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Perspectives on Electrified Passenger Rail

**RAIL ELECTRIFICATION COALITION
WORKSHOP**

April 30, 2024

Michael Testerman, VRPI Executive Director

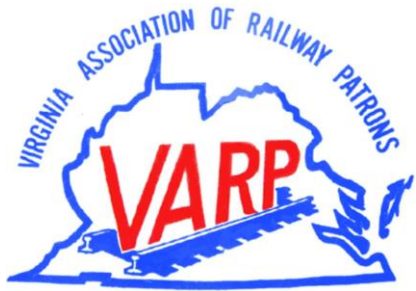
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MISSION

VRPI's mission is to strengthen and improve public policy with respect to both freight and passenger rail in the Commonwealth of Virginia.

Through objective and rigorous research, publication, education, and outreach, VRPI strives to increase public understanding of freight and passenger rail and to promote public policies that will secure the future of inter-city rail as a cost-effective, sustainable, and essential element of Virginia's 21st century transportation system.



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VRPI was conceived in 2002 by a group of citizen rail advocates affiliated with Virginians for High-Speed Rail (VHSR) who believed there was a need for an independent, academically-oriented rail policy research-and-development center to support public policymaking for rail in Virginia.

VRPI was formally incorporated and established as a 501 (c) (3) organization in 2005. I have served as its executive director since 2013.

Areas of inquiry include: truck diversion to rail; shared-use, high-performance infrastructure; optimal station design, autonomous rail vehicles, and; publicly incentivizing common-carrier best practices.

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Rail advocates have matured from just promoting passenger trains to a holistic view of upgraded rail for both passenger and freight conveyance, powered with renewable electrical energy.

Joe Boardman, as FRA Administrator (2005-2008) encouraged CSX to submit the only non-highway grant application to the SAFETEA-LU “Corridors of the Future” program.

- He envisioned railroad electrification paralleling I-95 from New England to Florida.
- The CSX grant application would study an upgraded rail corridor, south of Washington, DC., where passenger trains would *share the right-of-way* with freight trains, but largely on their own dedicated tracks. This at least left open the option for passenger trains to be electrified.

Alan Drake and Andrea Bassi – Millennium Institute’s T21 “Study of Peak Oil” paper on carbon free transportation: Modal shift to rail, powered by renewable energy can affect a 62% reduction in petroleum use by 2038. (Best alternative)

Sir Richard Branson’s **Carbon War Room**/Rocky Mountain Institute looked at CO2 reductions at the macro level, as promoted at the 2010 Georgetown University “Creating Carbon Wealth Summit.”

“Draft” Reebie, April 1, 2004, p. 69:

"Our conclusion is that if substantial diversion of traffic from trucks to NS is to occur in this [I-81] corridor, NS's *average train speed* needs to be increased to approximately **60 mph**, or 15 mph faster than average truck speeds of 45 mph, in order to offset the minimum projected terminal time. To do so would require significant track upgrading as well as increasing NS's **maximum authorized speed for intermodal trains** to as much as **79 mph**, comparable to its existing maximum allowable speed for *passenger trains*."

POTENTIAL RAIL IMPROVEMENTS

- Full double track
 - Reduced curvature
 - Bi-directional TC signaling
 - Frequent crossovers
 - 36-mile new construction
 - IMX terminals
- ☐ Improvements serve product strategy



