Toll Roads for Trains

A Plan for Effective American Supply Chain and Climate Emergency Response

Contents

Developed by Thomas White

www.vtd.net

Revised March 30, 2023 based on review and comments received from Robert J Wasson. His insight and advice is appreciated.

Revised April 19, 2023 to explain the potential transition from government control to government ownership.

Revision 1: 03/30/2023

Toll Roads for Trains: The Plan

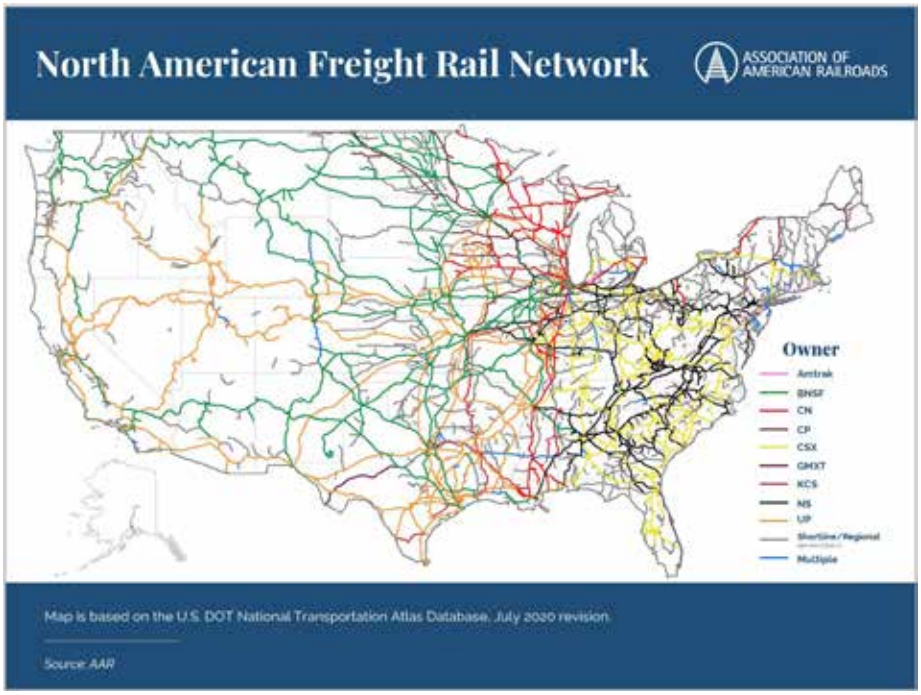
Toll Road for Trains (TRT) is a new model for operation of the US rail system that would be similar to tolled highways, except the infrastructure could remain in private ownership. The plan separates rail infrastructure and rail service into financially independent businesses. Existing railroad companies could, if desired, retain ownership of both by forming a holding company that owns both divisions. Any business or public entity that is qualified to provide rail service would have nondiscriminatory access to operate trains on the national rail network for a published fee paid to the infrastructure company. Access for train operation would be reserved on a per train basis for a specific time and route schedule. The TRT arrangement serves the national interest and brings rail infrastructure under public control.

Why is it Needed?

Rail transportation has been diminished by the Monopoly power that comes from the lack of intra-modal competition.

A monopolist maximizes his profit by producing less while charging more than he could in a competitive market. There are two elements to this:

- The higher price for rail is probably a factor in current extreme income inequality. We all pay a little more for what we use directly or indirectly that is shipped by rail, and all this money goes to the few.
- Railroads doing less than market economics suggests they should.
- Working conditions and the levels of service and safety of the railroad industry are unacceptable.
- Deregulation has allowed the railroad industry to generally operate as regional monopolies. Freight customers have a limited choice of carriers, if they have any choice at all. Railroad labor, generally with specialized, not-easily-transferable skills, is placed in the same disadvantaged position.
- As corporations, railroad companies have the fiduciary responsibility to act in the best interests of the stockholders. That is accepted to mean making the greatest possible return on investment



This color-coded Association of American Railroads map, generated from US Department of Transportation data clearly demonstrates the local and regional monopolies of the railroad industry. There are a small number of routes on which trains of more than one railroad operate, usually required by regulators because of a merger.

The highway network in the US is subsidized by federal, state, and local governments. The property is not taxed. Funding sources are more favorable than available from commercial banks for improvement to railroad property. The highway system is available to any business that desires to engage in passenger or freight transportaiton.

Enforcement of railroads' common carrier duties, both before and after the Staggers Rail Act of 1980, has been ineffective. The Class 1 railroads discourage shipments they consider to be not profitable enough. They provide a level of service and/or a rate that is not competitive with trucks, the truck 'wins,' and the railroad company's Common Carrier obligation has been met.

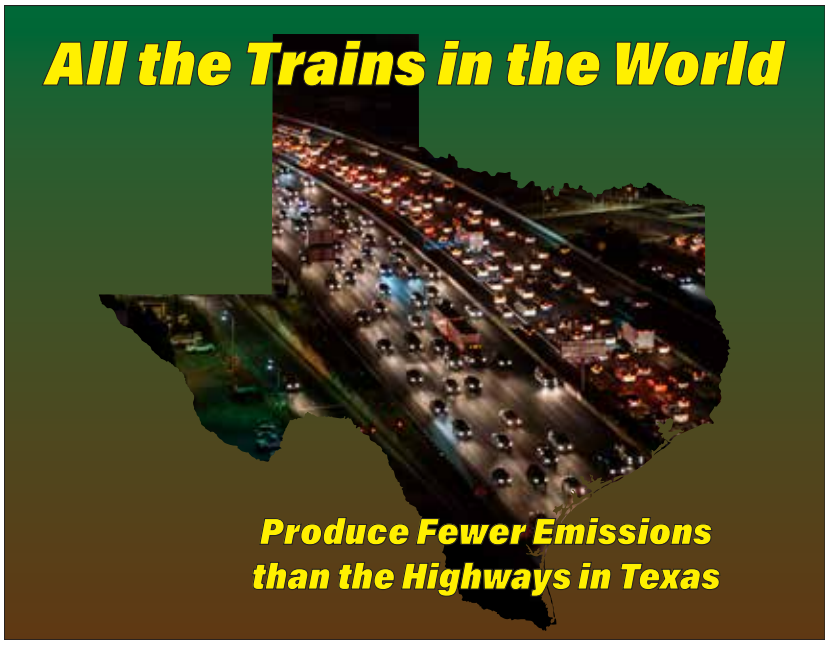
- Safety of railroad operations is directly related to crew scheduling, among other factors. A more structured and competitive model will provide better workforce standards and protections. Work schedules can be anticipated, allowing for rest, sleep, and optimal worker performance.
- The US rail system is far from being well utilized because of the chaotic way in which it is operated. Improvised operation results in long stretches of tracks that see trains only infrequently, as well as segments that are heavily congested.
- The US needs economic opportunities to expand in the form of rail industry-related jobs and professional careers. Competition among operators incentivizes retention of workers and fair worker contracts. Industry-wide opportunities will be created by reinstating professional institutional knowledge through expanded post secondary rail programs and curricula.
- Railroad companies have developed their business model in part as a result of the federal, state, and local governments subsidizing highway transportation.

