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THE STATE OF POSITIVE TRAIN CONTROL IMPLEMENTATION IN THE UNITED STATES

(114–23)

HEARING

BEFORE THE

SUBCOMMITTEE ON
RAILROADS, PIPELINES, AND
HAZARDOUS MATERIALS

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

JUNE 24, 2015

Printed for the use of the
Committee on Transportation and Infrastructure

Available online at: http://www.gpo.gov/fdsys/browse/
committee.action?chamber=house&committee=transportation

U.S. GOVERNMENT PUBLISHING OFFICE

95–230 PDF WASHINGTON : 2015

For sale by the Superintendent of Documents, U.S. Government Publishing Office
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Committee on Transportation and Infrastructure
U.S. House of Representatives

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Washington, DC 20515

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June 19, 2015

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Railroads, Pipelines, and Hazardous Materials
FROM: Staff, Subcommittee on Railroads, Pipelines, and Hazardous Materials
RE: Hearing on "The State of Positive Train Control Implementation in the United States"

PURPOSE

The Subcommittee on Railroads, Pipelines, and Hazardous Materials is scheduled to meet on Wednesday, June 24, 2015, at 10:00 a.m. in 2167 Rayburn House Office Building to receive testimony on the status of implementing positive train control (PTC) on the freight and passenger rail network by the December 31, 2015, deadline.

BACKGROUND

The Rail Safety Improvement Act (RSIA), Pub. L. 110-432, Division A, included a number of provisions meant to improve safety of freight and passenger rail operations for the benefit of rail passengers, railroad employees, and communities. One of the major safety features of RSIA was the requirement that certain freight, commuter, and passenger rail lines install PTC by December 31, 2015.

The PTC mandate was in response to a September 12, 2008, accident in California, where a Metrolink commuter train collided head-on with a freight train in the Chatsworth district of Los Angeles, California. The scene of the accident was a curved section of single track on the Metrolink Ventura County Line just east of Stoney Point. According to the National Transportation Safety Board (NTSB), which investigated the cause of the collision, the Metrolink train ran through a red signal due to the engineer being distracted by text messages. After running the red signal, the commuter train entered a section of single track where the opposing freight train had been given the right of way by the train dispatcher. In the resulting collision, the Metrolink locomotive telescoped into the passenger compartment of the first passenger car and caught fire. All three locomotives, the leading Metrolink passenger car and seven freight cars, were derailed, and both lead locomotives and the passenger car fell over. Tragically, there were 25 fatalities and 135 other individuals were injured.

Section 104 of RSIA amends title 49 of the United States Code to add a new section 20157, Implementation of positive train control systems. This section mandates that Class I railroad carriers and intercity passenger rail and commuter rail entities must implement PTC systems by December 31, 2015, on: (1) lines over which intercity passenger rail or commuter rail are operated; (2) main freight lines over which poison- or toxic-by-inhalation hazardous materials are transported; and (3) such other tracks as the Secretary may prescribe by regulation or order.

The Association of American Railroads (AAR), the American Public Transportation Association (APTA), and the Federal Railroad Administration (FRA) have reported that most railroads will not have PTC fully implemented by the deadline. While freight railroads have made strides toward implementing PTC, it will not be fully operational on the entire network by the December 2015 deadline. In general, commuter railroads must wait until freight railroads and Amtrak equip the rail lines they operate on, and most commuter railroads do not expect to meet the 2015 deadline.

Elements of Positive Train Control

"Positive train control" describes technologies designed to automatically stop or slow a train before certain accidents caused by human error occur — specifically, train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where maintenance activities are taking place, and movement of a train through a track switch left in the wrong position. A fully functional PTC system must be able to precisely determine the location and speed of trains; warn train operators of potential problems; and take action if the operator does not respond to a warning. For example, if a train operator fails to stop a train at a stop signal, the PTC system would apply the brakes automatically.

To install PTC, there are two primary types of systems—overlay and standalone— that functionally meet the PTC requirements in RSIA. An overlay system allows railroads to install PTC components over existing rail infrastructure and operate the train in accordance with the existing signals and operations in the event of a PTC system failure. Almost all railroads required to install PTC are installing overlay systems because it makes it more feasible to meet the PTC implementation deadline than installing a standalone system.

Of the various PTC overlay systems that have been developed, all seven major freight railroads in the United States plan to implement Interoperable Electronic Train Management System (I-ETMS), which will account for most of the approximately 60,000 miles of track. Amtrak is implementing Advanced Civil Speed Enforcement System (ACSES) on the Northeast Corridor. Although ACSES and I-ETMS are functionally similar, they differ technologically. To determine train location, ACSES relies on track-embedded transponders, while I-ETMS uses Global Positioning System (GPS) information. Since most commuter railroads run over tracks owned by freight railroads or Amtrak, they are largely implementing the same systems developed by the freight railroads or Amtrak. For example, eight commuter rail systems that

operate over Amtrak infrastructure on the Northeast Corridor—including major commuter systems in the New York City, Philadelphia, and Boston areas—are installing ACSES.[1]

To implement PTC that meets the requirements of the RSIA, railroads are developing more than 20 major components that are currently in various stages of development, integrating them, and installing them across the rail network. AAR recently reported that as of April 2015, railroads had spent $5 billion on PTC implementation, yet significant challenges still remained.[2] Similarly, APTA reported that, as of May 2015, commuter railroads had spent nearly $1 billion on PTC implementation of the estimated $3.48 billion in total cost for commuters. Even with these levels of spending, a lot of work remains to be done.

PTC Mandate Impact on Freight Railroads

AAR issued a report in April 2015 updating Congress and interested stakeholders on the implementation of PTC by freight railroads. In terms of installation, AAR reported that about half of wayside interface units, which are needed to communicate data, had been installed; 50 percent of locomotives needing upgrades had been fully equipped; and just over half the signals needing replacement had been completed.

Unfortunately, over the last several years, the freight railroads have been working through a backlog of submissions to the Federal Communications Commission (FCC) for review of wayside antennas under the historic preservation laws. The FCC had placed a year-long moratorium on all new wayside antenna reviews, because its process for review was not able to handle the over 22,000 antennas needed to implement PTC. While FCC has established a new procedure for the reviews, it still takes approximately two months per submission for the FCC to complete each review.

In addition to resolving the FCC process, AAR reports that accomplishments over the last year or so include:

- Submittal of a revised PTC Development Plan to include FRA required enhancements to the I-ETMS system;
- Development of PTC Safety Plans which must be submitted to FRA prior to FRA certifying the PTC systems;
- Approval from FRA in April to utilize shared brake testing results and the resources of TTCI to further validate the I-ETMS brake algorithm in lieu of extended live field brake test of "worst case" conditions;
- Field qualification testing of PTC on Class I railroads; and
- Establishment of AAR's committee on PTC standards.[3]

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[1] U.S. Gov't Accountability Office, GAO-13-720, Positive Train Control: Additional Authorities Could Benefit Implementation (2013).
[2] Assoc. Am. RRs, PTC Implementation: The Railroad Industry Cannot Install PTC on the Entire Nationwide Network by the 2015 Deadline 13 (Apr. 2015).
[3] Id. at 1-2.

While progress has been made, significant challenges remain, including:

- Wayside implementation continues to be constrained by the limited number of firms that provide signal design services and the scope of the redesign task;
- Signal systems must be redesigned and replaced at approximately 6,400 locations before PTC wayside can be installed at locations;
- Wayside design and installations will extend into 2018;
- The track database must be validated mile-by-mile (the display the crew sees via onboard systems reflects what is shown by railroad signals);
- Limited expertise available to accelerate design and development;
- I-ETMS Back Office Server (BOS) software will not be released until late 2015;
- 60 percent of Class I employees must receive PTC training; and
- PTC must be implemented in phases, starting with less complex areas and proceeding to more complex areas.[4]

AAR concludes that an interoperable PTC system will not be implemented by the December 31, 2015, deadline.[5] It is not clear how this deadline will be enforced by FRA, nor is it clear how this will affect the freight railroads' duty to carry TIH/PIH materials under their common-carrier obligation.

PTC Mandate Impact on Commuter Railroads

There are currently 23 commuter railroads operating in the United States. Commuter railroads have serious concerns about the underlying mandate itself, particularly given that they are public agencies managed at the local level by transit agencies and receive federal capital grant funds through the Federal Transit Administration (FTA). The FTA formula grant funds are required for ongoing system maintenance and modernization, and the estimated $3.48 billion[6] price tag for implementation of PTC on commuter rail systems is not within reach for commuter rail agencies. In fact, most transit agencies in the United States have had to cut service or increase fares to make up for declining local and state support over the last two years. Commuter railroads argue that the PTC mandate could have the unintended consequence of degrading system safety by requiring the deferral of needed state of good repair projects in order to fund initial phases of PTC.

Commuter railroads are also concerned about the issues of interoperability and spectrum allocation. Because commuter railroads often run over tracks owned by a Class I freight railroad, their PTC systems must be interoperable with the system installed by the freight railroad. Some commuters operate on both freight and Amtrak lines, therefore, requiring that they equip their locomotives and other primary movers with both I-ETMS and ACSES compatible systems.[7] Additionally, 220 MHz radio spectrum is necessary to allow the wireless communications between train locomotives, wayside equipment, dispatch centers, and communications

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[4] Id. at 2-3.
[5] Id. at 13.
[6] Am. Public Transp. Ass'n, Positive Train Control: An Assessment of PTC Implementation by Commuter Railroads 4 (Apr. 2015).
[7] Id. at 8.

subsystems that make up a PTC network.[8] The freight railroads have been successful in securing enough spectrum bandwidth for the freight PTC installation, but commuter rail systems operate in and near cities, where there is already strong demand for radio spectrum. The commuter railroads are concerned that there will not be sufficient spectrum for effective PTC implementation. Furthermore, APTA members report that 4,900 locomotives and passenger cars with control cabs would need to be equipped with PTC technology.[9] APTA states that there are 8,300 miles of lines that need to be equipped and only 40 percent of that mileage will be completed by the end of 2015.[10] Indeed, full implementation by APTA members is not projected to be completed until 2020.[11]

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[8] Id. at 4,8.
[9] Id. at 6
[10] Id. at 10.
[11] Id.

WITNESS LIST

Ms. Sarah Feinberg
Acting Administrator
Federal Railroad Administration

Mr. Charles Mathias
Associate Bureau Chief
Wireless Telecommunications Bureau
U.S. Federal Communications Commission

Mr. Frank Lonegro
Vice President - Service Design
CSX Transportation

Mr. Donald Orseno
Executive Director/Chief Executive Officer
Metra Commuter Railroad

Mr. Russell Kerwin
Deputy Project Manager, Positive Train Control
Metrolink/AECOM

THE STATE OF POSITIVE TRAIN CONTROL IMPLEMENTATION IN THE UNITED STATES

WEDNESDAY, JUNE 24, 2015

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m., in room 2167, Rayburn House Office Building, Hon. Jeff Denham (Chairman of the subcommittee) presiding.

Mr. DENHAM. The subcommittee will come to order.

Good morning. Welcome to the Subcommittee on Railroads, Pipelines, and Hazardous Materials. Our hearing today will focus on the implementation of PTC, Positive Train Control, in the United States, one of the most complex and costly safety mandates ever taken by the railroad industry.

Positive train control is a radio or GPS-based [Global Positioning System-based] system designed to automatically control trains to follow speed limits and avoid train-to-train collisions. Following the deadly commuter train crash in southern California, Congress mandated the installation of PTC on lines where certain hazardous materials are carried and any line on which passenger or commuter rail services operate.

The recent tragic Amtrak crash in Philadelphia has reminded us that, while these accidents are rare, they can happen, and PTC will make our rail network safer. This mandate was included in the Rail Safety Improvement Act of 2008, and Congress set an implementation deadline of December 31 of this year.

From the beginning, the PTC mandate was going to be a daunting undertaking to consider. What completely implemented PTC will require is 38,000 wayside interfaces, 18,000 locomotives to be upgraded, and 12,000 signals will need to be replaced.

While similar systems exist in Europe and on some portions of Amtrak's Northeast Corridor, PTC has never been implemented on such a scale and has never required such a high level of interoperability. Since the 2008 mandate was enacted, freight, passenger, and commuter railroads have spent the last 7 years working to implement PTC. According to the Association of American Railroads, freight rail has spent $5.7 billion to date on PTC and is expected to spend a total of $9 billion to fully implement it.

The American Public Transportation Association has estimated that commuter and passenger railroads will have to spend nearly $3.5 billion on PTC. In addition to the sheer cost and complexities

of the system, there have been many unexpected delays. The process of approving PTC poles along railroad right-of-way was delayed significantly when the Federal Communications Commission mandated that each pole go through an extensive review process.

The FCC eventually created a more streamlined process for those approvals, and we will hear from them today about how it is working. Commuter and passenger railroads have also struggled to buy the necessary radio spectrum for PTC, especially in our dense metropolitan areas.

Today we will discuss how long it will take to get PTC implemented across the country and what it will take to meet this current deadline. In closing, I look forward to hearing from our witnesses regarding these issues.

I would now like to recognize Ranking Member Michael Capuano from Massachusetts for any opening statement he may have.

Mr. CAPUANO. Thank you, Mr. Chairman.

I want to welcome the panel. I am looking forward to your testimony and the discussion we have. I think the chairman has said pretty much everything there is to say about PTC from our end of it.

Honestly, this is long overdue, in my estimation. And, honestly, I would like to find out—we all know where we are today. Tell me how we get to where we want to implement as quickly as we can because that is what America wants, that is what I want. And if you think you need Federal assistance, please say so. Be clear.

I say that because we have our own differences of opinion in the House and the Senate as to whether we should be putting funds up or not. And if you think we should, you should say so. I would like to hear that.

With that, I yield back. And I look forward to the testimony.

Mr. DENHAM. I now call on the full committee chairman, Mr. Shuster.

Mr. SHUSTER. Thank you, Chairman Denham, for holding this hearing today. I think it is important to start off by saying that the number-one top priority of this committee and the Department of Transportation is safety.

In general, rail safety trends have gone in the right direction over the past years. However, the terrible Amtrak incident in Philadelphia last month showed us that we should always remain focused on our efforts to improve rail safety.

As Chairman Denham said—and I believe it is worth repeating—Positive Train Control is one of the most ambitious, complex, and costly safety enhancements the railroad industry has ever undertaken.

I was the ranking member of the subcommittee in 2008 when Congress enacted the PTC mandate. We knew the mandate would be challenging, but we hoped that railroads would be able to meet that deadline 7 years into the future. Unfortunately, we know today that that will not be the case.

With a few exceptions, most railroads, including the largest Class I freight railroads, will not meet December's deadline. This has happened for a few reasons.

Technology has been more complicated especially to ensure interoperability between the railroads. Spectrum has been harder to ac-

quire particularly for commuter railroads that serve in densely populated metro areas. And, finally, the Federal Communications Commission's approval process for new telecommunication poles was not set up to handle the tens of thousands of poles needed to deploy PTC.

So I am looking forward to hearing from you today, the witnesses, where the PTC implementation stands, and your testimony will help us to consider how we move forward to deal with the mandate in an appropriate fashion.

With that, I yield back.

Mr. DENHAM. And I will call on Mr. DeFazio for any opening statement he may have.

Mr. DEFAZIO. Thank you, Mr. Chairman.

Are you sure your microphone is working? I couldn't hear you. Jeff doesn't need a microphone, the chairman.

Thank you, Mr. Chairman. Thanks for holding the hearing.

We are going to focus on the extension of the deadline today. It is clear that the Class I's aren't going to be able to meet the deadline. Some passenger rail is not going to be able to meet the deadline.

But this was not a knee-jerk reaction to Chatsworth, and this has been something that has been a very, very long time in the making.

It was 45 years since NTSB [National Transportation Safety Board] first recommended the idea of Positive Train Control. And they have had it on their most wanted list for many years. It was temporarily removed after the passage of the legislation in 2008, but it was put back on when it was clear that the deadlines weren't going to be met.

Just to revisit why we did this, Chatsworth actually took place right before the House and Senate had acted. And it was a compilation of accidents over the years, including, in particular, one in 2005 that was a release of chlorine gas. Five thousand people were evacuated. Eight people died. Five hundred fifty-four were injured.

And the NTSB at the time said they had never seen anything like it, this was caused by human error—improper alignment of a switch—and, had PTC been installed, it wouldn't have happened. And then they went back over a litany; this again is, at the time of passage: 145 accidents, 296 fatalities, and 6,700 injuries over the past 45 years since their first recommendation would have been prevented with PTC. So we passed it.

Chatsworth took place, actually, right before House passage, which led the Senate to change its position. They started out, I believe, with 2018 as the deadline, and they were pushing, at the behest of the two California senators, 2014. We compromised on 2015 as something that could be achievable. Unfortunately, we aren't going to meet that deadline in many cases.

Congress was helping some of the passenger rail folks with grants. The President has asked for $1 billion. We got one $50 million grant. But, since 2010, nothing has been allocated by Congress.

Now, for freight, it is a heavy expense, but at least it is a business expense. For nonprofit passenger rail, you know, it is an expense which is hard to pass on to the customers, but that is pretty

much what they have to do, or the local operating jurisdiction. So grants could be helpful, I believe, and we hopefully will hear more about that today.

And yet, our colleagues on the Appropriations Committee—it doesn't quite take the same view of these issues as we do—we are a little more enlightened on this committee—actually cut Amtrak's capital grants by $290 million the day after the accident.

And among other things that those grants fund is Positive Train Control in addition to other critical infrastructure, which is likely to cause other accidents, derailments, bridge collapse, tunnel collapse. The system is decrepit, needs an incredible amount of investment. Very, very shortsighted.

So I have observed that we got a man to the moon after President Kennedy issued the challenge. It only took 8 years, and that was 1 year after the NTSB first asked for Positive Train Control.

I know we can do it. We just need to hear today what impediments remain and what can we do to expedite the installation across all of the system in the critical categories.

We defined toxic-by-inhalation routes included in addition to the passenger and the other very heavily used routes.

So I look forward to the testimony. And, if necessary, I would urge the committee to take further action if we hear testimony today that says we need to take steps to get this done.

Mr. DENHAM. Thank you, Mr. DeFazio.

I would now like to welcome our panel of witnesses. First, Ms. Sarah Feinberg, Acting Administrator of the Federal Railroad Administration, FRA.

And I want to pay a special thanks. You have continued to come before this committee. There have obviously been a number of big issues that this committee is addressing, and you have not wavered as far as coming before us and answering some very difficult questions. So we thank you for being here again with us this morning.

Also, Mr. Charles Mathias, Associate Chief, Wireless Telecommunications Bureau, Federal Communications Commission, FCC; Mr. Frank Lonegro, vice president of service design, CSX Transportation; Mr. Donald Orseno, executive director and chief executive officer of Metra Commuter Railroad; and Russell Kerwin, deputy project manager of Positive Train Control, Southern California Regional Rail Authority (Metrolink).

I ask unanimous consent that our witnesses' full statements be included in the record. Without objection, so ordered.

Since your written testimony has been made part of the record, the subcommittee would request that you keep your statements limited to 5 minutes.

With that, Ms. Feinberg, you are recognized.

TESTIMONY OF SARAH FEINBERG, ACTING ADMINISTRATOR, FEDERAL RAILROAD ADMINISTRATION; CHARLES MATHIAS, ASSOCIATE CHIEF, WIRELESS TELECOMMUNICATIONS BUREAU, U.S. FEDERAL COMMUNICATIONS COMMISSION; FRANK LONEGRO, VICE PRESIDENT OF SERVICE DESIGN, CSX TRANSPORTATION, INC.; DONALD ORSENO, EXECUTIVE DIRECTOR AND CHIEF EXECUTIVE OFFICER, METRA COMMUTER RAILROAD; AND RUSSELL KERWIN, DEPUTY PROJECT MANAGER OF POSITIVE TRAIN CONTROL, SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY (METROLINK)

Ms. FEINBERG. Thank you.

Chairman Denham, Ranking Member Capuano, Chairman Shuster, Ranking Member DeFazio, and members of the subcommittee, thank you for the opportunity to appear before you to discuss the implementation of Positive Train Control in the United States.

PTC technology is arguably the single most important railroad safety development in more than a century. The technology is not new, though. Elements of PTC have existed since the early 20th century. In fact, regulators and safety advocates have been calling on the rail industry to implement some form of PTC for many decades, the NTSB, since 1969.

The Rail Safety Improvement Act of 2008 required the current functionality of Positive Train Control to be fully implemented by December 31, 2015. PTC is required on Class I railroad main lines where any poisonous or toxic-by-inhalation hazardous materials are transported. It is also required on any railroad's main line where regularly scheduled intercity or commuter rail passenger service is conducted.

Following passage of the PTC mandate in 2008, railroads submitted their PTC implementation plans in 2010. These plans laid out a path forward that would allow each railroad to meet the deadline.

As I have stated to this committee before, safety is the Federal Railroad Administration's top priority. The rail system is not as safe as it could be without the full implementation of PTC.

A safe rail system requires the full implementation of Positive Train Control, and that is why FRA will enforce the December 31, 2015, deadline for implementation just as Congress has mandated.

For several years, FRA has been sounding the alarm that most railroads have not made sufficient progress in implementing PTC. In the 7 years since passage of the PTC mandate, FRA has dedicated significant resources and worked closely with the railroad industry in order to assist and guide implementation.

We have hired staff to assist and oversee implementation. We have worked directly with the FCC to resolve spectrum issues and improve the approval process related to PTC communication towers. We have built a PTC system test bed at Transportation Technology Center in Pueblo, Colorado.

We have provided approximately $650 million in grant funds to support PTC implementation. This includes American Recovery and Reinvestment Act grants as well as Amtrak grants and other annual appropriations.

We have requested $825 million to assist commuter railroads, and we have issued a $967 million loan through the RRIF [Rail-

road Rehabilitation and Improvement Financing] program to New York Metropolitan Transportation Authority, the Nation's largest commuter railroad.

I have also established a new PTC task force team within the FRA. That team is aggressively managing and monitoring each individual railroad's progress, tracking data, ensuring we have the most accurate and up-to-date information, and reporting in to me multiple times per week. This team is working in close collaboration with the many individuals at FRA based here in Washington and in offices around the country already working on this challenge.

But, unfortunately, despite FRA's financial support, technical assistance, and warnings, many railroads have stated publicly that they will still not meet the December 31 deadline. Recently, FRA received updated information about PTC implementation from 32 of the 38 railroads that we are currently tracking for enforcement purposes.

Initial analysis indicates that Class I railroads have completed or partially completed installations of approximately half of the locomotives that require PTC equipment, deployed approximately half of the wayside units, replaced approximately half of signals that need replacement, and completed most of the required mapping for PTC tracks.

By the end of the year, AAR [Association of American Railroads] projects that 39 percent of locomotives will be equipped, 76 percent of wayside interface units will be installed, 67 percent of base station radios will be installed, and 34 percent of required employees will be trained.

According to APTA [American Public Transportation Association], 29 percent of commuter railroads are targeting to complete installation of PTC equipment by the end of 2015. Full implementation of PTC for commuter lines is projected by 2020.

FRA continues our work to finalize an enforcement strategy for those railroads that will miss the deadline. As with any regulatory enforcement posture, our ultimate goal is to bring all railroads into compliance as quickly and as safely as possible.

Starting on January 1, FRA will impose penalties on railroads that have not fully implemented PTC. Fines will be based on FRA's PTC penalty guidelines, which establish different penalties depending on the violation. The penalties may be assessed per violation per day.

The total amount of penalty each railroad faces depends upon the amount of implementation progress the railroad has made. FRA is also planning for what will come after the January 1 deadline.

In both 2014 and 2015, the department and FRA asked Congress to provide FRA with additional authorities that would address the safety gap that will exist on many railroads between January 1, 2016, and each railroad's full PTC implementation.

These additional authorities would provide FRA with the ability to review, approve, and require interim safety measures for individual railroads that may fail to meet the PTC deadline. These interim safety requirements would be to ensure railroads are forced to raise the bar on safety if they miss the deadline, but will not and cannot be used to replace or extend the deadline.

In conclusion, I want to extend my thanks and appreciation to this committee for its attention and focus on achieving implementation as efficiently and quickly as possible. We look forward to working with you. And I am happy to respond to your questions. Thank you.

Mr. DENHAM. Thank you, Ms. Feinberg.

Mr. Mathias, you may proceed.

Mr. MATHIAS. Thank you.

Thank you, Chairman Denham, Ranking Member Capuano, Chairman Shuster, Ranking Member DeFazio, and distinguished members of this subcommittee. Thank you for inviting me to testify here today.

Mr. DENHAM. Can I ask you to pull your microphone a little closer.

Mr. MATHIAS. Promoting the safety of life and property through the use of wire and radio communication is a top FCC priority. As the Nation's communications agency, the FCC helps coordinate spectrum acquisition by freight and passenger railroads. We also manage the statutorily required historic preservation and environmental reviews of the poles, antennas, and associated infrastructure used to support Positive Train Control, or PTC, systems.

Because the FCC was given no mandate to set aside spectrum for PTC purposes, the FCC has been working closely with the railroads since 2008 to identify available spectrum on the secondary market.

The FCC has acted swiftly upon request to approve multiple spectrum transactions, including the freight railroads' acquisition of spectrum nationwide, Amtrak's acquisition of spectrum in the Northeast Corridor, as well as requested waivers to better enable and test PTC deployment. To be clear, the Commission plays no role in designing or assessing the railroad's choice of PTC technology. The railroads are responsible for PTC design and deployment.

The country's major freights have led the way in securing spectrum for PTC. Through private transactions, they acquired nationwide spectrum in the commercial 220- to 222-megahertz spectrum band just months before the act became law. These railroads quickly focused on utilizing this spectrum when the PTC mandate was established.

When they did, the freight railroads effectively drove other railroads, including Amtrak and commuter rails, to spectrum in and around the 220-megahertz band for their PTC operations as well. For most of the country, this strategy appears to have been successful.

The FCC has proactively facilitated and continues to facilitate freight and passenger railroads' successful acquisition and lease of spectrum on secondary markets. We have also granted the railroads extensive technical waivers, more transmitter power, for example, to facilitate the use of this spectrum for PTC purposes.

Spectrum acquisition in the Northeast Corridor differs from the rest of the country because Amtrak and the freights are deploying two different PTC systems that were not from the outset engineered to be compatible in the same spectrum band.

So unlike in a market such as Chicago, where the freight railroads tell us that 11 different railroads can share the same block

of spectrum using a single PTC system, in the Northeast Corridor, the choice to deploy 2 systems requires 2 blocks of spectrum far enough apart to avoid interference.

FCC staff will continue to work with Amtrak, the commuter rails that use the Amtrak system in the Northeast Corridor, and the freights to help identify solutions to these problems.

PTC infrastructure deployments are also a priority. Federal environmental and historic preservation law requires the FCC to assess the potential impacts of agency "undertakings," including potential impact on properties significant to tribal nations.

To facilitate this process, in May 2014, the Advisory Council on Historic Preservation issued streamlined rules for future PTC pole deployments. Under this streamlined approach, the majority of proposed rules are exempt from historic preservation review.

The Commission has the capacity to receive 1,400 exempt and nonexempt pole applications from the major freight railroads every 2 weeks. By the middle of June, the freight railroads could have submitted as many as 40,000 poles for review. In fact, the railroads have only submitted around 8,300 poles, or about 21 percent of our total capacity.

Going forward, issues in the Northeast Corridor remain complex and pose significant challenges. We stand ready to work with Amtrak, the commuter rails, and the freight rails there and across the country to help them meet their evolving deployment needs.

We appreciate this subcommittee's commitment and leadership on this issue and its efforts to ensure the successful deployment of PTC systems.

The FCC is committed to working collaboratively with Congress, our Federal partners, and the railroads to get the job done. I look forward to answering any questions you may have. Thank you.

Mr. DENHAM. Thank you, Mr. Mathias.

I would now like to call on the representative from Florida, Ms. Brown, to introduce our next witness, Mr. Lonegro.

Ms. BROWN. Thank you, Mr. Chairman.

I am pleased to introduce Mr. Frank Lonegro—and you can correct that name, Frank, when it is your time—who will be testifying today for CSX railroad located in my hometown of Jacksonville, Florida. Frank has worked for CSX since 2000, focused on technology issues, and has taken the lead for the Class I Positive Train Control initiative.

CSX is an employer that plays a major strong role in the Jacksonville community. The company and its CEO, Michael Ward, have been a long advocate for veterans in Florida and throughout the United States.

Let me just say that I am very proud of the Wounded Warrior program. They gave the first million dollars, and they have received 2 years in a row the top award from the President for over 33 percent of their employees are veterans.

So, with that, I want to welcome Frank and the other panelists. And thank you for joining us today.

Mr. LONEGRO. Thank you, Member Brown.

And, Mr. Chairman, Mr. Ranking Member, members of the committee, thank you for the opportunity to be here. I am Frank Lonegro, vice president of service design at CSX. And since the

passage of the PTC mandate, I have been the project owner for PTC at CSX. I also chair the industry committee that is tasked with achieving PTC interoperability across 60,000 miles of railroad.

Given the recent Amtrak tragedy and remembering all of those who have been impacted by PTC preventable accidents, I believe four issues are presented for resolution by this committee:

Number 1, why are most railroads unable to meet PTC by 2015?

Number 2, why are a few railroads able to make 2015 while the remainder cannot?

Number 3, what happens if a PTC extension is not passed?

Number 4, what is the path forward?

Since PTC was mandated, accidents have happened that were PTC-preventable. A turnkey system did not exist in 2008 and had to be created by the rail industry. That task continues.

As one of the many railroaders working on PTC every day, let me reflect briefly on accountability. I am ultimately responsible for PTC at CSX. And, unfortunately, it will not be completed by the deadline. This is not the result of lack of will or lack of commitment.

To the contrary, CSX has provided people, allocated ample funding, and ensured executive support. We are hundreds of millions of dollars over budget, yet CSX has never hesitated to provide the required capital. With these ingredients of success, companies do not fail at delivering projects that are achievable from the outset.