Source: Joseph Bryan presentation to AASHTO-SCORT mtg. Dec. 14, 2005



Demonstration segment - North American Steel Interstate System



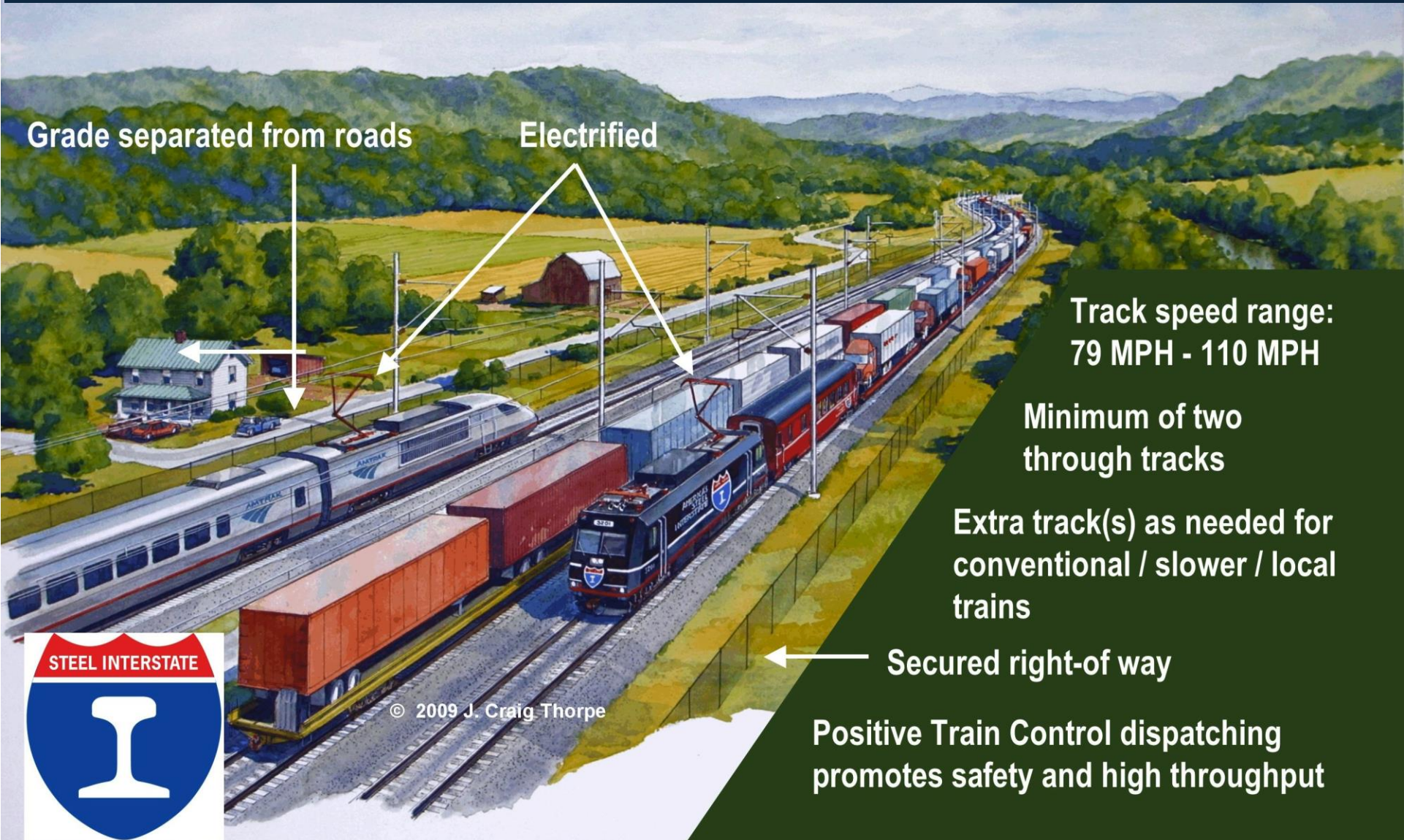
- A minimum of two grade separated, (electrified) *through* tracks*
- Reduced curvature*
- Bi-directional Positive Train Control signaling
- Frequent crossovers*
- Regional Intermodal terminals/stations*
- Improvements serve mid-range mobility (~500 mi.) for freight and passengers*

*Reebee recommendations



200 + daily trains, all moving between 79 mph & 110 mph
Slower trains at night/off-peak or on additional auxiliary/
local access tracks

Demonstrate this in the Interstate-81 Corridor...



Grade separated from roads

Electrified

Track speed range:
79 MPH - 110 MPH

Minimum of two
through tracks

Extra track(s) as needed for
conventional / slower / local
trains

Secured right-of way

Positive Train Control dispatching
promotes safety and high throughput



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VIRGINIA'S PASSENGER RAIL NETWORK

- Current/Future Amtrak Station
- Amtrak Long-Distance Routes
- Enhanced Regional Routes
- Future Regional Routes
- Bus/Transit Connector





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Electrifying Rail

Best practices and Future opportunities

April 22, 2022



Alan Fisher
ArmChair Urbanist



Jim Blaze
Consultant, railroad economist, &
contributing editor for Railway Age

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Current takeaways on electrified passenger rail

The future belongs to the efficient.

VRPI's primary interest in rail electrification is to lower the energy requirements of essential mobility for travel and cargo, using renewable energy.

Meredith Richards opened our webinar saying, "We hope to explore, and possibly add credibility to the idea that North America's core national rail network should be electrified."

Current takeaways on electrified passenger rail

- Virginia is well suited to extend the Northeast Corridor's (NEC) electrification to cover the reach of the NEC Regionals into our state, so locomotive swaps are unnecessary at Washington Union Station.
- As an interim measure, VRPI encourages the use of dual-power locomotives that can run under existing catenary to D.C., then run on diesel power south of there, without changing locomotives.

