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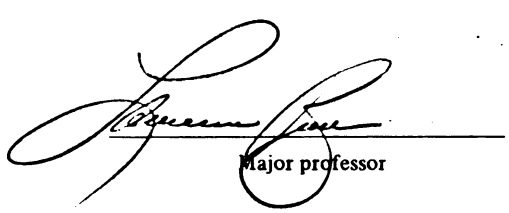

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THE DRIVE TO AN AUTOMOBILE-DEPENDENT SOCIETY

By

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ABSTRACT

THE DRIVE TO AN AUTOMOBILE-DEPENDENT SOCIETY

By

Deborah Ellen Kosina

Despite growing traffic congestion, environmental polution, and national defense concerns, the United States maintains a policy that almost exclusively relies on a dangerous, inefficient and costly system for transportation, the automobile. To understand the automobile's grip upon society involves a study of the key individuals and groups, the historical events, and the government policy(ies) that led to a "car" dependency. Although, the automobile appealed to the American values of greater personal mobility, privacy and status, its increased use was not entirely by free choice. The auto industry and special interest groups influenced policy and manipulated the physical and social environment to eliminate transportation options and promote automobile dependency. Understanding the developments that have led up to the present system of automobile dependency are imperative when planning for the future.

To Marc and John

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INTRODUCTION

Late on a portentous June night in 1896, Henry Ford axed down the brick wall of his backyard shed and unleashed his "quadricycle" on an young and unsuspecting country (Wright 1988:19). Almost 100 years later, Americans, five percent of the world's population, have 33 percent of the world's automobiles and log in 2 trillion miles behind the wheel each year--about as many miles as the rest of the world combined (MacKenzie et al. 1992:vii; Flavin et al. 1989:8).

American society is unique in its automobile orientation. The country's landscape has been carved to the vehicle's specifications and scale and the people have adopted a drive-through approach to living with their restaurants, hotels, movies, banks, liquor stores and churches. The walkable villages and markets found in Europe have been translated by Americans into isolated islands of shopping malls.

However, in a world fraught with crises--energy, environmental, urban and economic, to name only a few--the energy inefficiency and problems of automobile dependency are only too clear. Driving accounts for approximately 25 per cent of U.S. carbon dioxide emissions that, exacerbated by controversial oil drilling, contribute to environmental

destruction (MacKenzie et al. 1992:vii). The growing dependence on imported oil also leaves the U.S. vulnerable to one of the most politically volatile areas in the world and necessitates costly military presence there. More immediate repercussions of automobile dependency are felt on the roads. Automobile use continues to be one of the most dangerous means of travel, causing a death every 11 minutes and an injury every 18 seconds, according to the U.S. National Safety Council (1988). And, ironically, ownership of an automobile no longer guarantees mobility as those who commute through the congested "expressways" of large metropolitan areas will attest. But transforming American society into a less automotive and, therefore, a less consumptive and dangerous society presents a formidable, if not seemingly impossible, task. The automobile and its related industries are embedded in all societal institutions including government, defense, employment, education and the economy.

The automobile has also found its way into the social institution of family and its cycle of life: many of us were conceived in autos, it is the carriage to and from our hospital births, the wheeled davenport upon which we do our courting, it whisks us from our weddings, carts our groceries home, enables us to vacation from Acadia to Yosemite and carries us to our graves.

How is it that such a machine was unquestioningly embraced and literally brought into the American home--by way of attached garages--as an invaluable family member? Were the

paths that led to automobile dependency chosen freely by the American public?

The history of the automobile-dependent society is the history of an evolving, or expanding, system presented in phases in which the activity named predominates: invention, development, innovation, transfer, and growth, competition and consolidation (Hughes 1987:56). This paper will focus on the latter half of these phases (growth, competition and consolidation) and discuss the influences and processes that shaped U.S. society and led to the country's second-rate transportation status (Snell 1973:340).

The discussion will begin with a theoretical background that helps explain the diffusion of new technology in society --in this case, the automobile--and discusses the elements that escalated that diffusion and created a system that perpetuated that technology's greater use. The second chapter will discuss the characteristics of the young, dynamic country and its people that fostered the growth of an automobile-dependent society--that is, why Americans were so receptive to the automobile's qualities. The third chapter will assess the powerful interest groups and the government policy that aided in the proliferation of the automobile and its related industries.

True understanding comes not from observing the current order, but by looking back to see what has led to those developments. If future transportation planning is to be effective and efficient, it is necessary to appreciate the

American propensity for the automobile and the historical processes that amplified these tendencies and eliminated other transportation options. Becoming dependent on automobile use was not a natural process but one that involved manipulation of the physical and social environment. Although technology may have ultimately shaped the landscape and refashioned people's expectations, underlying social forces promoted this dependency. This thesis attempts a discussion of this social orchestration to enable a comprehensive understanding of current U.S. transportation patterns and to discern the obstacles for future policy.

Chapter One

Theoretical Background

In order to understand the phenomenon known as the automobile, one must consider the interest groups and their subsequent social, cultural and economic influences that promoted the auto's dissemination and widespread acceptance in the United States. Within each of these groups, the automobile had taken on certain meanings and had become a part of some goal. In the case of the automobile, industrial companies like General Motors, Ford and Chrysler (the Big Three); unions, highway and construction associations, lobbies, the military, and farmers, to name a few, were all groups that developed interest in the artifact. In fact, any collection of "consumers" or "users" of the automobile, could also be seen as a significant social group. Even anti-automobile groups could be considered relevant because the artifact has taken on meaning even for them (Pinch and Bijker 1987:30-32).

For each of these significant groups the automobile served a function, created a concern and/or held meanings or values--such as profits, defense, employment, political office, or an improved lifestyle that included greater personal mobility. It is also important to understand why each group thought the automobile was a viable answer to a perceived "problem"--regardless of whether the problem was

real or fabricated (Pinch and Bijker 1987:35-39).[1]

In respect to the automobile, most "problems" were in the form of obstacles: the need for more roads which would facilitate a better life away from deteriorating urban centers, permit swift evacuation in national emergencies, and allow access to potential markets; the isolation of rural living; access to energy and competition from alternative transportation.

These groups solved their "problems," or fulfilled their goals by reordering the social and physical world in ways considered useful and desirable (Hughes 1987:53). This involved using whatever means were available and appropriate: marketing a lifestyle that focused on consumerism, playing upon national security fears, emphasizing the automobile as a status symbol, destroying alternative modes of transportation or securing powerful positions in government.

According to a social constructivist approach, the sociocultural and political situation of a social group shapes its norms and values which, in turn, influence the meaning given to the artifact (Pinch and Bijker 1987:46). Keeping within this framework, the automobile was valued because it meant personal mobility and the American Dream of a better life in the open spaces of the suburbs. However, these values and norms created greater physical distance in work and social

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[1]A problem is defined as such only when there is a social group for which it constitutes a "problem" (Pinch and Bijker 1987:30).

relationships that necessitated a growing dependence on the automobile.

We may look at the automobile industries and interest groups as interacting artifacts that engineered the auto-dependent society, or system, we now live in. The components of the system--the inventors, engineers, managers, financiers, workers, lobbyists, sympathetic government officials, construction interests, automobile enthusiasts, road promoters, the tourist industry, car buyers and others--tied their assembled forces *to one another* to build a machine, or system. In this case, that machine was a car-dependent society (Latour 1987:128-9).

This systematic interaction of all the elements--either physical or nonphysical--contributed directly or through other components to the common system goal of continued access to and growing use of the automobile. Within this system, as components were removed and/or its characteristics changed, the other artifacts in the system also altered their characteristics (Hughes 1987:51). For example, the dismantling of mass transit lines led to more cars purchased and more road construction.

Once a system has gathered a mass of technical and organizational components that possesses direction or goals it begins to display a rate of growth suggesting velocity and acquires "momentum" (Hughes 1987:76):

> The system of automobile production created by Henry Ford and his associates provides a classic example of a high-momentum system. Coordinated to ensure smooth

> flow from raw material to finished automobile ready for sale, interconnected production lines, processing plants, raw material producers, transportation and materials-handling networks, research and development facilities, and distributors and dealers made up the Ford system (Hughes 1987:79).

Similar to this "momentum" found in the physical production of the automobile, there was a momentum found in the social production of an automobile-dependent society. This momentum was energized in a variety of ways. Management within the system reinforced its advantageous position by aligning itself with (or supporting) other components (military, politicians, lobbies) that bolstered the structure, or organizational form, and its own management (Hughes 1987:52). The cohesiveness of these newly-formed interacting groups was enhanced by threats from concocted adversaries--such as a national defense argument--and marketing a lifestyle dominated by consumption.

While the automobile industry may not have controlled all activities and resources, it came very near to the ideal of enjoying a completely closed system (Hughes 1987:53). Over time, it increasingly managed to incorporate factors of the environment--government, energy sources, mass transit, patterns of housing construction--into the system, thereby controlling the environment and eliminating sources of uncertainty or competition.

Of course, the goal of the auto industry--like all technological enterprise--was and is to attract consumers and orient them toward a positive consumptive decision. The

ultimate consumers can either be located in the consumption domain (as car owners are) or in some other domain (i.e., car dealerships, automobile production, or road construction) (Cowan 1987:273).

In order to increase the elements involved with the product and, thus, gain wider acceptance, promotion and consumption of the product, others must be enrolled in the construction of what is held as fact--the automobile as a necessity--and their behavior must be controlled in order to make their actions predictable (Latour 1987:108). In American society, this required a reorganization or a redirecting of physical and social structures in order to enmesh more elements into the use of automobiles (Cowen 1987:263).

There were many ways in which the American people were enrolled into the construction and investment of a car-dependent society. But in some instances, little provocation was necessary and the needs of the consumer were "piggybacked" onto the goals of the automakers. This was the case with American farmers whose isolation was alleviated and whose social lives were enhanced by the vehicle. Hence, the farmer willingly enrolled in a system that seemed to further his own interests while, subsequently, promoting the industry's growth (Latour 1987:108-110).[2]

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[2]"Interests" are what lie *in between* actors and their goals, thus creating a tension that will make actors select only what, in their own eyes, helps them reach these goals amongst many possibilities (Latour 1987:108-9).

Enrollment into a automobile society was also increased by marketing strategies that played on people's beliefs and values. Rhetorical approaches, whether planned or not, told people what to believe, how to behave and how to persuade others. Advertising became a powerful persuader that promoted the automobile as a status symbol whether one wanted to be seen as rich and successful or youthful and sporty (Latour 1987:30-44).

Another rhetorical approach was the advantageous placement of pro-automobile and pro-highway people into influential government positions. These alliances allowed for policymaking that advanced the objectives of the automobile industry under the guise of sagacious state decisions. This "argument from authority" was a tactic used to promote the interstate highway system (Latour 1987:30-44).

Another way rhetoric was used to influence the American people was through the seeming "disappearance" of problems because of automobile use. The problem may not have been solved--it needed to only be *seen* as solved by the relevant social groups. For instance, similar to the "safety controversy" surrounding the high-wheeler bicycle in the late 1800s (Pinch and Bijker 1987:44), the automobile--particularly the Corvair and Pinto--was presented as a safe means of transportation and any damaging information was suppressed (Nader 1965; Dowie 1977).

Another tactic was to redefine the key problem. That is, the new problems associated with automobile use were

acceptable since they constituted a solution to quite another problem. For instance, automobiles meant an escape from the unsanitary conditions created by horse "emissions" and increased personal mobility; however, the new problems it created--carbon dioxide emissions, land loss to roads, increasing accidents and traffic jams--were downplayed (Pinch and Bijker 1987:46).

Through this series of translations and transformations, U.S. society has become intensely dependent on an inanimate object that did not exist only a century ago (Latour 1987:128). This explosion of growth was driven by relatively stable directing *social interests* (Law 1987:113) that tied together more and more elements coming from less and less expected resources (Latour 1987:162). The automobile industry enrolled allies from such unexpected sources as the Department of Defense, construction associations, the Board of Education, farmers, and suburban residents (Latour 1987:121).

But along with this concerted effort to enroll, organize and systematize an automobile-dependent society, the adoption of the motor vehicle in the U.S. was advanced by another factor. Just as timing is important in the functioning of the automobile's engine, so it was important to American society's receptiveness to the automobile. These intricately-woven and systematic interactions developed when American society was most malleable and its people most receptive. With guile and the proper individuals steering through historical events, it was possible to enlist an entire nation into expanding

automobile use until the artifact became indispensable in American society. Before long, it was the automobile owners who were doing the moving, the begging, the compromising and the negotiating. At first seduced by the perceived freedom and advantages the automobile seemed to offer, they then became enslaved by it. Whatever they did, wherever they went, they had to utilize, subsidize and advance the interests of the automobile manufacturers (Latour 1987:120).

Oftentimes, it is these social, cultural and political influences that are overlooked when considering the growth of both science and technology and planning for the future, as Latour (1987:156) observes:

> If you get inside a laboratory, you see no public relations, no politics, no ethical problems, no class struggle, no lawyers; you see science isolated from society. But this isolation exists only so far as other scientists are constantly busy recruiting investors, interesting and convincing people.

So, too, is this analogous of the beloved automobile. Inching along at rush hour, we do not see the social, business and political factors that were able to shape, influence, direct or slow our path down the hot asphalt. We do not see the calculated destruction of mass transit, the obstruction of safety legislation nor do we see any option for energy efficient alternatives. What we do see is the plush interior of our status symbol and the need for more roads.

