

# The Future of Railroading and BNSF's role in Supply Chain Sustainability



NUTC

Sandhouse Rail Group



# The BNSF Vision

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**Our vision is to realize the tremendous potential of BNSF Railway by providing transportation services that consistently meet our customers' expectations.**



# Our Network

- **32,500 route miles** in 28 states and three Canadian provinces
- **+13,000** bridges and **89** tunnels
- Serves **+40 ports**
- **27** intermodal facilities



# BNSF Safety Vision

## WHAT:

A workplace free of accidents and injuries.

## WHY:

Everyone goes home safely at the end of the workday.



# A Major Shift in Mindset

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## COMPLIANCE Mindset

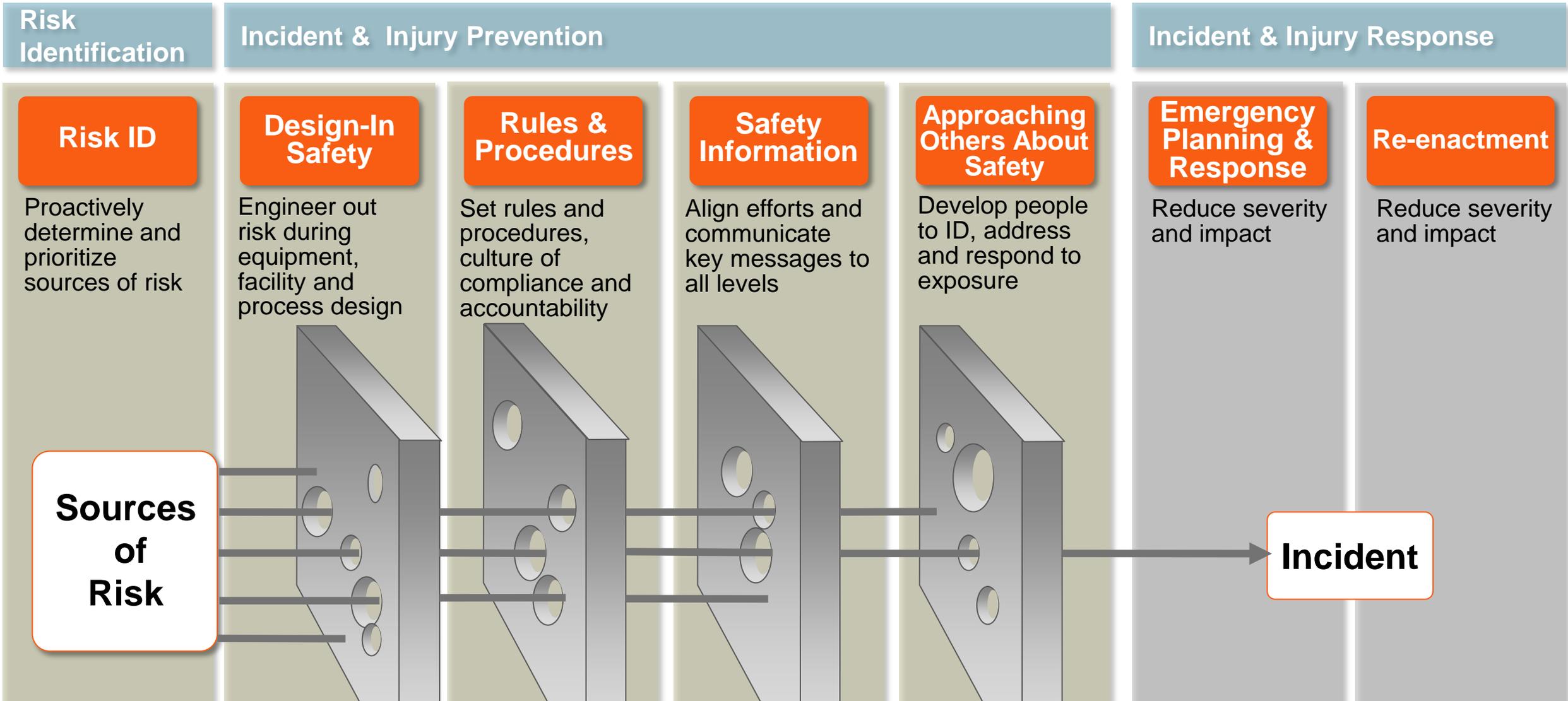
- Rule-based
- Safety is a priority only if nothing else is more important at the time
- Motivation to either get something or avoid punishment
- Take short cuts or go around the rules when I think I can



## COMMITMENT Mindset

- Risk-based
- Safety is a core value woven into everything we do, at work or at home.
- Motivated because I recognize risk and am committed to safety
- I make safe decisions, even when no one is watching

# Risk-Reduction Efforts – Layers of Safety



A BNSF freight train, led by several orange and black locomotives, is crossing a large, dark steel truss bridge. The bridge spans a wide river with rocky banks. The sky is overcast with soft, grey clouds. The text "Let's Talk Results" is overlaid in white on the right side of the image, with a dotted orange line underneath it.

# Let's Talk Results

# Rail is Safe and Getting Safer

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The train  
accident rate  
is  
**down  
33%**  
since 2000

Employee  
injury rate  
is  
**down  
61%**  
since 2000

Grade  
Crossing  
Collision rate  
is  
**down  
39%**  
since 2000

**Artificial  
Intelligence &  
machine learning  
implemented in  
BNSF Operations in  
recent years**

Hump Yard Track Assignments  
Train Line-ups & ETA's  
Track Inspections  
Intermodal Load Planning  
**Mechanical Inspections**  
**Movement Planner**  
Operation Desert Night  
Intermodal Dwell Optimization  
Intermodal Yard Check  
Flat Yard Car Switching Optimization

*Leading the Future of Rail's*

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*Supply Chain Solutions*

*For intermodal to capture its tremendous potential, it needs to offer:*



**Available Capacity**



**Reliable Service**



**Sustainable &  
Competitive Solution**

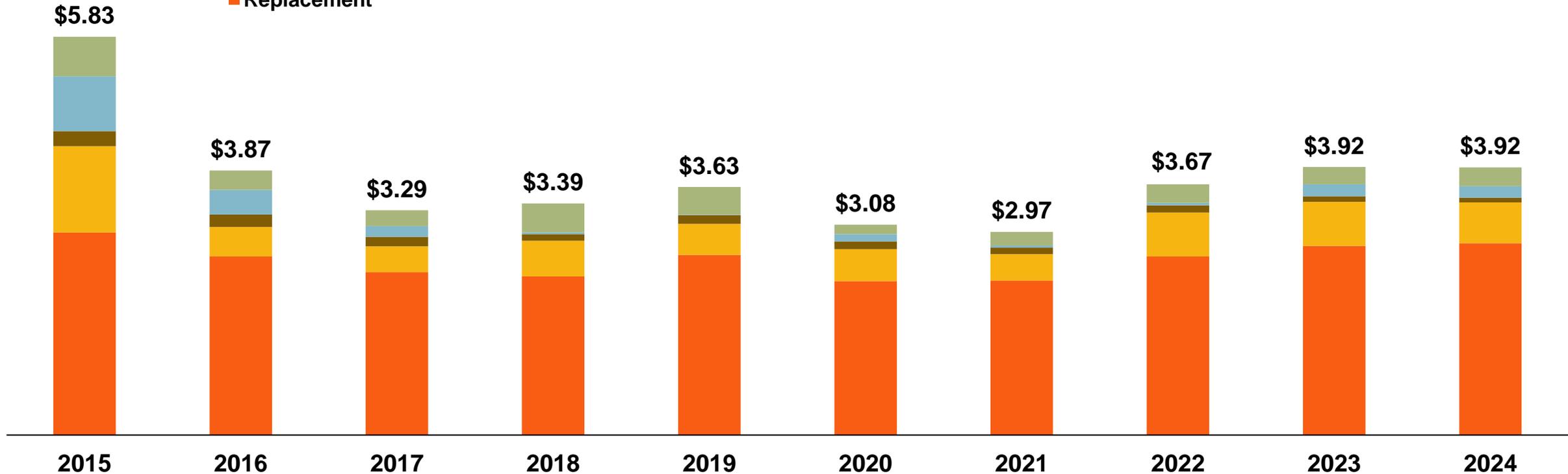
# Physical Capacity

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# 2024 Capital Investments \$3.92B

