

## **The Interstate Highway System**

### **It's Development, and It's Effects on the American Spatial, Economic and Cultural Landscape**



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**Economic History of the United States 375**

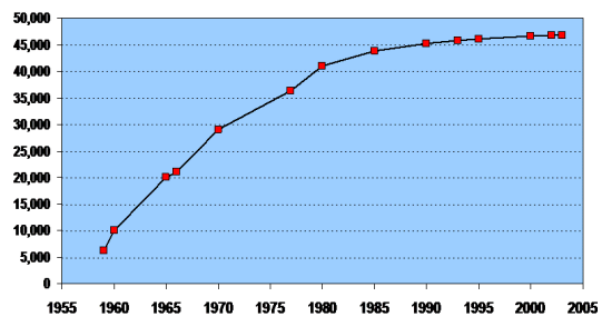
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## *Introduction*

The construction of the Interstate Highway System beginning in the 1950's and ending in the 1970's increased the dominance of the automobile, which contributed to 'urban sprawl', caused the spatial structure of United States metropolitan areas to become horizontally structured, and contributed to the economic, spatial and cultural decline of American urban centers. This restructuring changed the dynamics of both private and mass transportation in the United States. There exist both perceived benefits and inherent problems embedded in this horizontal spatial structuring, including issues of economic mobility and growth, and problems of sustainability, pollution, congestion, and the creation of metropolitan landscapes which lack spatial and cultural harmony.

Following World War II the Eisenhower administration passed through congress an act that was to create the largest public works project in American history. The Interstate Highway Act of 1956 laid out a plan to build over 41,000 miles of limited-access arterial highway across the whole of the United States and through every metropolitan area in the country [see Appendix]. The project, which was 90% federally funded, would begin in 1956 and end in 1972 [see Figure A]. The result is the complete reorganization of the metropolitan areas in the United States. This reorganization and its subsequent effects on the spatial, economic and cultural fabric of the country will be discussed in detail.



**Figure A.**  
The length of the  
Interstate Highway  
System (in miles).

Source:  
Federal Highway  
Administration

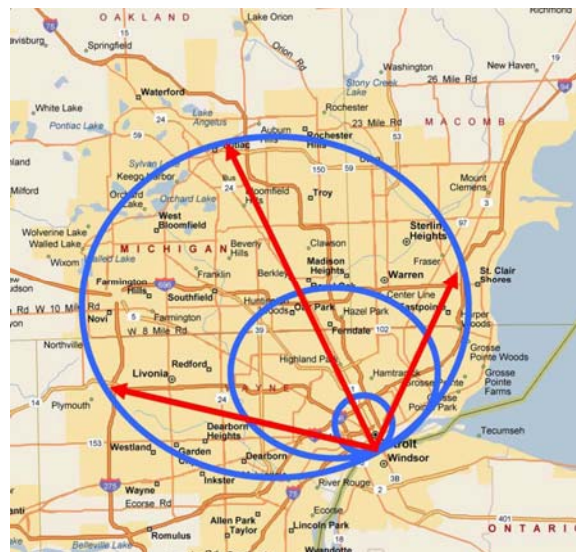
## **How and Why the Interstate Highway System Has Shaped the Contemporary US Metropolitan Landscape**

By the end of the 1970's the Interstate Highway System in the United States was largely complete. The Federal Government had spent in excess of \$300 billion USD (Lewis, pg.26). This system was herald to a massive transformation of the myriad metropolitan areas of the US. Major shifts occurred in the relationship between the traditionally dominant core cities and the surrounding suburban areas that they originally bore: economies began to shift out from the core cities, and population patterns gravitated towards suburban areas. This was accompanied by dramatic changes in the physical landscapes of urban and suburban areas and their relationship to the overall metropolitan economic/physical landscape.

### Changes in the Relationship Between the Core City and Suburban Area

At the outset of the 1950's a rising trend had already emerged in the migration from core city to outlying area. This was because post-World War II land prices outside of the city became incredibly low as developers wished to attract more clients; soldiers returning from the war started families and the trend was to prefer more space to raise those families; and as private automobile use rose, more spatial distance could be covered in a shorter period of time. However, the central city was still the dominant force in the metropolitan fabric. [Gutfreund, pg.51] The central city was a strong and vibrant area, and the area surrounding it was dominantly agrarian and economically secondary. Mass transportation was a vital medium of intra-city transportation. With the implementation of the Interstate Highway System, the next twenty years would see this structure change dramatically.

