

Transportation Pricing and the Economy

A Perspective From the U.S.

By

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Our long-term economic success as a nation is linked to the efficiency of our transportation system and they are mutually at risk. For an entire century the U.S. has developed using essentially the same philosophies. We are dependent upon the automobile for passenger travel and increasingly the truck for freight transportation. Not only has that dependence continued it has grown to the point that highway congestion threatens to drastically affect the national economy. Our ability to change the behavior of the individual transportation customer is severely limited in a free democratic society. We have unsuccessfully attempted to encourage and subsidize mass transit through public policy and all the while more Sport Utility Vehicles, SUV's are purchased and more automobiles are registered and driven further. We have tried to encourage the most efficient movement of freight while experiencing significant growth in highway freight transportation.

Much has been done in the last thirty years to provide alternative modes of transportation in the United States however our transportation capacity remains inexorably tied to the rubber tire vehicle. The reasons are many but the fact is undeniable. Our love for the automobile is philosophical but it also arises from the desire for convenience and the need to accommodate ever more hectic schedules. Concurrently, more freight is being delivered "just in time" by tractor-trailer combinations to assembly lines and retail operations, moving from a "push" to a "pull" model of logistics. While this is occurring little or no new highway capacity is being added.

The transportation system is the evolutionary result of a patchwork of transportation policy decisions over nearly two centuries of economic progress. It is the result of a swirling mix of changing politics, business lobbying, economic decision-making and evolution. The resultant expectation of the citizenry is that transportation, especially highways, should be "free" and that sufficient funds already exist to provide highways, if only the public sector were as efficient as business. We have been lulled into a sense of peace and continued prosperity arising out of the existence of superior highway systems typified by the Interstate Highway System. Concurrently we have been collectively unwilling to address the issue economically or politically.

Through the prism of transportation economics, it is clear that we are fast approaching a crisis that will directly affect our ability to compete in the global marketplace. The ability to move people and goods over great distances quickly, at low cost and in a flexible manner has produced tremendous economic growth in the United States and results from the superior highway system. The transportation system is at risk from the effects of accelerating congestion.

Growing congestion also jeopardizes the safety of the traveling public. Such safety concerns entail great personal and economic costs that must be borne by the public. With more vehicles competing for the same space, accidents become more likely which create delay and the likelihood of further incidents. All of this significantly reduces highway capacity. Taken in combination, the effect is a growing impediment to economic efficiency.

There is little doubt in the academic community that an inherent close relationship between transportation and economic vitality exists. It is fundamental that the movement of people and goods is inherent in a healthy economy. What is not well understood is the definition of this relationship in specificity. At the core of the transportation/economic relationship are the concepts of time utility and place utility, critical to understanding the economic link.

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The economic value of goods and services is derived from time utility. For a good or service to have value, it too must arrive on schedule especially in a “just in time” business model. Consider the consultant who arrives at an important corporate client meeting after the meeting has ended. Consider a bid document that is due at precisely 5:00 PM on a given day. If it arrives at 4:59 PM and has the low bid, it is worth the contract amount but the same document has no value if it arrives at 5:15 PM. Services that require special expertise and must be performed in the presence of the client are especially time sensitive. Even services that do not necessarily require the presence of the customer such as lawn services, pest control, cable TV repair etc. have a time limit before the customer chooses to use another service. Congestion levels in urban areas particularly affect the costs of providing these services. I recall a particularly salient presentation by the CEO of a large pest control company describing his logistics plan and detailing how congestion directly related to the need for more trucks and people to handle the same level of business because of increases in congestion.

These examples demonstrate how critical dispatch and tracking control systems have become in today’s transportation system process. It also provides some enlightenment as to why the Internet thrives in a services based economy such as the U.S. Information and transportation systems have become inextricably linked and interdependent. As a corollary, transportation information has become increasingly valuable and the competition for information can be the deciding factor between surviving and thriving. In those businesses in which transportation is a major component of the cost, information about the instantaneous location of goods in transit, approximate arrival times etc. play an ever increasing role, especially when viewed from the perspective of time utility. The value of a retail product is the sum of the cost of production, transportation and profit. The same equation holds for the value of an hour of service. Transportation is central and can be the determining factor of profitability.

The companion concept to time utility is place utility. The value of a good or service is directly related to its location. An orange in Florida has less value than an identical one located in Saskatchewan, Canada. By transporting oranges from an area with a large supply to one of low supply the value and coincident price increase. Transportation adds value therefore by moving the product from one set of demand and supply market conditions to another. Consider a supply/demand chart for oranges in Florida and one in Saskatchewan. While they would be quite different in terms of price

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derived in the respective locations, transportation provides the means for balancing these charts, one with the other. The cost of transportation cannot exceed the difference in the price structure of the two locations or the goods will not move. Once the demands in Saskatchewan have reached a higher level to justify the cost of transport, the goods will be moved. All of this of course assumes a perfect provision of information by all parties in the transaction.

Place utility likewise impacts the value of a service. Consider a surgeon trained to perform a unique procedure. A patient who requires that procedure to live would place an enormous value on the services of the surgeon. However, if there is no way to transport the surgeon the value of his services is zero to the patient. Telecommunications and the Internet are changing this relationship via very sophisticated remote surgical equipment.

With the relationship established, the question of immediacy arises. How much time will pass before events create a transportation crisis? What if nothing is changed? What are the risks if transportation policy and practice remain unaltered?