Three Critical Challenges

The US is facing three critical challenge areas that are linked to rail transportation:

1. Climate Change: Greenhouse gas emissions must be reduced by about 50% by 2030 to prevent irreparable climate damage[1]. A rapid and substantial mode shift from highway to rail, for passenger and freight, is essential for reducing emissions and conservation of energy.

- The Department of Defense has stated that the climate emergency is a matter of national security[2].
- Rail generates only one-third of the emissions of equivalent highway transportation. Nationwide, highway transportation is responsible for 82 percent of greenhouse gas emissions; rail is responsible for two percent[3]. As an example of the magnitude of the problem, the combined emissions of all the trains in the world are less than the emissions of the highways in Texas[4].
- Rail uses one-third the energy of highway vehicles, which is important when considering the immense



amount of new electric power generation needed to electrify highway vehicles, a greatly expanded power grid, and other industry requirements.

2. Supply Chain: The supply chain must be restored to efficient and effective operation.

- Aspen Institute has stated that supply chain weakness is a threat to national security[5].
- Imbalance in subsidies: Highway, air, and marine transportation are heavily subsidized. With only a few exceptions, rail transportation, an important climate emergency response, is not. Funds must be redirected to investment in rail transportation. The TRT arrangement gives the railroad system the same public utility as the highway system.
- Rail transportation should play a much more substantial and important role in the US transportation system.
  - By any measurement, US passenger rail transportation is last in the developed world.
  - US railroads are second in the world in ton miles carried. That is not surprising since the US has the largest rail network in the world, the Class 1 railroads discourage shipments of under about 700 miles, and they discourage shipments of less than the maximum permissible weight per car. They also discourage shipments of a single car or a small number of cars.
  - Measured by weight, trains carry 9.3 percent of the freight; trucks carry 71.5 percent[6].
  - Measured by value, trains carry 1.4 percent of the shipments; trucks carry 73 percent[7].
  - Measured in train miles per mile of track, the US is 11th in the world, adjusted for US train lengths[8].

3. Workforce Policy: Restore integrity and fairness in rail workforce policies.

- Many railroad industry trades have unique knowledge requirements and characteristics that are not easily transferable to other industries.
- Many railroad employment locations are substantially served by only one railroad.
- The railroad industry takes advantage of employees by subjecting them to oppressive working conditions, with the knowledge that employees have limited chances for other similarly compensated employment near where they live.
- The ways in which the railroad companies circumvent the intention of the hours of service regulations is dangerous to employees and to the public.

Rail Transportation is Essential to the National Interest

Effective rail transportation is an essential climate emergency response, important for national security, and for public safety

- The Pentagon has declared climate change a national security issue. The low energy consumption, low emissions, safety, and better land use of rail transportation are needed for continued economic strength and reversal or mitigation of the climate crisis.
- The US Department of Transportation estimated in 2009 that highway congestion costs the US $85 billion annually[9]. It also causes secondary problems related to delayed emergency response as the traffic has no way to clear for the passage of emergency vehicles.
- Building highway capacity has been demonstrably ineffective in reducing congestion.
- The number of highway accident fatalities is about 732 percent of rail accident fatalities. The number of highway accident injuries is about 396 percent of rail accident injuries.
- Every month, the number of fatalities in highway accidents is the equivalent of the fatalities in the September 2001 attacks. The number of highway accident injuries every year exceeds the number of wounded US soldiers in all conflicts since 1940[10].

How To Improve Rail Transportation by Bringing Rail Infrastructure Under Public Control

The Non-Option of Immediate Nationalization

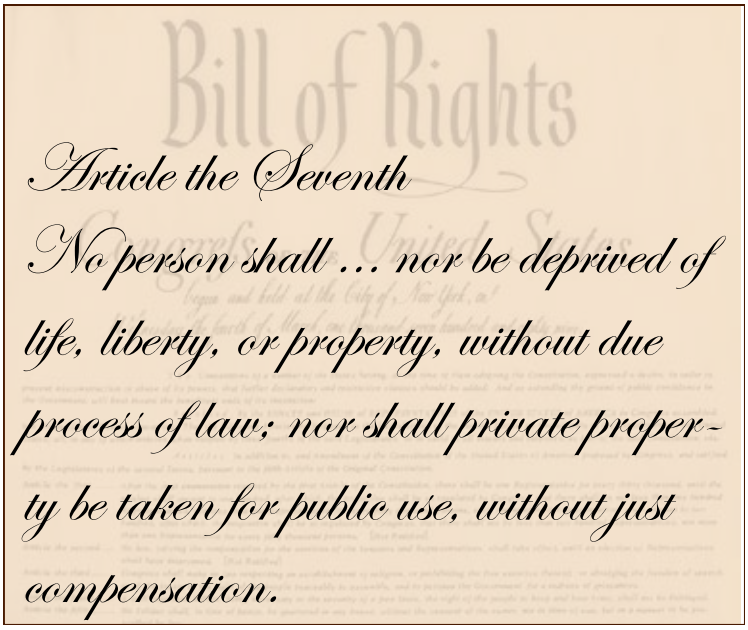
Eliminating the regional monopoly arrangement of the railroad industry is essential for improving rail transportation. There are many proponents of nationalization of the US railroad network. They observe that the other modes of transportation, highway, air, and navigation, are conducted on publicly-owned facilities and rail transportation should be likewise.

