A 30-year process of destruction of American infrastructure

by Richard Freeman

The breakdown of the Conrail system's ability to deliver goods across 14 states of the Midwest and Northeast during the Jan. 14-22 cold snap comes as no surprise. In fact, it is a chilling confirmation of a 30-year trend of the breakdown of every basic form of infrastructure in America. Economics is surely not the arrangement and trading about of scraps of money, though this holds great fascination for financiers. Rather, the essence of measurable economic science is the relationship between rates of scientific and technological progress, as cause, and the increase of the productive powers of labor, which drives the economy forward, as a result.

How is this achieved? Through man's mind, creative reason's sovereign power, acting in the living image of God (*imago viva Dei*). Man's mind creates and advances science and technology, which modifies and fosters improvements in his own power of labor. This increases the rate of relative potential population density, as economist Lyndon LaRouche has discussed in many published locations (see, for example, *The Science of Christian Economy,* Washington, D.C.: Schiller Institute, 1991).

As LaRouche emphasizes, infrastructure is indispensable to this process. Before a producing firm can start business, it must have available to it the quantity and quality of basic economic infrastructure required by the scale of business operations and by the type of business and the level and kind of technology. Without the necessary infrastructure, not a business, not a household, not a city, not a state could exist. He who defends a Robinson Crusoe "free market" economics based on pure exchange and trading, beware. He who denies the role of infrastructure, denies his own existence.

To understand economic processes, one must look at them as historical processes, over the long term. But one must also examine them on a *per capita, per household, and per square kilometer (or square mile) basis*. These are like power functions. The *per square kilometer* basis allows one to view the intensity of an economic process per land area. The *per capita* and *per household* basis tells one how intensively the household—the delta of least economic action—as well as the individual, act upon and shape, acting through the economy, man's intervention upon nature.

If one employs the LaRouche-Riemann economic method to examine the American economy, one can see that the Jan. 14-22 cold snap was a minor event, a tertiary triggering mechanism, which simply rooted out and brought to the surface the 30-year collapse of American infrastructure. *EIR* analyzed this collapse in its Jan. 1, 1994 special issue, "Thirty Years after JFK: Restore Economic Sanity." We forecast that disasters, such as of January, would occur, and *EIR* Economics Editor Christopher White asked, "Could the United States Go the Way of Russia?"

Look at **Figure 1,** which describes America's railroad network, showing kilometers of track, divided by key parameters. The 1967 values were set equal to 1.0, and subsequent years are compared to 1967. Notice that on the *per square kilometer* basis, railroad trackage slightly increased and then stayed constant, but that on a *per capita basis* and *per household* basis, it fell, approximately 15% and 30%, respectively. Notice further, that the policies during period 1979-82, when

FIGURE 1

Railroad network

(indexed to 1967=1.0)

