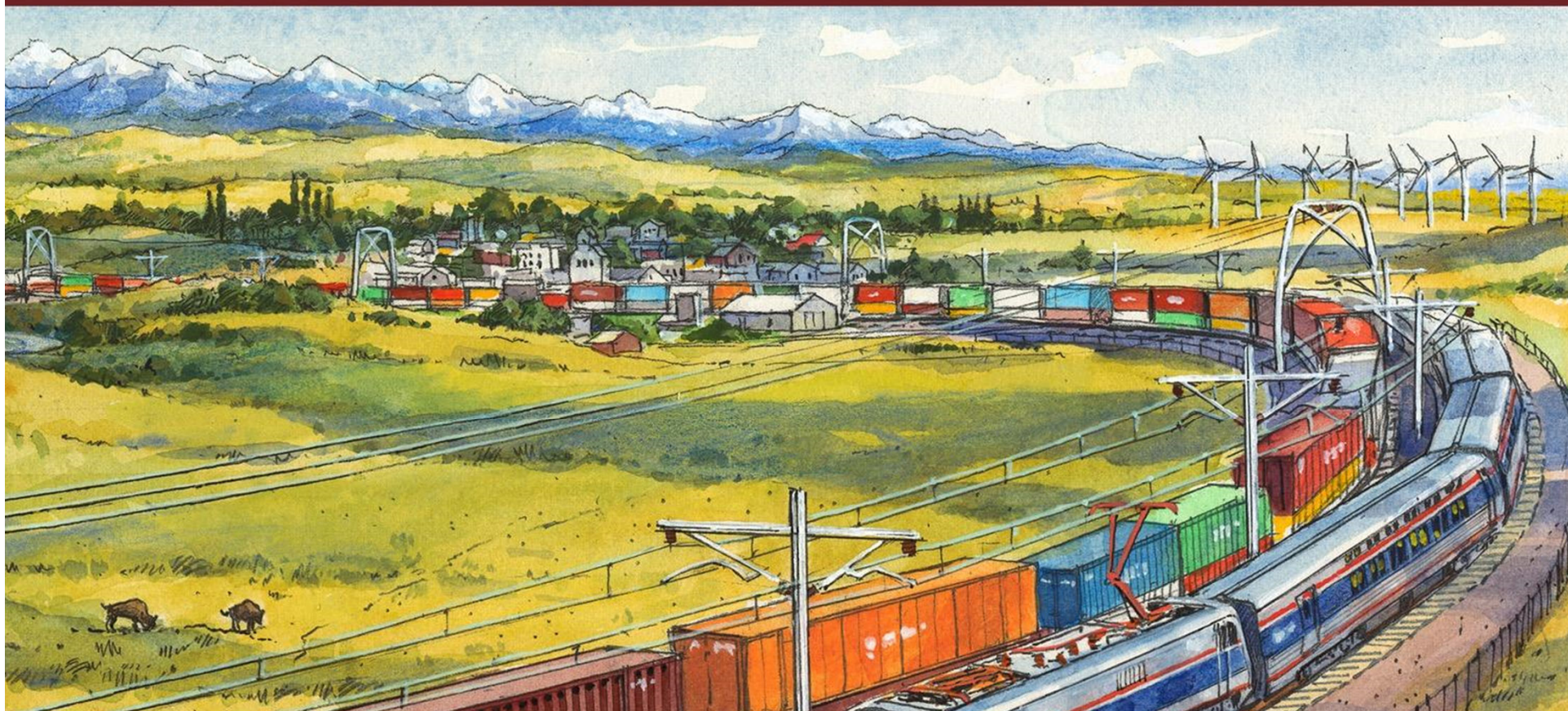


SOLUTIONARY RAIL

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



What is Solutionary Rail?

- It's a comprehensive plan to transform the US rail network by electrifying major rail corridors
- It will cut carbon emissions from transportation by powering rail with wind & solar.
- It will use rail corridors as transmission corridors to get that power to new markets
- It will upgrade existing rail lines for higher speeds and more freight and passenger service.
- It will create jobs and investment opportunities through Public-Private Partnerships.
- It will revitalize communities and redress old wrongs.
- It's affordable, doable, and can be done in years, not decades.

Why Now?

- Because we can – it doesn't require new technology or breakthroughs.
- Because we have to – Climate change doesn't leave us much choice.
- Because it can be done for reasons that make sense even without including climate.
- Because the political and economic winds are shifting in rail's favor once more.

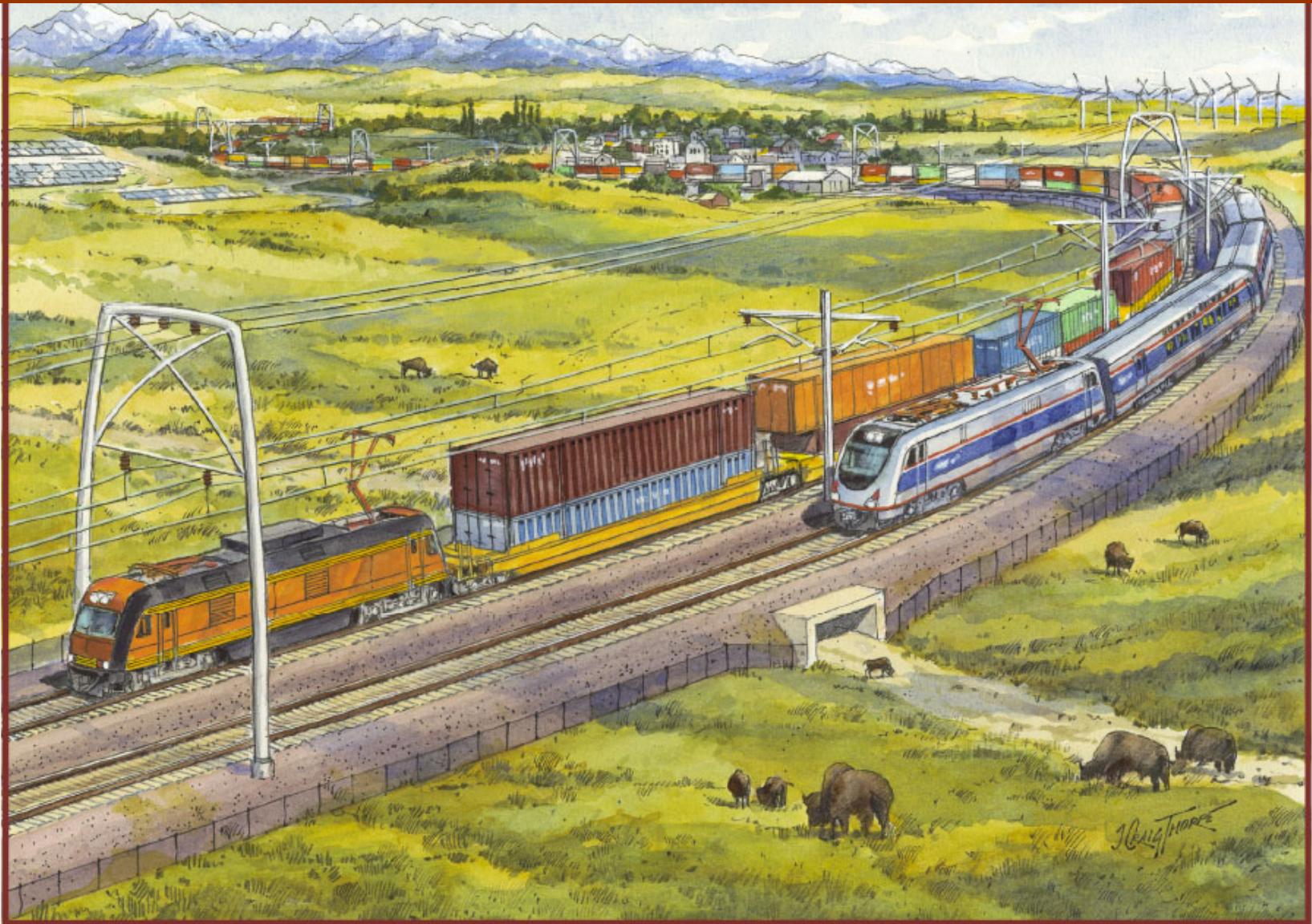


Image by J. Craig Thorpe

Some Numbers:

- A rule of thumb is that electrification costs on average \$2 million for a single-track mile and \$2.5 million for a double-track mile.
- To be economical, electrification must be done on a systemic basis in increments of at least 500 miles.
- That could represent a \$1.25 billion investment.

Some More Numbers:

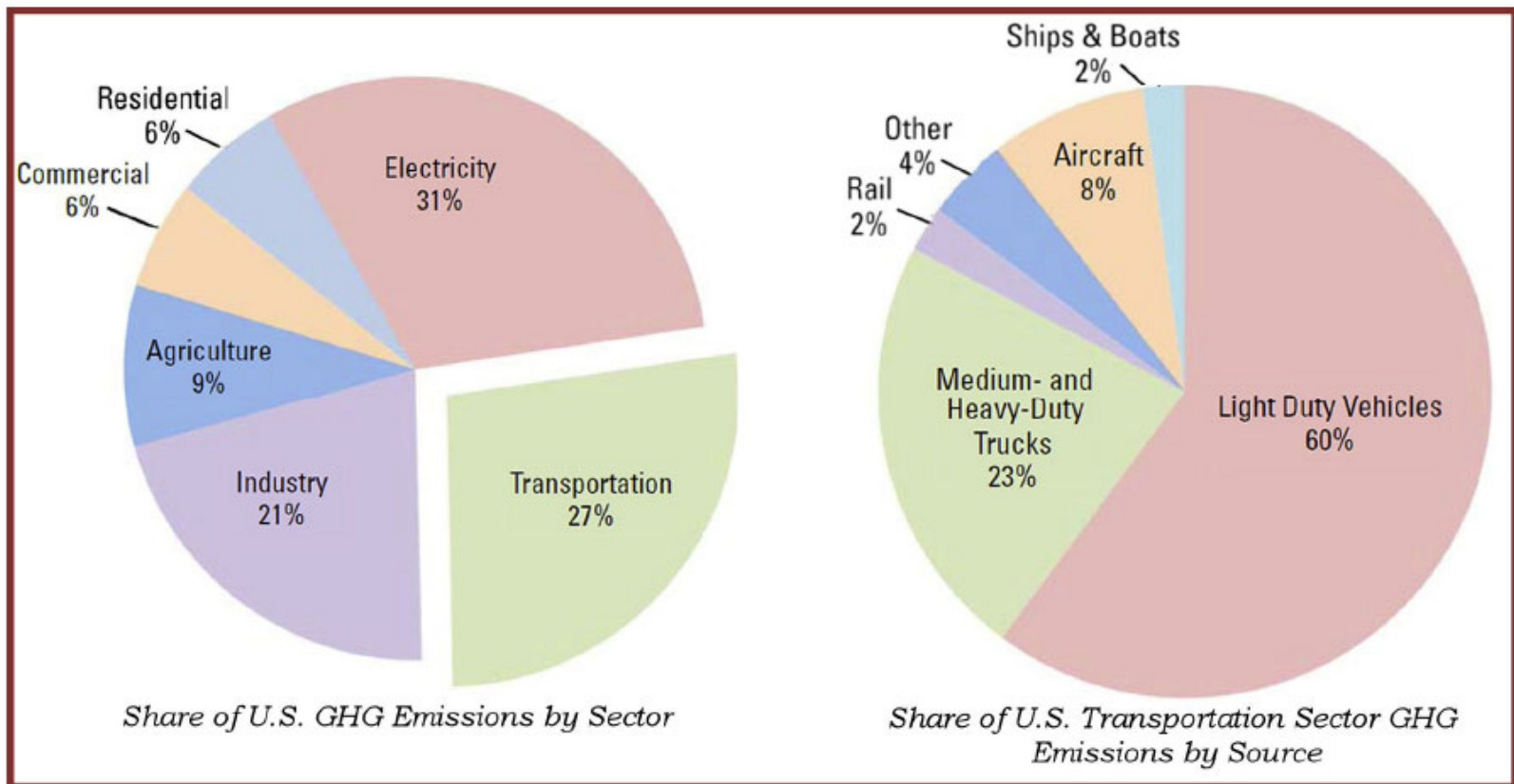
- Diesel power rail fuel efficiency varies from 156 to 512 ton-miles per gallon, truck fuel efficiency ranges from 68 to 133 ton-miles per gallon.”
- At the low end, a unit auto train is 1.9 times more efficient than its truck equivalent, while a double-stack container train can haul freight 5.5 times more efficiently than trucks.
- Electrified rail is even more efficient.

Advantages of Electrified Trains

- Electricity can come from renewable sources
- Electricity costs less than diesel fuel
- Regenerative braking reduces costs even more
- Electric locomotives are cheaper to buy and operate than diesel
- Electric locomotive maintenance costs are lower

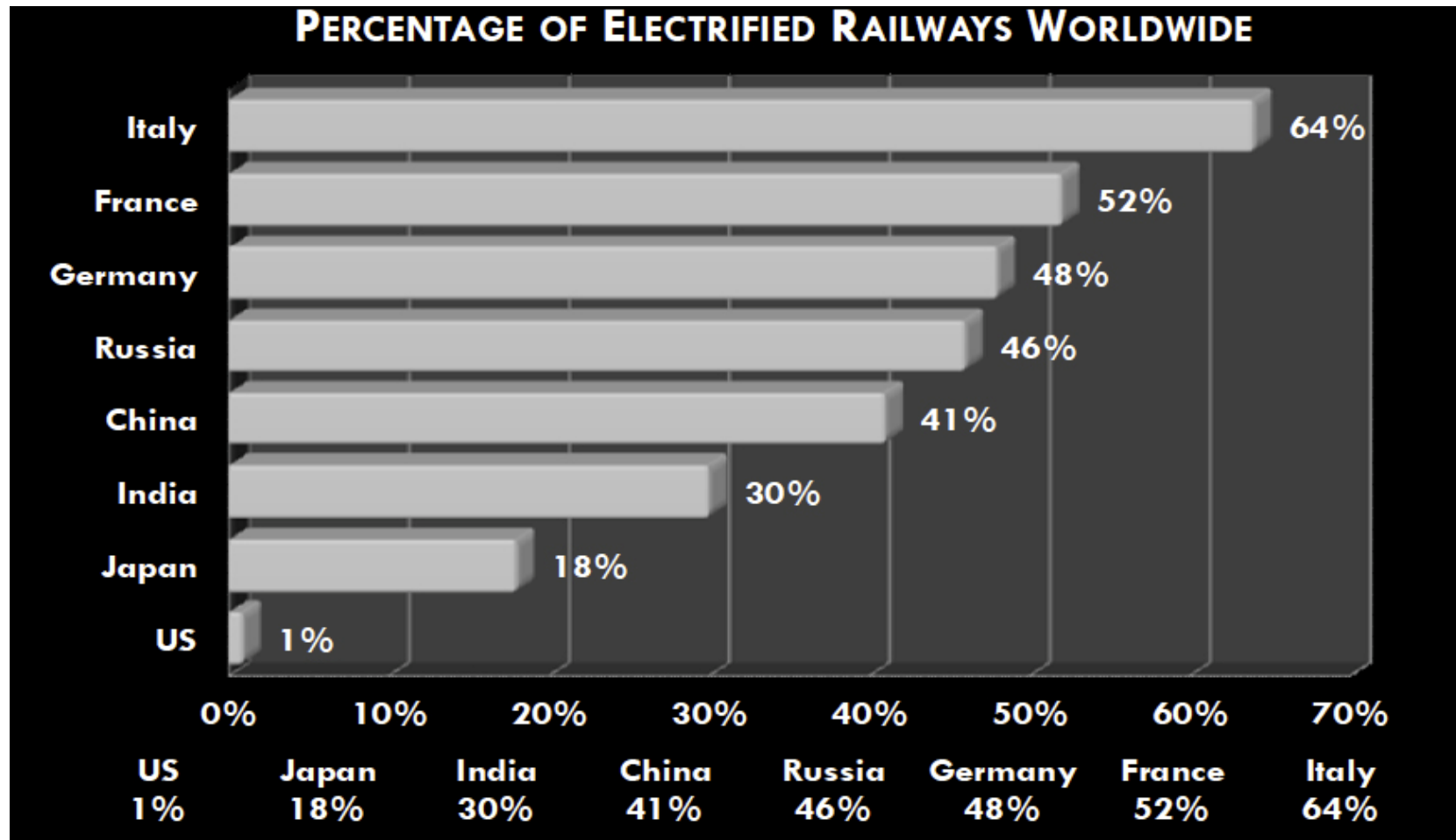


Where US greenhouse gases come from.



Source: US EPA

How the US compares to the rest of the world.



Electrification is working around the world!





Meanwhile, back in the US...

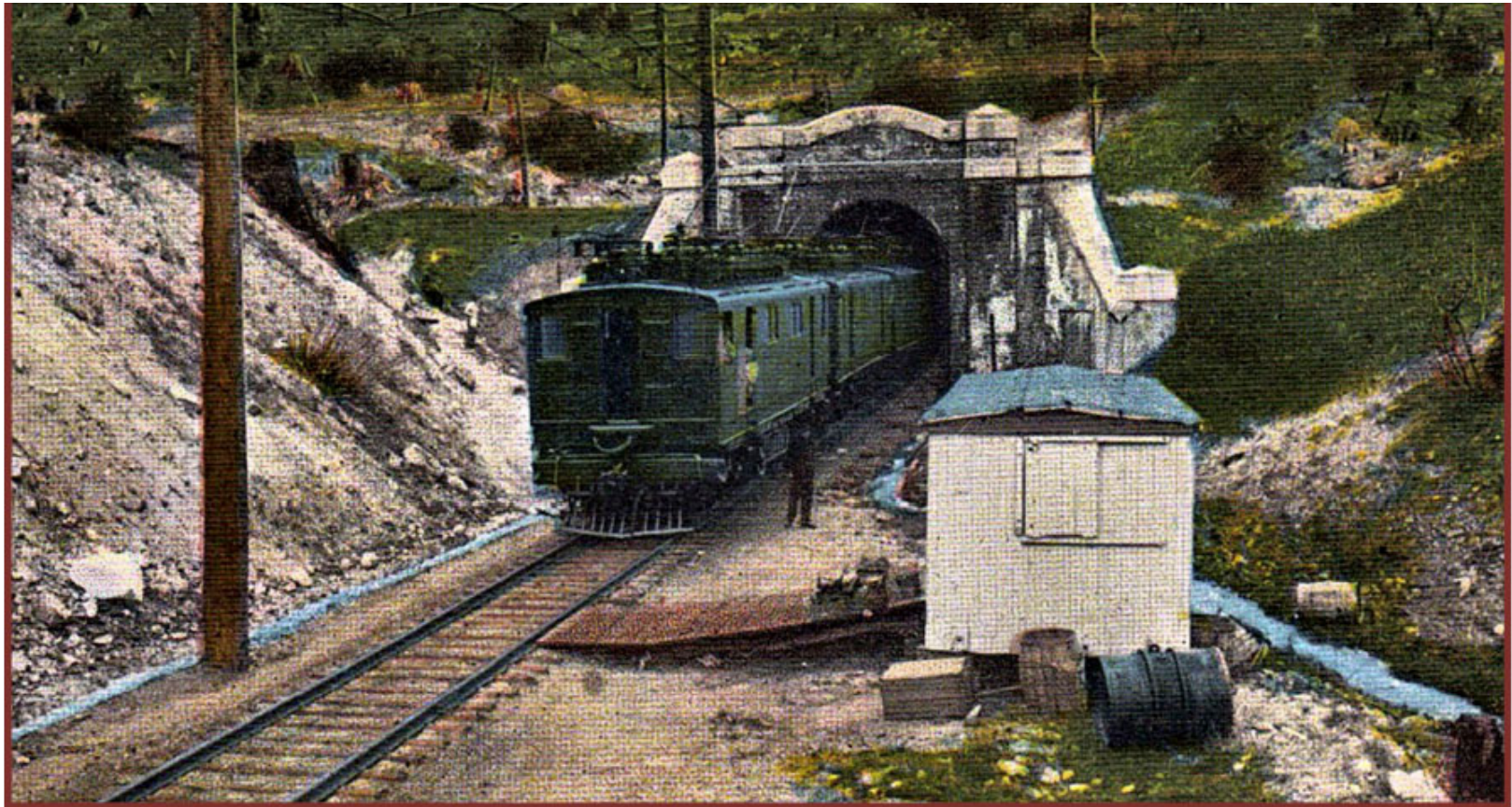


Photo by Curtis and Miller, 1924

More Numbers: The Cost of Highways

- According to the ASCE, the price tag for maintaining major highways in their current state would be \$101 billion annually from 2008–28.
- Even at that figure, only 46% of pavement would provide good ride quality under the US Department of Transportation's State of Good Repair benchmark.
- To elevate that portion to 74% by 2028 would require an additional \$69 billion annually, for a total of \$170 billion annually.