The impending crisis is only beginning to become evident, predominantly in urban areas. Congestion rate statistics reveal growing travel times that convert directly to economic inefficiency, reduced safety, damage to the environment and an overall lowering of the quality of life. The 2003 Urban Mobility Study prepared by the Texas Transportation Institute places 2001 delay costs for 75 urban areas only at \$69.5 billion. That is greater than the total highway capital outlay for all levels of government documented in the 2002 Bottom Line Report published by AASHTO. Over the last forty years the U.S. population has grown, urbanized, suburbanized and become more mobile. For a period of time mobility was served by the construction of the Interstate Highway System and the accompanying urban arterial network. Increasingly however the urban, and in some cases rural, arterial capacity is being absorbed by traffic.

Freight traffic has grown tremendously with the concurrent events of NAFTA, “just in time” logistics and the deregulation of trucking. The demand for more flexibility in the delivery of goods and the introduction of “just in time” inventory control, has resulted in rapid growth in rubber tire freight traffic. This heavy vehicle traffic growth added to automobile traffic growth is a recipe for a poor safety environment. Vehicles with vastly different acceleration/deceleration characteristics, residing on the same increasingly congested highway is a fertile environment for reduced safety and higher costs to society overall.

While these are momentous national issues for the U.S., we must view them in a global context. Global economic competition and the global exchange of goods and services is a reality. It is significant that nations, such as China, are showing strong sustained growth in economic power and that other nations are confederating into larger and more efficient economic units, such as the European Union. The competition has recognized the need to improve transportation systems and they have defined the transportation investments necessary to support continued economic growth. To remain competitive the U.S. must renew its vigor to have a well-planned, well-funded and aggressively implemented transportation system.

The subject of transportation policy in America is not simple but it can be made understandable. The U.S. has been the envy of the world in terms of our ability to move people and goods by public highway, air transportation, water transport and rail, whether public or private. However, we have been living off of one of the greatest public works projects in the history of mankind, (the Interstate Highway System) all the while obfuscating this fact with elaborate treatises and political agenda resulting from the short term of election cycles. To develop solutions there must be a definition of the problem and that can only be done by first dissecting the greater transportation question into its component subsystems.

It is not sufficient and many times not helpful to the public agenda to discuss transportation generically. Statements about what we should do to improve transportation too often overlook the various and variable facets of the issue. What may be true in the urban area is not true in the rural

areas of America. What is true for freight movement might not hold for passenger traffic. What is true in one part of the country may not be true in another. Transportation planning must incorporate these facets in the determination of strategies for improvement.

To globally compete in the long term will require a change in the assumptions about transportation and particularly the implementation model. While much can be said for and against methods of planning for transportation systems, it is in the implementation stage that the greatest challenges exist. We must begin to think like a business without the requirement to be one. We must seriously consider private sector models for financing and managing some of our country's greatest assets; it is an acceptable practice to do so for other public infrastructure in the U.S. Government can function using private sector models but the "public trust" must be held paramount. Concurrently, we must not assume that the goal of operating public facilities is the exclusive domain of public agencies. Many organizational models are in action around the world wherein the private sector operates the entity. Such organizations and approaches should be considered complementary to the public process not competitive. As the organizational arrangements are modified public finance and the sources of capital will transform.

Funding of public infrastructure in the U.S. has evolved within the doctrine of equity (fair share) to the detriment of efficiency. A balance must be struck between the two based on market forces rather than political forces. We must realize that current funding methods are inadequate and consider other scenarios based on pricing and demand management that create a potential for balancing equity and efficiency through market driven mechanisms. Finance plans must take into account the time value of money and the loss of buying power as projects are delayed. Further, we must begin to realize that opportunity costs resulting from delay are perhaps the largest economic loss. Finally, the concept of a nexus or linkage between use and cost must exist. It should not be surprising that demand has outstripped the ability of public agencies to provide a public good when the perceived cost is zero. Attempting to fund public infrastructure on a "pay-as-you-go", categorical funding basis further complicates.

Why haven't we recognized the urgency and adopted some of these techniques? First and foremost is the lack of understanding of the critical nature of delaying needed transportation facilities. Second is the confusion resulting from an overly complex funding process devised more for encouraging policy adherence and ensuring equitable allocation by geographical region rather than funding needed transportation infrastructure. Such political processes have tremendous momentum. U.S. transportation policy must focus on maintaining current transportation advantages such as the Interstate system and leverage the transportation corridors to expanded purpose. The networks of rail, highway, pipeline, waterways and air corridors are established and well traveled. Our strategic future use of these assets may well determine our global competitiveness.

Policy is inherently political and a great challenge is the need for political courage. It is extremely difficult for political leaders to take long-term views when election cycles are short term and the outcome could affect a political career. Political courage can come at the price of losing an election. It may be more expedient to satisfy popular opinion irrelevant of factual base. It may be politically convenient to accept recommendations for minor reallocations of funds to satisfy the desires of influential special interests groups or constituencies. These tests of political courage incrementally accumulate and substantial changes in transportation policy are unlikely until it becomes evident that the economic vitality of the U.S. is threatened. When that time arrives however a very long recovery period may be the result.

The question of economic competitiveness and the necessity to take bold action in transportation policy, finance and delivery systems will center on the concept of pricing transportation. Pricing transportation through direct user fees will generate the funding necessary and do so in a way that affects demand for the valuable commodity of transportation.

It is important to note that the discussion thus far has not addressed questions of social justice and ensuring transportation availability. Access to an automobile in most U.S. urban areas is essential. If an automobile is not available, that individual is partially disenfranchised from employment,

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recreation, education and the basic freedoms that comprise quality of life. While inherently relevant to transportation policy discussions, the focus of this article has been economic competitiveness.

The attention of the citizenry and the transportation policy makers alike must be alert to the probability that the future for transportation and the accompanying economic success of America is in jeopardy. Our economic malaise is not the result of the internet bubble, corporate greed or other short term factors alone, it results from a long term transportation generated, economic pathology only now beginning to be felt.