



# **The Positive Train Control Mandate**

**National Grain and Feed Association  
San Diego, California  
March 13, 2011**



# PTC – Why Are We Installing the Technology?

- Mandated by 2008 rail safety bill.
- Required for:
  - All main lines handling passenger trains
  - All Class I main lines with a traffic density greater than 5 million annual gross ton-miles per mile handling toxic inhalation hazard (TIH) materials.
- Installation by December 31, 2015.



# PTC – What is it ?

An overlay to the existing signal system that is intended to prevent:

- train-to-train collisions,
- over-speed derailments,
- incursions into established work zone limits,
- movement of a train through a switch left in the wrong position.



# PTC – What does it do ?

PTC essentially does only three things:

- Develops and provides very precise train location information.
- Compares that train location information to –
  - Data on geographic and geometric descriptions of the rail line, and,
  - Current information on authorities to operate trains or equipment on the rail line and adjacent lines.
- If it identifies conflict(s), either stops, or slows down, a train.



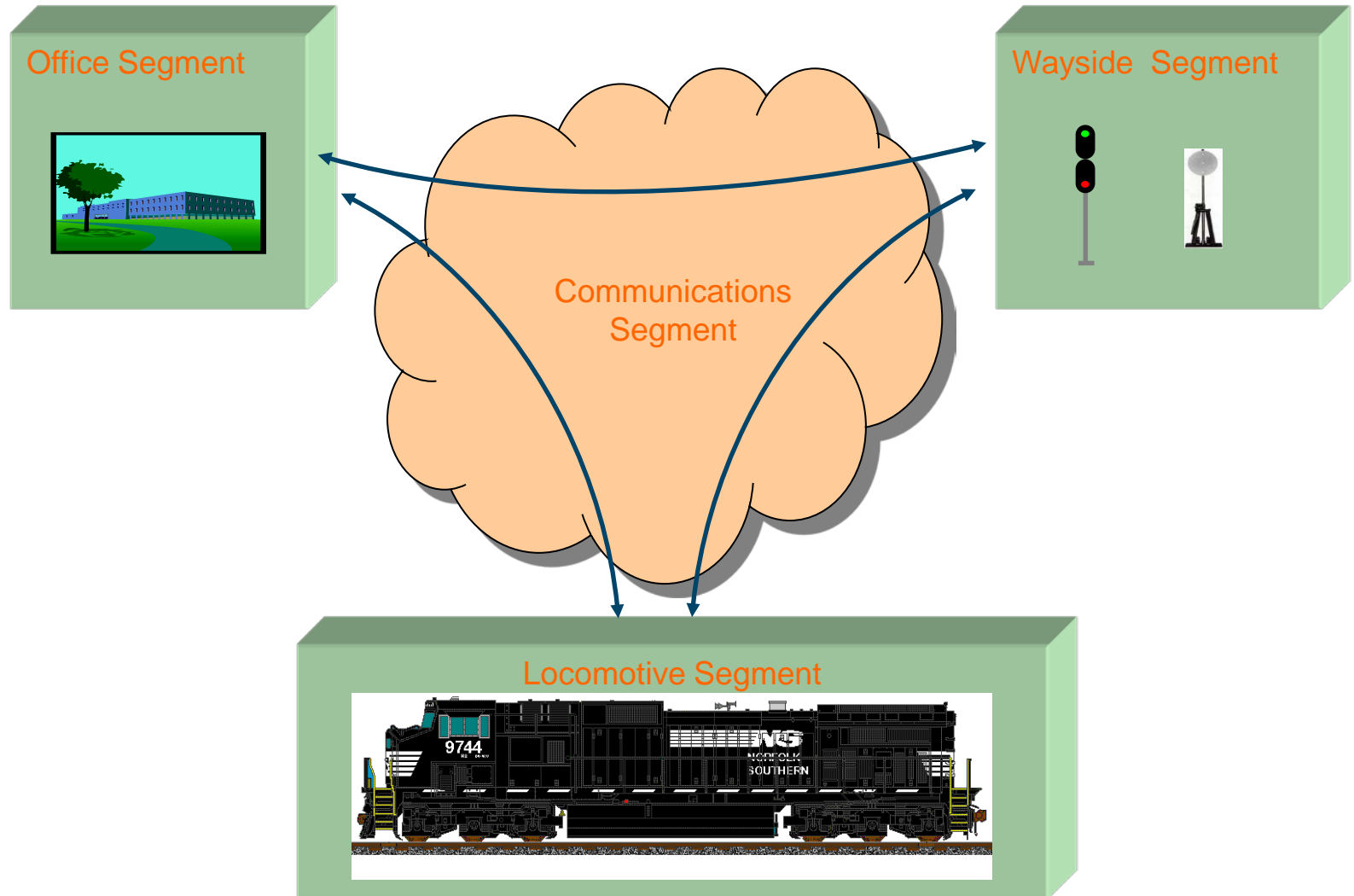
# PTC – What it is Not

Because it is an overlay, PTC

- Does not change the method of operation
- Does not replace the existing signal system where one exists



