OKLAHOMA SENATE INTERIM STUDY ON RAIL SAFETY

Presented by Kevin Dawson

Retired Manager and Locomotive Engineer,
Union Pacific Railroad

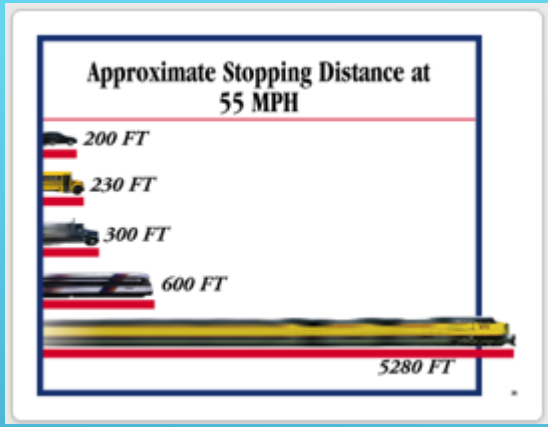
KEVIN DAWSON'S BACKGROUND

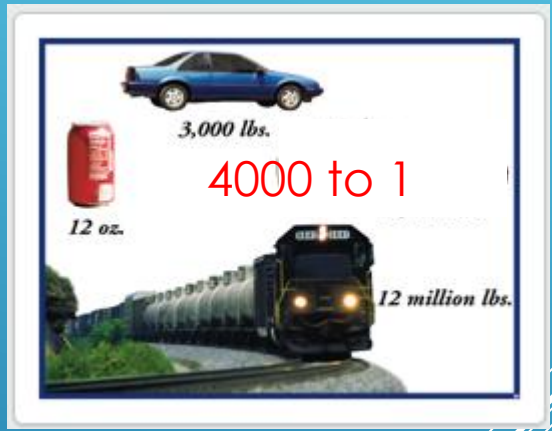
- Began railroad career in 1979 with Missouri Pacific Railroad as a Locomotive Fireman
- Promoted with Missouri Pacific Railroad to Locomotive Engineer in 1980 at age 19, one of the youngest in the nation
- Entered management with Union Pacific Railroad in 1994 as Manager of Operating Practices
- Promoted to Senior Manager of Training and Attendance in 2004 (Wichita, Kansas)
- Earned Bachelors Degree in Leadership from the University of Oklahoma 2010
- Became Manager of Public Safety for the Northern Region in 2011, covering Illinois, Wisconsin, Iowa, Missouri, and Arkansas
- Promoted in 2014 to Manager of Human Resources for the eastern half of Union Pacific Railroad, overseeing Louisiana, Arkansas, East Texas, Oklahoma, Kansas, Nebraska, Colorado, Wyoming, and Utah
- Earned Masters Degree in Leadership from the University of Oklahoma 2015
- Returned in 2018 to Oklahoma to finish career as a Locomotive Engineer working El Reno, Chickasha, and Oklahoma City

PUBLIC SAFETY AND BEHAVIORAL RISK

Train stopping distances, weight ratios, and public behavior at crossings.

The longer the train obstructs the public, the more impatient the public becomes.