Congress shares in this responsibility. The 2015 PTC deadline was not grounded in fact. It was a political compromise reached after Chatsworth. Various constituencies in the House and Senate advocated for 2012, 2014, and 2018. The compromise halfway between those extremes gave us 2015, a political date, not necessarily an achievable date.

Other responsible stakeholders are FRA, FCC, and the supplier community. The industry has thousands working on PTC. The FRA has about a dozen. The PTC final rule was published in August of 2014, hundreds of pages of regulations, 6 years after the mandate.

FRA is requiring significant documentation, validation, safety assessments, and fault analyses. All are geared toward deploying a safe and reliable system, but also require a tremendous amount of time and effort on both sides.

No one anticipated the regulatory requirements relating to PTC towers. When FCC realized they would have to clear 20,000 towers, they imposed a moratorium to develop a better process. That moratorium impacted the PTC timeline by over a year. The resulting review process appears to be working.

FCC has also recently approved the antenna height waiver, J Block swap, and Canadian border agreement. While each of these is complicated, we do need a greater emphasis on speed, given that much work remains, especially solving the PTC radio interference in the Northeast.

Lastly, given the complexity of the technical task, our supplier partners have yet to hit a major deadline or deliver software that is free from defects. In the beginning, I think we all believed PTC was further along.

A few railroads have indicated that they will make 2015, most notably, Metrolink in the L.A. Basin and Amtrak in the Northeast

Corridor. Importantly, both railroads have previously promised completion in 2012.

I remind us of that not to denigrate their great work, but to illustrate the challenges of PTC even for small deployments. Successful completion in 2015 will be a testament to 7 years of hard work by those railroads and great leadership by PTC veterans like Darrell Maxey and Keith Holt.

There are two main reasons why some railroads will make 2015 while others will not. The first is scale. The Amtrak and Metrolink deployments are very similar in size, 100 to 150 engines and 300 to 500 miles of railroad. In contrast, deployment at CSX involves 3,900 engines and 11,000 miles of railroad, about 25 times larger. More engines and more miles means more time.

The second is the state of the legacy infrastructure. PTC is brandnew technology that does not interface with legacy signaling and dispatching systems. At CSX, PTC is requiring us to completely replace 7,500 miles of wayside signals, geospatially map 21,000 rail miles, and enhance our dispatching system to a precision of one ten-thousandth of a mile, all while delivering the Nation's freight and passengers. Once we are finished, it will no longer be our fathers' railroad.

If no extension is passed, the railroads have a serious legal dilemma. Does the PTC mandate make it illegal to transport TIH/PIH [toxic by inhalation/poisonous by inhalation] commodities irrespective of our common carrier obligation?

Similarly, we are also required to allow commuter and interstate passenger agencies to run on our lines. Which law should we violate? The passenger requirement or the PTC mandate?

If we cannot transport TIH/PIH commodities or passengers by rail, the outcome is not good for the American people or the American economy. If we continue to haul the commodities and the passengers which trigger the PTC mandate, we will be in violation of the law and run the risk of regulatory enforcement, potential uncapped liability, and questionable insurance coverage, an untenable situation for CSX and its employees and shareholders.

The need for an extension is clear. The question is how to fashion the extension that recognizes the enormity of PTC, rewards railroads that will make 2015, hold the remaining railroads accountable to complete the project expeditiously, and provide legal certainty for shippers, passengers, and railroads alike.

We look forward to working with you to forge that path ahead. Thank you.

Mr. DENHAM. Thank you, Mr. Lonegro.

Mr. Orseno, we have met several times already. But if I have butchered your last name as I have twice already and been corrected by colleagues, please let us know.

Mr. ORSENO. OK. Thank you.

Thank you, Mr. Denham, and members of this subcommittee.

I would also like to thank Congressman Lipinski. You are our representative on this subcommittee, and we appreciate your championship for transportation.

I am Don Orseno, executive director/CEO of Metra as well as the chair of the APTA Commuter Rail Committee. I was lucky enough early in my career to be a card-carrying engineer that I was very

proud of. I operate trains every single day. It is an enormous responsibility that I didn't take lightly, as no engineer does.

A few years ago I was appointed executive director/CEO of Metra, and I took those experiences with me early in my career to my position now. Let me be clear. Safety is paramount at Metra and, to that end, we are committed to implementing PTC. But let me also be clear on another item. It is not without challenges.

Metra is one of the largest commuter rail systems in the country. Last year we provided over 83.4 million passenger trips. We primarily serve customers commuting from the suburbs to work in Chicago. We operate 11 lines with 241 stations. Four of those lines are owned and operated by the UP [Union Pacific Railroad] and the BNSF [Burlington Northern Santa Fe Railway]. Chicago is the Nation's busiest rail hub and the most complex, with six of the seven Class I railroads operating throughout the network.

Coordination of PTC implementation must include all of these railroads. The BN and UP were further along with PTC installation than us. So we directed all of our resources to put equipment on the trains that will be operating on the BN and the UP so we could be compliant when they were.

Those lines, once they are operational, will be—40 percent of Metra's fleet will be PTC-compliant, covering 50 percent of our passengers. The BN equipment installation will be complete September of 2015, with the UP following closely behind it, the second quarter of 2016.

We have also made significant progress on Metra-owned lines. To date, we hired a system integration team, Parsons Transportation Group, awarded contracts to engineering firms to design signal system upgrades, and continue to hire the necessary staff, including leadership positions in the field installation crews.

Even though we have made substantial progress, challenges still remain: the limited number of signal design systems, spectrum availability. In Chicago, it is undetermined if we have enough spectrum for PTC needs in the region. We won't know that answer until the spectrum study is completed.

Continuous verification and validation is part of the testing process to test the reliability and accuracy of PTC. So far, only testing of individual segments has taken place. The FRA must also review and certify the railroad's plans. Interoperability is a huge challenge for Chicago, given the complexity and the integration of the system.

Metra's costs are approximately $350 million. APTA estimates approximately $3.5 billion for all commuter railroads. We receive $150 million per year in Federal formula funds. These are the same sources of funds that are used for other safety-related critical infrastructure projects, such as bridges, tracks, and rolling stock.

Metra has allocated $133 million over the last 2 years for PTC between our State and Federal partners. The Metra board approved a $2.4 billion modernization plan last year, which included $275 million to complete PTC, which is a combination of borrowing and fare increases. The balance would need to come from our State and Federal partners, which is uncertain at this time. There is also a significant operational and maintenance cost. These are estimated to be $15 million annually for Metra.

Given these substantial challenges, it is no surprise that no commuter rail system has fully implemented PTC today. Metra is estimating 2019 for full implementation. Metra, along with APTA, is asking Congress to provide FRA the authority to grant individual waivers for the deadline as long as the agencies show a good-faith effort as determined by the FRA.

Metra is also asking for funding from Congress. On that note, I would like to thank Representatives Lipinski and Quigley for introducing H.R. 1405, which reauthorizes the safety technology program for PTC, which is $200 million annually for the next 5 years.

Even though PTC will not be fully implemented by the deadline, Metra, however, has taken significant steps to provide safeguards for our passengers. For example, we have reviewed the FRA 2015–03 safety advisory and are in the process of implementing automatic notifications through our GPS system.

This system will notify the conductor in advance where the speed is reduced by greater than 20 miles per hour for a bridge or curve. The conductor will then communicate and remind the engineer of the restriction.

We have also instituted the C3RS program, which is the Confidential Close Call Reporting System, in conjunction with our labor unions at FRA.

Before closing, I wanted to bring to the committee's attention that, recently, a question was raised at the APTA Rail Conference with regards to the commuter rail industry's ability to continue to operate past the PTC deadline as it relates to insurance liability. The commuter railroads are currently investigating this matter.

It is Metra's commitment, along with the rest of the commuter rail industry, to implement PTC as expeditiously as possible. With that said, we ask Congress to grant the FRA authority to provide waivers based on good-faith efforts and the funding to support the implementation of PTC.

I want to thank the committee for inviting me here today, and I will be happy to answer any questions.

Mr. DENHAM. Thank you, Mr. Orseno.

Mr. Kerwin, you may proceed.

Mr. KERWIN. Thank you.

Good morning, Chairman Denham, Ranking Member Capuano, and members of the committee. My name is Russell Kerwin, deputy project manager of Positive Train Control for the Southern California Regional Rail Authority, a.k.a. Metrolink.

I appreciate the invitation to testify today to update the subcommittee on the most significant investments Metrolink is making to increase the safety of our passengers—PTC. I am proud to report that, as of June 14, Metrolink has fully implemented PTC in revenue service demonstration, RSD, across the entire 341-mile network of Metrolink-owned lines.

In addition to this major accomplishment, we will submit our PTC safety plan to the FRA next week, on June 30, seeking FRA certification by the end of the year in accordance with the Rail Safety Improvement Act of 2008.

Metrolink operates on 7 routes through 6 counties in southern California, carrying over 43,000 weekday riders. We are also a dispatching hub for about 350 trains that traverse Metrolink property

on a daily basis, including trains from BNSF, UP—Union Pacific, that is—and Amtrak.

Metrolink's PTC program is a locomotive-centric overlay system based upon the interoperable electronic train management system, a.k.a. I–ETMS software. The full build-out and testing of Metrolink's PTC infrastructure was completed over the past 6 years, which includes PTC onboard equipment installed and tested on all 109 locomotives and cab cars, all antennas, wayside devices, and PTC radios installed and operational, a robust communication network built out and tested, and a new hardened dispatch and operations facility for PTC constructed and put into service under the project.

In addition to our network of owned lines, we are also working closely with our railroad partners—BNSF, Union Pacific, Amtrak, and the North County Transit District—to ensure PTC implementation is achieved throughout the region.

We have been very fortunate to have tremendous support from our local freight partners, and we appreciate the many challenges to implementing PTC, most of which have also impacted our program.

They include the prolonged nationwide development of this interoperable technology and the need for ongoing software upgrades, development of our back-office server and dispatching systems, relentless testing, impacts to operations, challenges in acquiring spectrum, and funding constraints.

In regards to spectrum, Metrolink has been working with the FCC through many challenges to secure approval of the spectrum that we entered into purchase agreement for in 2010. Currently, Metrolink is trying to follow the same procedures under which the FCC's Wireless Telecommunications Bureau recently granted Amtrak's application.

Through our partnership with the freight railroads, Metrolink has been fortunate to execute a 5-year lease for spectrum from PTC–220, LLC. This lease enables us to meet our near-term needs. However, for long-term needs, we are attempting to acquire our own spectrum.

Our current PTC program costs the agency $216.4 million. To put that in context, it is roughly equivalent to Metrolink's entire annual operating budget of $221 million. The majority of our PTC funding, about 85 percent of it, came from State and local sources.

The investment in our PTC program has been very significant for the agency. However, it was the priority of the Metrolink board and our funding partners to implement this lifesaving technology.

Moving forward, the agency will be required to continue to prioritize funding as we transition into operations. The ongoing costs for project staff, contractors, consultants, and vendors to operate and maintain PTC will increase our budget costs. Metrolink is proud to be leading the industry on PTC implementation. Despite the many challenges, we have maintained our unwavering focus on advancing our PTC program.

I would like to thank Chairman Denham and Ranking Member Capuano for the opportunity to testify and share our experience. I will close my remarks by stating that, at Metrolink, we continue to believe that safety is foundational and our investments in PTC

as well as a number of other safety technologies are evidence of this unyielding commitment to the safety of our passengers. Thank you.

Mr. DENHAM. Thank you, Mr. Kerwin.

Our first round of questioning will be 5 minutes. I would ask members to keep their questions to 5 minutes.

I will start things out this morning, first of all, with Ms. Feinberg. Again, let me thank you for your response. The last committee meeting, we did something somewhat out of the ordinary and asked you for a quick response with some of the questions that this committee had on the Amtrak crash.

I think that those issues are important to resolve and understand quickly. And this committee thanks you for your rapid response. We are getting those answers to those questions back out to committee members this morning.

But I did want to continue on an exchange that you and I have had several times now. I pressed FRA on: If Positive Train Control is such a big priority, why are you not using California high-speed rail dollars to upgrade not only the corridor, but those connecting routes in California?

In California, obviously, where PTC was started, it is a big concern for those that ride the rail in California. It is a big concern for those that live by rail in California. You know, this is a national issue. But in our home State, we are looking to provide leadership to resolve the safety concerns that people have quickly.

And the California High-Speed Rail Authority continues to have its challenges. And certainly, by their current burn rate of dollars, they do not appear to be able to spend the money that has been allocated to them by the deadline.

And so, in our ongoing exchanges, what else could you use that money for? Could it be used for safety in California?

And I got your written response that it wasn't possible, but I wanted to bring one issue to your attention.

Under California High-Speed Rail Authority's investment strategy for phase 1, they specifically state, "Electrifying the entire Caltrain corridor so as to replace outdated diesel technology with electric locomotives or electric multiple-unit train sets and introducing Positive Train Control will not only speed up Caltrain's service, but pave the way for high-speed rail. Positive train control is a Federal mandate that will reduce the potential for train-to-train collisions and improve signaling at crossings so as to allow increased train frequencies while enhancing safety."

This money was taken from California high-speed rail. They approved the grant agreement to put it in a different corridor to upgrade Caltrain and put PTCs. Obviously, by their own words, this is a priority for them.

Also, previously FRA has diverted funding from the Central Valley with $400 million that went to the Transbay Joint Powers Authority to construct the foundation for high-speed rail service at the Transbay terminal.

Again, you are moving money out of California's Central Valley hours away to where it may connect some day, if it ever gets built, to San Francisco and to L.A. through Caltrain.

And under the High-Speed Intercity Passenger Rail Program, the following activities are expressly eligible for grants, as noted in the Federal Register: acquiring, constructing, improving or inspecting equipment, track and track structures, highway rail grade crossings, improvements related to intercity passenger rail service, including communication and signalization improvements.

That sounds a whole lot like PTC to me. Positive train control affects each one of those areas. So I understand by this they would be able to use these same dollars.

So I know from your response you say the grantee would have to approve this process. The grantee in this case would be the California High-Speed Rail Authority.

But, again, if they are not spending the money and they already have the precedent of transferring money and safety is all of our number-one concern, why would we not take money that is available to be spent in a corridor that is available to be spent under Prop 1A and address safety for our State?

Ms. FEINBERG. Mr. Chairman, we have gone back and forth about this a lot, and I am happy to continue to go back and forth with you, and I know our staffs have had many conversations about it as well.

As I said in my letter to you earlier this week, we do not believe that we can take California high-speed rail money and put it in other priorities. I explained——

Mr. DENHAM. But you have done that a couple of times already. They requested that you change the grant approval, and you have granted that request. And they have done it several times for PTC, for Caltrain, and for the Transbay Joint Powers Authority, $400 million, $171 million, and another grant for PTC. It has been done several times already.

Ms. FEINBERG. I join you in a concern that the California High-Speed Rail Authority is not burning through ARRA [American Recovery and Reinvestment Act] money in a sufficiently fast manner, and we are working with them very closely to make sure that they meet all of their obligations to do so.

Our legal analysis of where we are at this moment is that we cannot shift money that has already been obligated to California high-speed rail and move it to another priority. Even if we were willing to take money away from California High-Speed Rail Authority, it would go back to the U.S. Treasury. But we will continue to engage with you on this and talk through it with you.

Mr. DENHAM. Thank you.

That appears to be a change in policy, since it has already happened several times. I would understand if you need them as the grantee to make the request to FRA, then my question would be to the California High-Speed Rail Authority: If they have already spent money on PTC, why, if this is a priority for FRA, the administration, and the California High-Speed Rail Authority, are they not improving safety in California?

Ms. FEINBERG. I do not believe it is a change in policy, but we can continue the conversation.

Mr. DENHAM. Thank you.

My time is expired. We will have a second round because I have got many other questions from a more national perspective. But, as

you know, California is a big concern of mine and so is California high-speed rail.

I now go to Mr. DeFazio for 5 minutes. And I would recognize the fact that Mr. Capuano once again has been very gracious to our colleagues on the other side to skip his time so that others may go first.

Mr. DEFAZIO. I don't think "Capuano" and "gracious" go together in the same sentence, but certainly I would defer to your judgment, Mr. Chairman.

Ms. Feinberg, you heard what CSX raised about the potential conflict with the hard deadline and whether or not their continued carriage of inhalable and other hazardous and passenger—can you resolve that or do we have to statutorily resolve that?

Ms. FEINBERG. The Congress is going to have to act. I cannot make a legal decision for CSX based on their liability.

Mr. DEFAZIO. And you can't give relief because of the hard deadline that was set.

Ms. FEINBERG. I cannot extend the deadline.

Mr. DEFAZIO. OK. Now, you talked about enforcement and you talked about penalties, and I would just like to get a little insight into that.

We are looking forward now, and there is a lot of history here, a lot of questions about how we got to this point and how some people are much closer to meeting the deadline than others, et cetera.

So are you looking at penalties that exact funds from the railroads? You know, wouldn't it be better if you mandate everybody puts together a schedule that you would approve or not approve in terms of how quickly they can implement, put in benchmarks, and then look at assessing penalties going forward?

Ms. FEINBERG. Well, that would really be extending the deadline. That would be our view. I mean, the deadline is the deadline. And if we then communicate to railroads, "If you don't like the deadline that we have, why don't you come up with a plan that involves a new deadline for yourself," that would actually, in my opinion, be extending the deadline.

Mr. DEFAZIO. OK.

Ms. FEINBERG. So we would not want to go about that.

But in terms of the penalties, there is, you know, three or four pages of specific fines and penalties that were finalized back in 2010 that, you know, go from everything from not equipping a locomotive to failure to have PTC in a certain segment, so quite detailed in the public realm.

Mr. DEFAZIO. Yeah. But what I am trying to get at here is everybody here wants to get this done as quickly as possible. There is a lot of history.

And in order to go forward, I am wondering if we give you flexibility from the deadline, but we give you a mandate that it will be implemented as soon as technologically and physically practicable, you know, by each of those who do not meet the deadline and then you set benchmarks and then they violate the benchmarks, that is when I think fines might be appropriate.

Would that be a way to go forward?

Ms. FEINBERG. Well, you know, I take my cues from the Congress, and I enforce what the Congress mandates. So if the Congress instructs us to enter negotiations like that, we would do that.

But, again, my concern would be entering into brandnew negotiations with each individual railroad based on what they would like their new deadline to be.

Mr. DEFAZIO. Well, I am not thinking so much what they would like. I am saying that is why as soon as practicable physically and, you know, I mean, not something that meets their convenience or their capital outlays or whatever. It is just like—anyway, this is a difficult issue.

Quickly to the FCC, you now have the capacity to deal with these pole applications and approvals in a streamlined way. And, as I understand it, there are quite a few that have not been applied for and you aren't pushing your capacity here. Is that correct?

Mr. MATHIAS. That is correct, sir. Thank you. Since our streamline process was put into place, we have had the capacity to review about 40,000 poles. To date, we have only received applications to review about 8,300. So we are ready for more work.

Mr. DEFAZIO. OK. That is something to take into account as we are moving forward.

This is off the subject, but I have got to ask you very quickly. Mr. Mathias, 5.9 gigahertz—part of the problem here was you have to go out and buy spectrum and negotiate and Amtrak had to negotiate and I am really concerned about what you might do with the 5.9 gigahertz for smart cars and communication between vehicles of the future.

There are some proposals to maybe parcel that up a little bit, which might lead to interference, which might lead us to a point where smart car manufacturers of the future are going to have to go out and buy spectrum as opposed to having something reserved. And I just hope you would take that under advisement.

Mr. MATHIAS. Thank you, sir.

Mr. DEFAZIO. Yeah. OK.

And then to CSX, how soon can you get it done?

Mr. LONEGRO. At CSX, our plans call for us to be hardware-installed, meaning all of the wayside interface units, all the, you know, obsolete signal replacement work that we are doing, all the locomotives equipped, all the technology hardware installed by the end of 2018 with full deployment by 2020.

And, as I say that, though, I think it is important to know that, by the end of 2018, we will have a significant portion of the system operable. So it is not as if we get to 2020 and then we turn on the 11,000 miles that we have under our PTC footprint.

It is a very methodical, you know, almost linear implementation pretty much from here on out. We will have about 500 miles in place by the end of the year, which is about the size of the corridor and about the size of the Metrolink deployment. And then we get into the thousands of miles per year that ramps us up through 2020.

Mr. DEFAZIO. Well, again, that seems like a long time. And that is why I was proposing the idea that the Administrator—I don't think we should be giving people a blanket exemption till 2020 be-

cause some people are going to take till 2020 who don't need to. Maybe you do.

But I think there needs to be some level of review of that, and I think that is something the committee will be looking at. Thank you.

Thank you, Mr. Chairman.

Mr. SHUSTER [presiding]. I thank the gentleman.

Ms. Feinberg, you have testified and others at FRA have testified before Congress that, if the December 31 deadline is not extended, that you will use all the enforcement powers, including warnings, emergency orders, enforcement fines, to encourage PTC to be adopted.

But will you share with Congress a transparent policy with regard to how you will determine who the good actors are, the bad actors are? I think you have categorized them that way. And what I am looking for is metrics. Are there ways to measure it so that it is not arbitrary, so everybody knows going into this?

And I see you have some bullet points I have here on things you intend to do, but I am really looking for how we measure CSX versus BNSF versus UP versus Metrolink to be able to determine that.

Ms. FEINBERG. Absolutely. And we would not want to be arbitrary or subjective. We would want this to be quite black and white so that railroads would know what to expect and that the Congress would know what to expect.

What was summarized in my oral testimony was an attempt to be quick and to move through the 5 minutes quickly. But our plan is to take the penalty and fine schedule that is already laid out and to be very transparent about what our approach will be and to communicate it both to the Congress and to railroads so that everyone knows what to expect.

Mr. SHUSTER. Will that be seen? Will we be able to see that shortly? When do you expect to have that done? Because the deadline is getting awfully close and we want to make sure that there is a transparent—because, again, I have seen agencies in the past be very arbitrary, don't like one person over another.

Ms. FEINBERG. No. No. That would not be our approach, and that would not be the way we would go about it. We will be very transparent about it.

We owe the Congress an update on PTC implementation on how railroads are doing in implementing PTC. Due to recent feedback we have gotten back from the Congress, it is clear that the Congress would like that report to also include very specific information about how each railroad is doing individually, but also what our enforcement strategy will be. So we are now including that in the report and plan to get it to you as quickly as possible.

Mr. SHUSTER. And if you could go to levying fines against people, will that be on a daily basis? Monthly? Weekly? How would you levy those?

Ms. FEINBERG. The statute lays out that it can be per violation per day, but there is some amount of discretion there.

Mr. SHUSTER. And would you consider shutting down a railroad?

Ms. FEINBERG. I think that would be actually up to—the railroad's own lawyers would probably make the determination.

We have certainly heard from railroads that their lawyers are making that determination based on both their liability and the likelihood of the magnitude of fines and penalties.

Mr. SHUSTER. Thank you very much.

And in terms of transit systems and commuter rails, my understanding is you folks are having a very difficult time. I know that SEPTA [Southeastern Pennsylvania Transportation Authority] down in the Southeast has to make some real tough decisions on whether they are going to repair, replace cars, track, because there is just only so much money in the budget. Can you tell us a little bit about Chicago?

Mr. ORSENO. Yes. Thank you, Chairman Shuster.

That is definitely a major challenge for us. As I stated earlier, we get about $150 million through our Federal formula funds. PTC alone is $350 million to $400 million.

You know, we have to balance using that money for other safety-sensitive concerns like bridges. I mean, bridges are very important. We have got many bridges that were built in the 1800s, and we are in the process of doing those projects.

It is very important for us to find the funding and make sure we can get this implemented. It is a very significant safety enhancement. There is no question about it. But it also competes with every other safety issue that we have.

Mr. SHUSTER. And you have got to be the most challenged of all the systems because you have all Class I's coming in around Chicago. So that interoperability—is that a significant challenge or is that something you are moving towards working out?

Mr. ORSENO. That is a huge significant challenge for us because you have got six of the seven Class I railroads coming in and out of Chicago that have to communicate between each train, all the signal locations, and the back office. That has been probably one of the most significant challenges for the industry, is the interoperability.

Mr. SHUSTER. Thank you very much.

Now go to Ms. Brown.

Ms. BROWN. Thank you, Mr. Chairman.

Ms. Feinberg, first of all, let me just say that every last one of us supports safety in the industry, but I think you are leaving me when you talk about daily fines.

The industry itself has spent over $5 billion on Positive Train Control, and I don't feel that the Federal Railroad Administration or the U.S. Federal Communications Commission—we have had daily—not daily—but we have had meetings where we have discussed spectrum, and we don't think—I don't think that the administration has done all they need to do to move us forward.

And to sit here and say that we are going to have daily fines and we may have to shut down the industry is not going to fly. And so I would like for you to respond to that

Ms. FEINBERG. Ma'am, I was responding to the question about what our authority is in terms of fining. We are now working on our enforcement strategy and will communicate it to you.

Ms. BROWN. No. No. I am not talking about enforcement. I am talking about support, what we have done to help the industry, for example, with the spectrum.

Amtrak had to purchase it. How come we did not provide it for the industry? But I—and they had a hard time getting it, and that delayed the projects.

Ms. FEINBERG. I will let the FCC answer the spectrum question, but I can tell you from the FRA's perspective, we have hired a significant staff. One of the witnesses previously said there is only a dozen staff at FRA working on PTC. That is absolutely incorrect. We have staff in Washington and across the country. We have offered loans. We have asked for grants. We have offered financial assistance. We have offered assistance across the board. We are still waiting for safety plans to come in from railroads based on implementation——

Ms. BROWN. I hear what you are saying. But as far as I am concerned, you all have been the caboose as far as helping and assisting us moving forward. And I don't mean it in a negative sense, but we have had—you haven't been here the entire time—we have been going over this for years. And we just have not gotten the administration where it needs to be as far as assistance moving forward.

I mean, when we say Positive Train Control, it is a combination. What happened at Amtrak, it wasn't just: didn't have Positive Train Control, didn't have the proper equipment as far as the cars are concerned, had to purchase the spectrum. It is just a whole list of things that I feel that the administration should have worked—and I don't mean this administration, I am saying it has been a multiplicity of administrations that haven't done everything that they need to do to get us where we need to be.

Now, even if they come up with, well, here we are, even if they come up with it in 2018, then it still would take 2 or 3 years to determine whether or not the system is working together.

Ms. FEINBERG. Ma'am, I can only speak for this administration. I can't speak for previous administrations. But this administration has done a great deal to try to bring railroads along and into compliance with a mandate that was passed by this Congress in 2008. And we have been sounding the alarm for years about our concern that railroads were not going to meet the deadline. And so I believe this administration has done a great deal of work to bring railroads along, but we have not seen the progress that we need to.

Ms. BROWN. All right. I am just letting you know you are leaving me. But go ahead to the next person.

Mr. MATHIAS. You are asking about the question of the Amtrak spectrum?

Ms. BROWN. Yes, sir.

Mr. MATHIAS. Thank you.

The way the railroads approached this process initially, they selected a spectrum band in the 220 to 222 megahertz, I am sorry to get technical on you. But it is a part of the spectrum that was already owned by other people. It has licensees.

Unfortunately, in that case what we would have had to do to give that spectrum to anyone else is we would have had to have taken it away from the existing owners through a process that would have required compensation, finding them additional spectrum, and also potentially would have led to litigation. So what we thought would be a more productive approach would be to actively

work with Amtrak to find spectrum on the secondary market that they could use for PTC in the same spectrum block.

Ms. BROWN. Well, as we move forward, that is an issue that the Congress needs to address.

My next round I will go to you, Frank.

Thank you.

Mr. DENHAM [presiding]. Thank you, Ms. Brown.

Mr. Rice, you are recognized for 5 minutes.

Mr. RICE. Thank you, Mr. Chairman.

Ms. Feinberg, and you may not have been around when all this started, but why is there the need to create this new system? I mean, it seems to me that there are so many systems that are similar to this that would be incredibly cheaper and quicker to institute. Why did we settle on creating this entire new system?

Ms. FEINBERG. Well, I think PTC is actually an overlay of some other systems. But if you are referring to ATC [Automatic Train Control] and some of the technologies we have talked about in this committee previously, it is basically a step beyond that. But it would assist in taking human factors off the table. It is one of the most important technologies that we believe can be implemented for rail safety.

Mr. RICE. Mr. Kerwin, I am going to switch over to you because maybe you know more about the technical aspects. You are a project manager, right, you are putting this stuff in.

Mr. KERWIN. Yes, sir.

Mr. RICE. I know that there are GPS systems out there that you can buy for a thousand dollars that will control the motion of a vehicle, right, stop it, start it, and all that kind of thing.

Mr. KERWIN. It tells you where you are at, but as far as controlling the vehicle——

Mr. RICE. I have had one on my boat that cost $900 that would steer my boat to a point. Why is this so much more difficult than that?

Mr. KERWIN. The key to PTC is it is not a specific technology as much as a specification that it prevents train-to-train collisions——

Mr. RICE. Well, I mean, as long as the GPSs were connected, it seems to me that it could do that very, very easily. I mean, this seems to me that this is light years easier than a Google car, or whatever you call the thing, because a Google car has got to sense people walking in front of it and obstructions appearing, and this doesn't have to do any of that. This just has to control motion. I mean, all it can do, it can't steer, it has got to go how fast, how slow, or stop, right?

Mr. KERWIN. Yeah.

Mr. RICE. It is not that complicated.

Mr. KERWIN. I understand and appreciate your point. It is much more complicated than it would seem. One of the key factors is interoperability. The PTC mandate requires seamless transition from one railroad to another railroad's property and the communication between different railroads.

Mr. RICE. No, I understand that. But, I mean, this GPS technology exists today.

Mr. Lonegro, I am going to switch over to you. Do you have technology today before this technology we are talking about here that

you know where all your locomotives are? I mean, can you tell where they are at any time when they are running?

