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An Argument for the Nationalization of Railroad Rights-of-Way

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Transportation is a crucial element in any economy. With such a large portion of the United States' economy centered around transportation, an efficient system of moving goods would be in the nation's best interest.

Competitive markets are the most effective mechanism for allocating resources efficiently. An efficient transportation system, therefore, would be one where competition among carriers is the norm.

Enormous infrastructure costs prohibit new railroads from entering the market, and prevent existing railroads from competing with trucks for freight transportation revenues. This paper focuses on the lack of competition in the railroad industry and attempts to demonstrate why trains are a superior mode of transportation than trucks. This paper will also show that increasing competition in the railroad industry can reduce freight transportation rates, increase service quality, reduce pollution, and reduce fossil fuel consumption. Nationalizing railroad rights-of-way in the United States would significantly improve competition in the transportation sector.

Before discussing nationalization as a socially desirable policy for railroad rights-of-way, it is appropriate to first examine the competitive conditions that exist in the railroad and trucking industries.

COMPETITION IN RAILROADING AND TRUCKING

Perhaps the best way to illustrate the lack of competition in the railroad industry is by comparing it to the trucking industry. The goal in this section is to illustrate the difference in competitiveness between trucks and railroads, which will demonstrate the degree to which competition can be improved in railroads.

Let us consider the number of buyers and sellers of freight transportation. In 1990 the American Trucking Association reported 45,791 trucking firms in the United States (American Trucking Association 1990, 10). In 1991 there were 342 railroad firms (Beier and Cross 1993, 8). These numbers have little meaning without considering the volume of freight moved by each mode. For the same respective years trucks moved 25 percent of all freight in the United States and railroads moved 38 percent (Statistical Abstract of the United States 1995, 626).

In terms of competition, these numbers are quite telling. Over 45,000 trucking firms competed for 25 percent of the freight in the United States in one year, while 38 percent of the freight was handled by 342 railroads in the next year. Worse still, 83 percent of the rail cars loaded in 1991 were handled by the 14 Class I carriers¹ (Beier and Cross 1993, 7). This fact may lend support to those who argue that railroads exert monopoly or oligopoly power (Schmidt, 1995 (?)).

The difference in barriers to entry and exit for trucks and trains are just as extreme. The most obvious difference is in equipment costs. A new semi tractor costs anywhere from \$60,000 to \$100,000 (White, 1996) and the average trailer cost \$20,000 to 30,000 (Harvey, 1996). In 1994 a new locomotive cost \$2 million, and rail cars ranged from \$45,000 to \$50,000 each (Kruglinski 1994, 12). These differences are magnified by the fact that one semi tractor can reach its minimum efficient scale² with just one trailer. A train, on the other hand, requires more

¹ Class I railroads are defined as railroads with annual gross revenues of \$253,700,000 or more (Association of American Railroads, 1994, 3).

² Minimum Efficient Scale is the smallest quantity of output at which a firm's long run average cost is minimized (Mansfield, 1993, 312).

than one car to reach its minimum efficient scale. Clearly it is more expensive to buy new railroad equipment than trucking equipment.

A less obvious difference between starting a new trucking firm and a new railroad firm is the cost of infrastructure. To begin moving freight by truck, a firm does not need to sink millions of dollars into new highways and bridges. Firms pay for existing roads and bridges through diesel and road use taxes. These taxes are based on usage, i.e., how much fuel is consumed or how many miles are traveled. These taxes are a variable cost to the trucking firm.

In theory, a new railroad firm would require new rights-of-way. In other words, before a new firm could move a single train, that firm would have to purchase land, build roadbeds, lay tracks, and install the necessary switches, signals, and crossings. Constructing new rights-of-way presently costs about \$1 million per mile (ENR 1993, 18).

In practice, new railroads do not build new rights-of-way. Many times a Class I carrier will sell-off lines that do not meet minimum profit margins and a new regional or local carrier will purchase these lines. Other times an existing regional or local railroad will fail and new owners will buy the rights-of-way, rolling stock, and facilities of the defunct company.

Data seem to support the claim that high infrastructure costs make starting a new railroad much more difficult than starting a new trucking firm. Between 1980 and 1990, 27,746 trucking firms were created (American Trucking Association 1990, 10). One hundred forty-six railroads were created during the same period

(Beier and Cross, 1993, 8). Enormous infrastructure costs are a barrier to firms wishing to enter the railroad industry.