**\$Billions**

- Equipment
- Locomotive
- PTC
- Expansion
- Replacement



# 2024 Capital Investments \$3.92B

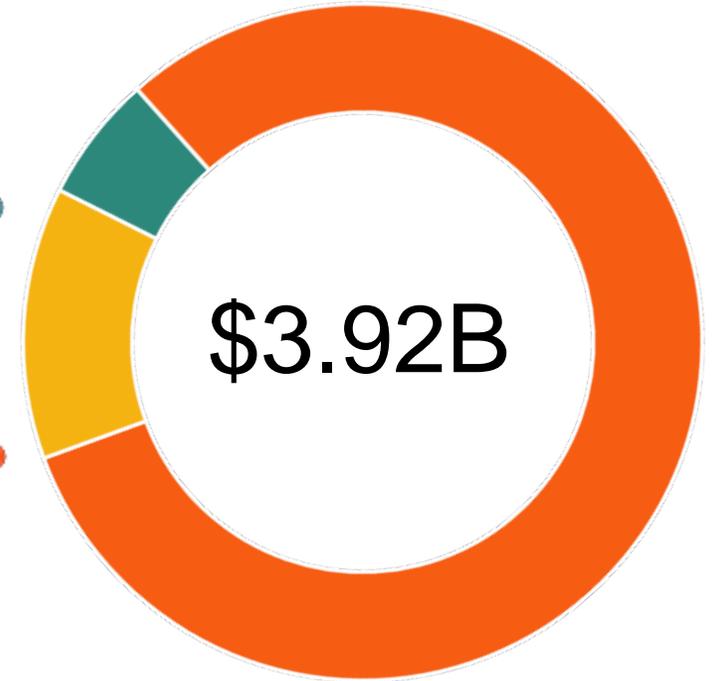
**11%** Locomotives, Freight Cars & Other Equipment \$441M



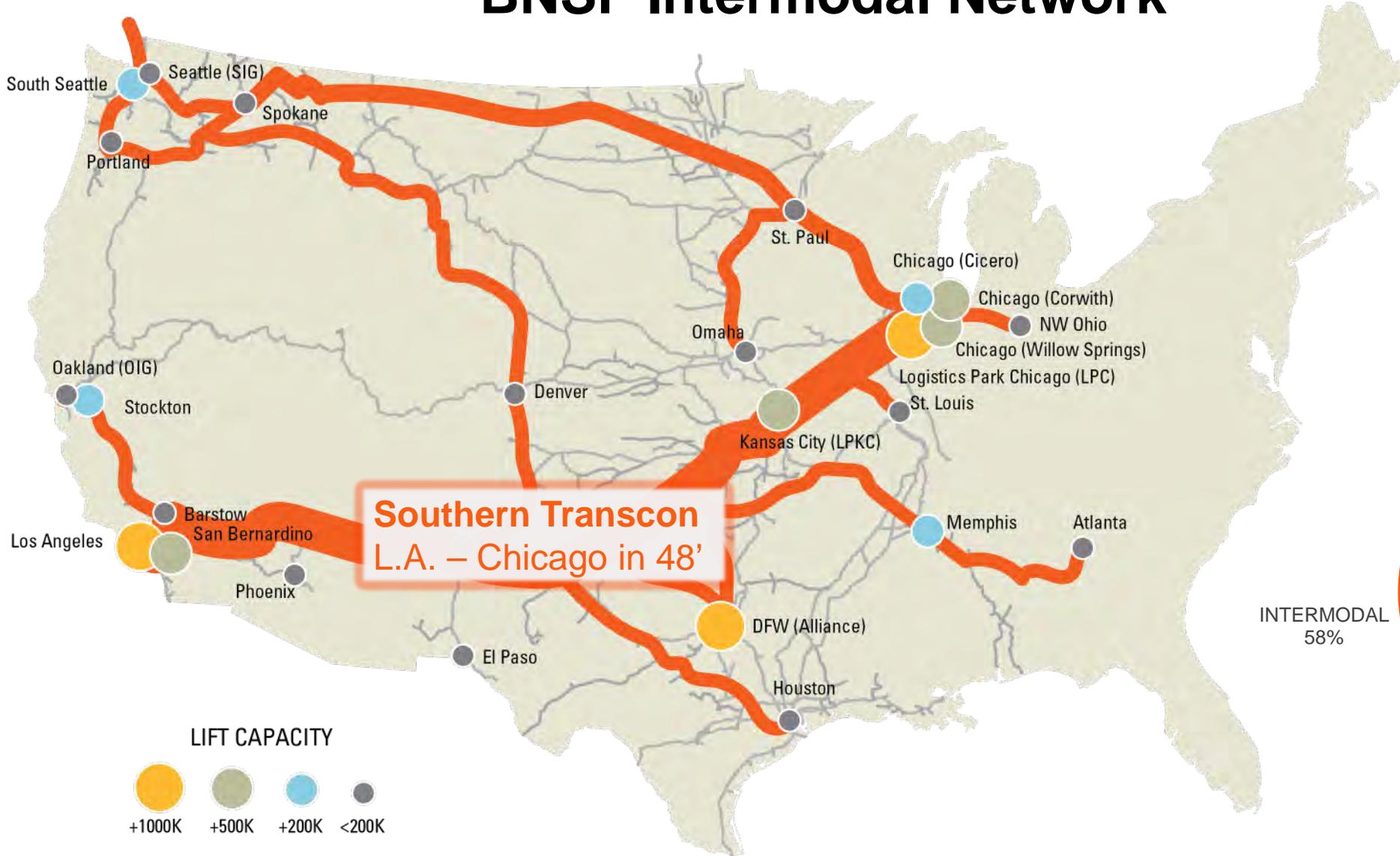
**15%** Expansion & Efficiency \$597M



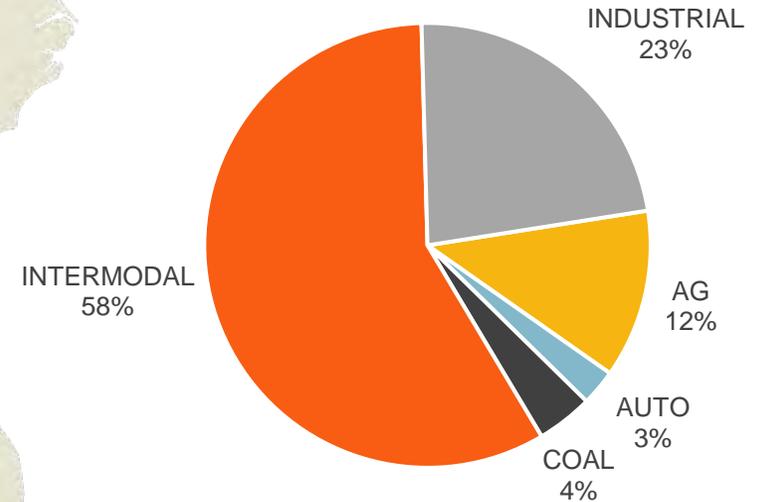
**74%** Core Network & Related Assets \$2.88B