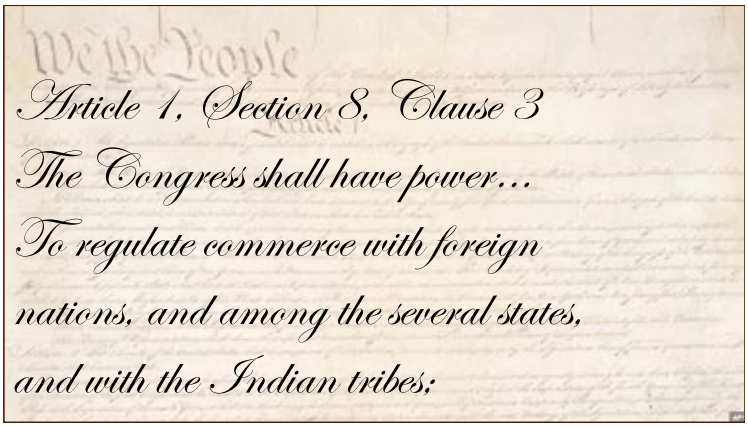
However, immediate nationalization is not practical. By definition, nationalization involves conversion of an industry to government ownership and control. Government ownership is the general implication of nationalization. That connotation is also generally associated with the government commandeering the industry.

Government taking of property in that manner is prohibited by the Constitution.

The US rail network of about 90,000 route miles is almost entirely privately owned. There are few rail lines that were constructed by a public/government agency, for example the New Orleans Public Belt. A small amount of the network is owned by states, branch lines purchased to prevent abandonment.

Actual nationalization would require the government to purchase the property and infrastructure. Not only would the purchase price be great, but determination of the fair value would also require extensive litigation. Alternatively, the federal government might merely buy





Railway Control Act, March 21, 1918

An Act To provide for the operation of transportation systems while under Federal control, for the just compensation of their owners, and for other purposes.

Be it enacted ..., That the President, having in time of war taken over the possession, use, control, and operation (called herein Federal control) of certain railroads and systems of transportation (called herein carriers), is hereby authorized to agree with and to guarantee to any such carrier making operating returns to the Interstate Commerce Commission, that during the period of such Federal control it shall receive as just compensation an annual sum, payable from time to time in reasonable instalments, for each year and pro rata for any fractional year of such Federal control, not exceeding a sum equivalent as nearly as may be to its average annual railway operating income for the three years ended... [June 30, 1917].

The nationalization that wasn't. The nationalization of 1918 was regulation. It did not involve government seizing property, but rather government controlling the property and compensating the owner.

out the railroad corporations entirely, but that might present substantial political and economic problems.

There have been two nationalizations of US railroads. However, both were nationalized in name only. They were regulation, not taking property.

The Constitution gives Congress the power to regulate interstate commerce and establish post roads (a road constructed and maintained for the purpose of transporting and delivering postal mail). A subsequent Supreme Court decision stated that post roads could be used for other concurrent uses. The general interpretation was public highway. In 1838, Congress designated all existing and future railroads as post roads.

While immediate nationalization is not practical (but eventual government owndership of the rail network may be), effective public control of rail transportation is possible (page 17).

Government Control vs. Government Ownership

The US government need not own a transportation facility to control it. Commercial airports are typically publicly owned facilities. Ownership is local, e.g., a city, county, or port district, but operation is under strict federal control. The same arrangement can apply to railroads.

Also, train dispatchers and traffic scheduling and planning personnel may work for the federal government, as do most air traffic controllers, but federal employment is not necessary. The model of the Federal Aviation Administration (FAA) Contract Tower Program[11] may be used. Contract controllers are employees of private companies, but meet the same qualification and training requirements of FAA controllers and are subject to the same regulations and procedures.

