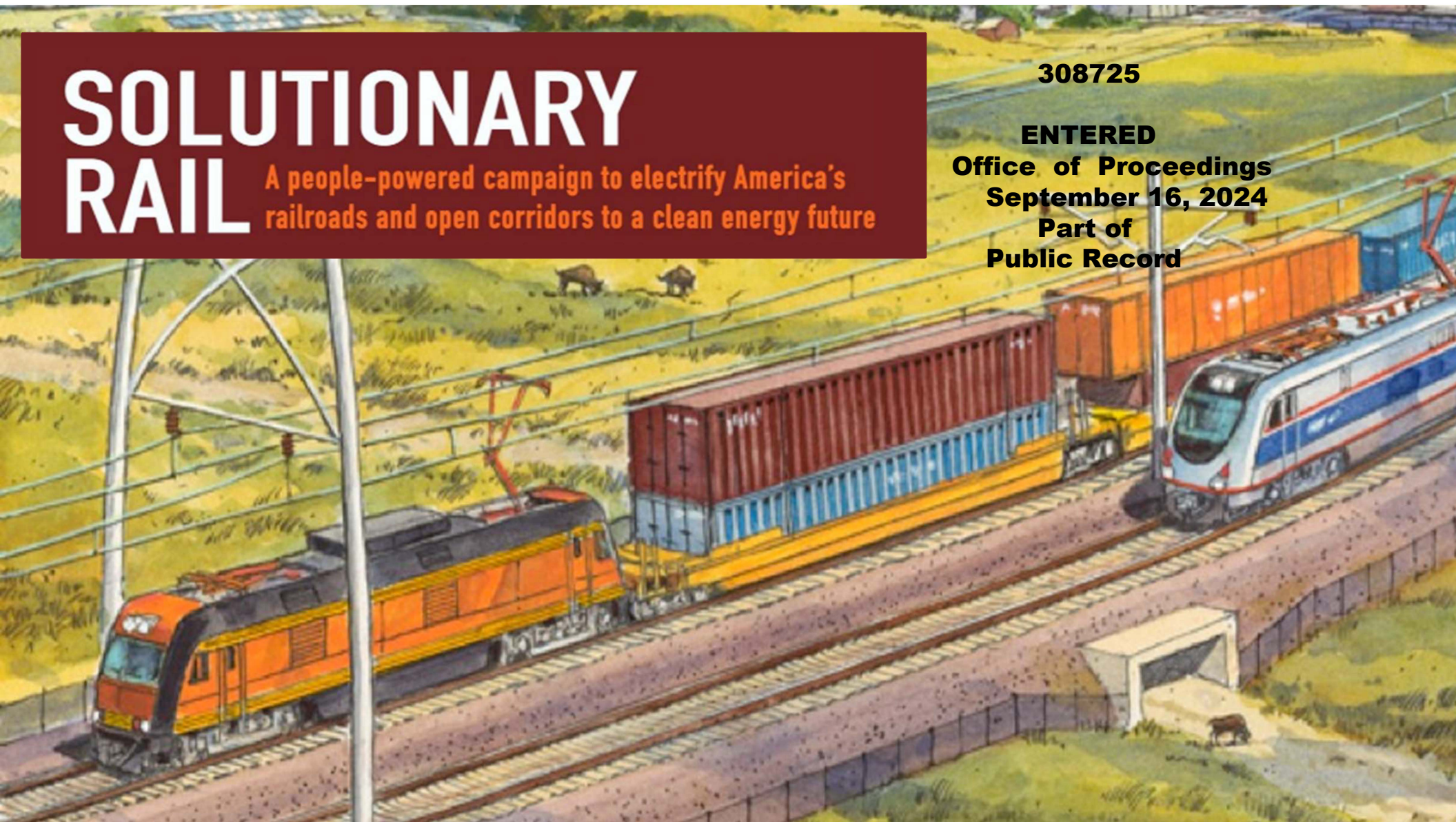


SOLUTIONARY RAIL

A people-powered campaign to electrify America's
railroads and open corridors to a clean energy future

308725

ENTERED
Office of Proceedings
September 16, 2024
Part of
Public Record



Reconnect America - Rail in the Public Interest



8:1

Typical External Costs May Be Eight Times Higher for Transport by Truck Than by Rail

2014 Cents Per Ton-Mile

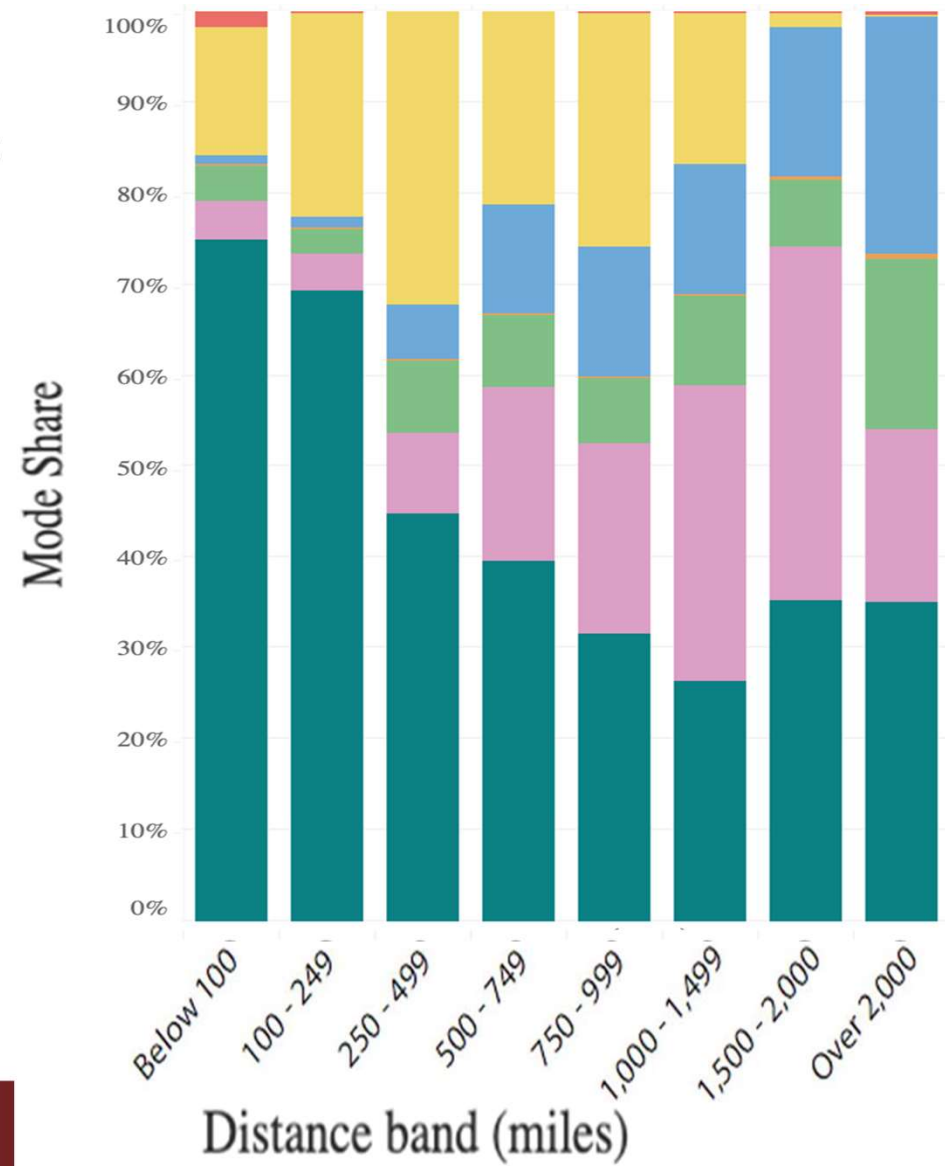
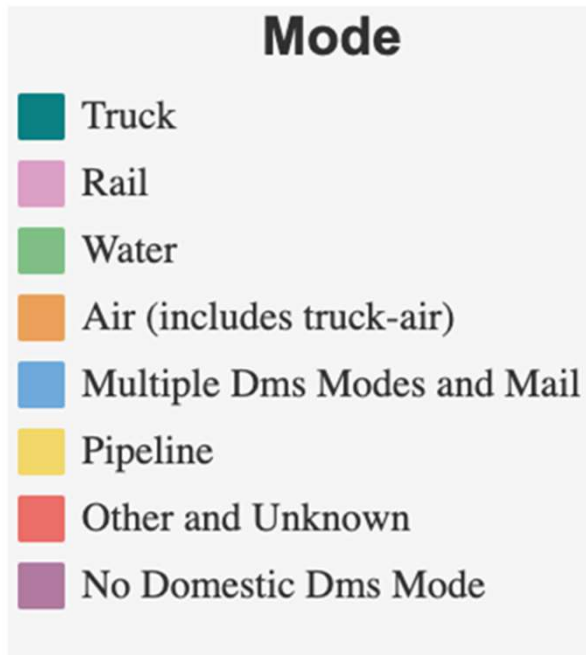
Type of Cost	Truck	Rail
Accident Risk	0.8 to 2.3	0.1 to 0.25
Pavement Damage	0.7 to 1.0	0.05 to 0.06
Particulates + NOx	0.6 to 0.8	0.1 to 0.2
Traffic Congestion	0.4 to 0.9	0 to 0.03
CO ₂	0.02 to 0.22 to 0.9	0.01 to 0.05 to 0.2
Total of Median Costs	4.0	0.5

Note: For damages from CO₂, three numbers are shown to describe the distribution of estimates of external costs; values toward the middle of the range are much more likely to be selected. For other sources of external costs, two numbers are shown; all of the values in the range are equally likely to be selected.