# BNSF Intermodal Network



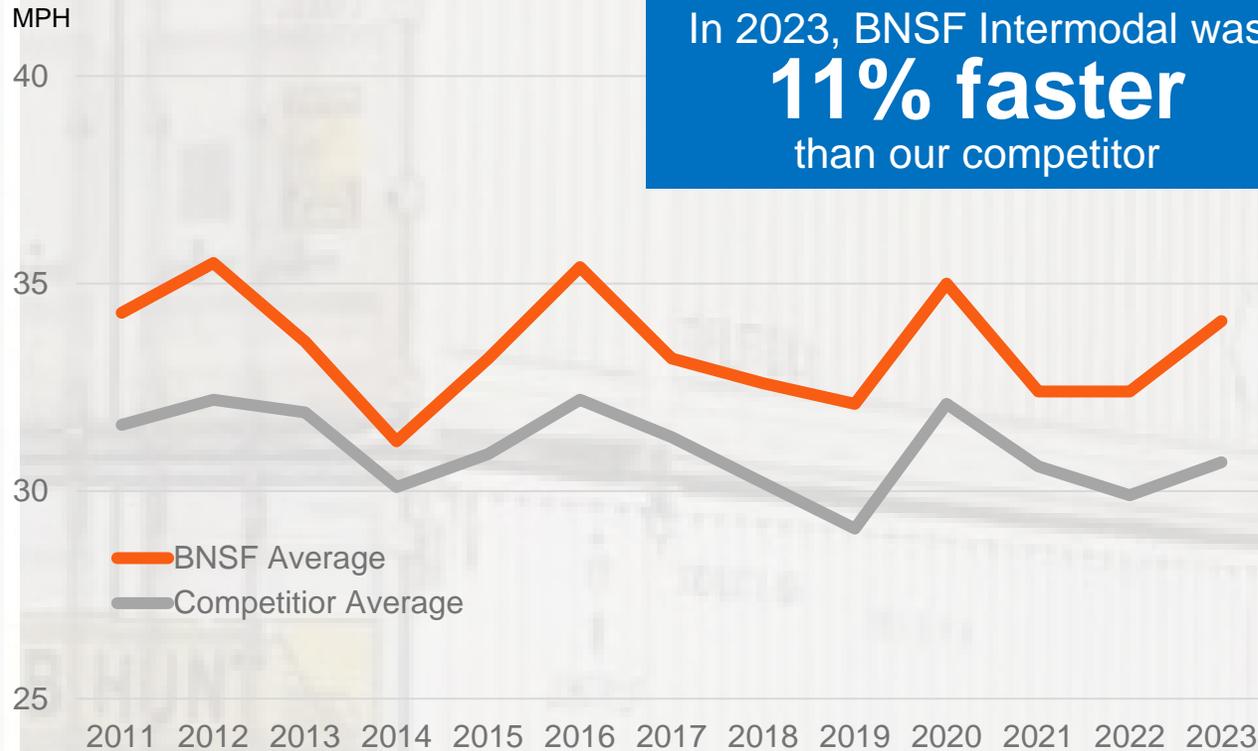
**Traffic Mix on the Southern Transcon**