Chapter Two

Socialization into a Car Culture: The Perfect Time and Place

The Mass Market Appeal

After a couple of false starts, Ford founded the present Ford Motor Company in 1903 with the backing of 12 investors. Unlike the carriage industry and the motor cars in Europe and New England which were being hand-built one at a time, Ford began to perfect a manufacturing foundation laid by Ransom E. Olds to mass produce cars. On October 1, 1908, Ford introduced the Model T, a car that was both cheap and reliable (Wright 1988:15-21). Ford offered very little in the way of custom design to his customers, but he could sell millions of his black $500 cars because his innovative assembly line had reduced the costs.[3] This manufacturing technique was important for two reasons. First, its low production costs allowed the automobile to be accessible to the majority of Americans and, by the early 1920s, the widespread acceptance of the installment plan made automobile purchases even more popular (Berger 1979:44).[4]

The second reason assembly-line production was so

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[3]The Model T received only minor changes during its 19-year production. When production ended in 1927, more than 15 million had been built and, in some years, it accounted for more than half the cars sold in the U.S. costing as low as $265 in the mid-1920s (Wright 1988:21-39).

[4] By 1925, almost three-quarters of all automobiles sold were sold on credit. This trend still holds true today (Wright 1988:39).

successful was its timing with mass immigration. The simplicity of mass production was employment particularly suited for the unskilled workers with little language skills who were pouring into the country. It was a place anyone could get a job and eventually buy into the new-fangled American Dream.

The mass-produced automobile had some obvious advantages. The automobile had an indefinite range of travel and storage space compared to both the horse and the bicycle. It offered affordable travel without the constraints of public transportation, provided privacy and a means of status. Fortunately for automobile manufacturers, the inexpensive vehicle inundated a young country that was in the throes of development and was highly susceptible to influences on patterns of lifestyle and settlement.

General Motors, under William Durant, quickly took over the leadership in car sales by combining Ford's assembly line innovations with unsurpassed marketing skills that included the yearly model change. Henry Ford had not developed the automatic transmission because he didn't think it was necessary; G.M., on the other hand, included it in a plan to make the car more marketable and more convenient.[5] The objective was to standardize and simplify the vehicle in order

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[5]Henry Ford's "give them any color that they want as long as it's black" philosophy so pervaded Ford Motor Company and became a part of its (corporate) culture, that, even today, the firm is slow to respond to demands in the marketplace, and has maintained a consistent second place among domestic auto makers (Bennis, Benne and Chin 1985:165).

to reach the lowest common denominator of driving ability and increase the market for cars. G.M. planners managed to put driving across as a privilege, a luxury and something to which to aspire. Their advertisements sought to set the car's function aside from the glory of the machine itself, to make driving seem like a less technical matter (Lord 1976:31).

But there was more than automobiles rolling off the assembly line. With those vehicles came the beginnings of a new culture. Robert and Helen Lynd's sociological study, *Middletown--A Study in American Culture,* found that automobile ownership in one mid-sized Midwestern city was approximately 2 cars for each 3 families by 1923 (Smith & Black 1986:183). By 1930, 26 million automobiles were registered in the U.S. No longer an object of curiosity nor considered a "plaything of the rich," the motor car had become an integral part of the daily lives of most American families (Davies 1975:8).

In fact, automobile usage was further encouraged by early automobile proponents who were making extraordinary claims about the benefits of the automobile and the social ills it would alleviate. Cars were welcomed as a panacea that would reduce the serious congestion problems caused by horse-drawn carriages and street cars. Motor vehicles were expected to help with the vast quantities of manure that was making city streets unpleasant as well as causing health problems (Brown et al. 1979:65). By 1910, American planners were heralding the "salvation" of the city, and predicting that passenger cars would soon render urban congestion a thing of the past

(Brown et al. 1979:8).

In a 1923 issue of *Motor*, Irvin Cobb proposed an outlandish idea that World War I might have been avoided if all of Europe had an abundance of inexpensive automobiles. He reasoned that the malevolence between peoples would disappear if common men could drive around and see that those of foreign lands were essentially good, peace-loving people like themselves. Cobb's universal solution for peace: "Give to every people of every land better roads and more automobiles and we shall do away with most of the ill-will that exists among human beings" (Smith & Black 1986:179).

Appealing to the American Spirit

The key players in the automobile industry filled a void in a young country without its own folk heroes and royalty. Henry Ford, in particular, came as close to the perfect icon as anyone could get. Here was a man who had an idea, pursued it and played by his own rules. He represented all that Americans held dear: individualism, innovation and the unlimited power of the creative mind and technology. Here was a man of humble beginnings who, through his own drive, now socialized with presidents and influenced the lives of others. He epitomized the American spirit and the opportunities to be had in the developing nation.

So, too, the automobile was attractive to the American people because it offered mobility to a country built by migratory people; they were restless by their very nature.

Unhappy with their homeland, these people (or their ancestors) had chosen not to stay but to *move* on, always looking for a better or less populated place. This passion for movement continues to be a big part of the fiercely-protected American lifestyle. Automobiles catered to those values placed on freedom and mobility along with the American fascination for power and technology. When it came to the area of personal mobility, many Americans held a faith bordering on religious conviction in technology and industrial solutions and saw hyper-mobility as an American birthright (MacKenzie et al. 1992:1; Lord 1976:18).

And the automobile reflected what the American people thought about themselves. The overseas victories of World War II seemed to reinforced the notions of Manifest Destiny and unlimited growth. The automobile industry capitalized on this triumphant, if not self-righteous, attitude and, consequently, cars got bigger, more luxurious and more powerful:

> After the War, with G.M. in charge and the spirit of technological conquest in the air, the V-8 became a symbol of power for the industry. A V-8 was less economical than a 6 (even though some advertisements claimed the reverse) but it was more powerful and it was destined to become the standard of the industry. The V-8 cost more and thus produced more profit for the automaker. It was the highest state of the art in a country that valued progress, and the V-8 emblem became an important symbol of power and prestige, attaching itself to hoods, fenders, and horn buttons. In post-War car ads the V-8 emblem replaced the "buy war bonds" slogan. Could it be that V-8 was a subliminal reminder of the "V" for victory sign? (Lord 1976:29).

Critics labeled Detroit's products "insolent chariots," but the American public had come to love what vehicles symbolized. In 1949, the auto industry enrolled more than 4.8

million new car owners and finally topped the old record set before the stock market crashed in 1929 by almost a million units sold (Wright 1988:65).

By 1955, horsepower was regarded as a sure bet for market percentage points. Acceleration was the newest fad, somehow the only measurement that seemed to mean anything to the public. The bigger engines were necessary to power the accessory-laden, ever longer-lower-wider-heavier-new cars that America wanted so badly (Jerome 1972:29). The automakers were more than happy to accommodate the American drivers penchant for heavy, gas-guzzling autos because, as Henry Ford II put it: "Minicars make miniprofits" (Commoner 1971).[6]

Profits were anything but small during the 1950s--a decade that consumption became a sacrosanct area of American life and allowed one to experience power and control (Sobel 1981). The marketing of a consumptive American Dream was essential to the country's economic well-being after the surge in technological production during WWII. With an expanded industrial capacity, American industrialists needed to keep factories full of workers and stores full of buyers. This "consumption junction" created the reorganization of such social structures as family, work and settlement patterns to accommodate technological production (Cowan 1987:263). The American Dream became the life in the suburbs. Because the

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[6]Ironically, two decades earlier Hitler had the foresight and wisdom to value the small car and ordered Ferdinand Porsche to design a "people's car" or "Volkswagen" (Wright 1988:45).

isolated nuclear family lifestyle provided the maximum consumption unit, romance, marriage and monogamy were celebrated like never before. The father's role became the sole provider while the family's job was to consume. Advertising, for the first time, played a critical role in motivating those consumers in what they bought and how they lived (Lord 1976:78).

The Auto as a Status Symbol

By the end of the 1920s, just about every family had a car. There were literally hundreds of nameplates to choose from, but they all functioned in more or less the same way. Now automakers found themselves in a quandary--how to sell cars to buyers who already owned one. The answer existed in advertising and marketing.

While the first phase of automobile manufacturing belonged to Henry Ford with his assembly line, replaceable parts, and rock-bottom prices that enabled everyone to have a Model T, the second phase belonged entirely to General Motors. GM became the experts in marketing and advertising to enroll the entire range of the diversified automobile market (Jerome 1972:28). GM product strategy emphasized "a car for every purse and purpose" (Leone 1986:98).

Now that people had come to accept that they couldn't live without a car, it was time for them to accept the idea that they couldn't live without the latest model. General Motors even tagged a name on it: "dynamic obsolescence"

(Wright 1988:62). GM's stylist Harley Earl claimed that changing models annually would increase the demand for new cars and, consequently, fuel the economy. In practice, however, it became the abandonment of quality for novelty and succeeded in eliminating the smaller companies who found it increasingly difficult to meet the expense of annual model changeovers (Jerome 1972:55).

This was no longer a world where Henry Ford's "give them any color as long as it's black" marketing philosophy could succeed. The automobile had a hold on people's emotions. All the clinging Calvinist sensibilities of practicality, economy, and simplicity were discarded. This was the "Age of Accessories." Americans wanted more and they got it; even a car's weight was trumpeted as a virtue. Detroit found customers wanting "custom-like cars that would give them an illusion of having one-of-a-kind" (Jerome 1972:25-65).

An example of one of the most curious and impractical styling fads in history is the tailfin. Inspired by the romance and style of the ace fighter pilots and by the technological look of the P-38, a twin fuselage WWII fighter plane, the fins had absolutely no function whatsoever but to sell cars:

> Tailfins were first introduced in 1948 on the Cadillac V-8, a car that offered a subliminal styling connection to the glory of the Air Force ace. Driving a V-8 convertible (with automatic transmission) with the top down, his long scarf trailing in the wind, the pilot-consumer could capture or recapture the exhilarating feeling of flight and conquest. His radio left an audio trail behind him like the exhaust trail left in the sky by a jet fighter plane. This was one

> of the memorable themes portrayed by ads in wartime issues of Life magazine (Lord 1976:25).

The automobile was no longer seen only as a means of reasonable transportation. The emphasis on style and option further underscored the idea that what was really being sold was a dream, a part of the socially-constructed imagery and symbolism that affected American daily life. The make, model, and style of an automobile served as an expression of its owner's status as well as a reflection of his value system (Davies 1975:8). The automobile became a visual and an abbreviated definition of who the owner was in society. A century earlier, Karl Marx had speculated that who we were was what we did at our work; now, in the U.S., who we were was what we drove.

Next to buying a house, buying an automobile is the largest investment many people make in their lives. But while stiff housing costs and restrictions may prohibit upward residential mobility among some socioeconomic groups, low interest rates and plentiful car loans allow many different groups to share the status of luxury cars. Thus, the car, a mobile status symbol, sometimes becomes more important than the home. "People will buy above their economic status," automotive consultant Thomas O'Grady has observed, "like 'dressing for success' in a car" (Weiss 1988:134-135).

The Cadillac is one car that has been seen consistently as an ostentatious symbol of success. Called "the essence of all that is avaricious and trivial in our middle-class

lifestyle" (Jerome 1972:27), it has always been less susceptible to sales fluctuations and gas shortages because its owners usually aren't individuals who rely on cost-of-living pay raises (Lord 1976:86).

Nonetheless, the Great Depression proved too trenchant even for the hardy Cadillac and GM seriously considered dropping the model. However, Nicholas Dreystadt, a Cadillac service manager at the time, noticed that the car was very popular with middle-class blacks, despite Cadillac's policy of not selling to blacks. Dreystadt pointed out that wealthy blacks had adopted Cadillac as a status symbol since they had limited access to high-status housing and other signs of success. He also pointed out that blacks paid a premium to white buyers to front for them. Demand like this should be exploited, he said, and the committee gave Dreystadt 18 months to develop the black market. By the end of 1934, Cadillac sales were moving up and the division was making money (Wright 1988:55).

Today, automobiles continue to be an American status symbol. As the more than 752 different models of cars and trucks sold in the U.S. become increasingly similar under the hood, such issues as fuel economy, safety, reliability, and manufacturing quality are rapidly becoming "non-issues" (Naisbitt 1982:260). In the future, personality and image, more than anything else, will sell cars and trucks, according to one senior GM executive (Morris 1990:69). Even with today's small economy models, the single central goal is still

the appearance of luxury. Extremely expensive cars continue to serve as models and the features that make them exclusive are carefully scrutinized for possible adaptation (Jerome 1972:27).

Even during the 1970s gas shortages, Americans were reluctant to resort to more energy efficient models. Consumers were unsure that everyone would make similar efforts to conserve and they feared the loss of status involved with driving a smaller car and doing without the energy-driven accouterments of the middle-class lifestyle (Cunningham and Lopreato 1977:26).

Yet a status assigned to a particular model can be fleeting. Left to their own devices, automakers alter the profile of their customers by redesigning cars and targeting their advertising to different markets (Weiss 1988:136). In the past, this conscious targeting of markets also dictated the location of an automaker's dealers and led to regional biases. After World War II, General Motors made a marketing decision to follow consumers to the suburbs and concentrated their dealers accordingly. Meanwhile, Chrysler-Plymouth carved out its turf in communities of Midwestern blue-collar workers and Ford opened dealerships to cater to America's farm towns. This marketing manipulation of brand loyalty among Big Three customers contributed to a "closed system" that foreign automakers found difficult to infiltrate beyond the big city markets (Weiss 1988:139; Hughes 1987:53).

