and state water and soil experts, to decide on, and implement appropriate kinds of local interventions to improve and maintain their specific resources base of land conformation, soils and water. Over the decades, the methods included contour farming, ponds, terracing, underground drainage, windbreaks, and others.

The purpose is expressed in the Act itself, which states (from 49 U.S. Statutes at Large 163): ". . . [I]t is hereby recognized that the wastage of soil and moisture resources on farm, grazing, and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion, and thereby to preserve natural resources, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health, public lands and relieve unemployment; and the Secretary of Agriculture, from now on, shall coordinate and direct all activities with relation to soil erosion and in order to effectuate this policy."

Today the soil districts cover half of all the privately owned land in the country. There have been marked results. One demonstration project was started in Coon Valley, Wisconsin, which is located in a region called the Driftless Area. The 1920s Coon Valley soil erosion rate was estimated to be nearly 15 tons per acre. But by 1992, the rate was down to just over 6 tons per acre. Moreover, this improvement occurred despite the changeover of cropping away from small grains (wheat, oats, barley—which normally have a lesser erosion rate), to row crops (corn, sorghum, and others—which encourage higher erosion).

Thus, for over 60 years, the Coon Valley remains a very productive agricultural area. Among the practices introduced were contour tillage (illustrated in the photograph), strip-cropping, and terracing; also use of no-till (ploughing only every few years, and otherwise using seed-boring, and herbicides) and other forms of residue management practices. In recent years, some land was also taken out of farming (in the Conservation Reserve).

However, this kind of improvement process has been counteracted over the past 30 years by underfunding, and by the imposition of the *anti-improvements* view—presented under many guises, such as back-to-nature, or "free markets." In 1937, some $463 million was appropriated to the Agriculture Conservation Program and Soil Conservation Service. Today, the equivalent public funding level would be around $5 billion a year, but barely half of that—$2.2 billion—was the annual expenditure norm in the late 1990s. This accompanies drastic cutbacks in the Army Corps of Engineers' mandate, and in funding for water infrastructure projects.

Launching long-overdue large-scale water management projects—such as the North American Water and Power Alliance—reinvigorating the Soil Conservation Districts, and unleashing the Army Corps of Engineers, can literally create new "natural resources" of land and water.

1956 Highway Act Broke Down U.S. Transport

by Richard Freeman

The United States set the stage for compromising the integrity of its entire transport network when it decided to pour huge sums into the U.S. Interstate highway system, by passing the Interstate and Defense Highways Act of 1956. President Dwight Eisenhower signed the Act into law on June 29 of that year. At the time, this may have seemed a useful decision to benignly move a greater volume of motor vehicles, and for national security travel in an emergency. But the Wall Street-City of London financiers who sponsored the legislation had other ideas in mind.

Their plan was to make truck and car traffic the primary mode of U.S. freight and passenger transportation. They sought to destroy the U.S. rail network, which was America's most efficient transport mode, and then its dominant one. Along with real estate interests, they envisioned highways as the primary means to rake in hundreds of billions of dollars through the creation of suburbia, including building suburban housing developments and shopping malls, which speculatively raised land prices several-fold. The oil and automobile interests also had a heavy hand in this *coup de grâce* to the traditional railroad-transport economy.

Since that 1956 legislation, Federal, state, and local governments have poured more than $2.5 trillion into building—and increasingly, repairing—the U.S. highway and road system; road spending was $125 billion in 2001.

The United States is now reaping the fruits of destruction.

Nowhere To Expand Any Further

The highway system is imploding in two interrelated ways: one, of which the public is acutely aware, is high and constantly increasing traffic congestion; the other, less noticed but as serious, is that the ever-escalating volume of truck traffic rips apart the roads at an horrific rate, which exceeds their possible repair.

First, whereas two decades ago, travellers normally travelled the Interstates or principal arterials at posted speeds of 55-65 miles per hour or more; now, at peak congestion times, especially in urban areas, many crawl along the major routes at speeds of 20-45 mph. Millions of commuters are forced to spend between 1.5 to 3.5 hours each day commuting to and from work.

Alongside this slow and slowing passenger traffic, the increased use of trucks, and accompanying destruction of roads, is raising the bill for roadwork. In the period since the

Robert Moses: Enemy of Railroads

Born in New York City in 1888, Robert Moses attended Yale and then Oxford University, where in 1913 he wrote a doctoral thesis on the British Civil Service. He praised it as the means by which the "upper division"—by which he meant the wealthier men drawn from the "best" schools—ruled. Moses became a close ally of New York Gov. Al Smith, who in the 1930s helped lead the pro-fascist American Liberty League, which in 1933 attempted a coup against Franklin D. Roosevelt.