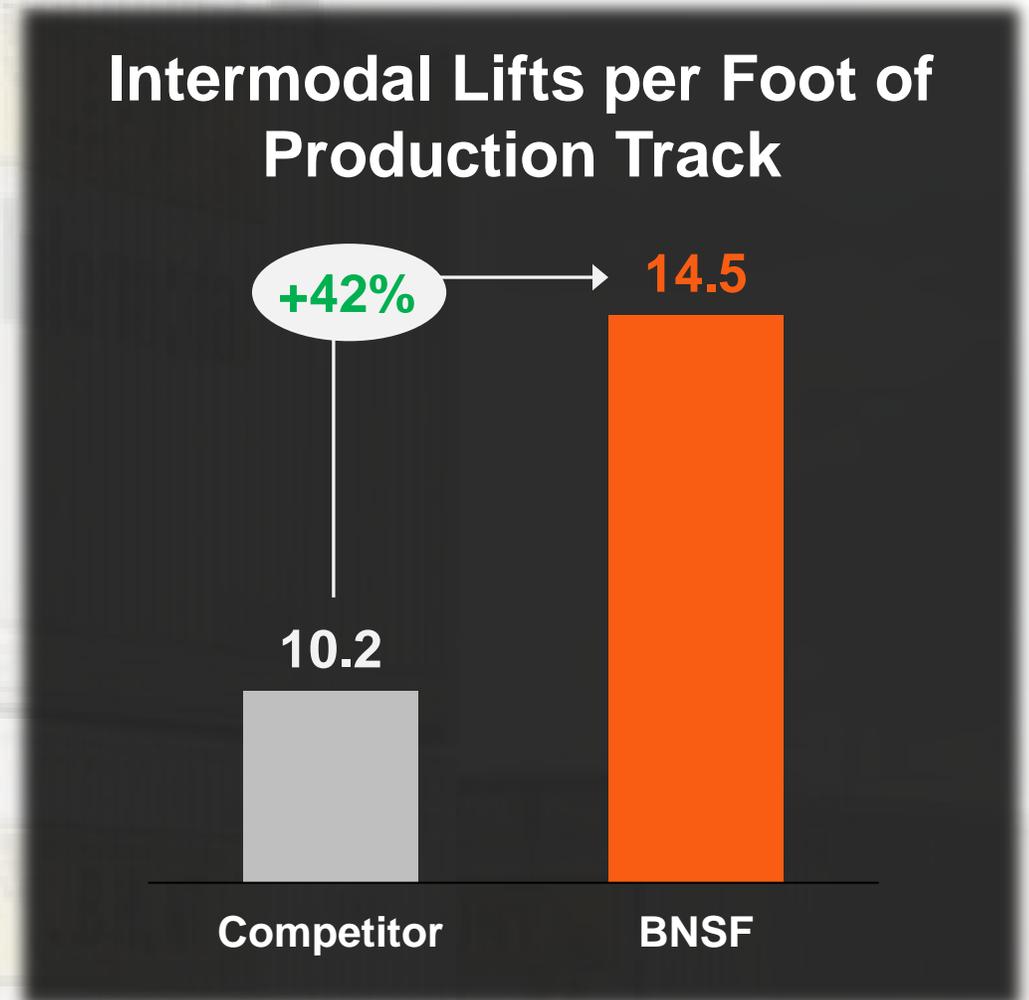


# BNSF's Leading Position through Operational Facilities, Process & Innovation to meet market needs

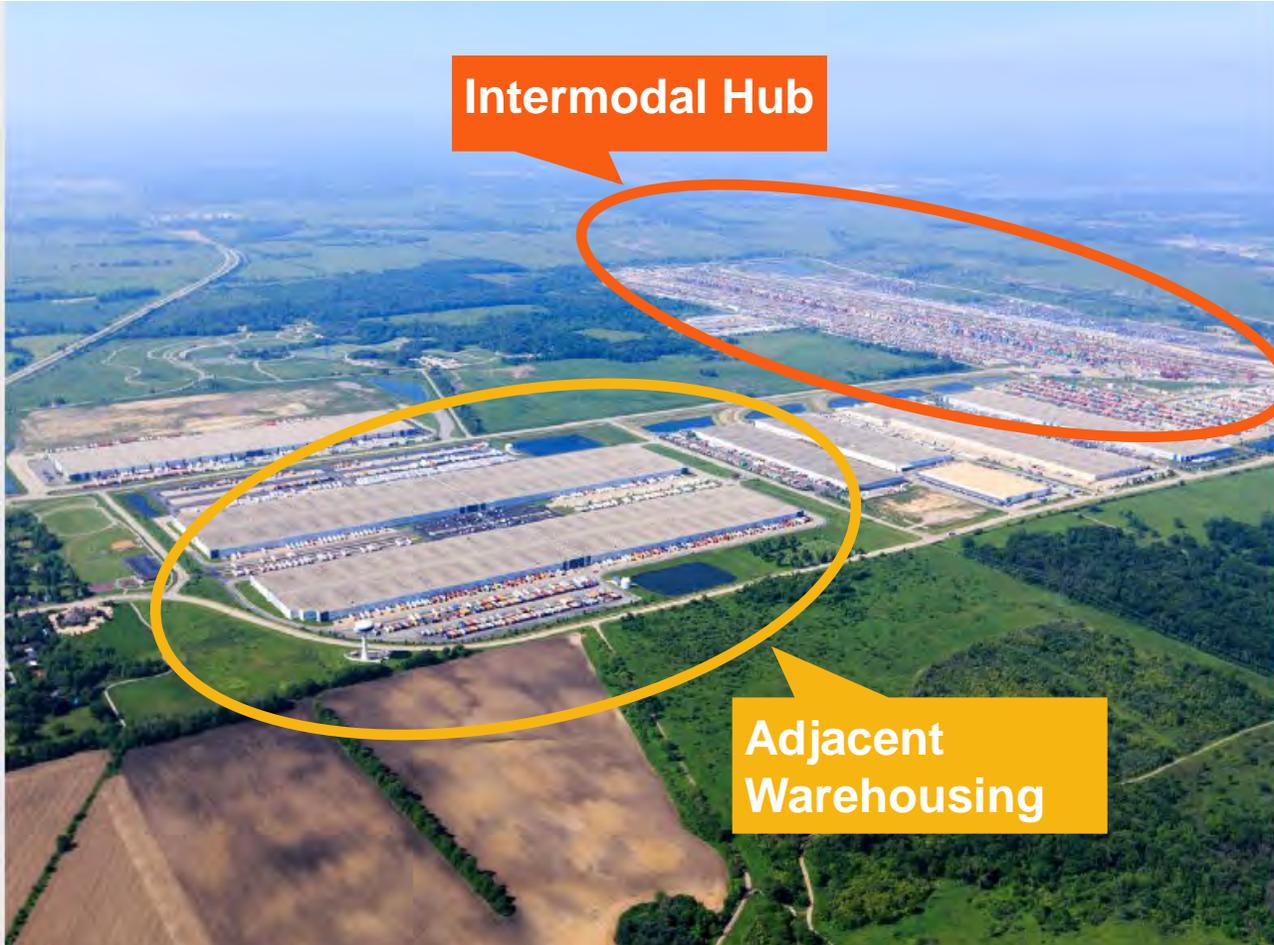
## Intermodal Train Speeds



## Intermodal Lifts per Foot of Production Track



# Logistics Park Chicago



**ACCESS TO BNSF CHICAGO CAPACITY  
ESSENTIAL TO SUPPLY CHAIN**

**1** out of **5**  
U.S. FREIGHT  
UNITS traffic  
touches Chicago

**37%**  
of all INTERMODAL  
UNITS in the U.S.  
touch Chicago

BNSF is the  
**largest**  
rail carrier in  
Chicago

# Co-Location near Logistics Parks to Reduce Carbon Emissions

## Carbon Emissions Case Study

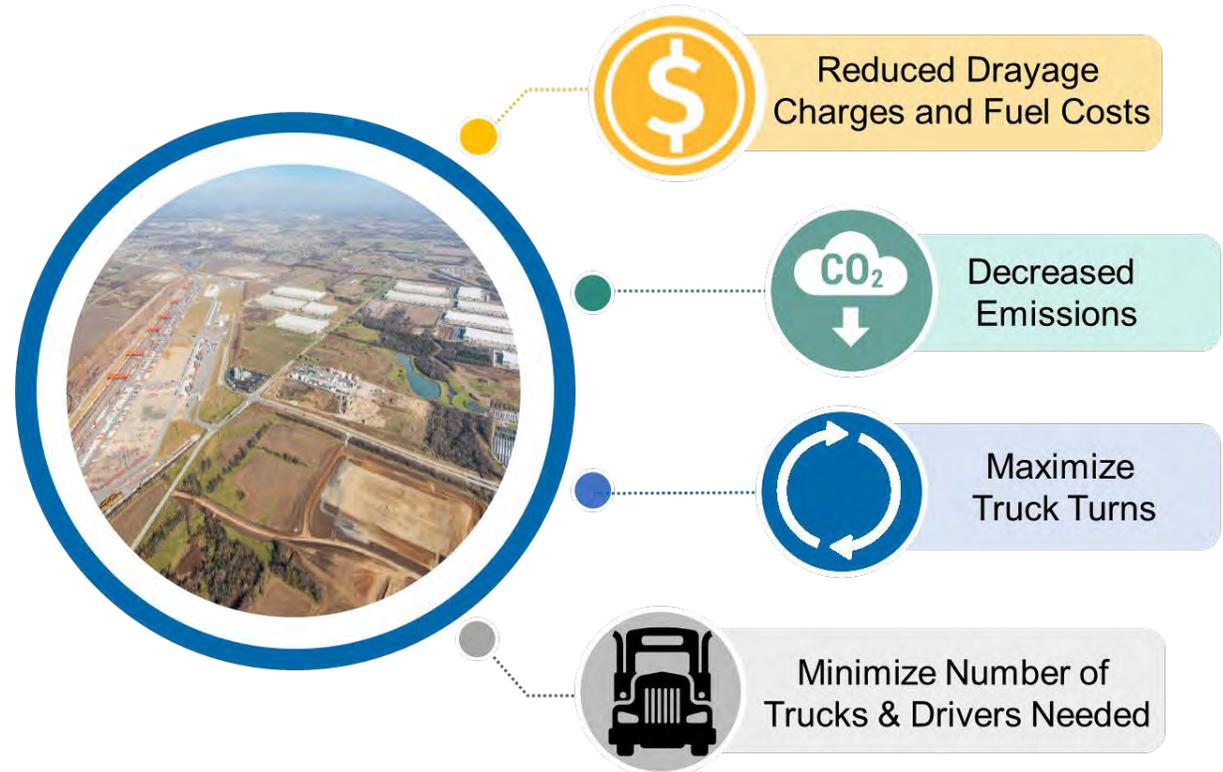
2,000mi D2D move



Sustainable Solution  
for Supply Chains

Mode	CO <sub>2</sub> e Per Unit	
 Over The Road	2.3 MT	
vs. OTR		
 IMDL + 50 Mile Dray	0.8 MT	
 IMDL + Colocation	0.7 MT	