The Automobility of Social Patterns

The automobile helped cultivate the "recreational environment" that emerged between 1910 and 1920 and changed the ways in which both adults and youths used their leisure time. Movies, bowling alleys and skating rinks appeared even in small towns. But along with these changes in *how* one's leisure time was spent, the automobile was changing with *whom* that time was spent. The automobile tended to multiply friendships based on age, sex, and similar interests, as opposed to those dependent on family relationships and geography (Berger 1979:106).

Studies of Oxfordshire, England, villages found that for 150 years marriage partners had been collected from the surrounding 10 kilometers, and two-thirds came from the same parishes. After the railway was built in 1850, the distances jumped to about 40 kilometers and the numbers from the same parish dropped to one-third (Townroe 1974:59). Similarly, the automobile enlarged the radius of travel which led to increased intermarriage between men and women living in different geographic areas (Berger 1979:67).

And while the automobile allowed for a wider choice of friends, it also meant more privacy in those relationships. The Lynds found that boys and girls went riding without their parents approximately 40 percent of the time (Lynd & Lynd 1929:257). It seemed that the car had replaced the parlor when it came to socializing:

> Cars became mobile living rooms, and Americans moved right in. A Ford brochure proclaimed: "The '49 Ford! There's room and to spare for three people on each of those "sofa seats"...trimly upholstered in new, modern fabrics. And there's "picture window" visibility... the rear window is 88 percent larger! Yes, it's a living room on wheels, this '49 Ford!" (Lord 1976:31)

And Buckminster Fuller, architect and philosopher observed that:

> ...After the automobile, people stopped building porches onto their houses. The porch--that vantage point from which one could observe the world--had taken on wheels and became in effect the home away from home. The weekend "spin" gradually became the two-week vacation on wheels. Mobility became more frequent, and more important than the stasis of the home (Pactolus 1970:24).

With that "weekend 'spin' and the two-week vacation on wheels" came an immense economic growth in the area of tourism. The automobile enabled the individual to travel to places one could never travel to before. Leisure travel became a booming business and towns with special character, festivals, fairs, theatres and concert halls sprang up everywhere and people flocked to them. Once one's leisure time was limited to the confines of one's parlor or the limits of one's horse. Now, "weekending" in a recreational vehicle replete with microwave and television 500 miles from home is a common occurrence. The automobile had created new expectations in socializing and had successfully appealed to the American affinity for travel and leisure.

Down on the Farm

If the automobile industry was looking to capture, or "enroll," as many markets as possible it certainly did not have to try very hard with the rural community. Although the automobile was initially thought of as expensive "plaything of the rich" and some rural inhabitants did take steps to slow the onrush of automobiles to the country, the vehicle seemed custom tailored to the farmer's interests. Consequently, the number of automobiles used on farms went from 85,000 in 1911 to 2,146,512 in 1920 (Berger 1979:26-51).

That same year, a survey conducted by the National Automobile Chamber of Commerce showed that the average farmer drove his car 4,600 miles a year, with business purposes accounting for 78 percent of the distance. It was also found that only 10 percent of the automobiles were used for pleasure driving exclusively (Berger 1979:42).

As a matter of business, the automobile improved the condition of the farmer and provided a shortcut to his goals (Latour 1987:111-112). The cars were used in ingenious ways to lighten farm work: sawing wood, pumping water, generating electricity, running small grain mills and unloading hay.[7]

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[7]The motor vehicle and the cheap tractor (which appeared between 1915 and 1918) were mixed blessings. Increased crop yields drove down the price of crops. At the same time, the farmers' own costs increased because the new technology was not cheap. This paradoxical problem of increased efficiency undermining the prosperity of the farmer persists to this day. Increased productivity and low crop prices drove more of them off the farm and into the cities. The Great Depression started with the stock market crash in October 1929, but a rural depression preceded it by several years (Wright 1988:39; Hill 1967:76).

The automobile (and later the truck) also widened the market range of the farmer while its maintenance was relatively inexpensive. It was a practical option because most farmers had experience with power-driven machinery and standardized parts were available through the mail; therefore, the farmer could fix his vehicle himself (Berger 1979:41-9). The automobile, too, provided many advantages that the horse did not have. It did not require feeding when not in use and the land used for horse feed could be relegated to other uses.

By 1928, the effects of the motor vehicle prompted rural sociologist Newell L. Sims to write that "the automobile, needless to say, has been the greatest revolutionizing force yet experienced by rural society" (Berger 1979:10). The very nature of farming--the isolation, the land in need of constant attention and the limited availability of social activities --made the automobile very appealing to the rural community. It offered a new mobility that effectively doubled the farm family's range of social activities from six or seven miles with horse and buggy to nine to twelve with the motor car and enabled *constant* availability of commercialized sources of recreation and amusements (Berger 1979:63).

No one championed the automobile's dispersion into the countryside more than the farmer's wife. Although the early hand crank hindered the rate of rural women driving, the motor car became so popular with farm women that it was often preferred and purchased before household appliances:

> What the critics seemed to ignore was that the automobile lessened the chores of the farm woman, and this lighter work load allowed her more leisure time. For example, she no longer had to grow or make all foodstuffs that the family would consume during the year, especially during winter. The farmer's wife now could drive to town or a nearby city to purchase produce shipped in from the south, thereby avoiding malnutrition (Janeway 1956:165).

Rural schoolchildren, too, benefitted from the growth in motor vehicle use. Educators had long realized that distance from school was a reason for poor attendance, which in turn usually led to unsatisfactory school work. One 1920 study of rural Maryland schools found that "...Children living greater distances attend fewer days, do inferior work and get farther behind, and then being both farther from school and farther behind in school, they lose still more time, do more inferior work, and still more often fail, and get even farther behind" (Berger 1979:154).

But besides increased mobility and availability of bookmobiles and libraries, educators were recognizing the benefits of consolidating schools. In 1923, a comparative study of one-room and consolidated schools found that the consolidated school was superior in holding power and in grade, age, and subject achievement, and that these differences increased as pupils progressed through school. Centralization also allowed a more economical use of facilities and equipment, as well as administration and faculty (teachers could now visit parents at home much to some students' chagrin).

Consolidation, or centralization, may have meant a better

education, but it also meant a greater distance to be traveled for that education. Thus, when it came to greater knowledge and education, "authorities" were exalting the motor vehicle as the elixir for what ailed the rural area (Latour 1987:30-44; Berger 1979:149-165).

The automobile altered other areas of rural society as well. It became necessary to redefine the Sabbath since "going to church" no longer amounted to a full day's event. Automobile ownership led to strained community cohesiveness because the vehicle provided the option for many rural Americans to desert their local churches and attend the higher-quality services in urban churches. Following in the path of the education system and reacting to the exodus, individual religious sects consolidated into centralized regional activity (Berger 1979:127-145).

Another important aspect of farm life that was affected by the horseless carriage was the area of health. No other occupational group enrolled in the automobile society with so little debate as did rural physicians. It increased the geographical area for health care and freed the physician from the tiring horse and buggy. House calls and ambulatory care were made easier and patients were less apt to inconvenience the doctor with false emergencies because the doctor was more accessible on short notice (Berger 1979:177).

Although the economic, educational, religious and health benefits may have been paramount in the farmer's mind, he was not immune to the primal attractions of the vehicle as a

powerful plaything that the urban man was also feeling. At least one Studebaker agent felt that there was a social explanation for the appeal of the motor car: "No farmer ever bought one purely from the standpoint of saving time and money. It's the fun of the thing that appeals to him. I usually cinch a sale after my man has driven the car slowly for a quarter of a mile or so. He is tickled to death with the sport" (Berger 1979:43).

But despite alleviating some discomforts of farm living and adding some "fun," the automobile came with some drawbacks as well. Besides a loss of community cohesiveness, the consequences of "automobility" struck closer to home. The farm house was no longer the focus of leisure activities. Farm families paid for their loss of isolation with a decrease in what rural sociologists Pitirim A. Sorokin, Carle C. Zimmerman, and Charles J. Galpin term "the familistic basis on which rural society was organized in the past..." (Sorokin et al. 1930-2:642).

But these negative effects, or new problems, seemed inconsequential compared to all that the motor vehicle provided to those previously sequestered in rural areas:

> While the automobile may have had the potential to alter rural institutional life and mores radically, this was not the prime concern of the average farm family. Their isolation had led them to think in individualistic terms, and their primary concern was enhancing *their* existence, rather than developing the community. The automobile offered a means to this end by providing rapid, direct transportation at minimal cost. One computation placed the immediate cash cost of a country trip for a family of five at eighteen cents a mile by railroad, as compared with only a penny a mile

> in a Model T Ford. Furthermore, the car delivered you to the door and was faster than a horse-and-buggy, thus allowing longer trips in shorter time (Berger 1979:61).

It was for these reasons--improved and more accessible medicine, markets, leisure-time pursuits, religion, education, and mail service--that the automobile became a necessity for the rural family:

> ...For in changing the transportation habits of rural America, the motor car transformed the very institutions that defined life outside urban areas. The extended farm family, the crossroads rural community, the Protestant church, the little red school house, the country doctor--these were some of the traditional foundations of rural American life that were destined to be altered radically by the twentieth-century transportation and communications revolution, in which the motor car was to play such an important role (Berger 1979:52).

Rural families used the automobile to fulfill what they felt to be their needs and best interests. It alleviated the characteristic loneliness and isolation of farm living and promised to make it a more enjoyable place to live. If automobile manufacturers were looking to "enlist" new supporters to their system, the farmers were more than willing to join in.

Changing Settlement Patterns: Suburbia

From the beginning, the love affair with the car was more passionate in the U.S. than in Europe, where incomes were lower and less well-distributed and where the shorter traveling distances made the need for cars less obvious (Brown et al. 1979:10).

Like most highly industrialized countries, the United

States is characterized by regular displacements of population and by far more movement in, around, and between places of settlement and occupation (Barbour 1982). But unlike other industrialized countries, its youthfulness and differences in development made the automobile especially suitable for the American landscape.

The U.S., in the throes of expanding settlement, seemed a place with an infinite amount of land in which to push out into with no containment. If one didn't like a particular area there was always the option of a less populated place. Space was so abundant that there was even a time when the government gave land away. Europe, on the other hand, was a place tight in living space. Living quarters were within walking or horse riding distance from shops and extended families. These areas were places firmly settled, a place where a car could not develop into a necessity so readily.

In 1925, the United States Chamber of Commerce, in an effort to encourage road building and the redistribution of the population, praised the automobile because it afforded its owners "the ability to live in pleasant and healthful surroundings yet depend on transportation facilities that permit work in the urban centers" (Davies 1975:8).

These "pleasant and healthful surroundings," otherwise known as suburbs, were a totally new form of human community, created and dominated by the automobile. In earlier years, cities sprang up around something: a river, a factory, a university, or mineral deposits. The congregation of people

into one location was an unplanned response to whatever a region or a new community had to offer (Pactolus 1970:23).

The suburb did not employ this type of evolution. In fact, quite the opposite occurred. Its key feature was not what the center had to offer, but rather it created a sprawl of roads that were then packaged into lots and sold for the most advantageous offer (Pactolus 1970:23). Thus the suburbanite got a "better life" via rush hour traffic and went home to a landscape sculpted by the automobile:

> The suburbs were designed for the automobile. Churches, schools, and stores were almost always beyond walking distances. So were places of employment. In fact, the active suburban family with two children found two cars a virtual necessity for its daily pattern of existence, thereby increasing traffic problems (Davies 1975:29).

Besides the impact that expressways had in greatly accelerating the movement to the suburbs, there was also the factor of just who was doing the moving. Suburbanization and new roads had the opposite effect of what was prophesied. While most urban planners saw the automobile as the solution to city transportation problems, crowding and urban problems in general, the result was that the affluent moved out of the cities and actually sped up urban decay. Urban flight grew out of many factors: dislike for the congestion and the confusion of the central city, a fear of violence, the attractions (which often proved temporary) of lower land prices and much lower property taxes, a longing for more living space and clean air, and a desire to escape the growing number of poor blacks who were moving into the central cities

in large numbers (Davies 1975:29).

Thus, suburbanites traded old problems for new ones. In the quest for a utopia outside the city, the commuter endured congested roads and greater travel times, created more pollution and developed a deeper dependency on automobiles and petroleum (Pinch and Bijker 1987:46). The automobile industry had succeeded in "piggybacking" its needs onto the consumer needs (as it had done with the farmer) and had enrolled more elements into the automobile system (Latour 1987:108-110). In sum, the automobile was thus both cause and effect of the massive growth of the American suburbs following World War II and those affluent enough to leave the cities also had the greatest ability to buy cars and influence politicians in policymaking.

Chapter Three

The Real Power Behind the Automobile: Interest Groups and Political Ties

The Early Push for Automobiles

When the automobile was first introduced, the U.S. government did relatively little to control its use, or to foster alternatives--in fact, it was only after some years that vehicle registrations, driver's licenses, and traffic signals were required. But by the 1950s, it looked as if the U.S. government was *in* the automobile business and subsidizing its use. When it had an office to fill it looked over the executives at the "Big Three"; when it needed to bolster the economy it promoted some financial incentive to the auto industry; and then there was the Interstate Highway System--40,000 miles of asphalt and concrete heavily funded by the federal government.

