


Greater Houston Freight Committee


Houston Galveston Area Council

4/17/2025

Regional Collaboration • Transportation Planning • Multimodal Mobility

Houston-Galveston Area Council

Thank you for your service

Richard Zientek

GHFC Co-Chair

Senior Director – Public Affairs at UP

We express our deep appreciation for your contributions and service to the Greater Houston Freight Committee! Your time and insights have made a meaningful impact.

Welcome

Chad Burke

GHFC Co-Chair

Mr. Burke has served as President and CEO of the Economic Alliance since 2009. The Economic Alliance is the economic development corporation for the Houston Ship Channel region

Presentation

Long Freight Trains: Ensuring Safe Operations Mitigating Adverse Impacts

- David O. Willauer
- Senior Program Officer and Study Director
- Transportation Research Board

April 17, 2025

Long Freight Trains: Ensuring Safe Operations Mitigating Adverse Impacts

Committee on Impacts on Trains Longer Than 7,500 Feet

Infrastructure Investment and Jobs Act

Public Law 117- 58

The following excerpt is from the final legislation for the National Academies of Sciences, Engineering, and Medicine.

- **SEC. 22422. NATIONAL ACADEMIES STUDY ON TRAINS LONGER THAN 7,500 FEET**

(a) STUDY.—The Secretary shall seek to enter into an agreement with the National Academies to conduct a study on the operation of freight trains that are longer than 7,500 feet.

Impact on Trains Longer Than 7,500 Feet

TRB Staff:

David O. Willauer
Study Director

Thomas R. Menzies, Jr.
Director

Consensus and Advisory Studies Division

Committee Members	Affiliation
Debra L. Miller, Chair	Retired, Kansas DOT
Faye Ackermans	CP, Canada TSB
C. Tyler Dick	University of Texas, Austin
Theresa M. Impestato	Washington DC Metro
Venetta H. Keefe*	Indiana DOT
Gary F. Knudsen	Retired, former BNSF
Dennis S. Mogan	Illinois ICC
J. Allan Rutter	TTI, former FRA
John M. Samuels	Retired NS, consulting
Peter F. Swan	Penn State University
Elton E. Toma	NRC Canada
Paul E. Vilter	Retired, Amtrak

* Venetta Keefe was hired by FRA in March 2024

Statement of Task

Under sponsorship from FRA, the Transportation Research Board convened a committee of experts to examine potential safety risks from the operation of long trains relative to the operation of shorter trains. Consideration was given to the following:

a) Communications between locomotives and distributed power units
b) Radio communications between crew members
c) Derailments associated with in-train forces and slack action
d) Use and control of distributed power units
e) Braking, locomotive performance, and track wear

The committee also examined how engineers and conductors are trained to operate longer trains, impacts on passenger train operations, greenhouse gas emissions, and situations in which highway-rail grade crossings are occupied by trains.