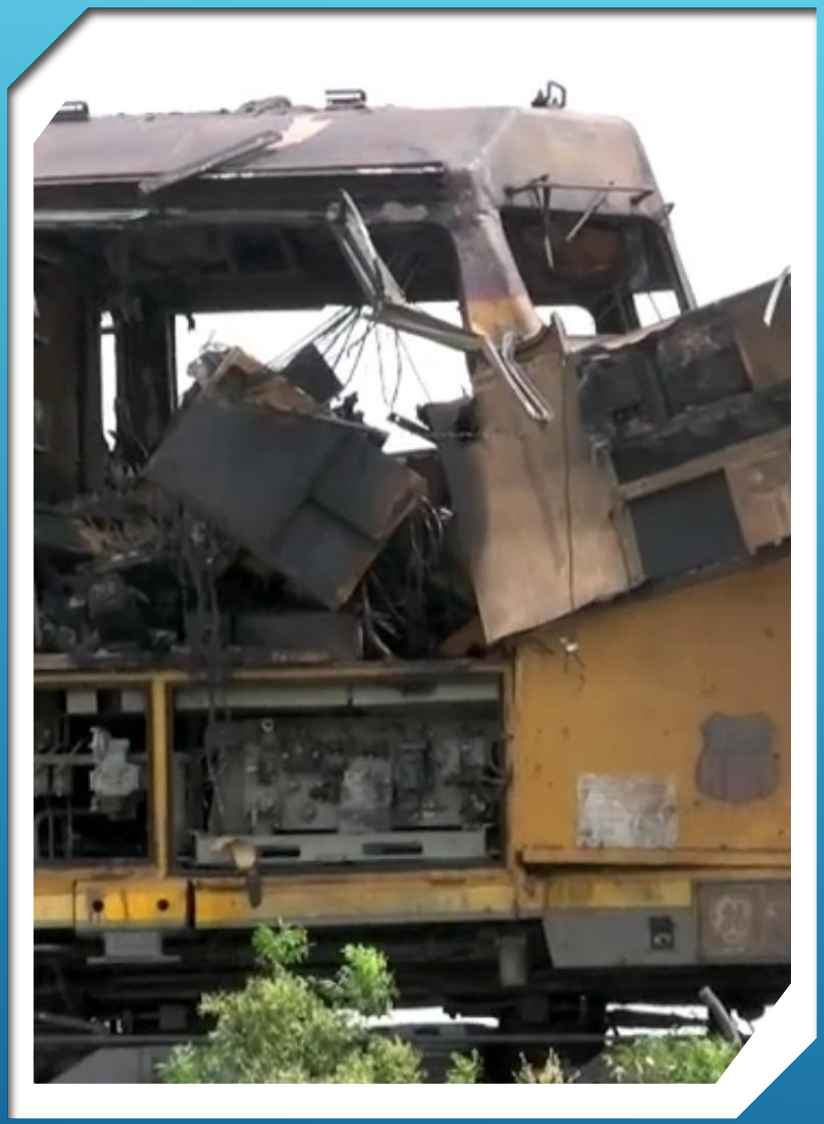


- 10 mph city restriction increased collisions due to driver impatience.
- Now Long trains are causing the same impatience.

WICHITA SPEED RESTRICTION EXAMPLE

THE CROSSBUCK PROBLEM

- The 1800s-era crossbuck has lost meaning. Modernization is overdue.



- Crossing protected by Crossbucks Only.
- Fatalities: Engineer & Conductor (UP train) + Tanker driver (severe burns later fatal).
- Cause: Truck failed to stop/yield at crossing; large hazardous cargo with minimal crossing warning devices.
- Consequences: Explosive rupture of tanker, heavy damage to lead locomotive, nearby power and facility disruptions.
- **Lesson: Active crossing protection and hazard-aware routing essential, especially where high-hazard materials traverse main lines.**

MEDFORD, OKLAHOMA – GRADE CROSSING COLLISION WITH LP-GAS TANKER (AUG 29, 2008)

Here's the breakdown of Oklahoma rail incidents (2021–2025) by warning device type

Category	Incidents	Fatalities	Injuries	Total Casualties
Passive (Crossbucks + Stop Signs)	91	8	40	48
Active (All others)	108	11	45	56

KEY TAKEAWAYS

ACTIVE WARNING DEVICES (GATES, LIGHTS) ARE LINKED TO SLIGHTLY **MORE TOTAL INCIDENTS**.

PASSIVE CROSSINGS SHOW A **GREATER ROLE OF NEGLIGENCE**—DRIVERS OFTEN FAIL TO STOP OR LOOK.
ACTIVE SITES INVOLVE **MORE DELIBERATE RISK-TAKING** OR **INTENTIONAL VIOLATIONS**.

IMPROVING SIGN DESIGN MAY INCREASE AWARENESS

Hypothesis and Preliminary Conclusion

HYPOTHESIS:
ENHANCING PASSIVE RAILROAD CROSSINGS WITH FLASHING OR LED-EQUIPPED CROSSBUCK SIGNS WILL IMPROVE DRIVER AWARENESS AND REDUCE VEHICLE APPROACH SPEEDS, PARTICULARLY AT NIGHT, LEADING TO SAFER CROSSING BEHAVIOR.