Moses became both New York City's Park Commissioner and its Construction Coordinator. In 1945-46, he planned out the construction of the Van Wyck Expressway, to run from the Borough of Manhattan into the northern part of the Borough of Queens, and then to the southern part of Queens, close to what would become Idlewild Airport—now called Kennedy Airport. At its peak, the Van Wyck could accommodate only 2,300 cars per hour. A leading city planner proposed that in the expressway's median strip or alongside it, there be built a mass transit train system that could accommodate, at its peak, 40,000 persons per hour. Moses crushed this sane proposal, so that it never saw the light of day. He deliberately built every expressway and bridge in and around New York City and parts of New York State that he had a hand in, so that it would offer no access to mass transit or heavier rail traffic.

Moses brought this anti-rail bias with him when, in 1956, he held several meetings with Gen. Lucius Clay to plan out the Interstate and Defense Highways Act.

1970s, in order to save money and increase the bottom line, shippers and trucking companies began to push hard for regulations increasing the weight limit of trucks allowed on the highways. On most of the U.S. Interstate highway system, the truck weight limit has been pushed up to 80,000 pounds, but much higher weight limits on principal arterial systems in 20 states have been grandfathered into Federal legislation, bringing the truck weight limit up to 130,000 pounds. These trucks rip away at the pavement at a frightening rate. This not only costs all levels of government nearly $100 billion per year in repairs, but the deteriorated road conditions cause tens of billions of dollars of damage annually to cars and trucks riding on the roads, and deaths to truck drivers and auto passengers. Many trucks try to travel at night or at off-hours; nonetheless, they still add to massive congestion in and around major cities.

Some parts of the U.S. highway system in urban areas have reached a physical end point: There is no physical space to expand to, without disrupting economic activity. In some areas, highway systems already have 10 lanes (5 for traffic in each direction). Highway planners have proposed adding 4 to 8 more lanes to highways across the country, which in the extreme would create 18-lane highway monstrosities. But in this situation, the system runs out of land and physical space; moreover, even were land available for such endless widening, it is time to put an end to this insanity: It is dangerous to keep expanding an inherently inefficient system, which when pushed to its limits, will collapse.

As Lyndon LaRouche emphasized in "Science and Infrastructure" (*EIR*, Sept. 9), the United States, and other nations, must institute transport systems which transmits scientific advances; whose characteristic is the increase in the anti-entropic activity of the economy as a whole. This means a rail transport system, which, compared to motor vehicles, can move people and goods at higher efficiencies; with greater power-flux density; with less land use; and at much higher speeds. This requires, on an emergency basis, rebuilding America's failing rail grid, and moving as quickly as possible to magnetically levitated trains, which represent a scientific revolution.

To accomplish this, we must free people from the ingrained, false idea that the way to fix the troubled transport grid is to fill pot-holes, and add more miles of highway. Look hard at the 1956 Act, and the destructive process it has unleashed over the last four decades.

Push Toward Highways

The 1956 Highway Act represented as sharp a shift in U.S. transportation policy as any since the decision by President Abraham Lincoln—and his economic adviser, the great American System economist Henry C. Carey—to launch the transcontinental railroad system.

In the 1830s, the United States had first begun building railroads: State governments, leading engineers from the U.S. Army Corps of Engineers, and private investors played a role in this. In the period 1861-76, Lincoln and Carey used the dirigistic power of the U.S. government to make railroads the instrument of a policy of nation-building: They built the transcontinental railroad system, which connected the nation's East and West Coasts, and radiated outward to connect most major areas of the country. In the rail corridors, there developed cities, manufacturing economy, and the spread of civilization.

During the 1939-44 economic mobilization for World War II, railroads played the leading role. In 1943, railroads carried 73% of U.S. goods transported; trucks carried only

5%. It is not known what the optimum percentage of goods carried by trucking should be; but during the 1939-44 mobilization, the economy functioned at a very high and expanding level, with trucking carrying only 5% of all goods. Railroads also transported a considerable share of passengers between cities.

The Federal government had been involved in highway construction since the 1910s. In 1916, the U.S. Congress passed the Federal-Aid Road Act, which established the concept of a cooperative Federal-state program, in which the U.S. government provided financial assistance for highway building through the respective state highway departments. This also aided in setting a national standard for grading the roadbed, installing culverts, laying a Portland cement or other type of base, etc.