## Co-Location Benefits



# 2024 Key Capacity Expansion Projects



# Operationalizing Technology



Bloomberg



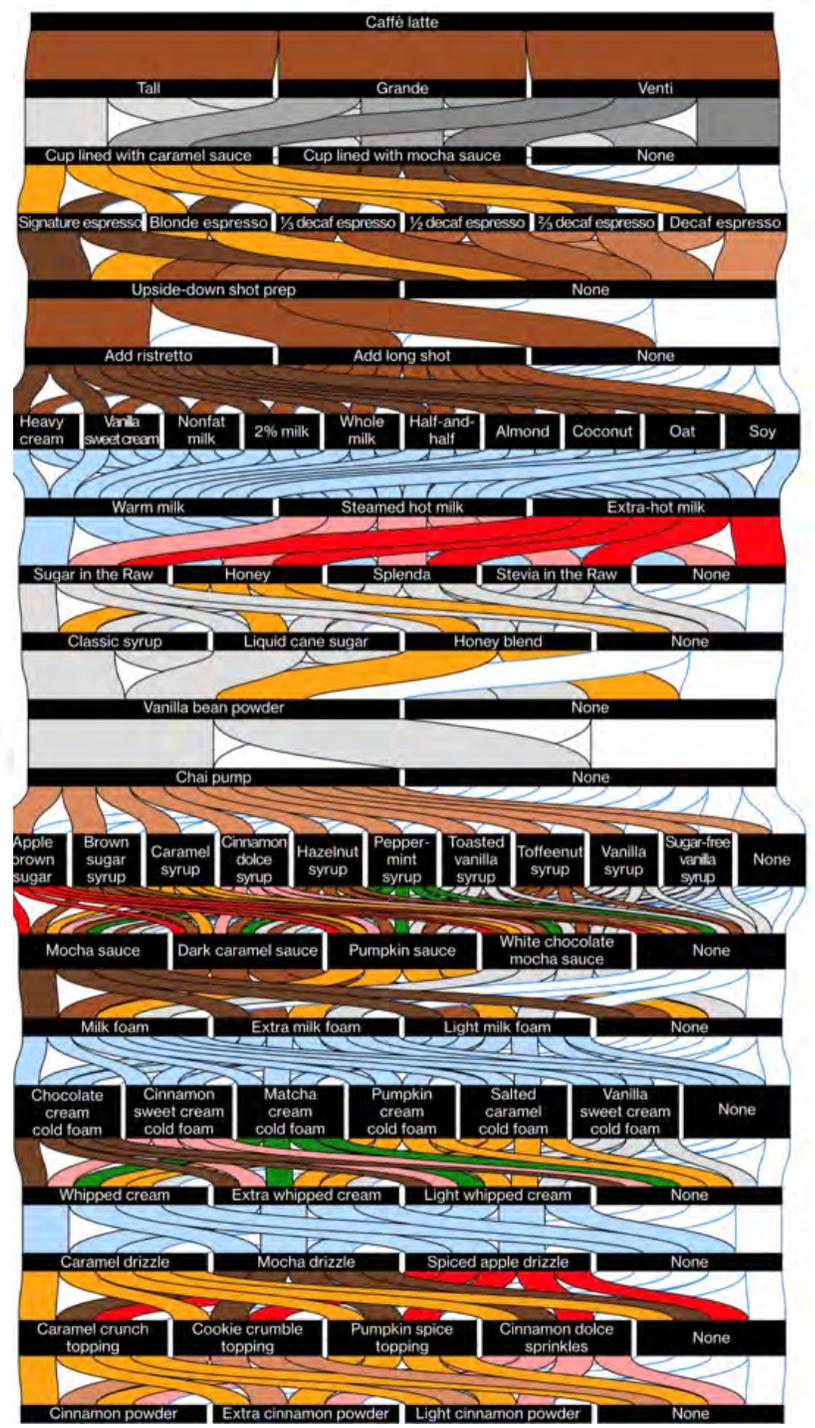
Illustration: Kyle Platts for Bloomberg Businessweek

Businessweek | Business

# Why Your Starbucks Wait Is So Long

Elaborate drinks and an almost endless array of combinations can slow baristas down, but a plan to hasten service has yet to materialize.

## Can I Get a ...?



Bloomberg



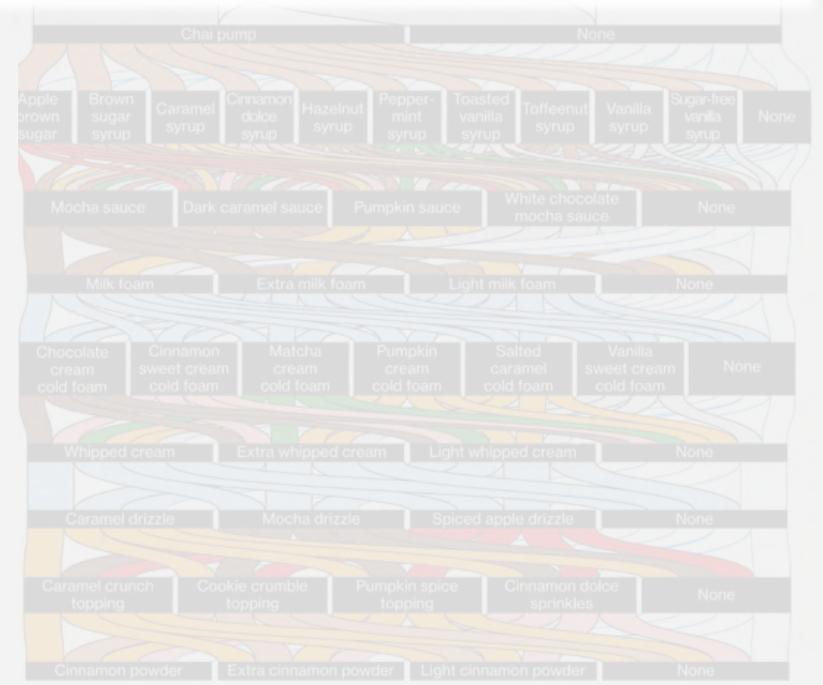
**383 BILLION combinations**

Illustration: Kyle Platts for Bloomberg Businessweek

Businessweek | Business

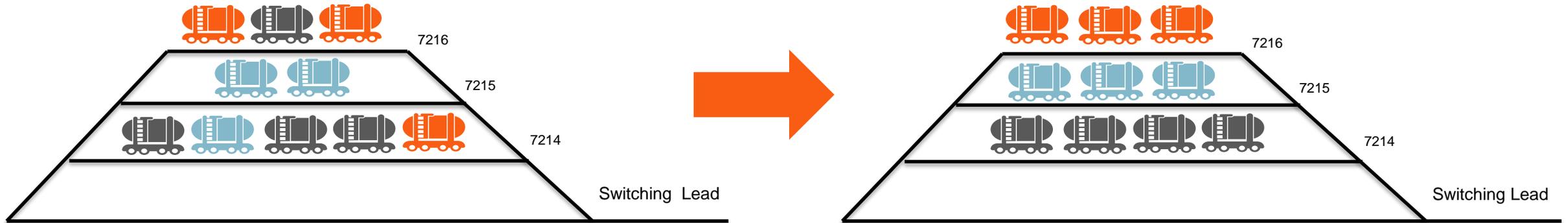
## Why Your Starbucks Wait Is So Long

Elaborate drinks and an almost endless array of combinations can slow baristas down, but a plan to hasten service has yet to materialize.