Toll Road for Trains

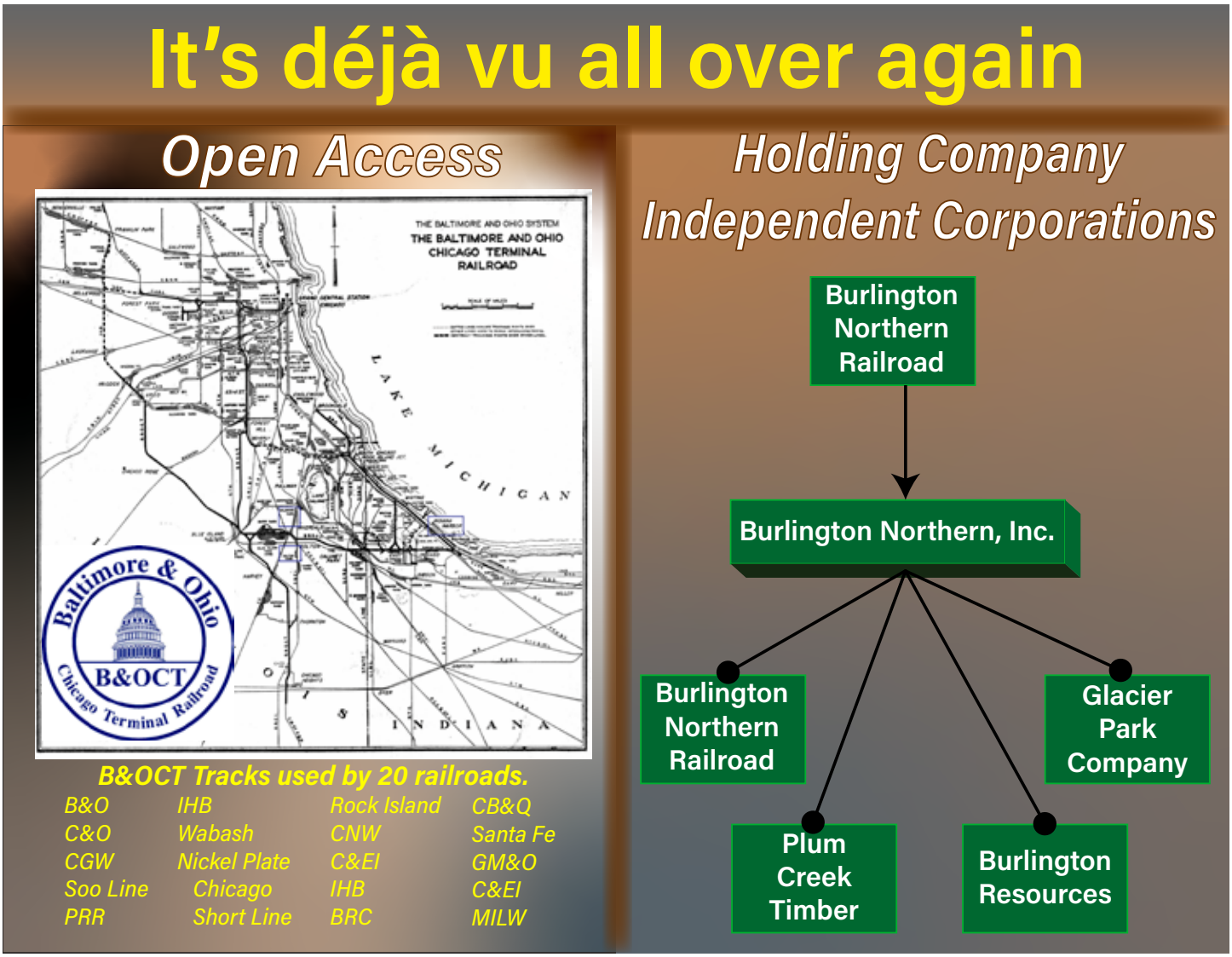
The Model

- The European Commission found that a government-owned monopoly was as detrimental to the national interest as a privately-owned monopoly. The European Union established a system of open access to the rail network through EU Council Directive 91/440/EEC of 29 July 1991[12].
  - The directive requires the financial and management separation of infrastructure from service regardless of ownership.
  - Infrastructure and service may share ownership, but only as financially separate subsidiaries. This arrangement may need to be modified or structured by regulation or legislation to ensure that there is no conflict involved in common ownership through a holding company.
  - The directive requires non-discriminatory access to the infrastructure, using a published fee schedule applicable to all train operators.
- Railroad infrastructure in the EU has effectively become a toll road for trains. In Germany, this has increased rail market share by almost 100 percent[13] and has generated the need to greatly expand and improve the rail system to accommodate more traffic[14].
- The TRT model for efficient, competitive use in the U.S. is essential. It does not involve nationalization or government taking or purchasing of private property.
- Rail infrastructure in the US would operate similarly to highway infrastructure, many individual transportation companies sharing the infrastructure.
- For comparison, European railroads were nationalized generally in the early 20th Century. Rail transportation was considered too valuable to the national interest to be trusted to for-profit corporations. In the late 20th Century, they were generally made government-owned corporations, similar to Amtrak and the Postal Service.
- The fee structure prescribed by EU regulations includes the cost of owning and operating the infrastructure and a profit margin.
  - In certain circumstances, mark-ups, additional fees, are allowed.
  - When an infrastructure company has a need for additional infrastructure to accommodate additional traffic,

a business case is made to the government. Grants are awarded for the new infrastructure, which becomes property of the infrastructure owner upon completion.

Business

- Congress can enact regulations that require separation of rail infrastructure from rail service, in the manner of the EU regulation. A rail infrastructure subsidiary owns and manages infrastructure. One or more Train Operating Company (TOC) subsidiaries provide rail transportation service.
- There is US precedent for the separation of elements of railroad corporations into holding companies controlling financially independent subsidiaries. For example Burlington Northern Inc. from Burlington Northern Railroad and Santa Fe Industries from Atchison, Topeka & Santa Fe Railway. Both formed a holding company to separate assets from the railroad company subsidiary.
- There is precedent in the US for the TRT arrangement. Baltimore & Ohio Chicago Terminal Railroad (B&OCT) was a wholly owned subsidiary of Baltimore & Ohio Railroad (B&O). The purpose of separation was the ability to take advantage of benefits available to railroads located entirely within the Chicago Switching District. Each railroad using B&OCT, including B&O, was charged a fee to use B&OCT tracks. Indiana Harbor Belt, Belt Railway of Chicago, and Chicago & Western Indiana Railroad, also in the Chicago Switching District, presented a similar



Precedent in the US. (left) Baltimore & Ohio Chicago Terminal railroad was a US model for the Toll Roads for Trains concept. Tracks were used for a fee by 20 railroads, including the owner, Baltimore & Ohio. (right) After passage of the Staggers Act, Burlington Northern Railroad became a holding company, creating financially separate businesses for portions of the railroad assets.

situation.

- TRT does not exploit the infrastructure owner, a fear of the railroad companies when this model is discussed. The arrangement would be an advantage to the owners of greatly underutilized US rail infrastructure. The US has vast expanses of virtually empty rail lines and a relatively small number of extremely congested areas, generally due to operating and infrastructure minimization practices.
- TRT allows the current railroad corporations to provide or discourage service as they currently do. However, they will compete with other TOCs.
- TRT allows other companies to provide the service that is now missing.
- Public agencies may subsidize rail infrastructure and/or operations as a matter of policy, for example, because of the climate emergency importance of rail transportation.
- In cases that involve service for public necessity that is not suitable for profitable operation, such as commuter or suburban service, (Public Service Obligations - PSO) public agencies may engage and subsidize a TOC to provide the service.
- The model would provide alternative employment opportunities for people currently trapped in an unacceptable employment arrangement.
- TRT would facilitate implementing new passenger rail service and would improve the punctuality of current passenger service.
- Prior to Amtrak, passenger trains carried a significant amount of express freight, most of which was lost to the government-supported competition of trucks. From the mid-1980s into the early 2000s Amtrak operated an extensive express freight service on passenger trains, but track access and schedule restrictions and opposition of the freight carriers caused the service to fail. Under the TRT model, such service could return and provide the basis for new passenger rail service and improvements to existing passenger and freight service.
- Service must be scheduled in detail, as is the current practice in most of the world. The schedule is a reservation for segments of track at specific times.
- TRT procedures include assessment of penalties for entities causing delays. For example, if a TOC's train breaks down and delays another TOC's train, the delaying TOC must pay the TOC of the delayed train. If the TOC's broken down train delays track maintenance work, the delaying train's TOC must pay the infrastructure company. If a track or signal failure delays trains, the infrastructure company must pay the TOCs of the delayed trains.

Infrastructure

The US railroad network presents a paradox. The US is 11th in the world in utilization[15], measured in train miles per track mile and adjusted for the length of typical US freight trains. This manifests in long distances of infrequent trains and small areas with heavy congestion. The US rail network has been configured for the industry's preferred traffic: infrequent, long, slow, heavy trains that are not time sensitive. Faster trains are stuck behind slower trains for the lack of a track to get out of the way.

The railroad industry has spent decades reconfiguring the infrastructure for their preferred business, long, heavy, low to moderate speed trains. The changes have involved removing track, closing yards, and modifying signal and traffic control systems.

To achieve the rail transportation we need, substantial infrastructure improvement must be made, but more infrastructure is not required in order for TRT to work effectively. However, substantial improvement in utilization can be achieved by changing the way rail service is conducted on the system we have now.

How is infrastructure improved for increased capacity or shorter transit times?

Infrastructure improvement in the TRT model is similar to the current practice for new or improved passenger service. The standard practice involves a public agency requesting and sponsoring the service. The property owner (host railroad) determines the new infrastructure needed to support the proposed service. The public agency funds the infrastructure improvements necessary for the new or improved service. The host railroad performs the work and/or hires

contractors to do it. The improvements become property of the host railroad. The fee charged to the sponsoring agency includes the cost of maintaining the new infrastructure.