There were also other Federal highway acts, including the 1941 Defense Highway Act.

In 1956, Anglo-American oil and auto magnates, and financiers mobilized to pass the Interstate and Defense Highways Act, and deliberately degraded the U.S. transportation mode to a lower level of technological functioning based on motor vehicle traffic. President Eisenhower was convinced to sign these into law, largely on the grounds that highways were needed for an emergency defense mobilization, as had been recommended in 1954 by a Presidential Advisory Committee on a National Highway Program, chaired by General Lucius Clay.

In all previous Federal highway projects, the Federal government had borne 50% of the construction cost, with the remainder split between state and local governments. However, in this Act, the United States officially committed to 90% of all construction costs, giving the project an outright subsidy. The Federal government spent approximately $40 billion, an enormous sum in the 1950s. The Act authorized the incorporation of some existing roads, but largely mandated the construction of new roads, to form 42,500 miles of highways as the Interstate highway system, which linked all 48 states in the continental United States. It was completed in the 1970s.

It could have been argued that the Interstate system had a delimited and circumscribed military use, and would help civilian transportation in outlying areas not fully served by rail—were it subordinate to the railroad and waterway grid, which represented better modes of transport. But the bankers sought to supplant rail and water transport by trucking entirely.

Multimillionaires and Malls

Financial and real estate interests saw the highway system as a speculative land policy, as well as a boon to the automobile and oil industries. In addition to the 42,500 mile Interstate highway system, improvement or new construction was undertaken of at least another 300,000 miles of principal highway arterials and main collector roads, which were not part of the Interstate network proper. Around this vast road network were built housing developments, where home mortgages would be taken out. Shopping and strip malls were built, which required major bank financing. The prices of previously undeveloped land or farmland went shooting up, making those who swooped in and bought up these lands multimillionaires.

Over the last 40 years, financial, real estate, and retail interests made trillions of dollars from this process spun outward from the highway system. A process of sprawl emerged, called suburbia, instead of the well-organized, planned, and populous cities, with factory systems and "downtown" centers for culture and economic activity, toward which Americans had steadily migrated throughout the nation's existence until that time.

The actual pro-land-speculation, anti-rail purpose of the 1956 Highway Act is epitomized by the work of Robert Moses, one of the people who helped draft it (see box).

In the 1950s, syndicates were formed to destroy the electrified streetcar and transit systems which were already in existence in cities, some of them dating back to the early 1900s, which had made the development of cities possible, but which were viewed as rivals to highways. For example, Los Angeles had an electrified streetcar system, known as the Red Cars, which travelled on large boulevards, and were an inexpensive and fast means of travel. A syndicate of oil and tire companies bought the Red Cars system, and then shut it down, taking pains to physically destroy it. In Baltimore, that city's electrified streetcar system was bought by a syndicate of oil and car companies, which destroyed the system.

The 1956 Highway Act—combined with this "search and destroy" operation—contributed to the initial sinking of the railroads. Then, the 1980 Staggers Act deregulated the rail industry. In the ensuing years, the financiers carried out takeovers and asset-stripping of the rail lines. With respect to rail freight transport since 1980, for Class I rail companies (the biggest rail companies), 40% of the trackage has been contracted, 27% of the locomotives have been furloughed, and 63% of the labor force has been fired. Wall Street and its Congressional allies, like Sen. John McCain (R-Ariz.), are moving to bankrupt and dismantle Amtrak, America's largest intercity passenger rail service.

This 40-plus-year onslaught by the financier and allied interests behind the highway lobby, shifted entirely the distribution between modes of transport in the United States: As reported, in 1943, rail carried 73% of U.S. freight, trucks only 5%; today, when the transport of coal is put to one side, more freight travels by truck than by rail.

But the shift to highways, trucks, and motor vehicles as America's dominant mode of transport has proven a disaster. Evidence is mounting that the fundamental inherent flaws of highways as a mode of transport, not only are destroying the highway grid, but the integrity of the entire U.S. transportation system with it.

Roadway Congestion

One of the three major problems crippling the highway system is the growing congestion.

The Metropolitan Washington Council of Governments, which formulates plans for the greater Washington, D.C. area, gave a stunning example of this in a report it released in October: Between 1999 and early 2002, on Interstate 66, extending from Northern Virginia to Maryland, the back-up of rush hour traffic had increased from 13 miles to almost 22 miles in length, a near doubling of traffic delays in three years.

