Testimony On Peak-Hour Traffic Congestion
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My name is Anthony Downs, and I am a Senior Fellow at the Brookings Institution. I am the author of the 1992 book STUCK IN TRAFFIC, which deals with the causes of and possible remedies for peak-hour traffic congestion, and which I am now revising for a second edition. The views I state here are solely my own, and not those of the Brookings Institution, its Trustees, or its other staff members.

My comments will consist of a series of major points, with some supporting discussion of each. These points are focused on a realistic view of the nature of traffic congestion, both present and future, and what actions might be taken to relieve it.

The Positive Social Function of Traffic Congestion

Most people regard peak-hour traffic congestion as an unmitigated evil, but that viewpoint is incorrect. Congestion is a vital de facto device we use to ration the scarce space on our roads during periods when too many people want to use that space at once. In effect, congestion is a balancing mechanism that enables us to pursue many other goals besides rapid movement B goals American society values highly. Those goals include having a wide variety of choices about where to live and where to work, working during similar hours so we can interact with each other efficiently, living in low-density settlement patterns, and enjoying highly flexible means of movement B that is, private vehicles. The only other possible means of rationing highway space when too many people want to use it would be (1) charging high tolls to keep many people off the roads then, which most Americans decisively reject because it would unduly favor the wealthy, or (2) spending enormously more money to build enough roads to handle all peak-hour traffic without delays. But that would require turning metropolitan areas into virtual cement slabs B which would be environmentally undesirable and prohibitively costly. Since we wisely reject those means of allocating road space, we must use delays from overcrowding in order to pursue the other goals we want to achieve. So congestion makes possible large-scale social benefits as well as the costs of delay on which most people focus when they think about it.

Peak-Hour Congestion Is Inevitably Going to Get Worse All Over the World

Because it performs a critical rationing function, traffic congestion is inescapable in large modern and modernizing metropolitan areas all over the world. In fact, it is certain to get worse in almost all of those areas, because populations are growing, and higher fractions of those increased populations will be using private vehicles for movement. So the biggest future ground transportation problem everywhere in the world will be coping with immense increases in the number of vehicles in use. In the United States, since 1980, we have added 1.2 cars, trucks, or buses to our registered vehicle population for every one person added to our human population. (This ratio was 1.49 to 1 in the 1980s, but declined to 1 to 1 in the 1990s.) In addition, we have increased the average number of miles each vehicle is driven each year. Hence total vehicle miles traveled increased by 72 percent from 1980 to 1998; whereas our total population increased by less than 20 percent.

In the 1990s, we added 32 million persons to our human population, and we may do so again in each of the next two decades. Unless American behavior changes radically, that means we will add as many as 64 million more vehicles to our registered vehicle population by 2020. Coping with the added traffic generated by this increase will be the main challenge to our ground transportation policy in the next two decades. Without doubt, traffic congestion will get worse because of these population dynamics.

Peak-Hour Congestion Is Almost Impossible to Eliminate Once It has Appeared

Once peak-hour congestion appears on a major roadway, it cannot be entirely eliminated by expanding the capacity of that road, though its duration can be reduced. That is because of the operation of the Principle of Triple Convergence. If the road=s capacity is expanded, traffic at first moves faster on that road. But soon people realize this, and start altering their behavior. Drivers converge on the expanded road from other routes they have been using to escape congestion, from other times they have been using to avoid it, and even from other modes like buses or trains. Soon the increase in vehicles overloads the expanded road once again until traffic at the peak hour is moving no faster than before. True, the peak period may be shorter and the number of vehicles carried by the road each hour may be larger, since the road=s capacity has been expanded. But traffic during the peak period will move no faster than before the road=s capacity was increased. This means we cannot Abuild our way out of congestion@ by expanding road capacity on crowded expressways or other key routes, once peak-hour congestion has appeared on them.

Another obstacle to Abuilding our way out of congestion@ is that expanded roads may attract more new development along their routes, generating more traffic than before the roads were expanded. This is particularly likely in fast-growing metropolitan areas.

Yet American Society Will Need to Spend Heavily on Road Construction in the Future

Though we cannot build our way out of existing congestion, large future spending on road capacity will certainly be needed for two reasons. The first is to maintain existing

roads and bridges, many of which are in serious need of repairs. Existing roadways are almost certain to carry much more traffic in the future than any new roads built, since the former serve large already-existing population centers; whereas new roads will mainly serve lower-density growth areas. That makes improving existing roads a very high priority goal.

