



**Thinking Strategically: Process Performance and Power**  
**Norfolk Southern Investor and Financial**  
**Analyst Conference**

*June 8, 2011*

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**Planning and CIO**

# TRACK 2012

# *Future Track Drivers*



- Safety
- Service Improvement
- Revenue Growth
- Fuel Efficiency
- Workforce Productivity
- Asset Utilization

## ■ Safety

*Unified Train Control System (UTCS/RailEdge),  
Process Control, Remote Control Locomotives,  
Wayside Detection Systems*

- Service Improvement
- Revenue Growth
- Fuel Efficiency
- Workforce Productivity
- Asset Utilization

- Safety
- Service Improvement
  - UTCS/RailEdge, TLMS, ABC, Process Control, Remote Intelligent Terminal (RIT), Crew District Optimization*
- Revenue Growth
- Fuel Efficiency
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# *Future Track Drivers*



- Safety
- Service Improvement
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- Safety
- Service Improvement
- Revenue Growth

## ■ Fuel Efficiency

*LEADER, Top Of Rail Friction Modification,  
Wireless Event Recorder/Scorecard*

- Workforce Productivity
- Asset Utilization

- Safety
- Service Improvement
- Revenue Growth
- Fuel Efficiency
- **Workforce Productivity**  
*RIT, Remote Control Locomotives, Scheduling  
Maintenance Activities, Crew District  
Optimization*
- Asset Utilization

- Safety
- Service Improvement
- Revenue Growth
- Fuel Efficiency
- Workforce Productivity

## ■ Asset Utilization

*UTCS/RailEdge, TLMS/LARS, ABC, GIS, RIT,  
Wayside Detection Systems, Process Control*