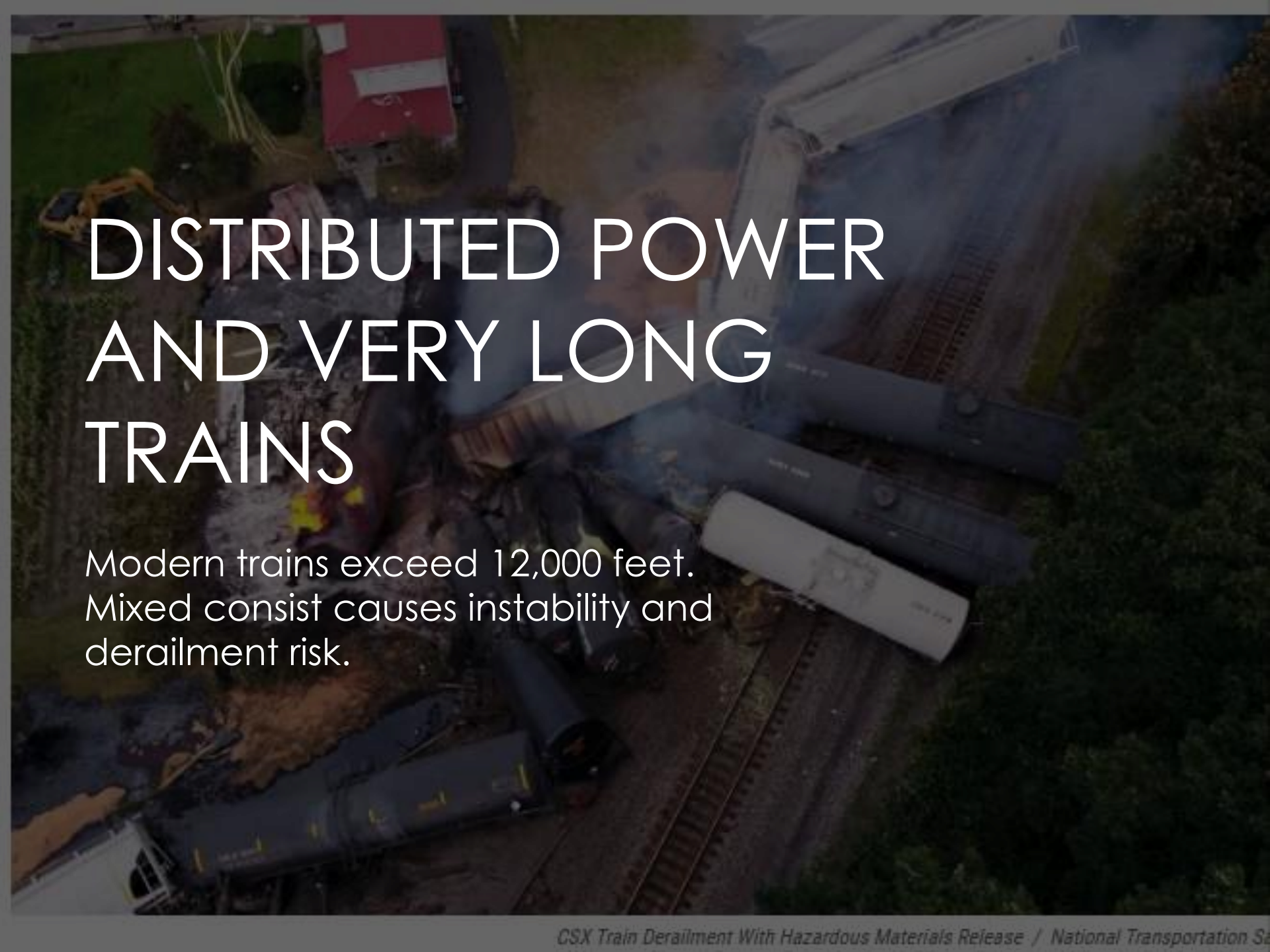
CONCLUSION:
STUDIES BY THE TEXAS TRANSPORTATION INSTITUTE, THE FEDERAL RAILROAD ADMINISTRATION, AND MULTI-STATE PILOT PROGRAMS DEMONSTRATE MEASURABLE IMPROVEMENTS IN DRIVER RESPONSE AND VISIBILITY FROM LED ENHANCEMENTS. OKLAHOMA SHOULD PURSUE A SIMILAR INITIATIVE AT PASSIVE CROSSINGS TO EVALUATE SAFETY BENEFITS AND POTENTIAL CRASH REDUCTION.

HOMELESS ENCAMPMENTS AND RIGHT-OF-WAY SAFETY

A humanitarian and safety issue. Coordinated state and local response needed.

NOVEMBER 11, 2021

- Inhumanity
- Her screams
- Helplessness



DISTRIBUTED POWER AND VERY LONG TRAINS

Modern trains exceed 12,000 feet.
Mixed consist causes instability and derailment risk.

CSX Train Derailment With Hazardous Materials Release / National Transportation Sa

Recent peer-reviewed research indicates that increasing train length, such as combining multiple shorter trains into a single very long train, is correlated with a measurable increase in derailment risk. For example, a 200-car train has an ~24 % higher odds of derailment than two 100-car trains, all else equal.

https://pubmed.ncbi.nlm.nih.gov/38807489/

CSX Train Derailment With Hazardous Materials Release / National Transportation Sa

Peer-reviewed research published in *Risk Analysis* (2024) found a clear, measurable relationship between **train length** and **derailment risk**.

