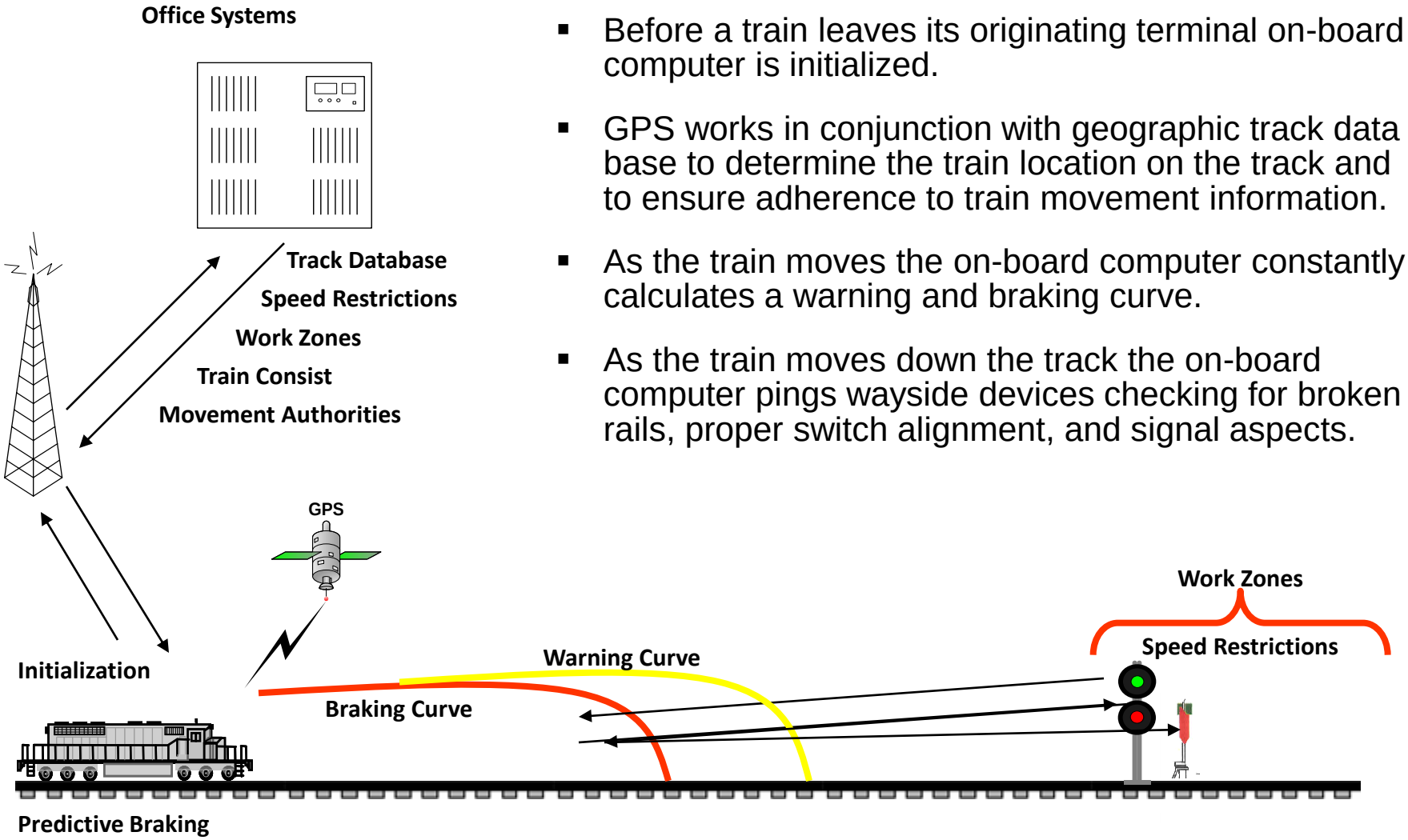
Positive Train Control (PTC): Alaska Railroad Status

Senate Finance Committee
January 28, 2014

AlaskaRailroad.com

How PTC Works



- Before a train leaves its originating terminal on-board computer is initialized.
- GPS works in conjunction with geographic track data base to determine the train location on the track and to ensure adherence to train movement information.
- As the train moves the on-board computer constantly calculates a warning and braking curve.
- As the train moves down the track the on-board computer pings wayside devices checking for broken rails, proper switch alignment, and signal aspects.

Why PTC?