The Interstate Highway System's design generally dictated a 'carving out' of primary arteries in a 'circum-linear concentration' [see Figure B] into the heart of the various urban cores. This generally divided once cohesive neighborhoods into segregated districts, separated by the impassible highway arteries. Highway arteries were directed towards foci of economic energy and in accordance with existing population density. The result was a core city that was fragmented into pieces, with the highway network concentrating itself as it is directed into the downtown areas and expanding as it is directed outward toward the city limits and beyond [see Figure B].



**Figure B.** The 'circum-linear concentration' of the Detroit Metropolitan highway system. As linear distance increases from the traditional core, concentration of highway arteries decreases.

Created by Andrew Armbruster, 2005

*Why was this structure designed as such?*

The initial reasoning for this type of spatial structure was based on security [Jacobs, pg.77]. The system was designed during the height of the Cold War where nuclear fallout was a very real possibility. Therefore routes were decided upon that could evacuate people from the densest population clusters and most active economic centers to the outlying areas. This had the subsequent effect, of course, of corresponding to a design that would facilitate non-emergency movement of people and freight between population clusters, economic centers, and the outlying areas. There were very little

zoning and land-use restrictions on developments occurring outside of the urbanized area, and prices were low. Once the potential for profit and growth were realized, the use of the IHS made the transition from an emergency evacuation corridor to that of an automobile-based commuter and freight shipment corridor.

### The Physical Landscape: 'Urban Sprawl'

This Interstate Highway System and its corresponding spatial structure have contributed to land-use patterns that need to accommodate the private automobile. Many have argued that this accommodation progressively and inevitably leads to congestion, pollution, economic and physical decentralization and a physical design of the urban environment that lacks character and supports architectural anonymity. These characteristics together compose the term '*Urban Sprawl*'. *Urban Sprawl* has had an enormous effect on the US metropolitan structure.

*Urban sprawl*, catalyzed by the Interstate Highway System, has helped lead to a *disintegration* of the country's core cities, while integrating a larger metropolitan framework. There are several reasons *why* this has occurred. After the highway networks were built people and later jobs followed them out from the core areas to the lesser-developed lands surrounding them. During the 1950's and early 1960's, assisted by the IHS, there was a shifting of the residential population to newly formed suburban developments. This is because the IHS now made transportation much quicker and more efficient for the private automobile. The residential population would then use the highway system to 'commute' (a relatively new term at the time) from the suburb to the urban core where the largest concentration of jobs still existed. However, in time, with loose land-use restrictions and friendly tax incentives in the suburban areas, developers

began to see the profit to-be-gained by developing primary commercial economies in these outlying areas. These developments could not be of the same spatial structure as those in traditional urban areas, however, because the nature of the transportation structure was altogether different. The transportation structure of the outlying areas was defined by the arterial highway and the automobiles that use them. Thus an entirely new form of urban development was composed that fit perfectly the needs of this hybrid spatial structure. This is exemplified by the suburban shopping center, or ‘mall’, which was built along the basis of spatial inversion and represents the epitome of the term ‘urban sprawl’. [see Figure C].



**Figure C.** A typical suburban shopping mall. Note the lack of architectural expression and the abundance of space required for vehicular accommodation.

Once the economies of the metropolitan areas began to shift outward, a trend that gained official momentum in the early 1960's [Hartshorn, pg.172], many effects were subsequent. Jobs began to bloom in the rapidly growing suburban areas and decline in the central cities. The more jobs that were available in the suburban areas, the more the population shifted to fill those jobs, and vice-versa.

