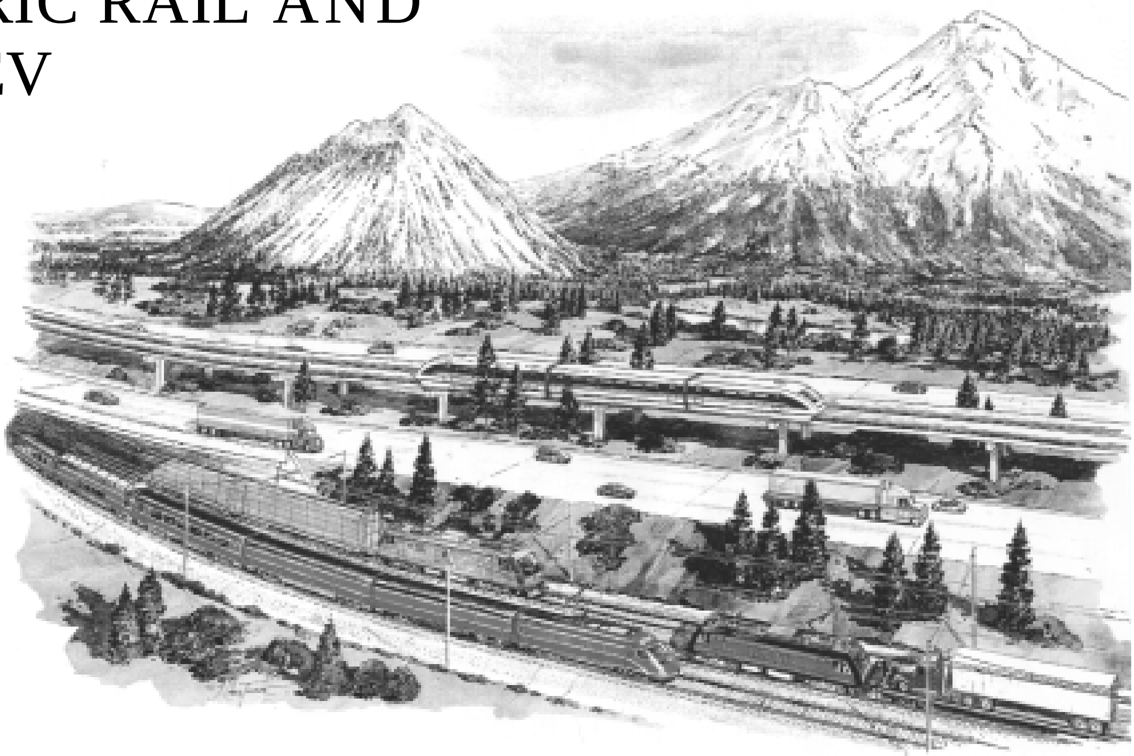
42,000 MILES OF ELECTRIC RAIL AND MAGLEV



An end to gridlock: The West Coast high-speed ground transportation corridor would use electrified railroad and magnetic levitation lines. Envisioned here is the Interstate 5 freeway route in Northern California near Mount Shasta, where a new maglev route would cross the existing north-south railroad.

Illustration by J. Craig Thorpe, commissioned by Cooper Consulting Co.

A Plan To Revolutionize America's Transport

by Hal Cooper

An experienced railway consultant lays out the requirements and timetable for how to get from here to prosperity, via electrified rail.

The United States, and indeed the world, is now at a critical juncture, with two starkly different pathways for its economic and energy future. One is to continue to degenerate into fiscal austerity, as the result of 40 years of world financial deterioration, which began with the introduction of free-market, free-trade policies in the 1960s. The other option is to rise to a new height of growth and prosperity by returning to the American system of economics, as advocated by economist Lyndon LaRouche.

It is proposed here to construct a 42,000-mile-long route network of conventional speed electrified intercity railroad lines for the transport of freight and passengers, which will be largely built on the trackage or rights-of-way of the already existing railroad network (Figure 1). There are also smaller route networks of 10,000 and 26,000 route-miles proposed as partial alternatives. In addition, there will be a 42,000-mile-long magnetic levitation network constructed generally along the existing interstate highway network, which will operate at very high speeds (Figure 2). There will also be 10,000- and 25,000-mile-long magnetic levitation networks.

The proposed national railroad electrification network will be designed to move large quantities of freight between cities, plus the passenger traffic which now goes by rail, as well as the traffic that will go by rail in the future. The proposed national electrified railroad network would be expanded from a starting point at almost zero today, to 10,000 route-miles by 2015, to 26,000 miles by 2020, and to 42,000 route-miles by 2030.

The operating characteristics of this intercity electrified railroad system would be as follows: The freight trains operating on these tracks would be designed to run at speeds of 90 to 110 miles per hour, carrying trucks and containers, and from 70 to 90 miles per hour for most other freight trains. The large, heavily loaded unit trains carrying coal would be the exception, as they would generally operate at speeds of 35 to 45 miles per hour, for safety reasons. Passenger trains would be designed to operate at maximum speeds of 125 to 150 miles per hour. The track configuration would be one of double tracks throughout, with crossover tracks and passing sidings at periodic intervals. There would be triple tracks or even four tracks along certain very heavily travelled railroad lines.

The construction of this national magnetic levitation network would be planned so that 5,000 route-miles would be in operation by 2020, with 10,000 route-miles by 2025, 25,000 route-miles by 2030, and 42,000 route-miles in operation at full capacity by 2040.The magnetic levitation system would be built as an elevated, double-guideway track system throughout, using some crossovers at periodic intervals. The system would be built primarily along the existing interstate highway medians, for ease of right-of-way acquisition as well as for safety and operational reasons. It would be designed to operate at speeds of 350 miles per hour, or even higher, in some locations between the major end-point cities.