# Network Efficiency - Local Service



ORIGIN SERVING YARD



**REMOTE INTELLIGENT TERMINAL (RIT)**

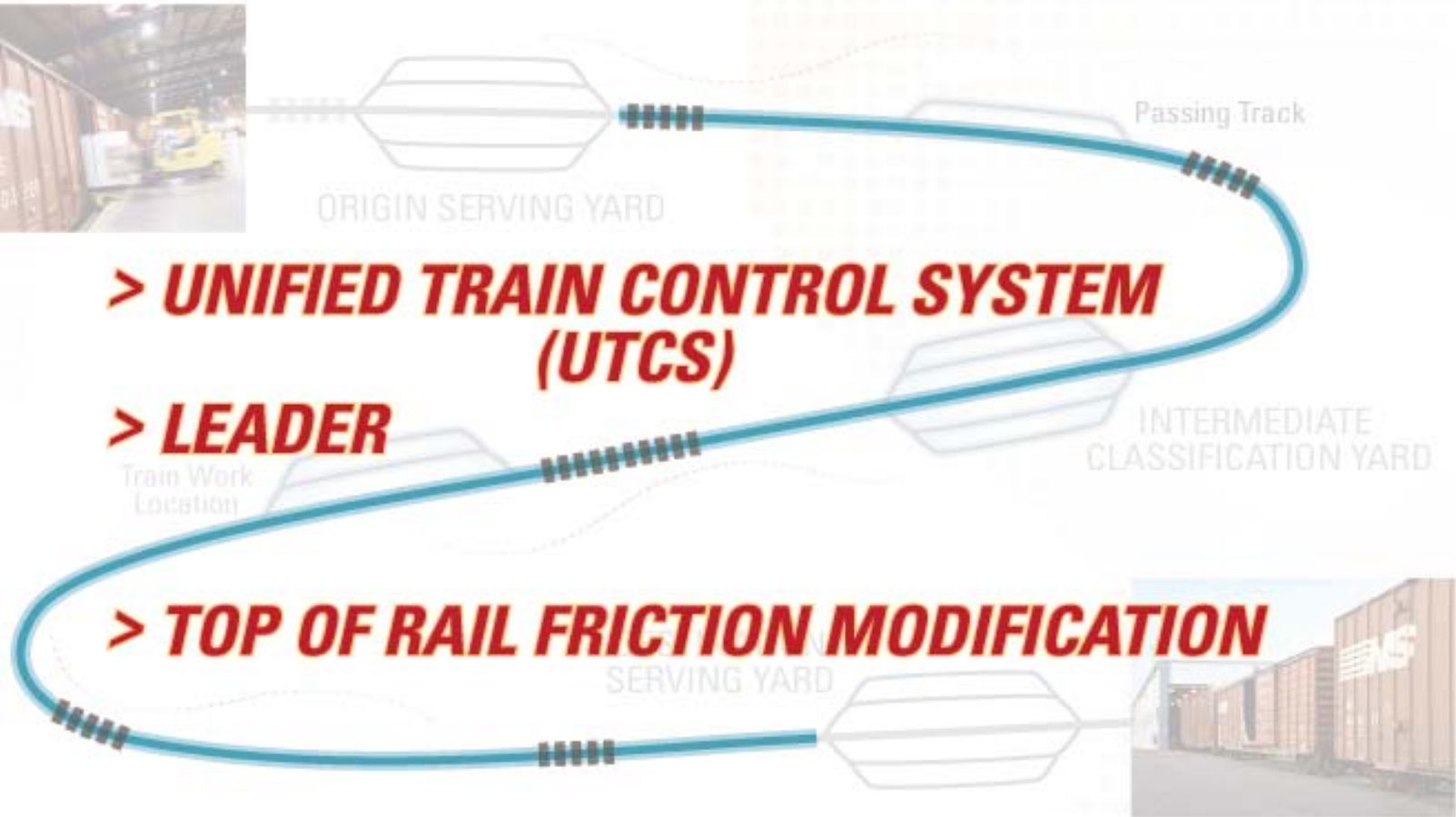
IMMEDIATE  
CLASSIFICATION YARD



DESTINATION  
SERVING YARD



# Network Efficiency – Train Performance



**> UNIFIED TRAIN CONTROL SYSTEM (UTCS)**

**> LEADER**

**> TOP OF RAIL FRICTION MODIFICATION**



# Network Efficiency – Connection Performance

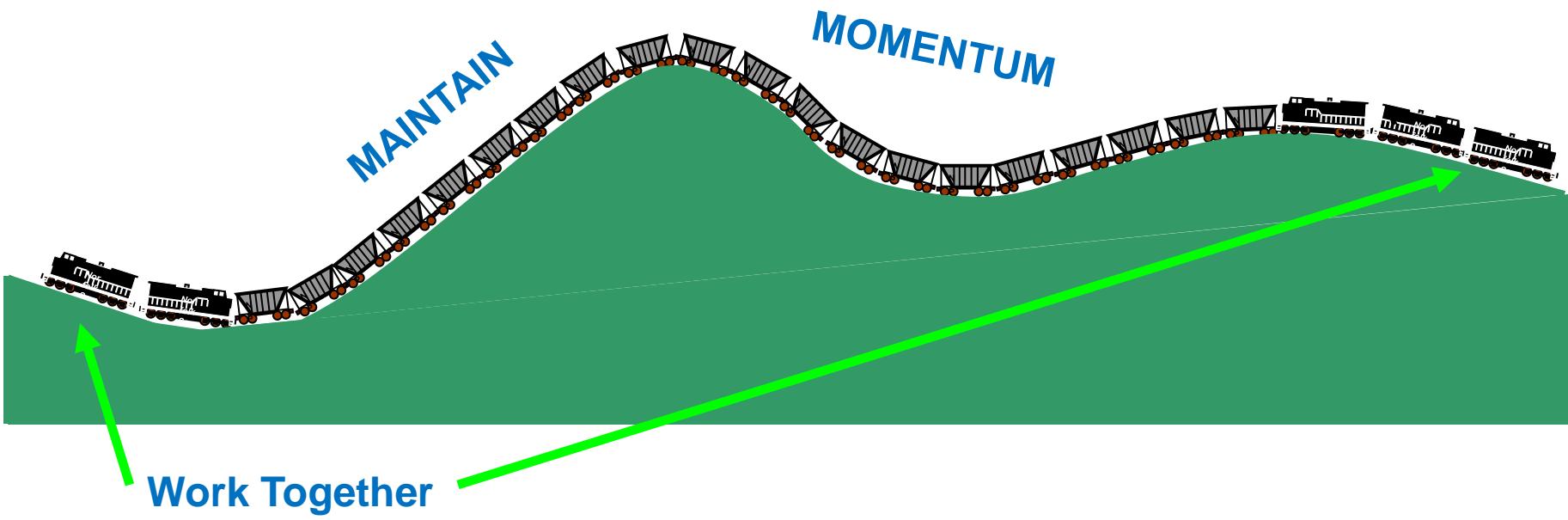


> **PROCESS CONTROL**

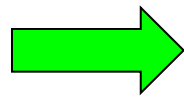
> **REMOTE CONTROL  
LOCOMOTIVES**

# What is LEADER?

Locomotive Engineer Assist Display and Event Recorder



Eliminate unnecessary  
