

THE FUTURE OF EUROPEAN CITIES AND THEIR TRANSPORTATION

Zurich – World Urbanization Conference

I. It is a pleasure to be here in Zurich to speak about the future of cities, with emphasis upon European cities, and the evolution of means of transportation within their metropolitan regions. I congratulate the city of Zurich on the 125th anniversary of its outstanding public transit system.

A. Most of the growth of cities throughout the world will occur in developing nations, not in Europe or other developed nations. The world's population is still growing rapidly. In 2003, the United Nations estimated that it was 6.06 billion in 2000, but will be about 8.13 billion in 2030. That is an average world growth of 69 million persons per year.

1. That urban growth from 2000 to 2030 of 2.08 billion, or 73%, will comprise over 100% of the world's total population growth 2000-2030. Rural areas are going to stop growing in the next 23 years. This is a radical change in world history. Rural populations have always out-numbered urban ones, and been the main source of world population growth. Urbanized areas passed rural areas in total population this year. In 2030, rural areas will be 39% of the total vs. 53% in 2000

B. The 25 nations in the European Union combined are still growing in population, but slowly. From 2005 to 2006, all 25 together grew 0.45%. But 83.5% of that was from net immigration. Five of the 25 lost people in spite of immigration – Germany, Poland, Latvia, Hungary, and Estonia. Italy, Lithuania, the Czech Republic, and Slovenia had negative natural increases, but offset that with immigration. Only three – Spain, Ireland, and Cyprus – grew more than one percent in that year. Switzerland grew .60%

1. A major source of immigrants to Europe is Turkey, which in 2006 had a total population of 72 million, about 1/6th of the EU's total. Turkey also had a natural increase in 2005 of over 909,000 – 2.7 times more than all 25 EU nations together

C. In 2006-2007, the 26 largest cities in the EU, counting only residents inside city limits, contained 44.7 million persons, but their metropolitan areas held 92 million. So just over half of their metro area populations were in the suburbs, not the central cities.

1. Overall, 60 % of the European Union lives in urban areas, and just under 85% of the EU's total gross domestic product is created in urban areas.

2. In 2006-2007, there were 68 cities in the European Union containing over 400,000 residents each within the city limits. Their total population was 63.6 million, or 13.8% of the EU's total population of about 461.5 million in 2006. These and Swiss cities are the cities on which I will focus my remaining remarks.

D. The main means of transportation in most European cities consist of private motor vehicles. West European city residents use private vehicles for 51% of travel, walking and cycling for 32%, and transit for 17% – 20% in Switzerland. In contrast, Americans use private vehicles for 88%, walking and cycling for 8%, and transit for only 4%. Of course, these figures vary greatly among individual cities. In Zurich, 60% of commuting by city residents and workers is by public transit. That is a higher fraction using transit than in any

American city – 50% of New York residents use public transit for commuting; nearly one-third of all U.S. transit trips each day are in New York city.

1. The Organization for Economic Cooperation and Development (OECD) published data on the percentage of total passenger miles traveled by rail, buses and coaches, and private cars in 18 nations in the EU in the early 2000s. Overall, 5.4% of the miles traveled were on rails, 95% were on roads, 88.8% in private cars. The average percentage in private cars in all 18 nations was 81.6%.

2. Residents of European nations own 607 motor vehicles of all types per 1000 persons, compared to 829 per 1,000 in the United States. Luxembourg, Italy, and Iceland have the highest ratios in Europe, all over 740. Switzerland is at 680, though only 390 vehicles per 1,000 residents in the city of Zurich. In terms of total kilometers of public roads per 1,000 residents, Europe has 8 and the United States has 22. Ireland, Norway, and Sweden all have 20 km. or more. Although Europe's aging population may use fewer vehicles, rising incomes in Europe will probably generate more vehicle travel, especially among immigrants.