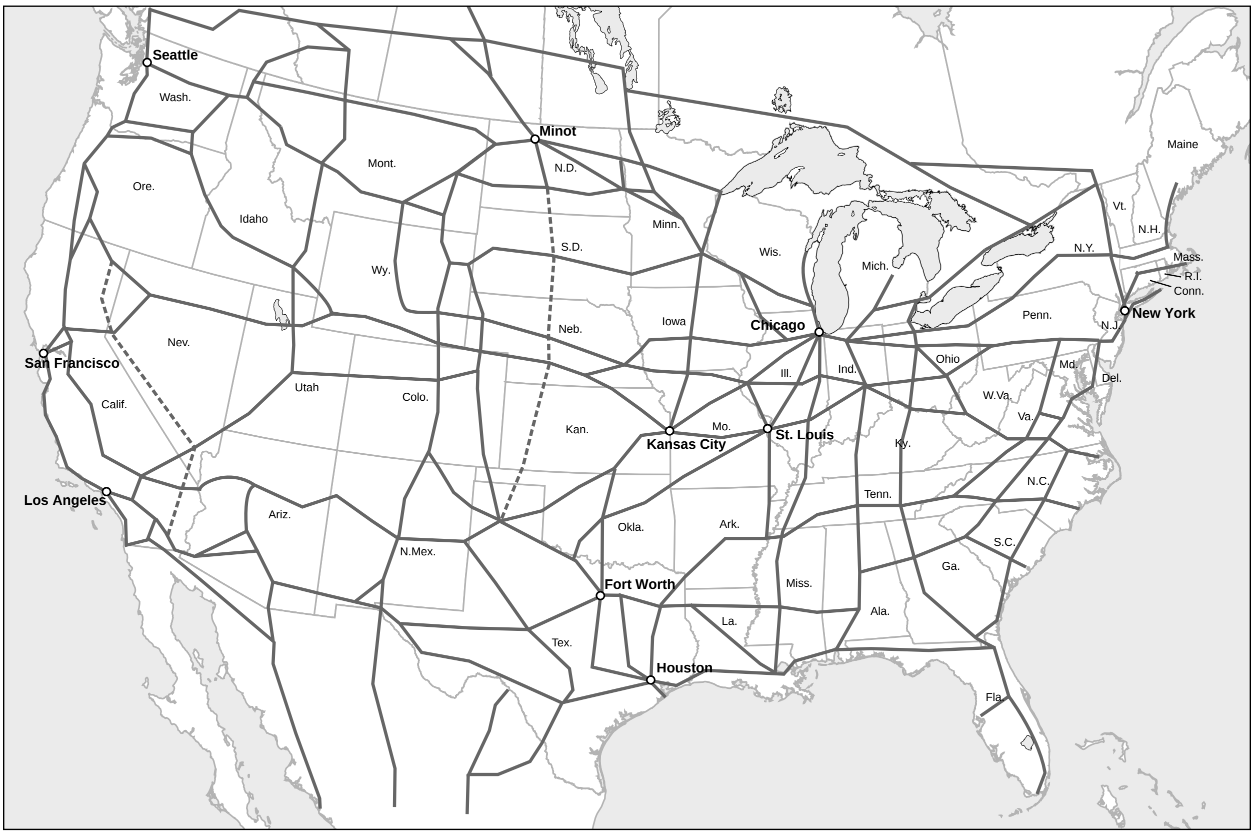


Figure 1
THE PROPOSED 42,000-MILE-LONG NETWORK OF NATIONAL ELECTRIFIED RAIL
This route network of electrified intercity rail would transport freight and passengers, largely on existing (upgraded) rail lines.

Figure 2

THE PROPOSED 42,000-MILE-LONG NETWORK OF MAGNETICALLY LEVITATED TRAINS

This new high-speed maglev network will be constructed along the existing interstate highway system.

The national railroad electrification system operating on the existing railroad lines would be designed to carry primarily freight, as well as passengers for the shorter trips. The electrified railroad would carry not only the existing railroad freight traffic-base, but also increasing volumes of trucks and truck-trailer combinations, as well as the box containers in intermodal combinations on flat cars. Drivers would accompany their truck freight in their own separate passenger cars, as a part of the intermodal freight train, so that they could then drive off to their destinations from the terminals.

Intermodal truck-rail transfer terminals would be located at periodic intervals throughout the entire national electrified railroad system, including at small towns in rural areas. Passenger stations, as well as intermodal freight terminals, would be located in a large number of communities throughout the entire rail network, in order to provide a maximum level of staffed station coverage for the public, and not only at end-point cities.

This would be designed to replace, at least in part, the need for automobile trips and some plane trips of less than 300 to 400 miles, and would have as its primary mission the intermodal diversion of truck traffic from road to rail for anything longer than local pickups and deliveries.

The proposed magnetic levitation system would have stops only at the major end-point cities and in the larger intermediate inland cities. Magnetic levitation, at 350 miles per hour or higher, would be designed to replace airplanes for those trips longer than 300 to 400 miles, but less than 1,000 to 1,200 miles for passengers. Airplane travel would then only be required for those cross-continent and long-distance trips greater than 1,200 to 1,500 miles, or for shorter trips to remote locations. An extensive feeder-bus network would serve both the magnetic levitation system, as well as the passenger trains of the electrified conventional railroad system. The magnetic levitation system would also be able to carry the majority of the high-value parcel traffic, with special cars on the existing trains for use by package carrier companies, and distribution and sorting centers in the major cities.