The auto industry understood this symbiotic relationship and its privileges. In its wake, mass-transit companies were destroyed to ensure a growing market for the automobile; artificially low gas prices were maintained in order to continue profits from guzzlers; and energy-efficient options --foreign or otherwise--were limited or eliminated on the American market (Clark and Page 1981). Time and again, the auto-addicted consumer blindly accepted the government-approved misdeeds of Detroit in an economic system where there seemed to be no alternatives. Soon, most Americans had taken

up the chant: "What's good for GM is good for America" (Wright 1988:68).

The Drive for More Roads: An Example of Special Interest

Ironically, the push for more and better roads after the Civil War originated with the popularity of the bicycle--the automobile's antagonist on the road today. Bicyclists were soon joined by various rural and farm organizations. In 1893, the National League for Good Roads (NLGR) held the first "Good Roads Convention" in Washington, D.C. with the expressed goal to "lift our people out of the mud" (St. Clair 1986:20).

This "Good Roads Movement" culminated in the passage of the Federal Aid Road Act of 1916, or the Good Roads Act, which began the active federal highway program. This legislation also created state highway departments and established a 50 percent matching-funds funding formula which characterized federal-state financing arrangements for the next 40 years (St. Clair 1986:20; Davies 1975:10).

The next decade's legislation defined the exclusively rural orientation of the federal highway program. The Post Office Appropriation Act of 1919 transferred all surplus war materials suitable for highway construction to the Department of Agriculture (St. Clair 1986:21). The Federal Highway Act of 1921 set up the Federal Aid Primary System which limited the use of federal funds to 7 percent of the total rural roads in a state. Again, urban areas were explicitly excluded from the system (St. Clair 1986:21). But it wasn't long before the

auto industry was feeling the road block that was keeping it from tapping into a huge potential market and began openly complaining of the waste of resources that was occurring in the rural roads program. In the industry's view, the point of diminishing returns had long since been reached in this area (St. Clair 1986:22).

By the mid-1920s, the "Highway Lobby" was established and exerted considerable control in national politics. Journalist Marquis Childs, a long-time observer of the Washington political scene, once aptly described the Highway Lobby as "the most powerful economic-political bloc in the nation...a force that can move mountains, literally or figuratively" (Davies 1975:16).

Automobile use received further nudges from an important lobbying group, the National Highway Users Conference (NHUC), organized by Alfred P. Sloan, Jr., president of GM, in 1932. This organization brought highway users together to resist the diversion of user taxes during the Great Depression. After 1946, the NHUC began devoting its energies to highway lobbying. Sloan remained the chairman of NHUC from 1932 to 1948 and then was succeeded by another GM chairman, Albert Bradley. Although the NHUC boasted some 3,000 member groups, the auto industry always played a dominant role. These "congresses" continued until the passage of the interstate legislation in 1956 (St. Clair 1986:138).

Proponents claimed the expenditure on new roads was justified on two counts: urban decay and defense. In 1941,

a special Inter-Regional Highway Committee prepared a master plan for postwar highway construction. The plan called for a system that would connect urban centers, thereby facilitating high speed traffic from the downtown area to outlying areas. The committee strongly argued that the plan would stop the problem of urban decay and would curb decentralization. And, just as in 1917-18, the encroaching war was used as an impetus by the Roosevelt administration to discuss the importance of more roads to augment the defense system (Davies 1975:12-13). And, again, here were those considered "authorities" proselytizing to others the glories of the automobile (Latour 1987:30-44).

Although the drain of manpower and resources during World War II actually halted most highway construction, the war marked radical changes in U.S. transportation policy. Once an exclusively rural highway program and emphasizing public transportation through regulated transit franchises, this new policy--inspired by Hitler's *autobahn* and the U.S.'s victorious industrial front--stressed the construction of urban expressways and freeways to solve urban transportation problems (St. Clair 1986:3).

The promotion of a new highway system was assisted by the advantageous placement of pro-automobile and pro-highway people into positions of authority in government. The close ties the auto industry established with U.S. government and the lengthy list of the industry's executives that made their way into government office allowed for policymaking that

advanced the objectives of the automobile industry. By employing the perceived expertise of "authorities" and using such rhetorical ploys as playing upon the public's national security fears, government committees were successful in promoting the interstate system (Latour 1987:30-44).

In 1956, highway lobbyists found an ally in Dwight D. Eisenhower who was looking to alleviate a pressing political problem in the face of a presidential campaign. At the time, the interstate program seemed the logical solution to the spiralling traffic accident rates and growing urban rush hour traffic jams (Davies 1975:6).

Two year earlier, the Highway Lobby had enthusiastically endorsed Eisenhower's creation of a special advisory committee chaired by General Lucius Clay, a Cold War hero from the Berlin Blockade. Clay carefully selected his committee members from well-recognized friends of the Highway Lobby. During the hearings, the committee effectively restricted testimony to pro-highway groups and succeeded in ignoring the plaintive requests for a "balanced" transportation system from a token spokesman for the outnumbered transit interests (Davies 1975:18).

What should have been a major topic of discussion--the role of urban mass transit--never received a proper discussion or study at this crucial time. Nor was any effort made to distinguish between the need for improved travel *between* cities and *within* them (Davies 1975:17).

Whether the interstate system was thought of as a

necessity by the average citizen is unclear. Only 2 percent of the people polled after 1956 knew what the interstate system was. But virtually no one challenged the highway system when it was established. Congress accepted the claims made by the Eisenhower administration and its many boosters that the system was essential for national defense--specifically, for the evacuation of cities in the event of atomic attack, and the rapid movement of troops and equipment in times of emergency (St. Clair 1986:25; Davies 1975:4).[8]

But the Eisenhower administration had made its decision within a very narrow framework, one which did not provide for a consideration of viable alternatives. Still, those involved were pleased--they had launched the greatest construction project in the history of mankind since the building of the Great Wall of China and the construction of the roman highways (Davies 1974:5). Sometimes referred to as the "national defense installation," the 40,000 miles of concrete and asphalt touched every major American city (Lord 1976:63; Davies 1975:4). The automobile industry and the Highway Lobby had served their own interests while appearing to simultaneously solve the American people's "problems":

> The Clay Committee Report, submitted to the president in January of 1955, concluded that the

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[8]In 1971, the issue of national defense was again sold as an essential aspect of the Good Roads Bill, despite the fact that in the country's last full-scale mobilization in World War II, the railroads carried 90 percent of the military freight and 97 percent of the military passenger traffic. When the original bill was passed, there was a single vote against it in the U.S. Senate (Lord 1976:63; Jerome 1972:115).

> metropolitan areas needed expressways as soon as possible: Our cities have spread into suburbs, dependent on the automobile for their existence. The automobile has restored a way of life in which the individual may live in a friendly neighborhood, it has brought city and country closer together, it has made us one country and a united people. But America continues to grow. Our highway plan must similarly grow if we are to maintain and increase our standard of living. There can be no serious question as to the need for a more adequate highway system. Only the cost and how it is to be met poses a problem (Davies 1975:21).

Eventually, it was decided that the Interstate Highway System would be backed by a generous and clever device called the Highway Trust Fund. This fund mandated that all federal taxes collected on motor vehicles, gasoline, and ancillary equipment would go to building a network of "superhighways," until completion of the system. The funding ratio was changed from the existing 60 percent provided by federal funds and 40 percent state-provided to increasing federal participation to 90 percent to the states' 10 percent.[9]

Construction began that same year consecrated with Secretary of the Treasury George M. Humphrey's fiscal blessing: "America lives on wheels, and we have to provide the highways to keep America living on wheels and keep the kind and form of life we want" (Davies 1975:4).

As originally conceived the system would cost $27 billion and take thirteen years to complete. Fifteen years and $43 billion later, the system was still not complete and the estimates had risen to 25 years and $70 billion (St. Clair

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[9]In some western states the ratio was 95 percent federal funds to 5 percent state funds.

1986:160; Lord 1976:63; Davies 1975:15-23; Jerome 1972:105). But a completion date was no longer important. American society was incorporated into an automobile-dependent system whose momentum was intensifying. Today, although the massive highway building is ending, the U.S. still spends nearly $200 million *every day* building and rebuilding the nation's streets and roads, despite predictions that congestion and delays will become worse (MacKenzie et al. 1992:3). It seems highway builders and automakers had developed a symbiotic economic relationship unsurpassed in its effectiveness.

This large and interwoven network of associations and pressure groups continues to influence the way America moves or doesn't move--as is the case in most urban rush hour traffic. The American Association of State Highway Officials is just one of the bureaucratic empires that depends on continued highway construction. Another, the American Road Builders Association, is made up of a myriad of "contractors, manufacturers and distributors of highway construction equipment, materials producers and suppliers, faculty members and students of engineering colleges and universities, engineers, investment bankers, state and federal highway officials, and members of Congress" (Jerome 1972:113).

Perhaps the association's location best symbolizes its close ties to and strong influence on government policy: "The association is located, appropriately, in a new building side-by-side with the Donohue Building which houses the Federal Highway Administration..." (Helen Leavitt quoted in Jerome

1972:113).

President Lyndon Johnson discovered how powerful this Highway Lobby was when he merely sought to delay the distribution of some $1 billion in Highway Trust monies as a means of curbing inflation in 1966. He was overwhelmed by the highwaymen in Congress, and with several of his favorite legislative measures threatened by congressional retaliation, he hurriedly released the funds (Davies 1975:37).

By allowing government policy to be influenced by these special interest groups--from the first auto club, the American Motor League of Chicago, in 1895, to the National Automobile Dealers Association (one of the most effective lobbies in Washington today)--the U.S. has been propelled into a "vicious cycle" of road construction and automobile dependency (Wright 1988:91; St. Clair 1986:24; Smith & Black 1986:81).

As the quality and quantity of roads improved and automobile commuting became more practical, such instances as the Boston Traffic Jam on December 30, 1963 that left vehicles immobile for over six hours have become more common (Pactolus 1970:26). By 1973, the average speed of "rush hour" traffic in cities dependent on motor vehicles was a mere 12 miles per hour--slower than city traffic in 1890 (Snell 1973:340).

While congestion caused the waste of 3 billion gallons of gasoline in 1984--3% of the nation's total gasoline consumption--and resulted in an extra 30 million tons of carbon dioxide in the atmosphere (MacKenzie 1992:18), the

Federal Highway Association expects traffic congestion to quadruple on the nation's freeways and double on other roads over the next twenty years. Of course this means more delays and an increase in travel time by 5.6 billion hours and wasting an additional 7.3 billion gallons of fuel and emitting another 73 million tons of carbon dioxide annually (MacKenzie et al. 1992:2).[10] But if the abundance of cars on the road is assessed as it has been in the past, the answer is--according to GM and those with vested interests--not alternative modes of transportation but more roads (Pactolus 1970:26).

Buying up Mass Transit

If the American people did not voluntarily choose to invest and follow a new path of consumption and automotive lifestyle, the auto industry found other ways to capture their attention. One way was to cut off their normal route of transportation (Latour 1987:111). The reduction or elimination of mass transit alternatives by automakers and others is representative of this "translation" to a more car-oriented culture. In this situation, the manipulation of alternative means of travel created a "problem" for American consumers and the automobile became the rational and logical "answer." Thus, it appeared that those who enrolled in this

[10]One example of immobility due to congestion is a one-way, 30-mile commute on U.S. Route 1 from New Brunswick, N.J. to Trenton. This could easily turn into a 5-hour ordeal by 2005, as traffic inches along at an average 6 m.p.h., slower than a trotting horse (MacKenzie et al. 1992:2).

new technology did so through their own decision making (Latour 1987:113).

Unlike every other industrialized country, the United States has come to rely almost exclusively on cars and trucks for the land transportation of its people and goods. Trucks are the only method of intracity freight delivery and account for 78% of all freight revenues. Cars are used for 90% of city and intercity travel. In contrast, just 40 percent of Europeans get to work on their own wheels and, in Tokyo, 15 percent get to work via automobile (Flavin et al. 1989:10; Snell 1973:338).

Although, most European and Japanese cities were developed before the advent of the automobile and, therefore, were not as susceptible to its sprawling effects on human settlement, there is evidence that the decline in mass transit patronage in the U.S. was not solely a result of rider preference. This evidence purports that ridership patterns were manipulated by a "motorized campaign" that artificially shaped preferences and eliminated transportation alternatives (St. Clair 1986:82).

Before 1920, just about every U.S. city and town of notable size had a public transit system. The vast majority of these systems used electric streetcars. But, by the late 1930s, GM had perfected the diesel bus and automatic bus transmission and began a nationwide push for conversion (St. Clair 1986:4-5).

The motor bus was touted as having two advantages over

electric vehicles. First, the self-propelled motor bus was free of the tracks and overhead transmission structures required by electric vehicles which permitted greater flexibility and ease in rerouting. Secondly, electrical vehicles had the disadvantage of an electrical failure that could shut down all of the vehicles on a streetcar or trolley line.

The "flexibility" argument of motor-buses becomes almost moot when looking at the stability of urban transit patterns over the last century. In such cities as Chicago and San Jose, travel patterns have remained essentially the same and, consequently, the need for rerouting has not been great. In fact, the most "fixed" systems--the subways and rapid transit systems--seemed to have experienced the greatest endurance (St. Clair 1986:85).