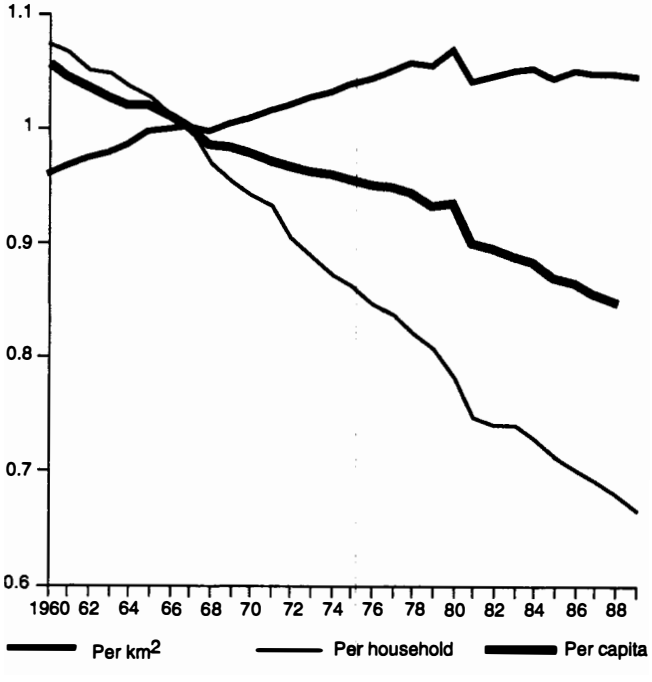
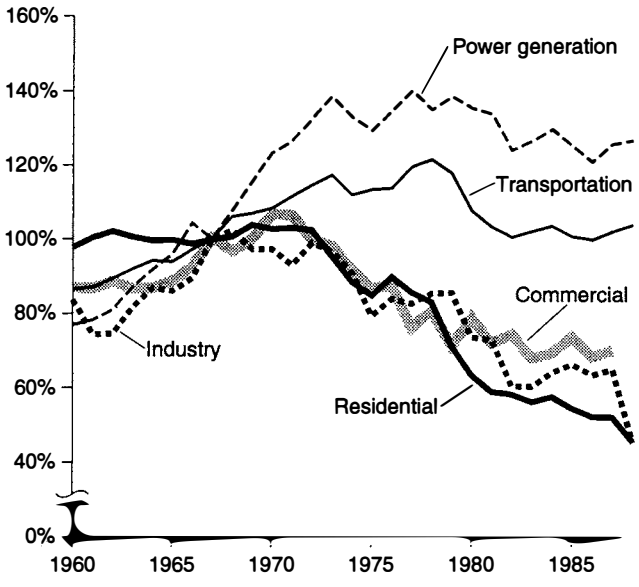
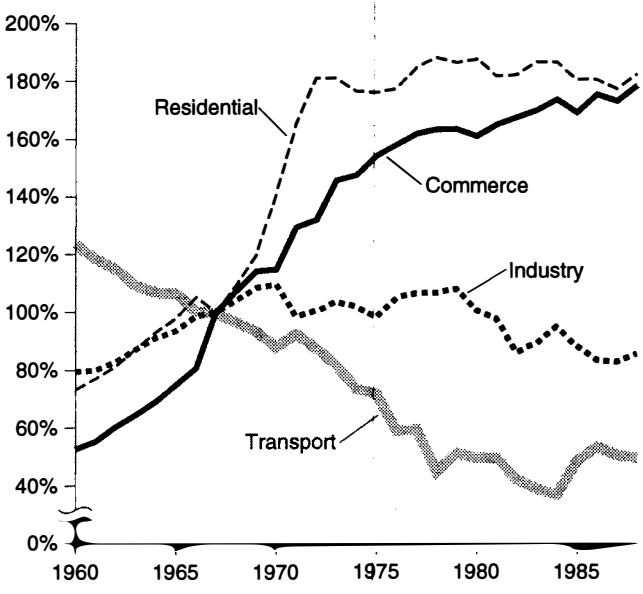


FIGURE 2
Fuel consumption
(percent of 1967 levels)



Source: *EIR*.

FIGURE 3
Electricity consumption
(percent of 1967 levels)



Source: *EIR*.

Federal Reserve Chairman Paul Volcker instituted his policy of astronomically high interest rates, caused the parameter levels of rail trackage to take another dip downward. This means that the American rail system is deteriorating in its ability to handle the per capita and per household needs of America. That represents a policy of attrition of our rail system which would correlate with the overall lack of upkeep of rails, such that during the recent cold snap, Conrail's brake system did not work; its tracks cracked, etc.

Fuel production and consumption

Next look at fuel consumption. **Figure 2** shows fuel consumed by end-use sectors of the economy, on a *per household* basis, that is, the amount of fuel consumed by industry, households, or others, each divided by the number of households. Again, 1967 values are set equal to 1.0, and subsequent years are compared to 1967. Industry and household consumption of fuel, on a *per household* basis, fell nearly 60% from their 1967 levels. Some fools will say this reflects energy conservation; what it really shows is that steel blast furnaces and other manufacturing enterprises that use fuel closed down. Use of fuel for transportation rose through approximately 1977, the year before the second oil shock, but then tapered off. (This reflects primarily the use by motor vehicles of 60% of the oil in the economy.)

The consumption of fuel for power generation (electricity) showed a 40% rise above 1967 levels. This showed a trade-off: In an attempt to counteract the sharp decline in industry and household consumption of fuels, the United States developed a heavier reliance on electricity. Electricity is a more highly organized and powerful form of energy.