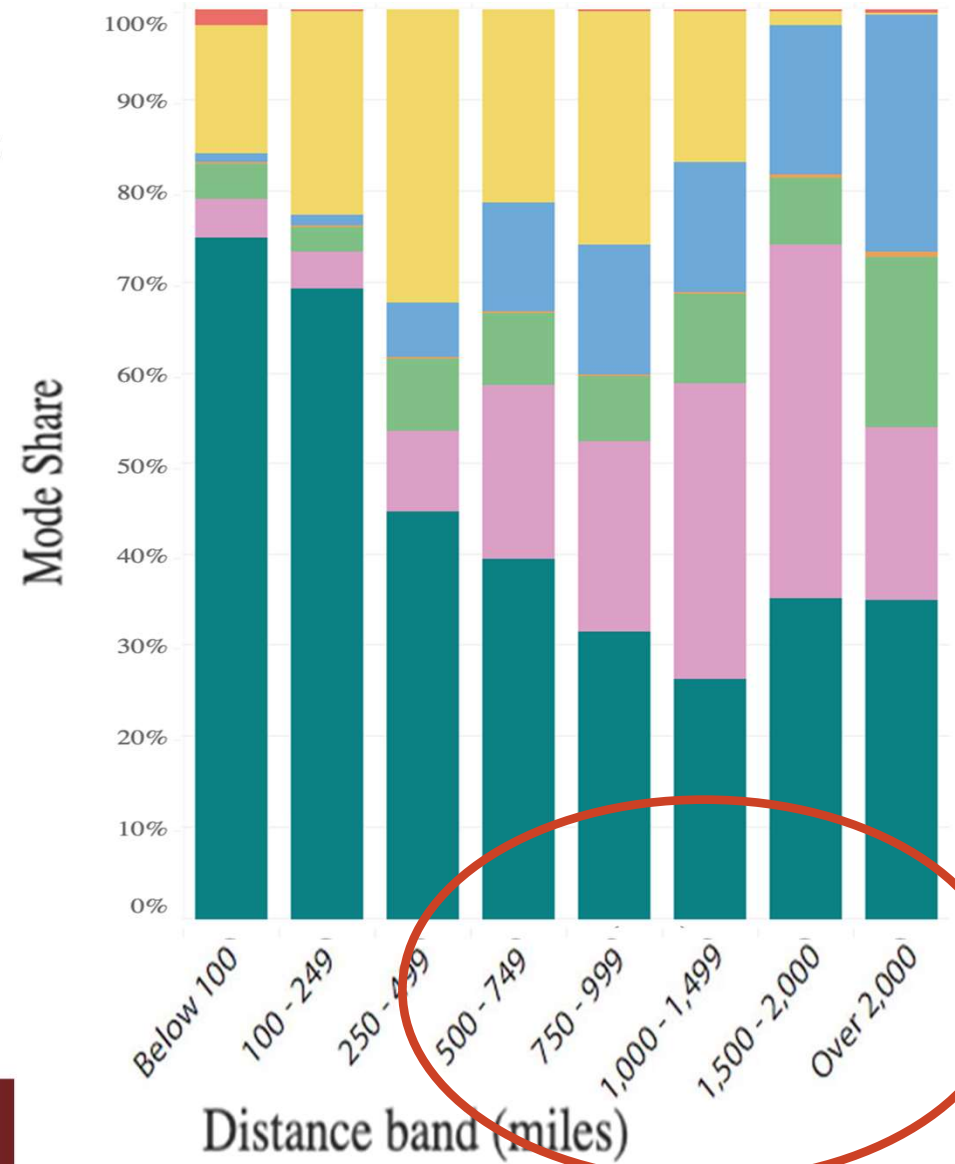
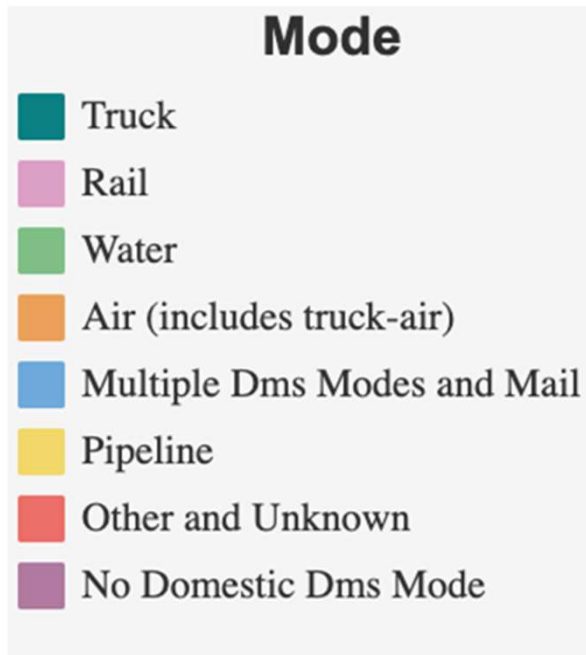
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Mode Share of Ton-Miles by Distance Band:



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Mode Share of Ton-Miles by Distance Band:



Using the CBO formulas (correcting for inflation) and FAF5 data for 2023:

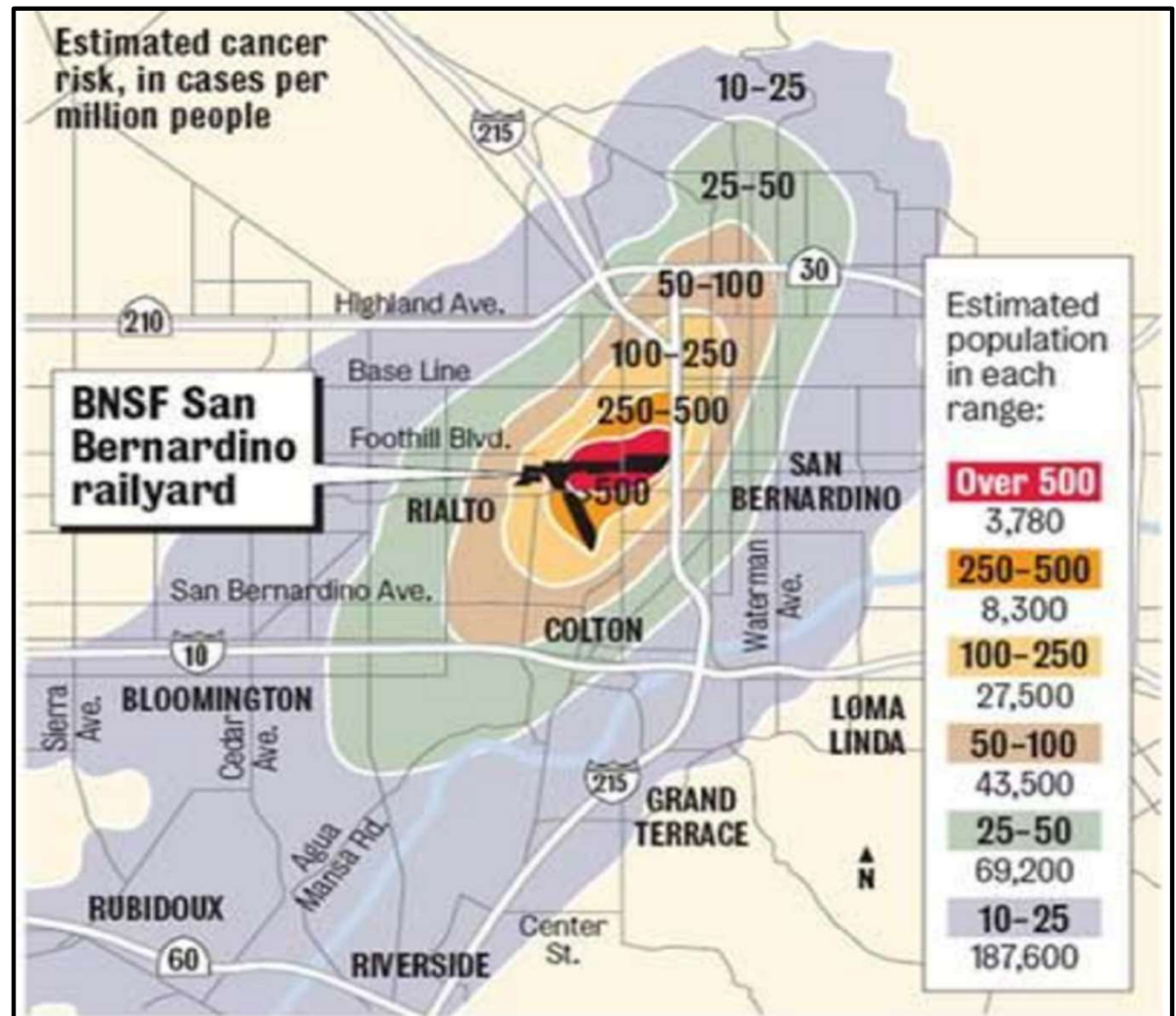
- 954 Billion ton-miles of US freight was transported by trucks on distance bands >500 miles.
- The external cost of long haul trucking to US society was >\$53 billion.
- Had that long haul freight been moved by train, the mode shift benefit would have been >\$46 billion.