Over the last four decades, the National Transportation Safety Board (NTSB) has investigated a long list of accidents in which crewmembers failed to operate their trains effectively and in accordance with operating rules.

Because of these human performance deficiencies, the NTSB has advocated for systems that would compensate for human error and prevent train collisions.

Why Mandatory PTC Regulations?

Two major railroad accidents (2005 at Graniteville, South Carolina and 2008 at Chatsworth, California) were cited as PTC preventable accidents during Congressional hearings that resulted in legislation leading to the unfunded PTC mandate.

- **Graniteville, 1/6/2005:** A *Norfolk Southern* train was diverted through a manual switch improperly lined for main track movement and collided with a parked train. 44 cars derailed including three tank cars containing chlorine gas. One tank breached releasing 60 tons of gas. Fatalities – 8; Injuries - 500+; Evacuated 5,400 people for two weeks; Cost - $190+ Million.

Why Mandatory PTC Regulations?

continued

- **Chatsworth, 9/12/2008:** A *Metrolink* train passed a “red” signal while the engineer was texting, entering a single main track where a UP freight train was authorized to operate. The trains collided. Fatalities – 25; Injuries - 130+ serious; Cost - $200 million, met the federal passenger rail liability cap.

2008 Rail Safety Improvement Act: Who must implement PTC?

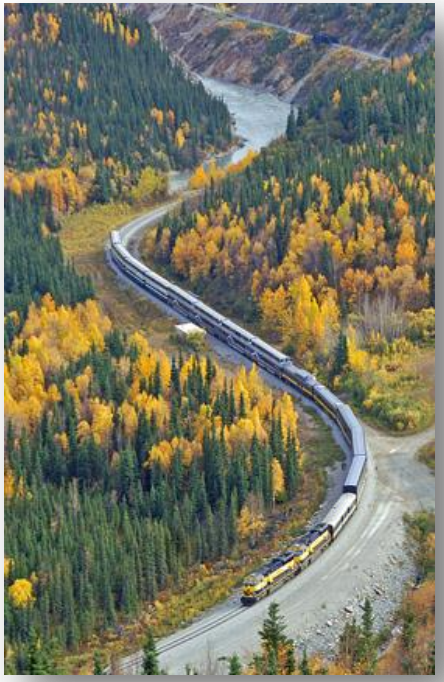
Act mandates a PTC Implementation Plan with a December 31, 2015 implementation for:

1) Class I railroad carriers; and
2) **each entity providing regularly scheduled intercity or commuter rail passenger transportation (i.e. ARRC)**

And the PTC must govern operations on:

a. Mainline used for passenger/commuter rail transport
b. Mainline used by hazmat freight transport
c. Other tracks prescribed by regulation or order

Why PTC for ARRC?



Large number of passengers per train moving through curvy, remote territory.