Track – Why Two is Better than One

- Apart from land acquisition costs, adding a mile of mainline track costs around \$2 million with modern signalling.
- Dual tracks allows two-way traffic, and provide a “passing lane” that allows express freight to share the corridor with regular heavy freight trains.
- The second track also lets faster passenger trains pass express freight trains.

Track – Why Two is Better than One

- Double tracking can provide seven times the capacity of a single track, but does not double costs since the right of way, signals, grade crossings and most other components are already part of the existing single-track operation.
- A double track with many medium speed cross-over switches has significantly more capacity than double track with few cross-overs.
- Double tracking dramatically increases speed and reliability since trains will not have to queue for their turn or wait on a passing siding as trains come the opposite direction.

Higher Speed vs. High and Ultra High Speed

- *High & Ultra High Speed* makes sense for passenger trains with high utilization – expensive
 - [price per mile]
 - *Higher Speed* makes sense for freight and less highly utilized passenger trips – affordable
 - \$2.0 M/mile to electrify for single track
 - \$2.5 M/mile for double track
- Solutionary Rail is a plan for higher-speed trains -- not high or ultra high speed – 80-125 mph.

How to Overcome Challenges

Challenge #1:

Fragmented infrastructure owned by 6 major companies

Solution:

Create a “Public Belt” above private Right of Way



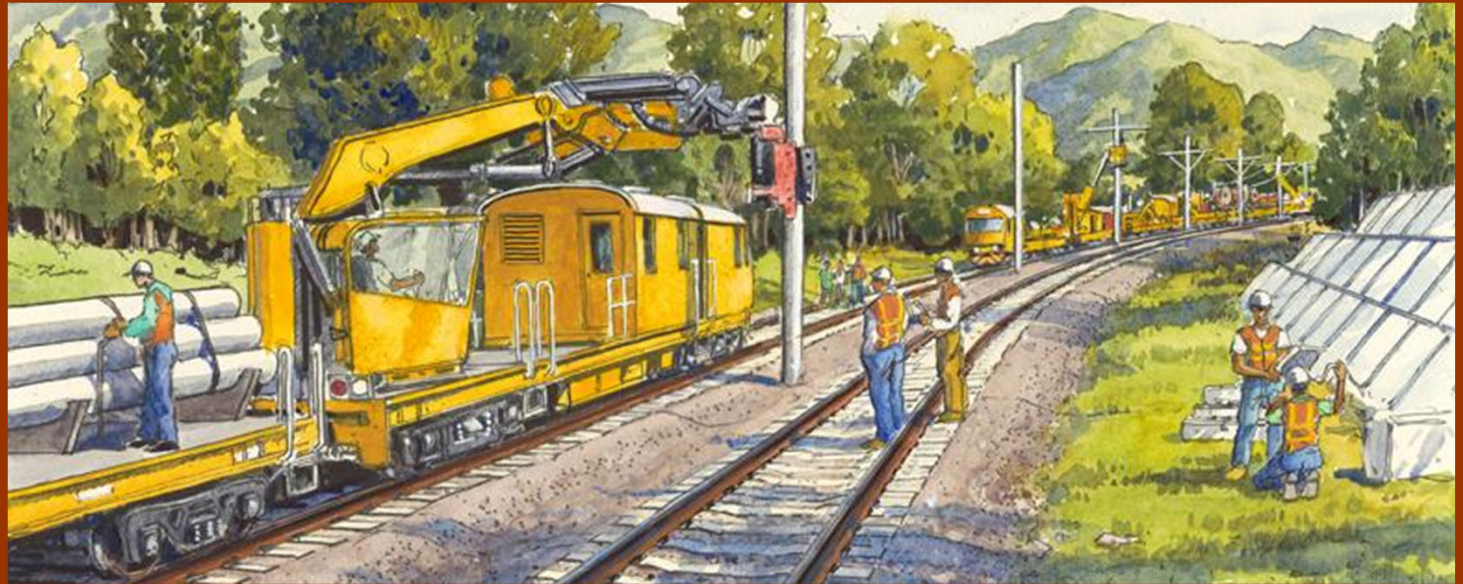
How to Overcome Challenges

Challenge #2:

Upfront capitalization cost, high commercial interest rates, and longer term return on investments

Solution:

Public-Private Partnership (PPP) and a new Steel Interstate Development Authority (SIDA)



Steel Interstate Development Authority (SIDA)

A not-for-profit corporation chartered with the authority to raise funds for infrastructure investment on both publicly- and privately- owned rights-of-way would:

- Issue tax-exempt bonds to sell at low interest rates
- Oversee funding, construction, and management of electrification infrastructure
- Self-finance through user fees paid by railroads
- Negotiate with right-of-way owners of site infrastructure
- Make direct investments in track improvements
- Seek financing in the form of TIFIA loans

How to Overcome Challenges

Challenge #3:

The U.S. railroad infrastructure is vast. Where do we begin?

Solution:

Possibilities include the northern transcon and southern transcon.