The railroad industry pays from almost all infrastructure from revenue. There is great competition among important projects for the available funds, so projects are chosen based on return on investment, typically with a five year planning horizon.

There are also federal grant programs for railroad infrastructure improvement. Again, the railroad company applies for the grant, describing the improvement and its purpose and intended result. On approval, the grant is funded, and the railroad company performs the work or hires contractors. The improvements become the property of the applicant.

Under the TRT model, improvements will be handled similarly. An infrastructure company may improve the infrastructure from revenue. It may determine that improvements are needed and apply for a grant. Public agencies may also apply for rail improvement grants. As part of regular review of the state of the network, FRA may also determine that improvements are needed. The cost of owning and maintaining the improved infrastructure will become part of the access fee charged to Train Operating Companies.

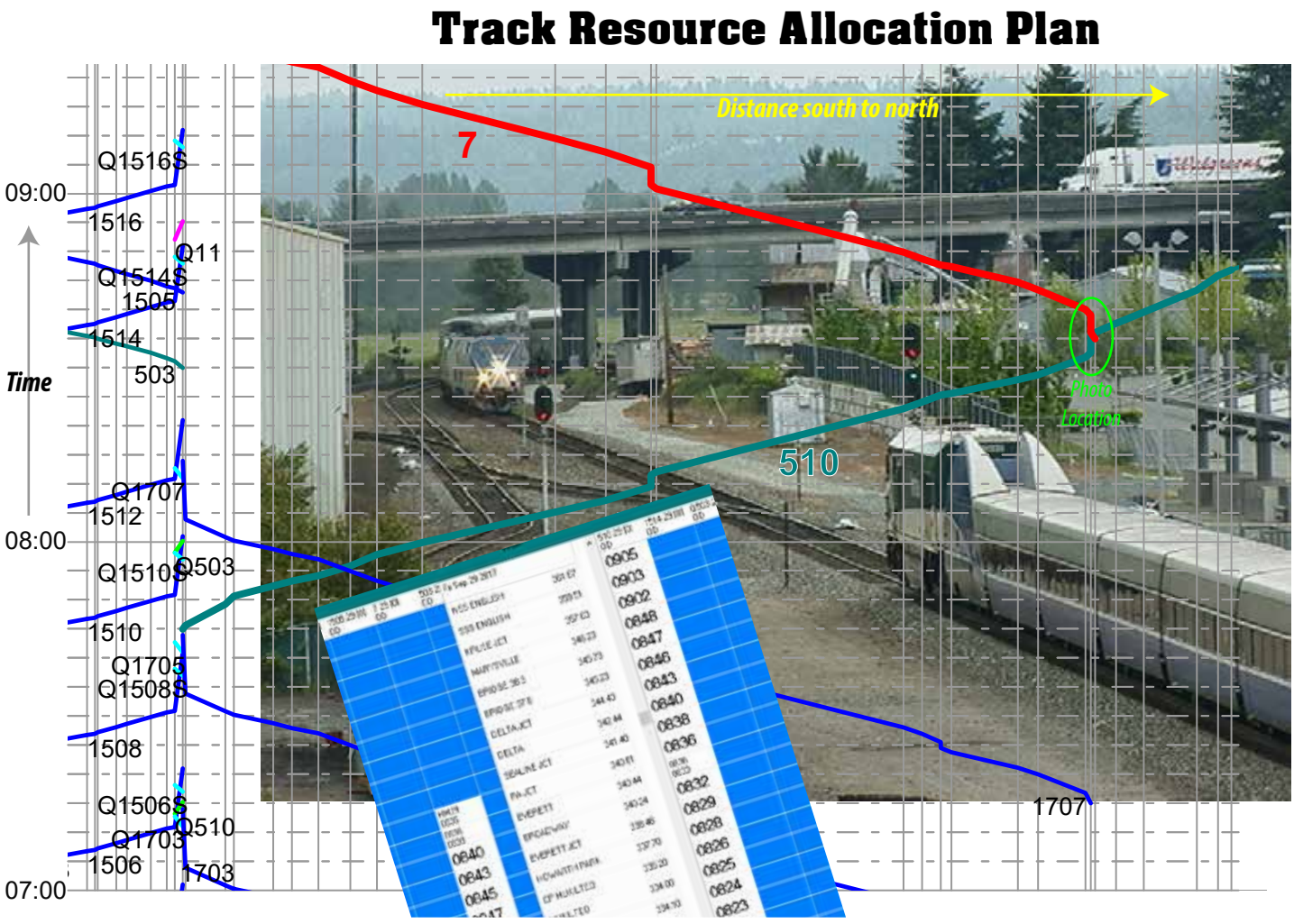
The TRT model provides a way to configure the railroad system for the public interest, for example, track arrangements needed for the desired freight and passenger services, and electrification. It also addresses the uneven distribution of public money for highways instead of railroads. Public funds support system expansion. Maintenance is funded by user fees.

Accommodating trains for reliable service

In the US, the best reliability of Amtrak passenger trains is about the same as the worst reliability in Europe. In a substantial part of Europe and China, freight trains are roughly half of the traffic and the shared operation is relatively seamless[16]. The important difference is the method of managing the use of the infrastructure. Properly managed, the US rail infrastructure can accommodate, in its current state, a substantially higher volume of traffic. Future infrastructure needs cannot be determined until the current chaotic improvised operation has been structured.

The movement of trains is constrained by the tracks. Trains cannot merely change lanes as needed when there is an obstruction or congestion ahead. Trains can only move from one track to an adjacent track or a branching track where the infrastructure (one or more switches) is in place to accommodate the movement. Reliable schedules require the schedule to have time to anticipate all predictable events (e.g., clearing the way for another train, waiting for another train, slowing to change routes).

An effective and reliable train schedule is a Track Resource Allocation Plan (TRAP). The schedule is a series of reservations for a specific track segment at a specific time. No other train can be allocated the same segment at that time. Train schedules cannot be developed in isolation. All traffic on the line must be considered. That process is called timetabling. The desired schedules for every train are considered simultaneously. Adjustments are made to schedules until the timetable is conflict-free (no track segment is scheduled to accommodate two trains simultaneously). Adjustments to



The timetable (a conflict-free set of schedules, a TRAP) in tablular and time-distance graph form shows that train 7 (red on the time-distance diagram, left in the photo) leaves the junction point and pulls into the station upon train 510 (green on the time-distance diagram, right in the photo) turning left and clearing the junction, just as shown in the photo.

create a conflict-free timetable include routing a train to another track, stopping a train to let another pass, reduce the speed of a train to prevent waiting, changing the leaving time at the initial station, or a combination of two or more of these methods[17].