Mr. LONEGRO. We have had GPS on our locomotives for, I would say, the last half a dozen years or so. But I think it is important to understand GPS is one of, I will say, 100, just for raw numbers, inputs into PTC. It simply provides one input, and that is where the train itself is. It is not an indicator of speed, it is not an indicator of grade, it is not an indicator of where the red signal is, it is not the indicator of where the work zone is. And I could go on and on, but I know you don't want me to. But that is just one input into it.

The technology you referred to earlier about ACSES [Advanced Civil Speed Enforcement System] is based on a cab signal method of operation. At CSX we only have about 400 of the 11,000 miles uses cab signal as a method of operation. And then ATC is built on top of that, and the ACSES system that Amtrak is using is built on top of that, and it is not a system that we utilize to run our trains.

Mr. RICE. All these other guys up here are dealing with taxpayers' money and you are not. Did you all do an analysis of whether it would be cheaper to use some of these legacy systems that could control the train or to create this entire new system? I think this says they are doing 23,000 locomotives that cost $9 billion. That is about $400,000 a locomotive. Did CSX do an analysis to determine whether it would be cheaper to modify the existing legacy systems or to create this entire new system?

Mr. LONEGRO. So there are a couple answers to your question. In the beginning, yes, we did an analysis about whether we should go the Amtrak route and the ACSES system or whether we should go with the system that the freight railroads had been working on since the mid-1990s which the precursor was known as CBTM, which was Communications-Based Train Management.

The thing that is important to know is that there are generally three or four methods of operations that freight railroads use to navigate their trains. A very small proportion of that is cab signal, as I mentioned, signal territory, and then nonsignal territory, and there are permutations of all of that. The only thing that ACSES works on is that first method of operation, which is cab signal territory.

So we would have had to change the entire method of operation of the entire railroad to cab signal which would have required both wayside changes, technology changes, as well as locomotive changes. And, yes, we did look at the two and believe that I–ETMS or the freight version of PTC was the right way to go, and still believe that today, sir.

Mr. RICE. Thank you, sir.

Mr. Kerwin, you said you spent $216 million on PTC. You have got it fully installed now?

Mr. KERWIN. We have it fully deployed on our network of owned lines. We are working with our freight partners and Amtrak to get those systems in service.

Mr. RICE. How many locomotives do you have?

Mr. KERWIN. 109 locomotive and cab cars that need to be equipped.

Mr. RICE. OK. So you spent about $2 million per locomotive then?

Mr. KERWIN. Our total cost is—our budget is $216 million and we have spent about $200 million of that. That is not just installations on locomotives. There is a tremendous amount of back-office components and wayside components as well.

Mr. RICE. Sounds ridiculously expensive to me. He is messing with his dollars, I believe, if he says he did the analysis that came in cheaper that way, I understand.

Thank you.

Mr. DENHAM. The gentleman's time has expired.

The gentleman, Mr. Lipinski, is recognized for 5 minutes.

Mr. LIPINSKI. Thank you, Mr. Chairman. Thank you for holding this hearing. Obviously, we all want to make sure that we do everything we can for safety. It has been a very difficult issue. I want to thank Ms. Feinberg for her work on this and other things. A very difficult time coming into the position as Administrator here.

I just want to first make sure that we are all clear. You are saying that FRA doesn't have the authority to shut down railroads. It is the fines that are what the FRA is able to level if the mandate is not extended.

Ms. FEINBERG. Ultimately, if we needed to take the action to shut down a railroad, I think we could do that. But my point was that I think what we are hearing from railroads is that is a decision that they are making in consultation with their lawyers on how they would operate on January 1 if they are not fully implemented.

Mr. LIPINSKI. That makes sense to me. Mr. Lonegro, Mr. Orseno, I don't know if you want to add anything to that in regard to the fines and the impact that they could have on you.

Mr. ORSENO. Yes, thank you, Congressman Lipinski. Being in the commuter side of the industry, we depend very heavily on tax dollars. What the commuter rail industry has advocated for was an extension, not a categorical extension, but an extension based on good faith efforts based on the railroad's ability to complete PTC.

I don't think, personally, it would be in the public's best interest to fine railroads that typically don't have the funding to implement PTC. I think we need to find a solution where we can implement PTC as expeditiously as possible and not fine the railroads, because it is just coming right out of our pot that we use for bridges and cars and everything else it takes to operate the railroad.

Mr. LIPINSKI. Thank you.

Mr. Lonegro, do you have anything you——

Mr. LONEGRO. Yes, sir, if I may. It doesn't matter how big the bear chasing you is or how big the cattle prod is, if you are running as fast as you can, you can't run any faster. And so the fines—I mean, we have spent $1.2 billion. We have got 1,000 people working on the project. It is hard to say that we haven't put the best foot forward that we possibly could.

And so we have supplied the FRA with both an aggregate level of information in terms of where we have been. We have done that on an annual basis since the end of 2012. The NTSB has asked for it in the interim 6 months. We have provided that information. We

have given a prognosis on a railroad-by-railroad basis about when we will be done.

Mr. LIPINSKI. I don't have much time, and I don't want to——

Mr. LONEGRO. So I don't believe the fines would be helpful.

Mr. LIPINSKI. All right. First of all, we all want to sit up here and find villains. And in this situation I think it is very complex, and there are not easy answers to this. We just want to move forward as quickly as possible. I have been in favor, I have tried, I have worked on getting more Federal funding, especially for commuter rail.

Mr. Orseno, so you are saying about $350 million to finish by 2019. Is that the——

Mr. ORSENO. That is correct. That is a conservative number, as we get moving into the process further along, as all these things have a tendency to change. But that is a conservative number.

Mr. LIPINSKI. And did you receive any funding from the Railroad Safety Technology Grant Program or any other FRA grant programs?

Mr. ORSENO. No, we have not.

Mr. LIPINSKI. And would additional Federal funding help expedite the safety efforts and help Metra invest in its infrastructure?

Mr. ORSENO. There is a very strong possibility that additional funding would help us move the project along faster. But I also want to be very clear that there is only a limited number of resources that are available for installation and purchasing things and the supply and demand chain.

We definitely can look at moving it quicker, and if we had Federal funding we could take the funding that we are using for that right now for other things. Like I explained before, we have got cars that are 60 years old. We have got bridges that were built in the 1800s. We could address some of those issues.

Mr. LIPINSKI. I just want to also make the point that Metra has significantly increased—has needed to increase fares as a long-term plan of increasing fares. So you are doing your part in regard to that.

Very quickly, before I conclude, I want to touch on one other safety-related issue with Administrator Feinberg. Regardless of whatever plan FRA chooses or is mandated to use moving forward, I hope your agency keeps careful tabs as I do on CN's [Canadian National Railway's] PTC efforts and the reports they submit. We already know from CN's reports that they have the least ambitious and aggressive timeline for finishing their PTC installations and some other issues we have had with them, which we have discussed, and I think we need to make sure we follow up and keep the rails as safe as possible.

Thank you. I yield back.

Ms. FEINBERG. Certainly. And if I could just make one point in response to the back and forth, we have asked for a sum total of $2 billion to go towards PTC implementation and technologies, $825 million in GROW AMERICA, but altogether $2 billion. So we are absolutely in favor of additional Federal funding going to PTC implementation.

Mr. DENHAM. Thank you. Thank you, Mr. Lipinski.

Mr. Perry, you are recognized for 5 minutes.

Mr. PERRY. Thank you, Mr. Chairman.

Good morning, Ms. Feinberg. I have got a question here for you. Start out with a little bit of a statement. Just to make sure I am clear, it is my understanding the FRA—and this comes from testimony—FRA will use all its enforcement powers, including warnings, emergency orders, and enforcement fines to encourage PTC adoption. Do we know how the FRA would assess the fines? Would they be assessed daily? Is there a policy that has been defined yet regarding that?

Ms. FEINBERG. So the goal of our enforcement actions, and I think probably any safety regulator's enforcement actions, is to bring about compliance and implementation as safely and efficiently as possible.

Mr. PERRY. I understand the goal. Do you have a policy? Do we know what is coming?

Ms. FEINBERG. As we discussed a little bit earlier, we are finalizing that now. Most of the enforcement policy is public and has been public since 2010. There are various fines and penalties based on whether it is locomotives or segments of track. But most of it has been public since 2010. And we are, in response to the Congress' request, finalizing our strategy now so that we can be completely transparent about what railroads and the Congress can expect.

Mr. PERRY. So it might be daily, it might be otherwise?

Ms. FEINBERG. That is correct.

Mr. PERRY. OK. So a few weeks ago when you were here shortly after the horrible mishap in Philadelphia, I asked you how much of the $1.3 billion in stimulus money that was received some time ago—because it was such an issue, right, and there were questions about Congress and one particular party not being responsive and cutting money for PTC—so how much of the stimulus money, when everything was in one hand in this town, was spent on PTC for Amtrak, in particular in the Northeast Corridor, right? Do you remember that question?

Ms. FEINBERG. I do remember that question, and it is $400 million of ARRA went towards PTC. That is not Amtrak specific. And, I am sorry, I didn't realize you wanted just Amtrak specific. But it is $400 million total.

Mr. PERRY. $400 million. All right.

Ms. FEINBERG. I believe it is $36 million for Amtrak.

Mr. PERRY. OK. All right. So right now, and that is Federal funding, we are looking at $9 billion is what the estimated cost of freight railroads. Right? We spent——

Ms. FEINBERG. Total.

Mr. PERRY. Yeah. Total. Right? With this deadline. But you can see the dichotomy, you can see the difference, right? We don't have PTC where we have money, and we are asking for exponentially more. We're not asking——

Ms. FEINBERG. We are asking.

Mr. PERRY [continuing]. But it is the requirement for, right, investor owned? This is private money, $9 billion. Let me ask you about the arbitrary—the deadline. I am calling it arbitrary. What is your opinion about the deadline? Does it take into account the technical aspects? Does it take into account the frequency spectrum

aspects? Does it take into account the timeline where the FRA took nearly a year to approve one of the single plans, one of the plans that is required by each railroad? Does it take into account those things, the deadline?

Ms. FEINBERG. It is your deadline. It is the Congress' deadline.

Mr. PERRY. I am asking your opinion.

Ms. FEINBERG. I believe it is a good deadline. And, in fact, it was the deadline that was reached during negotiations. It was preferred by the railroads.

Mr. PERRY. I understand. So you say it is good, but does it take into account those things?

Ms. FEINBERG. I believe that in 2008, when you passed this deadline, you took those things into account.

Mr. PERRY. You think we did. OK. And we foresaw all the things that might occur or not occur regarding frequency spectrum, regarding approvals, regarding finances. That was all known. There was no political solution to the two sides, one wanting earlier, one wanting later.

Ms. FEINBERG. I think there was an understanding in 2008 that while this would be complicated, it had been called for since 1969 and would not be so complicated it would be missed.

Mr. PERRY. OK. Well, I asked for your opinion. I appreciate it. So under the Consolidated Appropriations Act of 2015, FRA was directed to provide a report to Congress on implementation within 180 days. Do you know what the status of that is?

Ms. FEINBERG. Yes. Previously we had a quick discussion about it. It was due to the committee, I believe, a week ago. In recent weeks we have gotten additional requests from the Congress about additional information they want in that report. We are updating it now and should have it to you in days.

Mr. PERRY. But was it on time or wasn't it?

Ms. FEINBERG. No, sir, it was due last week, 1 week ago.

Mr. PERRY. So it is not in yet?

Ms. FEINBERG. That is correct. It is supposed to be an update on where the railroads are in implementation.

Mr. PERRY. I understand. But Congress also approved that, gave 180 days. Everybody agreed. There was a negotiation.

Ms. FEINBERG. But Congress has asked for it to now include our enforcement strategy and railroad-by-railroad information.

Mr. PERRY. Things changes, right? Things change. So who should we fine at the FRA when they are not timely?

Ms. FEINBERG. You can feel free to hold me accountable for the fact that the report is a week late.

Mr. PERRY. What should the fine be?

Ms. FEINBERG. I will leave that to you.

Mr. PERRY. Thank you, Mr. Chairman. I yield back.

Mr. DENHAM. Thank you, Mr. Perry.

Mr. Sires.

Mr. SIRES. Thank you, Mr. Chairman.

You know, I travel on the Northeast Corridor constantly back and forth, and I am still trying to get this idea with the spectrum, how we end up with two. And places like Chicago, they only have 1 and more than 11 companies use it. I just don't understand why we just can't come up with one system.

Now we have to worry where one is going to interfere with the other? To me, it just doesn't make sense when other parts of the country use one system. Could somebody address that? How did we get to this? How did we get to this point?

Mr. LONEGRO. I think it goes back to the conversation we had a few minutes ago where the ACSES system for Amtrak was really developed for passenger rail, and specifically for high-speed passenger rail. There is a certain way that passenger railroads run their operation, and they utilize certain technologies to run their trains, dispatch their trains, and the freight railroads have, literally, a different way of running the railroad. And so those two systems——

Mr. SIRES. But is this a company not making a concession to the other or Amtrak not making a concession to you? I mean, I don't understand it.

Mr. LONEGRO. Well, we are all making concessions, candidly.

Mr. SIRES. Well, how did we end up with two if we are all making concessions?

Mr. LONEGRO. The systems are separate. They rely on communications as a fundamental aspect. And so what we are really doing is the data transmission is using two radios, which are going to use two separate but close pieces of spectrum, and the closer those pieces of spectrum are the more interference there can be. But I would say that we are actively working between Amtrak, the Northeast commuters, as well as the FCC to solve that problem, and we believe we have line of sight to that. I don't know if Mr. Mathias would like to comment on that.

Mr. SIRES. The FRA states that 40 percent of all accidents are a result of human performance failures. The railroads, however, claim that PTC would only prevent 4 percent of all accidents, inferring that the cost outweighs the benefits. How did we come up with 4 percent?

Mr. LONEGRO. We looked at all of the accidents over, I believe it was either a 10- or a 12-year period, all accidents. Right? And I am not sure that the FRA looked at all accidents. They may have looked at a subset of all accidents.

Accidents are generally caused by a couple of things, either the conditions or the behaviors. Right? The conditions could be track related, signal related, how the car operates or some of the components on that, and the same on the locomotive side, and then you have behavioral based. So is there something that happened in the cab of the locomotive, the human factor side of things.

We looked at the entire portfolio of accidents and did the math on things that we thought were PTC preventable and were not, and came up with that 4 percent. At CSX it is actually only 2 percent.

Mr. SIRES. Two percent?

Mr. LONEGRO. Yes, sir, 2 percent of all accidents PTC preventable.

Mr. SIRES. So, in other words, in your eyes you don't think it is worth it to make this investment?

Mr. LONEGRO. You know, I think we are well past that conversation, to be honest with you, Member. We have already spent $1.2 billion on it. We have good line of sight to completion of the hard-

ware by 2018 and full deployment by 2020. I think we are well past that conversation.

Mr. SIRES. All right. Thank you, Mr. Chairman.

Mr. DENHAM. Mr. Hardy, you are recognized for 5 minutes.

Mr. HARDY. Thank you, Mr. Chairman.

Ms. Feinberg, I read your testimony clear through, and it states in your testimony it seems that FRA is ready to act, directing penalties on PTC if not implemented. Also you state that FRA is ready to act in the interim to bring railroads into safety compliance. You suggest that Congress should authorize FRA to require railroads to use alternative safety technology on specified lines. You also say, and I quote: "These requirements will likely be costly to railroads." Can you share with me your ideas on this alternative technology?

Ms. FEINBERG. Sir, what I was referring to was what I would refer to as the safety gap that will exist between January 1, 2016, so the day after the deadline, and when PTC is actually implemented by each railroad, and what, if anything, should be done to raise the bar on safety during that gap.

So whether it is additional communication between crewmembers, an additional person in the cab, we have not made final determinations. I think they would be railroad-by-railroad specific. But it would be how do you increase safety between the date of the deadline that is missed and when PTC is actually implemented.

Mr. HARDY. In your testimony you stated that these will be costly to railroads. So you have clearly run the numbers on how much it will cost. Can you share with me those calculations or how you come to that point with that statement?

Ms. FEINBERG. We just frequently hear from railroads that items like additional crewmembers are quite costly. That is based on that assertion.

Mr. HARDY. OK.

Mr. Orseno, with safety being paramount, I would like you to delve into the costs a little more. In your testimony that the commuter and the freight rail industries will have spent over billions of dollars on PTC implementation, although progress has been substantial, but it remains to be done before PTC can be safely implemented nationwide, companies, on how much money have they spent out of pocket, do you believe these costs will be passed down to consumers, which is naturally what happens, but I just want to hear from you.

Mr. ORSENO. In my opinion, yes, they would be passed down to consumers. When we raise our fares in order to cover PTC costs and other items, we have to pass those costs on, and we only have X amount of State and Federal funding.

The challenge that we have on the commuter rail side is the higher you raise the fares, the less likely you are going to retain all of your ridership. At a time when we want to get more people on our trains and off the roads, that is a big challenge for us. So it is a very difficult balancing act to still be able to provide safe, valuable service for our customers.

Mr. HARDY. Do you believe that we have done all that we can as a committee, as Congress, to help move this process forward? Do you feel like you are being penalized for our lack of action or inac-

tion or FRA's actions or inactions? I would like to hear your opinion on that also.

Mr. ORSENO. That is a challenging question.

Mr. HARDY. Yes, it is.

Mr. ORSENO. The answer is this is a very expensive proposition for all railroads, especially commuter railroads where we don't have the type of funding that we need. I believe that Congress needs to fund the PTC project. It is important. It is important for the safety of our customers, our employees, and the communities we operate through. So it is very important to me that the Federal Government supply some funding for it.

Mr. HARDY. Thank you.

Mr. Lonegro, you made the statement that the immediate impact of the deadline will be that RSIA [Rail Safety Improvement Act] has the potential of making certain rail operations illegal. Can you discuss these ramifications a little bit more, if you would, please?

Mr. LONEGRO. Yes, sir. We are in a legal dilemma, as I mentioned in the opening testimony. We have a law that requires PTC to be implemented on lines that carry passengers and lines that carry certain commodities, TIH and PIH commodities. And so the transport of those after January the 1st of 2016 would run in contravention to the Rail Safety Improvement Act. Yet we also have a common carrier obligation that requires us to haul freight that is tendered on reasonable requests and at reasonable terms and conditions.

And so we are in a situation of which law do we violate. And we have that same conundrum on the passenger side. I mean, Amtrak runs over us, a law that is 40, 45 years old, and so we are required to allow Amtrak to run as well as a number of other commuters, including Mr. Orseno.

And we also have this obligation under the Rail Safety Improvement Act which requires us to complete PTC on those same lines. And so if we are not able to meet it on those lines, do we need to tell Mr. Orseno that he can't run?

I mean, these are the challenges that many, many lawyers right now are trying to resolve, and we don't have the answer to that quite yet.

Mr. HARDY. Thank you. My time has expired.

Mr. DENHAM. Thank you, Mr. Hardy.

Ms. Esty, you are recognized for 5 minutes.

Ms. ESTY. Thank you, Chairman Denham, and thank you for, remarkably gracious Ranking Member Capuano, for waiting so long. I want to thank both of you for holding today's hearing. This subcommittee's work is extremely important to the thousands of folks in my district in Connecticut who ride these rails every day and to the businesses who rely on the freight service, as well, in northwest and central Connecticut. And I hear from a lot of those commuters that they are very concerned about rail safety, as you can imagine, with the last 2 years.

And we have been talking about, ever since the fatal collision in 1969, we have been talking about Positive Train Control. And as you can sense from today's hearing, there is increasing impatience and concern about how long that is taking.

Now, I think we really need to get down to brass tacks of what are the carrots and sticks? What are the incentives at this time, recognizing the difficulty with spectrum, the difficulty with interoperability, and with the budget challenges, what do we do now to move this forward as expeditiously and safely as possible? And that is where I would like to start from. The past is the past. We are here now. We are in June of 2015. How do we get this moving forward to keep people safe?

So first, Acting Administrator Feinberg, again, thank you for your patience and your transparency and your exceptional availability to us on the committee. We value that quite a lot. In your testimony, you noted that you think FRA needs the authority, given the situation right now, over PTC control systems, to test them, as well as to provide for interim safety measures when they do not meet that deadline, which it is all very clear most of them will not be meeting that deadline. Could you expand and say what should we be doing in this committee, what should this committee of jurisdiction be doing to give FRA authority, and why?

Ms. FEINBERG. Thank you for the question.

I think the most important thing that we can do starting now and going forward is to provide railroads with the resources that they need to implement PTC. So this administration has asked, the FRA has asked for significant resources for the commuter railroads so that they can implement PTC. I think that is the most important thing that can happen.

But additionally, in terms of our authority, the statute is quite narrow. And so, as others have discussed, we really do run into a problem on January 1 where the law is the law, and despite the preferences of railroads, I can't give waivers, I can't base waivers on good faith, I can't extend the deadline, and I won't extend the deadline. And so we have to figure out how to move forward past January 1 to make sure that passengers, folks who live near and along rail are safe.

And so I am happy to continue to work with the Congress on that, but the most important thing is to make sure that we are providing resources so that we can actually bring this technology online quickly.

Ms. ESTY. A quick followup question. Do you believe that the railroads that fail to meet that deadline, and I am asking now under current law, will be subjected to increased tort liability? Because the insurance issues were already raised here today. That is obviously a very, very big stick that, again, I think this committee needs to understand what is the legal opinion of FRA about that as well as the railroads.

Ms. FEINBERG. The opinion of the FRA—look, I don't want to give the railroads legal advice, and I am probably the only person in this room who is not a lawyer, but we are certainly hearing from the railroads that they absolutely believe that they are increased liability as of January 1, and we would—we agree with them.

Ms. ESTY. Well, I think we need to get to work on that because that is not in anybody's interest as we move forward.

Mr. Mathias, good to see you. We went to college together. So thank you for being here. I am hearing from the railroads, and particularly in the Northeast Corridor, we hear other Members ref-

erence this, the difficulty about spectrum. What is it from your perspective, from the FCC's perspective, that we can do, particularly in a very congested space—and that is spectrum space, as well as physical space—that we should be doing to expedite the safety in the Northeast Corridor, the most heavily trafficked area in the country?

Mr. MATHIAS. Thank you. And it is good to see you too. Thank you for your question.

We have an increasingly good news story in the Northeast Corridor with regard to spectrum. It is my understanding that currently Amtrak has the spectrum it needs to deploy, which would be relevant for Connecticut. In addition, we currently have in front of us a proposed transaction that would provide the MTA additional spectrum to provide coverage between New York and New Haven, which would fill a gap in their spectrum coverage, and we also understand that the MBTA has the spectrum that we need.

So what our job will be is to ensure that we are working as quickly as we can and are fully engaged to make sure that those transactions are completed as quickly as possible as soon as we have the information and to be ready in case something changes.

Ms. ESTY. Thank you very much.

Mr. DENHAM. Thank you.

Mr. Mica.

Mr. MICA. OK. Let's go right to Mr. Mathias. You were talking about the Connecticut connection, putting PTC in from Boston to New Haven. Isn't that most of what Amtrak doesn't own?

Mr. MATHIAS. No, sir. The Amtrak has spectrum——

Mr. MICA. But that is where it was installed. It is installed there, isn't it? Last hearing you gave us a map, and that one was—that was pretty much complete.

Mr. MATHIAS. Yes, sir.

Mr. MICA. Right. But that is really mostly under a private operation. Amtrak runs trains over it. They don't own that part of the line. I am telling you that they don't own it. I know. OK? All right. Just interesting that they could get it done. OK.

Let's go to the Acting Administrator. Here she is back asking for money again. And last question I asked, how many RRIF loans had been given since 2012, and first I got an answer of until last year two, and then add one, we got to three. Is it still three RRIF loans since 2012?

Ms. FEINBERG. Yes, sir.

Mr. MICA. OK. How many of those were for PTC?

Ms. FEINBERG. One.

Mr. MICA. One. OK. You could say 33 percent of them. It sounds more impressive.

Ms. FEINBERG. Good idea.

Mr. MICA. Let's go back to our communications guy. There was an 11,000 backlog you took care of. At one time I thought there were as many as 20,000 applications.

Mr. MATHIAS. We understand from the railroads that their total deployment would be approximately 30,000——

Mr. MICA. What is your number of applications approved and what is your backlog at this point?

Mr. MATHIAS. We have had before us for review 8,300. We have no backlog today.

Mr. MICA. No backlog. They are all approved. And you are expecting more. In the past, and I gave you credit, before your average processing was about 2,000 a year. Is that correct or did I lie?

Mr. MATHIAS. I think we are able to do more.

Mr. MICA. OK. Where is my guy from—OK, Metrolink. When was the accident at Metrolink?

Mr. KERWIN. 2008 was the Chatsworth.

Mr. MICA. 2007?

Mr. KERWIN. 2008.

Mr. MICA. 2008. Mr. Oberstar, we did the bill. You still don't have Positive Train Control in all of Metrolink service, or do you?

Mr. KERWIN. We have our entire system of Metrolink-owned lines in service.

Mr. MICA. By what?

Mr. KERWIN. Metrolink-owned lines are all in service.

Mr. MICA. With Positive Train Control.

Mr. KERWIN. With Positive Train Control.

Mr. MICA. OK. What is missing then?

Mr. KERWIN. The lines that we run on with our freight partners are not currently PTC operational with our trains.

Mr. MICA. But Ms. Feinberg, we will go back to here, she just testified she is going to hammer those freight people and the hammer is coming down the end of the year. Right? Is that what you said? I heard you in the beginning.

Ms. FEINBERG. I said we would enforce the deadline.

Mr. MICA. You are going to enforce it, right. Well, that is kind of interesting because then I see you submit a budget that proposes a 6-year schedule, 2016, of funding commuter railroads to implement PTC. So is it going to take another 6 years?

Last I checked, there are not a lot of passengers on freight trains. Isn't that right? I mean, most of them I know they are carrying freight not people. But I would think people would be pretty important. Most of those people that were killed out there in that incident were people. It might have disrupted some freight traffic, but it was people. So is this the new policy: On people and commuters we are going to take 6 years, but we are going to hammer those freight people, aren't we?

Ms. FEINBERG. Well, no. So, first of all, we will enforce the deadline against all the railroads, not just the freights.

Mr. MICA. OK. But then we have a plan to go forward with——

Ms. FEINBERG. If they can implement it sooner, that would be great. Happy to use those resources for other items.

Mr. MICA. Cameras. Metrolink, you got them? Are there cameras in the cabs?

Mr. KERWIN. Yes.

Mr. MICA. All of them?

Mr. KERWIN. We have all inward facing cameras in all of our cabs.

Mr. MICA. OK. Because that has been a recommendation of NTSB for some time since that accident, and I cited all the other times back to 1973, and they weren't implemented in most instances.

Mr. KERWIN. Ours have been implemented since 2009.

Mr. MICA. OK. Last thing. Is TIFIA [Transportation Infrastructure Finance and Innovation Act] eligible for use of installation of Positive Train Control? Does anybody know?

Ms. FEINBERG. TIFIA, not RRIF?

Mr. MICA. Yes.

Do we know? Does anybody know? Staff know or anybody? Come on. Some of you guys are brilliant on the other side. You don't know? It is? OK.

They think it is. So that is a mechanism for funding. But let me tell you the last thing before I conclude. I have 7 seconds.

I was flying up here and I met a guy on a plane. I didn't know him from Adam's house cat.

"What are you doing on the plane, Mr. Mica?"

"Well, I am coming back to DC."

I said, "Why are you coming back to DC?"

He says, "Well, I am with some kind of a project, and we finance projects." And he says, "It took us between 60 and 90 days to get approval for financing under TIFIA, the private sector."

I said, "Well, what are you doing here?"

He says, "It has taken us a year." He says, "These guys are screwing around with the paperwork for a year."

So you can go out and get private sector financing while they screw around in DOT, and here is a mechanism that may be available and is available, and you have huge capacity at RRIF, and both of them don't work.

Did you want to respond on your own time, because I am over?

Ms. FEINBERG. Sure. I believe that under Secretary Foxx both of those programs have moved along much faster than they have previously. There is always room for improvement.

Mr. MICA. Mr. Chairman, I have got to go to the medical center.

Mr. DENHAM. Thank you, Mr. Mica.

And the previous chairman did say that the witness' time was also the Member's time today.

Ms. Hahn, you are recognized for 5 minutes.

Ms. HAHN. Thank you, Mr. Chairman, for holding this hearing.

Thank you to my colleague Mr. Capuano for yielding to the rest of the committee.

First of all, I want to commend Metrolink, the second-largest rail system by size in the country, for the outstanding work that they have done in meeting our PTC deadline. I like it that you worked closely with your railroad partners, BNSF, Union Pacific, Amtrak, to make sure that their technologies were interoperable and worked hard to acquire the funds needed to fund the implementation of your system. I want to point out that 85 percent of the funds that Metrolink used to fund the rollout were from the State of California and local sources, only 15 percent were Federal.

PTC is clearly a top priority for me, and it really is for the American people. I think when the American people hear that we can prevent train accidents and deaths of people by the implementation of PTC, they are also very frustrated that many railroads are not going to be meeting our deadline. But I will say, I would like to go on record and agree to disagree with Chairman Denham, that I don't think we should take money from the California High-Speed

Rail Authority to pay for PTC. The California High-Speed Rail Authority has it within their budget to make sure that there is PTC on the California high-speed rail project. We need to find money for both.

I am going to ask Mr. Mathias my first question, and we have heard from testimony a major part of the process to implement PTC is acquiring the spectrum. According to Metrolink, the process of acquiring spectrum has been trying and prolonged. It purchased the license for spectrum 5 years ago, and before they can use it, they need FCC's approval. In order to meet the deadline, Metrolink is currently leasing spectrum at the rate of $50,000 per year from freight railroads while awaiting the approval.

I think everyone is going to want to know, why has it taken 5 years to approve the use of spectrum? Is this normal? And shouldn't we have, in light of the recent accidents and in light of this urgency to prevent future accidents, shouldn't there be an expedited process for approval for projects that deal with our public safety?