# Optimized Switching for Yard Operations

Illustrative Example (NEW: NUTC Sandhouse Yard):



Scenario:

- 10 Cars
- 4 Tracks
- 3 Classifications by Destination (orange, blue, gray)

Desired State:

- Switched by destination classification (color)

*How many possible solutions are there to perform these **five** switch moves?*

# Decision Assisted Switching for Yard Operations

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Illustrative Example

**5,210,673**

***(and there is an optimal one)***

Scenario

- 10 Cars
- 4 Tracks
- 3 Classifications by Destination (orange, yellow, gray)

*How many possible solutions are there to perform these five switch moves?*

# Moving to Automated, Optimally Planned Switching Operations

## Today's Switch List:

Manual  
Time  
Consuming  
Subjective

SeqMe NumCd	Car Init	Car Number	CarL KndE
1	9	CBTX 742631	T5IL
2	6	MCSA 3143	A76L
3	9	TTZX 865149	F18L
4	6	FBOX 505461	ABEE
5	L	TILX 623144	C5PL
6	9	CBFX 490857	C5PL
7	6	FPAX 931037	T98L
8	L	FPAX 151015	T98L
9	9	FPAX 140100	C5PL
10	L	FPAX 200436	C5PL
11	6	CTCX 722338	T6IL
12	L	CTCX 722340	T6IL
13	8	AOKX 482867	C3GE
14		SHPX 435095	C3GE
15		HWCX 13273	C3GE
16		NAHX 322209	C3GE
17		NAHX 322185	C3GE
18		CBFX 316401	C3GE
19		AOKX 491078	C3GE

## Tomorrow's Switch List:

Track 7214					
Cut	Seq	Trk	To_Trk	Car	TBlk
✂	1	7214		C9	
✂	2	7214	7216	C1	
	3	7214		C2	
	4	7214		C3	
	5	7214		C4	
	6	7214		C5	

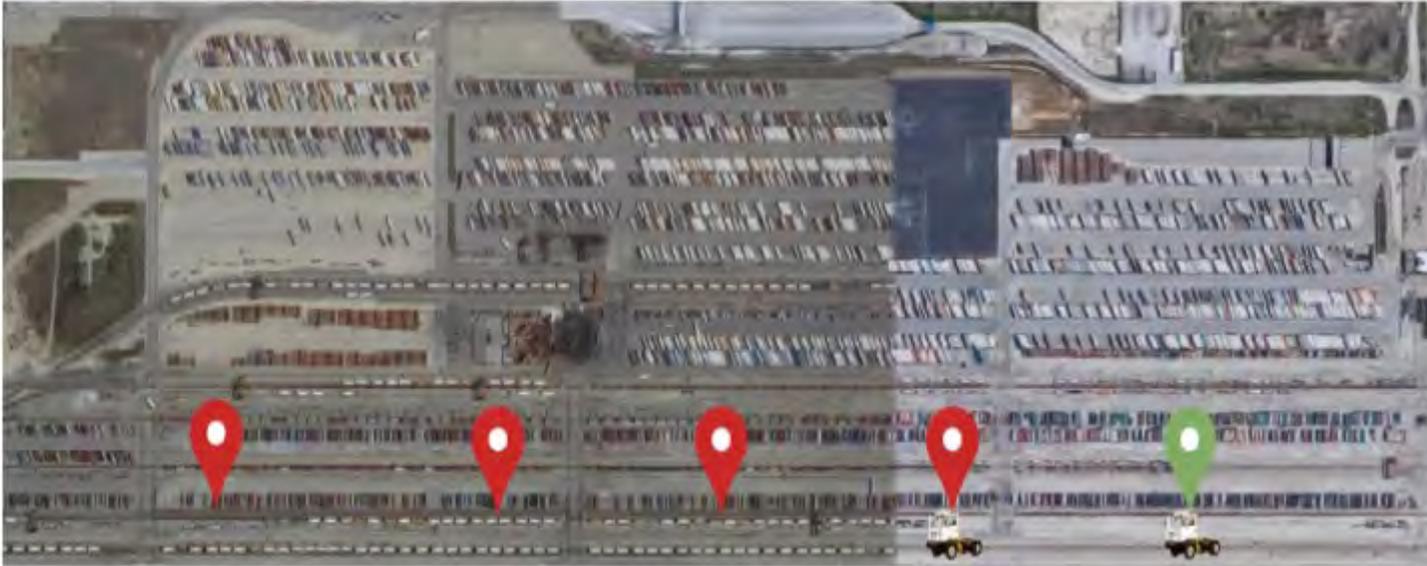
Automated  
Optimized  
More Consistent Service