Trucks and trains both pay infrastructure costs, but the different nature of the costs magnify the disparity in competitive conditions between the two. Trucks pay for highways and bridges on a variable basis, while trains pay fixed expenses for infrastructure. The costs associated with property taxes and building rights-of-way remain constant throughout a particular year whether a train moves over the tracks or not. Maintenance costs are somewhat fixed in the sense that once the maintenance has been performed, those costs must be paid regardless of the volume of traffic over the repaired line. Variable infrastructure costs give trucks a bottom line advantage over trains; economic profits are reached sooner for trucks because of the much lower fixed costs.

Trucking is clearly more intermodally competitive than railroading. This competitiveness results in lower prices and better service for trucks compared to railroads. Lower prices and better service results in freight being diverted to trucks when trains can move the same loads more efficiently in terms of resources.

Assuming that there is excess capacity on rail lines and that reallocating resources through competition is desirable, it is logical to illustrate how altering infrastructure ownership might improve competition among railroads.

Reducing or eliminating the barriers to entry—the high fixed costs of infrastructure—in the railroad industry would increase competition. As the cost of starting a railroad decreases, the number of individuals or organizations

capable of financing a new railroad increases. If there are profits to be captured in rail freight transportation, more railroads would be created, increasing competition.

Let us now take up the issue of how to reduce or eliminate infrastructure costs in railroading.

NATIONALIZING RAILROAD RIGHTS-OF-WAY

Federal, state, and local governments work together to construct and maintain highways in the United States. Gasoline, diesel, and road use taxes are the primary source of financing for these highway expenditures. Federal and state governments establish laws to regulate traffic over highways, and fund agencies to enforce the laws. This system is the model for changing infrastructure ownership and maintenance responsibility in the railroad industry.

The federal government would own all of the railroad rights-of-way in the United States. The government would maintain existing trackage, construct new trackage as needed, and coordinate railroad traffic across the nation. Private companies would own and operate locomotives and cars with universal access to all rail lines in the United States. This system would be financed by an access fee; railroads would pay a tax to use the government-owned tracks based on the number of ton-miles traveled and the quality of the track.

There are five major issues that must be considered to make nationalization a viable policy option. The first issue is how to compensate railroads for the loss of their largest asset: rights-of-way. One method would be to determine a dollar value for an individual railroad's rights-of-way and then pay

the firm that dollar amount (or some percentage of that amount) in return for their rights-of-way³. This would complete the transaction immediately, and would provide railroads with capital to improve rolling stock, switching yards, and other facilities. The drawback is the enormous expenditures the government would incur.

An alternative method of compensation would be to spread the acquisition cost over time. Once a dollar value has been assigned to a railroad's rights-of-way, this value could be split into yearly credits. These credits, plus some amount of interest, would reduce the amount of access fees the railroad would pay the government.

To clarify this method, consider this example. Suppose that a railroad firm owns 100 miles of trackage, for which the government decides to pay one million dollars over twenty years at 5 percent interest. Further suppose that in the first year of this arrangement, the same railroad accumulates \$250,000 in access fees that it must pay the government. If the government were to amortize the value of the firm's trackage (\$1 million) over 20 years and add the interest premium, the railroad would owe \$197,500 to the government in access fees for that year. That is,

$$\$250,000 - \frac{[1,000,000 \times (1 + .05)^t]}{20} = \$197,500 \text{ where } t = \text{the number of years}$$

³ Purchasing the track would be no small expense. The 110,425 miles of road owned by Class I railroads (Railroad Facts, 1994, p. 44) is valued at over fifty-four billion dollars (Moody's, 1995, a27).

since the tracks became government property. The railroad firm would use this formula to calculate its access fee credit each year for the length of the agreement (20 years in this example).

The advantage of this amortization method is that it eliminates the up-front cost of buying rights-of-way from railroad firms. Additionally, the government would generate revenues from the access fees in the first year of this arrangement, although the credit would reduce these revenues. One major concern with this proposal that must be addressed is the consequences of railroad failure prior to receiving all the credits due.

The second issue is how to tax railroads for using rights-of-way. A simple answer is to charge firms for the number of ton-miles moved over a certain quality of track. One hundred-thirty pound rail (130 pounds per yard) is more valuable and more expensive than 110-pound rail. Heavier rail lasts longer and permits higher train speeds and rail car weights than lighter rail. It seems logical, then, for firms to pay a higher tax per ton-mile for higher quality track and a lower tax per ton-mile for lower quality track.

Assessing these varying tax rates would not be difficult. Trains are (obviously) restricted to the rails, making it relatively simple to follow their route. Knowing the exact tracks that a train uses would permit accurate taxation for usage based on the quality of tracks.