2010 PTC Regulation Requirements

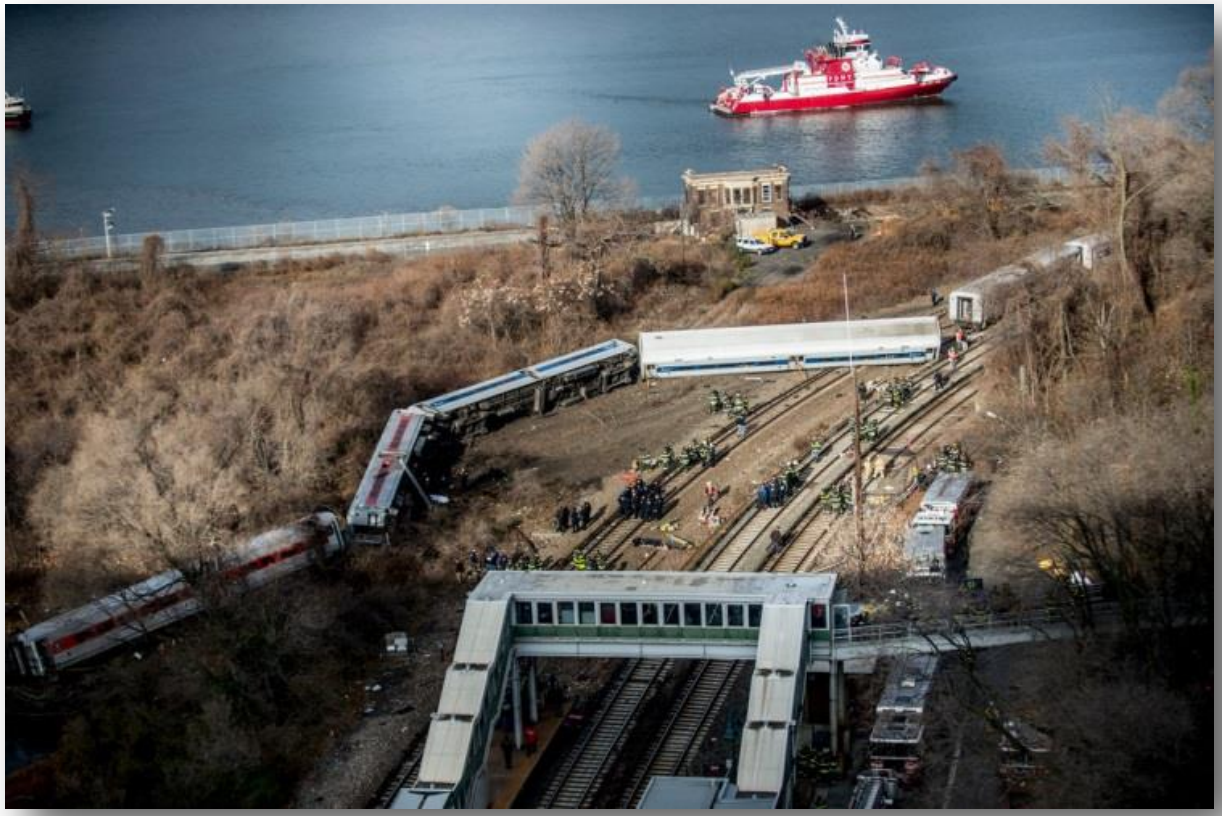
2010 regulations require PTC systems to **reliably** and **functionally** prevent:

1) Train-to-train collisions by enforcing authority limits
2) Overspeed derailments
3) Incursions into established work zone limits
4) Train movement through a main line switch in the improper position.

December 1, 2013 Accident

National Transportation Safety Board (NTSB) :

- **Added PTC to the "Most Wanted List" in 2012 due to number of train accidents**
- **NTSB wants railroads to do more to implement PTC.**



4 killed, 63 injured in the Bronx, NY on Metro-North Passenger train that was going 82 MPH in a 30 MPH curve. Nodding off is suspected, investigation underway.

Items PTC Does Not Address

PTC is NOT designed to protect against derailments caused by, among other things:

- **equipment failures** such as broken wheels, pulled drawbars and seized journals;
- **infrastructure conditions** such as washouts, rock slides and some broken rails and heat kinks; and
- **external factors** such as grade crossing accidents or deliberate vandalism.

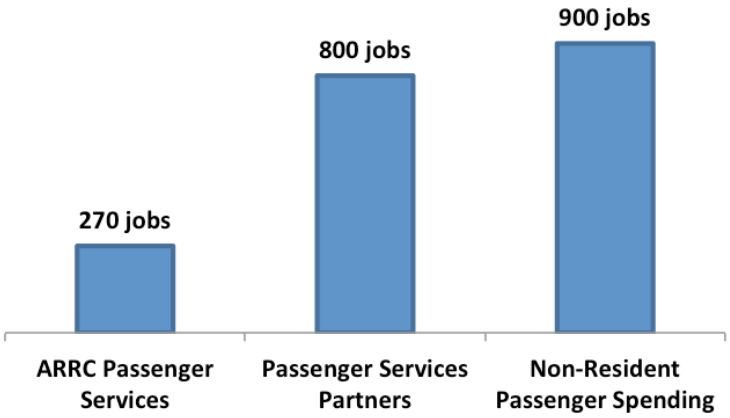
What if ARRC Does Not Comply?