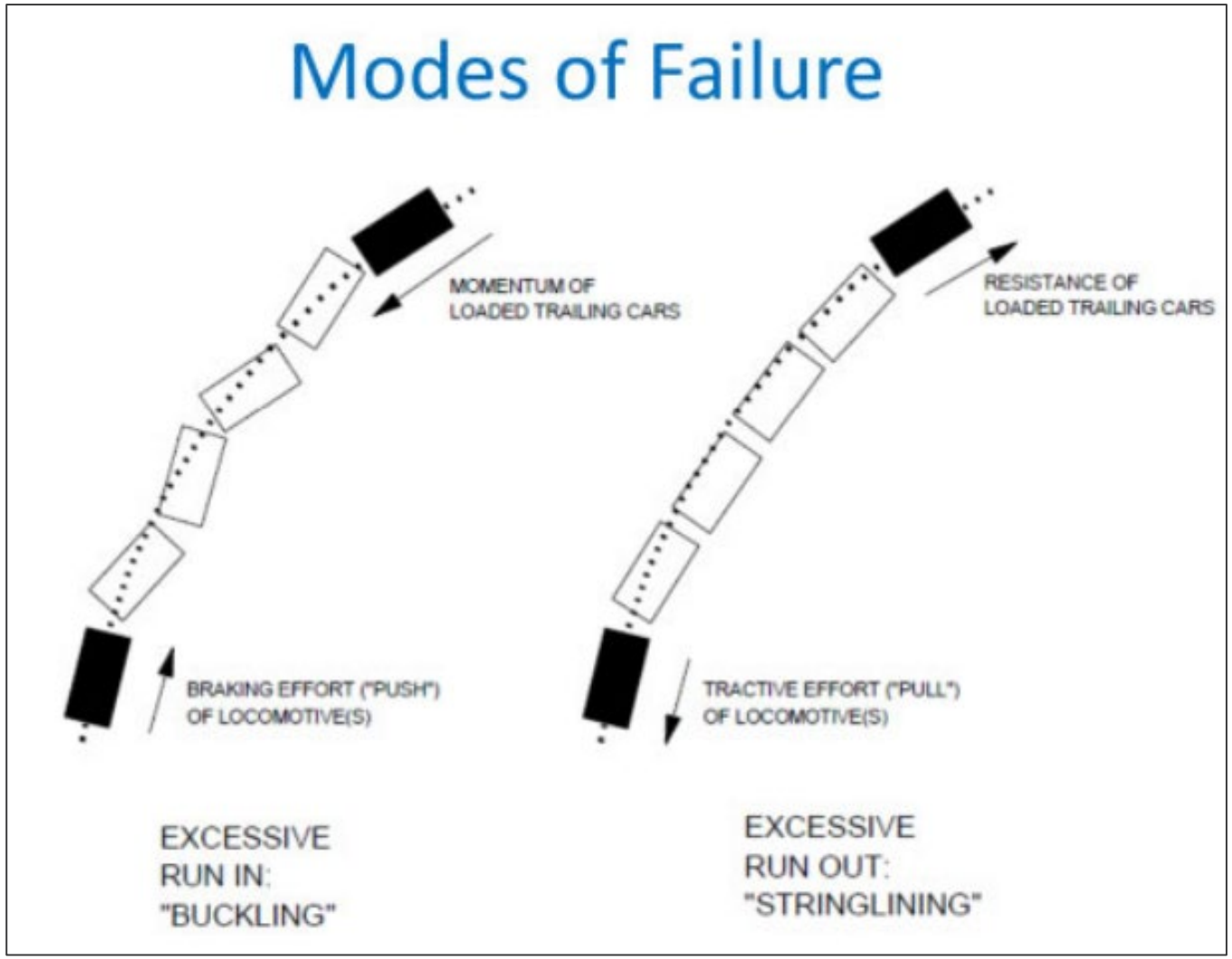
Interpreting the Statement of Task

- **Four specific impacts** are called out in the study charge: (1) safe operations, (2) highway-rail grade crossing blockages, (3) efficient passenger and freight train operations, and (4) greenhouse gas emissions.
- The committee determined that increasingly longer **manifest** trains are creating **safety concerns**, and therefore should be the safety focus.
- GHG emissions are a major public policy concern, but on a national scale freight trains are **not intense emitters** of these pollutants.
- ***Therefore, the committee's assessment focuses on long manifest trains and impacts on rail safety, the functioning of highway-rail grade crossings, and Amtrak passenger train service.***

Long Trains Create More Buff and Draft Forces

Buff (pushing) forces results in buckling or jack-knifing effects

Draft (pulling) forces result in string-lining effects



Importance of Train Make-up

- **Train makeup is critical for manifest trains** which have cars and blocks of cars that **vary greatly in weight, length**, and other characteristics, such as coupler and cushioning arrangements, that can make **train handling more difficult**.

- Railroads must also pay attention to the placement of locomotives for **distributed power (DP), as these units can help control in-train forces** through adjustments to power and activation of air brakes and dynamic brakes, or they can add to the operational challenge if poorly positioned.

Risk Reduction Programs

- Currently, FRA does not require railroads to target all major operational changes in their safety management systems. Instead, the agency requires that railroads have **only "streamlined" Risk Reduction Programs**, which the report says raises questions about whether railroads are being sufficiently proactive and systematic in controlling the risks from longer trains.
- The trend toward longer manifest trains represents a **major operational change that could create or heighten train operational and handling challenges** such as for managing in-train forces, ensuring proper train makeup, and maintaining crew communications.