GM's involvement in public transportation began in 1925, when it acquired Yellow Coach, the nation's largest manufacturer of both intercity and intracity buses. One year later, GM formed Motor Transit Corporation, a $10 million holding company whose name was soon changed to Greyhound Corporation. Although it did not retain complete control over the intercity bus business, GM assisted the transit company with financial problems and made sure that mutually advantageous decision makers presided over Greyhound. One of these decisions was that Greyhound would only invest in

General Motors' Yellow buses (St. Clair 1986:57).[11]

In 1932, GM formed United Cites Motor Transit and began motorizing intracity operations. "In each case [GM] successfully motorized the city, turned the management over to other interests and liquidated its investments," Henry Hogan, GM general counsel later observed (St. Clair 1986:58).

Another approach taken by GM, prior to the dissolution of United Cities Motor Transit in 1935, eventually led to the formation of National City Lines. This began with GM providing ad hoc financial backing to investors in their acquisition of some midwestern city transit systems. In one such case, the buyers entered the local transit arena and began scrapping streetcars and purchasing transit buses--Yellows in most instances (St. Clair 1986:59).

By 1949, GM had been involved with the replacement of more than 100 electric transit systems with GM buses in 45 cities including New York City, Philadelphia, Baltimore, St. Louis, Oakland, Salt Lake City, and Los Angeles. In April of that year, a Chicago federal jury convicted GM of criminally conspiring with Standard Oil of California, Firestone Tire, Phillips Petroleum and Mack Truck to replace electric transportation with gas- and diesel-powered buses and to

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[11]Based on 35 bus passengers and an average automobile price of $3,700 with an average life span of 5 years for the car and 18 years for the bus, one GM bus at $40,000, would result in $466,200 in lost car-sale revenue. Using this logic, it could be argued that GM, with its hand in bus sales, was reducing its own profits in car sales. However, there is no reason to believe that some of those 35 cars would not have been sold anyway, even if 35 commuters utilized public transit (Snell 1973).

monopolize the sale of buses and related products to local transportation companies throughout the country. It charged that various "front" organizations, such as the National City Lines, Pacific City Lines, American City Lines, et al., acquired transit properties and then forced expensive and inefficient products on congested streets in order to destroy alternatives to the automobile (Snell 1973:334).

For its wrongdoing, GM received little more than a financial hand slap. The court imposed a $5000 fine on the multi-million dollar corporation and charged H.C. Grossman, a key player in the motorization campaign and treasurer of GM, $1. Given what seemed like a nod of approval by the government, GM continued its policy of acquiring and "dieselizing" electric train properties and went on to successfully monopolize rail locomotive production as well (Snell 1973:334).

This declared monopoly on ground transportation in the U.S. is not an exaggeration since, presently, GM accounts for 100% of all passenger and 80% of all freight locomotives manufactured in the nation, and a large share of the bus market. As Snell (1973) explains:

> Although GM technically accounts for 75% of current city bus production, its only remaining competitor, the Flxible Co., relies on it for diesel propulsion systems, major engine components, technical assistance, and financing. In short, Flxible is more a distributor for GM than a viable competitor; virtually its sole function is the assembly of General Motors' bus parts for sale under the Flxible trade name. Likewise, in the production of intercity buses, its only remaining competitor, Motor Coach Industries, is wholly dependent upon GM for diesel propulsion systems and major

mechanical components (p. 327).

Snell's (1973) preachings about the inferiority of the motor bus and the illegal dealings that promoted their use do seem warranted. Literature and studies in the economic feasibility of the urban transit vehicles makes a strong case for the superiority of the old trolley coach. It suggests that the streetcar, too, was generally more economical than the motor bus especially during the 1920s and 1930s when diversification began and at least among the more heavily used lines (St. Clair 1986:53).

But economics also fostered the ease in which these lines were transformed to the motor bus. The transit industry, always closely welded to the movement of the economy, experienced a serious decline in mass transit patronage during the 1930s due to the Great Depression and its subsequent high unemployment rates (St. Clair 1986:9). Unfortunately, the timing for this decreased ridership could not have been more detrimental. With the increasing ownership and use of the automobile in the 1920s, mass transit revenues declined; consequently, transit schedules were pared, lines were abandoned and equipment deteriorated because replacements could not be purchased. Thus, a downward spiral ensued that resulted in 80 percent of urban residents commuting by car and only 13 percent using public transport in 1979 (Brown et al. 1979:68). This is in sharp contrast to Japanese ridership which increased throughout the sixties and seventies (Brown et al. 1979:68).

Attempts to curb this transfer from mass transit to personal vehicles in the U.S. have been lackluster at best. European and Japanese governments have strong financial disincentives against car use: purchase taxes, gasoline taxes, and even expensive parking permits for residential neighborhoods (Brown et al. 1979:14). And U.S. attempts at mass transit planning have not always met with great success. The Bay Area Rapid Transit (BART) system in San Francisco is an example of a mass-transit system that, despite great planning and expense, is only capable of serving 5 percent of the area's population because of random commuting patterns. The Washington, D.C. subway system is better planned than BART and has the advantage of serving a more concentrated metropolitan area, but ridership has been augmented by its integration with an extensive network of buses that bring people to the stations. However, even with the supplementary service, Metro has managed to quench only slightly the city's formidable thirst for private mobility (Brown et al. 1979:71).

But private mobility need not be inefficient. Some of today's small cars, when carrying four people, can manage 100 passenger miles per gallon in the city and 180 passenger miles per gallon between cities. This far exceeds the efficiency rates of mass transit, but most American commuters drive inefficient cars and average only 1.4 passengers per car, thus achieving a meager 16 passenger miles per gallon. The important point is that the efficiency of both public and private vehicles depends on how they are used. Trains and

buses can exceed the efficiency of even the most economical automobile--but only if fares are cheap, and the service is convenient enough to attract passengers (Brown et al. 1979:67).

But the U.S. government has never made public transportation a high priority and, instead, has often chosen to subsidize the use of private vehicles. In August 1979, President Carter proposed that the government spend $13 billion over and above the $27 billion it was already committed to spend on mass transit during the next decade. Even so, these funding levels were low compared with the $10 billion each year that the U.S. Federal Highway Trust Fund spent on roads in the early eighties (Brown et al. 1979:70).

This hardly seems the wisest transportation investment for the money when comparing the modes of transit. In terms of energy consumption, accident rates, contribution to pollution and displacement of urban amenities, motor vehicle travel is possibly the most inefficient method of transportation devised by humankind. Although rail travel is 23 times safer than motor vehicles and can move passengers and freight for less than one-fifth the amount of energy required by cars and trucks, U.S. transportation policy still favors government-supported roads (Snell 1973:338). Between 1947 and 1970, the federal government spent $58 billion on highways, $12 billion on airport construction and airline subsidies, and even an additional $6 billion for waterway development. In contrast, it spent a meager $795 million on urban mass transit

(Davies 1975:36).

Such distorted spending has led to the single transportation system--with a couple of small-time competitors in the form of airplanes and railroads--within the United States today and has left 20% of our urban population--the aged, youth, disabled and poor--without access to employment or educational opportunities and other amenities (Snell 1973:340). And it has left many other Americans sitting in cars inching along smog-covered highways.

Influence on the Economy and Employment

Since that fateful night in Ford's backyard, more than 2200 different makes of automobiles have been manufactured in the U.S. (Smith & Black 1986:74). In 1929, U.S. auto plants produced over 5.5 million cars and trucks and GM stock sold for $73. Three years later, the output had fallen to less than 1.4 million and GM stock bottomed out to $8. The "Big Three"--General Motors, Ford and Chrysler survived the Great Depression, but the economic strife left behind the remains of many other companies (Wright 1988:42).

There is no denying that the automobile economically fostered a whole range of American industries and also led to a new emphasis on consumer goods. The automobile industry was the major reason for the economic boom of the 1920s and, after the disruption of the Great Depression and the war years, it resumed its leadership in the economic expansion of the 1940s. When Henry Ford II drove the first post-WWII car off the

assembly line on July 3, 1945, North American plants found themselves in an advantageous position. European and Japanese industrial plants lay in ruins; the Americans alone were triumphant. Their homeland and industrial plants unscathed, they set about converting to civilian production. Work and money were plentiful, suburbs loomed on the horizon and a nationwide system of interstate highways was being planned. Encouraged by the construction of housing and roads, many people used their personal mobility to move even further away from their place of work. Thus, through the years, the automobile industry became further entrenched in the American economy:

> In 1970, the zenith of the Age of Asphalt, Americans drove their automobiles more than one trillion miles and spent over $93 billion to buy, operate, insure, park, and build roads for their automobiles. Between 1955 and 1970, Americans purchased nearly 100 million automobiles....The automobile thus became a vital cog in the national economy....The automobile accounted for about one-sixth of the Gross National Product....Whenever the nation's economy turned "soft," presidents from Truman through Nixon instinctively turned to devices to stimulate automobile manufacture sales. Thus in 1973, a total of 112,000,000 automobiles were registered in the United States; significantly, each had a life expectancy when new of just five years. And a well-conditioned American people readily accepted the fact of an annual automobile fatality number of over fifty thousand along with four million injured (Davies 1975:9).

One out of every five to six U.S. workers is involved in the manufacture, distribution, servicing or commercial use of vehicles. Auto dealerships alone account for more than 28 percent of all the retail business in this country according to the U.S. Census Bureau (St. Clair 1986:3; Wright 1988:4;

Tashchian and Slama 1985:39; Jerome 1972:18). Automakers continue to be among the biggest consumers of steel, aluminum, copper, glass, zinc, leather, plastic, and platinum and they use most of the lead and rubber in the U.S. (Wright 1988:4).

In 1982, General Motors alone had 18 percent of the world market and a turnover of over $60 billion. Although the recession in 1978 softened its status as the world's biggest company, it now sits behind Exxon and Royal Dutch Shell--two automobile-related firms (Tank 1984:153).

In order to maximize the U.S. automobile's market power, the Big Three consciously tried to control their environment and simulate a "closed system" (Hughes 1987:53). One way this was accomplished was by keeping their suppliers small and fragmented--by some counts GM, Ford and Chrysler bought from more than 50,000 suppliers; thus, the automakers maintain control and need not become dependent on any one source. Even today, after a substantial period of increased "outsourcing," GM still makes about 70 percent of all the parts in its cars, Ford makes about half its own parts, while Chrysler, partly under the duress of its period of insolvency that was alleviated by a $1 billion dollar loan from the U.S. government, now buys about 70 percent of its parts externally.

In-house design bureaus produced rigidly detailed specifications and put them out to competitive bid, often encouraging new companies to enter into the bidding process to keep the pressure on established suppliers. The whole system of internalizing separate steps in the sequence of

production was designed to produce maximum economic leverage for the Big Three's purchasing departments and control their marketing environment (Morris 1990:57-58). Thus, the "invisible hand" of management coordinated the flow of production through the channels of mass distribution in order to dominate economic sectors (Constant 1987:233).

By being in the propitious position that allowed control of the marketplace and suppliers, employment of a vast number of U.S. workers and, subsequently, a direct impact upon the country's economic structure, the automobile industry increased its influence and stepped up the momentum in a system dependent on its product.

The UAW: Continuing the Momentum

In 1933, the National Recovery Administration (NRA) administered the National Industrial Recovery Act (NIRA). This act contained a clause that stated that all workers were entitled to union representation and employers were obligated to negotiate with them. Only Henry Ford refused to agree to this section on unions and bargaining (Hill 1967:134).

In May 1935, the NIRA and the NRA were held to be unconstitutional; however, in July of the same year, Congress passed the National Labor Relations Act, or the Wagner Act.[12] This law provided that workers were entitled to unions of

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[12]The National Labor Relations Act was more commonly known as the Wagner Act after its introducer, Senator Robert F. Wagner.

their own and that employers must bargain with them. To enforce this legislation, the National Labor Relations Board was created with ample power to punish efforts made to evade those provisions (Hill 1967:135).

Meanwhile, the Committee for Industrial Organization (CIO) sprang up for those involved in unskilled labor and mass production.[13] Building on this lead, the United Automobile Workers of America (UAW) was formed and welcomed all motor-vehicle companies' employees. It promised to fight all abuses practiced in the industry and work for higher wages and contracts between employers and employees (Hill 1967:136).

What followed was nothing less than an industrial war--a succession of strikes, intimidation, trick elections, and disputes among the workers themselves. Eventually, the Wagner Act was accepted as legally binding law by everyone except the Ford Motor Company (Hill 1967:136).

After the enactment of the NIRA, Henry Ford had enlisted the efforts of Harry Bennett, an influential man with reported underworld connections, who successfully suppressed union activity within Ford plants (Wright 1988:50).

In Cleveland, however, trouble was brewing at GM's Fisher Body plant. Workers were angered by the plant manager's refusal to discuss piece work reductions and partook in a

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[13]The Committee of Industrial Organization later changed its name to the Congress of Industrial Organizations in 1938. In 1955, the CIO merged with the American Federation of Labor (AFL), a craft union for construction, metal and building trades. After the merge, the distinction between skilled and unskilled trades became less important.

sit-down strike on December 28, 1936. A few days later, members of the Flint UAW local seized two of the Fisher plants in Michigan and within a week GM production stopped. Forty-four days later--after court intervention, reinforcements from both sides, police confrontations, National Guard installments and the concerted efforts of fewer than 2,000 workers had illegally shut down GM and idled more than 150,000 other workers--an agreement was reached. Although the contract gave the workers very little, collective bargaining had truly found its way into the auto industry and the UAW was recognized as a bona fide power of contention (Wright 1988:48-49).