Federal law provides penalties for non-compliance:

- FRA authority to fine 61 different PTC-related violations
- Maximum FRA fine is $16,000 per day per violation and $25,000 per day for each “willful” violation.
- FRA rail safety law compliance pertains to “persons” so both the corporation and individuals are on the hook.
- Prohibit passenger service

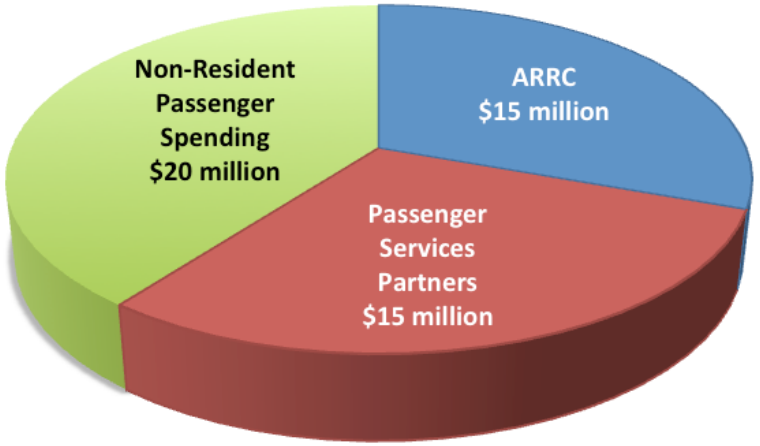
Loss of Passenger Service

A total of just under 2,000 jobs are connected in some way to Alaska Railroad's passenger services.



ARRC Passenger Services-Related Employment, 2012

Approximately $50 million in labor income is related to Alaska Railroad's passenger services.



ARRC Passenger Services-Related Labor Income, 2012

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Loss of Passenger Service

Discontinuation of Alaska Railroad's passenger services would have significant impacts not only on the Railroad, but on the Railbelt's visitor economy and infrastructure.

- Loss of all ARRC jobs and wages associated with providing passenger services.
- Loss of all ARRC passenger-related income, jobs, and wages in 275 businesses that provide goods and services to ARRC in support of its passenger operations.
- Unknown economic effects on ARRC's visitor industry partners, who would be challenged to replace the popular, scenic, high-amenity-value rail service with some other form of transportation with equal customer appeal.
- Loss of federal funding opportunities available to public transportation providers.
- Unknown, but certain redistribution of (and potential loss of) visitor spending in the region, as railroad passengers seek to replace their rail experience.
- Estimated 3,700 additional motorcoach trips along the Parks and Seward Highways and other areas served by the Railroad, with traffic congestion and highway maintenance impacts. There could also be increases in RV, van, rental vehicle, personal vehicle, and/or airplane usage as a large number of visitors will be forced to find alternative transportation methods.

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ARRC Facts

Territory to be covered by PTC:

- 525 Miles of track
- 54 Locomotives and cab cars
- 36 Signal Control Points
- 108 Switches to be monitored
- Commercial power not available in many locations that are required to be monitored

PTC Operations at ARRC

PTC is used in conjunction with a railroad's current train operation controls, providing a **safety overlay** to eliminate human errors. ARRC's train operations include:

- **Centralized Traffic Control**
  Train movement based on signal remotely called by a dispatcher.
- **Track Warrant Control**
  Train movement based on dispatcher providing a movement authority and transmitting verbally the limits of the authority.

Origin of PTC at ARRC

ARRC began voluntary implementation of PTC in 1997.

- FRA no longer allows other track equipment to operate on “track car lineup”.
- Method of Operation changed from train orders to industry standard Track Warrant Control to accommodate a Computer-aided Dispatch (CAD) – implemented in 1999. CAD was implemented to eliminate human-factor errors due to issuing conflicting authorities.
- UP and BNSF test Positive Train Separation System to/from Oregon to Washington.
- VP Transportation wanted to eliminate human-factor error that caused a near-miss between a NB freight and a SB loaded coal train near Montana Creek on June 30, 1995.

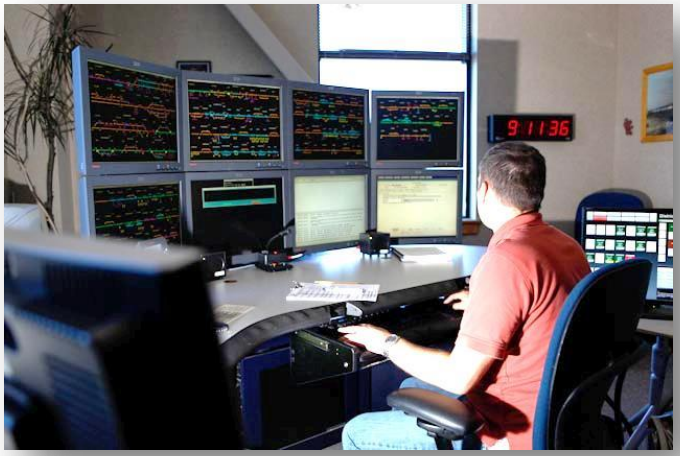
ARRC PTC Implementation History

1997-2001: GE Harris proposes a phased PTC system – failed due to issues with GE Harris digital radio system. Implemented a Computer-Aided Dispatch system to reduce dispatcher-issued overlapping authorities (human error) and verbal errors.