Federal Authority Needed to Enforce Blocked Crossings

- In the past, state and **local governments had the power to** force railroads to alter their operations or provide infrastructure to **remedy blocked crossings.**
- Exclusive **federal authority to regulate blocked crossings** has been recently affirmed in State of Ohio v. CSX Transportation, the case for which concluded “the regulation of railroad transportation **is a matter of federal law**, and the federal government alone has the power to address the threat to public safety caused by blocked crossings.”

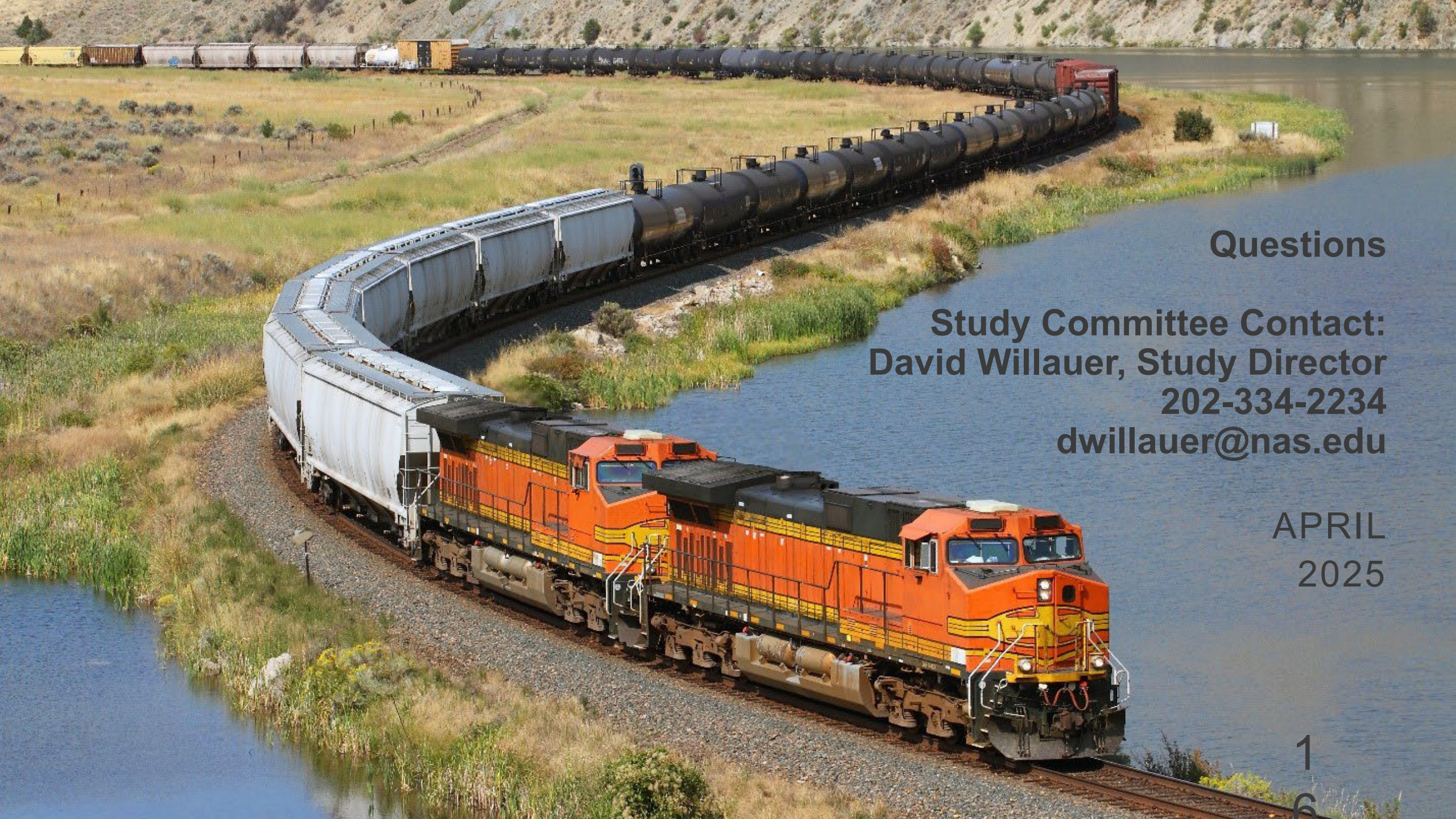
Long Trains and Amtrak Delays

- Amtrak presented **delay data** to the committee for its trains operating on host railroads from 2014 through 2022.
- Amtrak contends that **increases in passenger train delays** from freight trains experiencing issues such as broken knuckles, train repairing and recrewing, meeting, passing, and routing conflicts are not just **coincident with the increase in longer trains** but adversely impacted by this development.

Recommendations

The Committee presented the following four recommendations to Congress and FRA:

- FRA should require more rigorous Risk Reduction Plans for railroads that are more in line with other industries that are required to have safety management plans.
- Congress should provide administrative authority to FRA to fine railroads for problematic blocked crossings.
- Congress should authorize FRA to impose financial penalties on host railroads where there is a mismatch between infrastructure and train length and Amtrak trains are delayed.
- FRA should convene the Regional Safety Advisory Committee to consider issues around crew training and communications and develop workable solutions.



Questions

Study Committee Contact:
David Willauer, Study Director
202-334-2234
dwillauer@nas.edu

APRIL
2025

Presentation

Innovative Rail Technologies

- Rick Herndon
- Founding Partner IRT

Innovative Rail Technologies

Environmentally and Economically Sustainable Rail Solutions

IRT's Objective

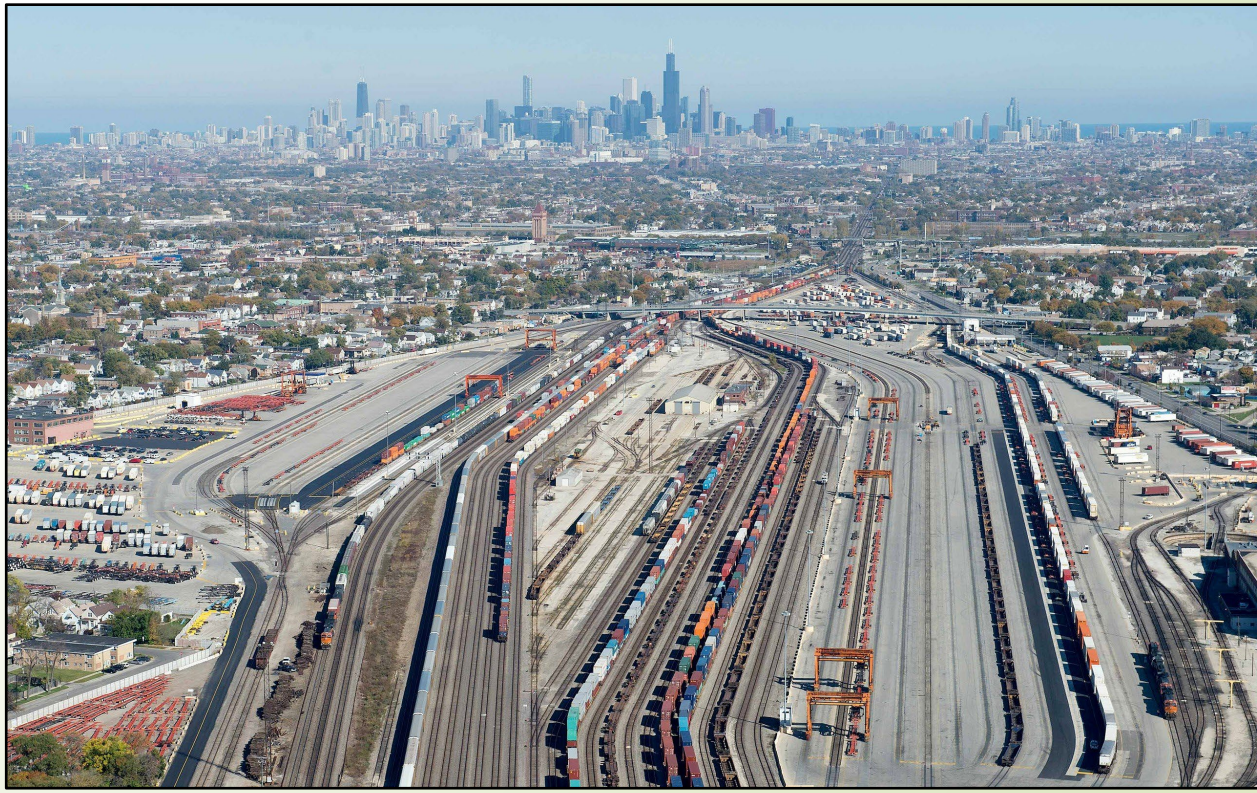
Disrupt the Rail Market with robust Li-Ion battery propulsion technology targeted to rail segments where this technology will provide direct operational benefits, including zero emissions.