The proposed schedule for the construction of the respective 42,000 route-mile national electrified-railroad network and the parallel 42,000 route-mile magnetic-levitation networks are illustrated in Figure 3. The national electrified railroad network would be completed and in full-scale operation by 2030, with service starting in 2010; while the magnetic levitation would begin service in 2016 and be completed by 2040.

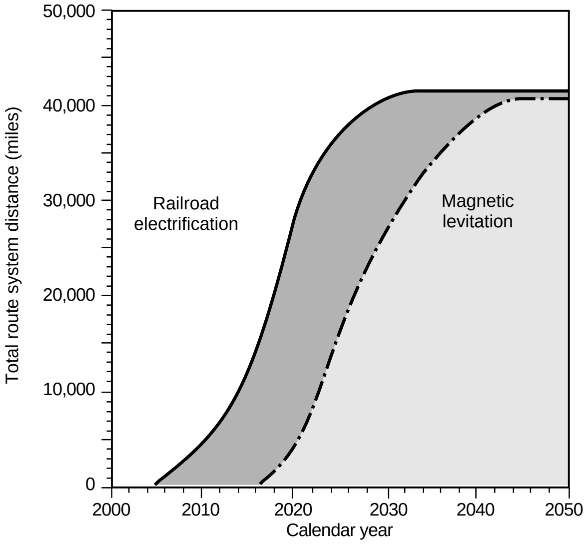


Figure 3
THE 45-YEAR TIMETABLE FOR REVOLUTIONIZING AMERICA'S TRANSPORT SYSTEM
The intercity railroad electrification would start immediately. Maglev would be phased in starting in 2016.

There are some locations where both the electrified railroad and the magnetic levitation systems would operate on common rights-of-way, at locations where interstate highways and major railroad lines would be in close proximity to each other. One such location is along the Interstate 5 freeway in southern California, south of Bakersfield, where a new railroad line would connect through a major new 32-mile-long tunnel under the Grapevine Grade, along with a magnetic levitation line along the freeway going up the mountain, as shown in Figure 4. The second location is along the Interstate 5 freeway route in Northern California near Mount Shasta, where a magnetic levitation route crosses the main existing north-south railroad line, as illustrated on page 22. (Both illustrations were painted by the noted railroad artist J. Craig Thorpe, and were commissioned by the author for the Schiller Institute to illustrate the present concept.)

Intercity Freight and Passenger Traffic

There has been a considerable increase in intercity freight traffic volumes in the United States in the past 20 to 25 years. The overall freight traffic volume in net ton-miles per year has increased from 1,492 billion net ton-miles per year in 2000, at an annual rate of 2.8 percent per year. The percentage of this freight carried by truck has increased from 37.2 percent in

(Continued on page 30)

Figure 4
HIGH-SPEED RAIL AND MAGLEV IN CALIFORNIA
Here is another location where electrified railroad and maglev would operate in parallel in California: Along the Interstate 5 freeway, south of Bakersfield, a new electrified railroad line would connect through a new 32-mile-long tunnel under the Grapevine Grade. A maglev line would follow the freeway, going up the mountain. (An illustration of another California tandem route appears on p. 22.)

Source: Illustration by J. Craig Thorpe, commissioned by Cooper Consulting Co.

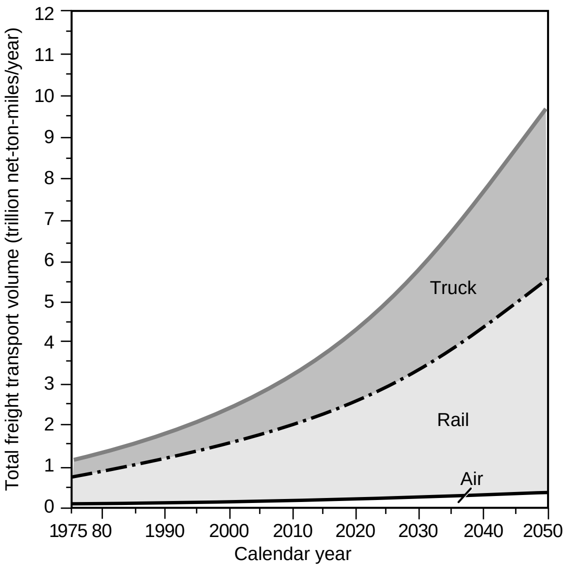


Figure 5
TRUCK INCREASE DOMINATES INTERCITY FREIGHT TRANSPORT
Without electrification, if present trends continue, truck traffic will dominate U.S. intercity freight transport. Here, total U.S. intercity freight transport by air, rail, and truck, from 1975-2050. Projections are based on current trends.

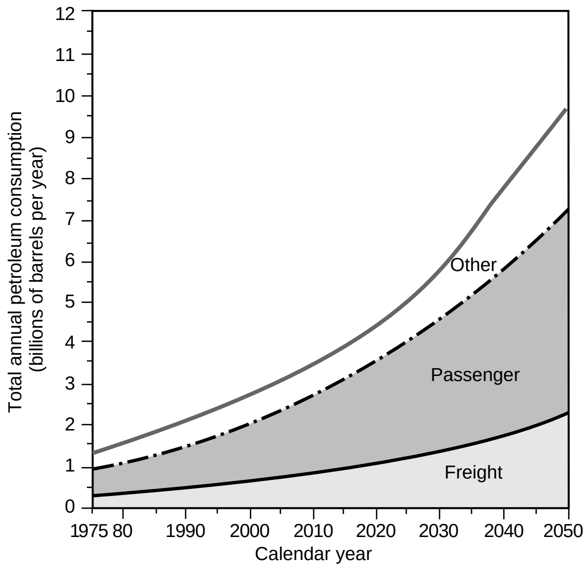


Figure 6
PETROLEUM CONSUMPTION WILL ZOOM UPWARD WITHOUT RAIL ELECTRIFICATION
If the United States does not electrify its railroads, and move more freight by rail, the petroleum used to carry freight and passengers will increase from 1.463 billion barrels in 1980 to as much as 9.603 billion barrels a year by 2050—more than the present national total petroleum use.