2003: Limited Notice to Proceed to Quantum Engineering Inc. (QEI) for Collision Avoidance System documentation including Safety Case. QEI did not successfully deliver documentation.

2003: Contracted with US&S to deliver Computer-aided Dispatch (CAD), placed in revenue service May 2005. GE-Harris had withdrawn CAD maintenance support.

2004: Installation of Meteor Communications Inc. (MCC) Data Radio Network with integrated GPS. Implemented locomotive tracking that increased situational awareness of train movements.



ARRC PTC Implementation History

2004: Contract with Ansaldo STS US (ASTS) to deliver Safety Server and On-Board Computers. After rulemaking related to 236 Subpart I, ASTS requested a change order for rough order of magnitude (ROM) of $20 M and had not addressed the “not required” monitoring of manual switches.

2010: Termination of Contract with ASTS to provide Collision Avoidance System when ROM change order (CO) could not be reduced and radio vendor was purchased by BNSF, UP, CSX and NS.

2010: Contract with Wabtec Railway Electronics (WRE) to replace CAD and begin negotiations for Phase II including installation of back office servers and locomotive train management computers.

2012: Develop prototype design and order of wayside manual switch monitoring bungalows based on GE specifications provided by Interoperable Train Control (ITC) committee. Order MCC data radios for pilot corridor. Work on arranging RF spectrum through the PTC 220 LLC.

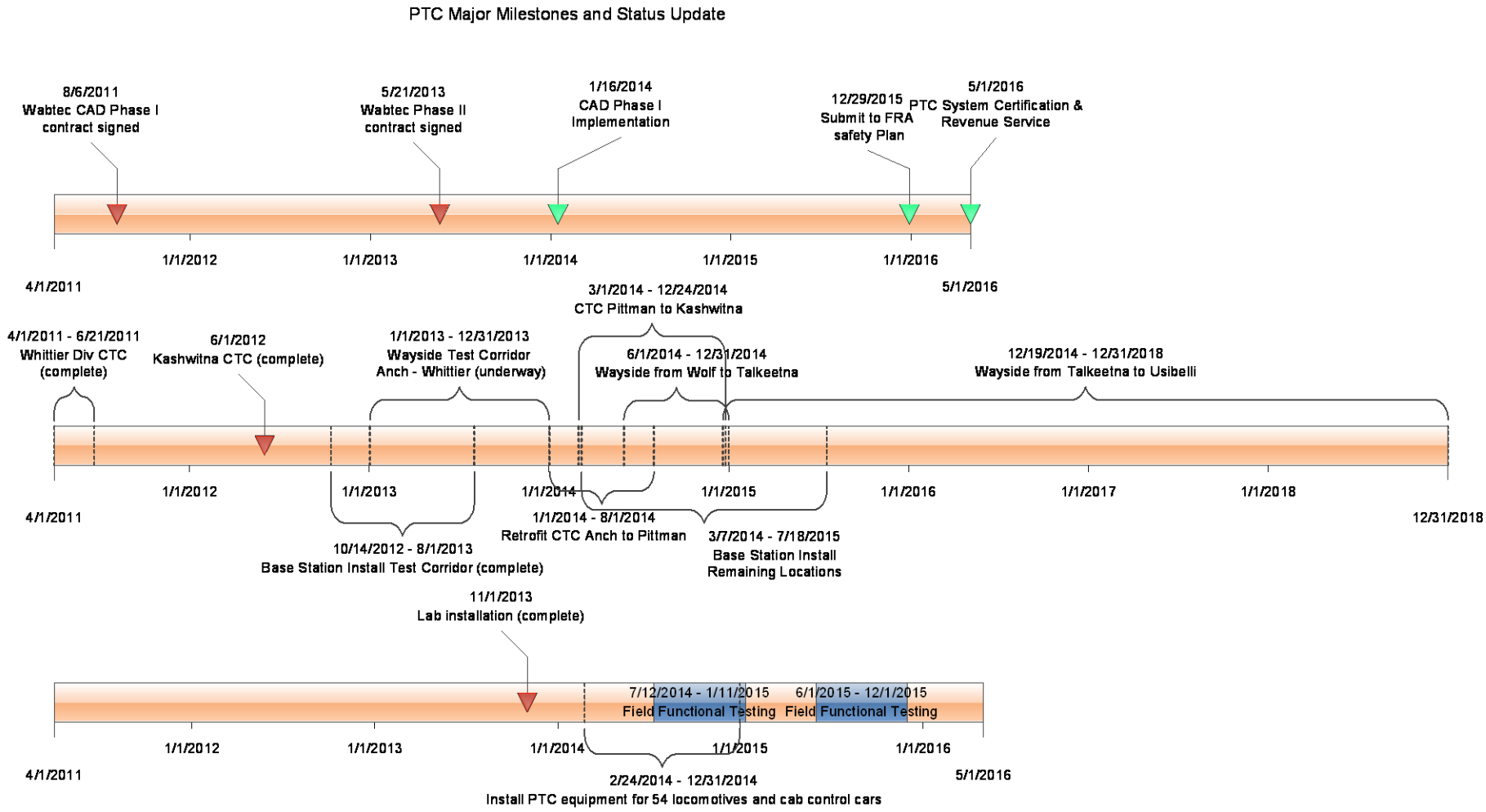
2014: WRE CAD in place and operational.