braking and throttle use



Conserve  
Energy



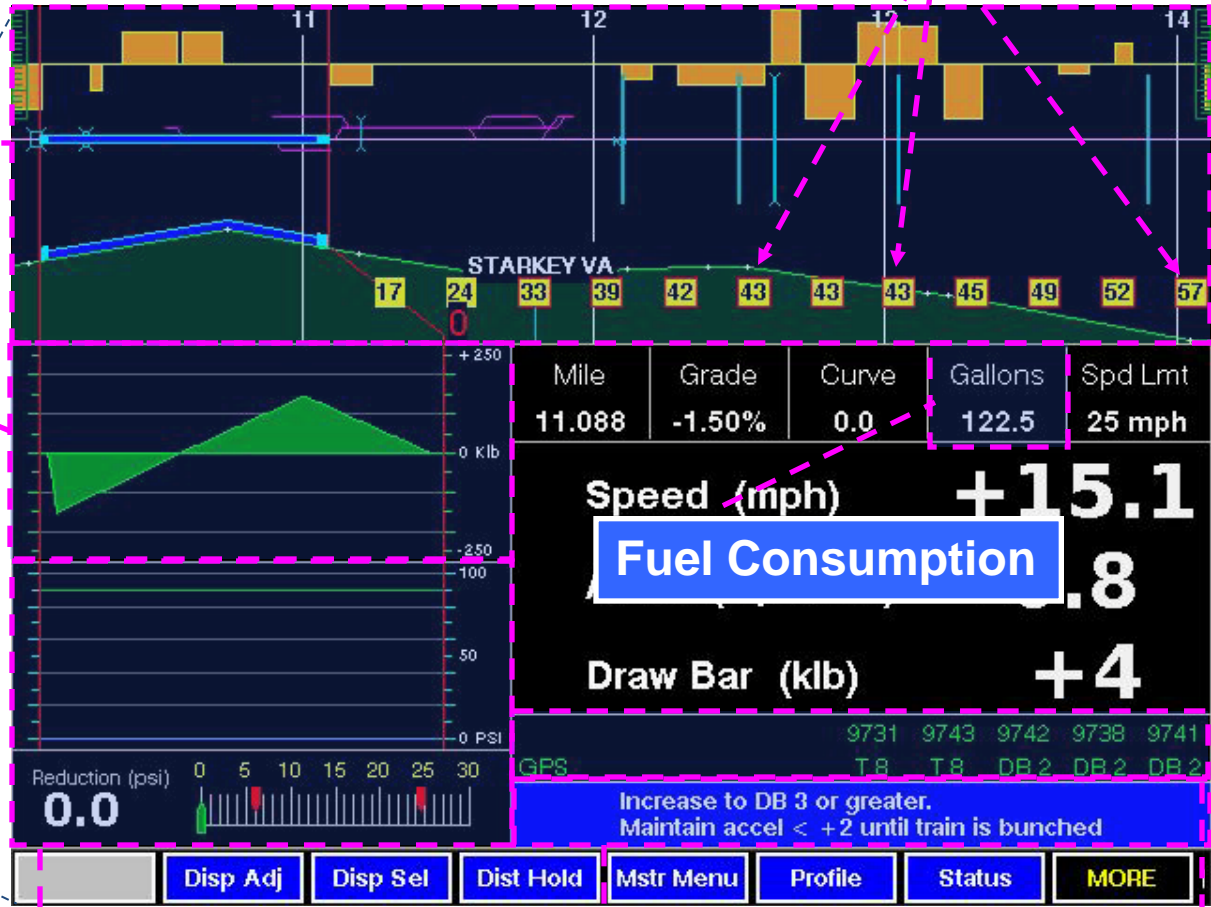
Achieve  
Golden  
Run

# The LEADER Screen

Look-Ahead Speeds

Track Profile

In-Train Forces



Air-Brake Status

Engineer Assist Prompts

Locomotive Status

# *Railroad Benefits*

- **Better train handling**
- **Carbon footprint reduction for NS and by extension NS customers**
- **Reduced emissions**
- **Reduced in-train forces**
- **Enhanced reporting capability**
- **Fuel Savings**

# Phases of LEADER

2009                      2010                      2011                      2012                      2013                      2014                      2015