(Continued from page 25)
1980, to 40.9 percent in 2000, at an average annual rate of increase of 3.3 percent per year for truck traffic over the 20-year period.

The percentage of freight carried by railroad has dropped from 62.5 percent in 1980 to 58.5 percent in 2000, with an annual average rate of increase in rail freight traffic volume of 2.5 percent per year. It is expected that the volume of total freight traffic will triple between 2005 and 2050, if present trends continue into the foreseeable future, as shown in Figure 5.

Similar results are reported for intercity passenger travel in the United States between 1980 and 2000. The total intercity passenger traffic increased from 1,468 billion passenger-miles per year in 1980 to 2,494 billion passenger-miles per year in 2000, at an annual rate of 2.65 percent per year. The portion carried by car decreased from 82.4 percent in 1980 to 76.6 percent in 2000, as the total automobile traffic increased by 2.3 percent per year during this period. The portion of these passenger trips carried by air increased at a much faster rate of 4.2 percent per year, from 229 billion passenger miles per year in 1980, to 530 billion passenger-miles per year in 2000, as its market share increased from 15.6 percent in 1980 to 21.2 percent in 2000. The portion of the total passenger trips taken by rail remained below 1 percent of the total during the period from 1980 to 2000, so a significant increase in rail travel would require major changes.

Reducing Transportation's Petroleum Budget

In the absence of major policy initiatives, such as the electrification of intercity railroads and major intermodal diversion from road or air to rail, the amount of petroleum to be used in the transport of freight is expected to increase from 380 million barrels per year in 1980, to 580 million barrels in 2000, to as much as 2,353 million barrels per year by 2050, if the present trends continue, as shown in Figure 6. The total annual petroleum consumption in the transportation sector is expected to increase from 1,463 million barrels per year in 1980, to 2,508 million barrels per year in 2000, to as much as 9,603 million barrels per year by the year 2050 (which is more than the present national total). The passenger sector would predominate.

The present petroleum consumption totals appear to be clearly unsustainable, in view of the present and future limitations on world oil supplies. Clearly, national railroad electrification is going to be needed for purely national-economic and energy-security reasons, as the expected oil demand will exceed expected oil supplies.

The electrification of railroads for freight transport would ultimately replace this petroleum consumption with other energy sources, by generating electricity at central power plants. The preponderance of energy consumption for freight transportation is for truck transport, with essentially all of the energy supplied by burning diesel fuel or gasoline refined from petroleum. Shipments of freight by truck constitute 41

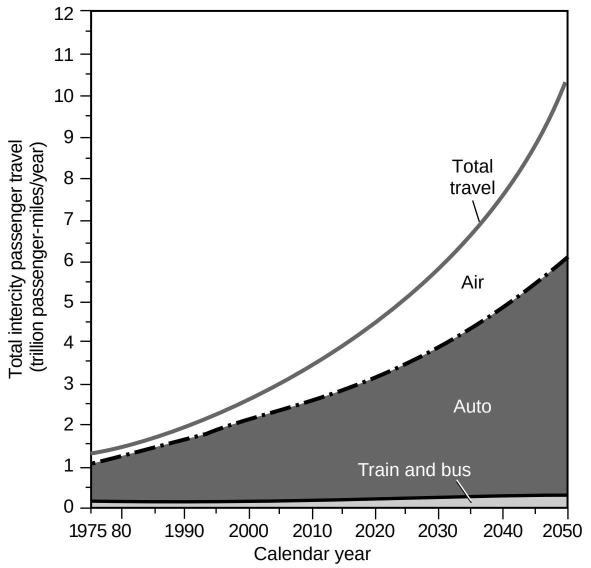


Figure 7
AUTOMOBILE TRAFFIC WILL INCREASINGLY LOCK THE HIGHWAY GRIDS, WITHOUT ELECTRIFICATION AND MAGLEV
If present trends continue, oil-dependent auto and air passenger transport will continue to increase.

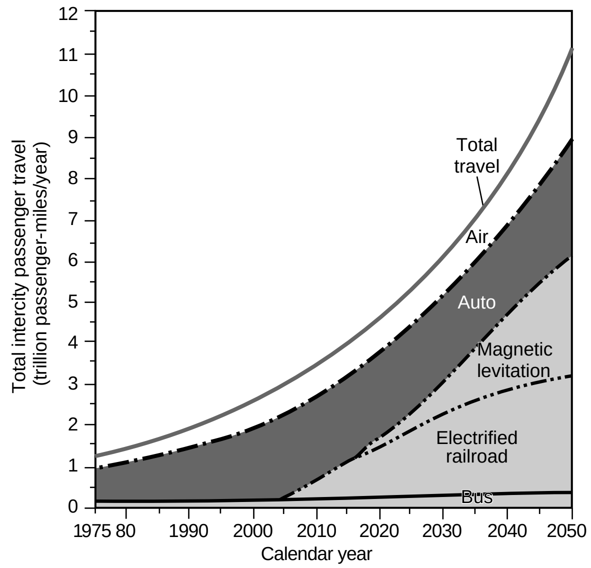


Figure 8
ELECTRIFICATION AND MAGLEV WILL GREATLY REDUCE PASSENGER AUTO AND AIR TRAVEL
With the introduction of electrification and maglev, the projected trends (to 2050) for U.S. intercity passenger transportation will reduce highway and air travel.

percent of the total movement in ton-miles, but require 57 percent of the total energy consumption in the form of petroleum. In contrast, railroads move 58 percent of the intercity freight but require only 26 percent of the total energy required for intercity freight transport.