- **Commercial/Industrial/Port Yard Operations**
- **Government Locomotives & Rail Vehicles**
- **Regional Commuter Rail Service**




Current locomotives

Diesel locomotives are among the highest off-road source of pollution in the United States.



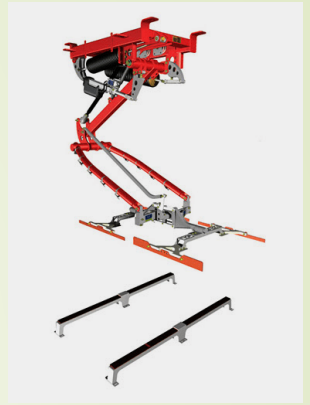
Introducing

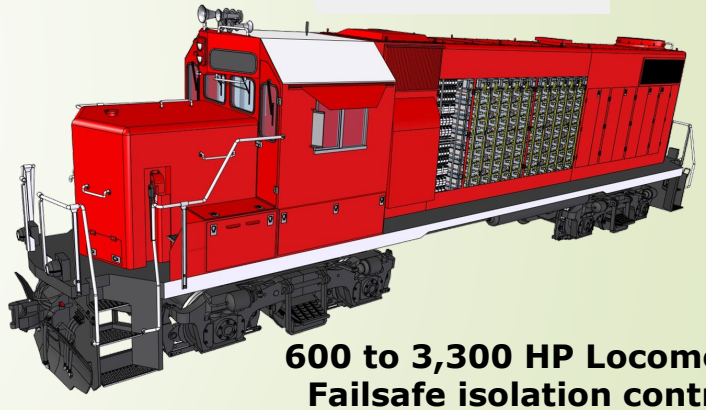
Safe – Intelligent –Reliable

IRT's ***ATLAS***™ Locomotive

Lithium-Ion Battery Electric Propulsion

Advanced
Technology
Li-Ion
Adaptive
System





600 to 3,300 HP Locomotive
Failsafe isolation controls

ATLAS™
ZERO EMISSIONS

IRT's proprietary Zero Emissions locomotives are <u>less costly</u> to operate than the current diesel technology.

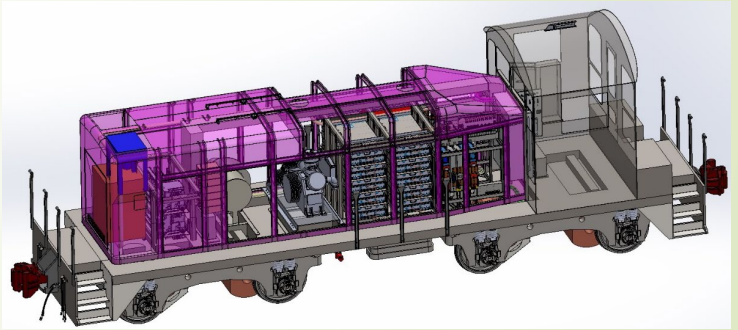
Proven Technology

Fast Technology Adoption
Current locomotives are diesel-electric.
IRT converts them to battery-electric.
Near Zero learning curve for current maintenance personnel and operators.