# PTC – How Does it Work ?



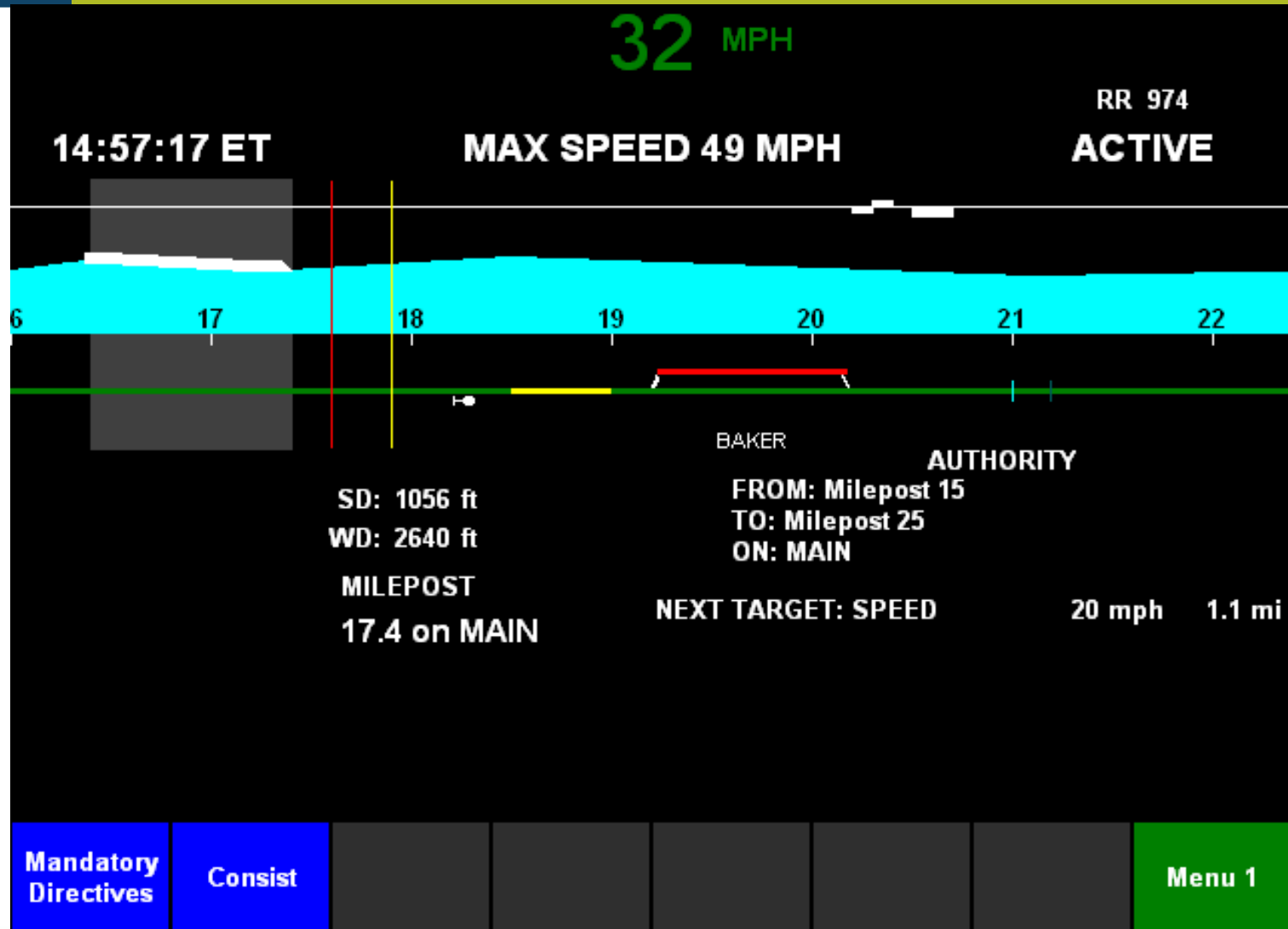


# Cab Display Unit





# Cab Display Unit







# What is the Scale of PTC Deployment ?

## Locomotives



There are approximately 24,000 locomotives in the Class I fleet  
Both mainline and local locomotives may be equipped  
Class II and III fleets are not yet required to be equipped  
Approximately **17,000 Class I locomotives** will need to be equipped with PTC  
Approximately 4500 commuter locomotives and cab cars to be equipped

▶ **71 percent of the Class I locomotive fleet will need to be equipped with PTC**

## Network



There are 94,209 route miles of Class I mainline track and 139,326 track miles of mainline in the US  
PTC will be installed on both signaled and non-sigaled Class I mainline tracks  
PTC will need to be installed on an estimated **73,467 Class I route miles**  
51,545 miles with CTC systems  
8,916 miles with ABS systems  
13,006 miles non-sigaled

▶ **78 percent of Class I mainline route miles will need to be equipped with PTC**



# ... And the Installation Cost ?

In 2009, FRA estimated installation at about \$5 billion for freight railroads alone, \$5.8 billion for the national system.

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As the industry gains a better understanding of the complexity of the system, the installation process and the limitations of existing technology, publicly announced preliminary cost estimates now exceed FRA's number by a substantial margin.

Publicly announced costs for Class I's -	\$5.8 billion
Publicly announced costs for Commuters -	\$2.0 billion
Publicly announced cost for Amtrak -	\$0.3 billion