The diversion of a significant portion of the intercity truck traffic from road to rail would significantly reduce the overall level of petroleum consumption, Electrification would increase the oil savings for the three alternative 10,000-, 26,000-, and 42,000-route-mile electrified rail networks, from 52 million barrels per year, to 73 million, to 94 million barrels per year. There would also be an estimated transport cost-savings resulting from electrification of the railroad with the comparative transport cost of 6.15 cents per net ton-mile for truck transport, 4.20 cents per net ton-mile for diesel trains, and 3.50 cents per net ton-mile for electric trains.

As a result, the electrification of the railroads would give shippers a net overall transport cost-savings from $7.1 billion per year for the minimum network, to $12.8 billion per year for the maximum network based on year 2000 freight traffic volumes.

The electrification of the railroad would also result in a reduction of petroleum consumption for those cargoes going by railroad. The petroleum savings which would result from the railroad traffic alone would increase from 33 million barrels per year for the minimum 10,000-route-mile network to 66 million barrels per year for the maximum 42,000 route-mile network. The total petroleum savings resulting from both the intermodal diversion of the trucks from road to railroad, plus the electrification, would increase from 85 million barrels per year for the minimum network, to 160 million barrels per year for the maximum network, excluding air freight service. The overall cost-savings resulting from the railroad electrification plus the intermodal diversion of truck traffic from road to rail would also result in a net transportation cost-savings to shippers, which would increase from $11 billion per year for the minimum 10,000 route-mile network, to $20 billion per year for the maximum 42,000 route-mile network.

It is also important to identify the potential petroleum savings which could result from the intermodal diversion of passenger traffic from air or auto to rail.

The proposed implementation of a national railroad electrification network could substantially reduce the need for oil-dependent air and auto modes for intercity passenger travel—by more than half, by 2050, as shown in Figure 7. The role of magnetic levitation becomes critical in the future for replacing air travel as a relatively time-competitive transportation mode for passengers. In contrast, the conventional electrified railroad-network will serve as a feeder service for shorter trips, as the means for diverting automobile traffic to the more energy-efficient and non-petroleum-dependent rail mode. The potential petroleum savings from intercity passenger transportation are potentially much greater than for freight transport, based on present-day traffic volume conditions (Figure 8).

However, there is a very blurred line which separates intercity trips and intracity trips, so that the above values are optimistic, to at least some degree. Estimates of the potential

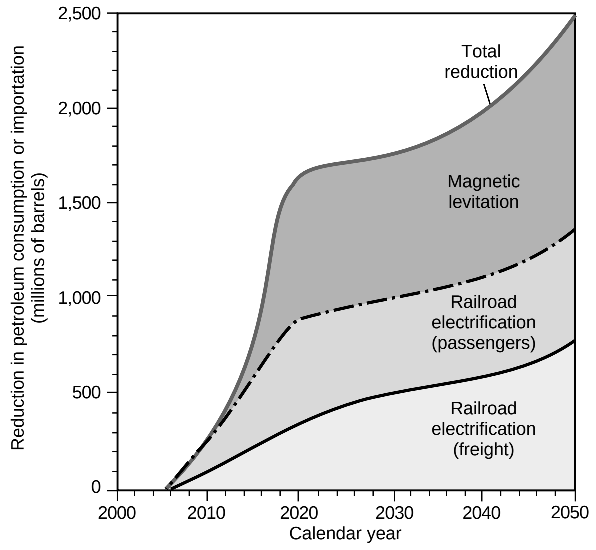


Figure 9
U.S. PETROLEUM CONSUMPTION PLUMMETS WITH ELECTRIFICATION AND MAGLEV
The introduction of electrified rail and magnetic levitation will produce these estimated reductions in the import and consumption of petroleum, (2005-2050). These reductions are equivalent to 61 percent of the present import level, and 37 percent of the total oil consumption level per day in the United States.

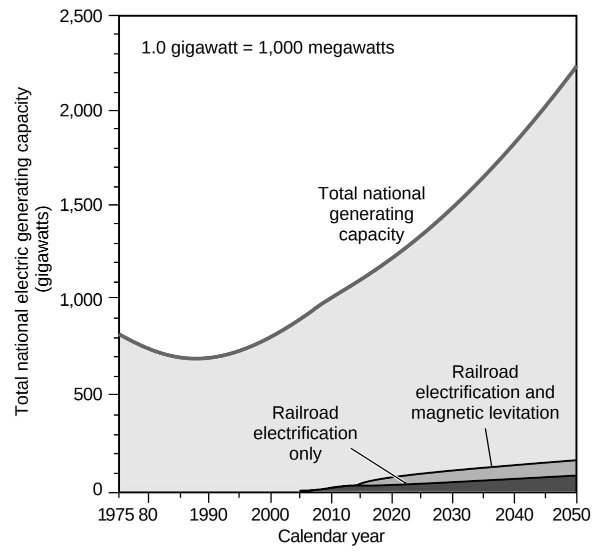


Figure 10
ELECTRIC-GENERATING CAPACITY REQUIREMENTS FOR ELECTRIFICATION OF RAIL AND MAGLEV
The electrified railroad and magnetic levitation networks will require an increase in the total national electric-generating capacity from 2.9 percent of the 2010 total, to 9.1 percent of the 2030 total.

impacts of national railroad electrification and magnetic levitation for both passenger and freight transport for intercity trips are illustrated in Figure 9. The results show that the potential reductions in petroleum consumption could be as much as 2,780 million barrels per year by 2050, or the equivalent of 7.6 million barrels per day. These reductions in petroleum consumption resulting from transportation are equivalent to 61 percent of the present import level of 12.3 million barrels per day, and 37 percent of the total oil consumption level of 20.5 million barrels per day in the United States.