Mr. MATHIAS. Thank you for that good question, and I can appreciate your concern. We are very glad that Metrolink actually has been able to negotiate a lease and that they will be able to have spectrum necessary to provide the PTC service.

We understand their concern and frustration that the spectrum that they had intended to purchase has taken so long to acquire. Unfortunately, it has been mired in Federal litigation, as well as in a closed proceeding at the Federal Communications Commission, so unfortunately I can't provide details.

But what we are trying to do is as much as we can to keep that process moving. We have taken the extraordinary step of taking the spectrum that they wish to acquire out of our closed proceeding so that we can move forward. They have several waiver requests that they need that would facilitate their use of the spectrum that are pending before us. We understand they need to update those. We look forward to receiving that information.

Ms. HAHN. Thank you. But, again, I think the American people are not going to be very sympathetic with excuses for the FCC not approving spectrum applications as quickly as possible. And I sort of agree with my colleague Ms. Brown on it is sort of difficult to be fining and enforcing the deadline when some of our own agencies are not moving as quickly as most of us would like. So I am just going to say that.

OK. Mr. Kerwin, you are a model, as I said. I am very proud of Metrolink in California. Maybe since you have been able to meet the deadline and you have been able to jump over obstacles and through the hoops to actually make this happen, what advice would you give other commuter rail lines in this country who are trying to meet the deadline by the end of the year?

Mr. KERWIN. Sure. Thank you for that question.

I would like to actually thank Mr. Lonegro for his shout-out to our project director, Darrell Maxey, who has been just diligent in pushing this project forward. That sentiment has come all the way from the top ranks of Metrolink. The board, our grantors have made a very, very strong commitment to this project. So the funding that they provided has been really the crucial element in get-

ting this project going, along with that adamant support from our board to really get this project started.

So we started early and made a very concerted effort, around the clock been working very hard at it for many years. So it is hard to give—I wouldn't say there is a silver bullet for other commuter railroads to accomplish it. It has been a very challenging process. So we do sympathize with the many challenges which we have also encountered.

So I would say that the funding is a key element and having a close working relationship with your freight partners that you operate with, because really that was the other key element for us, was the strong support that we had from our freight partners.

Ms. HAHN. Thank you. And, again, you have been a model for the country, and we applaud you.

Mr. DENHAM. Thank you.

Mr. Duncan, you are recognized for 5 minutes.

Mr. DUNCAN. Thank you very much, Mr. Chairman. I am sorry I had to be at another hearing until just a few minutes ago.

But, Ms. Feinberg, maybe you have covered this, but let me ask you this. It has taken these railroads several years to get to the point where they are now, and apparently there is still a pretty good ways to go. And I am wondering, do you have any estimate of how long it is going to take your agency to certify a railroad after this process?

Ms. FEINBERG. So the step is first a safety plan is submitted to us. So it is basically the railroad's plan for how they will implement PTC and how they will ensure that the system is working. We have received one of those and have turned it back around to the railroad.

They take a while to go through because you are not only reading the plan, but you are in close consultation with the railroad talking through it, offering edits and changes to make sure that the system is going to work. So it takes a while.

But we feel pretty confident that as they roll in, we will be able to staff up and turn them around in the kinds of time periods that we have laid out for the railroads. But as of now, we have just received one.

Mr. DUNCAN. Are you satisfied with the progress that the railroads have made thus far?

Ms. FEINBERG. I am not satisfied. I would not be satisfied unless the deadline were going to be met.

Mr. DUNCAN. My dad told me years ago, and I don't remember what he was talking about at the time, but he said everything looks easy from a distance.

And I was reading over Mr. Lonegro's testimony. Just for CSX it says the tasks are still monumental. And it said CSX has to do "a complete airborne-laser imaging survey of our entire 21,000-mile network" to have "all assets mapped to within 7 feet of their precise location, installation of 5,202 wayside units, replacing signals along 7,500 miles of track, installing 1,285 base stations, equipping 3,900 locomotives, training 16,000 employees." I mean, these tasks, monumental is being conservative when you say that.

And, Mr. Lonegro, tell me about the safety record of CSX so far.

Mr. LONEGRO. We have been an industry leader for the last 2 or 3 years in safety, sir, and the whole industry, if you go back and look at especially the train accident statistics, has seen significant, 40 to 50 percent reductions in train accidents since the 2000 time period.

Safety is a core value of CSX. Safety is a way of life. It is the first core value that we have, and it is very similar at every other railroad. So, I mean, every day we live and breathe safety, whether it is to improve conditions along the railroad, the track infrastructure, the signaling infrastructure, the equipment side of the house, cars, locomotives, and the human factor side of the house, the training efforts that we do.

We have a technology called ERAD [Event Recorder Automated Download], which is a virtual road foreman that looks exactly how that train was handled to figure out whether there are any anomalies in that train handling and then have a coaching session with that employee. If they were over speed, right, we have a conversation with them. If they happen to breach a red signal, they are taken out of service and decertified.

We have lots of things that we are doing. We are starting down the inward facing camera path a la Metrolink to understand the exact behaviors in the cab that contribute to accidents.

So I would say we are doing an awful lot on safety, sir.

Mr. DUNCAN. Well, the committee staff gave me a statistic a few minutes ago, and they said that the freight rail system is 99.995 percent safe based on the number of trips that are taken. I don't know, that seems to me to be a phenomenal safety record. My staffer Don Walker told me a short time ago that the Wall Street Journal said that 2014 was the safest year ever for the rail industry.

Now, I mean, everybody has tremendous sympathy for these families that lost loved ones in the Amtrak accident, but, my goodness, now we are going to be spending billions, already have spent billions and going to be spending billions more to try to make something that is already one of the safest things in the entire world. And I am thinking that we would be far better off to spend those billions in many, many other ways, cancer research and everything else.

My time is up. Thank you, Mr. Chairman.

Mr. DENHAM. Thank you, Mr. Duncan.

Mr. Capuano.

Mr. CAPUANO. Thank you, Mr. Chairman.

Mr. DENHAM. Thank you for being so gracious with your time.

Mr. CAPUANO. Gracious. Get that Pete? Gracious.

Mr. DEFAZIO. Yeah. Twice.

Mr. CAPUANO. I want to thank the panel too.

Ms. Feinberg, we are all here today because we think PTC can save lives. I think everybody agrees with that. If you are a week or two or a month late with a report, does anybody die?

Ms. FEINBERG. No, sir.

Mr. CAPUANO. Are there any major property losses?

Ms. FEINBERG. No, sir.

Mr. CAPUANO. OK. If one of the major railroads came to you and said, "We are not going to make December 31, but we are going to make January 15, we are going to make February 1," are you likely

to be imposing big fines on somebody who is going to be a few weeks or a month late?

Ms. FEINBERG. Highly unlikely.

Mr. CAPUANO. I didn't think so.

Mr. Kerwin, it cost roughly $200 million, a little over $200 million to institute the PTC on your system. Is that right?

Mr. KERWIN. Yes, sir.

Mr. CAPUANO. How much did the Chatsworth accident cost?

Mr. KERWIN. In excess of that amount, I would say.

Mr. CAPUANO. So in hindsight, knowing what that accident cost versus what the system cost, the system has already paid for itself.

Mr. KERWIN. Yes, sir.

Mr. CAPUANO. If it has paid for itself on your line, do you think it is a reasonable thing to say that it would pay for itself on any other line in avoided accidents?

Mr. KERWIN. Yes, I would agree with that.

Mr. CAPUANO. I think so too.

I guess nobody here believes—nobody wants any fines. There is no reason to have fines. We all understand that, Mr. Orseno. We have a commuter rail system too. We get that. But at the same time, we are sitting here 7 years later with some of the major railroads having done virtually nothing. How would you suggest, let's assume that we could come together as a Congress—by the way, Ms. Feinberg, who set this December 31 deadline?

Ms. FEINBERG. The Congress.

Mr. CAPUANO. And are you empowered to ignore that?

Ms. FEINBERG. No.

Mr. CAPUANO. Are you empowered to change that deadline?

Ms. FEINBERG. No.

Mr. CAPUANO. So it is only us?

Ms. FEINBERG. Correct.

Mr. CAPUANO. OK. I think that any reasonable person here understands the deadline is not going to be met. Any reasonable person understands the deadline has to be extended. We are not looking to do fines.

Now, if we don't, I would not ask Ms. Feinberg or anyone else to ignore the law. I would hope that Congress can come together and do this. At the same time, once we do it, how do we avoid a bad actor from simply ignoring it again for any reasonable period of time, 2 years, 3 years, 5 years, 10 years, without a stick?

Mr. Orseno.

And I don't want the fines, but how do I do it any other way?

Mr. ORSENO. Well, I think, as was brought up here today on many occasions, I believe that at the onset from the 2008 Rail Safety Improvement Act, that was a date that was agreed upon. I think once we got into the significant challenges that it——

Mr. CAPUANO. I understand how we are today. Let's assume today, right now, if I said to you write a law that says in some period of time, some reasonable period of time, 2, 3, 5 years, pick a timeframe, we are going to have this done, how do I then enforce it if I don't have fines?

Mr. ORSENO. Well, I think we would need to look at it at that time. But I think the key issue is right now we aren't going to meet

the deadline. And it is not from lack of effort. If it was from lack of effort——

Mr. CAPUANO. I respect that. But the bottom line is I don't know any other way to enforce it amongst bad actors. Good actors don't need an enforcement, bad actors do, which is why fines are in place. My presumption is you have contracts with suppliers that give them fines if they don't meet their requirements. We have to have the same thing if we really think that PTC is important.

By the way, I also fully agree that we should—the Federal Government should be participating in paying for this. But we are having that argument. You know the arguments we are having here. I am with you, but I need 217 other Members to agree with that. In the meantime, we can't do anything.

So I think that it is pretty clear to me that we have to do something, but to pretend that we do nothing or to pretend that somehow goodness will simply overcome the lack of goodness is ridiculous and unenforceable. We need to come up with a reasonable timeframe. We need to allow Ms. Feinberg to enforce the law, whatever it might be. I don't expect you to break the law. I also don't want to fine anybody. So we have to act.

And we can do it all day long, we can play games, we can dance around, we can point fingers, we can show what happened 5 years ago, 7 years ago, 10 years ago. But since 1969, according to the NTSB, according to their own figures, preventable accidents have killed 296 people and it injured 6,732. And I don't know how much money has been lost because no one has put that number together.

If the cap, the $200 million cap, which, by the way, would have cost Metrolink more if it wasn't for the cap, it is hard to tell, but it seems to me just rough numbers, it looks like the cap probably would have cost—even with the cap, it would have been about $20 billion that these accidents would have cost.

This is a doable action, and it is an action that pays for itself as proof positive by Metrolink. Help us work with you to get it done.

And by the way, Mr. Mathias, earlier you said you had 8,500 poles agreed to, but that doesn't count the 11,000 that you did previously. It is my understanding you are closer to 20,000 poles across the country that have been approved. Now, that 20,000 is about out of 30,000, 35,000 that they will need. So we have already got two-thirds of the locations approved and ready to go. Is that right?

Mr. MATHIAS. Correct.

Mr. CAPUANO. Thank you.

And thank you, Mr. Chairman, for your indulgence.

Mr. DENHAM. Thank you, Mr. Capuano.

Mr. Barletta.

Mr. BARLETTA. Thank you, Mr. Chairman.

Safety is my first priority, there is no question, and Positive Train Control is a necessary tool to improve safety. But the fact of the matter is that most railroads will not have the technology installed by the December 31, 2015, deadline. Today I am wondering what happens on January 1, 2016, if the deadline remains.

Mr. Lonegro, today Ms. Feinberg again committed to hold the railroads accountable for not meeting the PTC deadline, including potential fines and restrictions of service. If the deadline is not ex-

tended, what actions will the railroads likely take? I want to know what is going to happen on January 1.

Mr. LONEGRO. Well, sir, there is one way to be compliant with the deadline, and that is not to move TIH/PIH commodities or passengers, which is an untenable situation if you are a passenger agency or a TIH/PIH shipper. So the railroads right now are in a very difficult place with a deadline that can only be congressionally moved.

So we again have a lot of folks that are evaluating how we look at the common carrier obligation, how we look at the PTC mandate to, in essence, figure out is there a way to navigate through breaking the law on one hand or breaking the law on the other hand.

And we have a very similar situation with Amtrak and the commuter agencies where we are required to move the passengers or allow them to move their passengers over our lines. And again, we have a PTC mandate and we have a passenger requirement, and I hate to say which—we are being backed into a corner in terms of which law should we violate. And it may be that the path forward really does involve cessation of service.

But we are all looking at that. We are all evaluating. You heard a Member earlier talk about increased tort liability. We certainly worry about that as well.

So it is an untenable situation, as I mentioned in my opening statement.

Mr. BARLETTA. Mr. Orseno, in your testimony you mention concerns within the APTA Rail Conference about the ability of commuter rail to operate past the PTC deadline as it relates to liability and coverage. Can you further describe what liability and coverage issues would prevent commuter rail that doesn't meet the PTC deadline from operating?

Mr. ORSENO. Well, when we were at the conference a question was raised on whether we can operate or individual agencies can operate past the deadline because you would be operating outside the confines of the law and there may be restrictions in some of the liability coverages. And all the commuter railroads are now going back with their risk and legal teams to take a look and see if that is the case.

Mr. BARLETTA. You have already said that Metra won't make the December 31, 2015, deadline, and in Pennsylvania, SEPTA will not make the deadline either. If the worst-case scenario occurs and commuter rail does not receive any flexibility on the PTC deadline, how would commuters who rely on Metra or other commuter rail like SEPTA be impacted by operation changes?

Mr. ORSENO. That would depend on to the degree of what actually happens. If railroads were forced to close down because of liability reasons and insurance reasons, for us alone that would put 300,000 passengers on the roads already that are congested, and that wouldn't be a good solution.

Mr. BARLETTA. In Pennsylvania, SEPTA is furthest behind in the on board vehicle/locomotive system installations. You also cited in your testimony that one of the biggest PTC challenges is onboard software, and that final production release date is not yet known. Can you tell us why this has been such a challenge?

Mr. ORSENO. I don't have that technical knowledge, but I believe Mr. Lonegro does.

Mr. LONEGRO. PTC, in the very beginning, was somewhat theoretical in the way that the regulation was published in terms of what it had to accomplish and how it had to accomplish that. And so we took a system that was much smaller, much less complicated, and much less mature, and through the period of the last 7 years are really working to the point where it can comply with all of the regulations and the functionality that has been required.

I would tell you that from a software perspective, we are getting closer, meaning, arguably, the end of the year we could have a piece of software that is very, very close. At the same time, we have committed to not implement software that has any critical defects or severe defects, but yet we are willing to deploy software with medium or minor defects, right.

So we are not really trying to get to perfect necessarily, but we are making sure that it can provide all the functionality and doesn't create a situation where a safety problem is introduced.

Just in the last month or so, we have found a safety-critical defect in the onboard software which has to be corrected, has to be retested, has to be taken back to the field, and the same holds true for the back-office software. So these are people in the supplier community, this is their business, right, this is what they do for a living, and if they are unable to tackle the technical challenge that has been put in front of all of us, that gives you some understanding of the complexity of the challenge that we have because that is just one piece of the puzzle.

Mr. BARLETTA. Thank you.

Thank you, Mr. Chairman.

Mr. DENHAM. Thank you. And I would like to recognize Ms. Brown. If you will indulge me just for a second, though, I am going to turn it over to Mr. Rokita, but I did want to enter one piece of information for the record, without objection. This was prepared in association with the California High-Speed Rail Association. This is their June 2009 request for funding.

[The "San Francisco/Silicon Valley Corridor Investment Strategy for High-Speed Rail" can be found on page 108.]

Mr. DENHAM. On their request, they request $230 million from the ARRA Investment Strategy from those funds that have been allocated to California, $230 million. Here is a map here where it shows exactly where those improvements would be.

Can you zoom that in? Move it up.

This corridor here, Positive Train Control, $230 million. The California High-Speed Rail Authority thinks that it can do it. They have requested it. This is in California. We want to have the safety improvements there. Here is a good funding source to do that.

Ms. FEINBERG. Mr. Chairman, understood. My staff passed me a note during the hearing that states that ARRA high-speed rail funding has been at $328 million. So we will follow up with you and look at those two numbers together and respond.

Mr. DENHAM. Thank you. And I will have a staff member bring that down just for your record as we continue this ongoing exchange.

And with that, I would like to recognize Ms. Brown for our second round of questioning.

Ms. BROWN. Thank you, Mr. Chairman, but would you indulge me for a minute, because when I was out of the room, Mr. Mica said that Amtrak had not implemented Positive Train Control from New Haven to Boston. Not only did they implement it, it was the first in the country, and I want to submit that for the record.

Mr. DENHAM. Without objection.

Ms. BROWN. Thank you.

Now, Metrolink, who I visited with several times in California, and I just want to mention that you had the support of the State, the local recovery money. And funding is the issue for all of the commuter lines, and let's don't sit here and act like it is not, and a lot of the local resources are not available for the other lines.

With that, I want to go on to Frank, because you and I want to say all those great things about CSX, but you are the one that is here representing the Class I railroad, and they said that there are some positive players and there are some who are not. Would you give us an update, because we need an extension. The idea that we are going to start fining people, and then where is that money going? Against this reduction? I want the money to go into the system. So would you tell us who are these negative players that they are talking about?

Mr. LONEGRO. Thank you, Member Brown.

There are no bad actors here. This technology is very difficult to implement. The scale proposition that we each have is very challenging, as one of the Members mentioned earlier in terms of the scale of the CSX deployment. For at least the major U.S. Class I's, the scale is about the same, right, we all have that major challenge.

The Canadian railroads have a slightly smaller footprint because they don't run as much in the United States and there is no PTC mandate in Canada, so their footprint is slightly smaller. So at least in the Class I world, there are no bad actors. We are all going about this with all——

Ms. BROWN. That is not what I heard, though. And are you all working with the commuter lines also?

Mr. LONEGRO. We are. Each of us has a different set of commuters that we work with. So on the CSX footprint, we have commuters in and around DC, we certainly have commuters in Chicago, and then we have a full spectrum of commuters on Amtrak that run, in essence, from Baltimore up to Boston.

So we are in active discussions with them literally all of the time. We hosted a summit in Chicago at Mr. Orseno's facility where we brought in the Class I's in the committee that I chair at the industry level, we brought in all the commuters and all the short lines, and did our best to try to help educate folks on the state of the technology, some of the challenges that we face, so they wouldn't have to face the same challenges as they deployed on their railroads.

We had, I think, a good dialogue, and Mr. Orseno can certainly chime in. I think we had a good dialogue. We have kept that dialogue up. We have another meeting planned for later in this year

where we can reengage and reassess where we are both individually and collectively.

Ms. BROWN. What is the drop-dead amount of time that you need, Frank?

Mr. LONEGRO. As an industry, one of the things that we come forward with is the ability to be hardware complete by 2018 and completely rolled out by 2020. And again, I want to make sure that everybody understands, by the end of 2018, OK, we will have as an industry 87 percent of the PTC footprint installed and implemented, meaning we are operational with PTC, and that is based on current plans, plans that were in place certainly before the Amtrak tragedy, and then the remaining 13 percent is really what comes in those last 2 years.

So literally, we are starting to deploy PTC in operational mode right now, right, and then it ramps up from here fairly linearly, but ramps up from here through the end of 2020.

Ms. BROWN. Ms. Feinberg, how long will it take you all to inspect? If they complete it in 2018, you have some work to do. How long will it take you to verify the system?

Ms. FEINBERG. Well, they would submit to us a plan, which we would then turn around to them. Then they would complete implementation, and I think things would move quite quickly. The issue there would be that you would be 3 years past the deadline at that point.

Ms. BROWN. Yes, we understand. Everybody understands that. And we understand that the deadline is not realistic and nobody is going to meet it, and we have some concerns about the fines.

Mr. Mathias, I have a real concern about your spectrum, and we have talked a lot about it, even when it is implemented. What about the local responders? We need to be able to talk to each other; 9/11, we discovered that we couldn't talk to each other. And then Katrina, we are still not talking to each other, and even though they are implementing something and Amtrak is implementing something. And then you have those local responders. How come we don't have a dedicated system for emergencies for this country?

Mr. MATHIAS. Thank you for that question. I think that Congress has worked very hard and diligently to create an infrastructure for a national interoperable public safety communication system, and I think that is being addressed in that way, and it is in a separate spectrum band and being handled in a separate process. But that is on the way.

Ms. BROWN. Mr. Mathias, failure is not an option. We really need to get it done. Thank you.

Mr. ROKITA [presiding]. I thank the gentlelady. The gentlelady's time has expired. I will recognize myself for 5 minutes.

I appreciate everyone's testimony. Mr. Lonegro, I had a couple of questions for you about the two people in a cab situation. In our last hearing, NTSB Chairman Hart testified that having two-person cabs didn't necessarily improve safety, and he was on a panel with several union members and others. I wonder what your thoughts are on that kind of statement.

Mr. LONEGRO. We have two people in the cab of our locomotives on all our main line trains. We certainly over, I would say, the pe-

riod of years, if not decades in the future, we will look for the opportunity to reduce the crew size from two to one if the technology supports that and we are able to negotiate an appropriate agreement with our labor unions. I mean, there is a path forward for that, again, when the technology gets to the point where having two people in the cab really is no longer necessary.

Mr. ROKITA. Roger.

Last hearing Ms. Feinberg stated that the FRA is looking at having a two-person crew situation as an interim solution along with probably some additional backstops as well until PTC is implemented, before deadline, after deadline, whenever that is. Would you be supportive of that?

Mr. LONEGRO. Well, on the freight side I think it is not necessary. We already have it. I think maybe she was referring to the commuter side of the house and the Amtrak side of the house which generally operates with one person in the cab, although they certainly have crewmembers in the train itself. But we already have two.

Mr. ROKITA. Same question, this is the last question to you, Mr. Orseno.

Mr. ORSENO. We operate our trains with one person in the cab and two people in the body of the train that are both rules qualified. Two members up in the cab doesn't necessarily mean it is a safer situation. There have been many instances where there have been accidents when two people have been up in the cab. We don't support that initiative.

Mr. ROKITA. Thank you, sir.

Mr. Kerwin, same question to you.

Mr. KERWIN. Yeah, we have also evaluated this in the past, and we will continue to monitor the recommendations from the FRA and NTSB on this issue.

Mr. ROKITA. OK. Thank you.

And back to you, Mr. Lonegro. You said you currently have two people in a cab on all routes that will require PTC by 2016 or——

Mr. LONEGRO. Correct, all main line routes, yes, sir.

Mr. ROKITA. OK. So CSX having a two-person crew as an interim solution until PTC is fully implemented on PTC-required routes is logistically doable.

Mr. LONEGRO. It is already being done.

Mr. ROKITA. OK. So then would industry be supportive of having two-person crews as an interim solution until PTC is fully implemented, thus, theoretically you would be complying with the requirements of PTC if you had two people in a cab?

Mr. LONEGRO. Well, there is no requirement for two people in the cab today in the way——

Mr. ROKITA. But as an interim solution.

Mr. LONEGRO. Well, we already have it, and any time we would want to go from two to one, we would certainly have to work with FRA to get approval to do that. So it is just not necessary, at least with respect to the freight railroads, given where we are and the steps that we would have to go through to remove one member of the crew.

Mr. ROKITA. OK. Thank you.

And the only thing I would add for the record is that in addition to any of the other things Ms. Feinberg may or may not have been blamed for today, she now has apparently sent Mr. Mica to the hospital, which obligates me to have to go visit him. Add that to your stack.

And with that, my questions are done, and I don't see any more questions from Members. So on behalf of Chairman Denham, let me thank you each for coming again today. We thank all the members of the audience for their attention today. We move forward. And with that, hearing no other business before the committee, this hearing is adjourned.

[Whereupon, at 12:15 p.m., the subcommittee was adjourned.]

WRITTEN STATEMENT OF
SARAH FEINBERG
ACTING ADMINISTRATOR, FEDERAL RAILROAD ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

BEFORE THE
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS
U.S. HOUSE OF REPRESENTATIVES

"The State of Positive Train Control Implementation in the United States"

June 24, 2015

Chairman Denham, Ranking Member Capuano, and Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss issues related to positive train control (PTC) implementation in the United States.

PTC technology is arguably the single most important railroad safety technological development in more than a century. The technology is not new—early versions of PTC technology existed in the early 20th century—and regulators and safety advocates have been calling on the rail industry to implement some form of PTC technology for many decades.

The Rail Safety Improvement Act of 2008 (RSIA) requires our current version of PTC (i.e., the type that is designed to prevent train-to-train collisions, over-speed derailments, train incursions into established work zones, and movement of a train through a switch left in the wrong position) to be fully installed and implemented by December 31, 2015. RSIA requires the technology to be implemented on Class I railroad main lines—lines with 5 million or more gross tons annually—over which any poisonous or toxic by inhalation hazardous materials are transported (with limited exceptions and exclusions). RSIA also mandates the technology on any railroad's main line over which regularly scheduled intercity or commuter rail passenger service is conducted.

FRA currently estimates that this will equate to approximately 70,000 route miles of track and will involve approximately 20,000 locomotives.

Since passage of RSIA, railroads submitted their PTC Implementation Plans (PTCIP) to FRA in 2010. Each plan documented a path to implementation that would meet the deadline.

As I have stated before this Committee previously, and as I state again today in no uncertain terms, safety is the Federal Railroad Administration's (FRA) top priority. Simply put, the rail system is not as safe as it could be without full implementation of PTC. A safe rail system requires full implementation of Positive Train Control. Therefore, FRA will enforce the December 31, 2015, deadline for implementation, as mandated by Congress.

If PTC is not fully implemented by January 1, 2016, we can and should expect there to be accidents in the months and years to follow that PTC could have prevented. We owe it to the public to ensure that PTC-preventable accidents, such as the Amtrak Train 188 derailment north of Philadelphia on May 12, 2015, do not occur by ensuring that certified, fully-operational PTC systems are in place on the routes that require them as quickly as possible.

Enforcement Policy

In the nearly seven years since RSIA was passed and in the four and a half years since the railroads submitted their PTC Implementation Plans, the freight and passenger railroad industry has worked to develop PTC systems that will meet Federal statutory and regulatory requirements.

During this time, FRA has observed a wide range of efforts and resources that have been applied to PTC by different railroads. Some have diligently worked to implement this technology on time, some have worked to make progress on implementation but have been stymied by costs or spectrum availability, and some have chosen not to make implementation a priority.

FRA has noted previously that the implementation and certification of PTC systems are significant undertakings—implementation of PTC is both expensive and complicated. However, the challenges of implementing PTC are not insurmountable, partieularly several decades after the introduction of PTC technology, two decades following NTSB recommendations, seven years following passage of RSIA, and more than four years following official FRA guidance.

The following is a summary of FRA's enforcement policy under our current authorities. The enforcement policy presented below is designed to bring railroads that are in violation of the deadline into compliance with the law as soon as safely possible.

- FRA can assess civil monetary penalties starting January 1, 2016.
- Fines vary based on a railroad's failure to comply with Federal PTC regulations. FRA's PTC penalty guidelines establish different penalties depending on the violation. Examples include a $2,500 fine for a non-willful failure to keep records and a $25,000 fine for willful failure to complete PTC system installation on a track segment. FRA may assess the penalties per violation per day
- FRA reserves the right to use any and all enforcement tools from civil penalties to emergency orders, to require the railroads to make progress on PTC implementation to ensure public safety prior to January 1, 2016.

Many railroads have stated publicly that despite significant enforcement and liability concerns, they still will not meet the December 31, 2015, deadline.

In light of the concerns that some railroads would not meet the deadline, the Department's GROW AMERICA Act[1] submitted to Congress in April 2014 and March 2015 proposed that the Congress provide FRA with additional authorities that would address the safety gap that will exist for many railroads between January 1, 2016, and full PTC implementation. The Department requested these new authorities to allow FRA to review, approve, and require interim safety measures for individual railroads that may fail to meet the PTC deadline (such as allowing portions of PTC to be turned on for certain segments rather than waiting for an entire system to be completed; the goal of these interim safety requirements is to ensure adequate safety for railroads that miss the PTC deadline.

These interim requirements will not serve as an extension of the PTC deadline; rather they are strictly designed to enable FRA to bring railroads into compliance safely.

FRA recommends that Congress:

(1) Grant FRA authority over PTC systems and their operation under controlled conditions before final system certification is complete. This would allow for the incremental use of PTC systems as they are progressively rolled out and simultaneously increase operating safety because railroads could "turn on" portions of PTC on certain segments of track prior to turning on the technology for the entire system; and

(2) Authorize FRA to require railroad use of alternative safety technologies on specified line segments in lieu of PTC until PTC is fully implemented.

These interim requirements will likely be costly to railroads, but FRA believes they will save lives while bridging the gap to successful PTC implementation.

Status of PTC Implementation

FRA Action

In the seven years since passage of RSIA, FRA has dedicated significant resources and worked closely with the railroad industry on PTC, including taking the following steps:

- Hiring staff to assist and oversee the implementation of PTC technology;
- Urging timely submission of PTC development and safety plans;
- Discussing progress with individual railroads and with the Association of American Railroads (AAR) and American Public Transportation Association (APTA);
- Working directly with the Federal Communications Commission to resolve issues related to spectrum and improve the approval process related to PTC communication towers;
- Actively supporting deployment of PTC through the issuance of RSIA-mandated performance-based regulations in January 2010 as well as additional regulations that

[1]The Secretary of Transportation submitted the GROW AMERICA Act to Congress on March 30, 2015. "GROW AMERICA" stands for "Generating Renewal, Opportunity, and Work with Accelerated Mobility, Efficiency, and Rebuilding of Infrastructure and Communities throughout America."

lightened the regulatory burden and technical assistance documents to aid railroads, manufacturers, and suppliers to achieve full PTC functionality and interoperability;
- Building a PTC system test bed at the Transportation Technology Center in Pueblo, CO (which is available to railroads as they work to successfully integrate and test all of component technologies necessary to achieve implementation); and
- Making loans available through the Railroad Rehabilitation & Improvement Financing (RRIF) program to applicants interested in assistance in paying for PTC implementation.