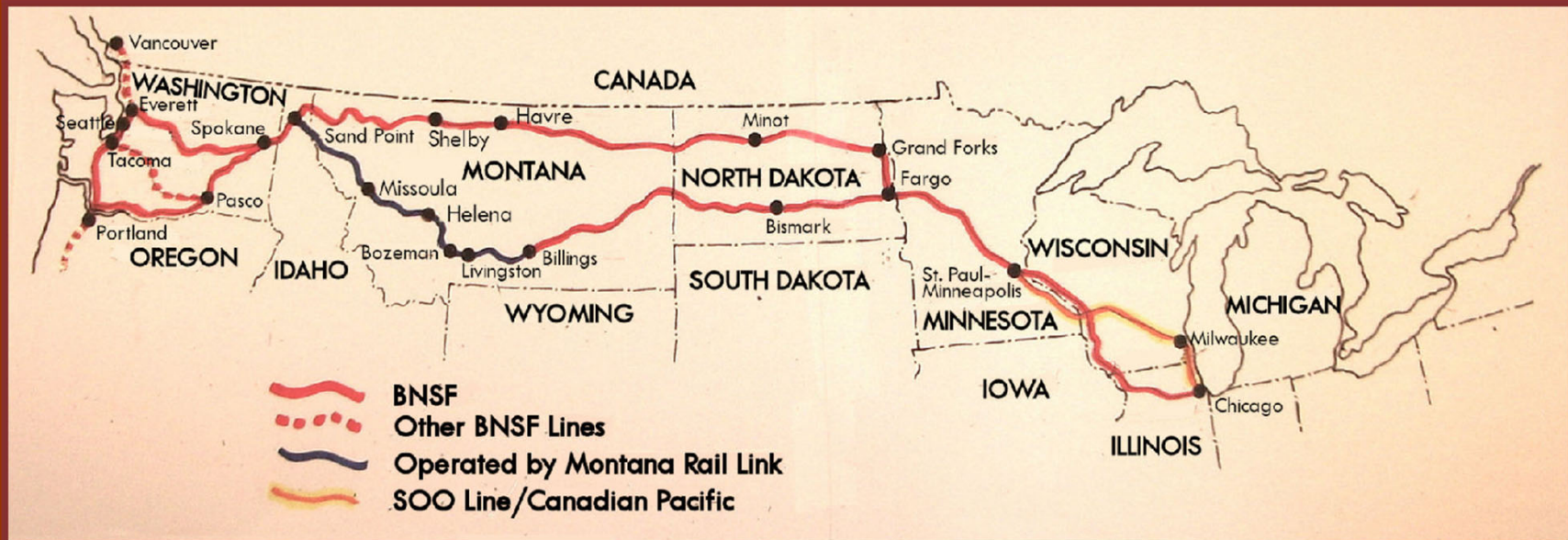
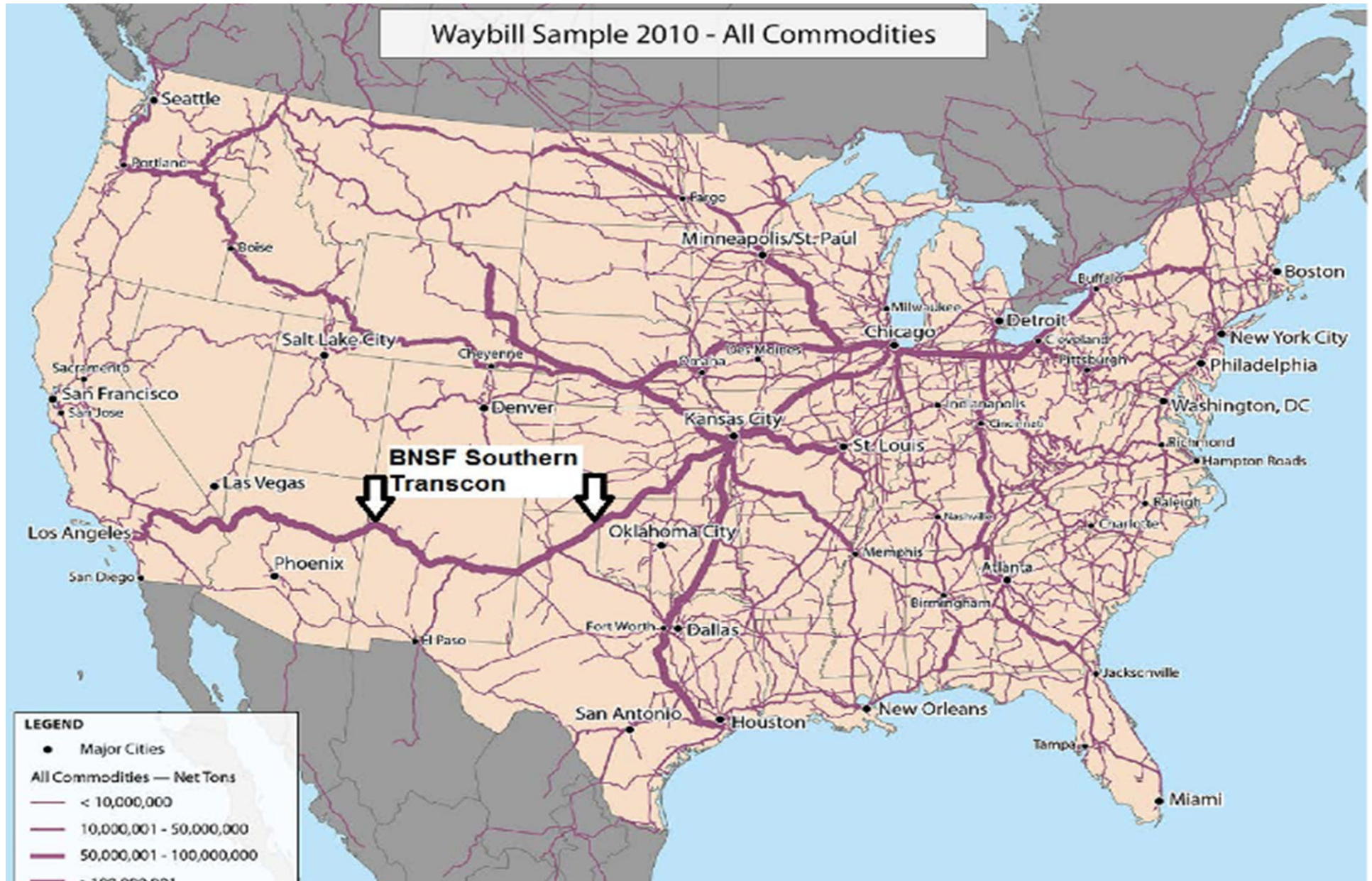
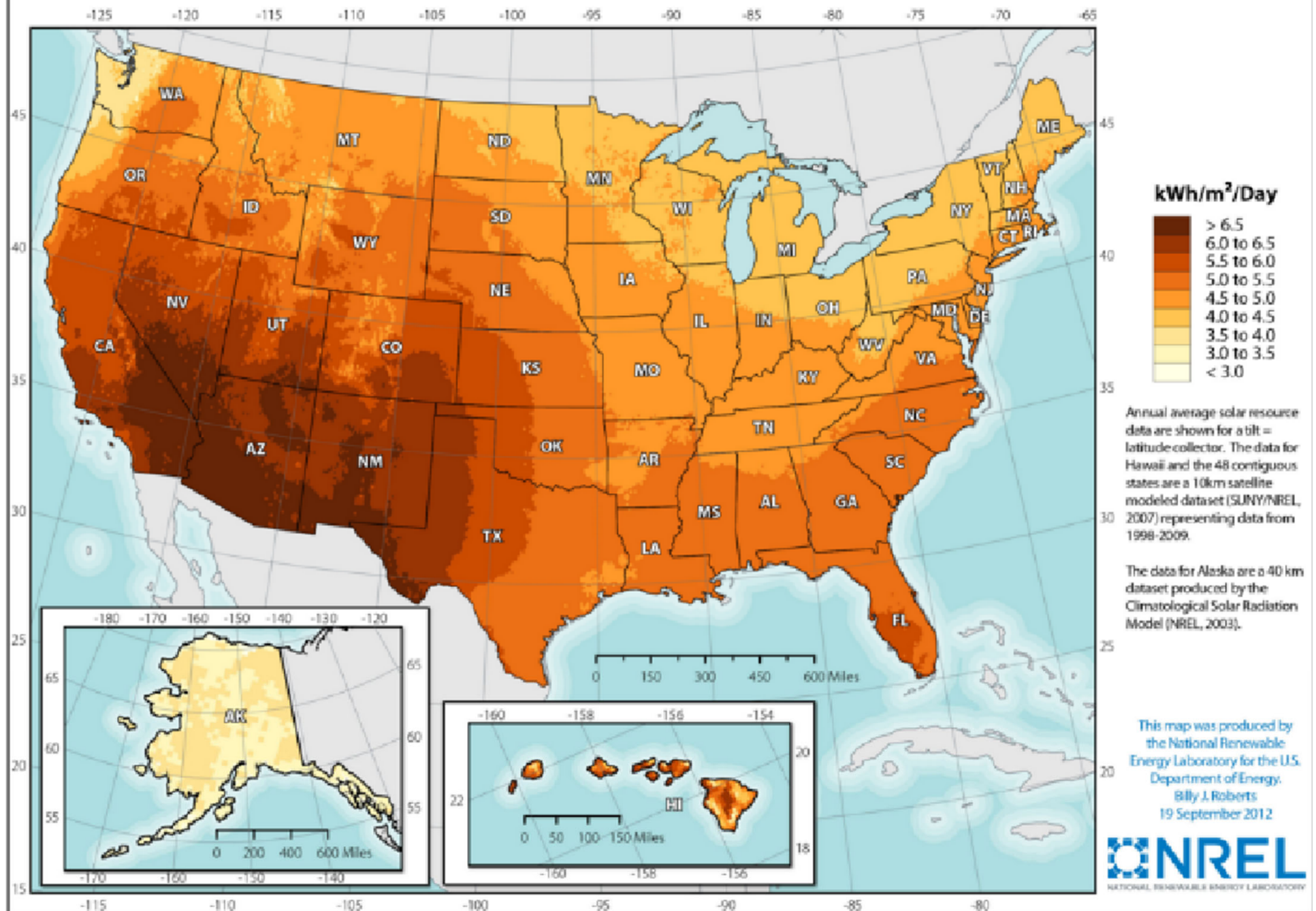


Image by J. Craig Thorpe

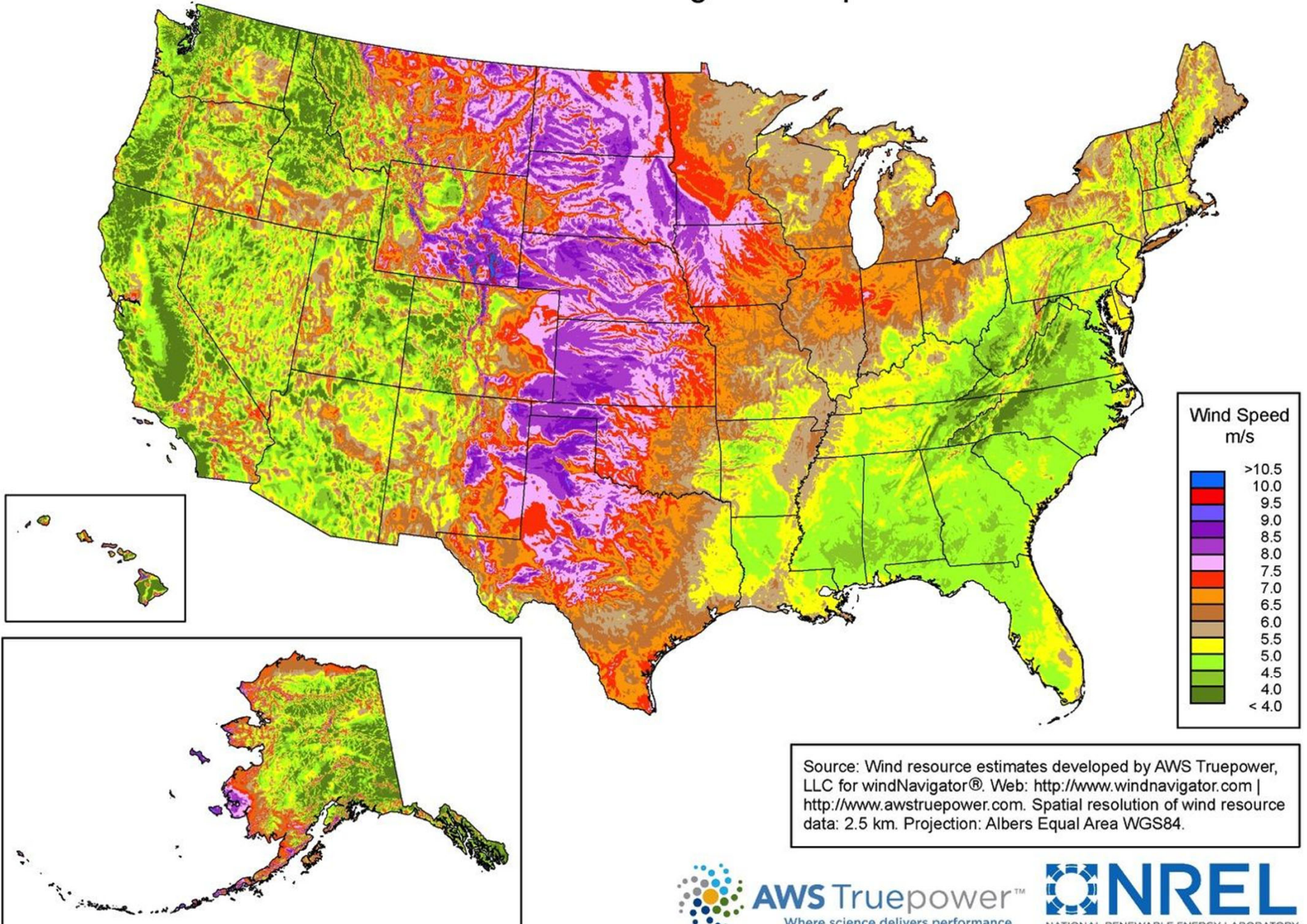
The Southern Transcon



Photovoltaic Solar Resource of the United States



United States - Annual Average Wind Speed at 80 m



AWS Truepower™
Where science delivers performance.