New Electric Power

The proposed 42,000-mile electrified railroad network to be built along the existing rail lines will require as much as 96,000 megawatts of new generating capacity by 2050, with 52,000 megawatts for freight, and 44,000 megawatts for passengers, plus another 67,000 megawatts for the proposed 42,000-mile magnetic levitation route. To some extent, the electrical energy can be provided from the existing power plants in the United States through the electric utility transmission grid network. However, it will become necessary to construct additional electric-generating capacity in order to meet the future need for electricity, in addition to providing the energy required for the proposed electrified railroad network and for the planned magnetic levitation network.

Present electric-generating capacity in the United States is approximately 810,000 megawatts, with an annual electricity consumption requirement of about 3,500 billion kilowatt-hours per year. Coal constitutes 51 percent of the existing electric generating capacity in the United States, but provides 56 percent of its electricity. Nuclear power constitutes 14 percent of the generating capacity but provides 23 percent of the nation's electricity. Natural gas and fuel oil combined comprise 24 percent of the national generating capacity, but only 12 percent of its electricity, because these are normally the higher-price fuels. Hydroelectric power comprises 10 percent of the national electric generating capacity and 9 percent of its electricity, while other renewable energy sources comprise about 1 percent of both the electric-generating capacity and its electricity.

The electricity growth rate in the United States is approximately 2.0 percent per year, as is its expected growth in electric-generating capacity, in order to maintain adequate reserve margins. If these growth rates continue into the foreseeable future, the electric-generating capacity in the year 2050 is estimated to reach 2,155,000 megawatts, which is 165 percent greater than at present. The electric generating-capacity requirement for the proposed railroad electrification network alone will increase from 27,000 megawatts in 2010, to as much as 96,000 megawatts by 2050, as illustrated in Figure 10. The increase in generating-capacity requirement for magnetic levitation will begin in 2015, at less than 10,000 megawatts and increase to 67,000 megawatts by 2050. The electricity requirement for the

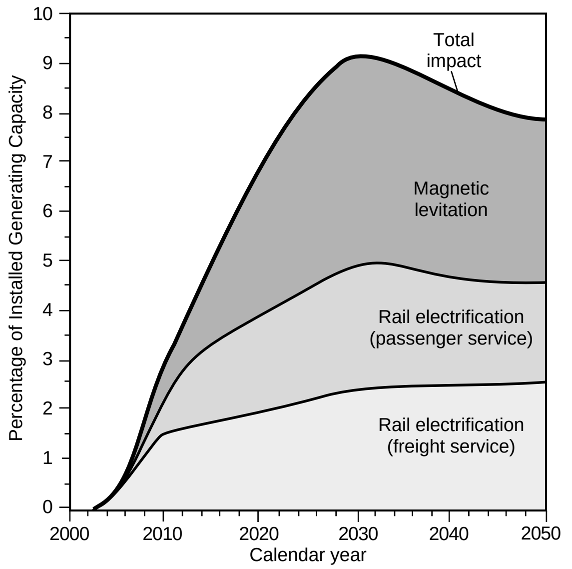


Figure 11
RELATIVE IMPACT OF ELECTRIFICATION AND MAGLEV ON U.S. ELECTRIC-GENERATING CAPACITY (2000-2050)

There is an initial rapid increase in electricity requirements as the magnetic levitation network gears up between 2020 and 2030, but after that, the maglev requirements level off. Hence the downturn in the graph between 2030 and 2050. Maglev requires 40 percent of the total rail electrical consumption; passenger rail uses 28 percent; and freight rail uses 32 percent of the total rail electrical consumption.

combined electric railroad and magnetic levitation network will increase from 27,000 megawatts to 163,000 megawatts by 2050.

The electrified railroad and magnetic levitation networks in combination will require an increase in the total national electric-generating capacity from 2.9 percent of the total in 2010, to 9.1 percent of the total by 2030, and then decrease to 7.6 percent of the total by 2050, as shown in Figure 11. The reason for the up-and-down in demand is that there will be a rapid increase in electricity requirements as the magnetic levitation network starts up between 2020 and 2030, which becomes relatively less after 2030 until 2050, because the rapid increase in electricity demand has already occurred. The magnetic levitation system will require 40 percent of the total rail electrical consumption, while the electric railroad will use 60 percent, of which 32 percent will be for freight transport and 28 percent will be for passenger transport.

The estimated capital cost of the fixed facilities infrastructure for the electrified railroad and magnetic levitation systems is presented in Table 1. The total capital cost of the electrified railroad system is expected to increase from $250 billion for the 10,000-mile route, to $735 billion for the 42,000-mile system, and to $800 billion by 2050 with the additional facilities improvements, expansions, and upgrading. The per-mile capital cost of the electrified railroad is expected to decrease from $25.0 million per mile for the 10,000-mile route system to $17.5 million per mile for the 42,000-mile system.