Railroads and Implementation

When railroads submitted their PTCIPs in 2010, they stated they would meet the 2015 deadline per the requirements of RSIA. All submitted plans acknowledged that there would be few, if any, technical and programmatic issues related to the design, development, integration, deployment, and testing of PTC systems that would require resolution.

For more than three years, FRA has monitored these technical and programmatic aspects and has sounded the alarm that most railroads are not making sufficient progress to meet the December 2015 deadline. FRA highlighted its concerns about PTC implementation in its August 2012 PTC report to Congress, as well as in the GROW AMERICA Act, and multiple public remarks, statements, and congressional testimony.

For those railroads that do not meet the PTC deadline, our goal is to achieve full PTC implementation as safely and efficiently as possible.

To facilitate implementation, I have established a PTC Implementation Team that is aggressively managing and monitoring the railroads' progress so that we have accurate and critical information to inform our enforcement actions. This team supplements additional staff working on PTC implementation full time. The team monitors the status of each railroad's PTC implementation, works with the railroad to gather data and answer questions, and tracks when the railroad will have a fully operational system.

Accurate and timely data from the railroads is essential to FRA's effectiveness. Recently, FRA received updated information about PTC implementation from 32 of the 38 railroads that we are currently tracking for enforcement purposes. Initial analysis, along with supplementary data from AAR, indicates the following:

Class I railroads have:
- **Completed or partially completed** installations of more than 50 percent of locomotives that require PTC equipment;
- Deployed approximately 50 percent of wayside interface units;
- Replaced approximately 50 percent of signals that need replacement; and
- Completed most of the required mapping for PTC tracks.

By the end of 2015, AAR projects that:
- 39 percent of locomotives will be **fully equipped**;
- 76 percent of wayside interface units will be installed;

- 67 percent of base station radios will be installed; and
- 34 percent of required employees will be trained.

According to APTA, **29 percent of commuter railroads, excluding Amtrak, are targeting to complete installation of PTC equipment by the end of 2015.** Full implementation of PTC for all commuter lines is projected by 2020.

A recent status update from Amtrak states:

- 85 percent of locomotives have been equipped with PTC to date, including approximately 97 percent of locomotives for the Northeast Corridor (NEC);
- 63 percent of track miles have been mapped;
- For the NEC, New Haven, CT to Boston, MA and portions of the railroad between New York, NY and Washington, DC, have PTC in service presently.
- By December 2015, PTC will be in service throughout the sections of the NEC operated and maintained by Amtrak. This will leave a 56 mile section without PTC on the segment owned by the states of New York and Connecticut that Metro-North Railroad operates and maintains. The Harold Interlocking, owned by Long Island Railroad, in Queens, NY also lacks PTC deployment; and
- Outside of the NEC, PTC is currently in service on the 97 miles of the Michigan Line owned by Amtrak between Porter, IN and Kalamazoo, MI. By December 2015, the Amtrak-owned Keystone Corridor from Philadelphia, PA to Harrisburg, PA and the Empire Connection in New York will also be completed and in service.

FRA Financial Support for PTC

FRA has long stated that a lack of public sector funding may result in unwanted delays in fully implementing PTC. FRA has requested funding for PTC development and implementation grants in every budget request dating back to Fiscal Year (FY) 2011.

For the past two years, as part of the GROW AMERICA Act, FRA has requested $825 million to assist commuter railroads with the implementation of PTC and additional funding to aid with the implementation of PTC on Amtrak's national network.

It is important to note that safety benefits, including those generated through the implementation of PTC, are a key criterion in FRA's grant programs. To that end, FRA has provided approximately $650 million in grant funds to support PTC. This includes American Recovery and Reinvestment Act of 2009 grants through our High-Speed Intercity Passenger Rail program as well as Amtrak grants and other annual appropriations.

In addition to mandating the December 31, 2015, PTC implementation deadline, the RSIA also authorized a grant program to assist in the deployment of PTC and other rail safety technology. Congress appropriated $50 million for the program in FY 2010. FRA awarded these funds to ten projects to help mitigate technical PTC deployment challenges affecting stakeholders. FRA recently added an additional $11 million from new authority provided under the FY 2014 Consolidated Appropriations Act for a total of $61 million in Railroad Safety Technology Grants.

Despite the lack of sufficient funding directed to commuter railroads, FRA is using the resources it has available to help railroads implement PTC. On May 6, 2015, FRA issued a $967 million loan through the RRIF program to the New York Metropolitan Transportation Authority, the Nation's largest commuter railroad provider, to facilitate deployment of the technology by Metro-North Railroad and Long Island Rail Road.

Conclusion

Thank you for the opportunity to testify and answer your questions today. Safety is FRA's first priority, and we appreciate your attention and focus on issues related to the impending deadline for PTC implementation and our enforcement policy for railroads that do not meet the deadline.

We look forward to working with this Subcommittee to improve our programs and make the American rail network as safe, reliable, and efficient as possible. I will be happy to respond to your questions.

Statement of Charles Mathias
Associate Chief, Wireless Telecommunications Bureau
Federal Communications Commission

Before the United States House of Representatives
Transportation and Infrastructure Committee
Subcommittee on Railroads, Pipelines and Hazardous Materials

Hearing on the State of Positive Train Control Implementation in the United States

June 24, 2015

Chairman Denham, Ranking Member Capuano, and distinguished members of the Subcommittee, thank you for inviting me to testify before the Committee today. Like the rest of the nation, we at the FCC are deeply saddened by the tragic Amtrak derailment in Philadelphia. We send our condolences to the families of those who lost their loved ones and our gratitude to the first responders for their efforts. I want to assure you that the FCC is doing – and will continue to do – its part to facilitate the implementation of Positive Train Control, or PTC.

Promoting the safety of life and property through the use of wire and radio communication is a top FCC priority. Since passage of the Rail Safety Improvement Act of 2008 (Act), we have worked directly with freight, passenger, and commuter rails to help them obtain spectrum licenses and complete statutorily-required historic preservation and environmental reviews prior to deploying infrastructure to implement PTC. We have also worked closely with existing spectrum licensees, our federal partners, including the National Transportation Safety Board (NTSB) and the Department of Transportation's Federal Railroad Administration (FRA), as well as Tribal Nations and state officials to facilitate the implementation of Positive Train Control.

THE FCC'S ROLE IN PTC

As a general matter, the Act requires Class I freight railroads, intercity passenger railroads, and commuter railroads to implement PTC on certain track by December 31, 2015. The Act requires PTC systems to be interoperable, and "designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zones limits, and the movement of a train through a switch left in the wrong position." The railroads have chosen to design PTC systems that rely on wireless communication links between locomotives, wayside signals, and central offices. The railroads' design approach involves the FCC in two aspects of PTC deployment.

As the nation's expert agency on communications, the FCC helps freight and passenger railroads acquire the spectrum that they need to support communications between PTC radios installed on locomotives, alongside rail tracks, and at their central offices. As a result of our responsibility for licensing spectrum

use, we also manage the statutorily required historic preservation and environmental reviews of the poles, antennas, and associated infrastructure used to support PTC systems.

The railroads have targeted previously-allocated commercial spectrum bands to deploy PTC. In the absence of specific statutory direction for the FCC to clear and reallocate this spectrum away from its specified use for PTC purposes, which would be a time-consuming and potentially litigious process under any circumstances, the Commission has encouraged railroads to acquire the targeted commercial spectrum from existing licensees who previously purchased spectrum licenses in FCC auctions. Since Congress passed the Act in 2008, the FCC has been working closely with the railroads, including Amtrak, to identify available spectrum on the secondary market and to approve secondary market transactions quickly.

We recognize that developing and deploying PTC is a complex undertaking. While we are actively engaged with the railroads and our federal partners on PTC issues, there are aspects of PTC deployment in which we play no active role. In particular, the Commission is not involved in designing or assessing the railroads' choice of PTC technology. The Act requires the railroads, overseen by the FRA, to design and deploy PTC systems.

PTC IS A PRIORITY FOR CHAIRMAN WHEELER

Since his arrival at the FCC in November 2013, Chairman Wheeler has made facilitating PTC deployment a top priority. Under his direction, the Commission staff developed a more streamlined process for required historic preservation and environmental reviews. It also crafted a one-of-a-kind settlement to allow the freight railroads to use the PTC facilities they had already constructed without required approvals. Chairman Wheeler has also encouraged Commission staff to develop creative approaches to meet the railroads' spectrum needs, such as facilitating an efficient secondary market by matching existing licensees with railroads needing spectrum, encouraging the freight and commuter rails to develop interoperable systems, examining spectrum sharing and lease arrangements, and waiving power level limits to enable PTC systems to operate more effectively.

OVERALL PTC CHALLENGES

All of us share the goal of successful PTC implementation from coast to coast. Significant progress has been made, and the FCC stands ready to act swiftly and effectively within our statutory authority. But it is important to acknowledge key, structural challenges. I would like to touch on them briefly.

As you know, the Act does not designate specific spectrum bands for PTC, nor does it direct the FCC to allocate specific spectrum for PTC. Absent such direction from Congress—and consistent with decades of successful, market-driven spectrum policy—the FCC encouraged the railroads to turn to secondary markets for spectrum, especially given that much of the spectrum the rails chose for PTC had previously been auctioned and licensed to other private parties in major rail markets.

In addition, the Act does not provide a funding mechanism for PTC spectrum acquisition, which can make acquiring spectrum in the private market expensive and challenging, especially for smaller railroads, like commuter lines, and also for Amtrak.

FREIGHTS ESTABLISH PRIMARY PTC SPECTRUM BAND

While challenges exist, it is instructive to take a brief look at the country's major freight railroads, which have targeted and secured channels in the commercial 220-222 MHz spectrum band for PTC. Because of their complex communication needs, the freight railroads have been active participants in the nation's secondary spectrum markets for many years.

The country's major freight railroads acquired nationwide spectrum in the commercial 220-222 MHz spectrum band just months before the Act became law through transactions with private parties that had previously acquired spectrum licenses in FCC auctions or through secondary market transactions. The freight railroads quickly focused on utilizing this spectrum when the PTC mandate was established. Several of the major freights collectively acquired an ownership interest in a company that is developing PTC technology and equipment, and also created a spectrum coordinator—known as "PTC-220"—to manage the spectrum. In doing so, the freight railroads effectively drove other railroads, including Amtrak and commuters, to spectrum in and around the 220-222 MHz band for their PTC operations as well.

For most of the country, this strategy appears to have been successful. Whether through secondary market purchases or leases with PTC-220, the freights, Amtrak, and the commuter rails have cooperated to find spectrum to meet their needs. They have reached agreements that address several challenges related to PTC, including sharing both spectrum and infrastructure. A good example of this collaboration is the planned PTC deployment in Chicago. There, 11 railroads, including the freights, Amtrak, and commuter rails, will use common PTC-220 spectrum and infrastructure to ensure the safe transport of passengers and cargo across the nation's busiest rail market.

While most of the railroads across the country have the spectrum they need, our work in facilitating spectrum access is ongoing. For example, we are actively reviewing recently proposed spectrum transactions in several markets, and we will continue to assist railroads in their efforts to identify partners for secondary market transactions as necessary.

NORTHEAST CORRIDOR

The Northeast Corridor is a difficult and congested spectrum market. The freights largely met their anticipated spectrum needs in this area through their initial 220-222 MHz band license purchases. Amtrak approached the FCC on several occasions beginning in 2011 about obtaining spectrum to deploy PTC in the Northeast Corridor. The FCC has had similar interaction with commuter rails in the area.

In the absence of sufficient spectrum inventory or specific statutory direction, FCC staff encouraged the railroads operating in the Northeast Corridor to investigate obtaining spectrum from existing licensees in the secondary market.

In fact, Amtrak and several commuter rails have been successful in obtaining spectrum through the secondary market. Once Amtrak and the existing private party licensees finalized their commercial agreements, FCC staff quickly approved the spectrum transactions and related requests for waiver of certain FCC rules. In the case of Amtrak, the FCC approved its purchase of spectrum from Boston to New Haven overnight, and its purchase of spectrum from Washington, DC, to New York City just two days after Amtrak finalized its application.

INTERFERENCE CONCERNS

Spectrum acquisition in the Northeast Corridor is more complicated than in the rest of the country because Amtrak and the freight railroads are deploying two different PTC systems that were not engineered to be compatible. The systems can operate without difficulty when geographically separate from each other, but when operating in close proximity on the same spectrum, as in the Northeast Corridor, the systems can encounter significant challenges. So, unlike in a market such as Chicago, where the railroads will share the same block of spectrum and use a single PTC system, in the Northeast Corridor each PTC system requires spectrum far enough from the other's to avoid the interference that could affect proper operations.

Amtrak and the freight railroads repeatedly assured the FCC that they would design their systems to operate with respect to each other on a non-interference basis. However, in late May, Amtrak and the freight railroads advised FCC staff in a joint meeting that using their separate PTC radio systems on the Boston to New Haven portion of the Northeast Corridor in the same spectrum block would result in harmful interference. This could degrade or disable communications on both systems, causing either or both to function improperly or stop functioning altogether.

The FCC has had two follow-up meetings with stakeholders, including the FRA, to identify possible solutions and how the FCC could help the parties resolve this emergent problem. FCC staff will continue to work with Amtrak, the commuter rails that use the Amtrak system in the Northeast Corridor, and the freights to help identify and review possible solutions to these recently identified problems arising out of the railroads' system design choices.

INFRASTRUCTURE

PTC infrastructure concerns played no role in the accident in Philadelphia. Amtrak has informed us that its physical infrastructure in the Northeast Corridor is already in place.

PTC-related infrastructure review has been a priority in other areas of the country, however. Long-standing Federal environmental and historic preservation laws—the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA), respectively—require the FCC (and every Federal agency) to assess the potential impacts of agency "undertakings" that they license, including possible impact on properties significant to Tribal Nations. This means the FCC must ensure that PTC deployments are reviewed by Tribal Nations and State Historic Preservation Offices in a manner that allows for appropriate consideration of potential impacts.

In 2013, FCC staff became aware that the freight railroads had installed approximately 10,000 PTC poles around the country without complying with the FCC's review requirements under NEPA and NHPA. Recognizing the need for railroads to comply with the PTC mandate, the agency worked as required by statute with all stakeholders—freight railroads, Tribal Nations, state officials, the Advisory Council on Historic Preservation (ACHP), and other federal agencies—to resolve the deployed pole issue and develop a "fast track" review process for future pole deployments.

This process was made more complex by the fact that Tribal Nations in key deployment areas resisted discussions about future PTC deployments until the deployed pole issues were resolved. In May 2014, the FCC signed agreements with all seven major freight railroads that created a $10 million Cultural Resource Fund to account for previous non-compliant deployments. The fund is providing direct support to Tribal Nations and State Historic Preservation Offices to support cultural and historic preservation projects.

Also in May 2014, the ACHP issued a set of streamlined rules for future PTC pole deployments. Under this approach, the majority of proposed PTC poles are presumptively exempt from historic preservation review, subject only to basic checks on their eligibility for the exemption.

At this point, nearly 20,000 poles have been constructed or submitted for streamlined review, and in April 2015 the Association of American Railroads estimated that its members have approximately 15,000 left to deploy. The Commission has the capacity to receive 1,400 pole applications (including exempt and non-exempt poles) every two weeks. As of June 18, 2015, the freight railroads *could have* submitted as many as nearly 40,000 additional poles for Tribal and state review. The railroads have submitted a total of approximately 8,500 poles, or roughly 21 percent of the system's capacity.

GOING FORWARD

The PTC spectrum situation in the Northeast Corridor is complex and poses significant technical challenges for the railroads. We stand ready to work with Amtrak, the commuter rails, and the freight railroads to facilitate resolution of the technical and spectrum issues arising from the decision to deploy separate PTC systems in the same frequency band in the Northeast Corridor.

CONCLUSION

We appreciate the Committee's interest in this issue and its efforts to ensure the successful deployment of PTC systems. The FCC is committed to working collaboratively with all parties to facilitate the deployment of PTC.

I look forward to answering any questions you may have.

TESTIMONY OF FRANK LONEGRO

VICE PRESIDENT – SERVICE DESIGN

CSX TRANSPORTATION, INC.

BEFORE THE U.S. HOUSE OF REPRESENTATIVES

HOUSE COMMITTEE ON TRANSPORTATION AND

INFRASTRUCTURE

SUBCOMMITTEE ON RAILROADS

HEARING ON POSITIVE TRAIN CONTROL

JUNE 24, 2015

CSX TRANSPORTATION
500 WATER STREET
JACKSONVILLE, FLORIDA 32202
904-359-3100

On behalf of CSX Transportation, Inc. (CSX), thank you for the opportunity to appear before you today to discuss positive train control (PTC).

CSX operates a freight rail network spanning approximately 21,000 miles, with service to 23 eastern states, the District of Columbia and two Canadian provinces. We are part of a 140,000-mile U.S. freight rail network that serves nearly every industrial, wholesale, retail, agricultural, and mining-based sector of our economy. Whenever Americans grow something, eat something, mine something, make something, turn on a light, or get dressed, CSX or another freight railroad is probably involved somewhere along the line.

In this testimony, I will describe what positive train control is; the extraordinary steps CSX and other freight railroads have taken to develop and implement this new technology, explain why – despite CSX's and other railroads' best efforts – the existing statutory deadline for nationwide PTC implementation is unrealistic and should be extended; and what some of the implications of not extending that deadline are – including the fact that the Rail Safety Improvement Act of 2008, for the first time in history, has the potential to make railroads' operations unlawful as of January 1, 2016.

Before I begin, I would like to emphasize that safety is CSX's highest priority, and zero accidents is our goal. We invest billions annually in technology and infrastructure to ensure that our network is suitable for the safe delivery of every load of freight consigned to us. In 2014, for example, we spent $2.4 billion of private funds on our infrastructure, including $300 million on PTC. In addition, our employees receive regular training aimed at creating a culture of safety populated by workers who feel empowered to take responsibility for protecting their health and the health and well-being of the communities where we operate.

What is Positive Train Control?

"Positive train control" (PTC) describes technologies designed to automatically stop a train before certain accidents occur. The Rail Safety Improvement Act (RSIA) requires passenger railroads and Class I freight railroads to install PTC by the end of 2015 on main lines used to

transport passengers or toxic-by-inhalation (TIH) materials.[1] Congress was single-minded in its mandate: PTC and only PTC was required. Other braking technologies such as Automatic Train Control or ATC was not deemed sufficient for purposes of the Act. Specifically, PTC as mandated by the RSIA must be designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where maintenance activities are taking place, and the movement of a train through a track switch left in the wrong position.[2] The PTC systems that will be installed to meet the statutory mandate are overlay systems, meaning they supplement – rather than replace – existing methods of operation and train control systems.

Positive Train Control is an Unprecedented Technological Challenge

A properly functioning PTC system must be able to determine the precise location, direction, and speed of trains; warn train operators of potential problems; and take prompt action if the operator does not respond to the warning provided by the PTC system. For example, if a train operator fails to begin stopping a train when approaching a stop signal, or slowing down for a speed-restricted area, the PTC system would apply the brakes and stop the train automatically, before the train passed the stop signal or entered the speed-restricted area.

Such a system requires highly complex technologies able to analyze and incorporate the huge number of variables that affect train operations. A simple example: the length of time it takes to stop a train depends on train speed, terrain, the weight and length of the train, the number and distribution of locomotives and loaded and empty freight cars on the train, and other factors. A PTC system must be able to take all of these factors into account automatically, reliably, and accurately in order to safely stop the train.

The development and implementation of PTC systems constitute an unprecedented technological challenge for railroads. The attached appendix illustrates the numerous interconnections between systems that must integrate in a PTC system, and the deployment process is described in some detail in the attached American Association of Railroads' white paper. Tasks involved include:

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[1] *TIH materials are gases or liquids, such as chlorine and anhydrous ammonia, which are especially hazardous if released into the atmosphere.*

[2] *A switch is equipment that controls the path of trains where two sets of track diverge.*

- Create a series of novel software solutions that must work together to create the system referred to as PTC.
- A complete physical survey and highly precise geo-mapping of the approximately 62,000 miles of railroad right-of-way on which PTC technology will be installed, including geo-mapping of nearly 440,000 field assets (mileposts, curves, grade crossings, switches, signals, and much more) along that right of way.
- Installing PTC technology on more than 23,000 locomotives.
- Installing over 34,000 "wayside interface units" (WIU) that provide the mechanism for transmitting information to locomotives and the train dispatching office from signal and switch locations along the right of way.
- Installing PTC technology on over 3,300 switches in non-signaled territory and completing signal replacement projects at more than 14,500 locations.
- Developing, producing, and deploying a new, nationwide radio network and new radios specifically designed for the massive data transmission requirements of PTC at 4,000 base stations, 31,000 trackside locations, and on 23,000 locomotives.
- Developing back office systems and upgrading dispatching software to incorporate the data and precision required for PTC systems.

For CSX the tasks are slightly smaller but still monumental:

- A complete airborne laser-imaging survey of our entire 21,000-mile network was required with all assets mapped to within 7 feet of their precise location
- Installation of 5,202 wayside units
- Replacing signals along 7,500 miles of track
- Installing 1,285 base stations
- Equipping 3,900 locomotives
- Training 16,000 employees

I'm proud to report that CSX has made great progress in all of these areas, and we have more than 1,000 employees who are dedicated to extend our achievements, over half of whom were hired directly as a result of the PTC mandate. As of May 15, 2,676 locomotives were at least partially equipped with PTC; some 2,200 WIUs are deployed; and 466 radio base-stations were installed. In addition, we have completed field qualification testing on the first territory type on

our network, and we're starting a revenue service demonstration in late July – using the system on a 480-mile segment of our network, or roughly the equivalent of the Northeast Corridor or Metrolink's system.

These statistics represent the significant progress CSX and other railroads have made toward installing the nationwide, interoperable PTC network. Notwithstanding these significant achievements, much more design, development, testing, training and installation work remains. We continue to find safety critical defects in the software that must be corrected and retested prior to revenue service.

More Time is Needed to Ensure Safe and Effective Implementation

CSX and other freight railroads have been working tirelessly, and spending tremendous amounts of money, to meet the PTC mandate. In fact, for the period of 2009-2014, PTC was CSX's third largest capital expense behind track maintenance and freight cars. CSX spent more on PTC in this period than it did on locomotives, intermodal terminals, bridges or commercial facilities. As of the end of 2014, CSX had invested $1.2 billion in PTC. We expect to spend another $300 million this year. Our current estimate for the total cost of PTC on our railroad is at least $1.9 billion. Freight railroads together have so far spent well over $5 billion – of their own funds, not taxpayer funds – on PTC development and deployment, and expect to spend at least $9 billion by the time PTC is fully operational nationwide. This does not include the hundreds of millions of additional dollars that will be needed each year to maintain the railroads' PTC systems when they are complete.

Despite these huge expenditures, PTC's complexity and the enormity of the implementation task – and the fact that much of the technology PTC requires simply did not exist when the PTC mandate was passed and has had to be developed from scratch – as the railroads have said since 2012, more time is needed for full implementation.

Much of CSX's and other railroads' efforts to date have been directed toward development and initial testing of technology that can meet the requirements of the legislation and can be scaled to the enormous requirements of a national, interoperable system. For example, production and installation of the new radios was possible only after a long period of development and testing.

Essential software and hardware for many PTC components are being designed and developed, and rigorous testing of these components is being performed. Only after this work is completed and the technology has been installed can the task of lab testing each of the individual parts, and then field testing the system as a whole, be completed.

This task is made particularly complex by the need to ensure that PTC systems are fully and seamlessly interoperable across all of the nation's major railroads. It is routine for one railroad's locomotives to operate on another railroad's tracks. When that happens, the "guest" locomotives must be able to communicate with, and respond to commands from, the "host" PTC system. Put another way, a CSX locomotive has to behave like a Norfolk Southern locomotive when it's traveling on NS's tracks; a BNSF locomotive must be compatible with Union Pacific's PTC system when it's on UP tracks, and so on. That's much easier said than done, and ensuring this interoperability has been a significant challenge.[3]

It is also critical that the many potential failure points and failure modes in PTC systems are identified, isolated, and corrected – all without negatively impacting the efficient movement of goods by rail throughout the country. This is incredibly important. The PTC systems the railroads ultimately deploy must work flawlessly, day in and day out, or risk seriously impairing operations on of the U.S. freight rail network. The damage that would cause to our nation's economy would be enormous if implementation were forced prematurely.

In addition, the Federal Railroad Administration must review each railroad's PTC safety plan and certify each railroad's PTC systems after the development and testing of the components are complete. Only then can a railroad's PTC installation be completed and placed into operation. You have heard from the FRA about the enormity of their task to review the railroads' safety plans. In a world of constrained resources, that timely review becomes more challenging. FRA has stated that it has received and reviewed one of the roughly 40 safety plans that need to be submitted by railroads. The railroad that submitted the plan coordinated extensively with FRA over more than a year, meeting informally to discuss and review the plan so that the formal review process would move as quickly and efficiently as possible. Once the plan was submitted

[3] *Some have questioned why railroads don't all implement identical PTC systems, thereby ensuring interoperability. That's not possible because a railroad's PTC system must function within the parameters of that railroad's existing communication, signaling and dispatching systems, and operating rules.*

formally, it still took more than 11 months for FRA to review the plan, and the plan has thus far only received conditional approval.

Railroads knew when the PTC mandate was passed in 2008 that the technological challenges related to PTC would be immense. But railroads have also faced significant non-technological barriers to timely PTC implementation.

One such challenge with which the committee may be familiar involved regulatory barriers to the construction of antenna structures. As you may know, the Federal Communications Commission initially required historical and Native American review of proposed antennae sites, and the system that was in place at the time to process those applications was overwhelmed by the volume of sites that needed to be reviewed. To its credit, the FCC worked with the railroad industry and now a path forward has been put in place on this issue. Unfortunately, diagnosing the problem and designing a new process ultimately cost railroads more than a year's construction season toward meeting the PTC deadline. We continue to work closely with the FCC on other PTC-related issues.

Despite these setbacks, railroads' aggressive implementation of PTC will continue. However, it is simply not possible to complete a nationwide, interoperable PTC system by the end of 2015. Adjusting the implementation deadline would more accurately reflect railroads' considerable efforts to design, test, approve, produce, distribute, install and train 100,000 employees on the use of this incredibly complex technology. Rushing PTC development and installation and foregoing a logical plan for sequencing its implementation would sharply increase the likelihood that the system would not work as it should, and potentially lead to degradations in safety and efficiency, which is an outcome that serves no one's purpose.

Some have suggested that the railroads have somehow not tried hard enough to meet the existing statutory deadline, and that there are so-called "good actors" and "bad actors" with PTC implementation. Not only is that not true, it is a gross mischaracterization of all the hard work that all the railroads have performed to date. CSX, as I mentioned, will have as many miles of PTC-equipped track in service at the end of 2015 as Amtrak or Metrolink will. I'm proud of CSX's and other railroads' efforts and I'm sure that those involved in PTC at other freight

railroads would say the same thing. We in the railroad industry are fully committed to PTC, but it must be done correctly. That's simply not possible by the end of this year.

Implications of Not Extending Deadline

While some attention has been focused on the potential implications of not extending the deadline for PTC installation, there are issues that we do not believe have received adequate exposure. Many assume, for example, that the Federal Railroad Administration will use discretionary fines, emergency orders and other tools to enforce compliance with the RSIA. Other implications of which the subcommittee should be aware could have more profound impacts on freight railroads, their freight customers and the thousands of passengers across the United States who daily rely on rail service provided over freight railroads' tracks.

The most immediate impact of the existing deadline is the fact that, for the first time in history, RSIA has the potential to make certain rail operations illegal. Because the law requires that tracks carrying passengers or TIH freight be equipped with PTC, operating any trains carrying passengers or TIH freight on tracks without PTC would be in conflict with the law.

This creates a significant dilemma for CSX: shall we operate in violation of RSIA, in fulfillment of our Common Carrier obligations to transport freight on reasonable request? Or, does the impossibility of operating lawfully render a request to transport unreasonable? If so, is our only choice to refuse to transport passengers or TIH materials so we are in compliance with the PTC requirements?

As you might expect, many lawyers are considering the potential commercial, operational and legal implications of these choices, and CSX is not today making any announcements about any conclusions of those reviews. But we would be irresponsible if we did not focus on and alert this committee to the potential consequences of this conflict.

For example, on CSX tracks alone, approximately 120 commuter and Amtrak passenger trains operate daily. Many are operated in the Washington DC metropolitan area, by the MARC and VRE commuter services. All told, an average of 42,000 passengers per day ride trains on CSX-owned tracks which the law requires to be PTC-equipped by year-end. Other freight railroads also support passenger operations, in metropolitan areas across the country.

If the PTC deadline is not extended, is CSX placing itself in legal jeopardy by continuing to allow passenger trains to operate on our tracks? Could CSX afford the liability of operating passenger trains in violation of the law? Would CSX be in violation of our fiduciary responsibility to our shareholders to assume such risks? More fundamentally, is it ever right to do something that is contrary to law? These are among the questions faced by CSX and each railroad that supports passenger operations.

For other railroad customers, such as those industries that require a reliable supply of essential but dangerous toxic-by-inhalation chemicals, the implications are equally dramatic. If railroads cannot transport those commodities, what alternatives are available? Will we see more trucks on the highways carrying TIH substances, introducing additional risks to the public and uncertainty to the supply chain? Are enough trucks available to support those needs, including the critical supply of chlorine and other additives that purify the nation's drinking water?