Current PTC Implementation Status

- Replaced Ansaldo STS US (ASTS). Replacement CAD is by Wabtec Railway Electronics.
- Implementation of Data Radio System and wayside monitoring equipment for testing in the pilot corridor (Anchorage to Whittier) is underway.

- GIS data of railroad critical features is being prepared.
- Completed contract negotiations with Wabtec for locomotive equipment , additional office servers and associated software. Installation is underway.
- Working with FRA on exemption for manual switch monitoring on low passenger density track through approval of PTC Implementation Plan.

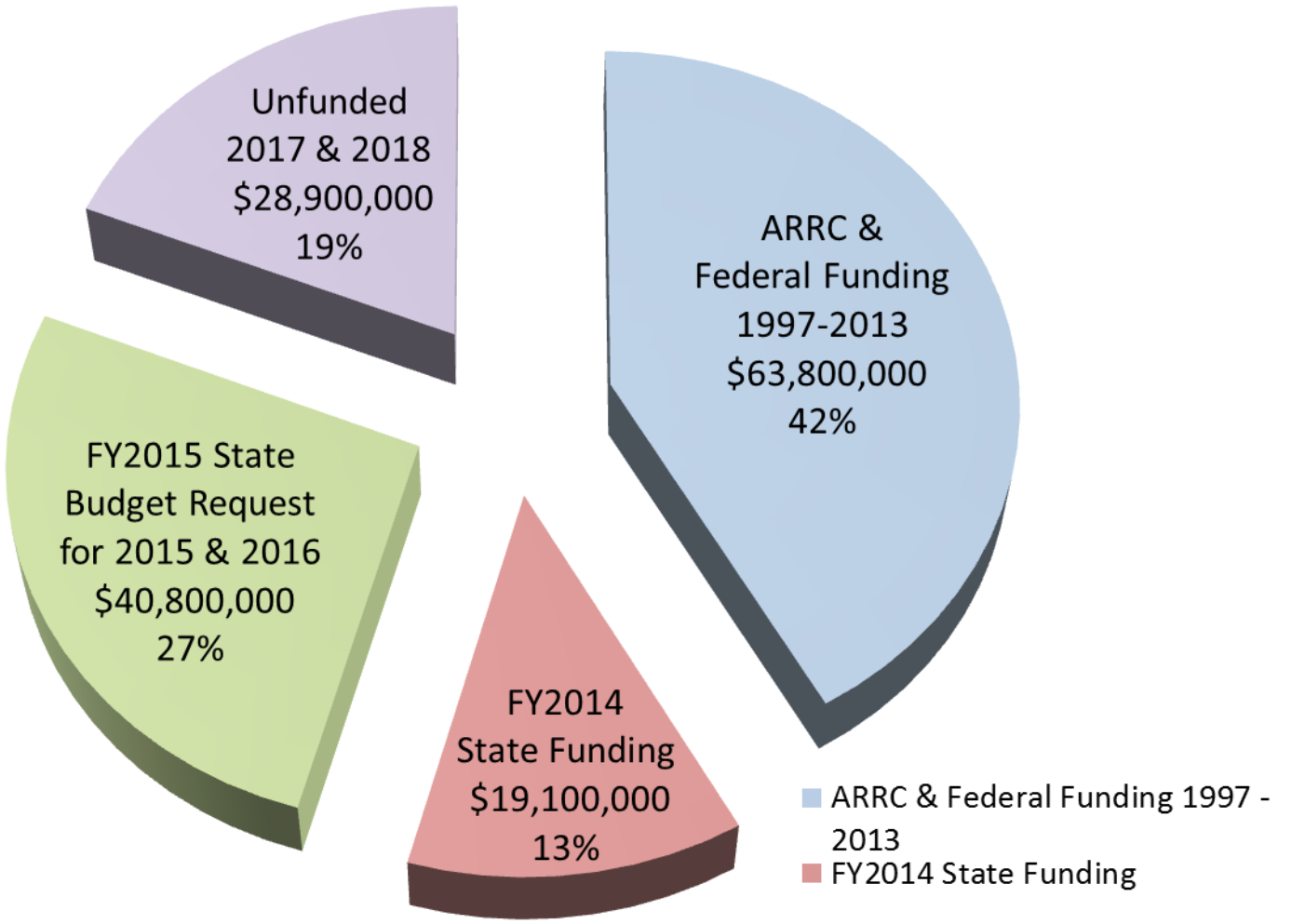
PTC Implementation Schedule



PTC Deadline Extension Status

- A Moving Target: Regulations still being written by FRA affecting cost and implementation planning – ARRC's participation in FRA and Association of American Railroads (AAR) committees vital
- Most railroads will not make the 2015 deadline
- Organizations all support extension of the deadline to at least 2018.
- Alaska Railroad making "good faith effort" to implement PTC

Positive Train Control Funding 1997 - 2018



Graph does not include $5 million to $6 million on-going annual operational and maintenance cost of PTC that will be funded by ARRC.

PTC Spending
1997 - 2013

through December 31, 2013	Federal Funds/ARRC	State FY14 Funds	Total
Overall PTC Integration and Management	$26,557,997	$4,181,500	$30,739,497
Office Segment	$17,591,965	$2,253,035	$19,845,000
Locomotive Segment	$3,663,749	$3,813,210	$7,476,959
