

Improving Transportation Requires a New Solution

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A Review of the Major Characteristics of Our Urban Transportation System Quickly Reveals that Historic Trends are Leading Towards Ever-Worsening Traffic Problems and are Likely Difficult to Change.

Most transportation solutions currently gaining traction will do little to solve the most pressing problems. The present focus is on improving existing systems. This article argues for a promising solution involving the introduction of a new transportation system into the present mix.

The problem

Table 1 lists major transportation characteristics and their growth over a 20 year period. The horizontal red line shows the U.S. population growth over that time (about 24%), and the discussion below compares the growth of each characteristic to the population growth, in order to put things in perspective (if nothing changed, these characteristics could all be expected to grow at the same rate as the population has grown).

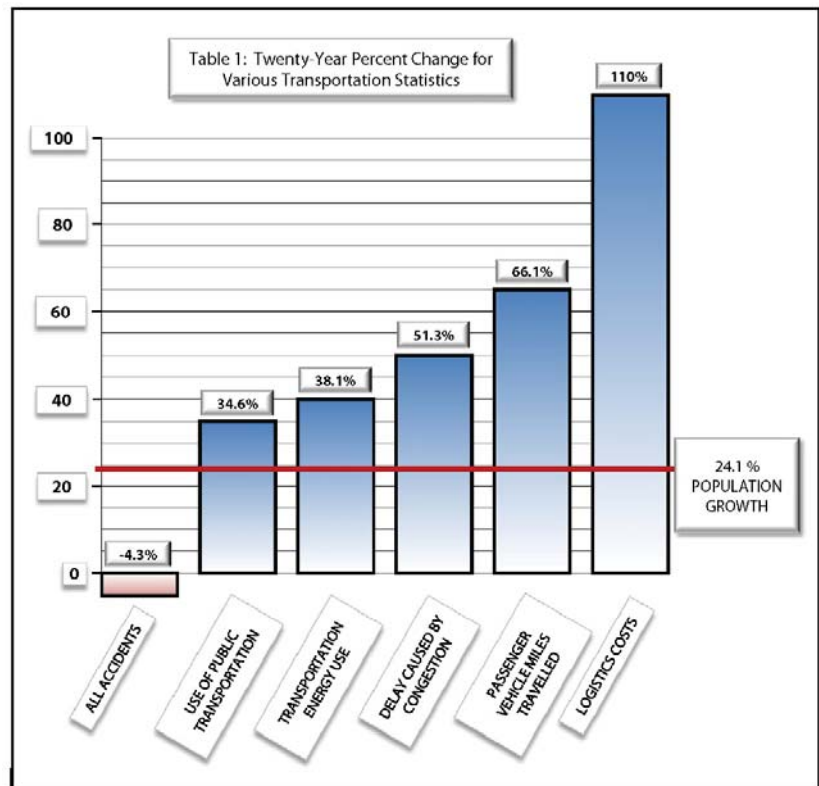
Accidents. The total number of accidents has actually declined. While this is the only factor to decline, and clearly a good thing, it is still not nearly enough. Over 40,000 people are killed on US roads annually (compared with

total U.S. deaths in Vietnam – 58,159; Iraq – 4,334; 9/11 – 2,993).

Use of Public Transportation.

Transit use grew a little more than population but much less than passenger vehicle miles traveled.

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Try as we might, we just cannot convince people to leave their cars for transit.

Subsidized transit systems may be necessary to ensure that the disadvantaged have reasonably priced transportation. However, a sustainable transit system, that can rise to meet changing demand, needs to cover at least its operating expenses from the fare box - something that few U.S. transit systems can accomplish.

Transportation Energy Use. This is growing an alarming 50% faster than the population and a large portion of this energy comes from foreign oil suppliers. 96.6% of all transportation energy use is petroleum-based and any growth at all is problematic. As cheap oil resources are depleted, and as countries such as India and China dramatically increase their oil use, cost of oil is likely to rise steeply and cause serious problems for transportation.

Delays Caused by Congestion. As more and more cities face rush-hour gridlock (and rush-hours get longer and longer), this factor is growing

twice as fast as the population, and congestion now wastes 3.5 billion man-hours every year.