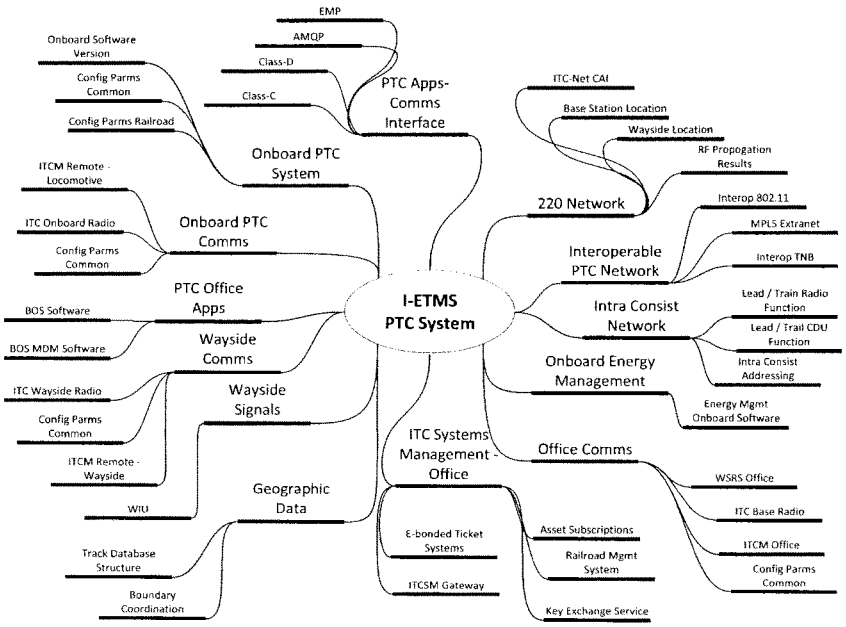
At this point there don't appear to be easy answers to these questions, but they are questions that clearly must be addressed and deserve the committee's attention. Operating certain trains on non-PTC-compliant tracks could be an unacceptable choice for some railroads, and the impact of railroads' decisions on commuters and industries that rely on rail service could have significant effects that have not yet been fully examined.

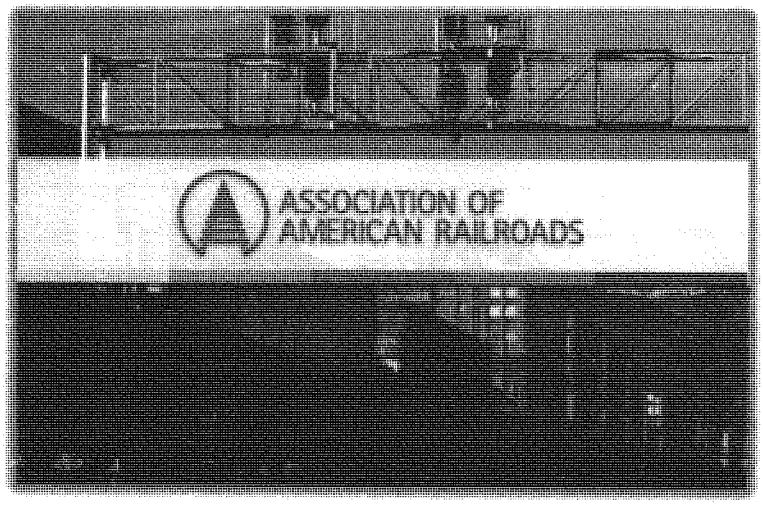
Conclusion

Since enactment of the RSIA, CSX and other railroads have devoted enormous human and financial resources to develop a fully functioning PTC system, and progress to date has been substantial. However, despite railroads' best efforts, the immense technological hurdles are such that a safe, reliable, nationwide, and interoperable PTC network will not be completed by the current deadline. Railroads remain committed to implementing PTC as early as possible and are doing all they can to address the challenges that have surfaced, but more time is needed to ensure safe and effective implementation on the nation's vast freight and passenger rail networks.

APPENDIX

POSITIVE TRAIN CONTROL – SYSTEMS DIAGRAM





Positive Train Control Implementation Challenges

Association of American Railroads

June 22, 2015

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Introduction

Positive Train Control (PTC) isn't just about installing a number of widgets, or "plugging in" or "turning on" components. Implementing a PTC system is a complex *process*, both in terms of safety engineering and deployment implementation.

The PTC system for the majority of freight railroads takes the information that is conveyed today, either by voice radio between dispatcher and crew, or by the signal system "traffic lights," and transforms it into the 0s and 1s of digital data. That digital information is then transmitted by a specialty communications system to the locomotive. The locomotive has a train management computer -- a "TMC" -- which is the "brain" of this system; it receives data and decides, through safety engineering programming reflecting many common railroad operating practices, whether it is safe for the locomotive to proceed. That is a tremendous simplification of an exceptionally complex system.

PTC is designed to automatically stop a train before certain accidents caused by human error might otherwise occur, including train-to-train collisions, derailments caused by excessive train speed, unauthorized train entry into work zones or movements through misaligned track switches.

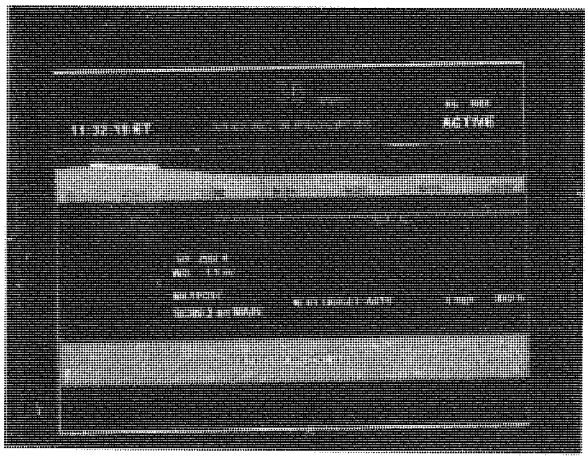

Figure 1- PTC Warning of Braking Event

But PTC is not a panacea. For example, PTC does not protect against derailments caused by equipment or infrastructure failures, and external factors such as trespassers, grade crossing violations by motorists, or deliberate vandalism. The figure below lists a few other things PTC does not protect against.

Rail Break in Non-Signaled Territory A rail break in non-signaled territory may not be detectable by PTC.	**Restricted Speed** When a train is operating within restricted speed limits, accidents can still occur.
Rail Break Under Train in Signaled Territory A rail break occurring while the train passes over it may cause an accident that PTC cannot prevent.	**Inadequate Equipment Clearance** PTC does not detect inadequate equipment clearances.
Excessive In-Train Forces Induced by Train-Handling Improper train handling can result in accidents that are not PTC-preventable.	**Un-Equipped Locomotives** The rules permit operation of non-equipped locomotives on PTC track in certain circumstances.
Accidents on Non-PTC Equipped Track Not all track is PTC-equipped.	**Crew Fails to Activate/Fails to Follow Procedures** If the crew fails to properly activate and engage the PTC system, it cannot protect the train.

Figure 2 - Some Rail Operational Aspects PTC Does Not Protect

PTC relies on safety critical information from the wayside - the signaling system and switch machines – to ensure that the route for the locomotive is safe. The PTC system must accept data from various sources, pass data to various sources, and compare data for exact match from various sources. The PTC system must handle millions of transmissions of data for the thousands of trains moving daily. PTC must do so securely, ensuring that any transposition or tampering is self-evident and instantly apparent. Furthermore, PTC must work across multiple railroads, regardless of which vendor's system the railroad deploys or how many different vendors' components a railroad deploys. There are few if any automated control systems in operation today that have this capability.

PTC must work properly to keep the trains moving as they do today. PTC failures will result in the slowing or stopping of one or more trains – which may then slow or stop other trains in the area. The net impact would be a reduction in capacity of the rail network and service quality, which ultimately impacts manufacturers and consumers.

The design, development and implementation of PTC also demands a carefully choreographed, multi-phase process with no short-cuts or skipped steps. There are countless dependencies and predecessor tasks involved in deploying PTC. Just like building a new space shuttle, tasks cannot be completed out of order.

Finally, tremendous planning and coordination within a railroad and among railroads are required to make a nationwide interoperable system work. All this must be done in a manner that minimizes PTC's potential negative impact on railroad operations.

Here is a list of some of the interrelated tasks and processes necessary for PTC deployment:

- Employ PTC methodology to determine footprint
- File PTC Implementation Plan
- Survey line segments for current condition to understand PTC wayside requirements
- Apply PTC signal mapping to design
- Design Line Segments
- Peer or lab Quality Assurance (QA) test wayside design
- GPS validate wayside and base tower locations
- Order Material
- Deploy labor to construct
- Construct PTC location, including tower
- Install equipment at wayside
- Insure connectivity of site to back office through communications links
- Cut-in/in-service test PTC locations
- Update Software Configuration Management Database
- Request FRA permission to conduct field testing
- Validate track database critical features
- Validate wayside interface unit (WIU) indications with TMC
- Validate PTC route for track data
- Lab test functionality
- Field test brake algorithm
- Field test functionality
- Request FRA permission to conduct track data validation and verification beyond pilot territories
- File test plans with FRA for approval
- File final test reports with FRA
- Design locomotive layout for PTC equipment
- Install onboard equipment

- Test connectivity between locomotive and office
- Commission the locomotive for PTC by conducting post installation check-out tests
- Survey sites and collect data for communications equipment and towers
- Conduct an RF study of site to select best tower location
- Make regulatory filings to FCC for approval of site location
- Create communications frequency plans with other railroads
- Order and ship material for base stations
- Install base station tower
- Develop instructions, procedures, training material for those who install, operate, maintain, repair or test components
- Schedule training for active agreement workforce
- Deliver training
- Commission line segments for implementation day

"Turning on" PTC is the culmination of hundreds of tasks, all effectively coordinated and integrated. While many of the tasks listed above could be completed independently, implementation only occurs when everything works in concert. Each location must have all necessary components installed and working, and then must be integrated into the district or "subdivision," which is a specific geographic section of a railroad, in which it resides, before any of the locations in that subdivision can be turned on, tested and validated. On top of this field component comes the required PTC software on board the locomotive, which must be fully tested and operating safely. Then there is the important project of setting up the ongoing support and maintenance that will be necessary to keep PTC operable.

PTC is truly a system of systems, and the integration challenge has been daunting. To use a metaphor from the airline industry, just having an airport constructed and ready isn't enough. Planes must be equipped and maintained, air traffic controllers available, crews rested, a communications system working, gate equipment ready, schedules defined, and the software that makes the planes fly fully tested. All of these things must come together to make an airline "system" work so your plane arrives at its gate and ready to depart safely when you are.

This paper will walk through the various aspects of the PTC implementation challenge in more detail. Railroads have invested billions in designing, developing and installing this system of systems, and will invest billions more before it is ready. The following pages explain why.

Wayside Planning

PTC starts with the PTC Implementation Plan methodology, which defines the footprint where PTC is required to be installed. From there, a railroad begins its design process. Each subdivision where PTC is required has representative wayside designs. These designs or track profiles are CAD drawings that illustrate the track infrastructure and define the requirements for installation and wiring for a safe signal, switch and grade crossing system. Each of these track profiles must be pulled, analyzed and marked up with color coded variances for the changes PTC requires. Signal design engineers who perform this work are a seriously constrained resource for the industry; there just aren't that many people who have the experience or knowledge to do safety design work for railroad signaling systems. The railroads have over 2,400 signal engineers working on PTC.

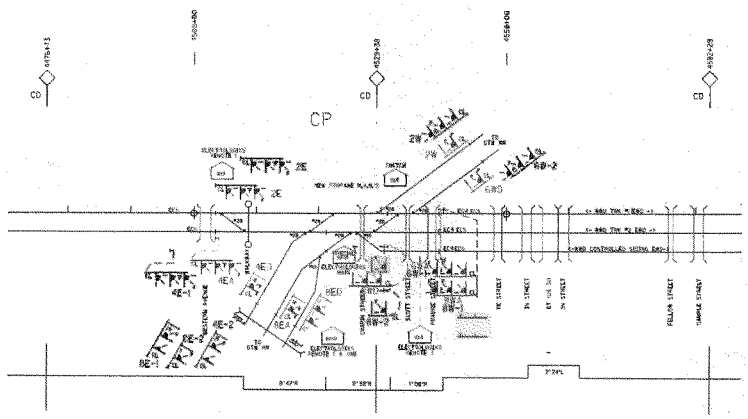

Figure 3- Track Profile Location Design

Engineers typically survey the current infrastructure in the field to assess changes required for PTC. Once the design for a district is completed, it undergoes QA before the design is implemented, i.e., peer reviews and/or lab testing of the design. Rack testing provides several benefits:

- testing vital software in a controlled environment without track and time constraints;
- discovering any defects in the software prior to the software being released to the construction forces; and

- verifying that the PTC behavior for a signal location is as expected prior to installation in the field.

Once a location is approved as designed, material must be ordered from the railroad's suppliers. Some railroads use material aggregators to lessen supply chain issues. Over 34,000 WIUs will be required for PTC.

The majority of PTC signal locations have older equipment in use. Older signal equipment cannot be upgraded to "speak PTC," so replacement is required. The industry refers to this effort as "green fielding" or "signal replacement projects." Almost 15,000 such projects are needed.

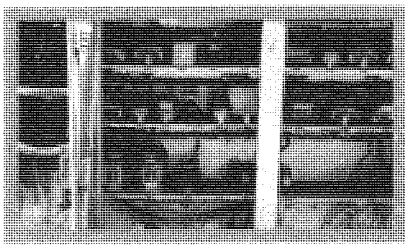

Figure 4 - Older Relay Signaling Equipment

Green fielding entails completing a new signal design for an integrated WIU, followed by the installation of a new bungalow, antenna, signals, track circuits and control equipment, along with rewiring. Compared to upgrading existing newer electronics, the green fielding process is much more time consuming. For example, one control point might be as complicated as having to work on or replace two cantilever signals, three dwarf signals, three cross-over switches, 1 single switch, 1 main bungalow and 1 remote smaller bungalow.

Any construction occurs along the railroad right of way where decades of wiring, cabling and other infrastructure lie below the surface to make current train operations work. Care must be taken not to cut or break cables, power lines and other assets connecting bungalows, signals, switches and track structure.

In general, every location for a Class I railroad that requires PTC will need some or all of the following work:

- replace bungalows;
- install and position wayside and base radio and GPS antennas at wayside locations and base station sites;
- install WIU;
- cable work;
- replace or upgrade battery power;
- install lightning & surge protection;
- replace track circuits where necessary;
- replace signals where necessary;
- install wayside message servers;
- perform in-service tests that can include running through every available combination of routes to insure signal indication accuracy; and
- update configuration management.

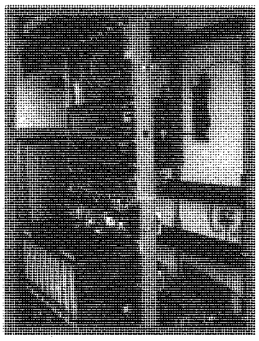

Figure 5 - New Signaling Equipment for PTC

The GPS coordinates for PTC towers also must be established. That process is described in the Communications Planning section. Because of the complexity of some locations and their connectivity with other railroads, or because of the year-long hiatus on tower construction imposed by the FCC, completed mileage in a district may not be contiguous. Many of the lines where construction is completed still have "gaps" that must be designed and/or constructed to complete a line segment.

In non-signaled territory, over 3,300 switches will require an upgrade to become PTC capable. For the most part, these upgrades will require: a) the provisioning of utility or localized power (e.g. generators, solar panels, etc.) to the location, given that many switches in non-signaled territory are "hand throw" or "spring" switches that previously have not needed power; b) the

installation of a switch position monitor; c) the installation of a WIU; and d) the installation and configuration of communication systems. Providing power to a switch location requires trenching along the right of way and burying cable.

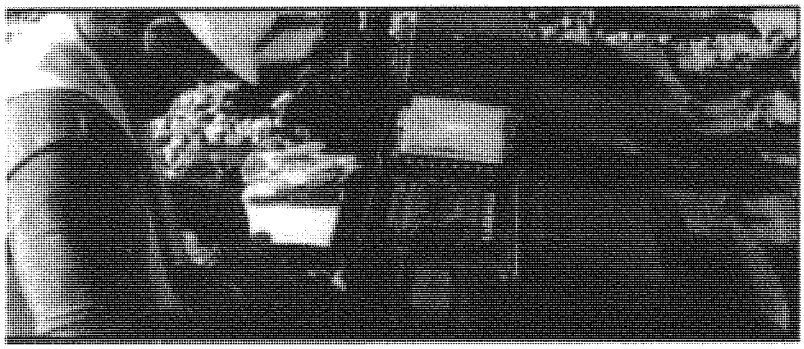

Figure 6 - Modifying a Switch Machine for PTC

Wayside Testing

It is critical to assess the accuracy of the wayside design and installation process to validate and verify that the signal system as installed is safe for operation. This often requires testing every route a train may take, to insure that the signal will return the expected and safe indication to the locomotive. Signal testing is part of standard safe operation of a railroad. But because of the addition of the PTC locations, is also very time consuming, tripling or quadrupling the annual effort of many signal departments. At many track locations there are complex interlockings through which hundreds of trains pass a day; each in-service test requires the signal team to have track time and protection to run the tests. Train operations must be halted or restricted through the "test zone."

Every test is recorded. All locations requiring any software changes or updates for PTC also require updates to the railroad's software configuration management database, which tracks current configurations deployed in the field.

After a line segment has been tested, it undergoes another round of validation for the track database. PTC requires a highly accurate track database for the wayside infrastructure. Nine "critical features" must be validated in the field to ensure the track database is accurate. Every physical infrastructure asset must have a GPS coordinate, validated against what the track database SUBDIV file has recorded for its location from field mapping exercises. Those field mapping exercises generally were conducted months or years in advance of this validation and verification effort. Approximately 440,000 assets must be mapped.

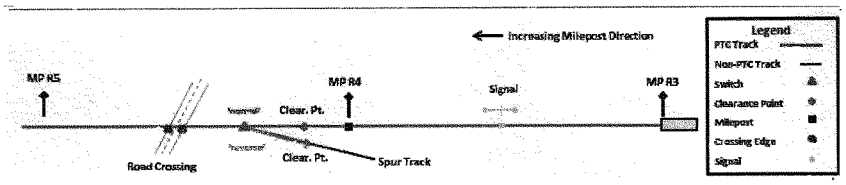

Figure 7- Track Data Validation of Wayside Assets

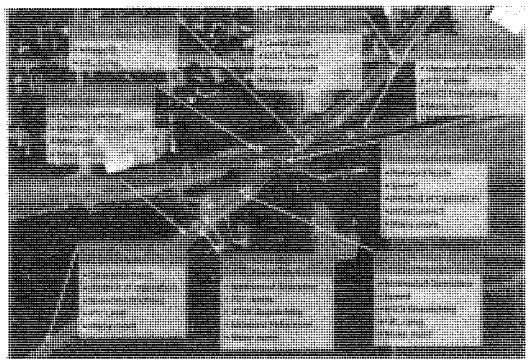

Figure 8- Important Features of Track Database and Their Attributes

All signals and switches must be validated against the track data through the use of an on-track vehicle equipped with GPS antennas, and a PTC Train Management Computer which takes readings at each asset. For a typical 100-mile district, this could involve over 2,200 features. Multiply that by 150 or more districts or subdivisions, and that's millions of rows of data to be collected. The track database basically replicates every data point found in a track chart and timetable related to assets, speeds, curves, method of operation, etc. All of this data must be entered and validated for PTC. This effort is the equivalent of mapping the interstates and state highways in the U.S. and validating the data in the field for every speed sign, milepost sign, traffic signal, exit ramp, etc. Otherwise, cars would have to run at reduced speeds.

After the track data is deemed accurate, it must be configuration-managed for all changes in the field. Thereafter, every time a track re-surfacing gang does work in the field or a railroad customer requests new business and a new siding is built, the changes that may occur in wayside assets must be updated in the track data and re-validated to ensure accuracy for PTC – 2.2 meter accuracy. On average, a Class I railroad may incur several thousand changes in field assets over the course of a year.

Communications Planning

Communications for PTC does not affect safety because a communications failure causes PTC to enter a fail-safe mode. However, failed PTC communications causes trains to slow or stop, resulting in train delays. Class I railroads have designed a special communications system for PTC to provide reliable and secure transmissions of data. To provide for that reliability, railroads have incorporated redundant communication modes: PTC220 network, cellular, satellite (for some roads) and Wi-Fi capabilities.

Placement of wayside and base station towers is a key task in the communications plan. Each location has surveying and documentation requirements. This wayside communication equipment is subject to the environmental and historical review requirements of the Federal Communications Commission. Many railroads are employing an environmental consultant to assist with this process. Environmental consultants typically screen for:

- officially designated wilderness area;
- officially designated wildlife preserve;
- any threat to endangered species or their habitat;
- historical properties;
- native American sacred sites;
- flood plain;
- significant changes in surface features;
- high intensity lights; and
- high intensity radio frequency

Railroads submit applications to FCC for approval through the FCC's Tower Construction Notification System site. SHPO and THPO (State and Tribal Historic Preservation Officer, respectively) consultation is completed and railroads are given authorization to construct the pole site or requirements to relocate the site. This process takes 50 to 100 days at best for any radio tower construction or the co-location of a new transmitter that involves use of an FCC licensed frequency.

Besides placement of towers to transmit communications, RF planning ranks high in the processes required to make PTC work. *Every* PTC location must undergo extensive analysis for frequency optimization for PTC. Software planning tools had to be developed and continue to be enhanced to support the field deployment of the PTC220 radio network. In the sample image below, green and grey colors are strong coverage areas; yellow on the cusp, and red and orange are poor coverage.

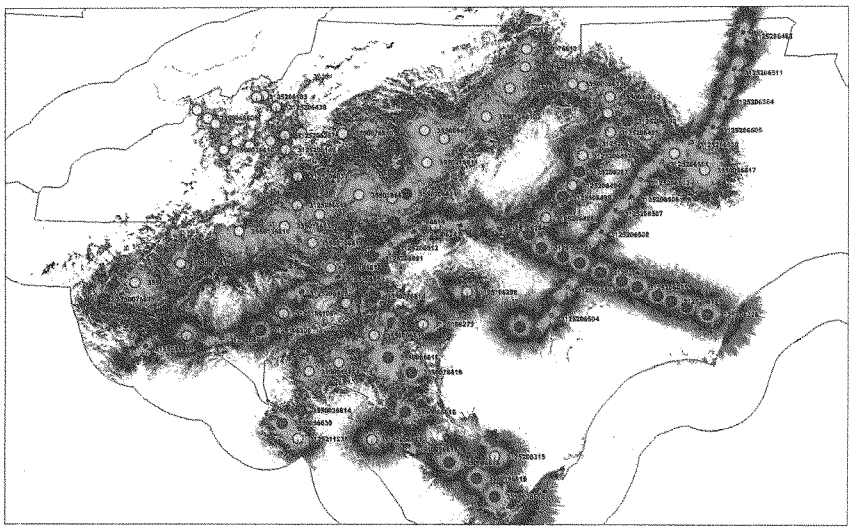

Figure 9 - PTC Communications Frequency Optimization and Coverage Analysis

PTC220 is a shared radio network; there is no concept of individual use. This design demands coordination among roads, especially for dense urban and rail traffic areas and for transition points between railroads. Elements of planning the RF network include:

- tower infrastructure;
- antenna design;
- radio performance criteria;
- ITCNet protocol;
- RF coordination;
- interference planning;
- shared channel use;
- channel loading; and
- frequency reuse.

The industry has developed planning standards through the Planet Administration Committee (PAC). This committee provides key design guidance in the planning and deployment of the PTC radio networks. These evolving standards allow various PTC operators working in a common geographic area to plan radio networks in a hosted environment utilizing the Planet Software Radio Frequency Prediction Tool.

DENSE URBAN AREA
CHICAGO
KANSAS CITY
ST. LOUIS
NEW ORLEANS
MINNEAPOLIS-ST. PAUL
TOLEDO
NY-NEWARK
ST. LOUIS
DALLAS-FT. WORTH
LOS ANGELES
KANSAS CITY
CHICAGO
NEW ORLEANS
MINNEAPOLIS-ST. PAUL
TOLEDO

Figure 10 - Dense Urban Areas Requiring Extensive Frequency and Tower Planning

Making the radio network work also requires a slot planning tool that will be critical in planning the time slots and frequencies for wayside status message broadcasts. The software module, which integrates into the Planet software tool, not only looks at RF coverage but also provides recommended time slots to avoid interference from other assigned slots that may be nearby. The industry also needed to work with an outside vendor to develop a Track Stitching tool that will combine individual files from each railroad into one track file for a geographic area. This tool was completed in October 2014. Railroads are continuing to load their respective track data into the tool.

For the 220MHz network, the Class I's along with TTCI created the Frequency Application Management Systems (FAMS) database. FAMS will enable a formal review of an industry-complete RF design, and provide the basis for formal authorization to activate a base station for service on the respective roads, once approved. FAMS will then become the plan of record for all licensing purposes. As frequency plans change due to the addition of other railroads in a geographic area, each participating road receives updates to this plan, critical for coordination among railroads.

Significant progress is being made in creating communications deployment standards for the industry to follow. Given the interoperable nature of the radio network for PTC, one of the key challenges when designing any one organization's radio network is how any specific design will impact other users in a geographic area. Significant coordination and planning between users is a necessity to avoid interference between base stations and the wayside.

Interoperability also requires the ability for a locomotive to "phone home" to its back office and to be able to receive information from a host railroad's back office. To make this happen, railroads have to join a "federated network" that involves configuration through a national

cellular carrier and coordination with other railroads with which a railroad interoperates. Those connections then need to be tested to validate operability.

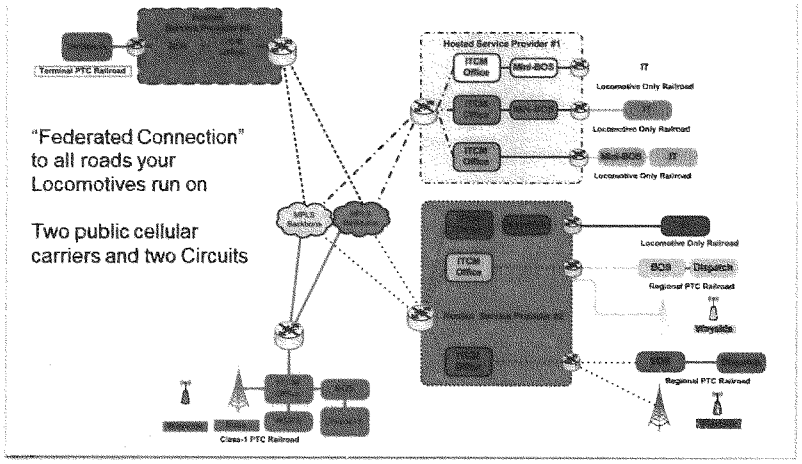

Figure 11 - PTC Federated Network Diagram

As should be obvious, careful planning is critical to PTC communications. There are numerous tasks that must occur behind the scenes to make sure the 58,000 wayside, base and locomotive radios that are "plugged in" in the field will perform as expected for PTC operation. Ultimately communications has to be interoperable and reliable for PTC.

Locomotive Installation

- Design locomotive layout for PTC equipment.
- Install onboard equipment.
- Test connectivity between locomotive and office.
- Commission the locomotive for PTC by conducting post installation check-out tests.

Locomotives are the draft horses for railroads. They are what move the nation's freight and our customer's businesses. PTC requires taking 23,000 locomotives out of service and moving them to a locomotive shop to install PTC equipment. That work is likely coordinated with other service or inspection requirements, such as 180-day inspections. Class I railroads typically have more than 200 configurations of more than a dozen models of locomotives. Each configuration must be modified to accommodate PTC components. Locomotive design engineers pull and modify locomotive plans for changes. Designs are reviewed for accuracy, safety and possible innovations.

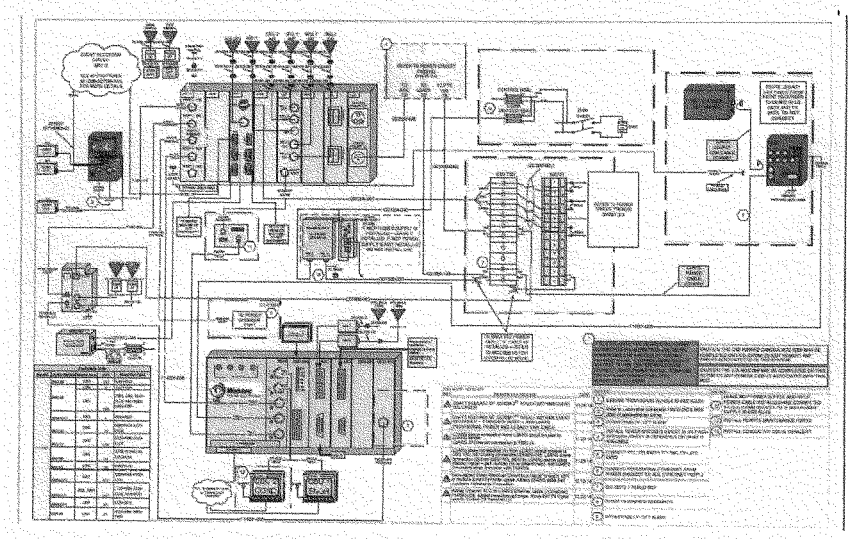

Figure 12 - Typical Locomotive Schematic

PTC ties together so many parts of a railroad that have not had to be technically connected before. The PTC locomotive architecture requires that an established locomotive system

accommodate new software systems and micro-electronics technology. This level of technology is new even to the locomotive experts; learning curves and adaptation must occur under tight schedule constraints.

Unlike wayside infrastructure, locomotives cannot be "green-fielded." Railroads have to find a way to insert new technology into old machines with myriad designs. Even within model types there typically are many variations because modifications are made over the life of a locomotive. This diversity makes installations harder.

On average, a new locomotive installation requires upwards of 200 components and parts from wires and connectors to antennas and brackets. Material must be ordered and delivered to shops for staging. Electricians and other craft employees are trained on proper installations.