In real life, thousands of lives were lost and destroyed. The time, energy efficiency, and pollution damage cannot be undone. And, we missed another opportunity to avoid putting nearly 200 million tons of CO₂ into the atmosphere. The 2024 numbers will likely be worse, as will 2025's, and so on.

Parameter	Truck Cost (\$/ton-mile)	Truck cost (\$)	Rail cost (\$/ton-mile)	Rail cost (\$)	Difference (\$)
1. Pavement Damage	\$0.0118	\$11,271,510,000.000	\$0.00076	\$729,333,000.0000	\$10,542,177,000.0000
2. Traffic Congestion	\$0.0096	\$9,149,814,000.0000	\$0.00021	\$198,909,000.0000	\$8,950,905,000.0000
3. Accident Risk	\$0.0218	\$20,752,839,000.000	\$0.00250	\$2,386,908,000.000	\$18,365,931,000.0000
4. Emissions: PM and NOx	\$0.00966	\$9,216,117,000.0000	\$0.00257	\$2,453,211,000.000	\$6,762,906,000.0000
5. Emissions: CO₂	\$0.0031	\$2,917,332,000.0000	\$0.000695	\$663,030,000.0000	\$2,254,302,000.0000
Totals:	\$.0559	\$53,307,612,000.	\$.00674	\$6,431,391,000.	\$46,876,221,000.

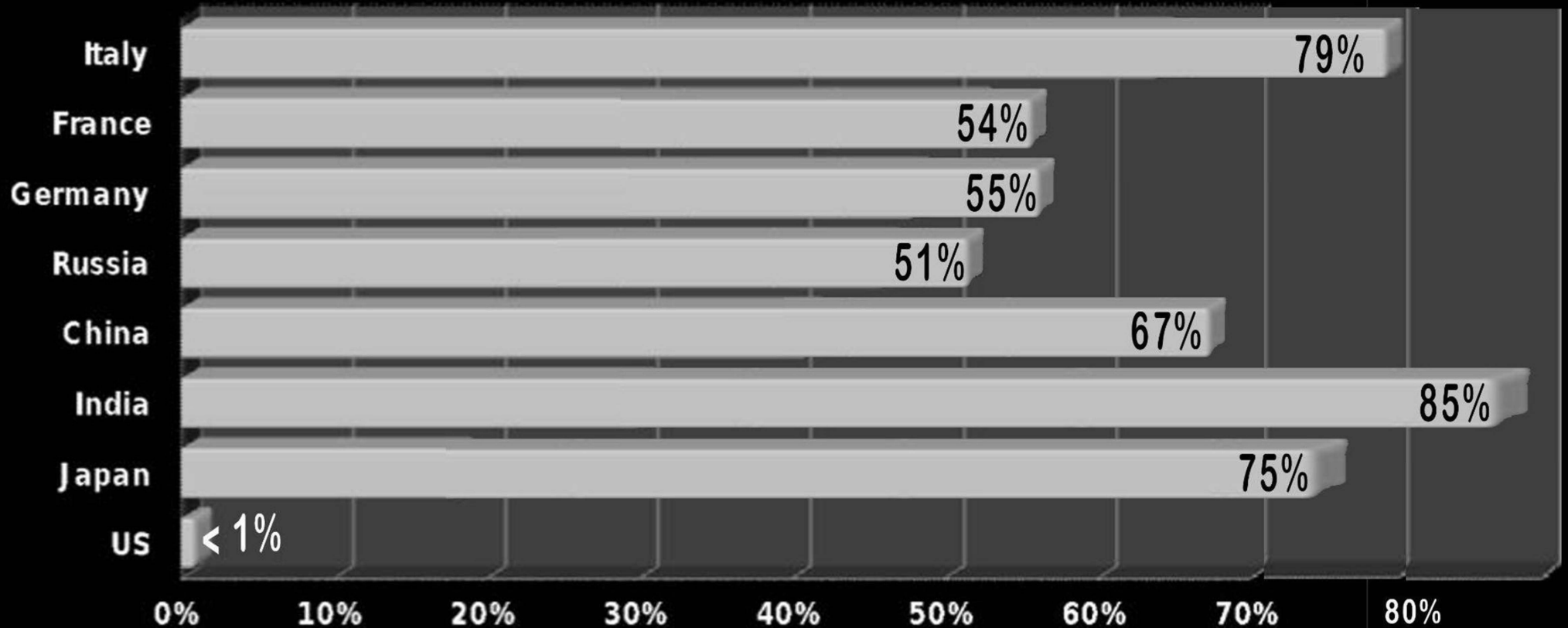


MODE SHIFT is NOT ENOUGH



Source: California Air Resource Board – the Press Enterprise

Percentage of Electrification Worldwide as of 2022:



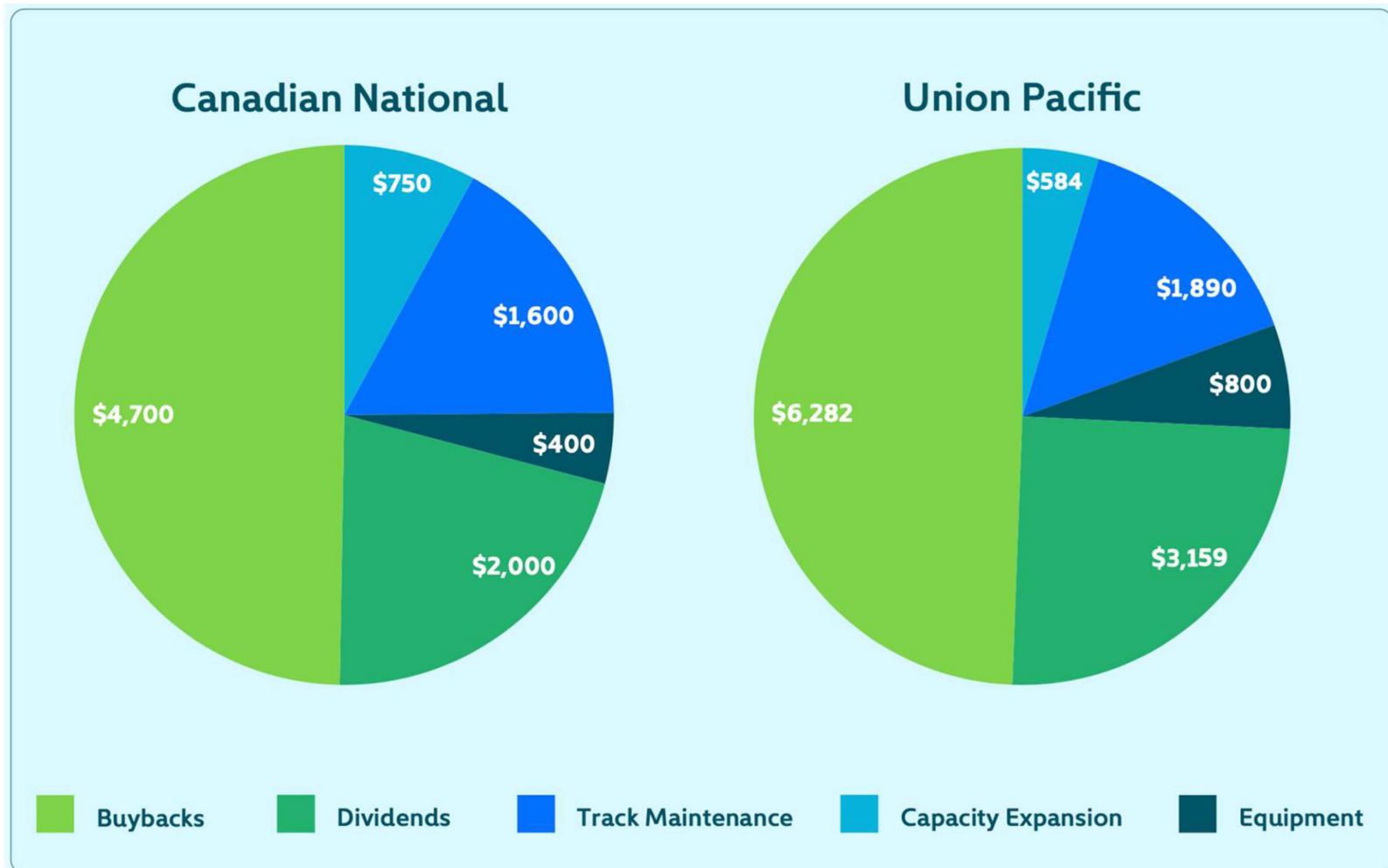
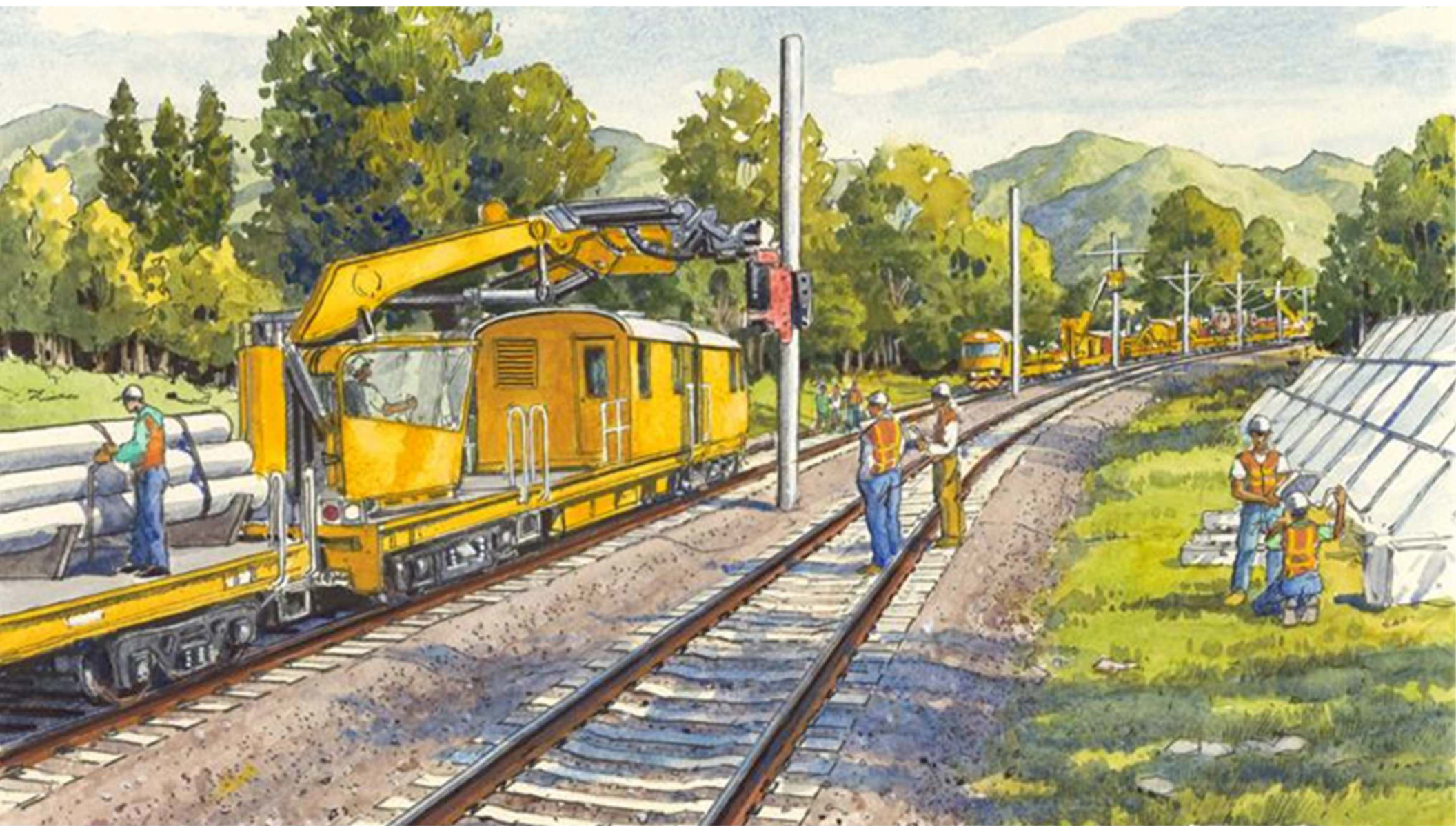
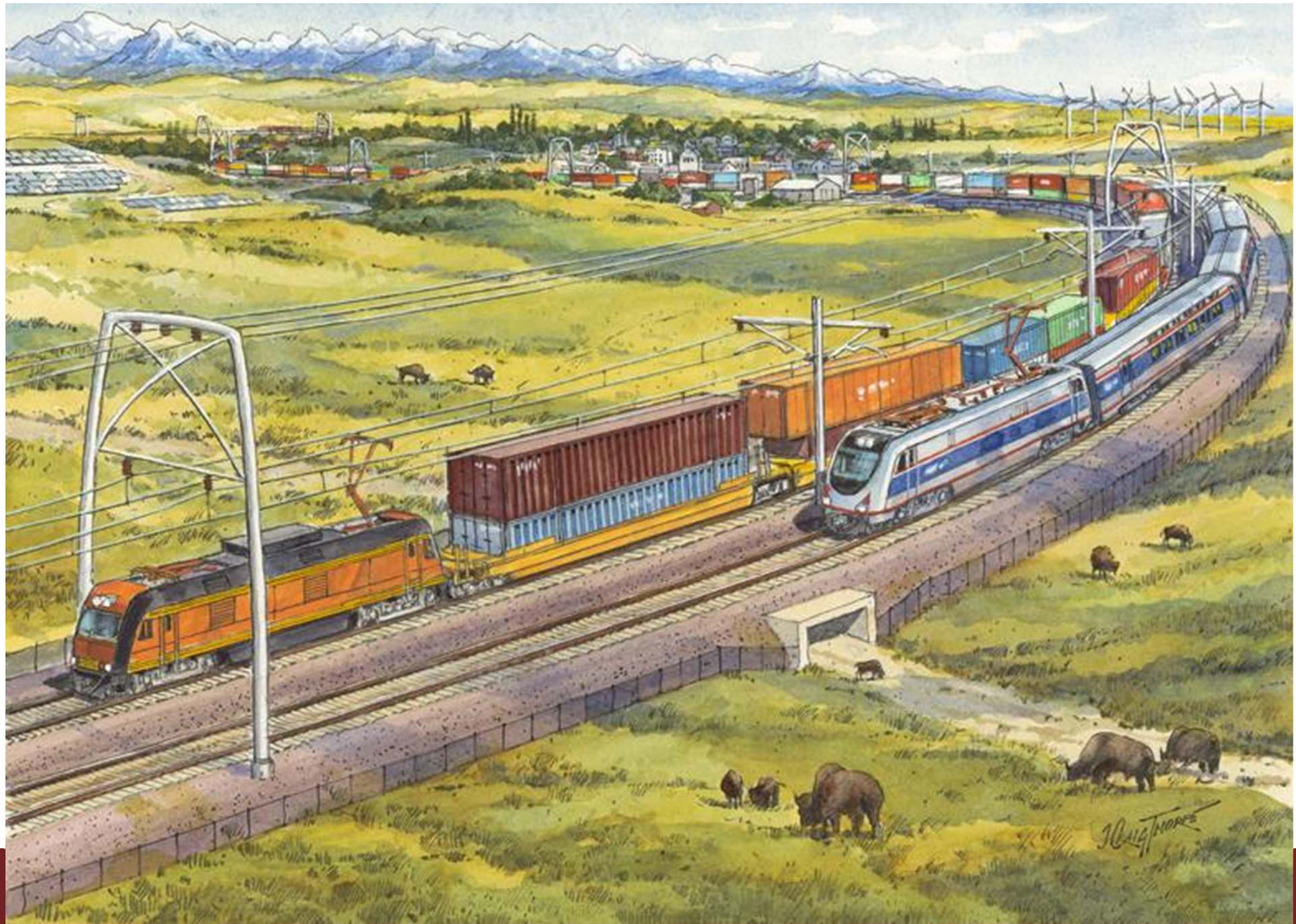


Figure 10. Capital expenditures and shareholder returns, Canadian National and Union Pacific 2022, in millions of U.S. dollars⁵⁷









