it is hard to see how we can cope with projected huge population increases without some type of regional planning of land-uses coordinated with regional ground and air transportation facilities. But it has little support today.
- VI. This brings up the thorny subject of how do we finance the future transportation infrastructures needed to accommodate our population growth. In the recent past, peripheral low-density growth in most metropolitan areas has been accommodated by financing enough new streets and roads to cause moderate increases in traffic congestion. *But the maintenance of previously-existing streets and roads has not been kept up adequately. This arrangement is not indefinitely sustainable, because too many older streets and roads will deteriorate into unusable condition.*
1. Fortunately, we have a relatively rational means of collecting taxes for transportation uses

and of coordinating transport spending among all levels of government – much more rational than our mechanisms for doing land use and housing planning.

- B. But Robert Burchell's projections of the infrastructure costs needed to continue sprawl, in excess of those needed to handle more compact growth, show ***absolutely very large increases*** to finance sprawl. The total "excess" he initially projected was \$250 billion over 25 years, or \$10 billion per year. That seems large, especially to officials in fast-growth states who must come up with the funds. The increases in taxes needed to finance infrastructures for sprawl are politically unacceptable to them.
  - C. On the other hand, in relation to our \$8 trillion gross domestic product, these "excess costs" of sprawl are almost trivial. Beneficiaries of sprawl would probably be willing to pay the extra costs. But our politicians are not willing to adopt such assessments.
  - D. The preceding points imply that ***we cannot accommodate projected future peripheral growth without either (1) under-investing in maintaining existing road systems*** to a dangerous degree, ***(2) failing to service the new growth adequately*** with new streets and roads, ***(3) increasing the densities of new peripheral growth*** to reduce the costs of new roads and other infrastructures, or ***(4) hugely increasing the share of national production we devote to building and maintaining streets and roads***. The first two alternatives – inadequate roads – are in theory unacceptable, leaving only the last two.
    - 1. Hugely increasing resources spent on streets and roads seems unlikely in light of competing budget pressures and the present heavy allocation of public spending to public transit. That leaves increasing density in new-growth areas, which we have seen requires going against the politically-powerful desires of homeowners.
    - 1. ***Thus, we have not faced up to the facts that (1) our present low-density growth patterns require much heavier spending on infrastructure than we are willing to finance, and (2) we are not willing to adopt much higher-density growth because it is opposed by entrenched existing residents. Unless one of these views gives way, we will have low-density growth but with inadequate roads.***
- VII. To a great extent, approaching future ground transportation rationally and efficiently is hampered by our archaic existing institutional structures of two types.
- A. ***Existing means of governance in most metro areas is not capable of managing regional growth so as to create consistently higher densities in new-growth areas.***
    - 1. ***Only some type of regional planning and authority over land-use and transportation actions of local governments could create such a major change in existing development patterns.***
    - 2. Until traffic congestion reaches much worse crisis proportions, politicians are not likely to give up their loyalty to the concept of local autonomy, which guarantees that future policies will not work. Local governments seek to benefit only their own residents by shoving off all costs possible onto others. No one has the well being of the entire region

in mind, so it is not served well at all.

- B. ***The second major institutional road block lies in the regulations that govern public transit.*** Existing authorities bolstered by transit unions want to maintain monopolies of very inefficient large-scale systems that cannot achieve flexible approaches to serving low-density residential areas – the vast majority of all new areas we will build. ***We need to deregulate or even privatize public transit*** and allow small-scale operators that will serve low-density and low-income areas on demand.
1. The construction of the Los Angeles subway is an example of institutional blindness willing to spend billions on an approach guaranteed not to meet the real needs of future growth.
  2. Monopolists like most transit authorities almost always act primarily for their own benefit, rather than for the benefit of their customers. Thus, one study shows that 75% of recent increases in government spending on public transit has gone to higher wages and benefits to the authorities; only 25% improved service.
  3. Imaginative management of public transit funds would encourage bidding for new types of services by private entrepreneurs. But the political power of unions and established institutions makes that unlikely.
  4. There is no need for both the ***funding*** of transportation and its ***production and operation*** to be carried out by the same organizations. Public funds could support privately-run transit systems. We need to break the operational monopolies of large transit authorities and generate a lot more competition.

IX. Are we going to resolve these difficulties in the near future – or at all?

- A. Regarding traffic congestion, ***I do not believe there is any such thing as a “solution” or a “remedy” that will stop congestion from getting worse.*** We can and probably should build more roads to accommodate new growth areas, and better repair the roads we already have. But the desires of the American public for low-density living and private transport and the immense flexibility it provides will not be diverted into a huge shift into mass transit. And all the added public transit we will build will not really reduce traffic congestion much, as our own experience so clearly demonstrates.
- B. Regarding land-use planning to reduce movement needs and emphasize public transit, ***only regional governance arrangements of some type can make a dent in our present infatuation with further outward sprawl – and even that may not work.*** However, anti-sprawl sentiment is rising around the nation, and it may eventually lead to willingness to accept some type of regional planning or coordination of growth closely tied to ground transportation facilities.
3. I realize that my assessment of the future of ground transportation may sound very pessimistic. But ***I have not mentioned one very positive factor. It is the adaptability of our population if given enough freedom from government rules and regulations.*** As

congestion and other undesirable conditions worsen, people and firms will react by moving their homes, their jobs, their firms, and even their regions of residence so as to minimize the worst impacts of those undesirable conditions.

1. That may take a long time, because people moved into congested areas in the first place because those areas were more attractive than elsewhere. But such adjustments will eventually occur.
  2. ***The key goals of public policies should be to remove the political and institutional barriers to this adjustment process that now block it at so many turns.*** These include local zoning barriers to new housing development, unwillingness to consider region-wide planning and decision powers, and the excessive regulation and monopoly powers of public transit. When we break down these obstacles, we will cope much better with the problems I have noted.
- X. That ends my analysis of ground transportation over the next two decades. You may be surprised that I do not forecast more radical technical and other changes in ground transportation. But when I look back 20 years to 1980, I do not see evidence of many radical changes from then until now. Even in the past 50 years, the major transportation changes seems to be the interstate highway system and the rise of air travel, rather than any big technical changes in types of movement on the ground. And ideas like high-speed automated highways being proposed by many futurists frankly strike me as ludicrously costly and ineffective.
- A. My only radical conclusion is that, in spite of all our problems, I optimistically believe the nation will continue to be able to get around on the ground well enough to maintain a rising standard of living. Good luck – and keep moving!