# Load Planning Optimizer (LPO)

Alliance, TX Intermodal Facility

Alliance, TX Intermodal Facility



Model Hostler Progress



Actual Hostler Progress



Network Capacity  
Added Annually

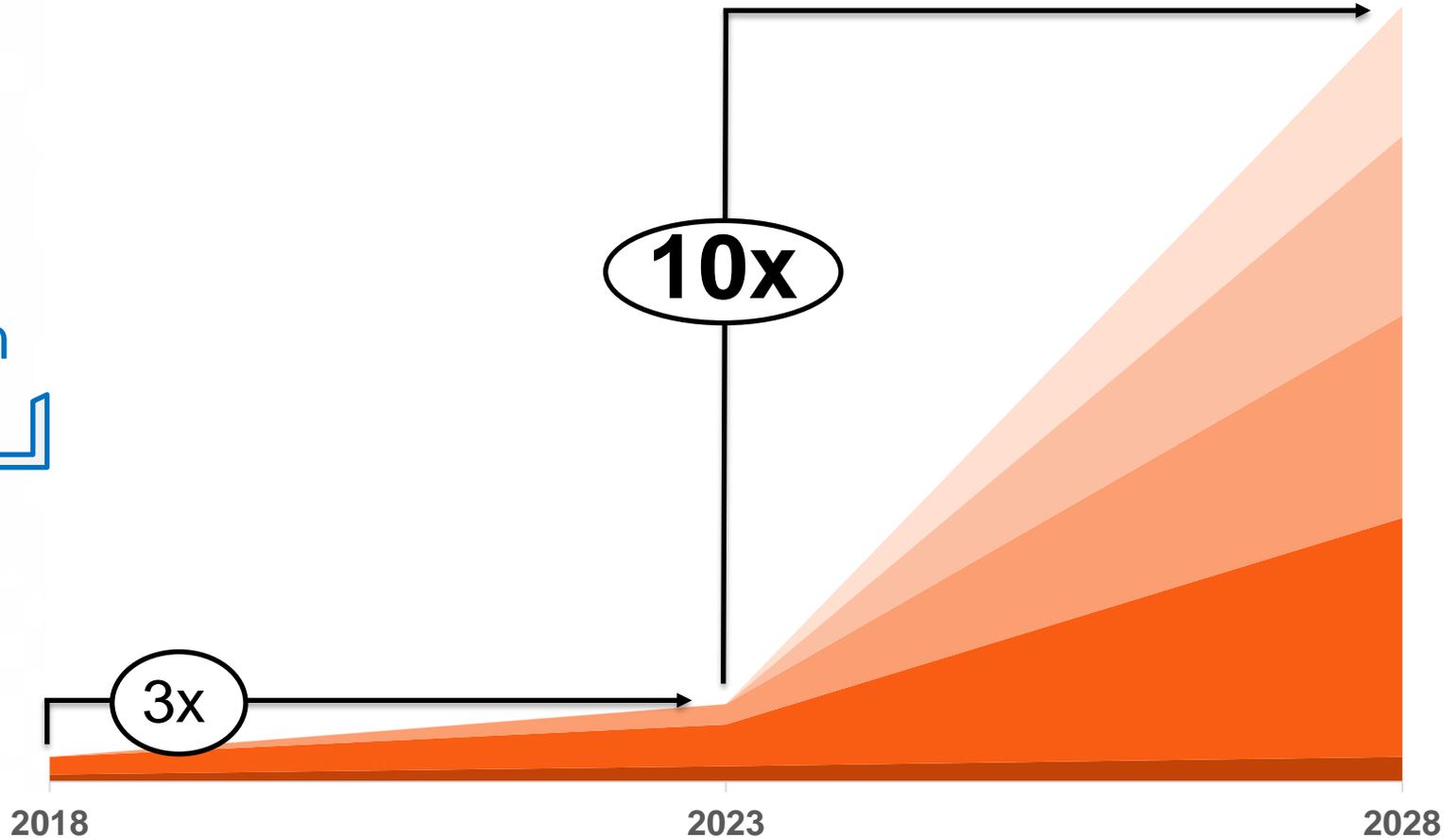
**400k** of lift capacity created  
**300k** gallons of fuel saved  
**375k** hostler miles reduced

Data around us is increasing exponentially

## BNSF Operational Data

Globally, we create more information **every two days** than was created from the dawn of civilization until 2003

Source: [Dataversity.net](http://Dataversity.net)

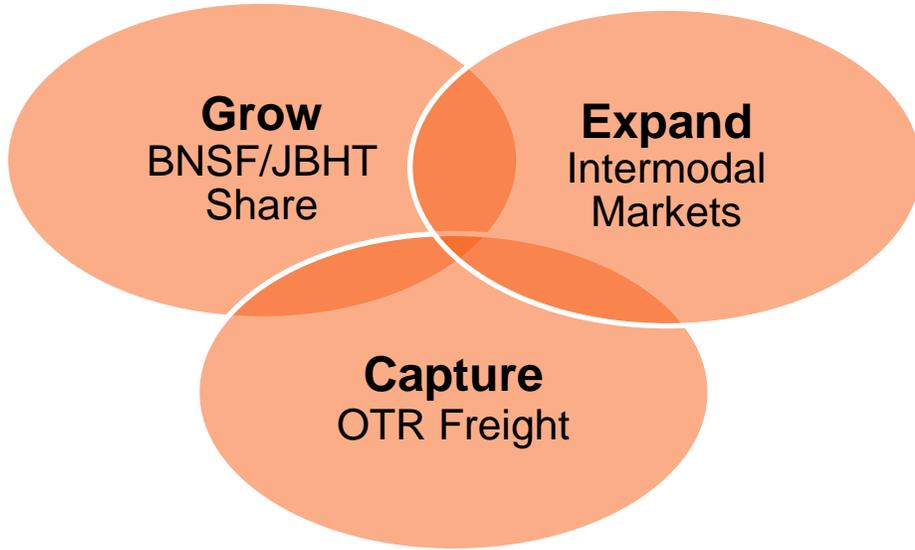




# QUANTUM<sup>TM</sup>

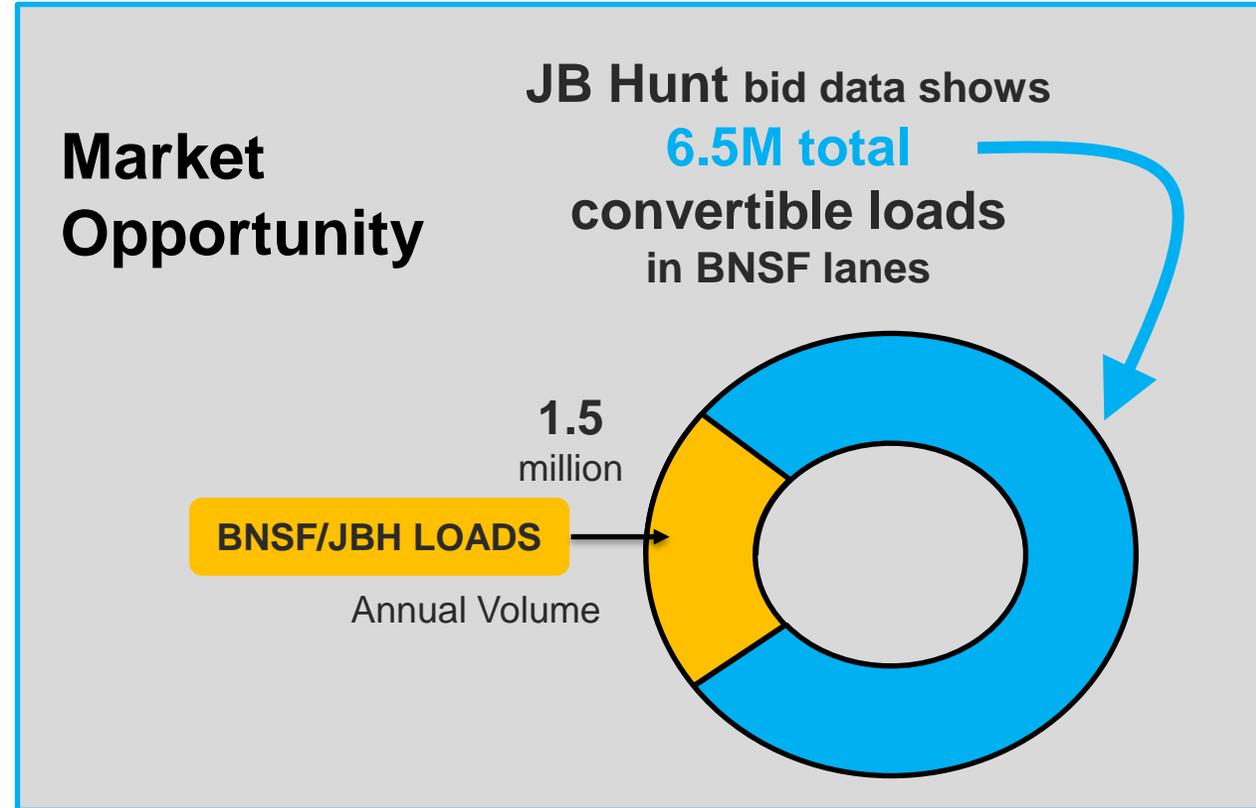
A J.B. HUNT • BNSF SERVICE

# Why Quantum?



## Targeting Highway Conversion Freight

- Service sensitive, high cost of failure
  - Vendor/customer direct freight, auto parts, etc.
- BCOs that are hesitant to use/try intermodal
  - Small to mid-size BCOs