21st Century Stakeholders



Rail Workers & Labor



RAIL WORKERS



PASSENGERS



FARMERS



TRIBES



**TRACKSIDE
COMMUNITIES**



**GREEN ENERGY
DEVELOPERS
&
RURAL ELECTRIC
CO-OPS**



**RAILROAD
INDUSTRY**



**RURAL
COMMUNITIES**

Trackside Communities



Environmental Justice for Fenceline Communities



Green Energy Developers & Rural Electric Co-ops



RAIL WORKERS



PASSENGERS



FARMERS



TRIBES



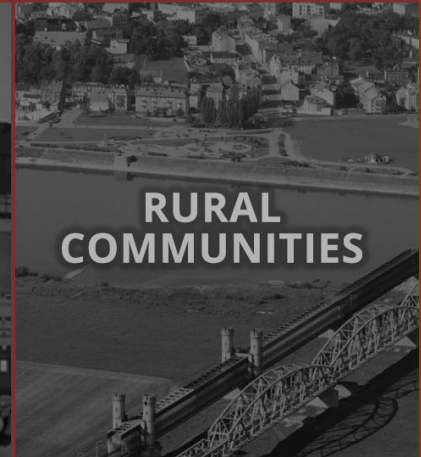
**TRACKSIDE
COMMUNITIES**



**GREEN ENERGY
DEVELOPERS
&
RURAL ELECTRIC
CO-OPS**

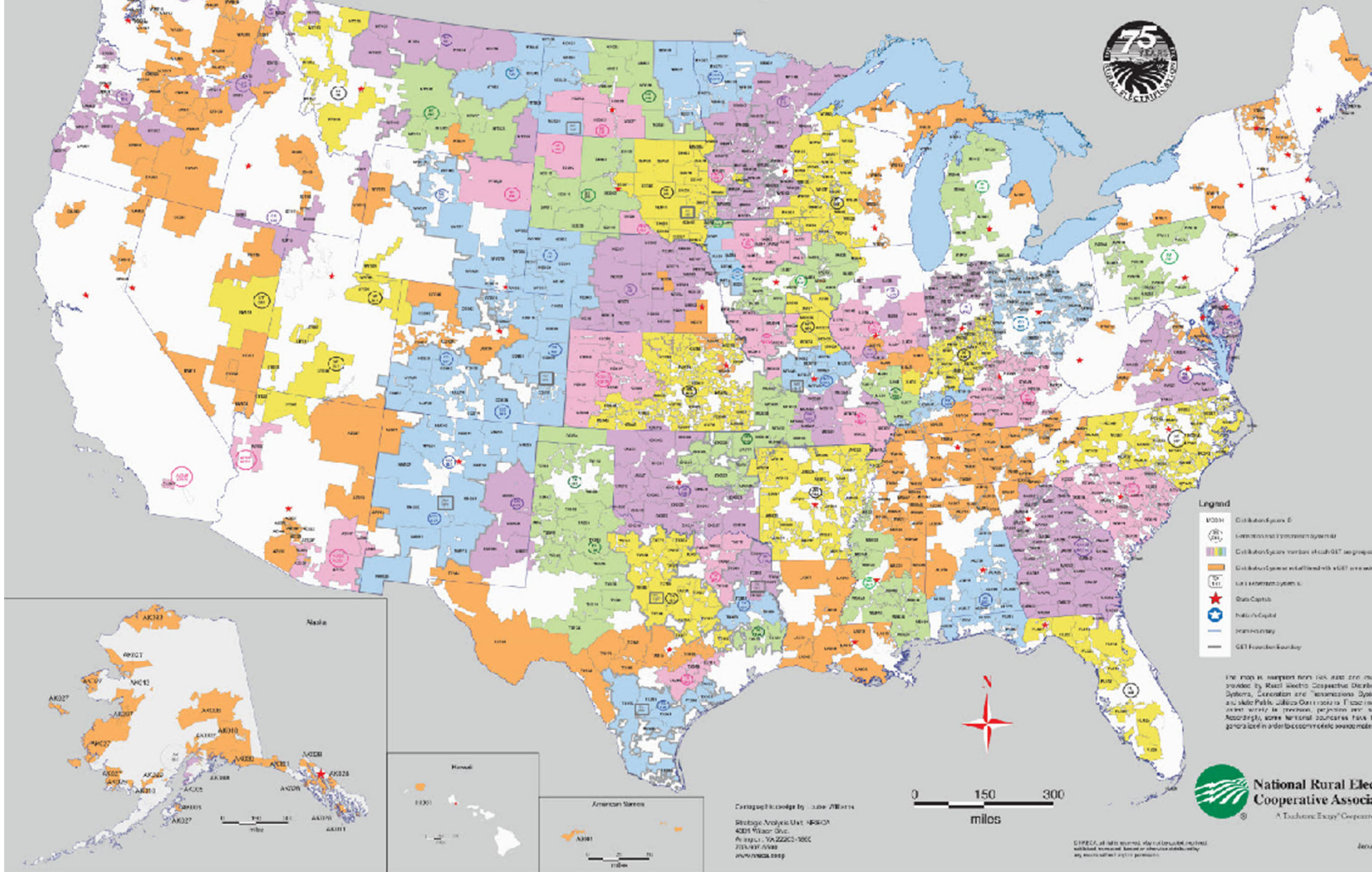


**RAILROAD
INDUSTRY**



**RURAL
COMMUNITIES**

America's Electric Cooperative Network

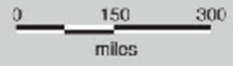


- Legend**
- RSED Distribution System
 - RSED Distribution System with GET
 - RSED Distribution System with GET and transmission systems
 - RSED Distribution System with GET and transmission systems
 - State Capital
 - Public Capital
 - State Boundary
 - GET Founder Boundary

The map is supported by data that may be provided by Rural Electric Cooperative Distribution Systems, Generation and Transmission Systems and Public Utility Companies. It may not cover every transmission, generation and distribution system. Some national boundaries may be generalized or not shown.



Cartography by: **John Wilkins**
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Tribes



RAIL WORKERS



PASSENGERS



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TRIBES



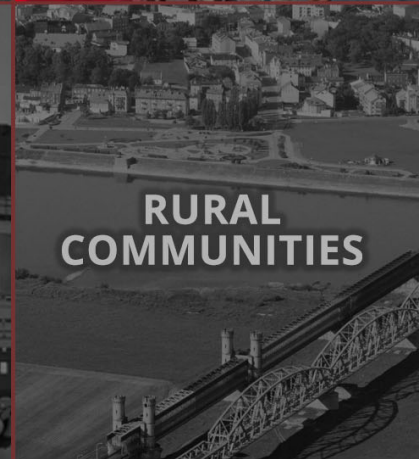
**TRACKSIDE
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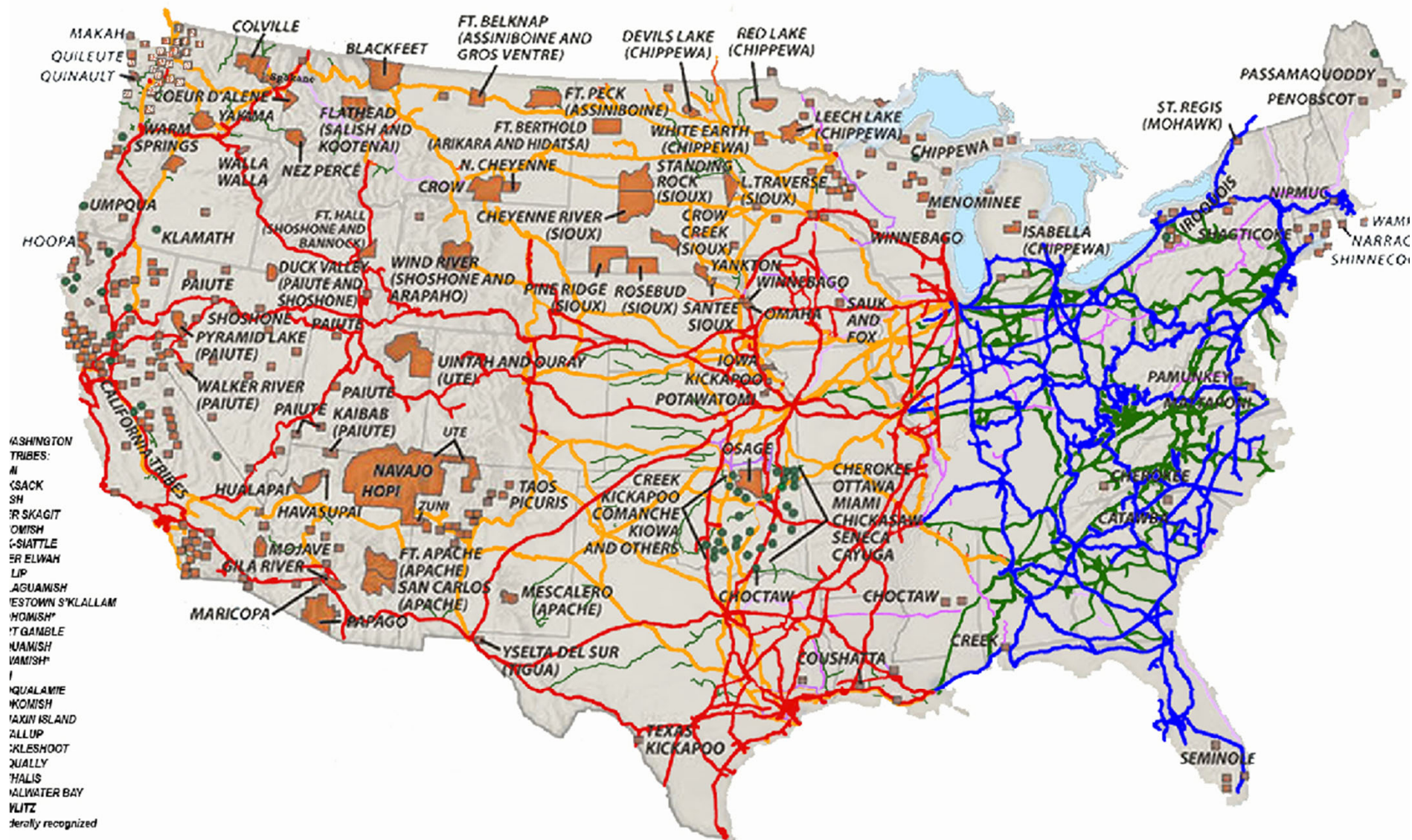