IRT Current Business

Current Contracts

- **US Steel Corp. – Pittsburgh** (1,500 hp)
- **Nucor Steel Corp. – Cofield, NC** (1,500 hp)
- **Palmetto Railways – Charleston, SC** (2,000 hp)
- **Dominion/US Army – Fort Cavazos, TX** (3,000 hp)
- **Cando Rail Services – Edmonton, AB** (1,200 hp)
- **Grand Canyon Railway – Williams, AZ** (3,000 hp)



Upcoming Contracts

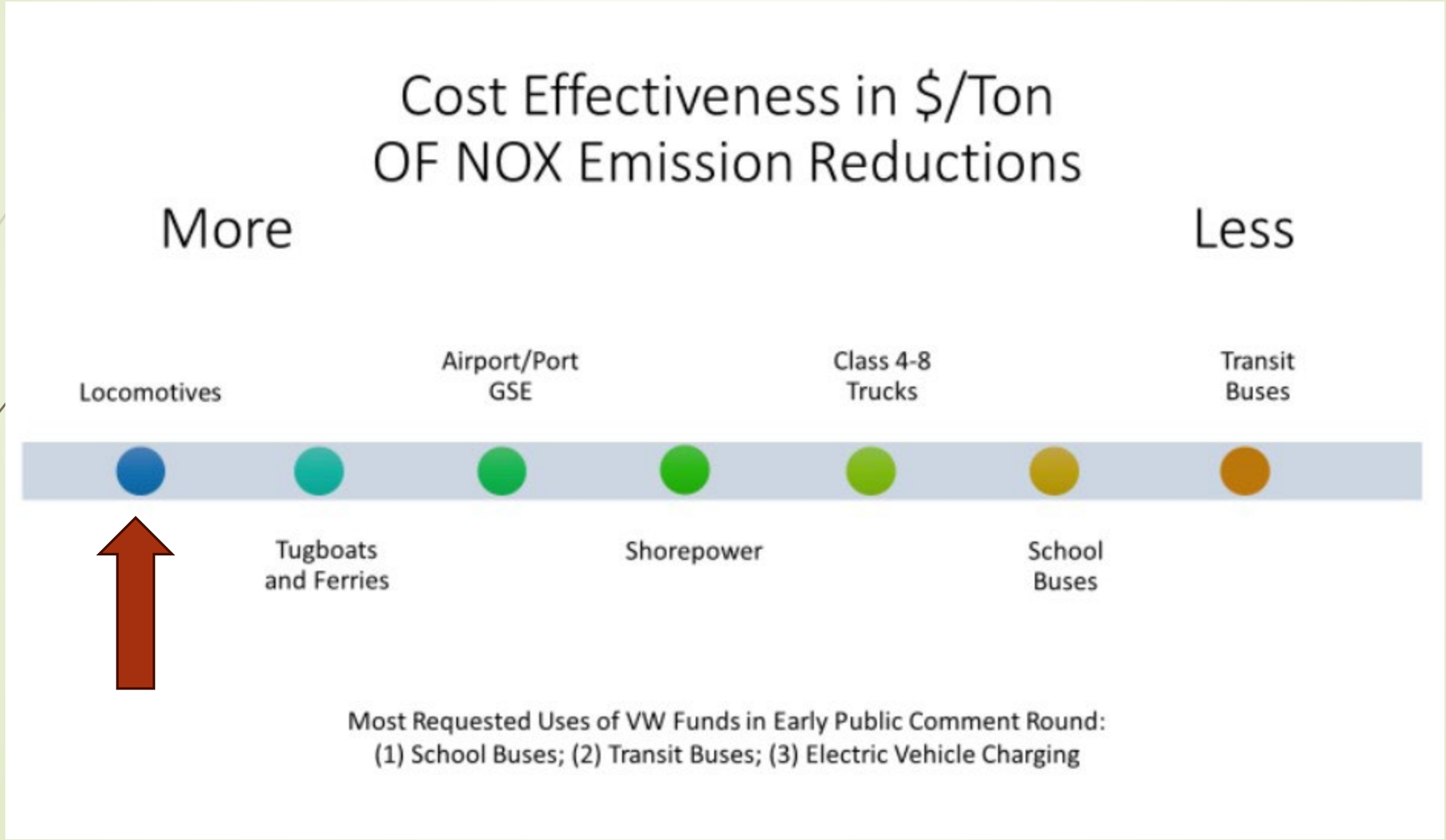
- **20-25 locomotives in a mix of ports, mining, short line, public agencies freight and passenger, and industrial**