Solutionary Rail

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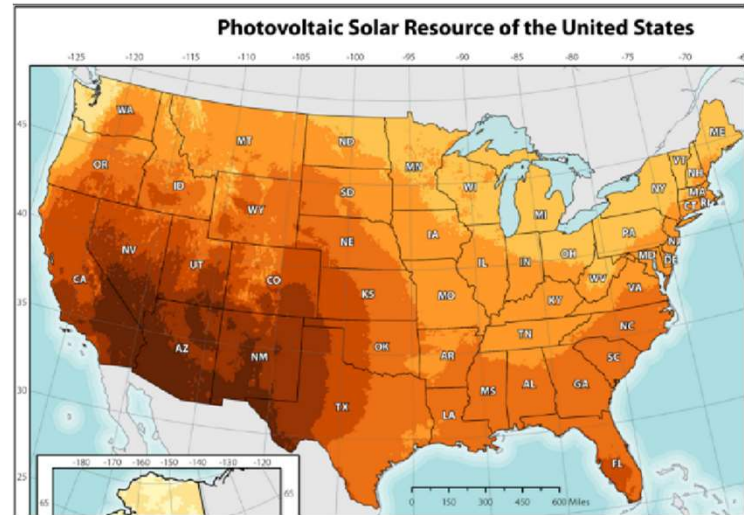
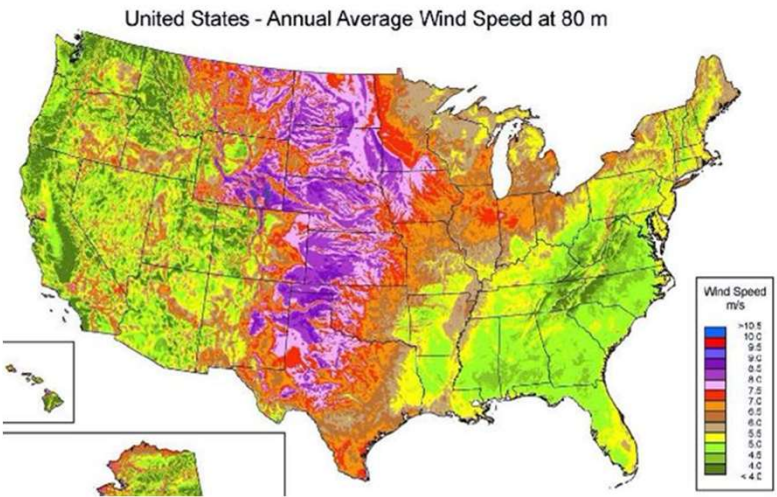
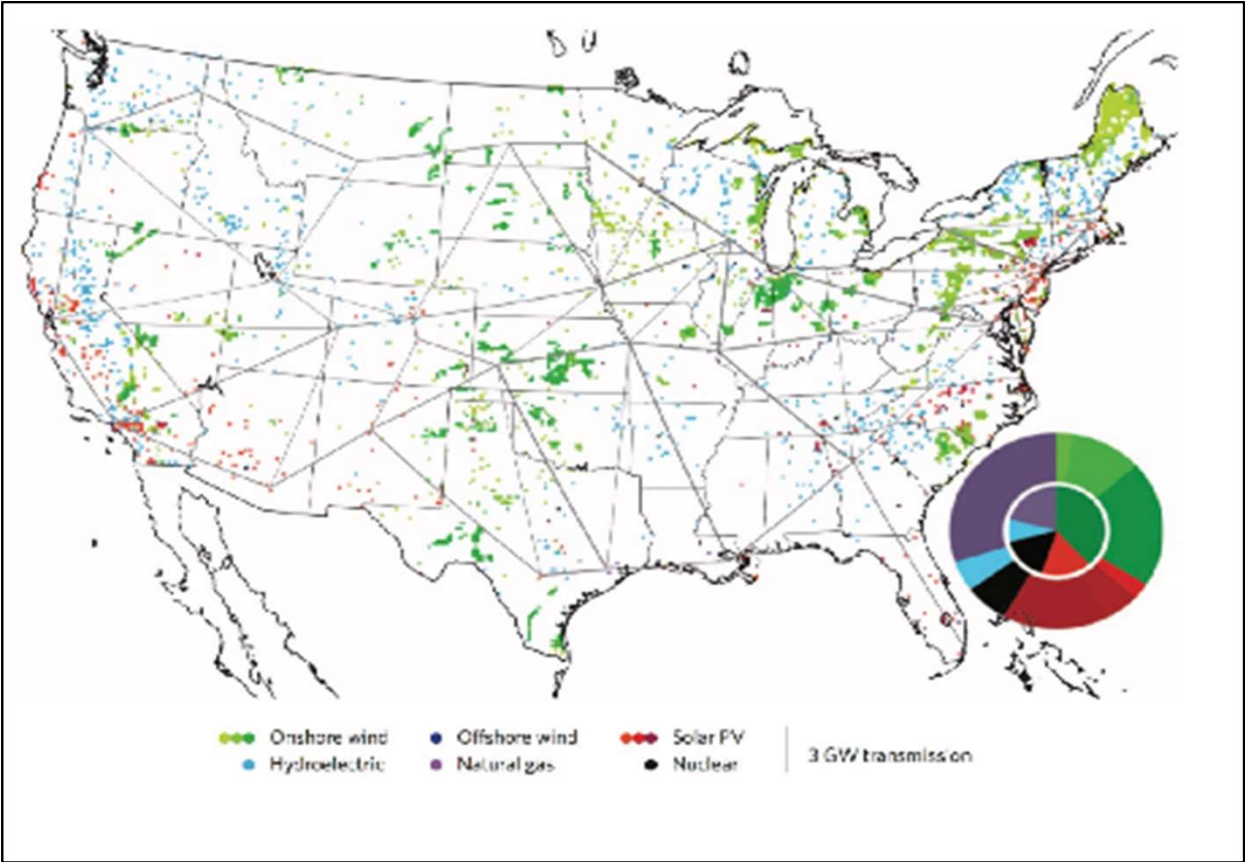
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SolutionaryRail.org & SolutionaryRail.substack.com