3. Surprisingly, Europeans are adding cars to their existing inventories faster than are Americans. From 1980 to 2000, Americans added 1.2 motor vehicles to the total of cars, trucks, and buses registered for every 1.0 human beings added to the U.S. population. But in Switzerland, from 1990 to 2000, 2.4 motor vehicles, including 1.7 passenger cars, were added to the total registered for every one human being added to the nation's population, and from 2000 to 2005, it was 2.0 motor vehicles and 1.4 cars added for every added person.

a. If this continues, you Swiss will be adding a lot more vehicles to your roads than people to your population, making traffic congestion worse in the future

4. Thus, private cars are the dominant means of transportation throughout Europe. They carry a smaller percentage within large cities where transit is concentrated. Thus, in Zurich itself, cars are less dominant – only 36% of city residents own motor vehicles, vs. 47% in Switzerland as a whole. One reason is that 56% of the cost of public transit is subsidized by the government. Yet it is vital for you to understand how traffic congestion operates on your roads.

II. The future of European cities likely includes relatively slow growth, mostly concentrated in outlying portions of your metropolitan areas. Therefore, how your cities plan their future development patterns will greatly effect what types of transportation issues will arise.

A. In the past two decades, much of the growth in Europe has already occurred in the suburbs. Among the most relevant issues concerning future growth are the following:

1. At what density should future settlements be built? The higher that density, the less land will be absorbed by growth, and the less distance future residents will have to travel. That is one reason why public transit supporters want future growth to occur at high densities. Yet as incomes rise and more households move to the suburbs, many will want more space. That is why sprawl development is likely to continue outside of European cities, as your first speaker predicted. Also, immigrants

tend to have larger households that require more space, and immigrants will form most of Europe's future growth.

2. Should workplaces be concentrated in clusters to make transit more efficient, or scattered to minimize distances between homes and work? If clusters are more desirable, how can they be created without giving economic monopolies upon the people who own land in those clusters?

3. To what extent can the future physical layout of European cities be changed from their present layouts, since their growth is so slow – under ½% per year? Even after 50 years into the future, growth from now until then will comprise less than one-fourth of all structures in each European metropolitan area.

4. Studies of European transportation needs show continuous increases in moving freight by roads, which means more trucks using existing roadways. Yet there will be little expansion of existing road capacity because creating it is very expensive.

a. This will create more pressure to shift freight shipping to waterways and rail. But most European shipping is for short trips not efficient except on roads.

5. An important issue will be: to what extent can future jobs be shifted from separate workplaces to tele-commuting? I believe a greater share of virtual commuting can be achieved. But most work will remain in central locations because collective work has many advantages not present when working alone.

III. A major future transportation issue is traffic congestion on streets, roads, and highways, since private vehicles handle most ground movements in all European nations. Because traffic congestion will continue to be important, I want to discuss some of its little-known aspects. I am basing this analysis on my book *Still Stuck in Traffic*, published in 2004 by the Brookings Institution. You can buy it for under \$20 at Amazon.com!

A. No one likes traffic congestion, so almost all politicians say they will eliminate or at least reduce it. They all assume congestion is caused by wrong transportation policies and so can be corrected by better policies. But this assumption is incorrect.

B. Traffic congestion in large metro areas is an inescapable result of the way modern societies organize their internal activities. All societies want to have all their business and government personnel working during the same hours each day to increase their overall economic efficiency. Those societies also want to have all their school children attend school at the same time so each teacher can handle 20-30 students at once.

1. Those goals – which are vital to overall social efficiency – mean that all those workers and children have to move twice during the same hours each day. No society in the world has enough roads or transit to move all their workers and children simultaneously without overloading their transportation systems. That overloading is what causes traffic congestion during morning and evening rush hours. That is what congestion consists of: waiting to move.

2. This means rush-hour traffic congestion is an inescapable result of efficiently organizing a modern society. Peak hour congestion occurs on both roads

and all transit systems, including off-road rail systems and subways. Congestion is not caused by wrong transportation policies, but by efficient organization of urban economies

a. Furthermore, as developing societies throughout the world get more populous or raise average incomes, such congestion is certain to get worse because more people will use private vehicles or move to suburban locations with densities too low for transit. Even Switzerland has been adding more motor vehicles than human beings through population growth.

b. In America, statistical regressions I conducted with the intensity of traffic congestion in 75 metropolitan areas in 2000 as the dependent variable showed that congestion intensity rises with (1) the absolute population of each metro. area in 2000, (2) its absolute population growth from 1990 to 2000, (3) the total lanes miles of freeways and major arterials in the region, and (4) its urbanized density in persons per square mile.