The commercial growth that took place occurred almost completely along the corridors of the Interstate Highway System, where private automobile use was most facilitated. The spatial linear economies that developed were completely decentralized and in stark contrast with the traditional ‘downtowns’ of the core urban centers that they

were beginning to replace. They also fit the characteristics of *urban sprawl* because their design dictated a need to support the automobile. No longer restricted (and supported) by the dense urban fabric of the central city, it became necessary for each establishment to provide their own destinations for automobiles. This was because private automobile transportation was the dominant medium of transportation supported by this new urban design. Also, due to the spatially generous areas that each building occupied, there could be no central transportation destination node. This meant much more space would be used per capita than ever before. As the commercial/residential shift grew in proportion, the suburban areas flourished and the urban cores suffered.

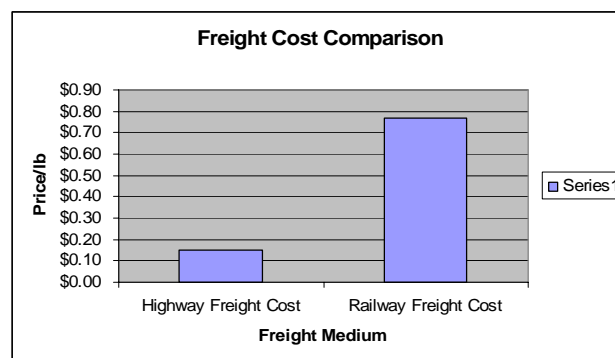
*The Interstate Highway System provided the requisite nutrients to allow the suburban areas to outgrow their core city parents*

By the mid-to-late 1960's the total suburban populations of the metropolitan areas of the United States began to outsize the core cities which first gave them life. This led to a significant strain on the interface between the core city and the suburban area surrounding it. Because the political structure of US localities makes it very difficult to implement a central, regional commission to plan and develop a balanced metropolitan area, local political entities battle fiercely for economic superiority. There is almost no coordination in development patterns. While this was (and is) certainly the case between the various suburban political units, it was (and is) most keenly observed in the relationship between the central city and the suburban area. The more that residents and commerce leave the central city, in general, the more the suburban areas grow. After all, where are most that flee, fleeing to?

Without the Interstate Highway System to enormously facilitate the utilization of the private automobile and facilitate the efficient transportation of large amounts of freight over regional distances, it would not be possible for the outlying areas surrounding the core city to develop urban space in a manner that minimized mass-transportation and maximized the automobile. The full brunt of the blame should also be distributed among lax zoning policies, weak opposition groups, a lack of regional planning, and the automobile industry. However, the Interstate Highway System and its policies allowed those lax zoning policies to be feasible, crushed opposition groups early on under the force of a federally funded super-project, paid no attention to regional planning during the planning phase of the system, and submitted fully and unrestrainedly to the demands of the corporate giants of automobiles.

#### Implications on the Movement of Freight

The Interstate Highway System has provided the American landscape with a highly mobile transportation network for the movement of freight. Movement of freight via trucks using the interstate highway system is markedly less expensive than movement by rail [see Figure D]. This also allows for a decentralized distribution of industrial facilities in order to accommodate the various needs of industrial movement and optimize operations.



*Figure D. Data compiled by Andrew Armbruster from the Policy Options for Intermodal Freight Transportation; Transportation Research Board Special Report 252, Transportation Research Board, National Academy Press, 1998.*

However, several problems exist in the fundamental framework of freight movement via the IHS. One problem is the fact that freight must share the highway with private automobiles. In heavily populated areas, this leads to a great deal more congestion. In fact, according to the Transportation Research Board, each medium sized freight truck can be equivalent to 2.5 passenger cars in their contribution to congestion (Sanderson and Davis, 2002). A second problem is that freight trucks emit heavy amounts of carbon into the air. This problem could be remedied by more advanced fuel-emission standards as time goes by. However the first problem is of a more fundamental nature. A solution would be to designate separate lanes/highways for freight/private automobile transportation. This has been experimented with, although to a limited degree (The I-710 corridor in California has a separate lane for trucks) [Minneapolis Transportation Institute Transportation Corridor Study, pg.42].