The second reason is to provide mobility for new-growth areas, most of which will be located on the peripheries of existing metropolitan regions. As settlements expand outward, new roads will be necessary to create mobility for their residents. Some advocates of Asmart growth@ argue that most future population increases should be accommodated by raising densities in already-built-up areas, rather than by expanding outward in more Asprawl.@ Some increases in density will probably occur. But residents of most American neighborhoods do not want higher densities and will resist them vehemently, as experience clearly shows. Therefore, the chance that even a majority of future growth will occur through higher densities rather than though more outward development is very small. A lot more roads will be needed to provide mobility for residents of those new outlying areas.

Emphasis on Measuring the Aggregate Costs of Congestion Tend to Exaggerate Its Pain

The Texas Transportation Institute (TTI) has developed useful measures of traffic congestion, and changes in it over time, for a large number of major metropolitan areas. But the way these measures are expressed tends to exaggerate the amount of pain inflicted upon the American driving public. TTI estimates that the greatest annual delay from congestion in 1999 per person occurred in the Los Angeles region and equaled 56 hours; the average annual delay per person for 68 regions was 36 hours. 56 hours is a whole week of 8-hour days, and that certainly seems like a lot of wasted time. But when divided by 240 working days, and then by 2 for two trips per day, the ***average delay per person was 7.0 minutes per one-way commuting trip in the worst case (Los Angeles) and only 4.5 minutes for all 68 regions.*** When viewed this way, the Aexcess@ time spent commuting does not seem so immense, though we all tend to remember the worst delays as being close to the average. This is the price we pay for rationing the scarce space on our roadways during peak hours so we can pursue all those other goals I mentioned at the outset of this testimony.

Americans Strongly Prefer Moving in Private Vehicles to Using Public Transit

Most Americans prefer using private vehicles for mobility instead of public transit because private vehicles have many superior traits. These include greater comfort, more flexibility as to timing, ability to perform several tasks on one trip, greater speed, more privacy, and B if parking is free B possibly lower costs. The average automobile commuting trip in 1990 was about 22 minutes; whereas the average bus commuting trip was 36 minutes and the average rail commuting trip was 45 minutes. Thus, any major shift from private vehicles to transit would increase the average amount of time spent commuting.

The strong preference among Americans for moving in private vehicles is shown by

data from the 1995 Nationwide Personal Transportation Survey. Over 90 percent of all work trips were in private vehicles, vs. 3.7 percent on public transit. (Since a large fraction of all public transit work trips are in New York City, if that city=s trips are removed, only about 2.2 percent of commuters outside New York City use public transit.) Counting all types of trips, 86.1 percent were in private vehicles, and only 1.8 percent on public transit.

Transit advocates have pointed out that transit usage has recently grown faster in percentage terms than miles driven in private vehicles. Therefore, in December 2000, the Surface Transportation Policy Project (STPP) claimed that AGrowth in public transit exceeds growth in driving.@ But transit usage is so tiny compared to driving that even very small percentage gains in highway travel involve vastly larger absolute increases miles traveled than much larger percentage gains in transit travel. In 1999, the year about which STPP said that AGrowth in public transit exceeds growth in driving,@ total transit travel grew by about 1.7 billion passenger miles. But car passenger travel grew at least 51 billion miles, and travel in all small private vehicles (excluding motorcycles and buses) increased at least 80 billion miles. Thus, the annual ***increases*** in highway passenger miles traveled in 1999 exceeded those in transit passenger miles by ratios of either 31 or 48 to 1. That hardly indicates that growth in transit was exceeding growth in driving!

More Spending Is Needed for Public Transit Too B But Much of It Should Be for a Different Kind of Transit

The nation=s public transit systems also need major future investments, but they should aim at making significant changes in the way public transit is provided. Future public transit expansion should focus on smaller-scale, more flexible, and less heavily regulated means of movement that are feasible for serving relatively low-density settlement patterns, which will remain dominant. Improving such forms of public transit will be vital in serving portions of the population unable to drive, especially the rapidly-rising very elderly population. Major spending on fixed-rail systems, including light rail, is not likely to be very efficient at meeting our most pressing public transit needs. Moreover, expanding public transit is also not likely to reduce future traffic congestion much, if any. Some of the regions with very extensive public transit systems also have among the most intensive traffic congestion, including Washington, Boston, St. Louis, and San Francisco.