Typically, a timetable of all traffic expected throughout a period such as annually, semi-annually, or quarterly. Traffic planned that far in advance generally consists of passenger trains and important freight trains such as mail and package freight trains. When a schedule is purchased for a periodic timetable, the TOC must pay for it for the life of the timetable whether or not the train is operated. The timetable is developed in priority order, the most important and travel-time-sensitive trains are allocated first, then other trains in successive levels of importance.

After the long term timetable is complete and in operation, additional (extra) trains may be operated using the TRAP method. The additional trains must be scheduled around the regularly scheduled trains. This arrangement allows extra trains to be requested on short notice, about three hours depending upon the scheduling entity's capabilities.

Operating under the TRAP method requires discipline and knowledge. Developing a timetable can be time-consuming and require substantial effort, even when assisted by computer software. A train that is not on time effectively loses its right to the tracks that had been allocated to it. The train dispatcher must develop a new allocation (schedule) that is not in conflict with other trains at the time the delayed train will be operating. Train Operating Companies must assemble trains complete with locomotives, crews, and the required cars, ready to start at the time required by the schedule.

Scheduling staff must be cognizant of every detail that can affect train operation. Dispatchers must be capable of and have a workload allowing anticipating delays and adjusting traffic to keep delayed trains moving while not affecting trains that are on time.

Infrastructure access managed and regulated by the TRAP method would bring the rail service reliability that is now lacking.

U.S. Department of Transportation
Federal Railroad Administration

Federal Agencies **Control Procedures**

Federal Aviation Administration

Who directly controls the scheduling and traffic movement?

When structured operation is correctly arranged, the procedures are fully documented like air traffic control procedures, and the scheduling and traffic control staff are fully educated in those disciplines, the employer is irrelevant. They may work for the infrastructure owner, their cost being included in the access fee, or for the government.

Which factors of TRT affect safety?

Many safety issues involving train crews arise primarily due to workforce management models. The number of hours that a conductor and engineer were off duty and whether they are rested when the go on duty are not related. US railroad operation is typically improvised. A crew that is off duty awaiting assignment may receive several conflicting updates of their expected on duty time. The actual time, of which they are notified one or two hours in advance, may be radically different from any of the updates. The question of sleep now or later to be awake and ready for work at the on duty time is common. Given the various updates during the off duty time, an employee may start a 12 hour shift having been already awake for many hours. The railroad industry does not consider this situation as a safety factor[18].

TRAP scheduled railroad operation is an effective response to that array of situations. All trains must be pre-planned. A train schedule may be purchased with only three hours notice, but the schedule will have a higher cost than one purchased well in advance. Other safety factors are outside the discussion of the TRT model.

Regulation

The Federal Railroad Administration (FRA) will continue to develop, maintain, and enforce safety regulations and administer infrastructure grant applications. FRA will also establish and maintain track access and traffic management like the FAA regulations for air traffic. FRA will also determine infrastructure adequacy of the national rail system, make periodic reviews, and initiate improvement projects as needed.

The Surface Transportation Board (STB) will administer network access, publish access charges and conditions, resolve disputes, and regulate access fees.

The cost of owning, operating, and maintaining railroad infrastructure may vary by line characteristics. Infrastructure operators will annually (or more frequently if needed) submit their access fees and documentation to STB for approval and publication.

Education

Occupations that manage the assets and provide the transportation that generates revenue, are not treated as professions by the US railroad industry. Often, the railroad employees providing transportation and managing or maintaining the infrastructure are considered by corporate management to be menial labor. There is no incentive for employees to invest in comprehensive rail-transportation-specific education. Consequently, there is almost none available.

For effective rail service, rail engineering, operating, and maintenance professions require a high level of expertise.

Before the 1980s, US railroads trained new employees by apprenticeship combined with on the job training. Many positions that the railroad industry has considered redundant and unnecessary in the past five decades were filled by junior employees gaining experience and training for the next level. That career path has been replaced with a system involving a training program of as little as six weeks, and the assumption of a responsible position. The result of this training method is manifested in safety deficiencies and inefficient operation.

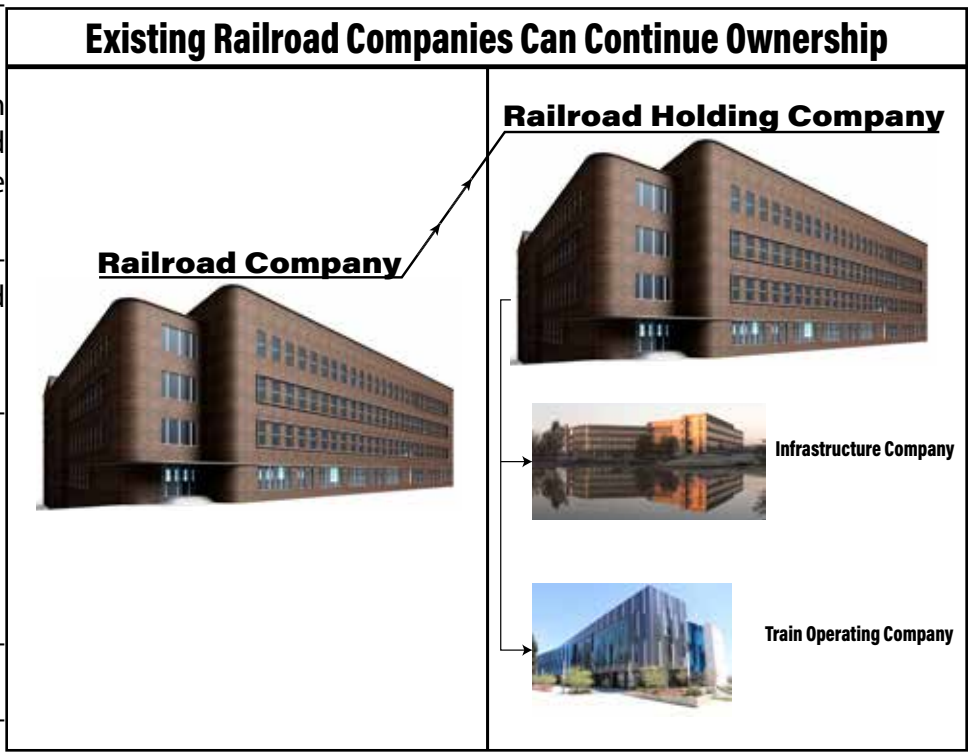
There are three universities in the US that have a railroad engineering degree program. There are 37 in Europe. Germany alone has nine universities with railroad degree programs. In Germany, train dispatchers, conductors, and engineers in Germany must complete a three year trade school program that includes 840 hours of instruction in railroad operations. Of course, individuals in those professions may have a university degree in railroad engineering and operations instead

of trade school.