**RAILROAD
INDUSTRY**



**RURAL
COMMUNITIES**

Native American Tribes juxtaposed with major class 1 rail lines (BNSF, Union Pacific, CSX, Norfolk Southern and others)



Right of Way Justice for Tribes



Farmers & Rural Communities



RAIL WORKERS



PASSENGERS



FARMERS



TRIBES



TRACKSIDE COMMUNITIES



**GREEN ENERGY DEVELOPERS
&
RURAL ELECTRIC CO-OPS**



RAILROAD INDUSTRY



RURAL COMMUNITIES

Rural Communities the Railroads Left Behind



Agriculture's Vital Interest in Rail Capacity



Passengers



RAIL WORKERS



PASSENGERS



FARMERS



TRIBES



**TRACKSIDE
COMMUNITIES**



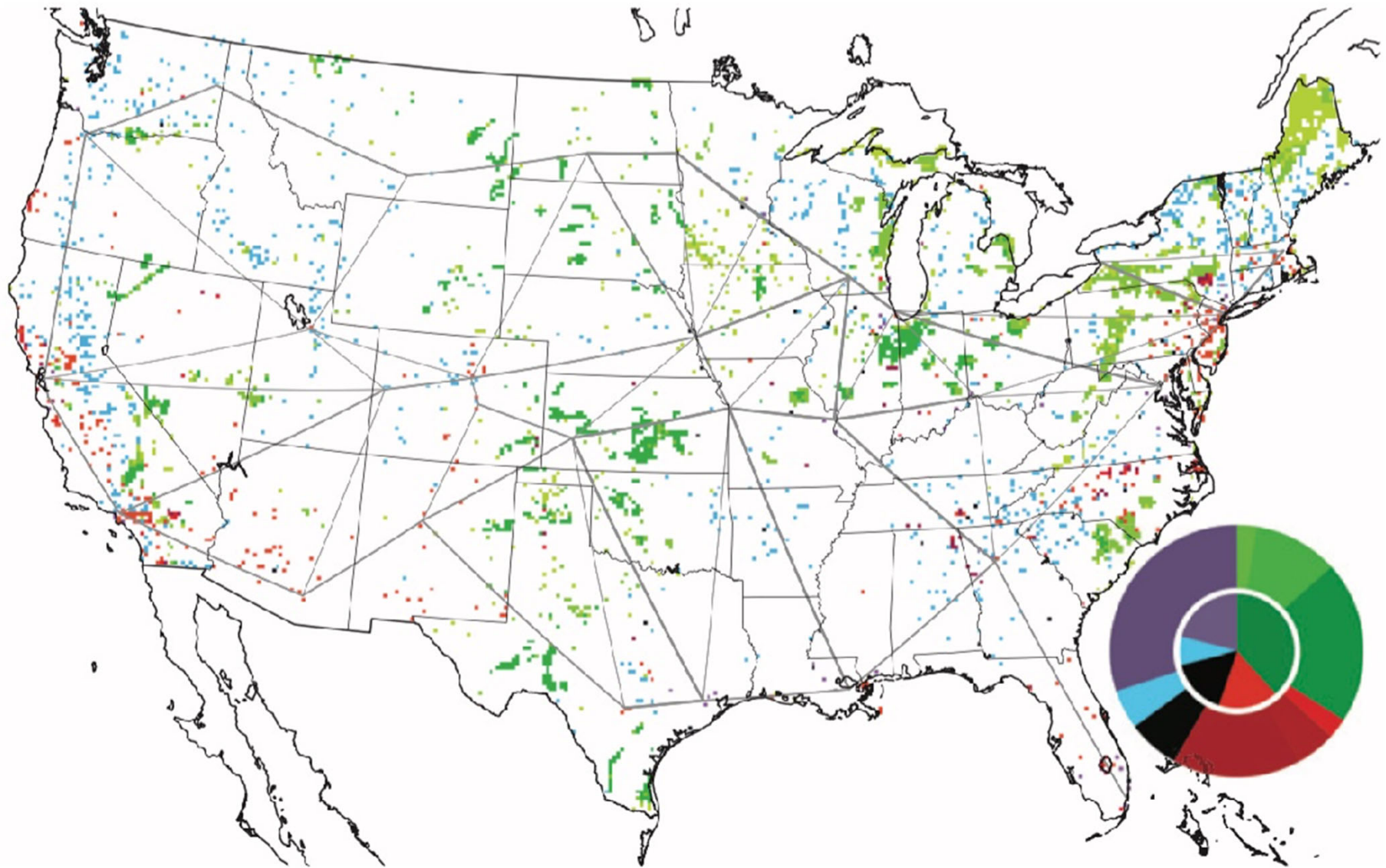
**GREEN ENERGY
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CO-OPS**



**RAILROAD
INDUSTRY**

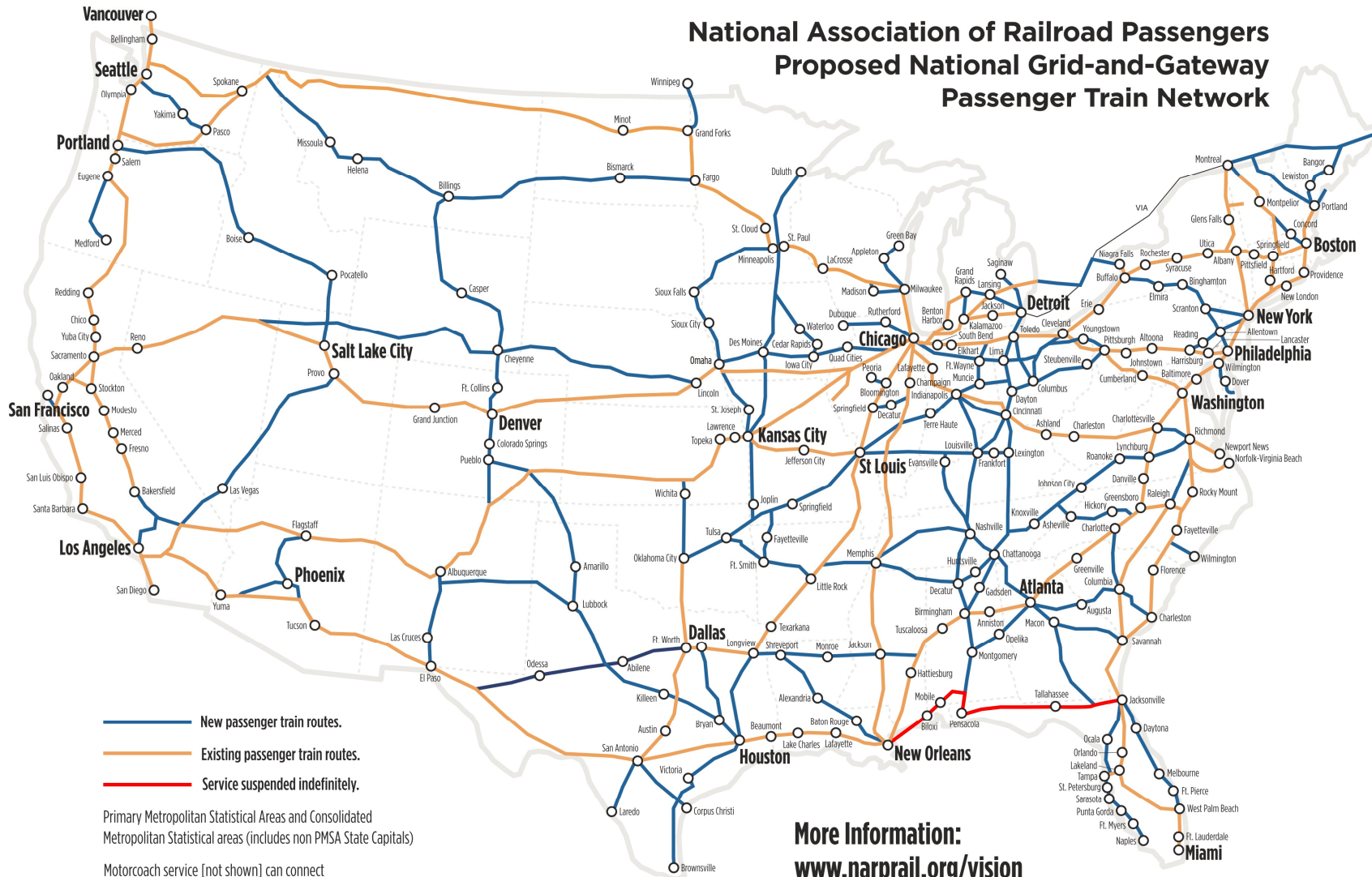


**RURAL
COMMUNITIES**



- Onshore wind
- Offshore wind
- Solar PV
- Hydroelectric
- Natural gas
- Nuclear
- | 3 GW transmission

National Association of Railroad Passengers Proposed National Grid-and-Gateway Passenger Train Network



TRAINS: A TRAVEL CHOICE AMERICANS WANT



SOLUTIONARY PERSPECTIVES [video podcast series]

Interviews with stakeholders and allies to build mutual understanding and solidarity



How Do We Promote This?