An important aspect of the tax is that it must be equal to the marginal social cost of using the tracks. Each time a train passes over a section of trackage there is wear on that section. Over time the rails, ties, and ballast deteriorate to a

point where repair is necessary. The marginal private cost would be equal to the damage caused by each incident of use.

The true cost of maintaining rights-of-way must also take into account the marginal social cost of use. As rail traffic increases line congestion increases, causing delays. Each carrier using a particular line occupies a zone that includes the actual section of track the train occupies plus space in front of and behind the train. No other train may be in this zone at the same time. Coordinating these zones may cause delays, and therefore costs, to other carriers wishing to use the track.

When a line closes for repairs, each carrier responsible for wear on that line inflicts costs on other carriers wishing to use the line. An efficient system of taxation would include not only the marginal private cost of use, but also the marginal social cost of use.

The third issue is how to transform existing rights-of-way into a functional network that spans the nation so that every rail carrier has access to every line. Presently tracks owned by different railroads are for the most part unconnected (Flint, et. al. 1995, 328). Constructing links and switches between existing trackage would be necessary. A nationwide system of train controls and monitoring would be required to safely control traffic over this network and record track usage for taxation.

A drawback to this proposal is that the initial cost of networking (building links and switches and implementing nation-wide train controls) would be in addition to yearly maintenance expenditures. If the access fee was set to recover

the marginal social cost of trackage use, the initial networking costs would not be included in the marginal cost calculation. Instead, networking costs would be a fixed cost that would require a special appropriation from the government.

Up to this point we have discussed construction, maintenance, and traffic control as the responsibility of the government but have neglected the labor concerns implied. This is the fourth issue. There already exists a labor force skilled in trackage construction, maintenance, and train control. The logical solution is for private sector maintenance workers, signalmen, and switchmen to become public sector employees.

There are two significant concerns with rail employees becoming government employees. The first is that the unions representing the maintenance workers and signalmen, the Brotherhood of Maintenance of Way Employees and the Brotherhood of Railroad Signalmen respectively, would have virtually no bargaining power against the government. Switchmen would be placed in an awkward position. The United Transportation Union (UTU), the union to which they belong, would still have members who are not government employees. The UTU would have bargaining power with the railroads, but not the government.

The second concern deals with compensation. Rail workers presently receive extra retirement benefits through the Railroad Retirement Act. Under this act railroads must contribute 16.1 percent of each worker's salary to a retirement account. This contribution is in addition to the standard 7.65 percent payment to social security and another 4.9 percent of wages that match employee

contributions (Flint, et. al. 1995, 329). The concern is whether or not these retirement benefits will continue after railroad employees become public sector employees.

The final issue deals with accountability for private trains moving over publicly-owned rights-of-way. This situation is analogous to private trucks and automobiles using the nation's highways. The government would likely require some sort of licensing for locomotive engineers, just as truck drivers are required to have a Commercial Driver's License. This would provide a minimum competence of train engineers and aid in safety and credibility.

ECONOMIC AND ENVIRONMENTAL JUSTIFICATION

A nation-wide network of trackage would provide present and future railroad carriers access to any shipper in the United States that is capable of utilizing rail transportation. If any carrier has unrestricted access to a shipper, that shipper has a choice of carrier with which it can contract its services. Once shippers have a choice, carriers will be forced to compete with each other to win a shipper's business. This competition can be in terms of rates, service, or some other criteria.

Consider a utility company that burns coal to generate electricity. In many cases a utility is served by one railroad which delivers coal to the plant (ENR 1993, 18). If only one railroad serves the facility, the utility has no choice among carriers, and must agree to the terms and conditions of service established by the railroad. If nationalization occurred and any carrier could use the rights-of-way connected to the plant, the utility could choose a carrier based on price, service

quality, or any other criteria. In other words, railroads would have to *compete* for lucrative coal hauling contracts.

Nationalization would also increase the number of railroad carriers in the United States. Since infrastructure costs are a significant barrier to entry for prospective railroad firms, nationalization would eliminate this barrier and reduce the cost of starting a new railroad. As start-up costs fall, the number of firms capable of financing a new railroad would increase. Assuming there are excess profits in railroad transportation, new firms would purchase the necessary rolling stock and facilities and compete with existing railroad firms.

Competition among firms will increase as the number of firms willing to serve a particular shipper increases—as both existing firms gain unrestricted access and new firms enter the market. As a result, freight transportation rates will fall until a new equilibrium emerges. After rates settle shippers will choose among carriers based on the quality of service offered. Nationalization will therefore reduce rail rates and improve service quality.