<u>Total publicly announced costs for all -</u>	<u>\$8.2 billion</u>



# Why Aren't the Business Benefits Greater ?

Previously Stated PTC Benefit	Oliver Wyman Estimate	Oliver Wyman Rationale
Communications for Precision Dispatching	\$190.9 M	Precision dispatching implemented separately from PTC Some benefit from increased location data provided via GPS
Line Capacity	\$191.6 M	Overlay system may actually reduce line capacity Sole benefit from dynamic track authority support in dark territory
Fuel Economy	\$0	All sources of benefit are dependent on technologies being developed and implemented that are not tied to PTC
Train Work Events	\$0	Railroads have implemented or will implement technology not tied to PTC that provides this benefit
Track Maintenance Work Blocks	\$0	Railroads have already implemented working technological solutions not tied to PTC
Locomotive Service Robustness	\$0	Railroads already possess relevant technology not ties to PTC. Reliability issues from additional PTC components may offset
Elimination of Track Circuits, Line Signals	\$30.7 M	Only selected signals could be removed, track circuits remain with PTC overlay system – any change requires FRA approval
Railcar Velocity	\$0	Overlay PTC may actually reduce velocity Most velocity benefits tied to precision dispatching, not PTC
Shipper Benefits	\$0	All sources of benefit are dependent on technologies being developed and implemented that are not tied to PTC
<b>Total Benefit</b>	<b>\$413.2 M</b>	

Note: All benefits are shown in 2009 dollars on a net present value basis, using a 7 percent discount rate and a 20-year planning horizon.