Dual-Power Catenary-Electric "B1/B2" Configurations

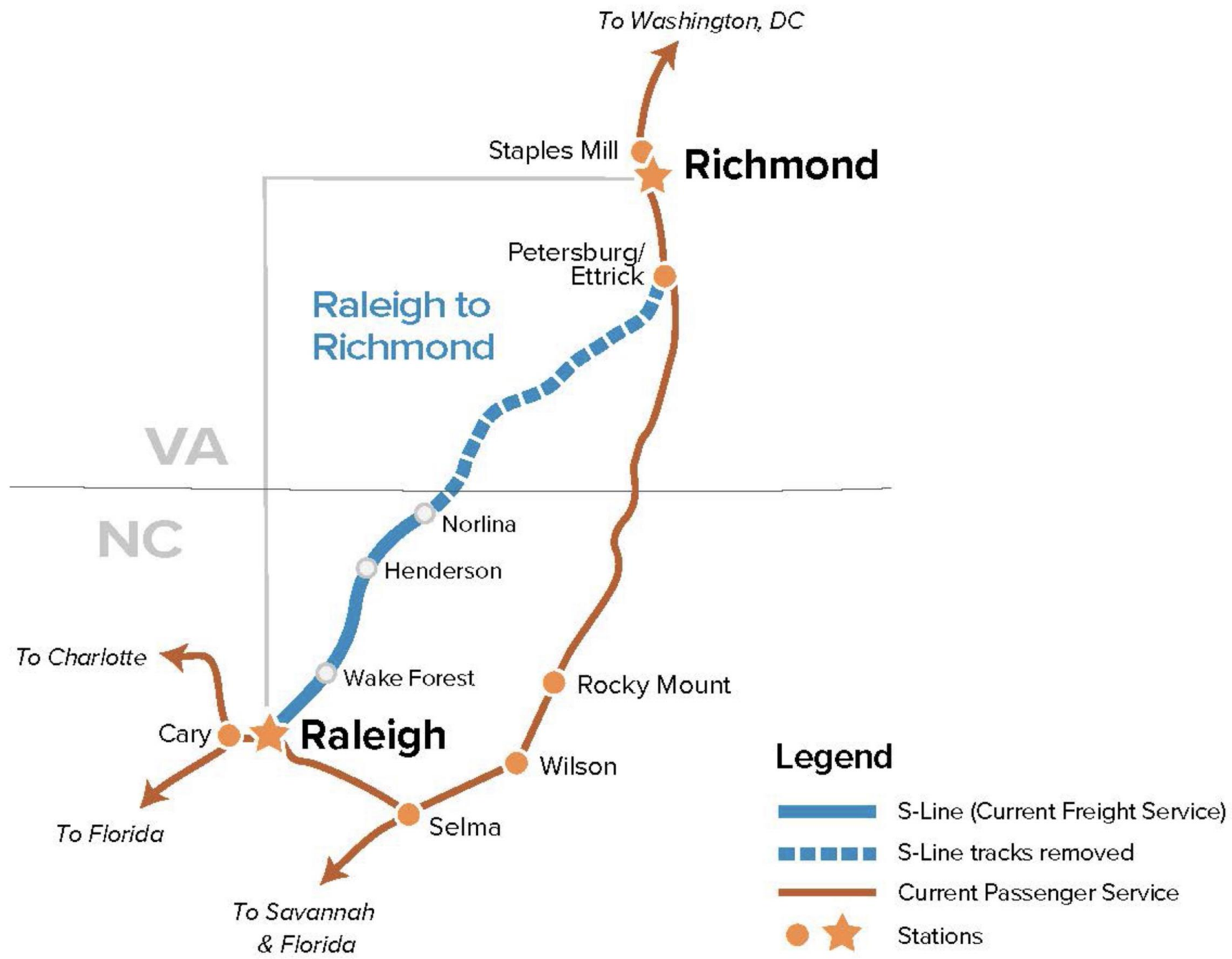


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Current takeaways on electrified passenger rail

- VRPI supports the electrification of the re-activated S Line so dual-power locomotives can run under wire an additional 100-or-so miles in the Southeast HSR Corridor.
- VRPI encourages Virginia to electrify the portions of its state-owned trackage that is being added or upgraded, to eventually create DC-to-Atlanta electrification.





Current takeaways on electrified passenger rail

- Most of the benefits that apply to electrified passenger rail and rail transit are applicable to rail freight, with the added benefits that electrified freight rail haulage will require fewer locomotives per ton-mile, while being cleaner.
- VRPI is beginning to explore* how freight-only lines can be upgraded for joint use by passenger and freight trains. As curvy routes are straightened, electrification may permit steeper ruling grades without sacrifice to speed and pulling power.

*Getting back to Joe Boardman's "Corridors of the Future" idea.



Current takeaways on electrified passenger rail

- VRPI recognizes that electrification of the main north-south corridor in Virginia would allow VRE to electrically power its Fredericksburg Line service and encourage run-through operations for both VRE and MARC services *through* Washington Union Station.
- We cite the example of CalTrains, which is electrifying south of San Francisco. Gains include:
 - 1) Faster acceleration between station stops permits faster schedules;
 - 2) Which increases the utilization of equipment and;
 - 3) Adds capacity on existing trackage;
 - 4) Over the long haul, all-electric locomotives may cost more up front, but they last longer, require less maintenance and;
 - 5) Use less energy per passenger mile.

Thank You!



**Conceptual view of
upgraded NS main
line, along the
Roanoke River, near
Elliston.**

**Artist: J. Craig Thorpe.
Commissioned by:
Hal Cooper**



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