A 1993 study by Donald Harper and Philip Evers surveyed manufacturers in Minnesota about their perceptions of railroad, truck, and intermodal freight carriers. The authors found that respondents who use intermodal service perceived railroads as more costly, less reliable, and much slower than trucks. Intermodal users overall perceptions for railroads and trucks, on a scale of one to five (1=poor, 3=average, 5=excellent) were 2.50 and 4.17, respectively. Manufacturers who did not use intermodal service indicated the same

perceptions of price and service quality—they scored railroads 1.97 and trucks 4.08 (Harper and Evers 1993, 37-38).

Nationalization could provide a framework for reversing these negative perceptions of railroads. One might expect that, as railroad rates decrease and service quality increases, perceptions of railroads would change for the better. As these perceptions improve the volume of freight moved by rail would increase.

Table 1

Preferred Mode of Freight Transportation when Comparing Price and Quality of Service Between Railroad and Trucking Companies

		Quality of Service		
		RR > Trucks	RR = Trucks	RR < Trucks
P r i c e	RR < Trucks	Train	Train	?
	RR = Trucks	Train	?	Truck
	RR > Trucks	?	Truck	Truck

Table 1 shows the relationship of price and quality of service between trucks and trains. If a shipper learns that railroads would charge a lower price than trucks, and that the quality of service offered by railroads is superior to trucks, then the shipper would choose to transport its freight by railroad (top left). If railroad rates were the same as trucking rates, but trucks offered better service, the shipper would choose trucks (middle right).

As railroad rates decrease and service quality increases, it is likely that more shippers would choose to move their freight by rail. In terms of Table 1, firms would tend to migrate to the northeast. When the difference in price and quality of service favor trucks (e.g., middle right), improvements in rail rates and service would make trains a viable alternative (top right, middle middle, or top middle). Where the choice between trucks and trains is currently unclear (indicated by "?"), firms would be compelled to choose trains as rail rates decreased and/or service improved.

The economic benefits of competitive freight transportation are compelling. Nationalizing railroad rights-of-way is certainly not the panacea that a flat tax is, but many of the same ideas hold true. Shippers using rails would realize cost savings through lower rates and service improvements if competition between railroads forced rail rates to decline. These savings could be passed down the value-added chain and result in lower prices for finished goods. It may also be the case that cost savings could prompt some kind of investment by manufacturers.

It would be naive to think that competition in the railroad industry would only affect railroads. As rail prices decline and service improves, trucks will be forced to compete with trains for freight that can be moved by either mode. Intermodal competition could drive trucking prices down, resulting in lower prices for even more finished goods.

Lower prices for consumers is not the only social benefit from nationalization. Shifting freight transportation from trucks to trains is also environmentally desirable. A 1995 study found that trains were three times more fuel efficient than trucks (Purchasing 1995, 52), and a 1989 report from the Association of American Railroads indicated that trains could haul 2.76 more ton-miles per gallon of fuel than trucks (Wilner 1989, 23).

Several studies have found that trains cause less pollution than trucks. A 1984 study by the Radian Corporation for the Environmental Protection Agency found that trucks produced eight times as many hydrocarbons, two and one-third times as much carbon monoxide and nitrogen oxide, and nearly nine times as much particulate matter as trains. In that year trains hauled 935 billion ton-miles and trucks carried 620 billion ton-miles (Wilner 1989, 24). A study conducted for APL Stacktrain Services in 1995 found that trucks emit ten times more particulate matter and hydrocarbons as trains to move the same amount of freight. Trucks also produce three times as much nitrogen oxide and carbon monoxide as trains (Purchasing 1995, 52).

If the volume of freight moved in the United States remained constant, nationalization would reduce pollution, measured in tons of emissions.

Shippers would be lured away from trucks by lower rates and improved service offered by trains. As less freight moves by truck and more moves by rail, hydrocarbon, particulate matter, carbon monoxide and carbon dioxide emissions would be cut drastically. Since trains are more fuel efficient than trucks, the amount of fossil fuel needed to move the constant amount of freight would also decline.

The economic and environmental benefits of increased competition in railroading are limitless. Competition, however, does not occur without causing other problems. Let us now focus on several caveats of nationalization.