Meanwhile, several years after the infamous and bloody "battle of the overpass," Bennett was beginning to loose his grip on union activities at Ford. On April 2, 1941, 50,000 workers walked out on a wildcat strike after eight workers were fired at the Ford Rouge plant. Workers blocked all entrances to the plant with an automobile caravan--Fords were used to shut down Ford. On April 11, 1941, Henry Ford agreed to a National Labor Relations Board election. Ninety-seven percent of his workers voted for a union and the paternalistic Ford, deeply hurt by what he saw as betrayal, was never quite the same (Wright 1988:51).

But the UAW was just beginning to establish its influence for itself and the auto industry. When President Harry S Truman lifted the wartime wage freeze thereby allowing increases as long as they did not force a price increase, he inadvertently gave Walter P. Reuther the issue he needed to

battle GM and win control of the UAW. Incredulously, Reuther asked for a 30 percent wage increase. After several months of strikes, Ford and Chrysler settled for 18.5 cents an hour, or a wage increase of 17.5 percent. GM followed suit a month later (Wright 1988:63). The UAW gained support and respect and a new president--Reuther; but, more importantly, the UAW gained in influence and power. Automobile workers were now an identifiable and cohesive group wielding their own power and reinforcing an automobile-dependent society. Despite the automakers' reluctance to recognize collective bargaining in the industry, the UAW has helped to strengthen and perpetuate the power the industry holds in the U.S. economy and political decision making. Policymakers must consider what keeps this significant group employed and the economy healthy; politicians must consider this large constituency for their political success.

A recent example of the influence the UAW and automakers have on government policy surfaced during the growing popularity of Japanese imports. Hit by a combination of recession and the gasoline price increases in 1979, the U.S. automakers and the UAW successfully pressured the Reagan Administration and Congress into limiting the number of automobiles shipped to the U.S., thereby, controlling the automobile market and preserving jobs (Leone 1986:105-106).[14]

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[14]This temporary reprieve for the U.S. auto industry resulted in Japanese producers up-grading the product lines they exported and relocating manufacturing to the U.S. (Leone 1986:109).

And so it seems that despite the intense and sometimes bloody disagreements in negotiations between the two parties, automakers had enrolled their greatest supporters--the auto workers who bought their homes and fed their children by making T-birds and Chevies.

Recruiting the Military

While employment in the auto industry has always been important to millions of Americans, the select few who sat at the upper level of the industry's management has always been important to the federal government. These positions were important for two reasons: first, much interaction went on and continues to go on between the two parties and, second, the federal government has often recruited the industry's chief executive officers and upper-level managers for powerful government positions. These placements were often within the Defense Department and increased the influence the auto industry had on the nation's decisions.

War has always meant enterprising times for the auto industry although it has not always been automobiles that it manufactured during these times. The initial interaction between the automobile industry and the government began, significantly enough, during WWI.

Ironically, GM--heavily involved in later military production--refused to convert a new Cadillac body plant to airplane engine production to help the war effort, so Henry Leland and his son broke off from the company. The Lelands

then organized the Lincoln Motor Company and built plane engines (Wright 1988:26-27).[15] This initiated a long association between the auto industry and the War Department (later the Department of Defense):

> This was only the beginning of the "defense connection," which continued in the next war. Prior to the Second World War, William S. Knudsen, president of General Motors, was appointed by Roosevelt to co-chair the Advisory Committee to the Council of National Defense (comprised of cabinet members). In January 1941 this loosely knit organization was superseded by the Office of Production Management (OPM) with Knudsen as director. Knudsen then oversaw the country's massive industrial war-mobilization campaign. His auto-industry orientation was explicit, and not too tactfully hidden. As Knudsen told Roosevelt, "What I think we should do...is to bury the automobile manufacturers under defense orders--three times as much stuff as they can make with their present facilities" (St. Clair 1986:139).

During the war, American automakers profited on both fronts. Besides the abundance of defense orders on its own soil, the U.S. government provided hundreds of millions of dollars of compensation to corporations like Du Pont, GM, Ford and Exxon which owned factories in enemy countries during WWII and produced everything from tanks to synthetic fuels for the Axis war effort. GM executives like Alfred P. Sloan, Jr. served on the board of directors of GM-owned firms in Nazi Germany throughout the war. GM and Ford subsidiaries built the bulk of Nazi Germany's heavier trucks which served as the

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[15] Henry Leland had been the master machinist behind the conception of the Cadillac and had suggested the auto be named not after himself but after Antoine de la Monthe Cadillac, the French explorer who founded Detroit (Wright 1988:17). After their war efforts, the Lelands went on to compete in the luxury car market with the first Lincoln car.

"backbone of the German Army transportation system." Instead of being prosecuted for trading with the enemy, GM collected more than $33 million in compensation for damages to its war plants in enemy territories. Ford Motor Company and other multinational corporations collected lesser sums (Parenti 1980:77-78). Later, war proved profitable in the Asian arena as well. The Du Pont family, who control eight of the forty largest defense contractors--including GM, grossed over $15 billion in military contracts during the Vietnam War (Parenti 1980:11).

But, perhaps more than any other events, the Great Depression and the Second World War were instrumental both through their timing and their intensity to further entrench the automobile and its industry in society and fostered an intimate relationship between government, defense and the automakers. This relationship strongly influenced the direction of government policy and contributed to the momentum of a system built around automobile dependency.

The Automobile Council for War Production, which played an important role in mobilization, brought a number of automobile executives and future lobbyists into government service. One example is Roy D. Chapin, Secretary of Commerce in the Hoover Administration and one of the auto industry's most powerful lobbyists prior to WWII (St. Clair 1986:140).

One instance of Chapin's influence was the Emergency Relief and Construction Act of 1932. The act suspended the requirement for 50-50 matching funds and provided for 100

percent federal financing for rural road projects. It was also at this time that the Hoover Administration initiated using federal funds for urban highways--the first break from the rural domination of the federal highway program (St. Clair 1986:140-144).

Although the automakers had begun to tool up for the War as early as 1940, production of new cars did not end until February 9, 1942. The last car off the line in Michigan was a 1942 Pontiac, a gray sedan with "victory trim," which meant it had no chrome. "The war abroad," G.M. chairman Alfred P. Sloan, Jr., announced, "can only be won on the American industrial front" (Lord 1976:18).

GM ordered its divisions to take any contract they could handle. GM built shells, bombs, fuses, navigation equipment, machine guns, artillery and anti-artillery and anti-aircraft guns in addition to engines and vehicles (Wright 1988:54).[16]

One of Edsel Ford's last undertakings before he died at age 49 was to oversee the construction of a new half-mile-long plant at Willow Run, west of Detroit, to mass-produce Liberator bombers. Also at the plant, General Manager Charles E. Sorenson took on the task of building the B-24 using automotive production techniques. The simple tasks that the assembly line technique created enabled the hiring of

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[16]The Jeep was another auto industry/military collaboration. The small American Bantam, dismissed by car buyers even during the depression, drew the U.S. Army's attention and laid the groundwork for the Jeep's success (Wright 1988:53).

unskilled labor to produced some of the most sophisticated war machinery available (Lord 1976:20).[17]

By July 1942, the war output of the automakers exceeded their peacetime production. By the end of that same year, the war industry had built 40,000 planes and 32,000 tanks (Lord 1976:20). All told, the automakers more than doubled their productive capacity during the war and the influx of workers put the most severe pressures on the city of Detroit in its long history.

After Edsel Ford died in 1943, the government was alarmed at the possibility of one of its biggest defense contractors collapsing, so it called Henry Ford II back from his post as a Navy ensign with the mission of saving the Ford empire (Wright 1988:56). In an attempt to turn the company around, Henry II brought in many military notables who not only made a name for themselves later in the corporate world but went on to influential positions in government as well.[18]

In 1952, Charles E. Wilson resigned as GM president to become Secretary of Defense in the Eisenhower administration.

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[17]Even the lack of employable men during World War II did not hinder output. Nicholas Dreystadt, general manager of Cadillac, hired and trained 2,000 aging black prostitutes--and their madams to manage them--from "Paradise Valley" on Detroit's near east side to work on a war contract to produce aircraft gyroscopes. The women proved to be a successful venture, but lost their jobs to returning veterans after the war (Wright 1988:55).

[18]One of these interchanges, Ford Motor Company President Robert S. McNamara, Secretary of Defense during the Kennedy and Johnson Administrations, brought along his cost-benefit analysis business philosophy to the White House (Wright 1988:57).

When asked by the president if he could make a decision as the secretary in the interest of the nation if it were adverse to GM, Wilson replied, "Yes sir, I could. I cannot conceive of one, because for years I thought what was good for our country was good for General Motors and vice versa. The difference does not exist" (Wright 1988:68).

And whether this philosophy is thought of as an example of corporate arrogance or as old-fashioned patriotism, it exemplifies the ties that were welded between the auto industry and the government and the impact the industry had on this nation's security, economy and its politics. The victory in Europe and the Pacific had championed the automobile industry and those in the upper ranks of the business were seen as something only slightly less than demigods. The nation's security and economic health seemed rooted firmly in the wise authoritative choices of these men.

In 1954, Eisenhower replaced the retiring director of the Bureau of Public Roads with Francis Du Pont of the Du Pont family that controlled GM and the federal government was replete with those sympathetic to the automobile industry.

And, so it was that year that the Clay Committee, filled with friends of the Highway Lobby, told an administration heavily laden with automobile people:

> From the standpoint of civil defense, the capacity of the interstate highways to transport urban populations in an emergency is of utmost importance. Large scale evacuations of cities would be needed in the event of A-bomb or H-bomb attack. The Federal Civil Defense Administrator has said that the withdrawal task is the biggest problem ever faced in the world. It has

> been determined as a matter of Federal policy that at least 70 million people would have to be evacuated from target areas in case of threatened or actual enemy attack. No urban area in the country today has highway facilities equal to this task. The rapid improvement of the complete 40,000 mile interstate system, including the necessary connections thereto, is therefore vital as a civil defense measure. Responsibility for selecting the highway facilities needed for this defensive action has been delegated by executive order to the Bureau of Public Roads (St. Clair 1986:153).

Whether it was an idea whose time had come, the Cold War had instilled fear in the hearts of many or Du Pont exerted a great deal of influence, the defense argument was successful in promoting an expanded federal participation in highway policy. In 1956, the Interstate System officially became the National System of Interstate and Defense Highways and another "problem" was solved by automobiles and their roadways (St. Clair 1986:149).

Parenti (1980) maintains claims that this "defense" argument continues to be used to motivate the American people to protect U.S. corporate interests:

> Knowing that the American people would never agree to sending their sons (and daughters) to fight wars in far-off lands in order to protect the profits of Gulf Oil and GM, the corporate elites and their political spokesmen play upon popular fears, telling us that our "national security" necessitates American intervention wherever a colonial order is threatened by a popular uprising seeking to establish a socialist economic system (pp. 91-92).

Examples of Power

While the auto industry may not have enjoyed a completely closed system, its extensive control of the environment--energy sources, government officials, consumers, the

marketplace, alternative transportation systems and other elements--was an important factor in cementing a system dependent on automobiles. The influence the auto industry has wielded through rhetorical, political and economic power in controlling American values and direction has been submitted throughout this thesis. This discussion would be furthered with a brief look at two elements under the industry's domain --petroleum and safety legislation.

Petroleum

In 1892, seven years after two Germans, Karl Benz and Gottlieb Daimler (independently) produced the first automobile, Charles and Frank Duryea were running the first gas-powered vehicle in Springfield, Massachusetts (Wright 1988:4; Smith & Black 1986:64). When the oil gusher "Spindletop" was brought in on a farm near Beaumont, Texas, in 1901, and thereby doubling the country's petroleum production overnight, it looked as if an inexhaustible supply of cheap fuel for the vehicles had been discovered (Wright 1988:13).

But by 1915, scientific speculation over the lasting availability of oil and a demand for faster cars created the need for more efficient high-compression engines. In 1922, Thomas Midgley, Jr., created a compound that eliminated pre-ignition knock and yet retained its high density energy. This

compound was tetraethyl lead, or "premium."[19] GM formed the General Motors Chemical Company with Charles Kettering as chairman and Midgley as president and contracted to buy a tetraethyl compound from Du Pont. GM then approached Standard Oil of New Jersey and the two companies formed Ethyl Gasoline Corporation. After some fatal explosions and a federal investigation, premium gasoline became a permanent feature at the fuel pumps (Wright 1988:37-38).

This secure network of automobile manufacturers and petroleum producers did everything they could to keep gas prices low (a market cost directly felt by the car owner) in order to maintain their environment and keep selling big, heavy cars and maintain their big profits (Commoner 1971).[20]

Between 1950 and 1970, U.S. energy consumption rose twice as rapidly as the increase in population with a good deal of this increase related to the rising use of the automobile. Fuel efficiency of American-made vehicles was given low priority and even began declining after the middle 1960s. Cars rolling off Detroit's assembly lines in the early seventies consumed more energy per mile than did their predecessors in the thirties (Brown et al. 1979:51). At the same time, however, the world had become increasingly

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[19]This "knock" had been inaccurately blamed on Charles Kettering's self-starter and battery ignition system.

