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.
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.

Share of U.S. GHG Emissions by Sector

- Electricity: 31%
- Industry: 21%
- Transportation: 27%
- Agriculture: 9%
- Commercial: 6%
- Residential: 6%

Share of U.S. Transportation Sector GHG Emissions by Source

- Light Duty Vehicles: 60%
- Medium- and Heavy-Duty Trucks: 23%
- Rail: 4%
- Aircraft: 8%
- Ships & Boats: 2%

Source: US EPA
How the US compares to the rest of the world.

Percentage of Electrified Railways Worldwide:

- Italy: 64%
- France: 52%
- Germany: 48%
- Russia: 46%
- China: 41%
- India: 30%
- Japan: 18%
- US: 1%

US 1%
Japan 18%
India 30%
China 41%
Russia 46%
Germany 48%
France 52%
Italy 64%
Electrification is working around the world!

- Russia
- Chile
- China
- India
- France
- And…
Meanwhile, back in the US...
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
  $2.0 \text{ M/mile}$ to electrify for single track
  $2.5 \text{ M/mile}$ 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:
Possibilites include the northern transcon and southern transcon.
The Southern Transcon
21st Century Stakeholders

- Rail Workers
- Passengers
- Farmers
- Tribes
- Trackside Communities
- Green Energy Developers & Rural Electric Co-ops
- Railroad Industry
- Rural Communities
Trackside Communities

- Rail Workers
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- Trackside Communities
- Green Energy Developers & Rural Electric Co-ops
- Railroad Industry
- Rural Communities
Environmental Justice for Fenceline Communities
Right of Way Justice for Tribes
Farmers & Rural Communities
Rural Communities
the Railroads Left Behind
Agriculture’s Vital Interest in Rail Capacity
Passengers
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/

Lots of subsidies
Lots of R&D
Lots of job creation
A great big carbon tax on the affluent
Here’s My Super-Abridged Green New Deal

KEVIN DRUM    FEBRUARY 24, 2019 12:10 AM


1. Huge boatloads of subsidized R&D.
2. Give away results for free.
3. Allow private sector to sell it.
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

Anna Bruce-Lockhart
Editor, World Economic Forum

https://www.weforum.org/agenda/2017/06/china-new-silk-road-explainer/
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Image: Lowy Institute
Borders Railway journeys pass four million mark

6 September 2018

The railway between the Borders and Edinburgh opened to the public three years ago.

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