c. Many studies have shown that the economic productivity of industries varies with (1) the geographic concentration of firms in each industry, (2) the diversity of labor markets in each region, which is influenced by the size of the region, and (3) the absolute size of the firms' labor markets. These findings imply that in general, larger metro areas have higher economic productivity than smaller ones. Since congestion intensity rises with a region's absolute population, and economic productivity does too, that means greater congestion is associated with greater economic productivity. In other words, the more prosperous and efficient a metropolitan area is, the worse its congestion will be. So great congestion implies high productivity.

d. This conclusion is confirmed by the fact that severe economic recessions greatly reduce traffic congestion. But no one wants severe recessions!

e. Yet many erroneous beliefs about traffic congestion are still widespread.

1. One is that time spent in congestion is a total waste and therefore should all be counted as a congestion cost. That is false, because waiting time is the price society pays to organize itself for maximum economic efficiency. Nearly all measures of the congestion costs exaggerate those costs because they do not recognize the benefits of society's efficient organization as offsets to the frustrations of traffic congestion.

2. Another myth is that excess time in congestion creates an economic handicap for each congested region vs. other metro areas in the world. But congestion is even worse in developing nations or other areas that compete with European cities, except in smaller cities, which are in most cases less efficient places to establish businesses.

C. Does this all mean that there is nothing anyone can do to cope with traffic congestion in the future? It does mean that traffic congestion cannot be eliminated, and that

in many places, it is bound to get worse as populations and incomes rise. But in European cities, populations are not growing, so congestion may not get worse.

1. However, some tactics can at least slow down the rate at which congestion gets worse. These include high occupancy toll lanes, metering the entrances to major roadways, charging tolls on motorways that vary with traffic loads, coordinating traffic signals on main roads, quickly removing accidents from traffic lanes, prohibiting free parking by employers, clustering high-density housing near transit stops, and encouraging more people to work at home at least some of the time.

a. Several European cities are considering charging fixed tolls for vehicles entering downtown as London and Singapore have done. However, that tactic only reduces road congestion slightly, and only in small localized areas already heavily served by mass transit, as in London. It does almost nothing to reduce congestion on motorways or outlying roadways. A recent report showed that traffic flows within the London cordoned payment area are today no faster than they were before tolls were charged there.

2. A crucial issue is: does building more public transit—especially rail systems not on roads—help reduce congestion? In America, the answer is NO because continued population growth adds private vehicle traffic faster than new transit systems can remove it. Portland, Oregon, doubled its light rail system in the 1990s, but traffic congestion rose there because added motor vehicles overloaded the road system. In Europe, with much slower population growth, and much of it low-income immigrants, new transit capacity might reduce congestion, but that will be mainly congestion on transit, not on roads. Moreover, adding new off-road transit in European cities is extremely expensive because of high land costs.

3. The net result is that traffic congestion in European cities is likely to remain high or get somewhat worse, especially in cities that are growing. That is not as likely in Zurich because 60% of all commuting is by public transit. If European traffic congestion rises in the future, that will be frustrating to many commuters and transportation officials, but it is not a disaster. After all, traffic congestion occurs because lots of people want to go to the same destinations at the same time, and that is a sign of prosperity and success, not failure. In America, the biggest cities with the most growth and prosperity are also the most congested. Get air-conditioned cars with radios and learn to like it!

IV. A major future issue for transportation developments in European cities will be how to finance improvements in capacity and networks as usage grows greater, even though total populations may not rise much. Vehicle miles driven will continue to rise.

A. Total transportation costs in 1990 as a share of gross domestic product ranged from 3.5% in Poland to 6.5% in Belgium and Denmark, according a paper written for the European Conference of Ministers of Transport. (In the U.S. it is 7.3%.) Another paper written for the same group said median government investments in transportation infrastructure ranged from 1% to 1.25% of GDP over the period from 1980 to 1995.

B. In the past, American and European methods of financing transportation systems and infrastructures have been fundamentally different. America relied primarily upon user charges in the form of gasoline taxes that were specifically dedicated to road and

transit financing. In contrast, European nations have much higher gasoline taxes, but they put the receipts into their general funds and used them for many purposes, rather than earmarking them only for road transportation uses. Both systems have apparently resulted in likely future inability to finance sufficient repairs and construction of new facilities to meet future transport needs.