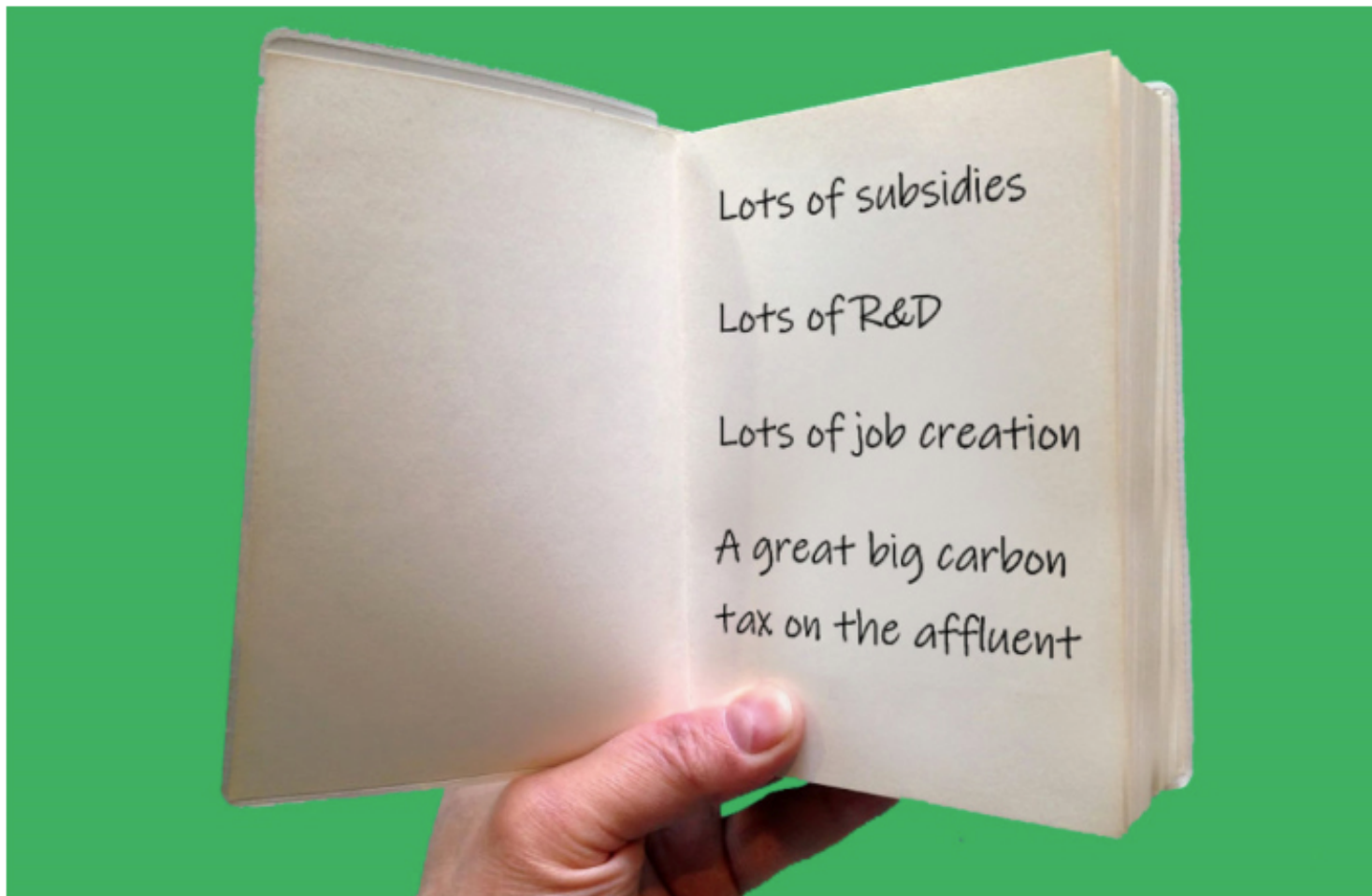
- Public perception of railroads needs work.
- Green New Deal Has gotten attention – but needs fleshing out. (Solutionary Rail does that.)
- Convince the public the investment is worth it.
- Work to change public perception that effective action means sacrifice.

My Abridged Green New Deal

KEVIN DRUM FEBRUARY 21, 2019 2:32 PM



<https://www.motherjones.com/kevin-drum/2019/02/my-abridged-green-new-deal/>

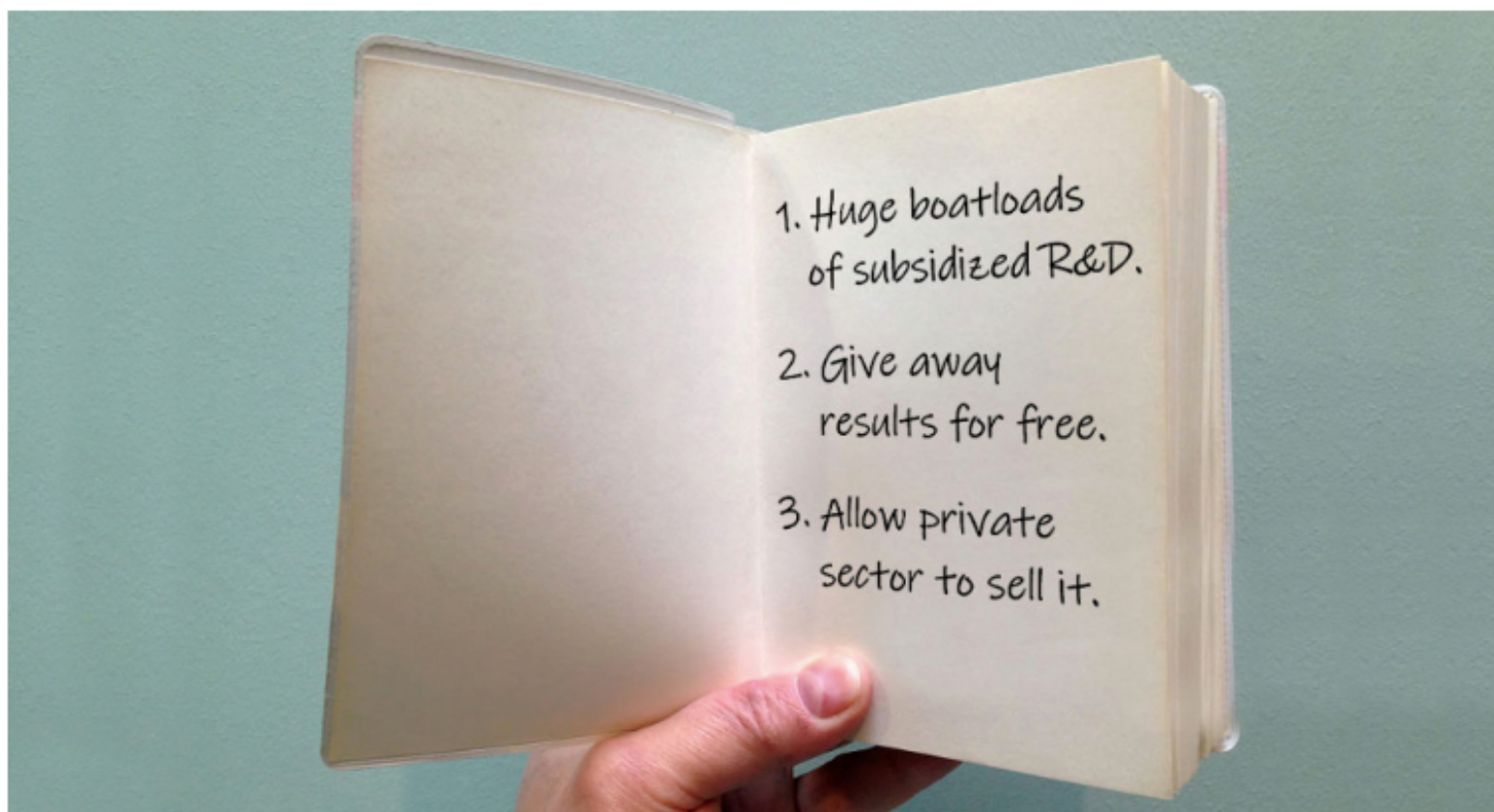


Here's My Super-Abridged Green New Deal

KEVIN DRUM FEBRUARY 24, 2019 12:10 AM



<https://www.motherjones.com/kevin-drum/2019/02/heres-my-super-abridged-green-new-deal/>



Show examples

- The New Silk Road.
- Major rail investments in Africa
- Effects of restoring, improving rail service.
- Show benefits from job creation and investment

China's \$900 billion New Silk Road. What you need to know

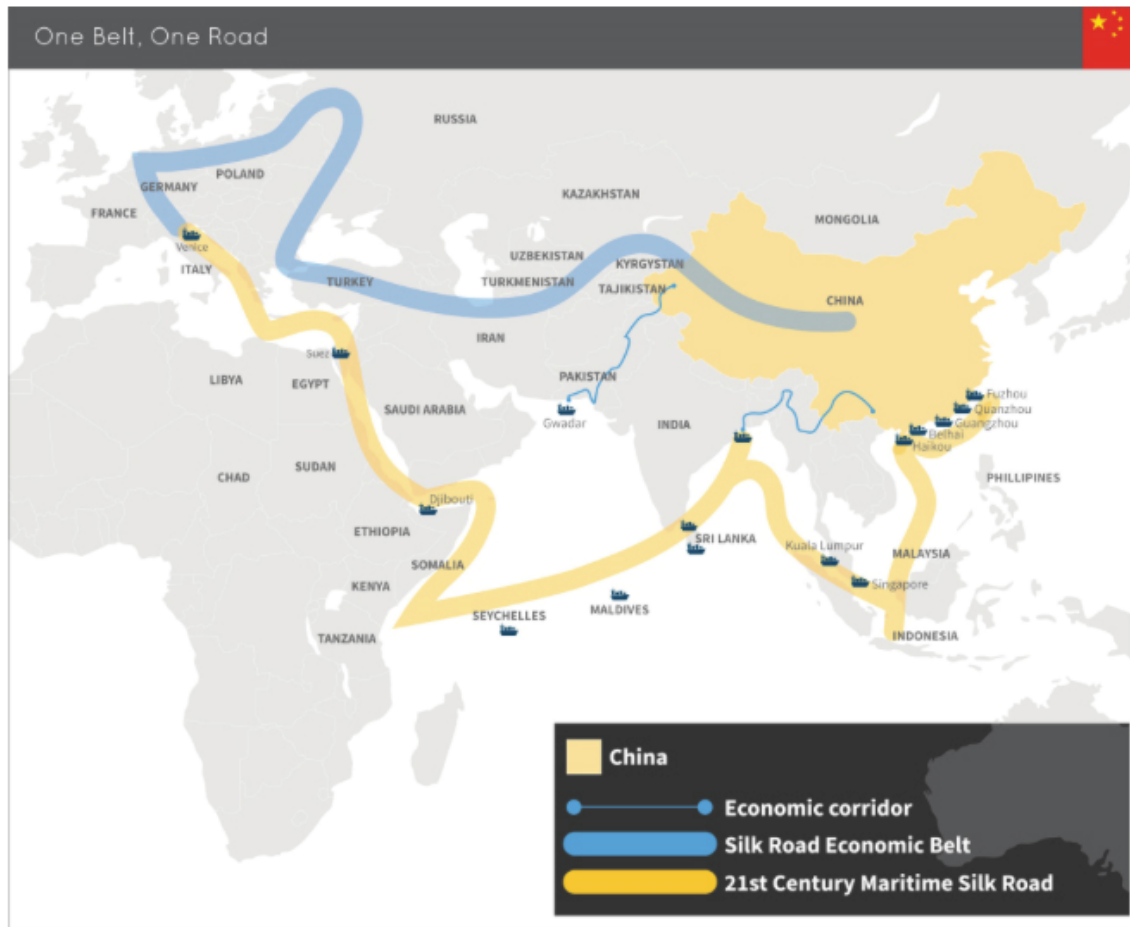


East to west ... who stands to gain from China's controversial trade route?
26 Jun 2017