The Austin-based Texas Transportation Institute has compiled an index to measure congestion, called the Travel Time Index (TTI). This index is a ratio of the total travel time it takes a vehicle to traverse a roadway in the peak of congestion, to the travel time it takes that vehicle on the same roadway in free-flow conditions. It takes into account delay caused by heavy roadway demand and from traffic incidents. For example, for an urban area that has an index of 1.5, that means, a trip that would take 30 minutes when there was no congestion (free flow), would take 45 minutes at peak congestion.[1]

Table 1 shows the 15 cities with the highest TTI, among the sample of 75 urban areas that the Texas Transportation Institute studies. Los Angeles leads the nation, with a TTI index of 1.90, meaning that a trip upon a roadway that under conditions of free flow would take 30 minutes, under peak congestion takes 57 minutes. The table shows that in all but a few cases, the index for each city has risen dramatically since 1982.

But a recent *EIR* discussion with one of the study's authors revealed that the study underestimates the congestion in two ways. First, the study measures congestion only inside the confines of what are called "urban areas"; for a trip starting outside an urban area, even if it is on a very congested road, the congestion won't be measured until the vehicle enters the urban area. Second, and more important, once inside the confines of an urban area, the congestion is an *average* of the congestion of potentially many hundreds of routes inside an area. So, for example, in Washington, D.C., if a car traveller's route on Constitution Avenue takes 4 times as long during congestion as during free flow, for a TTI index of 4.0; but other car travellers' trips on 5 other routes take only 1.2 times as long; then the TTI average for Washington as a whole, weighted by the traffic volume, might be 1.46. But for the vehicle in the heaviest part of traffic, the TTI index is very much higher.

Further, the Institute study of 75 urban areas found that whereas in 1982, the daily average amount of time the roadways are congested was 4.5 hours; by 2000, this had leapt to nearly 7 hours.

TABLE 1
Index of Congestion Increases in U.S. Cities

Metropolitan Area	1982	2000
Los Angeles, Calif.	1.34	1.90
San Francisco/Oakland, Calif.	1.21	1.59
Chicago, Ill./NW Indiana	1.19	1.47
Washington, D.C./Western Md./Northern Va	1.18	1.46
Boston, Mass.	1.14	1.45
Seattle-Everett, Wash.	1.13	1.45
Miami-Hialeah, Fla.	1.16	1.45
New York, N.Y./New Jersey	1.13	1.41
Denver, Colo.	1.10	1.42
San Jose, Calif.	1.18	1.42
Phoenix, Ariz.	1.13	1.40
Houston, Tex.	1.28	1.38
Minneapolis/St. Paul, Minn.	1.03	1.38
Atlanta, Ga.	1.08	1.36
Detroit, Mich.	1.12	1.34

Source: Texas Transportation Institute.

The Texas Transportation Institute calculated that, in 2000, in just the 75 urban areas of its study, 3.57 billion hours were lost by drivers sitting on the road on workdays, due to the delays of congestion.

How long it takes a worker to get from home to work on workdays, is compiled by the U.S. Census Bureau of the Department of Commerce, based on surveys. The Census Bureau reports that in the year 2000, it took a worker on average, 51 minutes to get from home to work and back again. One knowledgeable source reported that those who are surveyed tend to under-report the time it takes them to get to work. But even according to the Census Bureau's own data, 19.1 million Americans take between 1.5 and 3.5 hours each day to get to and from work. Most of them are sitting on a congested roadway, wasting away a part of their lives.

Truck Damage

The second major problem is that truck traffic is eating the roadways alive.

In 2000, there were 8.74 million heavy trucks bearing freight on the roads in the United States. But while the number of trucks on the road has increased, even more remarkable is the amount of miles each truck logs; between 1990 and 2000, travel by large trucks on urban roads increased by a striking 48%.