The rail transportation the US needs is dependent upon knowledgeable, professional workforce. To that end, the US must develop extensive and comprehensive education in rail engineering and operation. New employees, labor and management, must be required to graduate from an accredited rail engineering and operations program. For the locomotive engineer, and conductor professions, a trade school equivalent to the German model would be an acceptable alternative. Current employees will need an extensive continuing education program to match the qualifications for new employees.

Curricula must include all aspects of railroad planning, implementation, and operation, importing foreign expertise as needed, e.g., from Germany, Switzerland, Austria, or Netherlands:

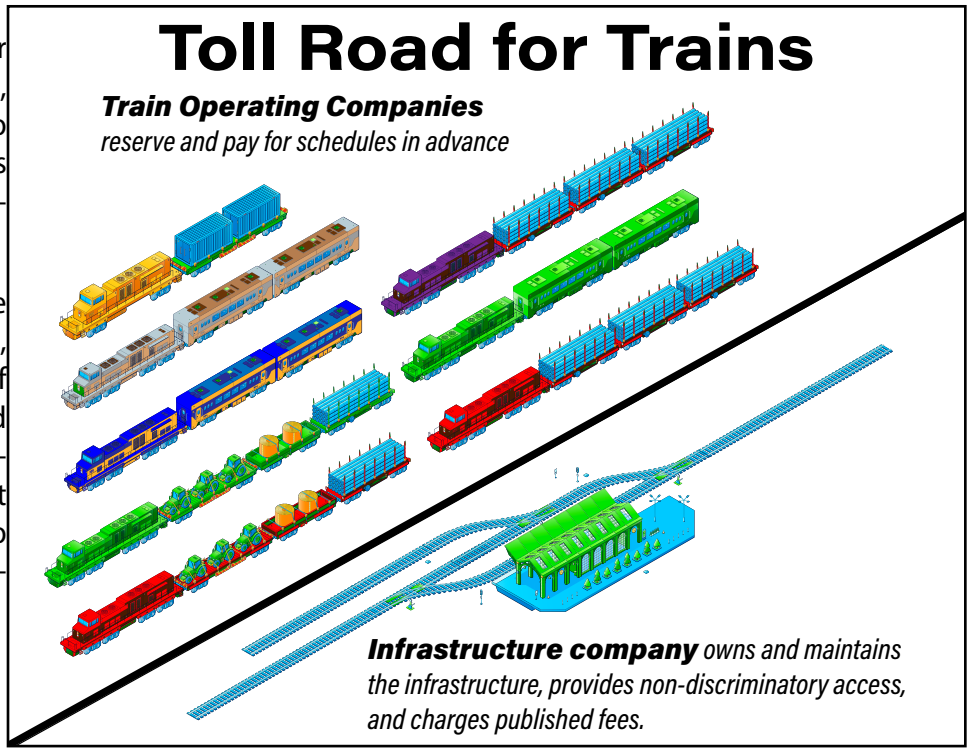
- infrastructure system design (what infrastructure is needed to provide the desired service and reliability),
- infrastructure engineering design (how to build the needed infrastructure),
- infrastructure maintenance,
- vehicle design and maintenance,
- service planning,
- scheduling and timetabling,
- traffic management,
- transportation management,
- yard and terminal management,
- laws and regulations applicable to railroad operation.



Almost all personnel engaged in air traffic control are federal employees, but there are a substantial number who are contractors. The FAA requirements for Air Traffic Controller, whether employed by FAA or a contractor, are

- hold three years at the same job, get a bachelor's degree, or do some combination of post-secondary education and work that totals three years followed by a 12 week program at the FAA Academy and two to four years of on the job training.

or



- complete education and training through a FAA approved Air Traffic Collegiate Training Initiative (AT-CTI) program; and then obtain a letter of recommendation from the school, spend seven weeks at the FAA Academy, and two to four years of on the job training.

Railroad professions engaged in operations must have a similar level of training and education.

The US must have a much greater emphasis on managing operations than current programs include. On the job training requirements must be much more extensive, similar to the FAA Air Traffic Controller requirements. The programs should be available at public universities throughout the country.

An Early Start

Railroad education need not be limited to formal education. Before the 1970s, many railroad professionals began their career as unofficial apprentices during middle and high school, learning on the job from family or friends. The practice was not officially approved, but it was often accepted.

The countries of the Soviet Union thought railroad knowledge to be of such importance that Children's Railways (also called Pioneer Railways), small-scale railroads like a zoo or park train ride in the US, were established. Here, any interested child, sometimes as young as 10 years old, "worked" in railroad professions, learning from experienced railroad profession teachers. After high school, they would go on to one of the railway universities. The Soviet Union is gone, but 55 of the Children's Railways remain.

Existing Children's Railways

Armenia	1
Belarus	1
Bulgaria	2
China	1
Cuba	3
Georgia	1
Germany	13
Hungary	2
Kazakhstan	3
Lithuania	1
Poland	2
Russia	25
	55

Summary

The report issued March 20 2023 by the United Nations International Panel on Climate Change has reinforced the conclusion of several reports published by the panel in over a decade. A reduction of about 50 percent in greenhouse gas emissions is essential.[19]

Effective rail transportation is an essential climate emergency response and essential to efficient and dependable supply chain and mobility. TRT is the best route to effective rail transportation.

TRT involves separating rail infrastructure and service into separate financial companies using the regulatory authority of Congress. Existing railroad corporations may continue to own the infrastructure and provide service as a TOC through a holding company arrangement. The infrastructure company charges a fee that includes all costs of owning and operating the property and infrastructure plus a profit. Infrastructure companies publish a schedule of fees for track access, based on factors such as origin and destination, scheduled travel time, and time of day

Rail infrastructure under TRT is open to any qualified TOC. Each train must be scheduled in advance to prevent track use conflicts with other trains.

TRT increases the utility of US rail transportation, reduces pollutant and greenhouse gas emissions, reduces transportation energy consumption, provides business opportunities, improves working conditions and safety, reduces highway congestion, and increases mobility.