Communications Segment	$7,803,271	$3,815,220	$11,618,491
Wayside Device Monitoring	$8,197,729	$5,037,035	$13,234,764
Total	$63,814,711	$19,100,000	$82,914,711
Funds Committed	100%	72%	
Funds Spent	94%	8%	

ARRC 2015 – 2018 PTC Unfunded Budget

	2015	2016	2017	2018	Total
Office, Comm and Locomotive Segments	**$ 10,784,110**	**$ 7,717,322**	**$ 5,756,240**	**$ 4,556,240**	**$ 28,813,912**
Overall PTC Integration and Management	$ 4,759,697	$ 4,267,322	$ 3,106,240	$ 2,906,240	**$ 15,039,499**
Locomotive Segment	$ 3,420,509	$ 800,000	$ 1,300,000	$ 300,000	**$ 5,820,509**
Communications Segment	$ 1,483,904	$ 1,300,000	$ 300,000	$ 300,000	**$ 3,383,904**
Office Segment	$ 1,120,000	$ 1,350,000	$ 1,050,000	$ 1,050,000	**$ 4,570,000**
Wayside Segment	**$ 9,414,400**	**$ 12,911,600**	**$ 10,467,000**	**$ 8,102,600**	**$ 40,895,600**
Monitoring CTC Signal and Switches	$ 2,000,000				**$ 2,000,000**
Dark Territory Manual Switch Monitoring	$ 7,414,400	$ 12,911,600	$ 10,467,000	$ 8,102,600	**$ 38,895,600**
Total Funds Required	**$ 20,198,510**	**$ 20,628,922**	**$ 16,223,240**	**$12,658,840**	**$ 69,709,512**

Passenger RR Funding Examples

Metrolink:

- Budget is $211 million received from state and local sources and some discretionarily re-directed federal funds from the CA DOT (high-speed rail funds for the Metrolink line on a high-speed rail corridor).
- Received $9.3 million from the state DOT bond sales for overruns due to vendor

Caltrain:

- PTC Budget is $213 million, funded with High-speed rail program funds.

