

Build Rail, Maglev for Fast, Safe Transport

by Richard Freeman

“The investigators into the Minneapolis bridge collapse still haven’t looked at a major primary cause,” declared Hal Cooper, a rail and transportation consultant, Aug. 6. “That cause is that bridges and highways are handling traffic volumes and loads far beyond what they were originally erected to handle; the principal problem comes from the increasing load of heavy trucks, which damage roads and bridges. If you drive, you see that east of the Mississippi, the trucks are everywhere.”

The unpostponable response to the Aug. 1 collapse of the I-35W Minneapolis bridge must be a crash mobilization to construct tens of thousands of miles of electrified rail in the United States, initially high-speed rail, but moving as quickly as possible to magnetically levitated (maglev) trains. For certain, the nation’s bridge system must be repaired and upgraded to scrupulously observed high standards. But our national highway system, as a mode of transport, is inefficient and backward relative to modern rail. Tens of billions of tons of freight must be taken off the roads, and put onto rails.

The move away from railroads began at the end of World War II, when the financier oligarchs, in alliance with the oil cartel, the highway lobby, and real estate interests, enforced a policy of suppressing high-speed rail and maglev development, in favor of insanely high levels of petroleum-powered truck and car traffic.

A 2002 *EIR* investigative study showed the genesis of the crisis: In 2000, there were 8.74 million heavy trucks bearing freight on the U.S. roads. Further, between 1990 and 2000, the number of miles that each truck logged increased by 48%.

The damage that trucks inflict on roads and bridges is beyond most people’s imagination. The American Association of State Highway Officials (AASHTO), has developed a function for the relation of axle weight (or truck weight) to pavement damage. According to the AASHTO, a five-axle tractor-semi trailer truck, fully loaded and weighing 80,000 pounds, does the same amount of damage to a roadway’s pavement as 10,500 cars, with each car weighing 3,000 pounds. Thus, even though the cars weighed 31.5 million pounds, the single 80,000 pound truck did as much damage. The AASHTO study showed that as the weight of a truck would increase arithmetically, the damage to the pavement would increase by a power function; e.g., increasing the weight of the 80,000 pound truck by one-fourth, increases the damage by 200% (threefold). It is

the concentration of the weight at each axle, that transmits the damage.

Even though current Federal law prohibits trucks carrying loads of more than 80,000 pounds on U.S. Interstate highways, 20 states have drawn up exemptions, through the use of “grandfather” clauses, which permit trucks to carry 90,000 to 135,000 pounds on Interstate highways. This does immense damage, ripping up the top layer of roadways, including those on bridges, creating and widening fissures, while putting excessive stress on their foundations. Impose this truck-load increase on the 158,912 bridges, 26.9% of the nation’s total, which are rated either “structurally deficient or functionally obsolete,” and an increased density of bridge collapse is pre-ordained.

Another key element in the collapse of bridges should be noted: From the mid-1960s onward, a significant number of bridges were not built with sufficient redundancy. Consider, by contrast, the Brooklyn Bridge, designed by John A. Roebling, and completed in 1883. The great suspension bridge was constructed on classical principles, six times stronger than required, to ensure it would support whatever traffic it might have to bear, far into the future. It has now lasted for a century and a quarter (see box).

The Solution: Rail Electrification

To solve this crisis requires the urgent building of high-speed-rail corridors—at travelling speeds for passengers of 150 mph (240 kph) and freight at 90-110 mph (145-175 kph)—and as soon as possible, maglev trains systems. This will produce an enormous upshift in the scientific-intensity and power of the economy as a whole, imparting leaps of productivity, through electrification of America’s rail network (high-speed rail and maglev run on electricity, which is externally generated and transmitted).

Even the best repair and upgrade of bridges—which must be undertaken as a preliminary step—cannot protect them against the inherent destructive effects of increasingly heavy truck-load-volume. And the number of truck ton-miles *will increase by 50-100% over the next two decades*, if highways remain America’s dominant mode of non-coal goods transport. This would intensify the rate of bridge collapse and other problems. The mode must be changed.

The United States has 141,000 route-miles of railroads. In 2005, *EIR* published a study which asserted that the U.S.A. should electrify its rail system in two phases: first, electrifying 26,000 route-miles, and then up to a total of 42,000 route-miles (“Congress’s Mission for Bankrupt Auto: Build U.S.A. Electrified Rail Network,” by Richard Freeman and Hal Cooper, *EIR*, June 10, 2005). While these 42,000 route-miles constitute only 29% of America’s total rail-route mileage, they represent the heart of the system, carrying 65% of America’s freight, and more than 70% of the intercity rail traffic.