THE SHORTCOMINGS OF INCREASED COMPETITION THROUGH NATIONALIZATION

If freight is diverted from trucks to rails, one concern is that many truck drivers may lose their jobs. This point is difficult to counter considering that one double-stack intermodal train traveling across the United States eliminates several days' work for up to 200 truck drivers. This brings up an important point,

however. Although long-haul trucking may indeed decrease, short-haul trucking would likely increase as a result of increased intermodal traffic⁴.

For a train to haul intermodal containers from a point of origin to a destination, there must be trucks at both points. Trucks must take containers from a shipper and deliver them to the rail yard to be loaded onto a train. After the train reaches its destination, there must be trucks to take the containers from the rail yard to their final destination. This local delivery to and from railroad terminals is referred to as drayage (Candler, 1994, 73).

The drayage and rail portions of intermodal freight are, by definition, complementary goods. As demand for intermodal rail service increases, demand for local drayage will increase as well. Lower employment that would result from decreased demand for long-hauls would be offset by increased demand for drayage short-hauls. Whether or not the increase in demand for short-haul drivers will completely offset the decrease in demand for long-haul drivers is difficult to say. It is possible that some drivers would lose their jobs, although not nearly as many as might otherwise be expected.

THE POLITICAL FEASIBILITY OF NATIONALIZATION

The theory supporting nationalization is intuitively appealing. In an era of government down-sizing and public distrust of the government, however, such a proposal may face serious political challenges. It is likely that many politicians would be opposed to nationalizing railroad rights-of-way. Motor, air, and barge

⁴ In this case, intermodal traffic refers to freight moved from one point to another using both trucks and trains.

carrier lobbying groups would certainly work to stop such a plan. There are several reasons, however, why the present time may be the most favorable for proposing nationalization.

High-speed rail is becoming a popular topic in Washington and elsewhere.

William Middleton noted that

“Amtrak is moving rapidly to complete the work needed between New York City and Boston to convert the full Northeast Corridor, from Washington to Boston, to high speed operation. New York State already has the Empire Corridor linking New York City with Albany and Buffalo, and last year Congress designated five priority high speed corridors. These include routes linking Washington, Richmond, Raleigh, and Charlotte, N.C.; a Maimi-Orlando-Tampa route; a Midwest route linking Chicago to St. Louis, Detroit, and Milwaukee; a California corridor extending from San Diego to Los Angeles, San Francisco, and Sacramento via the San Joaquin Valley; and an international line linking Eugene, Portland, Seattle, and Vancouver, B.C. Earlier this year the Clinton Administration proposed legislation that would establish a five-year \$1.3 billion program for high speed rail development” (Middleton, 1993, 13).

Two projects Middleton mentioned are already under way: Florida Overland Express will build a 319-mile high speed railway between Miami, Orlando, and Tampa for \$4.8 billion (Tomkins, 1996, 3) and Amtrak just announced that it will purchase 18 high speed train sets to run on the Northeast Corridor (Tomkins, 1996, 3).

Most high-speed rail uses some sort of magnetic levitation on special tracks. Other technology uses existing tracks modified with magnets to propel trains (Design News, 1995, 13). If high-speed rail becomes a national priority, only the federal government is capable of constructing a nation-wide system of special tracks for high-speed trains. An editorial in The Economist agrees that “[i]ninstalling tracks and signalling is the sort of big infrastructure projects governments do best” (The Economist, 1994, 18).

Finally, an interesting scenario has emerged in Great Britain. British railroads were previously owned and operated by the British Government. In 1993 Parliament voted to privatize the railroad industry with exception to rights-of-way (Anderson, 1995, 10). Now private companies make up 25 passenger train operating units, five freight train units, and several rolling stock and maintenance companies. The rights-of-way are still publicly owned by Railtrack (Anderson, 1995, 10).

This may prove to be a valuable case study in mixed ownership of the rail industry. While the means are very different, namely, starting from a completely public system, the ends are the same—privately owned trains using public rights-of-way. Careful study of the developments in Britain may yield actual data for a cost-benefit analysis of U.S. nationalization.

CONCLUSION

The high fixed costs of infrastructure preclude competitive markets in the railroad industry. Eliminating fixed infrastructure costs and granting universal access to all rail carriers would increase competition between existing carriers and increase the number of carriers competing in the future. Increased competition would likely yield lower rail rates, improved quality of rail service, and lower motor carrier rates.

Nationalization can eliminate fixed infrastructure costs and stimulate competition in the entire transportation sector. It can reduce pollution, reduce fossil fuel consumption, reduce overall transportation expenditures in the U.S., and potentially increase productivity in the U.S. Nationalization of railroad

rights-of-way is a viable proposition for improved economic performance, and should be a national topic of debate.

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