C. The American approach was successful for a long time, but has recently become quite inadequate for three reasons. One is failure to link gasoline taxes to inflation, so they did not rise over time as much as transport costs. A second was improvements in engine mileage that reduced the amount of fuel – and therefore taxes – required to permit more vehicle miles traveled. The third is refusal by Congress or the President to raise gas taxes because of strong popular resistance by American voters, who also drive

1. As a result, American vehicle miles traveled and highway costs have soared, but gas tax revenues have been stagnant. This pressured state and local governments to raise transportation funds through other means, like sales taxes and bond issues. The result is inadequate funds to sustain our highway, road, and bridge networks.

2. So we have recently begun building more toll roads, financed both by public agencies and private entrepreneurs. Private firms have been paying large sums to state governments in return for building and owning new expressways on which they control the tolls. This gives states large sums to meet current transport needs, but puts future tolls in the hands of private entrepreneurs who will raise them.

D. In Europe, gasoline taxes have been a much more fruitful source of revenues than in the United States, but the money has not all been used for transportation. This has begun to result in shortages of funds for improvements in transportation infra-structures. But European politicians rely on gas taxes for many other public services.

1. American experience is that public acceptance of higher gasoline taxes or other charges for transportation is much greater if citizens know all the funds so collected will be used for transportation. Yet Congress has been unwilling to raise American gasoline taxes enough to meet our own transportation funding needs. High oil prices have worsened our resistance to greater gasoline taxes.

E. Economists have long argued that motorists and truckers should be required to pay tolls for using roads during congested periods, with the tolls varied to limit traffic to levels that can allow swift movement. In America, we have been politically unwilling to put peak-hour tolls on all lanes of existing congested roads. Doing so gives an unfair advantage to wealthier drivers compared to poorer ones, and most voters drive cars.

1. However, when added lanes can be built alongside existing motorways and tolls charged only for using those added lanes, that is acceptable because it does not force poorer drivers off of the still-free lanes – though those lanes are still congested. Such new lanes are called HOT lanes, for High-Occupancy Tolls. This tactic will be increasingly used, but it neither eliminates congestion nor can it be used where there is no room to add more lanes. It may be used in Europe soon.

2. In Europe, a few cities, notably London and some in Sweden, have adopted toll fees for private vehicles entering congested downtown areas. However,

this has worked only in very small portions of the cities concerned, and only when those portions were already heavily served by public transit, as in London, where 85% of all commuters into the tolled zone had traveled by public transit before tolls.

F. In the very long run, it may be possible to charge user fees to every driver based upon exactly where that driver has traveled. That can be calculated by a satellite GPS system built into each vehicle that tracks its movements and links them to varying specific road charges for each individual road in Europe. This can even be done without revealing where each driver has been! It is already being used by some private trucking firms.

1. However, this approach would require European nations to shift to a basic user-charge approach with funds dedicated to transportation purposes, rather than put into general revenues. I think that approach makes the most sense in the long run.

2. If you create a user-based charge to pay for transportation, whatever it is, I urge you to index it to inflation and to allow for improving engine efficiency so as to avoid the loss of effectiveness we have experienced with our gasoline taxes

G. Meanwhile, experience with the deregulation of railroad and road trucking activities in America shows that major improvements in the efficiency of freight movements can be achieved through deregulations that permit changes in existing freight practices.

H. However, it is clear in both America and Europe that major changes in existing means of financing transportation must be developed in order to keep maintaining existing mobility infrastructures and build new ones to meet emerging future mobility needs

V. In the very long run, if global warming from excessive carbon dioxide emissions is truly a serious threat to humanity, we will have to develop some other type of private vehicle engine using a non-polluting source of power. Hydrogen is an example, but science appears a long way from getting the cost of hydrogen-run cars down to an affordable level.

A. The present infra-structure of providing gasoline to fuel cars and trucks is one of the largest commercial networks ever created by human beings. A gigantic set of ships, pipelines, refineries, trucks, and gas stations throughout the world keeps our vehicles running. To replace that vast network with another one is a major social challenge.

B. Yet I do not think it is realistic to believe we can reduce our carbon dioxide emissions from gasoline-driven vehicles enough to stop global warming from getting much worse. Huge increases in polluting private vehicle usage are now emerging in the developing world, where most future global population growth will take place.