Remote Operations

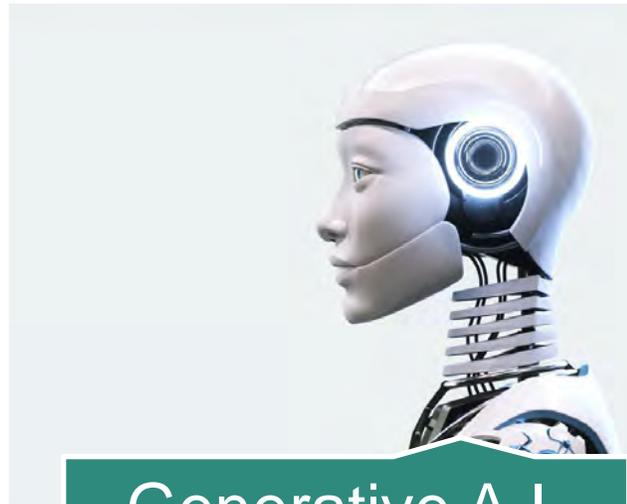


Autonomous Operations

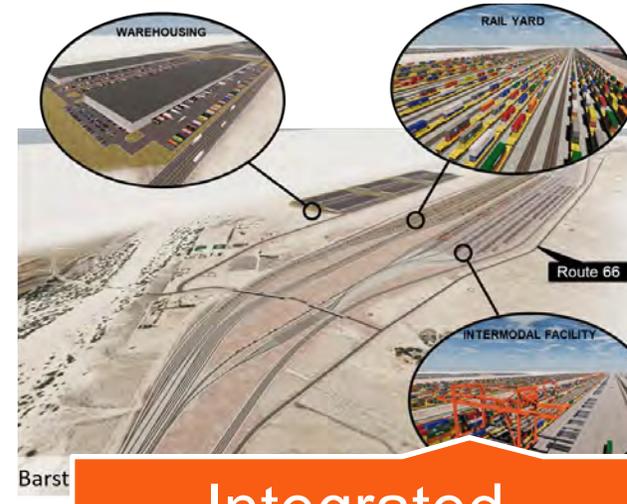


Digital Twins

# Intermodal Innovation Team Initiatives



Generative A.I. Decision Assist



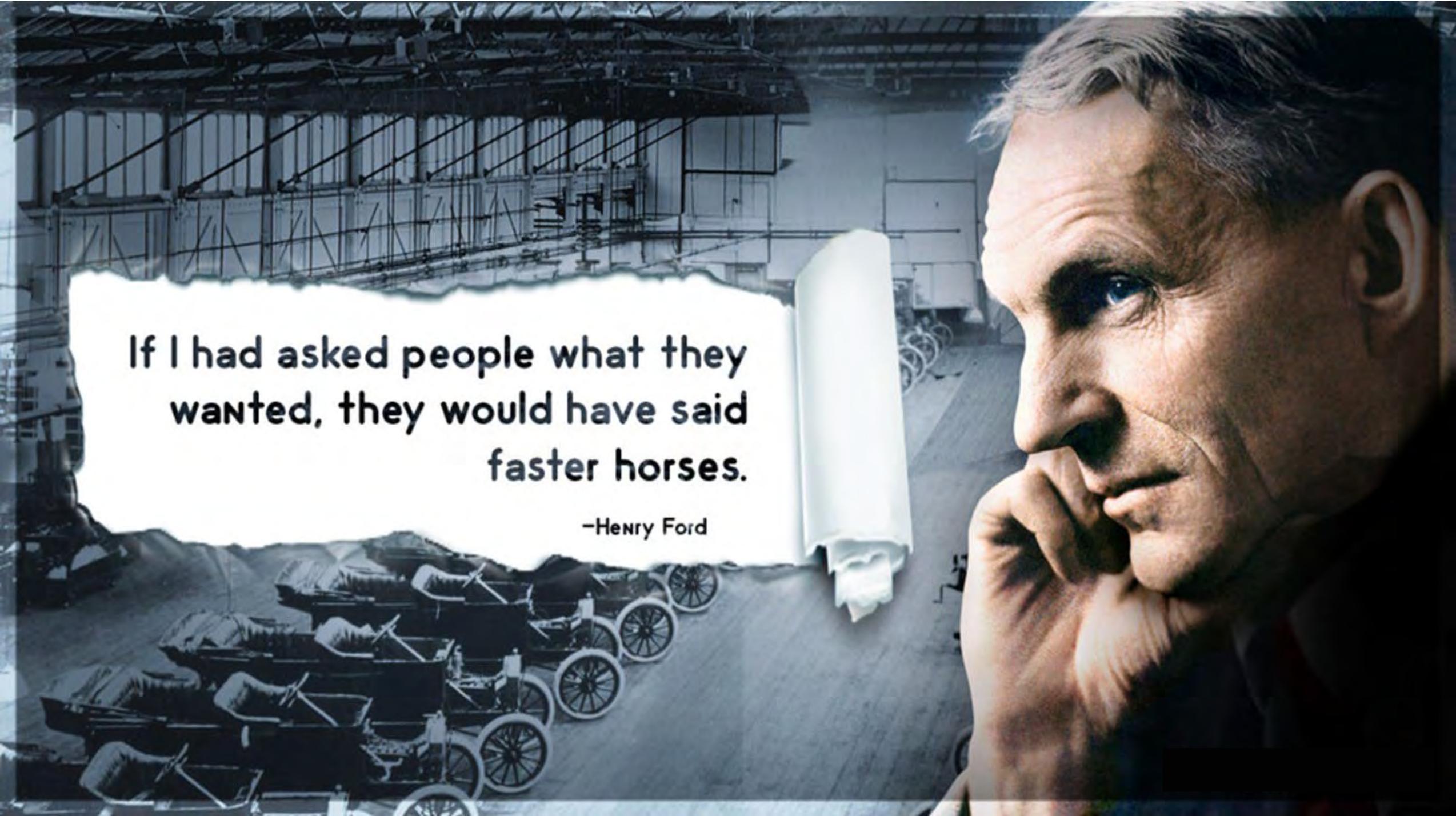
Integrated Ecosystems



**BARSTOW**

INTERNATIONAL

**GATEWAY**

A composite image featuring Henry Ford in the foreground on the right, looking thoughtfully to the left with his hand on his chin. The background is a large industrial factory with a high ceiling and complex structural beams. In the lower-left foreground, several early 20th-century automobiles are parked in a row. A white, torn-edge paper graphic is overlaid on the factory floor, containing the text.

**If I had asked people what they  
wanted, they would have said  
faster horses.**

**-Henry Ford**



**BNSF**<sup>®</sup>  
RAILWAY

THANK YOU NUTC  
Sandhouse Rail Forum!