[20]Even with a steep $2 a gallon rise in fuel--increased over a decade to soften the blow--U.S. gasoline prices would still be well below those of other individual nations (MacKenzie et al. 1992:24).

dependent on the Middle East for its oil supplies.

And just when the American automobile industry was making its most inefficient line of cars since World War II, the Organization of Petroleum Exporting Countries (OPEC) cut off the supply of oil to the United States in 1973 (Brown et al. 1979:51). The strength of the bond that Americans had for the automobile was clearly demonstrated during this embargo and again in 1979, when millions of people sat in gasoline lines for hours on end simply for the security of a full tank of gas.

But even after the energy crisis of the mid-1970s, numerous scientific and pseudo-authoritarian sources downplayed and even heartily denied the evidence of a continued and accumulative energy problem. Van Til (1982) illustrates:

> ...then-Congressman David A. Stockman, Republican from Michigan, has argued that proven reserves of fossil fuels have been added more rapidly than consumption so that "nearly five years after the scarcity threat first arose, new reserves are still being added faster than production." Moreover, Stockman asserts that "the planet's accessible natural hydrocarbon reserves readily exceed 20 trillion barrels. This is the equivalent of five centuries of consumption at current rates." Thus, to Stockman, the problem of energy is not one of supply, but of appropriately pricing different energy sources. It is on the assumption that plentiful fossil fuels remain and that the newer sources of energy can be developed before these fossil fuels are exhausted that confidence in an energy-sufficient future has been maintained (p. 13).[21]

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[21]It should be noted that, as a congressman, Stockman was viewed by his constituents as an authority who had access to "inside" information not available to the average consumer and, thus, made his "wise" decisions accordingly. It should also be noted that Stockman and his constituents reside in Michigan, the home of U.S. auto manufacturing and state that had

Not only Congressman Stockman but the U.S. government as a whole sent out these mixed messages and inconsistent information throughout the 1980s regarding the energy situation. One of Ronald Reagan's first official actions as president was to end the federal government's mandatory building energy standards, which set public building temperature levels for seasonal energy conservation (Clark and Page 1981:118). This anti-conservation behavior persisted throughout the decade as the Reagan administration succeeded in increasing highway speed limits and consistently sought to terminate all conservation programs except for a small amount of funds for basic research studies.

As oil prices dropped again in the 1980s, and as the Reagan administration rolled back fuel-economy standards, the U.S. automakers attempts at energy efficient cars and trucks dropped off too. While the average new U.S.-made car's gas mileage jumped from 14 miles per gallon in 1974 to 28 m.p.g. in 1989, from 1986 to 1988, the average U.S. new-car fuel economy increased by just 0.4 m.p.g. (Flavin et al. 1989:8; Wright 1988:81). By 1983, 27 percent of the total energy generated by the U.S. was consumed by the transportation sector.

The 1980s also saw a feverish merger boom with billions of dollars figuratively being passed across board room tables as already massive oil companies gobbled up smaller ones. The

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much to lose if car buyers changed their consumptive habits and tastes.

reasons behind the merger boom were a complex mix of political, technological and financial factors. Oil executives were wary of U.S. antitrust legislation and impending U.S. presidential election. But more important, the 'Seven Sisters' were running short of oil.[22] The life expectancies of their reserves were beginning to dwindle and looking for oil became a much more difficult and expensive task. The "finding costs" for new oil reserves had risen from $1 a barrel to over $10 per barrel between 1974 and 1984. So, compared to their true asset value, it was much cheaper to look for oil on Wall Street than in the Arctic (Tank 1984:152-3).

With less than 5 percent of the world's population, the U.S. consumes a quarter of the world's oil and one-half of this--about 8.9 million barrels per day--is burned in motor vehicles (MacKenzie et al. 1992:2). Since motorists use about half of imported oil, up to half the cost of maintaining a U.S. military presence in the Middle East--or $50 billion annually--could be considered part of what it costs to drive (MacKenzie et al. 1992:vii).

If the dependence on foreign oil was not enough of a volatile situation, there was always the environmental concern that accompanied petroleum consumption. Researchers in California had determined that the irritating cloud of smog

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[22]The "Seven Sisters" were Exxon, BP, Shell, Mobil, SOCAL (with Gulf) and Texaco.

that was spreading not only in the Los Angeles area, but metropolitan areas around the country, was caused by unburned hydrocarbons (droplets of gasoline) in automobile exhaust reacting with oxides of nitrogen, also present in auto exhaust, and sunlight (Wright 1988:80). The United States continues to be the largest contributor of carbon, producing 1.4 billion metric tons of carbon annually, one-fifth of the global total, or five tons for each citizen. And since 1986, the amount has increased each year (Flavin 1989:2).

It seems that U.S. society has traded its predicament with horse emissions for a far more precarious and lethal dilemma. Americans may now travel farther and more frequently than ever before, but toxic emissions and defense expenses have increased as well. This continuing adherence to energy use that is clearly inefficient and hazardous to the environment and national security attests to the stronghold the automobile-dependent system has on the nation.

Safety

Safety has never been a priority in the auto industry. Safety didn't sell cars; safety didn't make a profit. Americans have come to fully accept the fact that auto accidents are the leading cause of death of Americans from age 5 to 45 and the industry has become nefarious in its neglect to decrease such statistics (Wright 1988:4). In fact, the automobile industry was the last great unregulated business and its demise was mostly brought about through the efforts

of one man.

The industry's lack of interest in safety can be observed as early as 1929 when Du Pont produced safety glass and was pushing for its adoption from the comfortable position of making a profit on a demonstrable humanitarian product. Alfred E. Sloan, Jr., then president of GM said that GM would not lead the way in making driving safer. To do so, Sloan said, would "materially offset our profits. Our gain would be a purely temporary one and the net result would be that both competition and ourselves would have reduced the return on our capital and the public would have obtained still more value per dollar expended" (Jerome 1972:98).

The Corvair was another example of this emphasis on profits over human lives. The Corvair tended to oversteer and roll more easily than could be considered safe. Although much dissention arose among GM decision makers, one million Corvairs were sold before a stabilizer bar was installed and a new suspension designed.

This carelessness attracted the attention of young Harvard-trained lawyer, Ralph Nader, who had been collecting information on auto accidents. As a self-appointed lobbyist for the public, he served as a consultant to the new Senate Subcommittee on Executive Reorganization which decided to hold hearings on the federal government's role in auto safety. By 1965, more than 100 lawsuits involving the car had been filed (Wright 1988:70-71).

In his book, " Unsafe at Any Speed," an indictment of the

auto industry in general and the Corvair in particular, Nader cited the Corvair as "one of the greatest acts of industrial irresponsibility in the present century" (Nader 1965). GM immediately went about trying to suppress the bad publicity, but when it discovered that it could neither control nor silence Nader, it attempted to discredit him by hiring detectives to look for scandal in his private life (Jerome 1972:100).[23]

Nader's work was the catalyst for the Motor Vehicle Safety Bills introduced to both houses of Congress. Rushing to the Capitol, Henry Ford II held his own set of press conferences, contacted members of Congress and recruited business cronies to join the anti-regulation battle. But Nader's efforts had been effective and the Safety Act passed both houses and was signed into law by President Johnson in 1966 (Dowie 1977).

But GM was not alone in its abuses in automobile safety. Ford had also developed a system of "cost-benefit analysis" that pitted human life against profits. Similar to the decisions made over the highly-polished executive tables at GM, human life lost out at Ford as well. Ford reasoned that it was cheaper to knowingly allow hundreds of burn deaths than to install a $5.08 safety devise to the Ford Pinto's gas tank because as Lee Iacocca, Ford president at the time, said,

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[23] GM president James Roche was later directed to make a public apology to Nader and the U.S. Senate.

"Safety doesn't sell" (Dowie 1977). Thus, through political influence on safety legislation and the use of courtroom rhetoric, the company was able to continue manufacturing a while longer a profitable product that was a known fireball when rear-ended.

More recently, GM opposed air bags because the restraints increased the costs of the vehicle relative to other automotive services. It held that the air bags' mandatory purchase would encourage less frequent purchases of new cars and/or otherwise less costly vehicles (Leone 1986:69).

But, what may be evaluated as a greedy, irresponsible bid for profits may have been a rational assessment of what American drivers wanted. It seems that when it came to the added expense of safety accessories GM was not too far off the mark when reading the values of the American people. Paradoxically, although most Americans refused to wear seat belts before legislation took place, many drivers justified the purchase of bigger, heavier cars than they needed as a safety measure (Yerkin 1980:103). Of course, the larger, heavier car also had the added advantage of serving as a status symbol for the owner (and meant bigger profits for the manufacturers). Similar rationale was found in studies regarding energy conservation. Wilk and Wilhite (1987) found that homeowners were highly receptive to such improvements as gardening and landscaping because both had beautification properties highly visible to one's neighbors, yet energy-saving behavior like insulation/weatherizaton (or car pooling)

suffered because the benefits were economic and served no "social ends." Car buying figured along the same line of logic. The buyer was willing to pay for a "safety measure" if it added to one's perceived status, but not if it was an option without any redeeming social value. Thus, understanding the back-seat importance of safety in U.S. automobiles requires the analysis of both profit margins and American people's values.

Chapter Four

Conclusion

Few technologies have had a more fundamental impact on the U.S. than the automobile. Within several decades, it has not only transformed transportation patterns but created extensive social and physical changes as well. But while the automobile enabled greater personal mobility and the freedom to live in dispersed communities, it also locked people into a dependence on a technological artifact for work, food and friends. These social and physical changes did not arise out of necessity but, rather were the result of manipulation by those whose interests (prompted by either profits or values) could be furthered by an automobile-dependent lifestyle.

For the most part, enrolling new elements into believing, or constructing the fact, that the automobile was an indispensable part of a better life, or "the American Dream," did not necessitate a hard-driven campaign because Americans had a predisposition for what the vehicle enabled. Thus, embracing the car did not require a dramatic shift away from people's goals; the vehicle simply offered a shortcut in reaching those goals of greater mobility, power and privacy (Latour 1987:111-112). This was certainly the case with the farmer. Automobiles improved rural living conditions in many ways; thus, rural living was enhanced while the interests of the automobile industry were promoted. This "piggybacking" of interests held true for most of society (Latour 1987:108-

110).

Automobile use was also advanced by many timely events. A flood of immigrants provided a steady supply of workers for assembly line production. This same production allowed inexpensive technology to quickly inundate the market and re-establish expectations in lifestyles and community settlement in a young and growing nation. Concerns over national defense and urban decay were also cultivated by those with vested interests to promote the growing use of the automobile. The Great Depression magnified the downward spiral of mass transit systems by decreasing public transit ridership while the victories of WWII heightened the regard held for the auto industry and its managers.

Enrollment into an automobile-dependent society was accomplished with rhetorical approaches as well. Advertising was used to expand a market that was already saturated with vehicles by commercializing on the car's value as a powerful status symbol and marketing strategies like "dynamic obsolescence" expounded on the automobile's ability to reflect one's successful standing in society. Testimony by government officials and other "authorities" championed the automobile's problem-solving abilities while downplaying its negative consequences and suppressing the vehicle's critics.

The auto industry also begat powerful pressure groups like the Highway Lobby and the UAW. These groups, in turn, bolstered the considerable influence the industry had on government policymaking to subsidize private vehicle ownership

and encourage more energy-intensive highway freight movement to the detriment of the railways. When policy did not blatantly promote the auto industry's interests, it, at least, was relatively well synchronized with the industry's strategy as was the case with GM's downsizing strategy in 1974 and the Energy Policy and Conservation Act a year later (Leone 1986:98).

All these elements committed by various interests interacted and contributed to the construction of a "system" dependent on the automobile (Hughes 1987:76). As the system drew in more and more elements, a powerful momentum developed that energized itself and created greater ease in controlling the environment. Constructing this system often involved the destruction of alternative systems (Law 1987:113). This activity was clearly evident in the ruination of the electric transit lines that resulted in greater enrollment of elements into an automobile-dependent system.

Through the efforts of various lobbying groups, influential government positions, deft handling of national defense concerns and highway policy, and eliminating alternative transportation, the auto industry went about serving its own interests by creating a "derived demand" for automobiles (St. Clair 1986:26). Eventually, attribution lines became blurred and it was impossible to tell who was enrolled and who was enrolling, who was going out of his/her way and who was not. Ultimately, enrollment into an automobile society became inescapable (Latour 1987:118-138).

In sum, those involved in the push for widespread automobile use were able to construct and force unification and centralization from a pluralistic and diversified transportation system, and derive coherence from disorganization (Law 1987:113).

In terms of "automobility," Americans were and still are in a league of their own. Mobility remains an inalienable right in the United States and any tampering with personal driving habits is seen as an "unacceptable constraint on personal liberty" (Barbour 1982:162). In 1990, a record 190 million motor vehicles were registered in the U.S.--23 million more vehicles than licensed drivers (MacKenzie et al. 1992:1). But the fact that the U.S. has more licensed drivers than registered voters is probably more revealing. One of the main criticisms of the National Energy Plan during the Carter Administration was its failure to confront this "car culture" of the United States (Cockburn and Ridgeway 1977).