Co-Locating National Grid to Unlock Stranded Wind & Solar



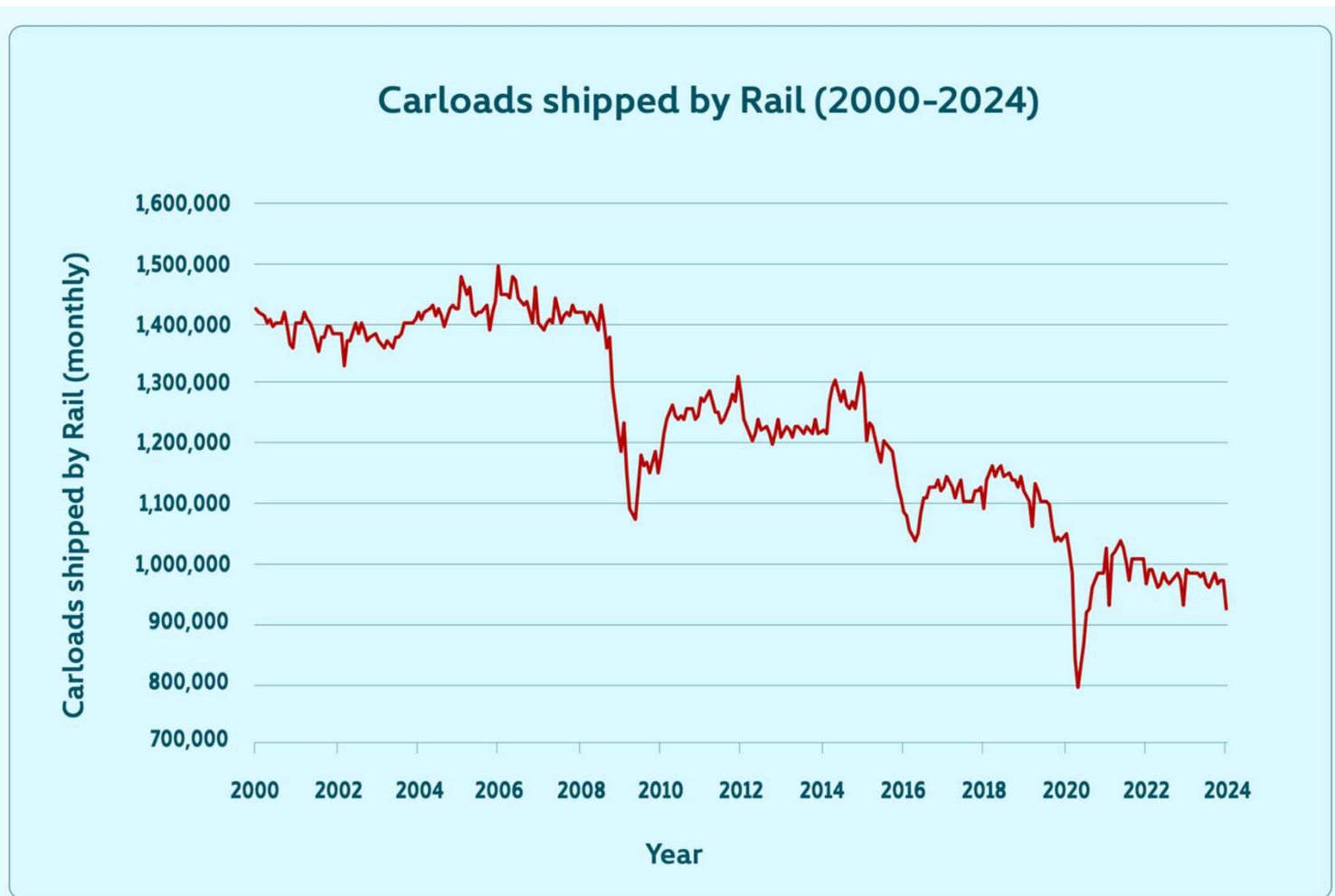


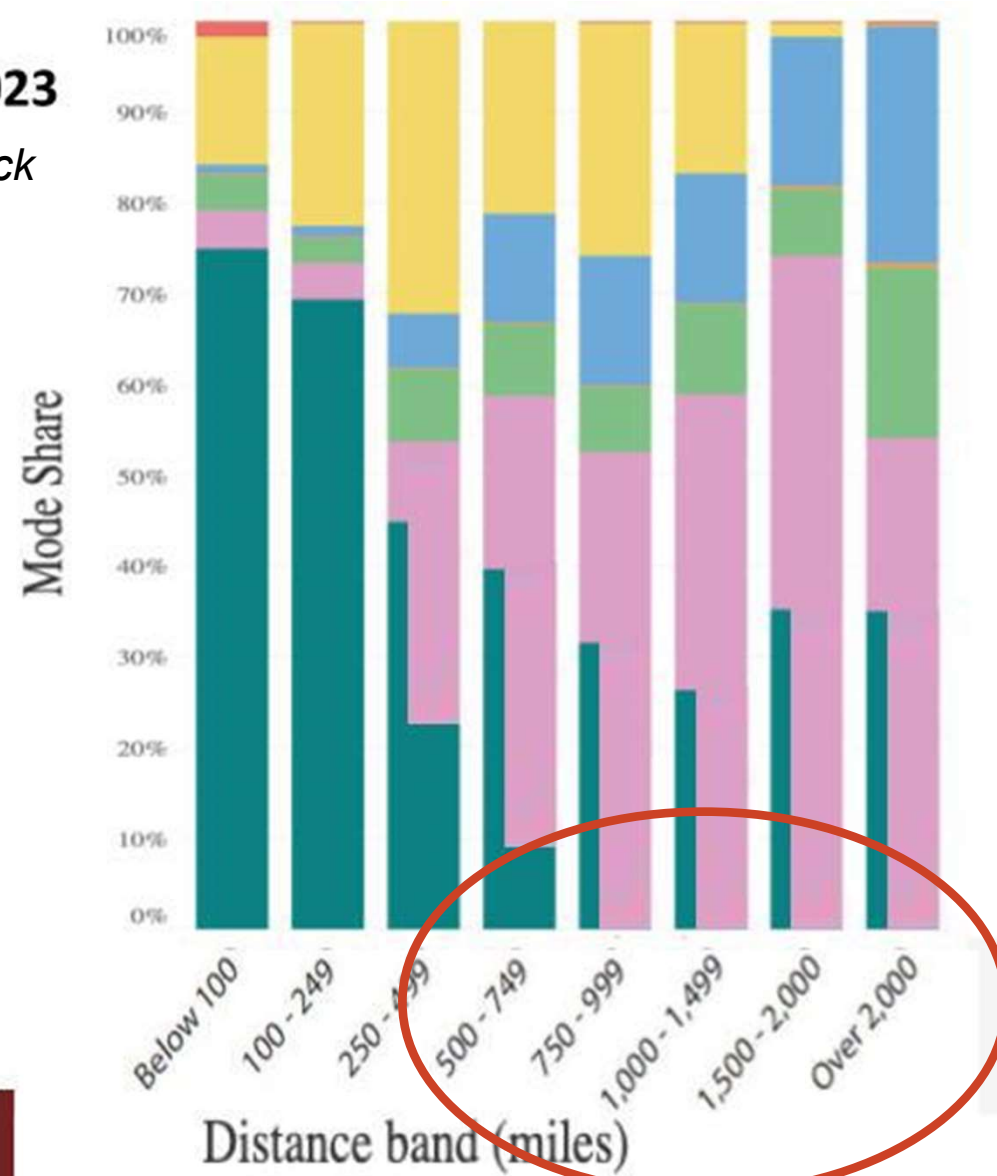
Figure 6. Monthly carloads shipped by rail, seasonally adjusted, 2000-2023³⁹



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Mode Share of Ton-Miles by Distance Band: 2023

Long haul alone offer the opportunity to decrease truck impacts by 1 trillion ton-miles.



MODE SHIFT OPPORTUNITIES:

- On dock rail
- Roll-On, Roll-Off (“RoRo”)
- Connectivity & access for communities and industry
- Enhance shortline railroad access to mainlines



ADVANTAGES OF ELECTRIC TRAINS

- Electricity can come from renewable sources
- Electricity costs less than diesel fuel
- Electric locomotives are cheaper to maintain
- Regenerative braking reduces power consumption
- Electric locomotives add capacity through more rapid acceleration and deceleration



ACTUAL SOLUTION for ELECTRIFICATION:

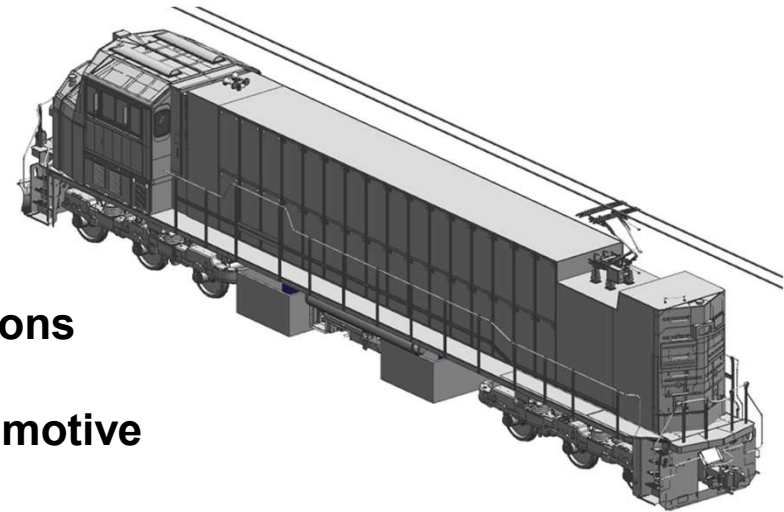
DYNAMIC CHARGING DISCONTINUOUS ELECTRIFICATION

Charging power supplied by catenary, but...