Truck damage to the roads is beyond most people's imagination. The American Association of State Highway Officials (AASHTO), representing the officials of the state highway systems, has developed a function for the relation of axle weight (or truck weight) to pavement damage. According to

1. The Texas Transportation Institute judges "free flow" travel, to be a vehicle travelling 60 miles per hour on a highway, and 35 miles per hour on main arterial streets. This information is found in the Texas Transportation Institute's study, the "2002 Urban Mobility Report."

the AASHTO, a 5-axle tractor semi-trailer truck having a fully loaded weight of 80,000 pounds (or what is equivalent, a single-axle weight of 20,000 pounds) does the same amount of much damage to a roadway's pavement as would 10,500 cars (each car weighing approximately 3,000 pounds) travelling over that roadway.[2]

However, the AASHTO function of truck weight to pavement damage is not a simple linear function, but a power function. Thus, if this same 5-axle tractor semi-trailer were to have its load increased to 100,000 pounds and travel over a stretch of road, it would do the same amount of damage to the pavement as 33,000 cars travelling over that same stretch of road. The reason for the more severe damage inflicted by the truck than 1,000 cars, is that a truck concentrates vastly more weight on any point of pavement than does a car.

Under current Federal law, the U.S. Interstate highway system forbids trucks carrying loads of more than 80,000 pounds, but there are approximately 20 states in which trucks can carry loads from 90,000 up to 130,000 pounds on Interstate highways.

The tremendous damage inflicted upon America's highway and road system by America's 8.74 million trucks carrying loads of 25,000 pounds and above, especially the trucks carrying 80,000 pounds and above, has taken its toll. This damage requires extensive repairs, and the repair bill mounts. Further, the backlog of unrepaired road grows. This unrepaired road has its effects and costs. The Virginia-based Road Information Project (TRIP) has determined that every year, cars accrue tens of billions of dollars worth of damage caused by roads that are in disrepair. Roads that are in poor condition increase auto deaths.

The volume of truck, as well as car traffic, that causes damage to highway pavement through use, is projected to grow.

No Physical Space

The third major problem is no physical space.

Take the situation in California. Its population of 35 million is expected to grow to over 50 million in the next 25 years. In cities such as Los Angeles, San Diego, San Jose, etc., there will not be enough room in portions of those cities, to significantly expand the highway system.

Groups such as the Texas Transportation Institute, which are acutely aware of congestion, still see the principal solution of the present highway system's problems as—building new highways. In its "2002 Urban Mobility Report," the Texas Transportation Institute states half-rhetorically, but half-approvingly, "It is difficult to imagine many urban street and freeway corridors with an extra 4, 6, or 8 lanes, but it may be required if the goal is to significantly reduce congestion by adding roads." This group also states that "several policy options, such as value-pricing or peak-travel restrictions," may be necessary to ration highway use, and get people off the road.

But with many highway systems having portions already groaning under 8- to 12-lane highways, the above recommendations do not offer a real solution. As a nation, we can achieve real knowledge only by recognizing the failure of our past axiomatic assumptions.

Forty years ago, this nation made a wrong turn. The highway system was never capable of being the nation's foremost mode of transport, and is now only capable of falling in upon itself.

The United States must build up, on a crash basis, its rail network: preserving what exists, restoring lost capacity, and above all, moving as rapidly as possible to magnetic levitation (maglev) railroads. Relative to trucks, maglev is several-fold more fuel-efficient, has a higher energy-flux density, and requires far less physical space—an advanced rail line uses one-third the space of a 10-lane highway system. It travels at far higher speeds, and carries orders of magnitude more freight.

Maglev engenders revolutionary scientific advances. In a maglev system, there is no steel wheel riding upon steel rail. Magnetic forces lift, propel, and guide a vehicle over, or under a guideway, so that it "floats" on a magnetic cushion. This eliminates the major source of friction, vibration, and wear on the vehicle, which slows all traditional modes of railroad transport. Current generation maglev systems travel, in extensive tests, at top speeds of 280 to 300 mph. This is between four and five times the normal speed of U.S. train or truck travel, a tremendous advance. Further, maglev trains negotiate curves and inclines better than traditional trains.

Design of freight-bearing maglev should be advanced: Currently, they can they can handle light freight, and require more engineering work for heavy freight transport.

In implementing the technological advance of rail, the integrity of the United States' transport mode will be restored, in the process of restoring the economy.

2. To figure out the relationship between single axle weight and the weight of the total truck that it corresponds to, AASHTO, based on tests, has the following correlation: A single axle weight of 20,000 pounds is equivalent to a tandem axle bearing a weight of 34,000 pounds, because a tandem axle distributes weight better (and does less damage to pavement) than two separated single axles. A 5-axle tractor semi-trailer usually is configured with 4 of its axles being 2 sets of tandem axles (each of which has 34,000 pounds, for a total of 68,000 pounds), and a single steering axle at the front of the truck, which has a weight of 12,000 pounds. Total weight of such a 5-axle truck is 80,000 pounds.