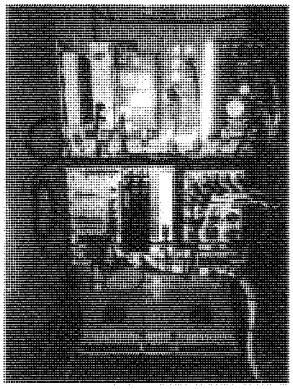

Figure 13 - Locomotive PTC Equipment

Onboard components and work for most roads include installation or connectivity of:

- a TMC;
- an Onboard Network Device (OBN);
- the locomotive PTC radio;
- Multiple Cell, 220MHz, GPS and Wi-Fi antennas (Ant Farm);
- two Computer Display Units (CDU);
- a Crash Hardened Memory Module (CHMM);
- penalty and emergency brake interface wiring;
- CAB signal connection (for roads operating cab signal); and
- Locomotive Systems Integration (LSI) racks for onboard equipment.

A new installation takes an average of three days to complete, start to finish, depending on the complexity of the install. That includes welding, cutting, wiring, communications connectivity and testing or commissioning the unit upon completion.

Several railroads use a laptop installation tool to assist and confirm installation, but these tools can only assess a number of characteristics. Qualified shop personnel run a checklist of tasks to commission or approve a locomotive installation.

Several railroads have locomotives that have been partially equipped and that will have to be cycled back through a shop for installation to be completed. PTC commissioning tests must be performed, final connections to the locomotive brake systems made, crash-hardened memory modules must be installed, where required, a non-interactive display must also be installed, and post-installation checkout tests must be run.

Railroads pursued this strategy of multiple equipping cycles not by choice but by necessity. Each of the required onboard PTC subsystems did not emerge from development at the same time. Installation of certain subsystems was performed as they became commercially available. In order to best work toward the PTC implementation deadline, railroads had to complete as much partial installations as they could in order to get as much as possible accomplished as soon as possible. Some subsystems have still not yet fully come to market.

System Integration and Testing

Integration testing and revenue service demonstration are where the determination is made as to whether the various PTC subsystems together constitute a safe, viable PTC system. Until this point in the deployment, the various components of PTC have largely been tested in isolation in labs.

Integration testing takes a team of experts to be successful. Expertise in programming, software quality assurance, test case writing, PTC requirements, railroad operations, railroad operating practices, configuration management, project management, and safety engineering are all required to make integration testing successful. PTC cannot be implemented without a quality testing program.

PTC is one of the largest hardware, software, and communications integration projects ever carried out. Components, most manufactured and delivered by different vendors, must all work in concert to meet the functional and safety requirements of a PTC system. The Congressional mandate also requires that PTC systems be interoperable, meaning they must be able to communicate with one another so trains can seamlessly move across track owned by different railroads *with potentially different PTC systems.*

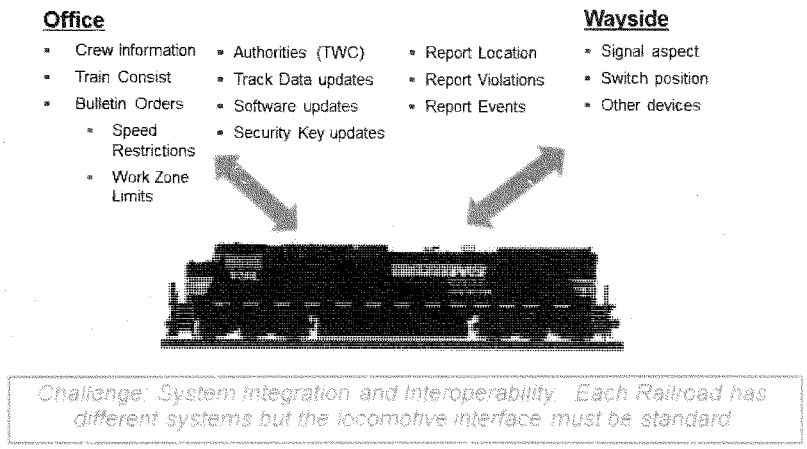

Figure 14 - Communications between the Back Office, Wayside, and Locomotives

To ensure a PTC system operates safely, thorough testing as a system must occur. Lab environments are limited in their ability to replicate actual train operations where a system

needs locomotive inputs to enforce PTC requirements. Many subdivisions have unique operating characteristics that are best exercised in their real-world environment.

Expertise is required to make integration testing work for PTC:

- The requirements of PTC. For the onboard TMC alone, the requirements document is a 700+ page document with over 1,000 requirements. For integration testing, though, the railroads aren't focused on the segment's requirements as much as the system's requirements. The testers have to understand how the parts fit together as a whole to make the system work to meet the mandated functionality.
- Railroad operations. Unless the test team has an understanding of railroad operations, it is difficult to recognize correct system behavior. While it may appear that everything is working correctly, a slight variance in functional performance could have a big effect in rail operations. Since PTC is a safety system, this is critical.
- Test case writing. Test cases must be developed which describe the data pre-requisites for test, the steps for test, and the expected results.
- Analyzing results of tests and runs to determine causes of unsuccessful runs. In a system this complicated, determining failure points through system forensics can be exceptionally challenging.
- Defect management. Every test requires the capture of artifacts so that in the event a defect is realized, data is collected to support investigation and potential programming changes.

Figure 15 - Lab Tests Exercise System Requirements

The integration challenge is made apparent when PTC moves to the field for implementation. While subdivisions have many similarities, they also have unique operational characteristics. PTC must work flawlessly under all circumstances. The complexity of some subdivisions would challenge any design engineer:

- Multiple track complexity, such as double and triple track, sometimes even quad track arrangements;
- Crew bases that operate over multiple districts, some of which may require PTC, others which may not; and some which will be implemented at different times, based on the risk methodology required by the Congressional mandate;
- Signal and communication complexity, such as triple track with four cross-overs, six signals and multiple highway grade crossings in a five to ten mile stretch;
- High and wide clearance moves, such as for power plant and military equipment, that require special railroad handling;

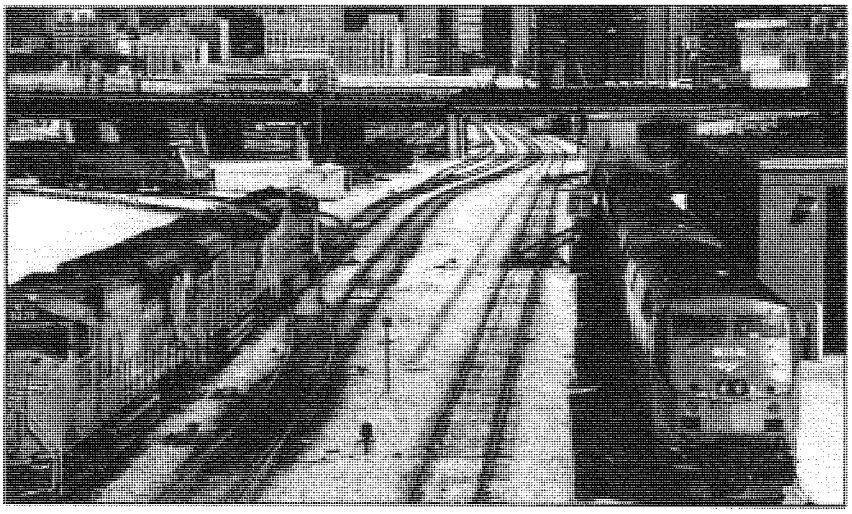

Figure 16 – Chicago Complexity

- Traffic density complexity found in the number of operating trains in a subdivision. Some locations have as many as 30 freight train starts a day, many with upwards of 300 train starts a day; and
- Interoperability complexity, discussed below.

This complexity plays out in communication frequency planning, WIU installation and configuration, correct configuration management of the track database that identifies dispatchable points along the track so the train can navigate and know where it is, the scalability of the back office to handle multiple trains sending and receiving multiple PTC messages at one time, and the crew handling the train as required under normal operating practices.

Training

PTC training is a massive undertaking for the Class Is. Thousands of employees must be trained on each railroad. The employees and contractors performing work that affects the safety critical functioning of the system, which includes the operation, maintenance, repair, installation, inspection, testing, modification and configuration management of the PTC system's components, must all be trained to perform the PTC aspect of their jobs.

Figure 17 - Freight Train Crew Reviewing Train Orders

To make this training happen, a team must:

- Create training material from a variety of documentation sources – requirements, the PTC Development Plan, the Operations and Support Hazard Analysis, instructions and procedures, vendor's manuals, etc. Most employees who traditionally develop training material are not also a part of a railroad's PTC team. This means more people have to educated about PTC tasks and the correct performance of those tasks.
- Update material as the system changes due to software or functionality updates made to meet FRA requirements for certification or to fix defects. Updates may also be made as best practices are improved upon or as components or materials change.
- Review and amend existing policies and procedures to accommodate PTC, and train on the changes. For instance, locomotive engineers and conductors rely on operating rules and associated training rather than a standards and procedures manual of instruction. Operating Rules will be modified for PTC. Locomotive electricians use instructions and procedures for installation of onboard equipment, as do signal maintainers for maintaining signal equipment. New

procedural documents will be created for PTC tasks or existing procedures will be modified as applicable for installation and maintenance tasks.

Figure 18 - Mechanical Operations & Maintenance Procedures

- Define learning objectives and develop a syllabus for the material.
- Develop an "examination" to test learning.
- Depending on what is most appropriate for the material and the audience, develop different delivery methods.
- Develop scripts, shoot videos, write simulator scripts and test products.
- Train trainers.
- Determine the logistics of delivery: who, what, when, how, tools and resources needed, scheduling conflicts, operational demands, etc.
- Deliver training in a time frame best matched with implementation so retention is strongest.
- Track all training delivery through records management.

Interoperability

This one facet of the statutory PTC mandate added years to the schedule of PTC implementation. Ordinarily, railroads design and build systems that work for their own operations, business processes and operating practices. While applications and systems can still be complex under those circumstances, they don't begin to approach the complexity of an interoperable PTC system.

The requirement that a locomotive be able to run seamlessly from one railroad to the next without stopping sounds deceptively simple. However, Interoperability is very complicated. It has taken hundreds of engineers, programming experts, system architects, communications experts, safety consultants, track infrastructure engineers, signal engineers, security architects, quality assurance testers and PTC requirement experts to design a system for interoperability.

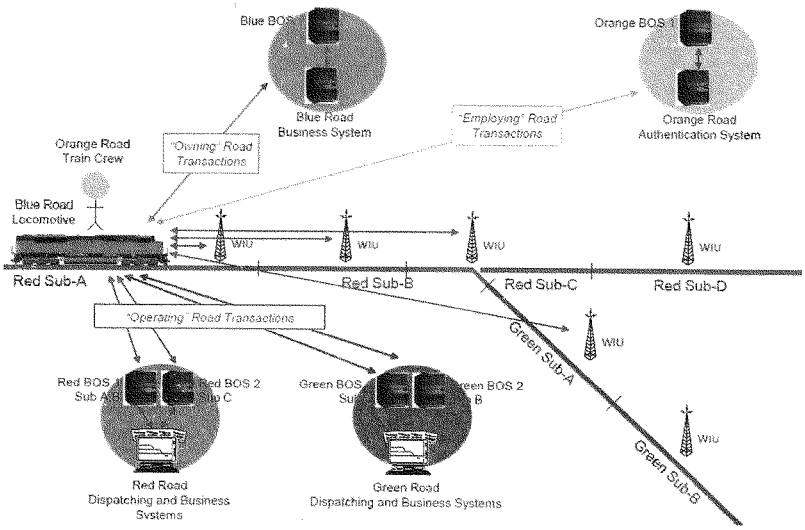

Figure 19 - Interoperability Challenge

The Class I freight railroads agreed to certain principles to ensure interoperability could be achieved:

1. Locomotive Segments shall utilize a single software executable.
2. PTC systems will implement certain concepts of operations, with common requirements for system initialization, wayside beaconing, and systems management.
3. PTC systems shall implement a common "look and feel" in regards to the Human-Machine Interface onboard the locomotive.
4. PTC systems shall utilize common data definitions and information relationships for track, wayside, and locomotive assets.
5. PTC systems shall utilize standardized Interface Protocols between the Wayside, Locomotive and Back Office Segments.
6. PTC systems shall implement interoperable communication systems to enable the delivery of messages between assets owned by multiple railroads located in the Back Office, Locomotive, and Wayside Segments.
7. Railroads shall share access to their 220 MHz radio base stations with other railroads physically adjacent to their PTC operating territory.

To that end, over 30 standards were developed for any railroad or manufacturer to utilize to help ensure interoperability and a clean system design. AAR now maintains and manages these standards in the AAR Manual of Standards and Recommended Practices – Section K.

Forty-one freight and commuter railroads have to implement PTC, and dozens more shortlines will have to equip their locomotives and make enhancements to their back offices to have PTC interoperability. The AAR standards are designed to facilitate the interoperability of those many systems, but some form of validation must occur when different PTC systems are in operation on a single district. This too is time and resource consuming.

Interoperability complexity also comes in other forms:

- Multiple-railroad complexity, such as situations where one host road might have 2 to 12 railroads operating around a complex area;
- Physical plant complexity, such as multiple terminals and adjoining terminals , possibly serving multiple railroads in a 35-mile radius;
- Traffic density complexity, found in the number of operating trains in a subdivision. Some locations have as many as 30 freight trains starts a day, many with upwards of 500 train starts a day, and Chicago has over 1,000 train starts a day.
- Multiple crews operating trains for multiple hosts over each other's railroad.

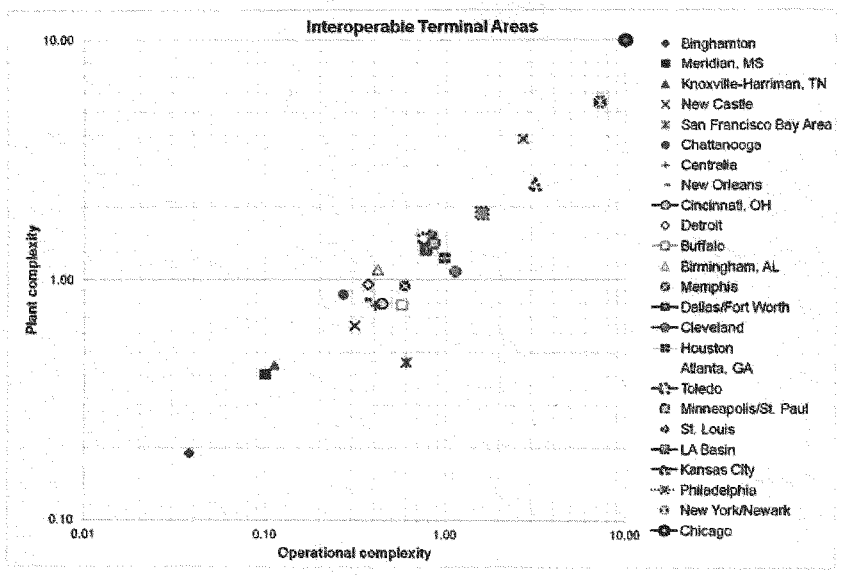

Figure 20 - Interoperably Complex Major Terminal (City) Locations

Interoperability is also a tremendous challenge for the Class Is' shortline partners. These railroads are typically smaller in size, have fewer people to focus on PTC, operate older locomotives and have financial challenges in terms of PTC expenditures. Equipping locomotives and the back office for shortline railroads is no small task; however, it will be a requirement for many shortlines operating on Class I PTC lines to maintain the safe operating environment and reduce risk of a human factor accident where passenger or TIH traffic travel on the nation's railroads.

Conclusion

It is difficult to overstate the challenge of implementing PTC. The freight railroads have spent over $5 billion to date and anticipate spending billions more to complete installation of PTC. However, dollars alone do not tell the story. The development of a new, technologically complex system, installation of all the back office, wayside, and locomotive components, and testing to ensure everything works properly as one system of systems by necessity is taking a number of years. The railroad industry is committed to devoting the resources and taking the time necessary to make sure PTC is done right. Safety demands nothing less.

TESTIMONY OF DONALD ORSENO

EXECUTIVE DIRECTOR/CHIEF EXECUTIVE OFFICER FOR

METRA COMMUTER RAILROAD BEFORE THE

SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS OF THE

HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE ON

THE STATE OF POSITIVE TRAIN CONTROL IMPLEMENTATION IN THE UNITED STATES

JUNE 24, 2015

SUBMITTED BY

METRA COMMUTER RAILROAD

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Metra Commuter Rail is the commuter rail operations for Chicago and the northeastern Illinois region. For more information, visit www.metrarail.com.

Good morning, Mr. Chairman and Members of the Subcommittee. I am Don Orseno, Executive Director/CEO of Metra, Chicago's commuter rail agency, and I am pleased to have this opportunity to speak to you today. I also serve as Chair of the Commuter Rail Committee for the American Public Transportation Association (APTA). In my role, my primary goal is the safe operation of more than 700 trains that run daily throughout our system, carrying about 300,000 passengers. It is in this context that I provide the Subcommittee a current update on the status of the installation and implementation of positive train control (PTC) in our system.

But first, I would like to provide a little background on our system to add proper context to the discussion. Metra was created to run Chicago's commuter rail system by the Illinois General Assembly in 1983. Our creation followed a tumultuous period in which the private railroads that had been operating the service experienced major financial problems and bankruptcies.

Over the years, Metra has grown to be the largest commuter railroad in the country based on track miles, and the fourth largest based on ridership, with 2014 being our second highest ridership year at 83.4 million passenger trips.

The Metra system has 11 separate lines with 241 stations and approximately 1,200 miles of track throughout the northeastern Illinois region. Metra owns and operates four of those lines, has trackage-rights or lease agreements to operate Metra trains over freight railroads on three lines, and has purchase of service agreements with two freight railroads which operate commuter service on four other Metra lines.

Metra's primary business is to serve people traveling to downtown Chicago to work. Approximately half of all works trips made from suburban Chicago to downtown are on Metra. Our riders come from all parts of our region's 3,700 square miles.

Also, Metra's system revenues cover at least 50 percent of our total operating costs, which is one of the highest recovery ratios of all passenger railroads and transit operators in the country.

Metra is in a unique position compared to other commuter rail agencies in the country as a result of the complex Chicago railroad infrastructure. Within our six-county system, over 1,300 trains operate each weekday, including 753 Metra trains, 500 freight trains and the remainder Amtrak trains. Metra must interface on a daily basis with all railroads operating in Chicago. Therefore, coordination of PTC implementation must include all of these railroads. As a result, Metra has directed much of its initial resources towards our contract carriers, Union Pacific Railroad (UP) and BNSF Railway (BNSF). We are working to ensure that Metra equipment is ready when PTC installation is complete on the portion of the Metra system owned by these railroads. Both of these carriers are further along with PTC implementation than Metra. We anticipate having all on-board equipment completely installed on the BNSF Railway by September of this year and on the UP by the second quarter of 2016. After those railroad's systems have been tested and become operational, more than 40 percent of Metra's train fleet will be PTC-compliant. These trains carry more than 50 percent of our riders.

Metra has also made significant progress towards implementing PTC on the lines we own. To date, that includes:

- Hiring a system integration team to design Metra's PTC system.
- Awarding contracts to engineering firms to design necessary upgrades to our signal system and to draft specifications for other tasks.
- Continuing signal upgrades at our numerous switching locations.
- Filling key internal leadership positions on the PTC project, as well as hiring 20 signalman and 33 mechanical employees to install PTC in the field and on our trains.
- Installing PTC equipment on each of our seven different types of locomotives and cab cars.

However, despite our progress, many challenges remain. Metra, like all other railroads, has been constrained by the limited number of firms that can provide signal design services and the limited expertise available to accelerate design and deployment.

Those firms and expertise are needed by most railroads to help redesign and renew existing signals and install trackside components – a tough job made even more so by the sheer volume and complexity of the task. We have also been limited by the availability of the needed equipment.

Another challenge has been the deployment of a national 220MHz communications network for PTC among U.S. railroads. The network is critical. The onboard, trackside and back office components of every railroad's PTC system have to be able to communicate via a radio network. In Chicago, it us undetermined if we have enough spectrum available for the PTC needs of the region's railroads until a spectrum study is completed by Transportation Technology Center, Inc. APTA notes that only 54 percent of the nation's commuter rail agencies have access to the spectrum necessary for their PTC systems to function.

Another challenge is that the onboard software continues to be revised due to numerous issues. A final production release date is not known at this time.

A major prerequisite for the PTC system is the creation of a detailed database of every route on the system, a time-consuming and extremely labor-intensive process. A process will be needed to document and update GPS coordinates every time a critical PTC asset is moved more than one foot.

Other challenges include expected issues with components and software as full system testing continues this year. So far, only partial testing of individual segments of the system has taken place. And the fear of component failure is driving designs with more redundancy, which is further lengthening the design process. In addition, the Federal Railroad Administration (FRA) must review and certify every railroad's plans.

There is also the need for every railroad's system to be interoperable with other railroads. That is a huge challenge in Chicago, which is has a complicated railroad network. Metra is the only commuter rail agency in the United States with such a high level of integration with freight railroads.

Then there is the issue of costs. PTC implementation is expected to cost Metra more than $350 million. APTA estimates that it will cost more than $3.48 billion to fully implement PTC on all commuter railroads nationwide. Metra must cover these PTC costs using the same federal and state sources that we use for other critical infrastructure projects. Metra receives approximately $150 million each year in federal formula funding. Over the past two years, Metra has allocated $133 million in capital funding from federal formula funds and state sources towards PTC.

In October 2014, the Metra Board approved a modernization plan that calls for a $2.4 billion investment in rolling stock, as well as $275 million required to complete PTC implementation.

The modernization plan will be funded in part by Metra bond issues or similar financing funded by fare increases. Metra is relying on anticipated state and federal funds to provide the remaining dollars needed to complete PTC. However, given the uncertainty in both Washington, D.C. and the Illinois State Capital, those sources remain unclear. It is also important to note that PTC implementation involves not only a substantial upfront capital cost, but will add to Metra's yearly operating costs for years to come. The operating cost is estimated to be more than $15 million annually. With all of these obstacles in mind, it should come as no surprise that no railroad has installed a fully functioning, interoperable PTC system to date.

Metra is currently targeting 2019 for PTC to be fully implemented and interoperable. In the interim, we have continued our advocacy efforts to Congress for legislative assistance. Metra, along with APTA, is asking Congress to provide the FRA the authority to provide individual railroads with waivers from the current 2015 PTC implementation deadline as long as those railroads show evidence of a good faith effort as determined by the FRA.

Metra has also asked for funding from Congress where feasible. Metra supports and thanks U.S. Representatives Dan Lipinski and Michael Quigley from Illinois for introducing the Reassuring Adequate Investment in Lifesaving Systems Act (H.R. 1405), which reauthorizes the Railroad Safety Technology Grants Program to provide critical funding of $200 million for each of the next five years for PTC technology.

The commuter and freight rail industries have spent billions of dollars to date on PTC implementation, and although progress has been substantial, much remains to be done before PTC can be safely implemented nationwide. Metra supports any Congressional efforts to assist the railroads with this enormous and complex undertaking.

Even though we will not fully implement PTC by December 31, 2015, Metra has however taken significant steps to safeguard our passengers. We have worked with our crews to identify fatigue

Even though we will not fully implement PTC by December 31, 2015, Metra has however taken significant steps to safeguard our passengers. We have worked with our crews to identify fatigue management strategies and the importance of securing proper rest; we have doubled the amount of operational speed verification tests over last year; we have reviewed FRA Safety Advisory 2015-03 and are implementing notifications through our GPS system to notify the conductor a minimum of two miles in advance of a speed restriction where the speed of a curve or bridge is reduced more than 20 miles per hour. The conductor will have communication with the engineer to remind them that there is a speed restriction.

Before I close, during the recent APTA Rail Conference with Metra's peer commuter railroads, one of the issues that came up was the railroads ability to operate past the PTC deadline as it relates liability and coverage.

In conclusion, Mr. Chairman, I again thank you and the Subcommittee for inviting me to testify. I appreciate the Subcommittee's interest in this area and would be pleased to respond to questions at this time.

TESTIMONY OF MR. RUSSELL KERWIN

DEPUTY PROJECT MANAGER OF POSITIVE TRAIN CONTROL

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY (METROLINK)

SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS

HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

HEARING ON "THE STATE OF POSTIVE TRAIN CONTROL IMPLEMENTATION IN THE UNITED STATES"

June 24, 2015

This statement is offered on behalf of the Southern California Regional Rail Authority, known as Metrolink. We want to offer our written sentiments regarding Positive Train Control (PTC) implementation and appreciate the opportunity to share our perspective and experience.

Metrolink is happy to report that we have PTC currently in Revenue Service Demonstration (RSD) across our entire 341-mile network of Metrolink-owned lines and we intend to be in compliance by the end of the year. We are extremely proud of this accomplishment. Further detail on this milestone is described in this testimony.

Metrolink – A Brief Picture

Metrolink is governed by a Joint Powers Authority comprised of an 11-member Board representing the transportation commissions of Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. Metrolink is the second largest commuter rail system by size and fifth largest by ridership in the United States, serving close to 20 million people working and living in Southern California.

The scope of Metrolink's daily operations includes trains that traverse 512-route miles in six Southern California counties. We transport nearly 1 million passengers a month throughout our network. In addition to operating 165 daily trains, Metrolink provides dispatching services to two freight railroads, Burlington Northern Santa Fe (BNSF) and the Union Pacific Railroad (UPRR), and three passenger rail services, Amtrak, Coaster, and Metrolink over one of the most complex multi-modal rail systems in the United

States. This includes select freight traffic coming out of the ports of Long Beach and Los Angeles, two of the busiest ports in the nation.

Chatsworth Legacy

On September 12, 2008, a tragic event occurred in Chatsworth, California where a Metrolink train traveling north towards Ventura collided into a Union Pacific freight train. The incident resulted in 25 fatalities and 135 injured. After an investigation by the National Transportation Safety Board, it was found that this accident could have been prevented with PTC. With the understanding of the importance of this life-saving technology, Metrolink has fully embraced and engaged in the implementation of PTC on our rail network in Southern California.

Background

PTC on Metrolink's system is a locomotive centric, GPS-based safety technology designed to prevent train-to-train collisions, over-speed derailments, unauthorized incursion into work zones, train movement through switches left in the wrong position, as well as accidents caused by the running of a red light. PTC monitors and, if necessary, controls train movement in the event of human error.

In October 2010, Metrolink contracted with Parsons Transportation Group (Parsons), along with its key industry vendors such as Wabtec, to design, install and test the agency's PTC system. Metrolink's PTC program is an overlay system based upon the Rung 1 Interoperable Electronic Train Management System (I-ETMS)® software and meets the requirements of the Interoperable Train Control Committee (ITC), allowing the railroads operating in Southern California to share in the safety benefits of this critical system. The PTC program includes back-office components such as a PTC back office server (BOS) and a new PTC-compatible computer-aided dispatch (CAD) system. The program also includes installation of PTC equipment on all 57 cab cars and 52 locomotives in the Metrolink fleet, PTC interface devices at 476 locations, including 104 control points, and extensive equipping and testing of the wayside and communication network. A six-county specialized communication network to link the wayside signals, trains, and centralized dispatch office was built to support the communication intensive PTC System.

The Metrolink system operates seven routes providing 165 weekday commuter trains on more than 225 host territory route miles and 341 track miles through six counties in Southern California and carries over 43,000 weekday riders. The Metrolink Operations Center serves as the dispatching hub for our trains as well as all trains, which traverse Metrolink property. The total number of trains dispatched on a daily basis exceeds 350.

PTC on the Metrolink System

We are proud to report that as of June 14, Metrolink has implemented PTC in RSD across the entire 341-mile network of Metrolink-owned lines to meet the current deadline in the

Rail Safety Improvement Act of 2008 of December 31, 2015. We will continue to work with others to get full system implementation.

Full build-out and testing of Metrolink's PTC infrastructure was completed over the past five years, including PTC onboard equipment installed and tested on all 109 locomotives and cab cars; all antennas, wayside interface units, and PTC radios are installed and operational; a robust communication network is installed; and a new hardened Dispatch and Operations Center (DOC) was constructed and is now operational.

In addition to our network of owned lines, we are working closely with our railroad partners – BNSF, UPRR, Amtrak and North County Transit District – to ensure PTC implementation is achieved throughout the region. A timeline of implementation is attached (Attachment A).

PTC Safety Plan

We are committed to submitting our Safety Plan (a nearly 7,000-page document) to the Federal Railroad Administration (FRA) by June 30 and are seeking certification by December 2015. BNSF, our freight partner, has been an industry leader and was the first to submit a final PTC Safety Plan to the FRA in 2014. BNSF was very helpful in the development of our Safety Plan and we are hopeful their assistance combined with other input will expedite the FRA review process to be as efficient as possible.

We have been very fortunate to have a great deal of support from our local freight partners as well as other freight railroads nationwide through participation in the ITC that have helped make our PTC program possible in our region.

Funding PTC

Our current PTC program cost is $216.4 million dollars. The majority of that funding, about 85 percent, was from state and local sources. The federal funds that we received came from the Federal Transit Administration (FTA) and FRA. These funds include: $17.8 million from American Reinvestment and Recovery Act formula funds, $6.6 million from an FRA technology grant, $3.4 million of a $13.5 million grant from FRA High Speed Intercity Passenger Rail (HSIPR), and $4.1 million in pass-through FTA funds from our member agencies. The $216.4 million budget does not include construction of the PTC-related Communications Backhaul Program, PTC implementation on new line segments, or on-going PTC operating costs. A full breakdown of funding for our PTC program is attached (Attachment B). We are now in the process of ramping down our capital funded implementation program and transitioning the operation, maintenance, and ongoing support of the PTC system. The operation and maintenance costs are expected to range between $4-8 million per year going forward.

PTC Implementation Challenges

There have been a number of challenges that have affected our implementation of PTC. Despite aggressive efforts by the contractor and the agency and our strong partnerships with freight rail and Amtrak, our schedule for implementation of PTC has been impacted. Thanks to the support of our rail partners and contractors, Metrolink has found workaround strategies and managed to proceed with its aggressive implementation timeline.