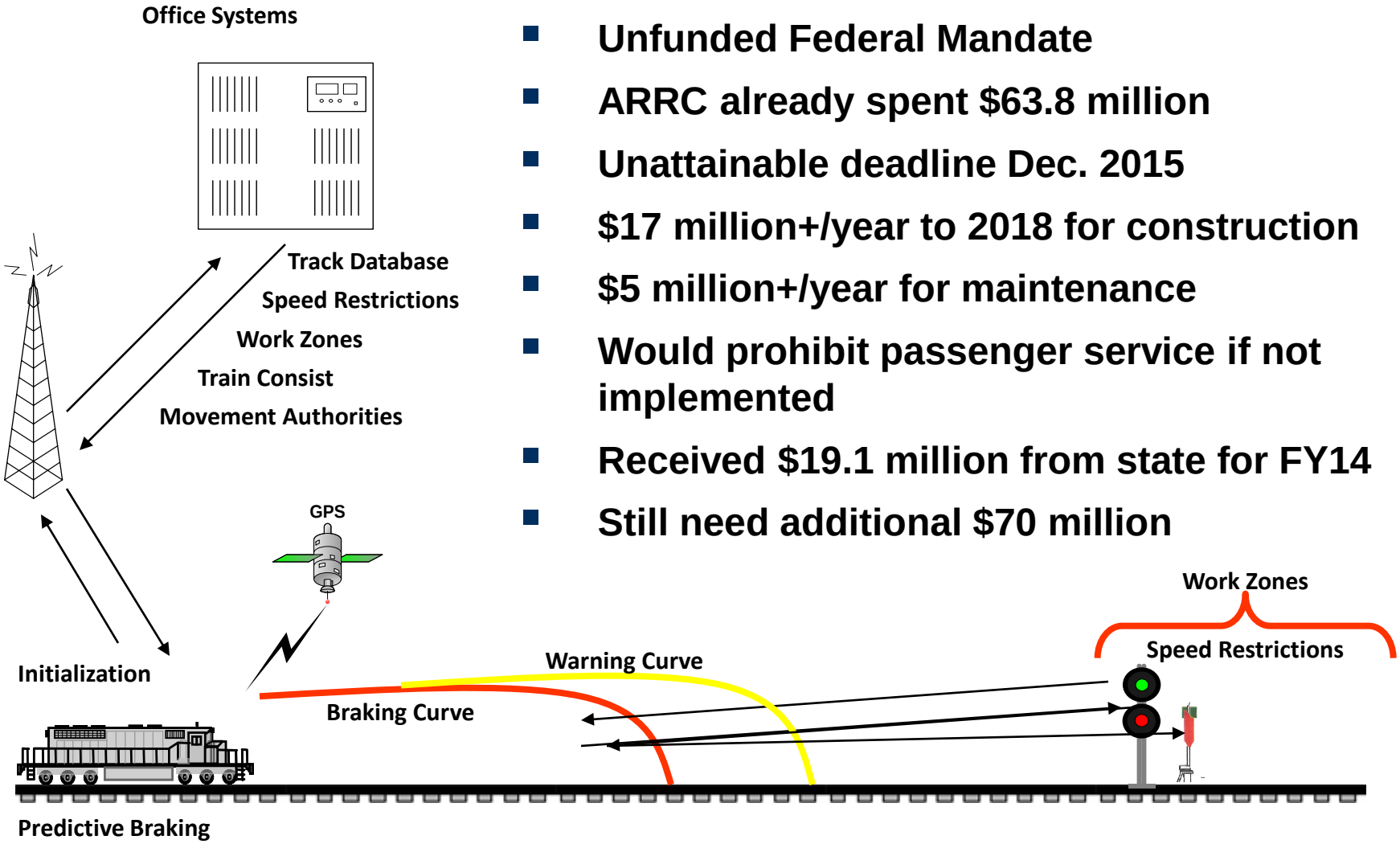
Denver RTD:

- FTA full-funding grant agreements matched 50% by state and local funds.

Trinity Rail Express:

- Partial funding from North Central Texas Council on Government. Rest to be identified.

Positive Train Control



- Unfunded Federal Mandate
- ARRC already spent $63.8 million
- Unattainable deadline Dec. 2015
- $17 million+/year to 2018 for construction
- $5 million+/year for maintenance
- Would prohibit passenger service if not implemented
- Received $19.1 million from state for FY14
- Still need additional $70 million