IRT THE VALUE OF ZERO™

IRT's Value of Zero™

- ✓ Zero Emissions
- ✓ Zero Diesel Fuel
- ✓ Zero Engine Oil
- ✓ Zero Noise
- ✓ Zero Enroute Failures
- ✓ Zero Engine Start Concerns
- ✓ Zero Battery Maintenance
- ✓ Zero Negative Health Impact
- ✓ Zero Operational Environmental Impact

Ohio EPA: Locomotives are the Most Cost-Effective NOx Reduction Strategy



Source: Ohio EPA

Switcher vs. Municipal Bus
1 switcher = 54 Transit Bus Emissions

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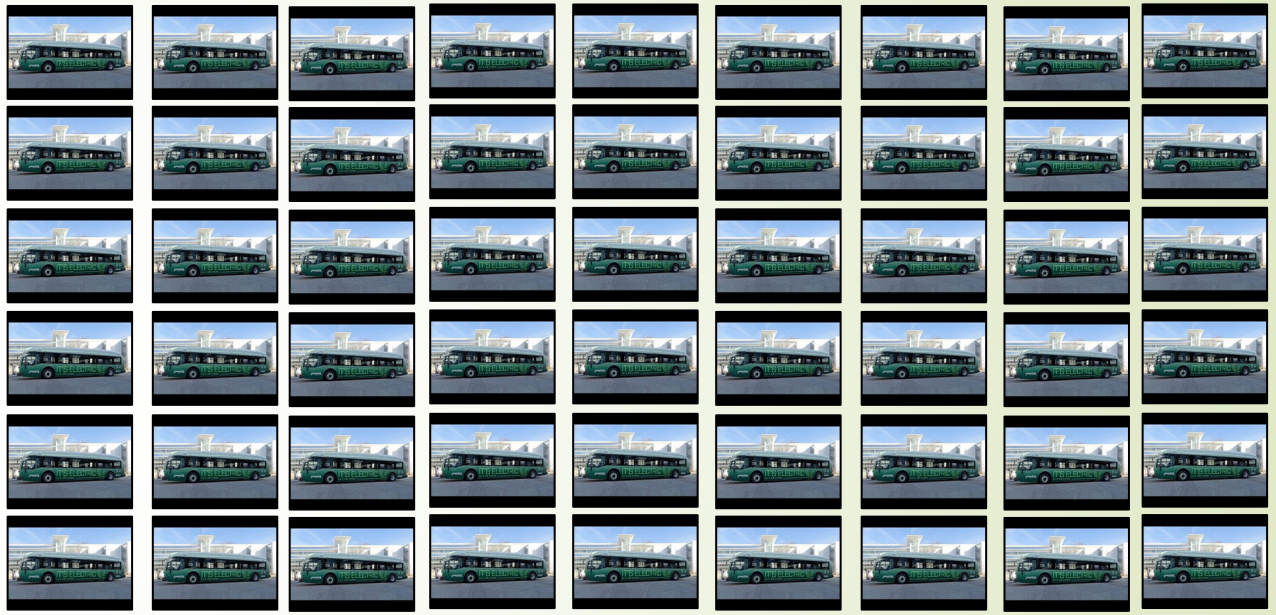


2,000HP, 8 hr. operational shift, 6 days

Emission Results

Here are the combined results for all groups and upgrades entered for your project.[1]

Annual Results (short tons)[2]	NO_x	PM2.5	HC	CO	CO_2	Fuel[3]
Baseline for Upgraded Vehicles/Engines	4.950	0.105	0.287	0.521	136.2	12,105
Amount Reduced After Upgrades	4.950	0.105	0.287	0.521	136.2	12,105
Percent Reduced After Upgrades	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Lifetime Results (short tons)[2]						
Baseline for Upgraded Vehicles/Engines	49.499	1.053	2.873	5.206	1,361.8	121,050
Amount Reduced After Upgrades	49.499	1.053	2.873	5.206	1,361.8	121,050
Percent Reduced After Upgrades	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