Despite the country's growing dependence on imported oil, a perilous trade deficit and the environmental hazards, there is little evidence that this lifestyle will disappear. Total gasoline consumption is once again rising in the U.S. and more people are buying cars with greater horsepower and less fuel economy. The use of public bus and rail systems was no higher in 1987 than it was in 1979 and Americans are driving more miles in more cars and usually on solitary trips (Flavin et al. 1989:8).

While the drive to build more roads may once have been

appropriate, today that strategy is destined to fail; ample evidence shows that every time a roadway is built or widened, more drivers appear and the new or expanded roads soon become as congested as the old ones (MacKenzie et al. 1992:25). So, ironically, as congestion increases, the path American society chose for increased personal mobility no longer guarantees that movement. But, any drive away from this dependence on an inefficient and dangerous system requires changes in technology, American values and government policy that allow for balanced opportunities in transportation alternatives.

Urban planning must incorporate residential areas where walking, biking and mass transit are viable alternatives. But in order to ensure the success of alternative transit systems, they must be more popular, convenient and effective in meeting people's needs. This includes promoting settlement of fairly high residential densities combined with mixed zoning that not only supports public transportation but bicycling and walking as well (MacKenzie et al. 1992:26). Fortunately, some planners like Andres Duany and Elizabeth Plater-Zyberk of Miami are already involved in pedestrian-oriented design or low-rise, high density neighborhoods that allow residents to drive fewer cars fewer miles. Ideas like the electronic cottage that allows more work to be done within the home and four-day workweeks are other ways to lessen consumption and congestion.

Since we cannot expect suburbs to go away nor rural areas to grow closer together, more energy efficient and alternative

energy vehicles must be supported by government policy. As an economic incentive to promote alternative uses and less wasteful behavior, petroleum prices must be allowed to increase as they have in other countries. A gallon of gasoline costs less today in *real* terms than it did in 1974 (Flavin et al. 1989:9). This artificial regulation is a part of the bias federal policies have been practicing to the advantage of the automobile industry. In the past, government policies have shifted the direct market costs away from drivers, therefore making driving personal vehicles seem cheaper and eliminating any strong economic incentive to buy energy efficient cars and use them less. A "polluter pays" principle of cost allocation would begin to shift the various costs associated with motor vehicle use to the drivers who impose them--such as an increased fuel tax and trucking levies. Thus, the heaviest users would bear the greatest burden (MacKenzie et al. 1992:5-7, 24-25). A coupon program for the poor is one way to alleviate the burden from falling on those less able to pay.

Federal funding formulas, too, must be changed to favor public transportation or at least not to disadvantage it. Policy should be redirected in the promotion of more energy-efficient forms of transportation such as rail cars that convert to truck trailers and bicycle commuting (Flavin et al. 1989:11).

The Intermodal Surface Transportation Efficiency Act of 1991 adopted some of these reforms. This landmark law

authorized $151 billion for highway and public transit over the following six years. Of this, $32 billion was specifically earmarked for mass transit--twice the previous annual spending and twice the amount recommended by President Bush. Except for the completion of a small portion of the interstate system--the same ratio of federal to local funding will apply to both highway and transit projects for the first time, removing the previous bias toward building roads (MacKenzie et al. 1992:26-27).

These extrinsic changes can begin promoting a less automobile-dependent society, but the social-psychological obstacles rooted in a consumptive lifestyle that has been reinforced by past policy and events will take longer to modify (Katzev and Johnson 1987:79). First, it must be realized that these consumption changes do not mean a change in living conditions.

In this issue, U.S. cities can take a lesson from European cities--proof that a high standard of living is compatible with a reduced need for cars. Sweden is an example of an industrialized country with a comparable standard of living, yet its residential energy consumption is 70 to 85 percent lower than U.S. rates (Erickson 1987).

Because of government policy and public concern, Swedes use more mass transit, drive lighter cars and have fewer cars per capita--there is one automobile for every four Swedes as compared with one for every two U.S. citizens. Consequently, Swedes use 31% less energy for transportation (Schipper and

Lichtenberg 1976).

The social and cultural factors Erickson (1987) found promoting energy conservation in Sweden--an ecological awareness and concern, a love of nature, a strong national and global identification, a moralistic outlook, and a code of moderation--stem from attitudes about community and nature.[24]

But, unlike in Sweden, energy conservation has not been emphasized or rewarded in the U.S. In fact, in the past, government policy and special interests have disparaged these values. As this thesis has asserted, deliberate steps have been taken to exalt a consumptive lifestyle, reorganize or direct the physical world to promote automobile use and undermine less consumptive alternatives.

It is important to understand the historical events and processes that have determined the particular transportation system that currently exists in American society in order to plan for the future. Old systems like old people tend to become less adaptable, but systems do not simply grow frail and fade away. Large systems with high momentum tend to exert a soft determinism on other systems and groups in society (Hughes 1987:54-5). A history of cheap and abundant energy, value placed on personal mobility and unlimited consumption, and the command of the auto industry and related interest

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[24]For example, Erickson (1987) found that Swedes chose walking or bicycling over driving mainly because it was *skont*, or beautiful, to exercise, rather than in order to reduce gasoline consumption. They also displayed a concern over fuel alternatives and how *miljovanlig*, or friendly, each alternative was to the environment.

groups is the foundation for U.S. institutions and human settlement. The subsequent beliefs and transportation patterns that evolved from this foundation are not easily altered and will remain as contentions for future policy.

LIST OF REFERENCES

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Barbour, Ian, H. Brooks, S. Lakoff, and J. Opie. (1982). *Energy and American Values*. New York: Praeger Publishers.

Bennis, Warren G., Kenneth D. Benne and Robert Chin. (1985). *The Planning of Change*. New York: Holt, Rinehart and Winston.

Berger, Michael L. (1979). *The Devil Wagon in God's Country: The Automobile and Social Change in Rural America, 1893-1929*. Hamden, Connecticut: Archon Books.

Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.). (1987). *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press.

Brown, Lester R., Christopher Flavin and Colin Norman. (1979). *Running on Empty: The Future of the Automobile in an Oil-Short World*. New York: W.W. Norton & Company.

Bruce-Briggs, B. (1975). *The War Against the Automobile*. New York: E.P. Dutton.

Buel, Ronald A. (1972). *Dead End: The Automobile in Mass Transportation*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Burton, Dudley J. (1980). *The Governance of Energy: Problems, Prospects and Underlying Issues*. New York: Praeger Publishers.

Callon, Michel. (1987). "Society in the Making: The Study of Technology as a Tool for Sociological Analysis," in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, pp. 83-103.

Clark, W. and J. Page. (1981). *Energy, Vulnerability, and War: Alternatives for America*. New York: W.W. Norton & Co.

Cockburn, Alexander and James Ridgeway. (1977). "Carter's Powerless Energy Policy," *New York Review of Books,* Vol. 24, May 26.

Commoner, Barry. (1971). "The Economic Meaning of Ecology," in Skolnick, Jerome H. and Elliott Currie. (1991). *Crisis in American Institutions*. New York: HarperCollins Publishers Inc, pp. 320-326.

Constant II, Edward W. (1987). "The Social Locus of Technological Practice: Community, System, or Organization?" in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, p. 223-242.

Cowan, Ruth Schwartz. (1987). "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, p. 261-280.

Cunningham, W.H. and S.C. Lopreato. (1977). *Energy Use and Conservation Incentives: A Study of the Southwestern United States,* New York: Praeger Publishers.

Davies, Richard O. (1975). *The Age of Asphalt: The Automobile, the Freeway, and the Condition of Metropolitan America*. Philadelphia: J.B. Lippincott Company.

Denison, Merrill. (1956). *The Power to Go*. New York: Doubleday & Company, Inc.

Dowie, Mark. (1977). "Pinto Madness," *Mother Jones,* Vol. II, No. VII, September/October, pp. 18-32.

Erickson, Rita J. (1987). "Household Energy Use in Sweden and Minnesota: Individual Behavior in Cultural Context," in Kempton, Willett and M. Neiman (eds.), *Energy Efficiency: Perspectives on Individual Behavior,* Washington, D.C.: American Council for an Energy-Efficient Economy, pp. 213-228.

Fink, James J. (1975). *The Car Culture*. Cambridge, MA: The Massachusetts Institute of Technology Press.

Flavin, Christopher; Rich Piltz with Chris Nichols. (1989). *Sustainable Energy*. A report by Renew America, Washington, DC.

Hill, Frank Ernest. (1967). *The Automobile: How It Came, Grew, and Changed Our Lives*. New York: Dodd, Mead & Company.

Hughes, Thomas P. (1987). "The Evolution of Large Technological Systems," in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, pp. 51-82.

Janeway, Elizabeth. (1956). *The Early Days of Automobiles*. New York: Random House.

Jerome, John. (1972). *The Death of the Automobile*. New York: W.W. Norton & Company.

Katzev, Richard D. and T.R. Johnson. (1987). *Promoting Energy Conservation: An Analysis of Behavioral Research,* Boulder, CO: Westview Press.

Latour, Bruno. (1987). *Science in Action*. Cambridge, MA: Harvard University Press.

Law, John. (1987). "Technology and Heterogeneous Engineering: The Case of Portuguese Expansion," in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, p. 111-134.

Leone, Robert A. (1986). *Who Profits*. New York: Basic Books, Inc.

Lord, Chip. (1976). *Automerica: A Trip Down U.S. Highways from World War II to the Future*. New York: E.P. Dutton & Company, Inc.

Lynd, Robert S. and Helen Merrill Lynd. (1929). *Middletown: A Study in Modern American Culture*. New York: Harcourt, Brace & World.

MacKenzie, James J., Roger C. Dower and Donald D. T. Chen. (1992). *The Going Rate: What It Really Costs to Drive*. World Resources Institute, June.

Mandel, Leon. (1977). *Driven: The American Four-Wheeled Love Affair*. New York: Stein and Day.

Morris, Charles R. (1990). *The Coming Global Boom*. New York: Bantam Books.

Nader, Ralph. (1965). *Unsafe at Any Speed*. New York: Grossman Publishers.

Naisbitt, John. (1982). *Megatrends*. New York: Warner Books, Inc.

Pactolus, William. (1970). *The Great American Toy: Automobiles in American Culture*. New York: Herder and Herder, Inc.

Parenti, Michael. (1980). *Democracy for the Few*. New York: St. Martin's Press, Inc.

Pinch, Trevor J. and Wiebe E. Bijker. (1987). "The Social Construction of Facts and Artifacts," in Bijker, Wiebe E., Thomas P. Hughes, and Trevor Pinch (eds.), *The Social Construction of Technological Systems*. Cambridge, MA: The Massachusetts Institute of Technology Press, pp. 17-50.

Schneider, Kenneth R. (1971). *Autokind Vs. Mankind*. New York: Schoken Books.

Schipper, L. and A.J. Lichtenberg. (1976). "Efficient Energy Use and Well Being: The Swedish Example." *Science* Vol. 194, pp. 1001-1013.

Smith, Mark and Naomi Black. (1986). *America on Wheels: Tales and Trivia of the Automobile*. New York: William Morrow and Company, Inc.

Snell, Bradford Curie. (1973). "American Ground Transport," in Skolnick, J.H., and E. Currie (eds.), (1991). *Crisis in American Institutions*. New York: Harper Collins Publishers, pp. 327-341.

Sobel, Michael (1981). *Lifestyle and Social Structure*. New York: Academic Press.

Sorokin, Pitirim A., Carle C. Zimmerman and Charles J. Galpin (eds.). (1930-32). *A Systematic Resource Book in Rural Sociology,* Vol. 3, Minneapolis: University of Minnesota Press.

St. Clair, David J. (1986). *The Motorization of American Cities*. New York: Praeger Publishers.

Tank, Andrew. (1984). "Multinationals: The Concentration Intensifies," in Pete Ayrton et al. (eds.), *World View,* New York: Pantheon Books, pp. 149-155.

Tashchian, R.O. and M.E. Slama. (1985). "Survey Data in Attitudes and Behaviors Relevant to Energy: Implications for Policy," in Byrne, John, D.A. Schulz and M.B. Sussman (eds.), *Families and the Energy Transition*. New York: The Haworth Press, pp. 29-51.

Townroe, P.M. (ed.). (1974). *Social and Political Consequences of the Motor Car*. West Vancouver, BC: Douglas David and Charles Limited.

Van Til, Jon. (1983). *Living with Energy Shortfall: A Future for American Towns and Cities,* Boulder, CO: Westview.

Weiss, Michael J. (1988). *The Clustering of America*. New York: Harper & Row, Publishers.

Wilk, R.R. and H. Wilhite. (1987). "Why People Don't Weatherize Their Homes?: An Ethnographic Solution," in W. Kempton and M. Neiman, (eds.), *Energy Efficiency: Perspectives on Individual Behavior,* Washington, D.C.: American Council for an Energy-Efficient Economy, pp. 51-68.

Wright, Richard A. (1988). *Love and Revolution: The First 101 Years of the Automobile*. Farmington Hills, MI: Thirty-Three Publishing.

Yergin, Daniel (ed.). (1980). *The Dependence Dilemma: Gasoline Consumption and America's Security*. Cambridge, MA: Center for International Affairs, Harvard University.

Zuckerman, Wolfgang. (1991). *End of the Road: The World Car Crisis and How We Can Solve It*. Post Mills, Vermont: Chelsea Green Publishing Company.