DRAMATICALLY reduces the cost of catenary electrification

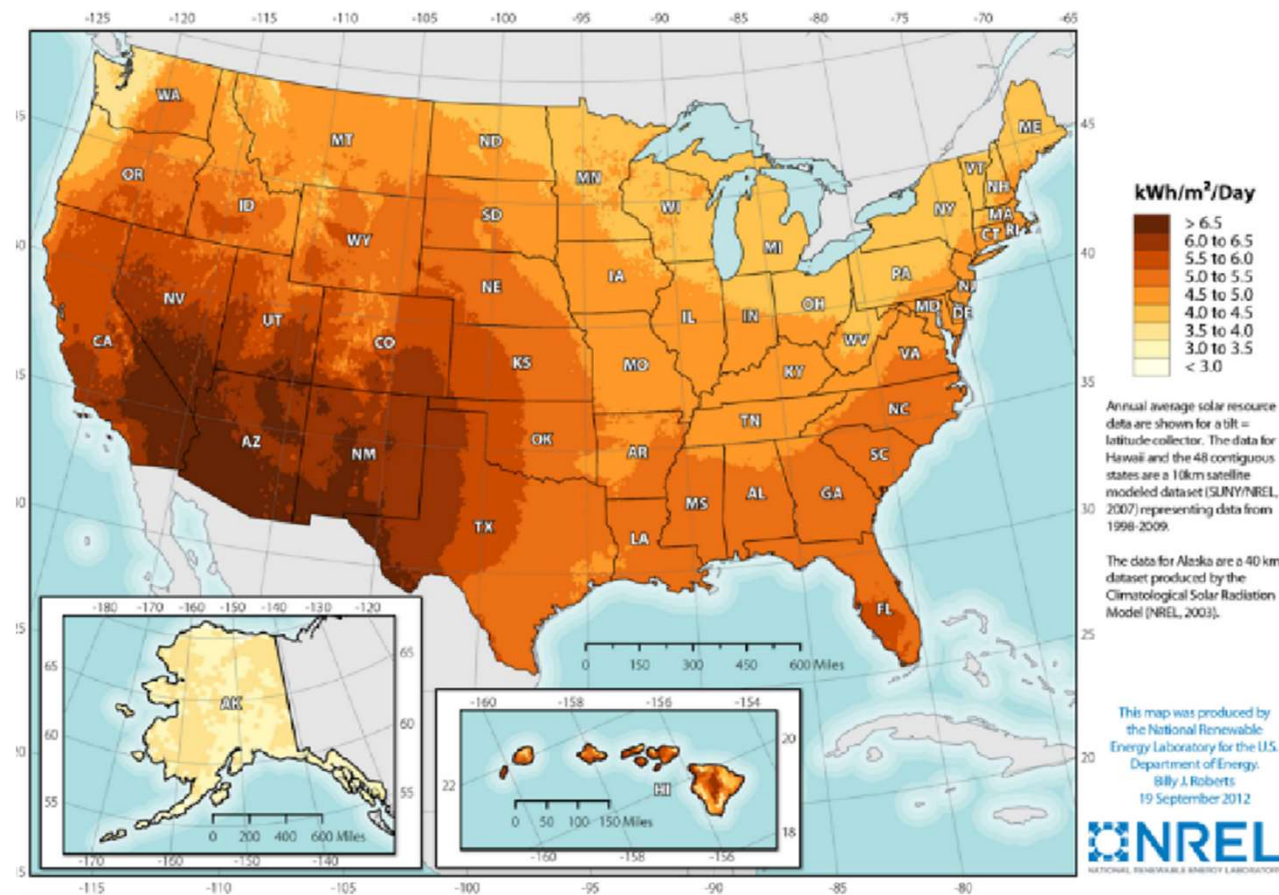


- Conventional pantograph on each locomotive
- Short segments of catenary installed at key locations
- Transformer and charging electronics on the locomotive

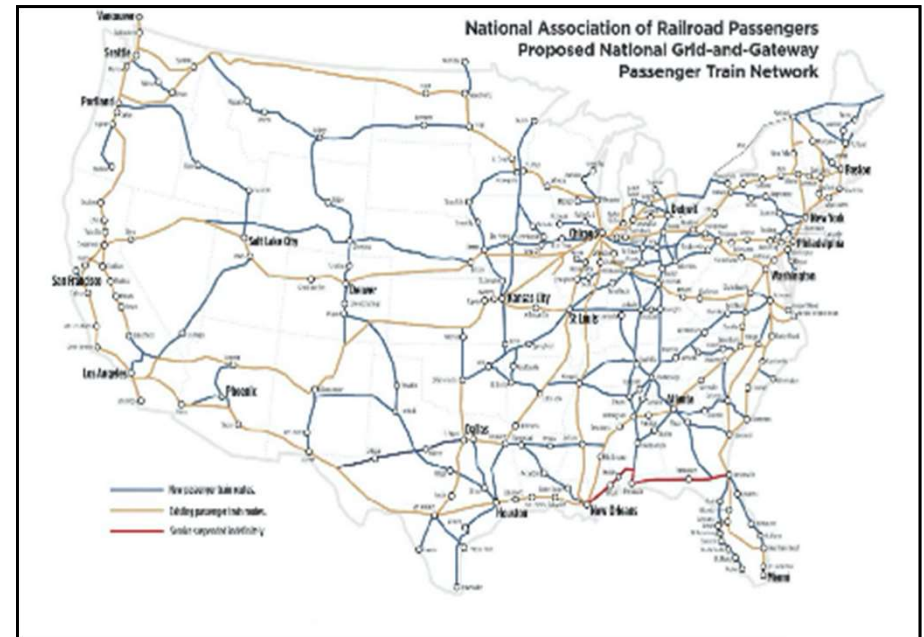
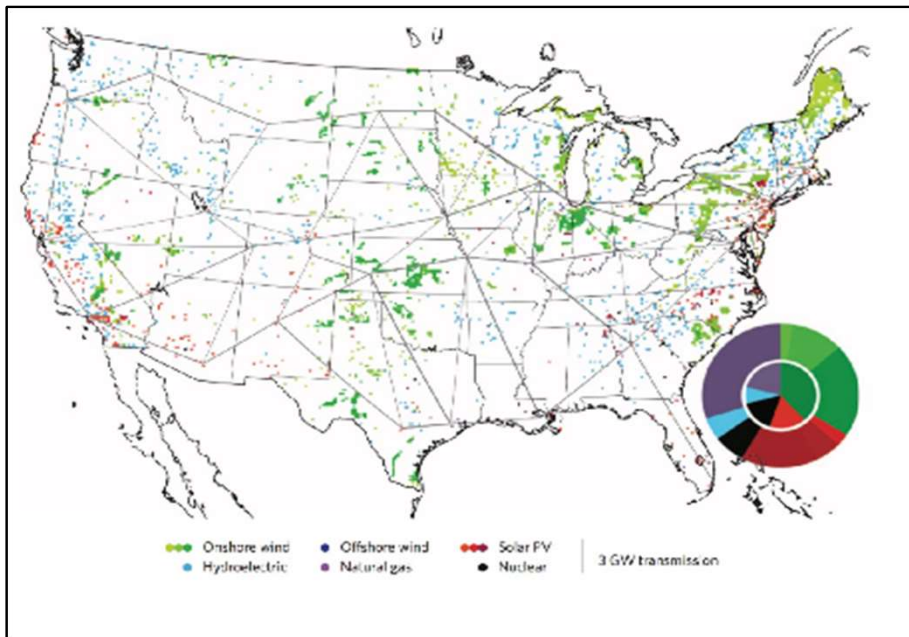


UNLOCKING STRANDED SOLAR

Photovoltaic Solar Resource of the United States



Compare density of transmission grid from NOAA model to a mainline rail map



Interstate (Class 1) railroads have the perfect rights-of-way for a National SuperGrid



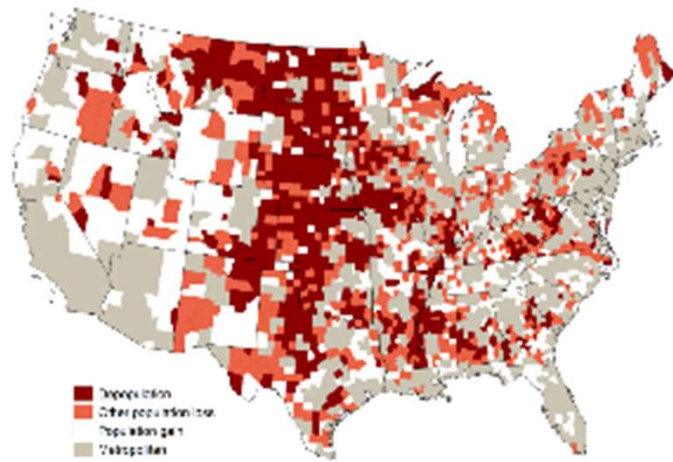
Proposed private SOO Green buried HVDV project is a regional example for what the Federal Government could do nationally.



Other considerations for rural economic vitality, passenger service, and opportunities for energy export to urban centers...

Address chronic rural depopulation

FIGURE 3. DEPOPULATION IN RURAL MIDWESTERN AMERICA



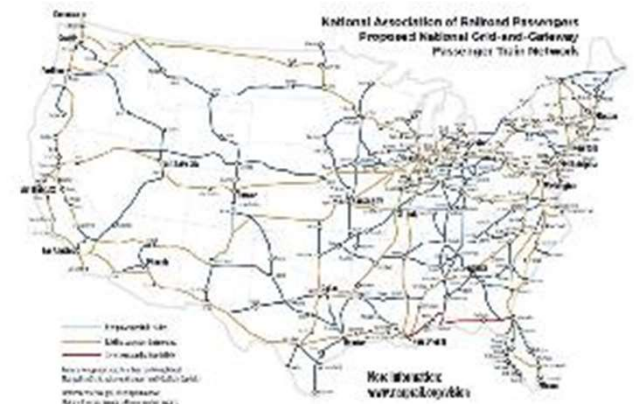
Source: Census Bureau, Census of 1990 to 2010