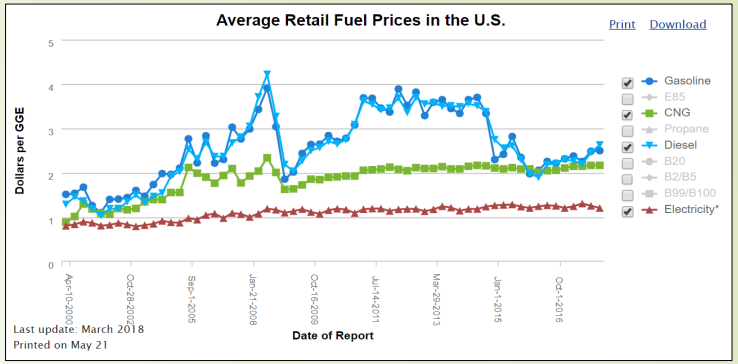
Municipal Transit Bus, EPA Average Duty Cycle

Emission Results

Here are the combined results for all groups and upgrades entered for your project.[1]

Annual Results (short tons)[2]	NO_x	PM2.5	HC	CO	CO_2	Fuel[3]
Baseline for Upgraded Vehicles/Engines	0.086	0.002	0.005	0.018	69.0	6,131
Amount Reduced After Upgrades	0.086	0.002	0.005	0.018	69.0	6,131
Percent Reduced After Upgrades	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Lifetime Results (short tons)[2]						
Baseline for Upgraded Vehicles/Engines	1.035	0.018	0.055	0.218	827.7	73,572
Amount Reduced After Upgrades	1.035	0.018	0.055	0.218	827.7	73,572
Percent Reduced After Upgrades	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Total Cost of Ownership



ATLAS™ Repower

Typical 10 Year Projection, 40,000 gal/yr Switcher

	EMD 645 Powered Locomotive	Tier 4 Diesel Locomotive	IRT ATLAS System (700 kWh)
Emissions	Tier 0	Tier 4	Zero Emission
Locomotive Core	$600,000.00	$2,250,000.00	$2,250,000.00
Maintenance Expense	$960,000.00	$1,056,000.00	$480,000.00
Fuel Expense	$1,012,000.00	$910,800.00	$354,200.00
Direct Lifecycle Cost:	$2,572,000.00	$4,216,800.00	$3,084,200.00
10 Yr. Health Cost vs. IRT (EPA)	$1,500,000.00	$20,000.00	$0.00
TCO:	$4,072,000.00	$4,236,800.00	$3,084,200.00

ATLAS™
ZERO EMISSIONS

Very High Reliability + Very Low Operating Costs = Best Value Locomotive Technology Available

Secondary Life

Environmentally beneficial technology

- **After the primary life of the locomotive battery (up to 12 years based on duty cycle) there is still tremendous energy available.**
- **This is due to the fact that power performance degrades at about 75% State of Health (75% of original capacity).**
- **Even though the power output diminishes there is still a majority of the battery's energy available for non-motive applications such as solar and wind energy collection/storage, electrical grid support, backup power.**

IRT's *ATLAS*™ powered locomotives deliver

A New Model for Locomotive Operation

- Improved Reliability: 24/7 Availability
- Improved Operational Readiness & Performance
- Improved Health and Safety
- Lower Total Cost of Ownership
- Energy Resilience Capabilities
- Emergency Preparedness Capabilities
- Significant Environmental Benefits including Zero Emissions
- Secondary Battery Life Applications
- Greater Overall Value than any current diesel locomotive

Solutions to improve the bottom line while improving health and the environment!

Thank You!

Better Business
Better Environment
Better Health

Innovative Rail Technologies

www.InnovativeRailTech.com

Presentation

TxDOT Freight Projects

- Jeffrey English
- Planner, TxDOT District Transportation Planning

Presentation

Port Houston Region Projects Update

- Robert Bacon
- Coastal Plain Venture Manufacturing Manager

Project Links

- Coastal Plain Project
- Baytown Area Operations

Thank you for attending

Future Meetings

- Transportation Policy Council – April 25. 2025
- Transportation Advisory Committee – May 14, 2025
- Future GHFC Meetings – Tentatively July 17, 2025