# What Are the Business Risks Going Forward?

## Key Issues-

- New technology
  - Cost escalation
  - Complexity and reliability
  - Communications
- Loss of Capacity

## Key Impacts -

- Priority access to scarce capital
  - Driven by legal deadline
  - Limits other technology innovation
- Interoperability mandate constrains future technology adaptations



# What Now ?

- April 16, 2010 – 40 railroads submitted PTC Implementation Plans and PTC Development Plans or a Notice of Product Intent.
- July 15, 2010 – Deadline for FRA to approve or disapprove all PTCIPs, identifying specific areas in which the plan is deficient.  
As of February 7, 2011-
  - FRA had approved 23,
  - Had provisionally approved 14, and,
  - Had disapproved 3.
- On March 2, 2011 AAR and FRA agreed to delay court hearings on issues related to PTC implementation rules pending reopening of rulemaking proceedings on the breadth of PTC application.



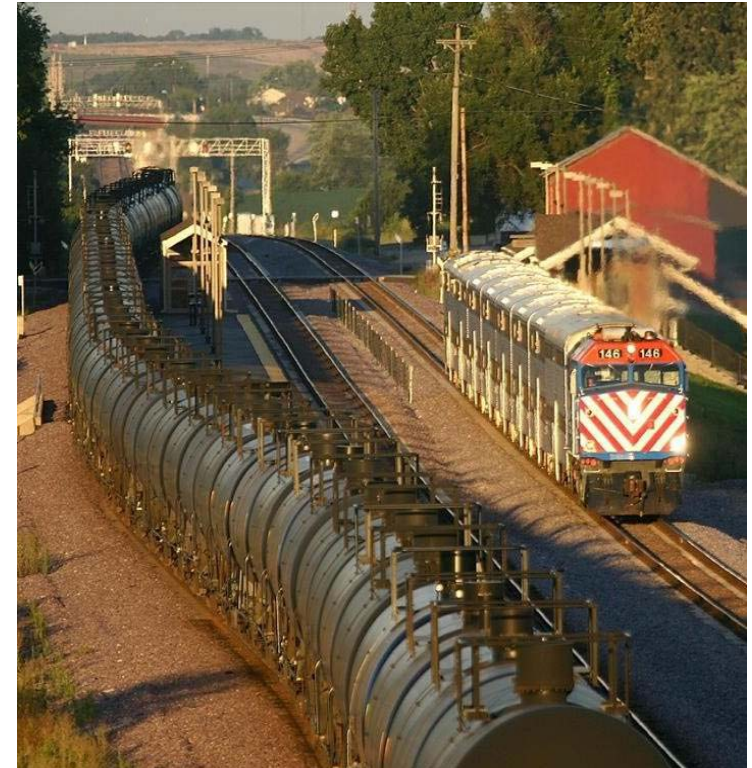
# Nature of the Court Approved Agreement?

- FRA has agreed to open a rulemaking on the footprint required for PTC installation and whether it should be based on traffic patterns of 2008 or 2015.
- Should AAR so petition, FRA will open rulemakings on limited operations, yard operations and en-route system failures
- Should eventual agreement be reached on these issues, AAR will withdraw its court action against FRA.



# Positive Train Control Implications

- Will absorb most growth capital and capacity improving technology spending for next 6 years.
- Will absorb capital otherwise used for productivity improvement ultimately resulting in a more expensive rail system.
- First generation systems will reduce capacity of rail network.
- Ongoing operating expense will reduce net operating income equal to 40% of growth capital.
- Thus, PTC may represent a long-term threat to rail capacity enhancement.





# Association of American Railroads

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