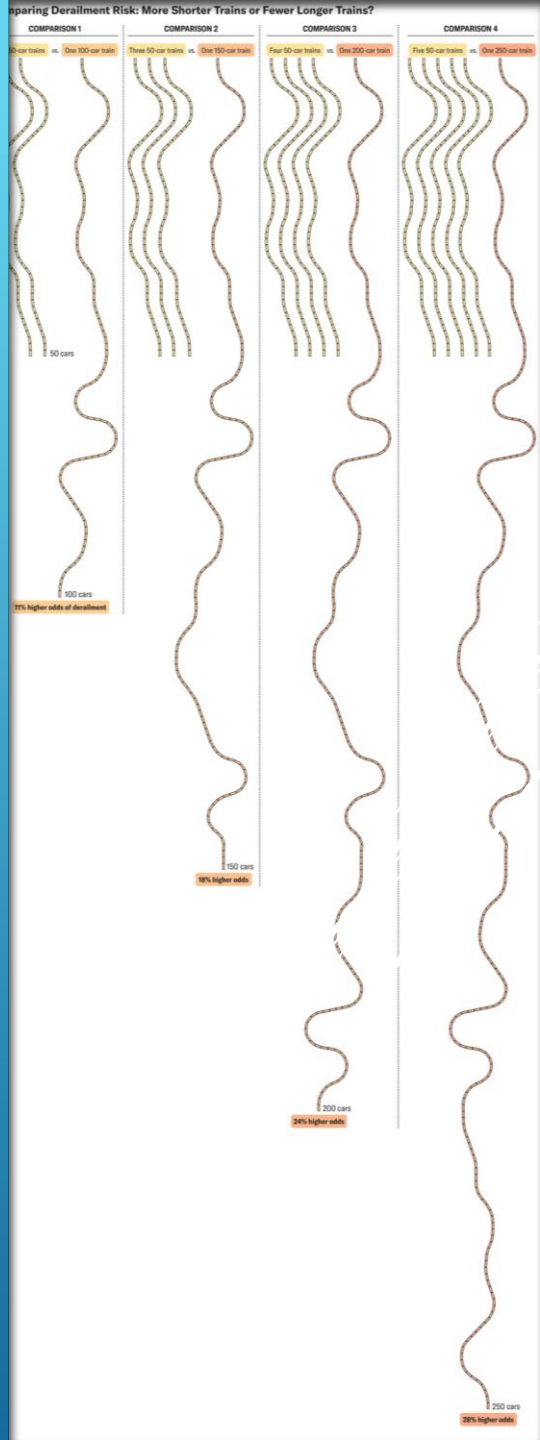
Combining two 50-car trains into a single 100-car train **increases derailment risk by approximately 11 percent**.

Expanding to **150 cars raises the risk to 18 percent**, **200 cars to 24 percent**, and **250 cars to 28 percent higher odds** of derailment.

Findings confirm what railroaders have long known: as **train length increases**, so do **in-train forces, braking variability, and risk exposure**.

Risk is greatest on **short-siding subdivisions, uneven terrain, and mixed-freight consists**.

TRAIN LENGTH AND DERAILMENT RISK, KEY FINDINGS (RISK ANALYSIS, 2024)