Figure 3 shows electricity consumption, expressed on a *per household* basis. Notice that a huge leap in electricity consumption is registered by the category "commercial." Its path from 1960 onward was straight up. This reflects, in a sense, a waste of the higher energy form. The commercial sector also doubled its share of the total output of electricity consumed in the economy between 1960 and 1990. Residential use of electricity also increased up through about 1972, and then it tapered off. This is largely for heating/cooling functions, and appliances. Notice that industry, which could benefit from revolutionary applications of electricity, such as laser machine tools, actually saw its consumption of electricity, on a *per household* basis, fall by more than 10% relative to 1967 levels. Overall, after 1972, electricity consumption *per household* for all the sectors either stayed flat or fell.

Now let us go one step back in the eletricity-generating process, and look at the utility companies acquiring the requisite capital goods to keep up their generating capacity. **Table 1** shows installed new turbine generator capacity at U.S. electric utilities. Turbines and generators are the *sine qua non* of electricity generation. When hydro or steam flows activate rotary motion in turbines, this motion induces current in the generator. On a *per capita* basis, newly installed turbine generator capacity in 1990 was one-sixth the level it was in 1969. Even on a *per square kilometer* basis, 1990

TABLE 1
Declining installation of turbine generator capacity by U.S. electric utilities

Year	Installed capacity (megawatts)	Per capita (watts)	Per household (watts)	Per km² (watts)
1969	22,291	109.9	358.2	2378.3
1970	27,741	135.2	437.5	2959.7
1971	26,087	125.6	405.2	2783.3
1972	31,924	152.0	478.7	3406.0
1973	35,392	167.0	518.5	3776.1
1974	36,397	170.1	521.0	3883.3
1975	34,440	159.4	484.2	3674.5
1976	20,421	93.6	280.2	2178.7
1977	27,525	124.9	371.0	2936.7
1978	22,729	102.1	298.9	2425.0
1979	17,195	76.4	222.3	1834.6
1980	22,406	98.3	277.3	2390.5
1981	15,177	65.9	184.2	1619.2
1982	13,236	56.9	158.4	1412.2
1983	10,032	42.7	119.5	1070.3
1984	19,730	83.3	231.0	2105.0
1985	17,108	71.6	197.1	1825.3
1986	16,065	66.7	181.6	1714.0
1987	11,443	47.0	127.8	1220.8
1988	8,068	32.8	88.5	860.8
1989	7,312	29.5	78.7	780.1
1990	4,504	18.0	47.6	480.5

Source: Edison Electric Institute.

TABLE 2
Declining new orders for power transformers
(for transformers 501 kilo-volt-amperes and larger)

Year	New orders (thousands mega-volt-amperes	Per capita (MV-A)	Per household (MV-A)	Per km² (MV-A)
1972	184,978	.88	2.77	19.74
1973	232,244	1.09	3.40	24.78
1974	293,012	1.37	4.19	31.26
1975	109,299	.50	1.53	11.66
1976	111,189	.50	1.52	11.86
1977	122,793	.55	1.65	13.10
1978	136,959	.61	1.80	14.61
1979	140,970	.62	1.82	15.04
1980	134,646	.59	1.66	14.37
1981	98,224	.42	1.19	10.48
1982	81,727	.35	.97	8.72
1983	70,732	.30	.84	7.55
1984	66,797	.28	.78	7.13
1985	66,004	.27	.76	7.04
1986	80,110	.33	.90	8.55
1987	78,974	.32	.88	8.43
1988	83,872	.34	.92	8.95
1989	89,309	.36	.96	9.53
1990	89,876	.35	.96	9.59
1991	80,745	.31	.85	8.62
1992	62,474	.24	.65	6.67

Source: Edison Electric Institute.

levels were but one-fifth those of 1969. This is the crowning proof that the Jan. 14-22 cold snap did not *cause* "rolling blackouts." The trend over 20-years-plus was for utilities to drastically reduce their net additions of fundamental greenfield electric generating capacity; that caused the crisis.