Passenger Vehicle Miles Travelled.

The amount of driving we do is outgrowing the population by almost three times! This high level of passenger vehicle use is widely seen as being unsustainable. The energy used (and the related foreign oil dependence) is seen by many as being the major issue. However, automobile use brings numerous other problems. The real estate used to support automobiles increases the cost of other utilities and decreases the quality of urban living. Furthermore, the cost of highways is increasing as design standards are continually raised in an attempt to reduce accidents. In addition, the tax revenue to support this infrastructure has not kept pace with need, and we are likely to face increased taxes and/or more and more tolled highways. The cost to society of individual automobile ownership is rising as we strive to make cars more sustainable. It's time we took a

long hard look at what automobile ownership really costs.

Logistics Costs. These are the costs of moving goods and they have increased far faster than the population has grown. At this pace, logistics costs are set to have major impacts on our economy.

Greenhouse Gas Emissions. Transportation accounted for 47% of the net increase in total U.S. greenhouse gas emissions since 1990. It currently contributes 34% of all greenhouse gas emissions. Reducing transportation-related greenhouse gases requires reducing the amount of energy used by transportation, as well as changing the primary source of that energy.

A solution

Transit is not the solution. In the U.S., transit uses (wastes) as much energy per passenger mile as the automobile. This is largely because trains and buses run around empty most of the day. Transit infrastructure is expensive to build, consumes much real estate and resources, and its construction contributes significantly to greenhouse gases.

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Americans have a long history of not using transit and this is unlikely to change, unless the characteristics of transit are radically improved.

What if you did not have to wait for transit, you always got a seat, and it took you where you wanted to go without stopping? Would you use it? Amazingly enough, transit that operates this way was invented over fifty years ago. It is called personal rapid transit (PRT) and it can be likened to automated (driverless) taxis operating on a system of guideways. The reasons PRT could help solve our transportation problems are:

1. It has a high level of service (more like a car than a bus) and really can attract drivers from their cars.
2. It uses about a third the energy of most other modes.
3. It is electrically powered so, as we convert the grid to renewable sources of energy, we automatically also convert PRT-based transportation.

4. It has proven to be about a hundred times safer than conventional transportation.

5. Elevated or buried (PRT tunnels are much smaller to move the same number of people) guideways do not use up real estate or cause neighborhood severance.

6. Small vehicle sizes (like a small automobile) require minimal infrastructure.

7. Each automated T-Pod (transportation pod) will be reused fifty or more times a day – an efficient use of manufacturing resources and a reduced need for parking.

8. In off-peak times, unused T-Pods wait in stations or depots – so there is much reduced empty vehicle movement.


Table 2 below shows the author’s opinion of the extent to which various solutions are likely to have a positive impact on the transportation problems mentioned at the beginning of this discussion. 0 = no impact, 1 = some impact, 2 = significant impact. Certainly, some will argue with the ratings, which are based on the author’s opinions and analyses. In addition, PRT has yet to be proven in large applications. The point is that PRT appears to have the potential for quite significant impacts across the board, yet it is receiving attention that is dramatically disproportionate to this potential. 

Table 2. Comparison of Positive Impacts

	High speed Rail	Light & Commuter Rail	Street Cars	Demand Management	Hybrid cars	Electric cars	PRT
Accidents	1	1	0	0	0	0	2
Congestion	0	1	0	1	0	0	2
Energy use	0	0	0	1	1	2	2
Cost	0	0	0	0	0	0	1
GHG	1	1	1	1	1	2	2
Logistics	1	0	0	1	0	0	1
Severance	0	0	0	1	0	0	2
Real estate	0	1	0	0	0	0	2
Walkability	0	1	2	1	0	0	2

UPCOMING CONFERENCES

Podcar City: COP 15

December 2009 • Malmö, Sweden

<http://www.podcar.org/cop15/index.htm>

TRB 89th Annual Meeting

January 2010 • Washington, DC

<http://www.trb.org/AnnualMeeting2010/Public/AnnualMeeting2010.aspx>

ACC/AAAE Symposium

February 2010 • Atlanta, Georgia

<http://events.aaae.org/sites/100201/index.cfm>