The implementation of this would require an all-out mo-

bilization of the economy. According to the study, it requires a tremendous bill of materials, including tens of millions of tons of steel; iron reinforcing bar; cement; vast quantities of wood, and copper, and other metals. Thousands of locomotives and train sets, and a vast number of machine tools. To power this system would require adding new generating capacity of 50,000 megawatts that would generate 383 trillion

kilowatt-hours of electricity per year. As well, tens of thousands of miles of transmission lines would have to be built. The project's construction would employ tens of thousands of workers in new, productive jobs.

To build this would require the adoption of LaRouche's Economic Recovery Act, and its National Infrastructure Bank (see article, this section).

Brooklyn Bridge: Built for the Ages

The Brooklyn Bridge, whose construction began less than five years after the end of the Civil War, stands today in happy rebuke to those who oppose great public infrastructure projects.

At the time of its celebratory opening, on May 24, 1883, the structure, then the longest suspension bridge in the world, was deemed the "Eighth Wonder of the World." Mayor Abram Hewitt declared it be "a monument to the moral qualities of the human soul." It was designed by John A. Roebling, a German immigrant, schooled in the tradition of the Humboldt education reforms, to withstand whatever forces of man or nature would be thrown at it, including storms and hurricanes. Roebling accomplished this by employing classical principles, namely the catenary (the principle used as well in the construction of Brunelleschi's great dome that crowns Florence Cathedral), and the stability of the triangle. The unique feature of Roebling's suspension bridges, including an earlier railroad suspension bridge over Niagra Falls, was the use of diagonal "stays" which were fixed to the towers at one end, and to the roadway, at a right angle, at the other. Its huge towers, with their double gothic arches, were designed to suggest the great cathedrals of Europe.

As today, the budget hawks, austerity mongers, environmental pessimists, et al., were livid. The *New York Times*, on opening day, complained that "the progress that was defined in terms of public works also had its price. It often enriched the corrupt, exploited the weak, and disrupted urban life in unforeseen and undesirable ways."

Roebling, who envisioned a worldwide land-bridge



Brooklyn Bridge ca. 1900.

Library of Congress

connecting the nations of the world, of which the Brooklyn Bridge would be a part, had written earlier, in his *The Harmonies of Creation*:

"Why is this splendid domain entrusted to our care? Is it that we should enslave our brother of a darker color, or that we should employ nature's forces and make them our slaves?"

"When the miserable competition, strife and jealousy that now exist between the different nations will cease and give way to more rational pursuits which will make plenty for all, then we shall go to work with these stupendous forces at our command, and change the face of the desert of Sahara in Africa...."

"...[W]e will then go to work on a large scale and sink artesian wells of 1,000 feet deep to water the extensive forests which we are bound to plant in the great basin. This will influence our climate and seasons.

"Nature invites us to do all this and plenty more."

—Bonnie James

Among the benefits of electrified high-speed rail and maglev systems: *Goods and passengers would move two to three times faster than they currently do.*

The U.S. highway system has a series of inherent interconnected characteristics which are destroying it and the U. S. transportation system. Following the passage, in 1956, of President Dwight Eisenhower's Interstate and Defense Highways Act, which built the nation's 42,500 mile Interstate Highway System, the financiers used the highway expansion to feed real-estate speculation, the proliferation of shopping and strip malls, and general suburbanization.

Suburban Sprawl

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 population-dense 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. Suburbia became a radiating hub for the post-industrial economy.

As a result, today, commuting to work now often takes 1.5 to 3 hours per day (or more), and the "rush hour" has become anything but, as traffic congestion turns highways into extended parking lots.

Now, even eight-lane highways are not enough: Some "urban planners" propose building them to 12 or 14 lanes. Even if the land existed for them, which is doubtful, this makes no sense.

In a petroleum-dependent mode, motor vehicles consume 8.7 billions of gallons annually of ever-more expensive gasoline.

And 24 hours a day, without cease, now more than 9.5 million trucks tear up the top surface of America's roads and bridges, while relentlessly and violently shaking their foundations.

A high-speed rail and maglev system must remove one-third of the freight off the highways. For trucks that carry containers, the containers could be taken off trucks and put on rail. In a process that is in the experimentation phase, entire trucks—cabs and trailers—are being put on trains in one city, transported to another city, and disembarking, so that they handle only the local routes.

In examining the problems within the highway system, some have their heads only within that system, which does not allow them to see how a much better situation could be created. In dealing with bridge collapse, every bridge, without fail, must be brought up to standard. The highway system must be maintained, but for a reduced function. The superior rail system must be assigned greater weight and responsibility. Unless that mission is accomplished, with an accompanying one-third reduction in truck traffic and load, no bridge in America is safe.