How Could Future Traffic Congestion Be Reduced?

What devices exist for improving future congestion levels B even though some worsening of congestion probably cannot be prevented? There are no total remedies, and not even many approaches that might slow down increases in future congestion. However, the following tactics seem the most promising:

--- ***Coping with Accidents and Incidents as Causes of Congestion Delays***. Many

experts B including the TTI B believe accidents and incidents are the single most important cause of traffic congestion. Accident rates per 100 million miles driven have been steadily declining, partly because a higher fraction of traffic is occurring on better designed roads, especially interstate highways. But the absolute number of accidents has stabilized because of increased driving. Probably the most effective way of reducing accident-caused congestion on major roadways consists of faster removal of accidents from traffic lanes using roving teams of specialists controlled by traffic management centers. Many states already have created such centers, but their effectiveness could be improved with more sensors and more roving teams of obstacle removing specialists. This requires intensive coordination of police, fire, health-care, towing, and communications agencies in each jurisdiction.

C ***Shifting Some Future Growth to Smaller Regions***. Multiple regressions based on TTI congestion measures show that congestion is most serious in the largest metropolitan areas, and those experiencing absolutely large amounts of population growth. Smaller areas are not as seriously affected by congestion even if they have high percentage growth rates. Hence one long-range offset to congestion would be shifting more population growth to smaller metropolitan areas. True, that is difficult to do through public policies. Most larger areas want to keep on growing, and they have important advantages of scale to attract future development. Yet any individual or organization extremely frustrated by congestion can greatly improve his, her, or its mobility by moving to a much smaller metropolitan area.

C ***Using HOT Lanes to Provide Drivers on Congested Roads with a Fast Choice***. On already-heavily-congested expressways, HOT lanes (High-Occupancy-Toll lanes) can offer a high-speed peak-hour mobility alternative to those drivers willing to pay tolls, without forcing all those not willing to pay tolls to drive at other times. HOT lanes accept both High Occupancy Vehicles (HOVs) and Single Occupancy Vehicles (SOVs) if the latter pay a toll during peak hours. The toll is variable, and it is set high enough to keep traffic on such lanes low enough to permit rapid traffic flow. This arrangement does not eliminate all congestion on such roads, but offers drivers a choice of rapid movement through paying high tolls or congested movement without tolls. Hence HOT lanes are politically superior to putting tolls on all the lanes in the roadway, which eliminates the choice of traveling without tolls on that roadway during peak hours. However, HOT lanes should be created only by adding new lanes to the roadway or converting HOV lanes, not by converting existing non-toll lanes to HOT lane use.

C ***Metering Access to Expressways***. Metering entry-points onto expressways so as to slow entering flows appears to have some potential for increasing the average speed during peak hours, according to experience in Seattle. However, it may shift some previous congestion to lines of people waiting to get onto the expressways through the meters.

C ***Adding Capacity at Specific Bottlenecks***. Where traffic flows suffer from definite bottlenecks, expanding the capacity of those bottlenecks might speed flows over the whole network of which they are a part. However, doing this is often difficult technically, and may be controversial as well. An example of both problems is the major traffic bottleneck created by the San Francisco Bay Bridge.

C ***Moving Home and Job Closer Together***. One tactic an individual can use to cut commuting time is moving either home or job so they are closer together. This can be quite effective for one person, but may be difficult for a household in which more than one person works outside the home. It is also difficult in regions with very high housing costs, such as the San Jose and San Francisco areas.

Get Used to Traffic Congestion

No matter what public policies are adopted in response to future traffic congestion, it is likely to get worse in nearly all parts of the world. So my final advice is: Get accustomed to it. Commute in an air-conditioned car with a stereo radio, a tape deck and CD player, a hands-free telephone, a micro-wave oven, and a fellow passenger whose company you enjoy. Realize that congestion is providing benefits to you by rationing the roads you use and letting you pursue other goals besides rapid movement. In short, learn to treat being stuck in traffic as part of your normal leisure life, because it=s here to stay.

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