Simply in terms of the economic impact of freight movement via the IHS, the system can be said to have been beneficial to industries which utilize vehicular freight transportation mediums. However, as population growth continues and more strain is put on the static capacity of metropolitan highways, this economic benefit will be tempered by lost productivity due to congestion and spent fuel. [see [Figure E](#)]



**Figure E.** Typical congestion resulting from the overuse of the static-capacity IHS.

[www.apa.org](http://www.apa.org)

## Economic and Spatial Impacts of the Interstate Highway System

*To what extent is the IHS an impetus of economic growth and/or decline?*

The implementation of the Interstate Highway System can be argued to have had an enormously beneficial effect on the overall metropolitan economies of the United States. It can also be argued to have caused more harm than good, facilitating the economic and social decline of the country's core cities.

*Economic/Spatial benefits*

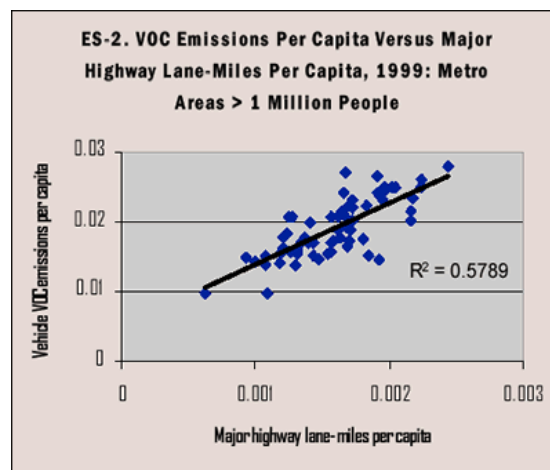
Advocates of the Interstate Highway System have some well-grounded evidence to support the assertion that the system has resulted in greater overall economic growth than had it not been constructed. The real estate and automobile market rank among the largest of consumer spending categories. In many ways these two markets have been prominent fuel for overall economic growth. The construction of the Interstate Highway System also created a metropolitan economy that is extremely mobile. Freight and people can access with ease every part of the metropolitan fabric at their own convenience and under their own jurisdiction. [Hartshorn, pg.170]

*Economic/Spatial harm*

While the above statements are all represented with factual evidence, they can be a bit misleading, especially when considering what the alternatives to this system are, and taking into account the fact that the autonomously-based transit system based on the IHS, in its current design, is not scaleable and has a paradoxical effect as more growth occurs beyond its optimal point of accommodation. A brief summary of an alternative transportation structure will be offered below in order to more clearly see the economic and spatial harm of the IHS.

The polar alternative to a vehicular-dependent transportation system based on a network such as the Interstate Highway System is essentially a system based on a fully-functional, scaleable mass transportation multi-modal network. In this system transportation corridor pathway-freedom is more fixed and based on a model that requires a high level of urban density, highly connected and interdependent spatial economies, and, it follows, a dramatic de-emphasis on the utilization of private modes of vehicular transportation such as the automobile. Mobility would suffer insofar as there would be spatial limitations according to the predetermined transportation network and the mobility of the human foot. However, this would be offset due to the increased spatial density.

Such an alternative system would not suffer from scalability problems, because a mass-transportation network is by its very definition scaleable. Where demand increases/decreases, transit frequency to that area increases/decreases. Therefore congestion would be defeated. Pollution would also be largely defeated because the chief precursor to transportation-based pollution is the automobile, which produces carbon emissions and other volatile organic compounds [see Figure F]. Therefore a sustainable economic environment would be created; one that will not collapse in on itself under too much pressure.



**Figure F.**

Source:  
*“More Highways,  
 More Pollution: Road-  
 building And Air  
 Pollution in America's  
 Cities”, 2004.*

### *The French Transportation Model*

It would be beneficial at this point to delve into the mechanics of a transportation network that is quite different from the US model: France. The French transportation system includes as an important constituent of the system an automobile network comparable to the Interstate Highway System. However, there are fundamental differences in the aggregate network that make the French network a worthwhile comparison.

The French transportation network is supported by a very large, very complex, very fast state-of-the-art high-speed rail network. The vanguard of the train system is the *Train de Grande Vitesse*, or *TGV*. This network links every city centre in the country. The network, privately owned, is subsidized by the French government— however it would remain profitable even without subsidization— such is its popularity among the French. This has produced— or, better, preserved— a highly dense urban spatial network that is regionally planned as opposed to locally planned.