C. I am pessimistic about the world's ability to change people's travel behavior away from private vehicles – especially in democracies – fast enough to prevent serious problems arising from global warming caused by carbon-dioxide emissions.

VI. Earlier in 2007, the European Commission published a Green Paper entitled “Towards a New Culture for Urban Mobility” which contained many recommendations about future urban transportation in the European Union. I would like to make some comments on it.

A. A major conclusion of the Green Paper is that “Local authorities cannot face all these issues (of transportation and its related effects) on their own; there is a need for cooperation and coordination at the European level.” This conclusion was reached after the Commission “carried out a broad public consultation in recent months [at] two conferences and four workshops.” That is not very impressive for 25 different nations!

1. The Commission said this conclusion embodied one over-riding idea: “To be effective, urban mobility policies need to be based on an approach which is as integrated as possible.” Such integration should include a unified approach to passenger movement, freight movement, environmental impacts such as pollution, traffic congestion, more use of bio-fuels, noise abatement, creation of urban green zones, economic development, and even land-use planning. Linking all those aspects into a closely integrated system is an enormous challenge which I personally do not believe can be done very effectively anywhere.

B. Reading this document makes me skeptical about the realistic prospects of creating what the Green Paper calls a “fully integrated approach to urban transport” extending from local governments to all of Europe. Such integration raises political issues about which levels of government are to exercise authority over transport decisions.

1. For example, in the United States, control over the location and nature of land uses is almost entirely exercised by local governments; whereas control over transportation networks serving land uses is in the hands of state governments.

a. In most American regions, local governments are highly fragmented into many small communities, each of which wants to control what land uses will be placed within its boundaries. Except in a few regions like Portland, Oregon, there is no single governmental body at the metropolitan area level to pay attention to how land use decisions will affect transportation.

b. Even in the Washington D.C. metropolitan area, where individual counties control land-uses at the county level and may contain over one million residents in a single county, there is little coordination concerning land uses among the many counties in the entire Washington region, which spans parts of two states and the District of Columbia. It is inspiring to call for an integrated approach to transportation. But who is to exercise authority over land uses, which have immense impacts on transportation needs?

1) Bob Cervero’s approach to reducing carbon dioxide emissions requires much more centralized control over land uses – as in Stockholm, Copenhagen, and Curitiba – than exists in most developed nations.

2) In actual practice in any capitalistic system, land-use development decisions are made mainly by individual private entrepreneurs, with local government approval. But local governments often compete to attract new developments for financial reasons, rather than to generate a single comprehensive land-use plan for an entire region.

c. In Europe, many national governments have more influence over urban affairs and land uses than in America. But you have 25 different nations with widely varying economies and cultures. How can a truly integrated European policy for transportation be developed and carried out effectively across such diversity among nations, as well as within each nation?

2. In my view, creating a reasonably integrated approach to transportation within a single metropolitan area is a heroic task. After all, it must take into account not only mobility, but land-use development, economic development, air pollution, other environmental impacts, political realities, competition with other regions, and financial costs. Just getting a coordinated approach to those issues in one metropolitan region within any nation is a huge challenge.

a. Of course, some international transport networks need to be coordinated across national borders. But the major challenge to creating effective systems lies within each large metropolitan area, rather than across all Europe. And the major obstacle to integrated systems is getting the land-use decisions made by local governments connected to those of all the other local governments and to the region's overall mobility systems.

b. Swiss Cantons do not coordinate their land-use planning now, and the role of local referenda in Swiss law-making will make it even harder to do so.

VII. It is time to bring this long analysis to a conclusion. Even though most European cities are not growing rapidly in population, as compared to cities in the developing world, your cities will still face immense challenges in meeting your future transportation needs efficiently.

A. The biggest challenge will be to substitute some other type of engine for our current use of gasoline-powered vehicles for most of our mobility so as to reduce pollution.

B. Long before you face that challenge, you will have to grapple with how to finance future transportation systems and how to integrate local political powers and region-wide transportation needs into effective area-wide systems. We have exactly the same challenges in America. The city of Zurich has done an outstanding job of developing and operating a great public transit system over the past 125 years. You are right in celebrating the importance of this major achievement in your city.

C. I hope Europe and America can work together to develop the most effective means of meeting those challenges in the decades ahead. Thank you.