Power Export Opportunities for Rural Electric Co-ops



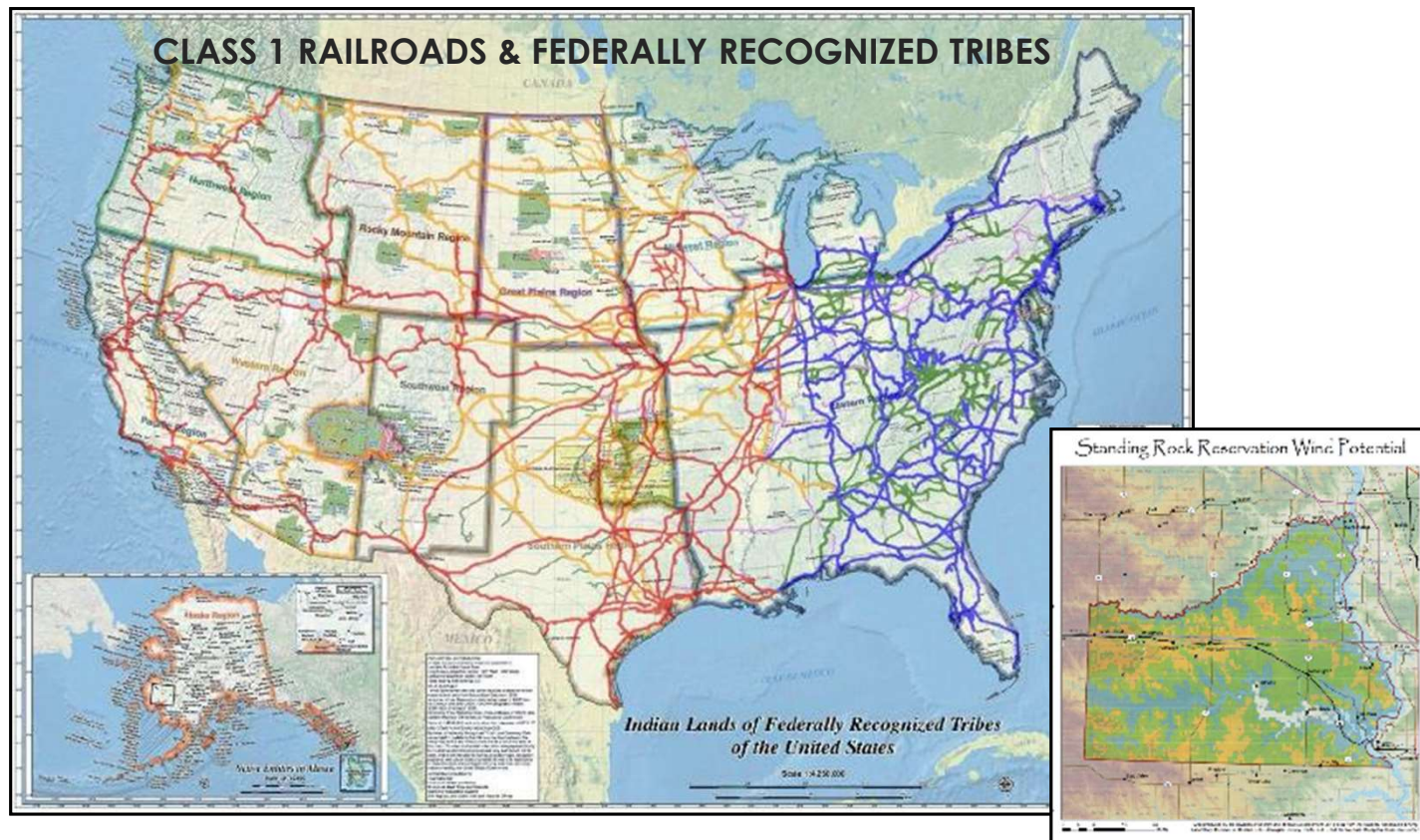
Expand Passenger Rail Service



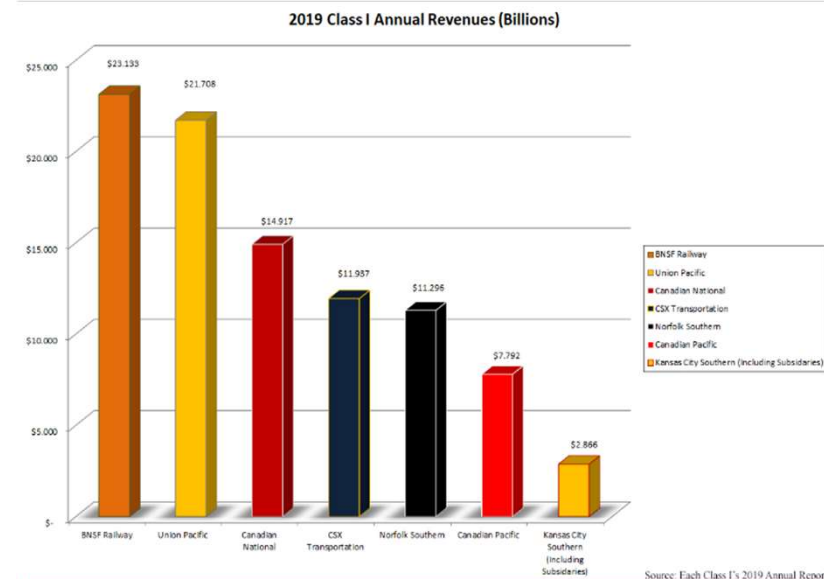
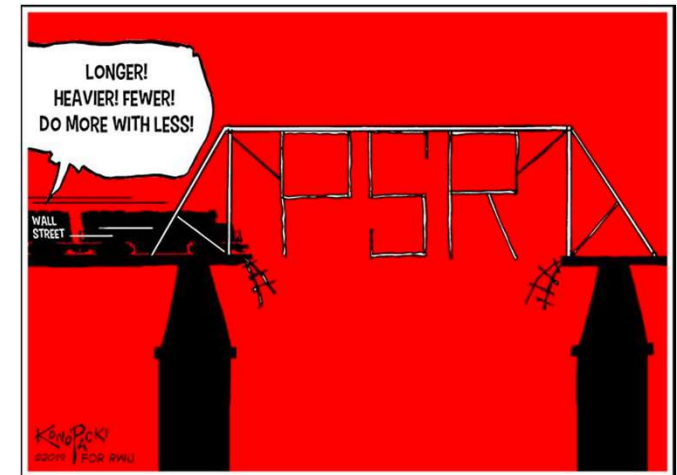
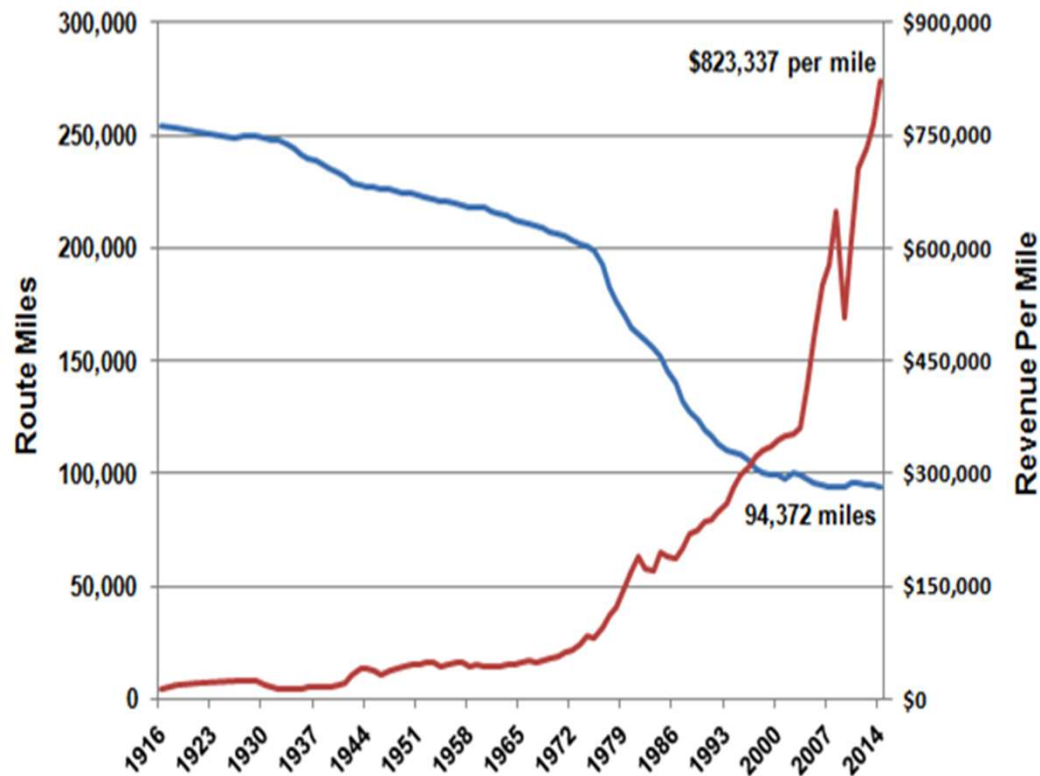
TRAINS: A TRAVEL CHOICE AMERICANS WANT



Opportunities for Tribal leadership & ownership, energy sovereignty & export and Right-of-Way Justice



Deregulation triggered massive profits for Class 1 RRs,
but austerity for workers and communities.



Source: Each Class I's 2019 Annual Report