The highway network of France is used for freight and personal vehicles, just as in the US. The difference however is that the network's capacity is carefully monitored in relation to developments that occur. Private automobile use is discouraged in major cities (the city of Paris began a program called "Master Plan Bicycle" in order to discourage private vehicle use); indeed, discouragement comes from largely indirect sources such as the fact that obtaining parking spaces is difficult at best in the dense urban cores. This significantly decreases pollution and the potential for congestion. When an automobile-dependent highway network is tightly controlled as a secondary

system, and mass transportation a primary system, the paradoxical effects of a static network's imbalance can be continuously countered by a network of scaleable systems.

A major reason why the French system has developed as it has (save the long history of European density) is that France's automotive revolution followed that of the United States, and, to be candid, great care has been taken not to reproduce the same inadequacies inherent to the US Interstate Highway-dependent System. [Garvin, pg.417]

[see Figure G]



*Figure G. An urban rail car, typical to French medium-sized cities. This follows a distinctly different transportation model than the United States.*

### *Concluding the economic and spatial impacts of the IHS*

The chief measures of economic stability (as concerns urban systems) are spatial and environmental sustainability. The Interstate Highway System is beneficial from a spatial standpoint only to the point where the static capacity of its network is optimized. In the 1950's-1970's almost no consideration whatever had been given to such an optimization (Lewis, pg.291). Thus what exists today is a poorly planned transportation network that is beyond capacity, producing spatial congestion and environmental pollution (Lewis, pg.293) — these products decrease overall economic vitality and thus are not sustainable if a dynamic metropolitan landscape is to exist in the long term.

### 'Transportation Modes Shape Culture'

A moment should be taken to examine an effect of the Interstate Highway System that transcends spatial/economic concerns and touches upon something that produces affects more intangible: the effect on American culture. Many argue that the IHS has reshaped the way Americans interact with each other and perceive their world.

Before automobiles and before the spatially-eviscerating effects of massive arterial highways, the urbanized United States consisted largely of a network of dense urban cores (not comparable to the density of European cities, but still quite dense compared with contemporary American core cities). This density produced communities in which people needed to interact with other people on a very physical basis. Mass transportation brought people together, and the pedestrian-oriented transportation infrastructure 'forced' people to develop the social skills necessary for living in an urban environment.

Today, this has largely disappeared. Automobiles replace people as objects of interaction. In many 'communities' our external environment allows for human interaction insofar as we walk from the vast suburban parking lots to the 'big-box' stores that they support. In many ways we as a society have forgotten how to feel comfortable in an environment with anonymous human life. Insofar as the depth of this section will allow, the chief cause of this social decline is the automobile and its *disintegration* of the American spatial-architectural-transportation landscape. [see [Figure G](#)]



*Figure G. The anonymous, sprawling landscape of Douglas County, Colorado. The Interstate Highway System facilitates the automobile and thus environments like this to exist.*

### **Conclusion: Aggregate Benefits and Harm of the Interstate Highway System in the United States Upon Its Primary Completion in the 1970's**

The IHS has proved both a blessing and, frankly, a disaster to the United States. When managed properly and efficiently a regional metropolitan network built around interstate highways creates a highly mobile economy and provides the freedom and convenience of personal transportation and the capacity necessary for freight transportation. However, it is almost never managed properly and produces such pejorative effects as congestion due to much too many private automobiles operating within a specific 'trip area'; pollution due to the carbon emissions of automobiles, economic losses due to lost economic productivity (a direct product of congestion) and constant upkeep; and a semi-urban landscape that emphasizes anonymous architectural design and is at best a poor generator of healthy communities.

In short the Interstate Highway System is not in-and-of-itself the progenitor of urban sprawl; but rather urban sprawl was created when we began to exploit the system in order to satisfy mass consumption and various methods of obtaining profit, and because of lax zoning standards and regional control. The method in which the United States has developed the Interstate Highway System is not a sustainable model for the future. If metropolitan harmony is to be restored we must look to the mistakes of the 1950's-1970's and make sure they remain relics of an ignorant era. At the same time, we

must look towards the past and restore the traditionally sustainable transportation modes that we have depleted, thus ensuring an economically and spatially viable future:

*Praeteritus Prologus* (“the past is prologue”).

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