The parallel capital cost of the magnetic-levitation system is expected to increase from $500 billion for the 10,000-mile system at $50.0 million per mile, to $1,700 billion at $35.0 million per mile for the 42,000-mile system. For the combined

Table 1
ESTIMATED TOTAL CAPITAL INVESTMENT REQUIREMENTS BY YEAR FOR NATIONAL RAILROAD ELECTRIFICATION AND MAGNETIC LEVITATION (in billions of dollars)

This summary of the expected cumulative capital investments required by year for the construction of the proposed 42,000-mile electrified railroad and the parallel 42,000-mile magnetic levitation network is grouped as fixed facility (track and guideway) and variable facility (locomotives and power plants) investments. The costs are in year 2005 constant dollars.

	Route-Miles		Fixed Facilities Investment			Variable Facilities Investment			
Calendar Year	**Electric railroad**	**Magnetic levitation**	**Electric railroad**	**Magnetic levitation**	**Fixed facilities**	**Electric locomotives**	**Power plants**	**Variable investment**	**Total capital investment**
2005	0	0	0	0	0	0	0	0	0
2010	5,000	0	150	0	150	100	55	155	305
2015	10,000	5,000	250	100	350	125	70	195	545
2020	26,000	10,000	500	250	750	170	160	330	1,080
2025	35,000	16,000	650	500	1,150	200	190	390	1,540
2030	42,000	25,000	735	1,150	1,885	230	220	450	2,335
2035	42,000	35,000	775	1,500	2,275	275	245	520	2,795
2040	42,000	42,000	800	1,700	2,500	285	250	535	3,085
2045	42,000	42,000	800	1,900	2,700	310	260	570	3,270
2050	42,000	42,000	800	2,000	2,800	335	330	665	3,465

Table 2
ESTIMATED UNIT CAPITAL COSTS OF SINGLE- AND DOUBLE-TRACK ELECTRIFIED RAILROAD LINES
(in 2005 constant dollars)

Cost element	Single-track dollars/mile	Double-track dollars/mile
Track construction	1,500,000	2,500,000
Electrification system	1,300,000	1,800,000
Signalling and communication	400,000	700,000
Subgrade and drainage	300,000	500,000
Unit cost	3,500,000	5,500,000
Other civil construction	7,000,000	12,000,000
Total cost	10,500,000	17,500,000

Table 3
EFFECTS OF DESIGN AND MAXIMUM SPEED ON THE CAPITAL COST FOR ELECTRIFIED RAILROAD LINES

Operating speed (miles/hour)		Unit capital cost (dollars/mile)	Total capital cost (Millions of dollars, 42,000 miles)
Passenger	Freight		
80-90[1,3]	60-80[1,3]	1,500,000-2,500,000	65,000-85,000
90-110[1,4]	80-90[1,4]	5,250,000-6,000,000	220,000-250,000
110-150[1,4]	90-110[1,4]	15,000,000-17,500,000	550,000-735,000
350-500[2]	350-500[2]	35,000,000-50,000,000	1,470,000-2,100,000

Notes
1. For conventional railroad lines.
2. For magnetic levitation routes.
3. Diesel-powered railroad lines.
4. Electric-powered railroad lines

systems, the total system capital cost is expected to increase from $750 billion at 20,000 miles in total, to $2,000 billion for the 84,000 mile systems by 2050 with all of the additional improvements.

The capital cost estimates for the electrified railroad are shown in Table 2 for the single-track and the double-track configurations. The actual unit costs are estimated as between $1.3 million and $1.8 million per mile for single-track and double-track electrification, respectively. The direct unit capital costs for the single-track and double-track configurations range between $3.5 million and $5.5 million per mile, respectively, with the trackage, civil works, electrification, and signalling all included. However, the need to build major bridges and tunnels plus grade separations and trenches or elevated viaducts raises the average total unit capital cost to an estimated range from between $10.5 million and $17.5 million per mile, respectively. These unit capital costs are very much a function of the required operating speeds for the trains, as presented in Table 3.

The total capital investment for the electrified railroad system for intercity freight and passenger transport is expected to range from $305 billion in 2010, to $1,105 billion in 2030, to $1,330 billion in 2050, as shown in Figure 12(a). The greatest part of this investment is for railroad fixed facilities, which are expected to increase from $150 billion in 2010, to $735 billion in 2030, to $800 billion by 2050. The purchase cost of the new electric railroad locomotives is expected to increase from $100 billion in 2010, to $235 billion in 2030, to $335 billion in 2050. The estimated capital cost of the new power plant generating capacity is expected to increase from $55 billion in 2010, to $140 billion in 2030, to $195 billion in 2050, as additional electricity is required.

The development of the proposed magnetic levitation network will have a considerably greater capital cost than for the electrified railroad network of the same route distance, as illustrated in Figure 12(b). The capital investment in the magnetic levitation fixed facilities and attached guideway vehicles is expected to increase from $100 billion in 2015, to $1,150 billion in 2030, to $2,000 billion by 2050. The associated power plant capital costs are expected to increase from $70 billion in 2020, when the system begins operation, to $100 billion in 2030, to $135 billion in 2050 based on a unit capital cost of $2,000 per kilowatt of installed capacity, which would be typical of a new nuclear power plant. The total capital investment in the magnetic levitation system would increase from $100 billion in 2015, to $1,250 billion by 2030, to $2,135 billion by 2050.

The total capital investment in the combined electric railroad and magnetic levitation system will increase from $305 billion in 2010, to $2,355 billion in 2030, to $3,465 billion by 2050, as the combined network size increases from 5,000 miles to start, to 10,000 miles, to 50,000 miles by 2030, to 84,000 miles by 2040. Approximately 58 percent of this new investment will be in fixed facilities for the magnetic levitation, with another 23 percent, or $800 billion, associated with the electrified railroad. The remaining 19 percent of the total capital investment will be broken down almost exactly equally between the power plants, with $330 billion, and $335 billion for the electric locomotives, for a cumulative total of $3,465 billion by the year 2050 for the entire integrated system. A summary of the expected cumulative capital investments required by year for the construction of the proposed 42,000-mile electrified railroad and the parallel 42,000-mile magnetic levitation network is presented in Table 1.