Table 2 shows the new orders for power transformers, of a size of 501 kilo-volt-amperes (KVA) or larger. Large power transformers, of 10,000 KVA and above, are used to step up the voltage of electricity generated by a power plant, usually between 2.4 and 30 kilovolts (KV) to the higher voltage (sometimes as high as 765 KV) required to efficiently move the current through hundreds of miles of transmission lines. These power transformers are known as generator transformers. Along the transmission lines are other power transformers known as shunt reactors, which operate to keep the voltage up to the required level over long distances. Where two different transmission systems interconnect, autotransformers operate to adjust the voltage level of one system to another. There are also transformers of varying size to download the power from the transmission lines to factories, and even smaller ones, to supply homes. The *per square kilometer* fall of two-thirds between 1972 and 1992 is stunning.

The construction industry

Figure 4 rips apart the idea that America is building new structures. Yes, America is building office buildings and shopping malls, but the crucial parameters are manufacturing plant sites, educational facilities, and hospitals. Figures for new building construction for each of the three, expressed in millions of square feet of new annual construction, were gathered by the Dodge/McGraw Hill research firm. These figures were then put on a *per capita* basis. Again, the value for 1967 was set equal to 1.0, and every other year was compared to 1967. Hospital new floor space construction, expressed on a *per capita* basis, was off 20% from 1967 standards, and manufacturing and schools were each off by 50% or more.

Finally, let us look at **Table 3,** an array of materials and capital goods that figure prominently in most infrastructure projects (as well as some homebuilding). The materials are gravel and crushed stone, clay, bricks, and cement. The capital goods are bulldozers and graders and levellers. A bulldozer is a machine with a large blade mounted squarely in front of a tractor unit, which is used to level or clear away excess soil and debris. A grader or leveller is equipped with a sharp cut-

FIGURE 4

New building construction

(square feet, per capita, indexed to 1967=1.0)

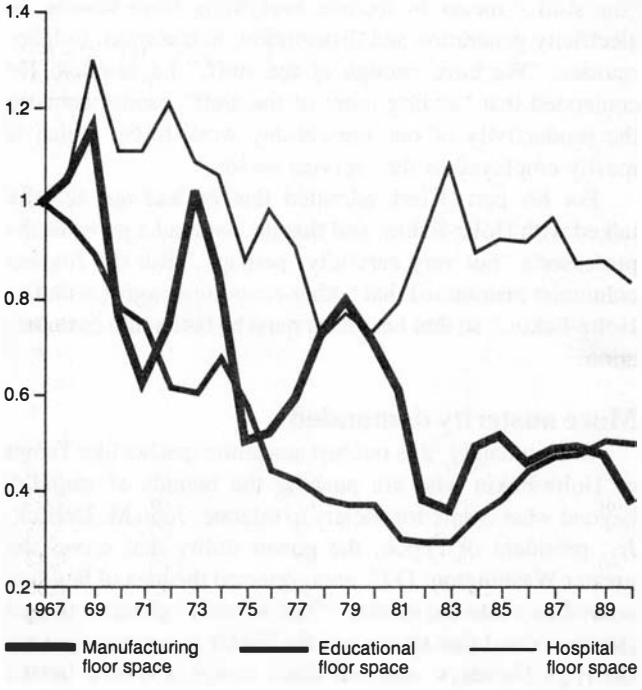


TABLE 3

Falling materials and capital goods production

(per household basis, 1967=1.00)

Year	1967	1973	1979	1982	1990
Gravel and crushed stone	1.000	1.023	0.914	0.624	0.575
Clay	1.000	1.022	0.759	0.459	0.544
Bricks	1.000	0.999	0.850	0.451	0.598
Cement	1.000	1.045	0.911	0.632	0.689
Bulldozers	1.000	1.200	0.713	0.334	0.306
Graders and levellers	1.000	0.786	0.748	0.383	0.349

ting edge designed to slice off topsoil, and usually has a lift capability to discard it. In this case, values were placed on a *per household* basis and compared to 1967 values. Notice that the falls, across the board, amounted to 30-65%.

When looked at from this 30-year historical perspective, American infrastructure, from rail to electricity generation, from new manufacturing plant construction to capital goods for road work and the like, is going through the floor. This was taking place long before the cold snap of January 1994 or the Jan. 17 earthquake. It will continue, transforming other moderate or garden variety natural incidents into major catastrophes, unless policy is reversed.

Workers repair a water main break in Washington, D.C. in November 1993. The decay of urban infrastructure long predates the January cold snap, being the result of 30 years of incompetent economics.