## Conventional (Clear Signal System)

- Virginia Division Pilot Project – 69 units
- Unit trains only / compatible with Distributed Power
- Decommissioned, upgrading units to Production (TMC)

## → Production – Standalone (Clear Signal System)

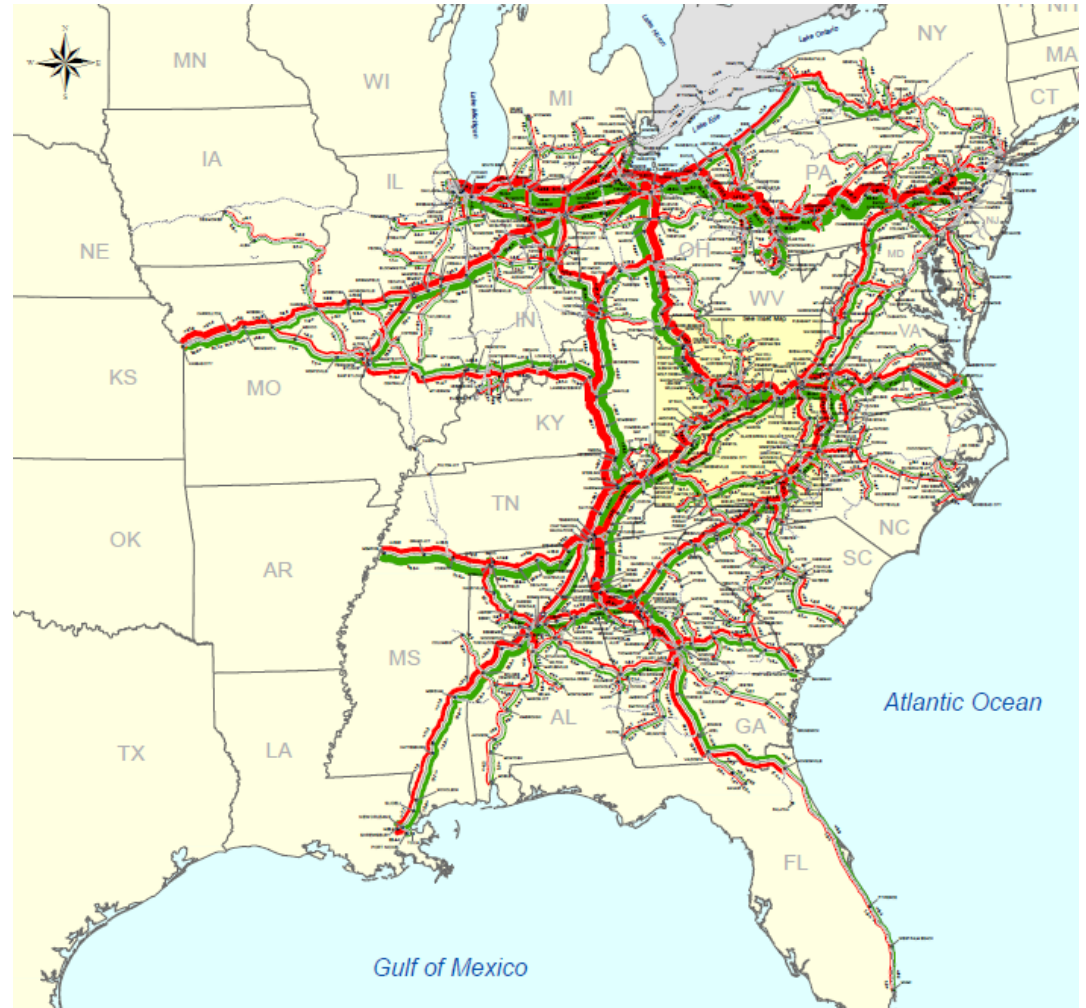
- In service on Northern Region / VA Division
- 900+ units through 2011
- Remote downloading of consist and territory data
- Compatible with Distributed Power

## → Production - Integrated

- Full compatibility with PTC / Signals / Dispatching
- All road units

# Next Steps

- **Expansion Criteria:**
  - Traffic density (GTM)
  - Track data availability (fly mapping)
  - Locomotive distribution
  - Training capability



# *The Power of Process Improvement*

- **18 major departments, including all locomotive shops, are ISO registered**
- **Six Sigma – 1,030 Yellow Belts; 316 Green Belts; 62 Black Belts; 5 Master Black Belts**
- **Lean Manufacturing since 2007**
- **\$11.5 Million in one-time and recurring savings in locomotive shops, 2009-2011**



# FUTURE TRACK