TRT is an essential transportation solution that is needed as soon as possible.

Appendix

Line Hannover - Braunschweig							**Seattle - Portland**					
section Lehrte - Gross Gleidingen							**Typical trains at Kalama**					
trains counted at station Peine							**2007 data**					
Timetable 2000/2001												
	eastbound		westbound					northbound		southbound		
hour	freight	passenger	freight	passenger				freight	passenger	freight	passenger	hour
00:00 - 01:00	2	1	4	0	7		2	1	0	1	0	00:00 - 01:00
01:00 - 02:00	3	0	4	1	8		7	3	0	4	0	01:00 - 02:00
02:00 - 03:00	2	1	4	1	8		0	0	0	0	0	02:00 - 03:00
03:00 - 04:00	5	1	2	0	8		1	1	0	0	0	03:00 - 04:00
04:00 - 05:00	3	1	0	1	5		2	0	0	2	0	04:00 - 05:00
05:00 - 06:00	2	2	2	3	9		0	0	0	0	0	05:00 - 06:00
06:00 - 07:00	6	2	3	2	13		2	2	0	0	0	06:00 - 07:00
07:00 - 08:00	2	2	3	3	10		4	3	0	1	0	07:00 - 08:00
08:00 - 09:00	3	2	3	2	10		0	0	0	0	0	08:00 - 09:00
09:00 - 10:00	2	2	1	2	7		3	1	1	1	0	09:00 - 10:00
10:00 - 11:00	2	2	2	2	8		5	3	0	1	1	10:00 - 11:00
11:00 - 12:00	1	2	4	2	9		2	1	0	1	0	11:00 - 12:00
12:00 - 13:00	3	2	0	3	8		2	0	1	0	1	12:00 - 13:00
13:00 - 14:00	3	3	3	2	11		2	1	0	1	0	13:00 - 14:00
14:00 - 15:00	3	3	1	2	9		3	1	0	1	1	14:00 - 15:00
15:00 - 16:00	2	3	3	2	10		3	2	0	1	0	15:00 - 16:00
16:00 - 17:00	1	3	2	2	8		1	0	0	1	0	16:00 - 17:00
17:00 - 18:00	2	3	1	2	8		5	1	1	2	1	17:00 - 18:00
18:00 - 19:00	3	3	3	3	12		3	0	1	2	0	18:00 - 19:00
19:00 - 20:00	2	2	2	3	9		2	2	0	0	0	19:00 - 20:00
20:00 - 21:00	2	2	0	2	6		3	2	0	0	1	20:00 - 21:00
21:00 - 22:00	1	2	4	2	9		0	0	0	0	0	21:00 - 22:00
22:00 - 23:00	2	2	4	2	10		1	1	0	0	0	22:00 - 23:00
23:00 - 00:00	1	2	4	2	9		7	6	0	1	0	23:00 - 00:00
sum	58	48	59	46	211		60	31	4	20	5	sum

Counts of passenger and freight trains passing an example station on a double track line in Germany and in the US.(page 11)

From Government Control to Government Ownership

There are an increasing number of advocates for government ownership of the railroad network as the initial step to open access rail service. The difficulties of that arrangement are discussed on page 6.

Since the Staggers Act deregulated the railroad industry, the US rail network has been extensively downsized, a process the industry calls rationalization. The process eliminates all of the unneeded infrastructure. However, the removed infrastructure is generally unneeded only for the type of service the industry wants to provide (page 3). Although more can be done with the rail network in its current state, the full scope of the rail service the US needs will involve substantial investment in new infrastructure (page 9).

As described, the practice of public investment in private rail infrastructure has been generally limited in scope to new or improved passenger service. The new infrastructure becomes part of the property on which it was built. This process is similar to a tenant renting a commercial building and making improvements necessary for the tenant's business.

The coming investment will be much larger in scope and magnitude. These investments can be used to facilitate government ownership. Investments in infrastructure will substantially increase the value of the property. Infrastructure grants can include a mechanism allowing infrastructure investment to be applied to an eventual purchase of the property by the government. The process might be similar to a rent to own arrangement for rental property or a lease to own automobile purchase arrangement.

Acquisition of railroad property can be accomplished incrementally after receiving the immediate benefit of the Toll Roads for Trains through regulation arrangement.

The same operating practices (page 11) apply regardless of public or private ownership.

Endnotes

1 Reiterated in several consecutive reports for over a decade. The latest was issued March 20, 2023 https://www.ipcc.ch/report/ar6/wg3/

2 *Department of Defense Climate Risk Analysis*, October 2021 https://media.defense.gov/2021/Oct/21/2002877353/-1/-1/0/DOD-CLIMATE-RISK-ANALYSIS-FINAL.PDF

3 Environmental Protection Agency data

4 Jordan, Jay R. Jordan *Texas Drivers Put Out More Carbon Dioxide Than Every Train In The World Combined*. Chron, https://www.chron.com/news/houston-texas/transportation/article/texas-cars-pollution-carbon-dioxide-16316641.php July 15, 2021

5 Viola, Melissa& Hogan, John P. *Supply Chain Weaknesses Are a Threat to National Security* .Aspen Institute, https://www.aspeninstitute.org/blog-posts/supply-chain-weaknesses-are-a-threat-to-national-security/ November 30, 2021

6 *National Freight Strategic Plan* US Department of Transportation August 2020

7 ibid.

8 UIC Railway Data https://uic-stats.uic.org/

9 USBureau of Transportation Statistics data

10 Fleming, Sean. *Traffic congestion cost the US economy nearly $87 billion in 2018*. World Economic Forum https://www.weforum.org/agenda/2019/03/traffic-congestion-cost-the-us-economy-nearly-87-billion-in-2018/ March 2019

11 https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/mission_support/faa_contract_tower_program

12 https://lexparency.org/eu/31991L0440/

13 *Shared Rail Infrastructure: The German Model for Access Fees* https://www.youtube.com/watch?v=d7yflmV9Bzs

14 Prof. Dr. Ing. Jörn Pachl, Professor, railway program, Technical University, Braunschweig DE

15 UIC Railway Data https://uic-stats.uic.org/

16 Example table in the Appendix

17 Hansen, Ingo and Pachl, Jörn. *Railway Timetabling & Operations*. Eurailpress, 2014

18 White, Thomas. *Quality of Life and Safety - Theirs and Yours*. https://climaterailalliance.org/quality-of-life-and-safety-theirs-and-yours/

19 Reiterated in several consecutive reports for over a decade. The latest was issued March 20, 2023 https://www.ipcc.ch/report/ar6/wg3/