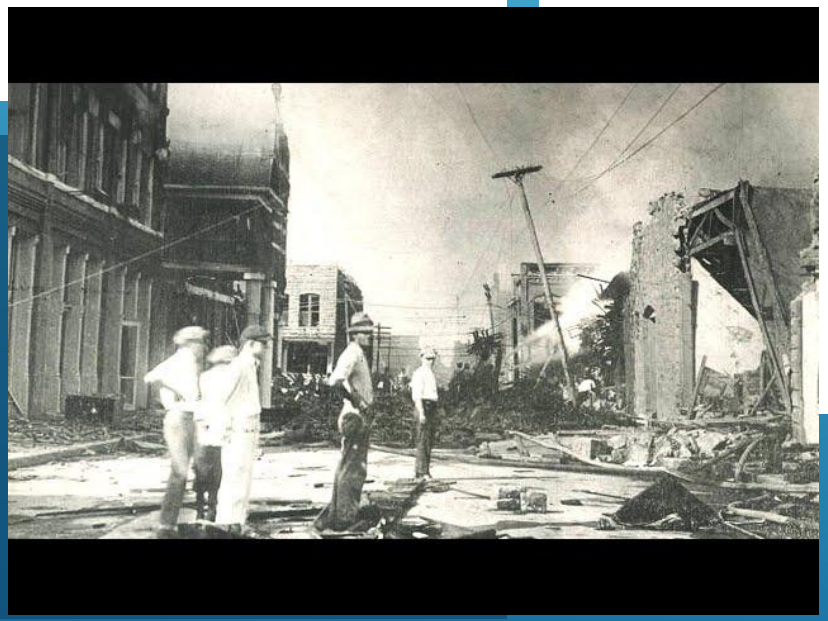


POLICY CONSIDERATIONS

- After the 2023 derailment in East Palestine, Ohio, Congress requested that the National Academies of Science, Engineering and Medicine (NASEM) form a committee to study trains longer than 7,500 feet (about 1.4 miles).
- OK can define Very Long Trains as exceeding 7,500 feet. Limit by siding length.
- OK can require that the data be tracked.
  - FRA nor AAR keeps track of VLT's.
- Require railroads to report all incidents involving VLT's

OKLAHOMA CASE STUDY: ARDMORE GAS EXPLOSION (1915)

- **Date:** September 27, 1915 – Ardmore, Oklahoma
- **Incident:** Tank car of *casinghead gasoline* leaked vapors while parked downtown.
- **Outcome:** Vapors ignited, **massive explosion leveled six city blocks.**
- **Casualties:** 43 killed, hundreds injured.
- **Cause:** Overheated railcar vented gas into city center; ignition source unknown.
- ***Aftermath: Led to new safety rules for hazardous materials storage, tank car handling, and placement of sidings away from populated areas.***
- **Lesson:** Hazmat risks in rail transport are **not new**—state and local oversight are vital to prevent repeat tragedies.



POSSIBLE RECOMMENDATIONS

- Define a Very Long Train as one measuring 7,500 feet or more, consistent with the American Association of Railroads standard.
- VLTs should not operate on Oklahoma's current infrastructure without comprehensive safety regulations.
- If operation is permitted, apply strict operating limits including:
  - Prohibit mixed manifest trains with hazardous materials and intermixed loads and empties.
  - Restrict movement on track with undulating grades, reverse tangents, or compound curvature.
  - Restrict operations through populated areas or where speed limits are below 20 mph.
  - These conditions significantly increase in-train forces, derailment risk, and potential public harm.
  - This will help mitigate:
    - crossings blocked for extended periods.
    - Increasing transit times of Emergency Vehicles.

ADDENDUM:
HOW MY TESTIMONY ALIGNS WITH THE FEDERAL RESEARCH ON VERY LONG TRAINS

Kevin Dawson Testimony

Practical Experience: 43 years in locomotive and management service witnessing the effects of Very Long Trains (VLTs) on braking, in-train forces, and public safety.

Distributed Power (DP): Originally improved safety when used correctly, but now often used to justify two-mile mixed-freight trains on outdated infrastructure.

Infrastructure Mismatch: Oklahoma track and siding capacity were built for one-mile trains. Longer trains block crossings and delay emergency response.

Regulatory Recommendation: Define a Very Long Train as 7,500 feet or greater and restrict operation on substandard infrastructure or in populated areas until safety regulations are adopted.

Core Message: Safety and efficiency can coexist through responsible operation, modernized crossings, and infrastructure readiness.

Grady Cothen White Paper (Federal Railroad Administration / National Research)

Empirical Analysis: FRA data show safety gains have stalled since 2010 and derailment risk rises as train length and tonnage increase.

Distributed Power (DPU): Effective only when properly placed and monitored. Very long trains lose braking integrity when radio communication is interrupted.

Systemic Concern: National infrastructure and safety systems were never designed for 200-car trains. Radio reliability and braking coordination must be improved.

Policy Recommendation: Require updated braking technology such as electronically controlled pneumatic (ECP) brakes, enforce train make-up standards, and revise FRA reporting to track in-train force factors.

Core Message: Safety progress has stalled. Without updated standards and technology, automation and very long trains will increase national system risk.

Summary:
Kevin Dawson's field testimony supports the national findings of Grady Cothen's research. Both conclude that Very Long Trains increase in-train forces, exceed infrastructure design limits, and require immediate regulatory and technological action to protect crews and communities.

CLOSING STATEMENT

- Safety, efficiency, and humanity must work together.

- Kevin Dawson, Retired Manager and Locomotive Engineer, Union Pacific Railroad