Image: Dmitrii Vaccinium/Unsplash

Anna Bruce-Lockhart
Editor, World Economic Forum

<https://www.weforum.org/agenda/2017/06/china-new-silk-road-explainer/>



<https://www.reform.org/agenda/2017/06/china-new-silk-road-explainer/>

Image: Lowy Institute

New East African railway



Source: Kenyan Railways, Ethiopian Railway Commission, Transit Transport Coordination Authority



<https://www.bbc.com/news/world-africa-40171095>

By Nancy Kacungira BBC Africa, Nairobi 8 June 2017

South Scotland <https://www.bbc.com/news/uk-scotland-south-scotland-45432576>

Borders Railway journeys pass four million mark

🕒 6 September 2018

f 🗨️ 🐦 ✉️ Share



More than four million journeys have been made on the Borders Railway since it opened to customers three years ago.



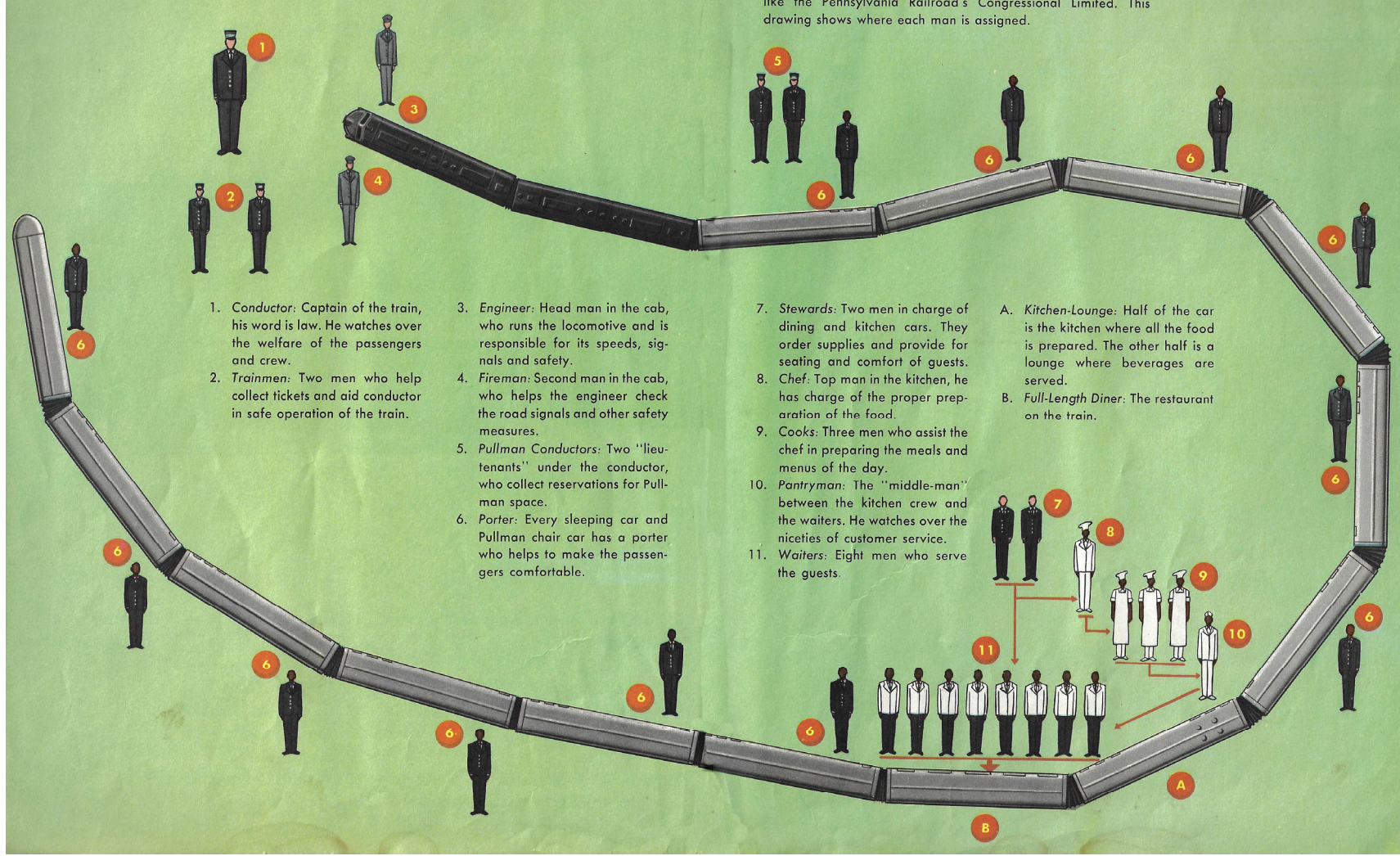
Image by J. Craig Thorpe



Image by J. Craig Thorpe

THE MEN WHO RUN THE TRAINS

A crew of 38 men is required to perform the many services for safe, comfortable and convenient travel aboard a streamliner like the Pennsylvania Railroad's Congressional Limited. This drawing shows where each man is assigned.



- 1. **Conductor:** Captain of the train, his word is law. He watches over the welfare of the passengers and crew.
- 2. **Trainmen:** Two men who help collect tickets and aid conductor in safe operation of the train.

- 3. **Engineer:** Head man in the cab, who runs the locomotive and is responsible for its speeds, signals and safety.
- 4. **Fireman:** Second man in the cab, who helps the engineer check the road signals and other safety measures.
- 5. **Pullman Conductors:** Two "lieutenants" under the conductor, who collect reservations for Pullman space.
- 6. **Porter:** Every sleeping car and Pullman chair car has a porter who helps to make the passengers comfortable.

- 7. **Stewards:** Two men in charge of dining and kitchen cars. They order supplies and provide for seating and comfort of guests.
- 8. **Chef:** Top man in the kitchen, he has charge of the proper preparation of the food.
- 9. **Cooks:** Three men who assist the chef in preparing the meals and menus of the day.
- 10. **Pantryman:** The "middle-man" between the kitchen crew and the waiters. He watches over the niceties of customer service.
- 11. **Waiters:** Eight men who serve the guests.

- A. **Kitchen-Lounge:** Half of the car is the kitchen where all the food is prepared. The other half is a lounge where beverages are served.
- B. **Full-Length Diner:** The restaurant on the train.

Contact:

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bill@SolutionaryRail.org

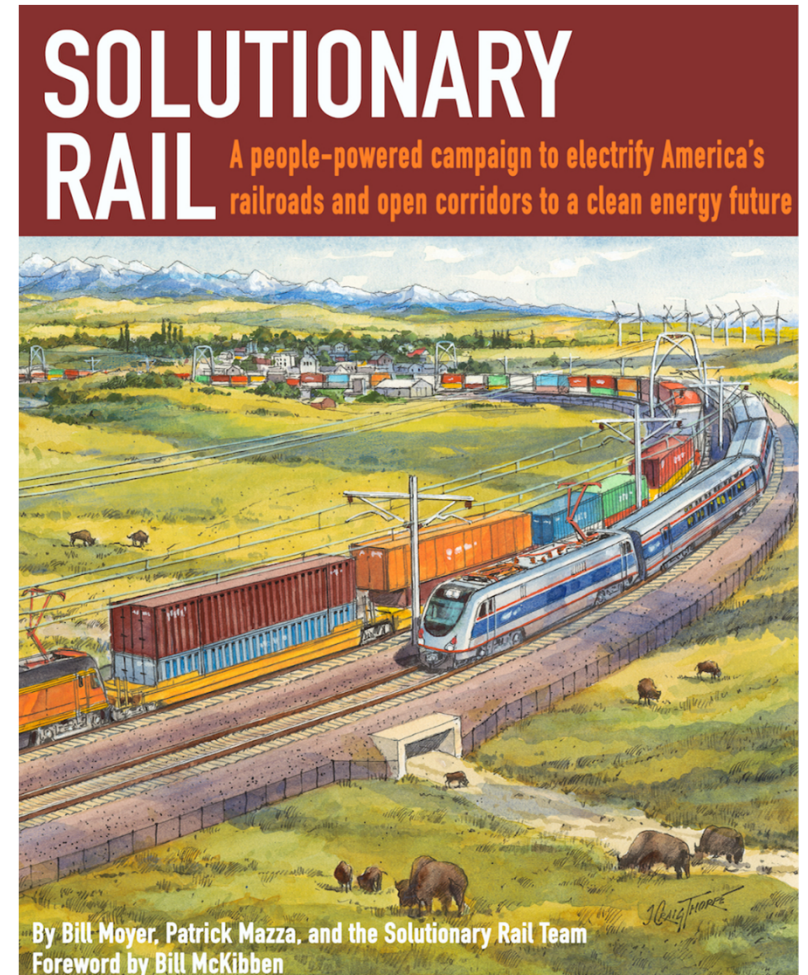
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