Although seemingly a very large capital investment is required for electrified railroads and magnetic levitation, it

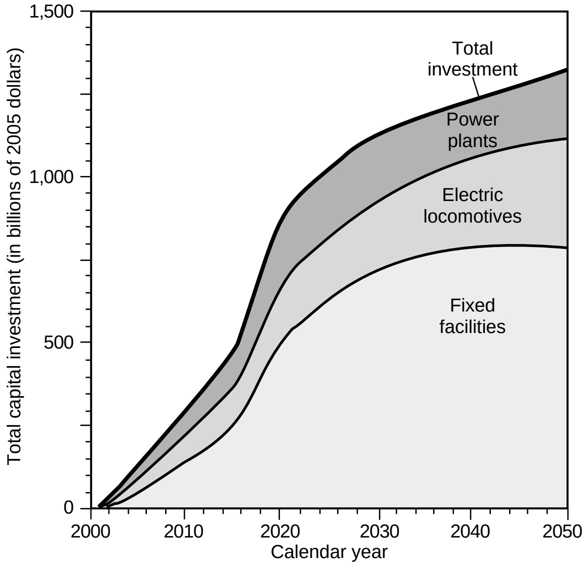


Figure 12(a)
FUTURE CAPITAL INVESTMENT IN U.S. RAILROAD ELECTRIFICATION (2000-2050)
The total capital investment for the electrified railroad system for intercity freight and passenger transport (including power plant construction) is expected to range from $305 billion in 2010 to 1,105 billion in 2030, to $1,330 billion in 2050. Most of this is for railroad fixed facilities.

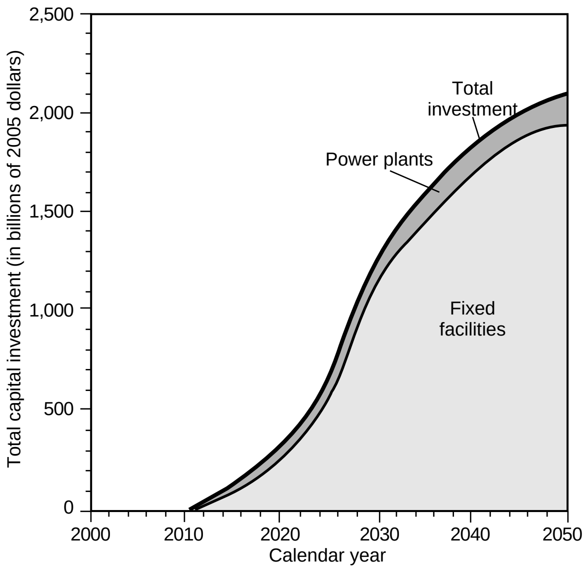


Figure 12(b)
FUTURE CAPITAL INVESTMENT IN MAGNETIC LEVITATION NETWORKS (2010-2050)
The capital costs for the magnetic levitation system are greater than those for the same route distance of the electrified railroad network. Most of the investment is in fixed facilities and guideway vehicles. The cost is expected to increase from $100 billion in 2015, to $1,150 billion in 2030, to $2,000 billion by 2050.

must be realized that the continued importation of foreign oil will involve a cost which is expected to increase from the present $230 to $250 billion per year to as much as $500 to $900 billion per year by 2050, if not remedied. If up to 30 percent of this oil import cost can be reduced by the above electrified railroad and magnetic levitation system, then an import cost reduction of as much as $150 to $300 billion per year can be realized by its construction. Many jobs will be created by the above electrified railroad system along with considerable transportation cost-savings to travellers and shippers.

In conclusion, it is proposed to construct a 42,000-mile electrified railroad system along the existing railroad lines for the transport of freight and passengers at speeds of 100 to 150 miles per hour, including intermodal trucks hauled by rail between cities, and to supplant car travel for trips of less than 300 to 400 miles. In addition, it is proposed to build a new 42,000-mile-long magnetic levitation system generally along the interstate highway medians for very high speed passenger and high-value cargo transport at 350 to 500 miles per hour to replace air travel for trips of less than 500 to 1,000 miles. This new proposed electrified transportation system is expected to ultimately cost up to $3.5 trillion over 45 years at an average annual cost of $75 to $80 billion. This system can ultimately result in a reduction in overall oil use of up to 2,480 million barrels per year, or up to 30 percent of the expected oil imports, and would require an increase in the national electric-generating capacity of up to 163,000 megawatts, or 7 to 9 percent of the expected overall national total of 1,500,000 megawatts by 2050.

The proposed financing for the construction of this future electrified rail and magnetic levitation transportation system is through long-term bonds and loans provided through a newly created National Infrastructure Development Bank (NIDB). This bank would be able to issue credits, guarantees, and currency entirely separate from the existing Federal Reserve Bank System, which has shown itself to be at best reticent about, and in the worst case opposed to, major infrastructure development projects. Loan and bond guarantees could be provided through commercial banks to private companies, as well as direct loans and grants to the federal, state, and local governments for the above energy and transportation infrastructure-development projects. The prescription for economic and infrastructure policy proposed by Lyndon LaRouche is the only way this and similar infrastructure projects to promote prosperity through the general welfare, can be realized as a superior alternative to the present insane free-trade/free-market/fiscal-austerity fascism, so rampant in government and business circles today.

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