New Technology Development Challenges

Delays in the nationwide-wide development of interoperable PTC specifications, processes, agreements, and hardware and software systems have significantly impacted Metrolink's schedule and budget for PTC deployment. Specifically, Metrolink was engaged in a prolonged development process with vendors for its back office server, PTC-compatible dispatch system, onboard locomotive hardware, PTC communication and messaging systems, and many other PTC components. Throughout the process, Metrolink had to overcome numerous development and testing challenges, including the development of license agreements and other commercial arrangements for the new systems. Although these challenges are largely overcome at this point, on-going software updates and testing are expected as this technology and the industry's utilization of it continues to evolve.

Spectrum Challenges

In regards to spectrum acquisition, Metrolink has been working with the Federal Communications Commission (FCC) through many challenges to secure approval of the spectrum that Metrolink entered into a purchase agreement for in 2010. Similar to the overall PTC system, the use of the acquired spectrum must be carefully planned and coordinated with other railroads to ensure that any spectrum acquired can support interoperability. While there have been delays at the FCC in the processing of Metrolink's applications, Metrolink is now trying to follow the procedures under which the FCC's Wireless Telecommunications Bureau recently granted Amtrak's application. Through our partnership with BNSF and UPRR, Metrolink has been fortunate to execute a five-year lease of spectrum from the spectrum holding entity PTC 220, LLC. The lease provides a workaround strategy and enables Metrolink to meet its near-term spectrum needs while Metrolink continues its efforts on a parallel path to secure its own spectrum, which is necessary to add to the pool of spectrum available in the region. Metrolink is approximately two years into its five-year lease with PTC 220, LLC. We are seeking a long-term solution to spectrum availability.

Funding Challenges

Funding of Metrolink's PTC system has been a substantial challenge that required strong commitment from Metrolink's Member Agencies and the State of California. Metrolink accumulated over 30 separate funding sources to fulfill the current program budget of $216.4 million. Approximately 85 percent of the funding came from state and local sources. The remaining budget to complete the scope within the capital budget, namely

interoperable testing, spectrum acquisition, documentation and close-out, is extremely tight. A slow-down in the industry's interoperable development or protracted resolution of regulatory issues could have an impact on Metrolink's project budget. As Metrolink transitions from a capital project to an agency operating cost, Metrolink has already begun incurring substantial costs related to training, adding and retaining staff for operations and maintenance of the system, component upgrades and replacement, and industry-wide software upgrades and enhancements.

For context, Metrolink's $216.4 million investment in PTC is roughly equivalent to the agency's annual operating budget of approximately $221 million dollars. Given the Metrolink Board's commitment to safety, hard choices were made and these funds were prioritized for PTC implementation. Federal funding has not been prioritized for PTC and remains a challenge for Metrolink going forward as we transition to operations.

PTC Implementation - Going Forward

As noted above, Metrolink has now completed the deployment of PTC in Revenue Service Demonstration (RSD) on our lines and we are working with our freight and commuter railroad partners to achieve full implementation of PTC across all trains in its Southern California operating region. We expect to be in interoperability testing with each of our partners and on lines where we are the tenant railroad by the end of this year. We are the tenant railroad on 171 miles of track. We are working with our host railroad partners on these miles to be operating PTC RSD as soon as possible.

The transition to PTC operations will be demanding and costly for staff and involve many challenges, such as on-going vendor licensing and support costs, industry-pushed software upgrades, regulatory agency coordination, system maintenance, and PTC implementation on future line segments and new locomotives.

Despite the challenges, the safety benefits of having the millions of passengers that ride Metrolink trains each year protected with PTC technology substantially outweigh the costs.

Metrolink is very proud to be leading the nation in PTC implementation and to actively participate in the ITC to build a very complex safety system that will meet the test of time, improving railroad safety. Like many other commuter rail agencies, Metrolink has faced many obstacles since we began our efforts in 2009. However, with the strong support of our passenger and freight rail partners, state and local transportation agencies, the NTSB, and the FRA, we have found solutions. Our success comes from the strong partnerships and our mutual unwavering commitment to safety and saving lives.

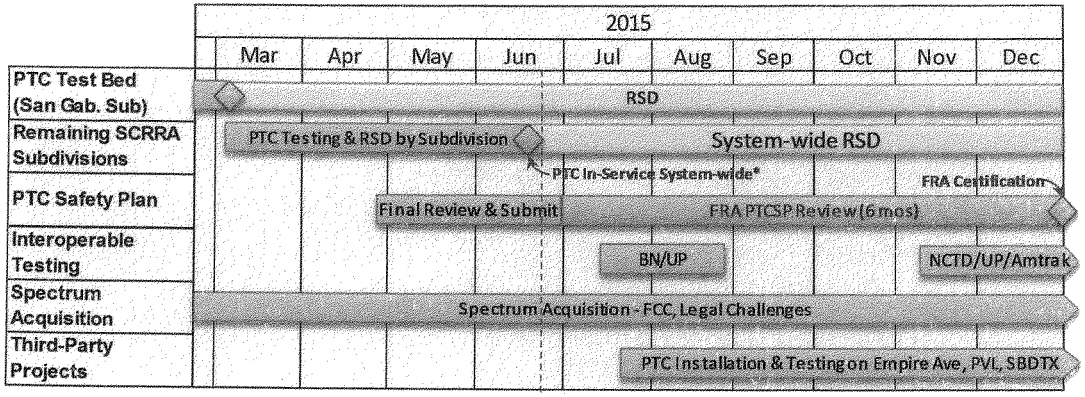
We would like to thank Metrolink's House and Senate delegation for their enduring support and sustained leadership on PTC.

We would also like to thank Chairman Denham and Ranking Member Capuano for the opportunity to testify before the Committee today and share our experience.

SCRRA's Phase Boundary PTC
(PSD) Deployment Schedule
METROLINK

METROLINK.

Summary Schedule



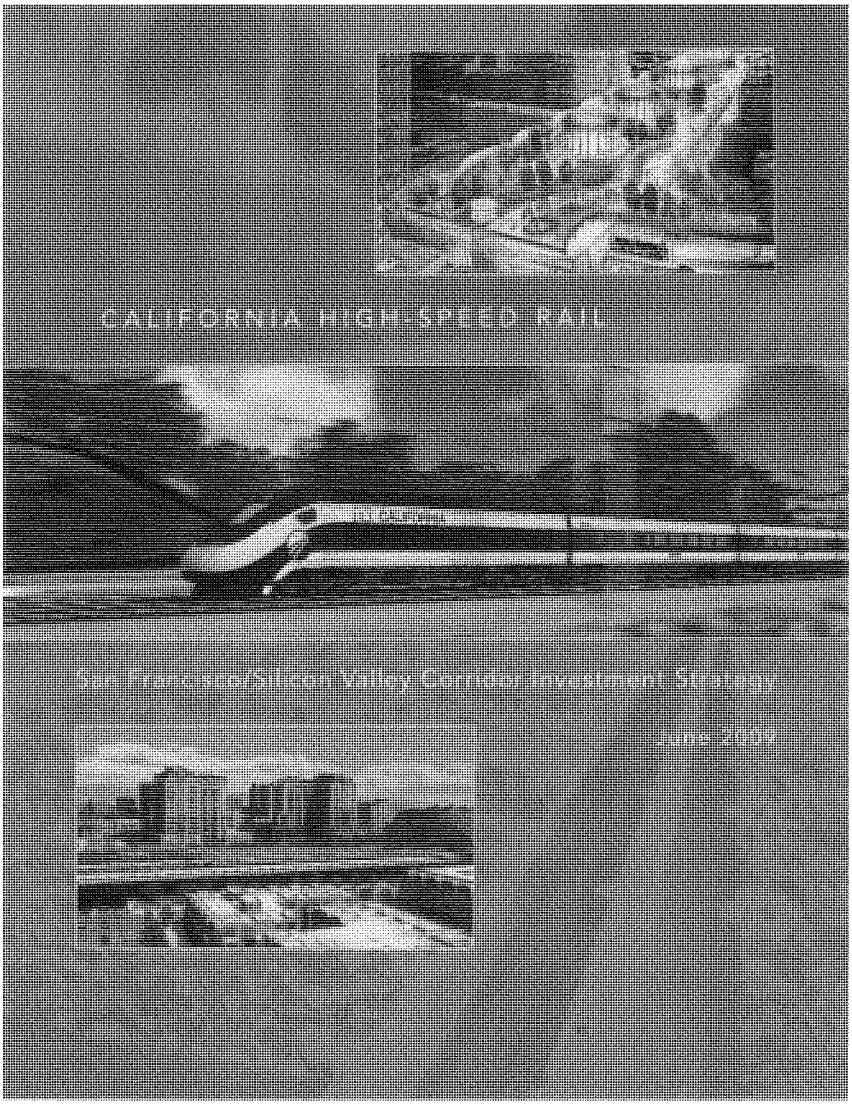
*Milestone for PTC In-service on Metrolink-owned Lines

Metrolink PTC Program Funding by Source

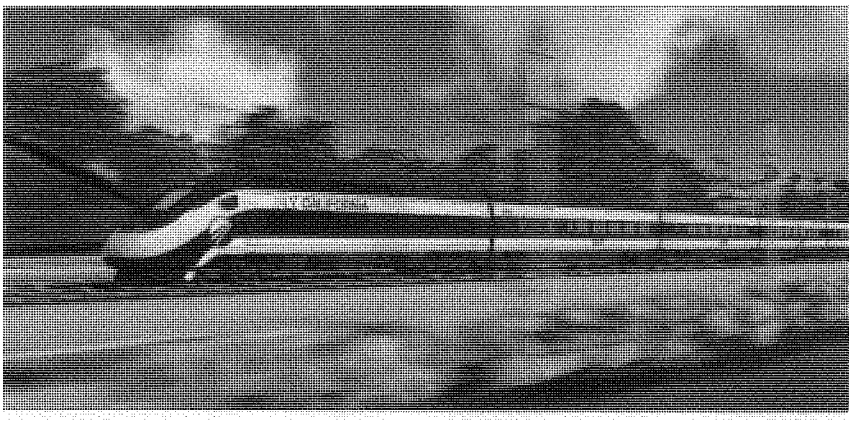
PTC Capital Project Funding	Source			Total Award Value
	Local	State	Fed	
Local MTA MOU funds	3,310,587			3,310,587
Federal formula Funds (Fed 5307/5309)			690,030	690,030
Federal formula Funds (Local Match)	99,090			99,090
State STIP		125,293		125,293
ARRA Formula			17,825,530	17,825,530
Prop 1B TSGP (Safety/Security) (SCRRA, VCTC)		7,065,024		7,065,024
Prop 1B PTMISEA (SCRRA)		199,668		199,668
National Railroad/ State		9,855		9,855
OCTA Prop 116 (Construction)		30,715,778		30,715,778
OCTA Prop 116 (Design)		2,000,000		2,000,000
FY 09-10 Prop 1B TSGP (VCTC)		709,972		709,972
Prior Year VCTC Prop 1B TCRP		21,366		21,366
Prop 1B PTMISEA		3,309,525		3,309,525
OCTA FTA Sec 5307			4,147,427	4,147,427
FY 09-10 Prop 1B TSGP (SCRRA)		3,356,923		3,356,923
Prop 1A Intercity to SCRRA		46,550,000		46,550,000
Prop 1A SCRRA		12,200,000		12,200,000
FY 10/11 Prop 1B SLPP		10,000,000		10,000,000
MTA Measure R	10,000,000			10,000,000
FY 11/12 Prop 1B SLPP		10,000,000		10,000,000
MTA Measure R	10,000,000			10,000,000
FY 09-10 Prop 1B TSGP (SCRRA from Caltrans DOR)		1,800,000		1,800,000
FY 09-10 Prop 1B PTMISEA (SCRRA)		4,362,126		4,362,126
Federal Rail Research and Development Funds (SCRRA)			487,000	487,000
FRA Technology Grant SCRRA			6,605,446	6,605,446
Prop 1A SCRRA		12,711,063		12,711,063
FRA High Speed Intercity Passenger Rail (HSIPR) via Caltrans Rnd			3,411,064	3,411,064
PTMISEA FY10/11		9,301,415		9,301,415
MTA Measure R	4,096,120			4,096,120
PTMISEA FY13/15		1,356,984		1,356,984
TOTAL	**27,505,797**	**155,794,992**	**33,166,497**	**216,467,286**
% of Total	12.7%	72.0%	15.3%	

PTC-related Funding on Comm Backhaul	Source			Total Award Value
	Local	State	Fed	
Prop 1A SCRRA		10,088,937		10,088,937
FRA High Speed Intercity Passenger Rail (HSIPR) via Caltrans Rnd			10,088,937	10,088,937
TOTAL	**-**	**10,088,937**	**10,088,937**	**20,177,873**
% of Total	0.0%	50.0%	50.0%	

Total PTC-related Funding (PTC+Comm Backhaul)	**27,505,797**	**165,883,929**	**43,255,433**	**236,645,159**
% of Total	11.6%	70.1%	18.3%	


CALIFORNIA HIGH-SPEED RAIL
San Francisco/Silicon Valley Economic Investment Strategy
June 2009

Caltrain
TJPA
VTA



VISION

Civic and **transportation leaders** representing the San Francisco/Silicon Valley Corridor — from San Jose to San Francisco — and from the greater Bay Area are joining together to **accelerate the arrival** of California **high-speed rail** between San Francisco and Los Angeles/Anaheim by preparing the historic Caltrain rail corridor for a **new level of service** appropriate for the **21st century**.

HIGH SPEED RAIL — San Francisco/Silicon Valley Corridor Investment Strategy

High-Speed Rail Picks Up Speed — Federal, State and Regional Funding Fuel Rail Renaissance

After more than a decade of planning, California's high-speed train system is rapidly gaining momentum, propelled by an infusion of both state and federal funding. The state stands to benefit from a sizable chunk of the $8 billion set aside in the American Recovery and Reinvestment Act (ARRA) signed into law by President Obama in February 2009. Expectations run high that additional federal funding for high-speed rail will become available via the appropriations process in future years.

This federal investment comes on top of the $10 billion high-speed rail bond measure approved by California voters in November 2008, and signals a new era for rail transportation. On April 16, 2009, the Obama Administration went one step further by releasing its *Vision for High-Speed Rail in America*, a strategic plan describing how the agency intends to use the $8 billion in ARRA funds for intercity and high-speed rail.

The Bay Area has been and will continue to be a full partner in this effort with significant local funding commitments that will leverage financial contributions from Sacramento and Washington, D.C.

In response to these developments and the potential for substantial new funding for rail projects, the Metropolitan Transportation Commission, the Transbay Joint Powers Authority, the Caltrain Joint Powers Board, the city and county of San Francisco, the San Francisco County Transportation Authority, the city of San Jose and the Santa Clara Valley Transportation Authority present the **San Francisco/Silicon Valley Corridor Investment Strategy for High-Speed Rail**. The agencies agree to an approach that complements the intent of the ARRA and *Vision for High-Speed Rail in America*, including their economic recovery principles and strategic transportation goals.

The San Francisco/Silicon Valley Corridor is **uniquely positioned** to **leverage** federal **economic recovery** moneys with local and state funds to **deliver** a *comprehensive package* of **improvements**.

High-speed rail is complementary to Caltrain and would utilize the Caltrain right-of-way and share tracks with **express** Caltrain ***commuter rail services***. The phasing plan includes significant local and regional **funds**, thereby greatly *expanding* the **effectiveness** of the *federal economic recovery program*.

A Two-Phase Approach to High-Speed Rail on the Peninsula

This package of rail improvements will transform the San Francisco Bay Area's landscape by bringing to fruition two iconic multimodal rail stations, one at either end of the San Francisco/Silicon Valley Corridor. These San Francisco and San Jose stations are destined to be stunning additions to the landscape as well as major magnets for transit-oriented development. Each will bring together, under one roof at both locations, Caltrain and high-speed rail along with a multitude of local bus/rail systems. They also will usher in a new era of transit access and connectivity, and help mold the travel patterns of the Bay Area populace into a more sustainable model. The San Francisco/Silicon Valley Corridor investments epitomize the kind of bold, forward-looking infrastructure projects that helped lift the San Francisco Bay Area out of the Great Depression in the 1930s, and that could help put the region on track for renewed prosperity in these economically challenging times.

The region's strategy for achieving this vision calls for implementing a package of transportation capital projects in two phases. Phase I includes transportation projects that will improve regional high-speed rail service between San Francisco's Transbay Transit Center and San Jose's Diridon Station by 2016 and enable state high-speed rail service to operate in the same corridor. These projects have or are expecting National Environmental Policy Act (NEPA) clearance, can proceed into final design and construction, and are projected to be completed and in service by 2016. A summary of the projects and more detailed descriptions are provided in the project detail section at the back of this booklet.

Phase I

Electrifying the entire Caltrain corridor so as to replace outdated diesel technology with electric locomotives or electric multiple unit train sets and introducing "positive train control" will not only speed up Caltrain service but pave the way for high-speed rail. Positive train control is a federal mandate that will reduce the potential for train-to-train collisions and improve signaling at crossings, so as to allow increased train frequencies while enhancing safety. Also included are grade separations at a key Peninsula location; construction of the underground-level train station structure and mezzanine for the Transbay Transit Center in San Francisco; new platforms and other improvements at the Caltrain station at Fourth and King in San Francisco to make way for high-speed trains; and the first increment of the new marquee Diridon Station in downtown San Jose.

Together these Phase 1 investments total $3.4 billion, with funding for more than one-half of that amount already committed. Our investment plan calls for augmenting these committed funds with $1.9 billion from the new federal sources. For more detail see the map on page 7 and the table on pages 8-9.

Phase II

This later phase upgrades the infrastructure up and down the line (new tunnels, bridges, tracks and signals; enhanced power; and modifications to intermediate stations and grade separations) to accommodate the mixed-traffic capacity requirements of high-speed rail service and Caltrain regional service. Cost and schedule detail for these Phase II elements will emerge when the California High-Speed Rail Authority completes its project-level environmental work on the San Francisco/Silicon Valley Corridor in 2011.

THE SAN FRANCISCO/SILICON VALLEY CORRIDOR ADVANTAGE

The San Francisco/Silicon Valley Corridor Investment Strategy is remarkably in sync with the *Vision for High-Speed Rail* released by the Obama Administration in April 2009. Our plan performs well against all major criteria in the Vision for selecting projects to benefit from high-speed rail money flowing from the American Recovery and Reinvestment Act (ARRA) and other federal sources.

Stimulate Economic Recovery

The projects in Phase 1 of our investment package will immediately employ hundreds of professional workers during final engineering, and thousands of technical, trade and labor workers during construction. Thousands more will be engaged in producing raw products and vehicles for new transit services.

> Based on federal estimates that $1 billion in infrastructure investment creates or saves 30,000 jobs, the San Francisco/Silicon Valley Corridor Investment Strategy anticipates the creation of over 100,000 jobs for the Phase 1 investments.

> This strategy will maximize total investment by leveraging the ARRA funds on a one-to-one basis with local committed funds to complete an overall financing package.

> This strategy also will focus funding on projects that are environmentally cleared and ready-to-go.

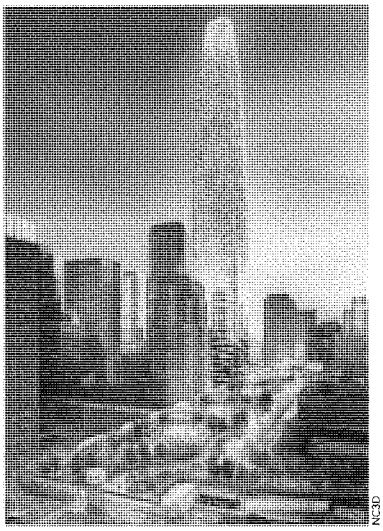
Build for Economic Competitiveness

The San Francisco/Silicon Valley Corridor is the right place to focus state and federal rail investments because:

> The San Francisco/Silicon Valley High-Speed Rail Corridor serves the heart of one of the world's most innovative, entrepreneurial, competitive and diverse regional economies. With economic output of almost $300 billion annually, the Bay Area ranks 24th in the world when compared to national economies.

> With two major international airports, the corridor is a gateway to international markets.

> The region is at the cutting edge of global technology and is home to the nation's largest concentration of national laboratories, corporate and independent research laboratories, and leading research universities; the highest density of venture capital firms in the world; more Fortune 500



NC30

Rooftop garden at the new Transbay Transit Center in San Francisco

companies than any region except New York; and the highest economic productivity in the nation — almost twice the U.S. average.

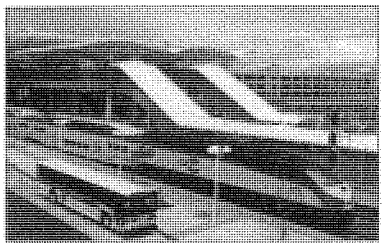
> As the birthplace of the semiconductor, Silicon Valley has long been known for symbiotic industry clusters that fuel strong economic growth and innovation.

Promote Energy Efficiency and Environmental Quality

By increasing transit ridership and reducing car travel, this package of investments will reduce greenhouse gas emissions. In fact, the California Air Resources Board, in its recently approved scoping plan for implementation of the AB 32 greenhouse gas reduction law, included high-speed rail as a key strategy. Specifically, the San Francisco/Silicon Valley Corridor investment package will:

> Promote energy independence and reduce pollutants and greenhouse gas emissions through the electrification of the San Francisco/Silicon Valley corridor;

> Encourage the use of alternative transportation modes from start to finish by bringing high-speed rail to major transit hubs such as the Transbay Transit Center and Diridon Station, which are also served by local and regional transit operators.



The existing multimodal BART/Caltrain station in Millbrae

Ensure Safe and Efficient Transportation Choices

The San Francisco/Silicon Valley Corridor investment package places a high premium on enhancing safety and efficiency for both the Caltrain commuter rail service and California high-speed rail.

> At the two major hub stations in San Jose and San Francisco, travelers will be able to switch between not only these two rail lines, but also to and from BART and an impressive array of other transit systems, making transit travel more seamless than ever before in the Bay Area.

> The project will enable seamless connections by integrating high-speed rail service with other modes of transportation, particularly San Francisco International Airport and Mineta San Jose International Airport.

> Our package promotes safe rail operations by separating right-of-way from traffic and pedestrians, including an underground connection to downtown San Francisco's Transbay Transit Center and grade separations on the Peninsula.

> The project will integrate the most modern train control technology to improve safety and lower the risk of accidents.

> The package will optimize the use of existing transportation infrastructure by enabling the shared use of right-of-way by the Caltrain commute service and statewide high-speed rail.

THE SAN FRANCISCO/SILICON VALLEY CORRIDOR ADVANTAGE
(continued)

NCSD

Transit-oriented developments are planned near the Diridon Station in San Jose.

Support Interconnected Livable Communities and a Healthy Urban Core

High-speed rail service and regional rail service will operate in high-density population centers so as to maximize ridership and connect the region's two largest cities — San Francisco and San Jose. Specifically, the package will:

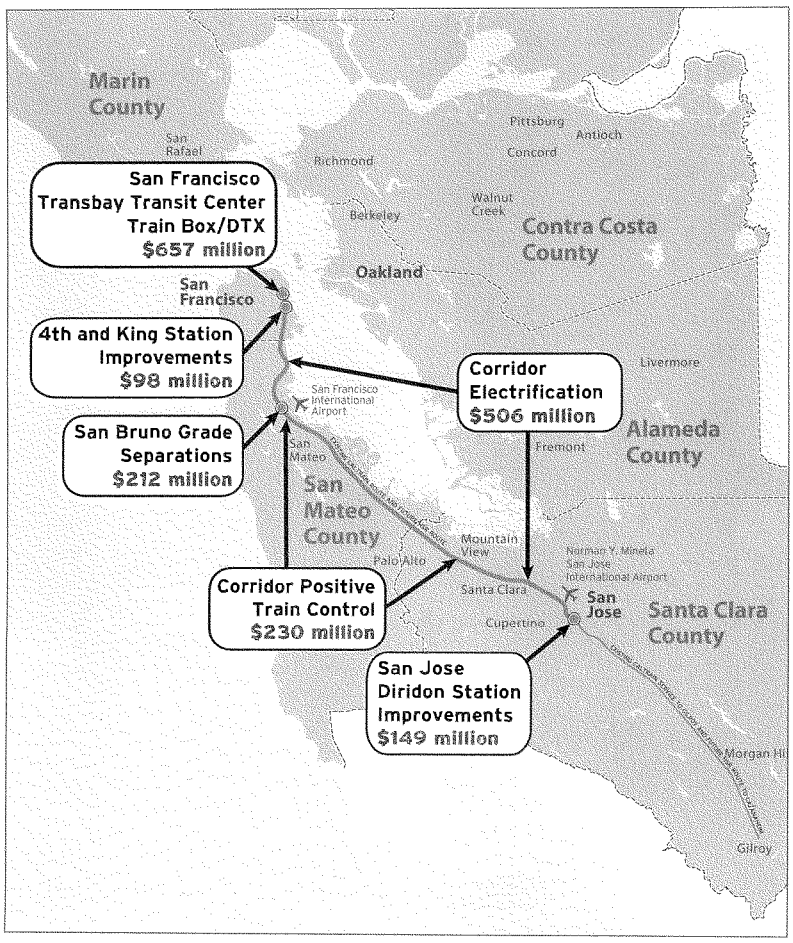
- Link transportation and land-use investments through smart growth to enhance transportation choices;
- Advance smart growth by bringing high-speed rail directly to the urban core, connecting the two largest cities in the region with frequent train service;
- Encourage transit-oriented development in the Transbay Redevelopment Area and Diridon Station area; and
- Leverage investments to improve existing Caltrain services, and thereby bolster the region's urban core.

Further, the Caltrain corridor has been designated a "priority development area" in the region's focused growth strategy.

Sensitivity to Community Partners and Customers

- Besides being environmentally friendly, corridor electrification is a "good neighbor" improvement that is quieter and removes local exposure to diesel emissions.
- We will maintain market-driven Caltrain commuter rail service while the high-speed rail projects are under construction.
- We are committed to protecting community character and minimizing impacts to the greatest extent possible.

CALIFORNIA HIGH-SPEED RAIL
San Francisco/Silicon Valley Corridor Investment Strategy
Phase I Federal Funding Request



San Francisco/Silicon Valley Corridor ARRA Investment Strategy
(Millions of Year of Expenditure Dollars)

PHASE I	Project Cost	Committed Funds	ARRA Request	ARRA Category	ARRA Share
Transbay Transit Center — includes Rail Level Train Box	$1,590	$1,190	$400	Project	25%
Transbay Transit Center — Rail Platform Extension	$205	—	$205	Project	100%
Transbay Transit Center — Downtown Extension DTX (Design)	$52	—	$52	Project	100%
Caltrain — 4th and King Streets Station	$100	$2	$98	Project	98%
San Jose Diridon Station	$150	$1	$149	Project	99%
Positive Train Control (Corridor-wide)	$231	$1	$230	Corridor	99%
	Requested $230 million from ARRA				
Corridor Electrification	$785	$269	$516	Corridor	66%
San Bruno Grade Separations	$275	$63	$212	Project	77%
TOTAL	$3,388	$1,526	$1,862		55%

Note: TJPA — Transbay Joint Powers Authority; Caltrain — Caltrain Peninsula Joint Powers Board

Construction Start Date	Construction End Date	Jobs	Environmental Status	Agency Awarding Contract
November 2008	March 2014	47,400	NEPA/CEQA cleared	TJPA
November 2008	March 2014	6,150	NEPA/CEQA cleared	TJPA
July* 2010	August* 2012	1,560	NEPA/CEQA cleared	TJPA
November 2012	January 2015	3,000	Environmental review to be completed by June 2011	Caltrain
July 2012	June 2014	4,500	Environmental review to be completed by January 2012	City of San Jose/ Caltrain/CHSRA
December 2011	June 2013	6,930	Environmental review to be completed September 2009	Caltrain
November 2011	December 2015	23,550	CEQA cleared; NEPA to be completed by August 2009	Caltrain
July 2010	July 2013	8,250	CEQA cleared; NEPA to be completed by December 2009	Caltrain
		101,340		

* final design phase

CALIFORNIA HIGH SPEED RAIL

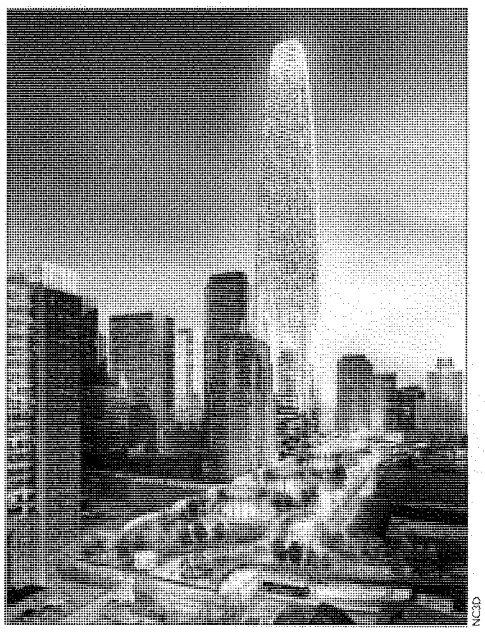
San Francisco/Silicon Valley Corridor Investment Strategy

PROJECT DETAILS

TRANSBAY TRANSIT CENTER — TRAIN LEVEL

The Transbay Transit Center project will replace the current Transbay Terminal at First and Mission Streets in San Francisco with a 21st century regional transit hub that will serve as the S.F. terminus for the high-speed rail service from Los Angeles as well as for the Caltrain commuter rail service from the Peninsula, and accommodate 45 million passengers annually. The project will include the above-grade levels of the new Transbay Transit Center serving local and regional bus and rail lines, along with Greyhound intercity bus lines. The project will also construct new ramps connecting the San Francisco-Oakland Bay Bridge with the Transit Center and a new off-site bus storage facility.

Construction of the underground-level train station structure and mezzanine for the Transbay Transit Center, and the future control center for San Francisco Muni, are part of this Phase I project.



NCSD

New Transbay Transit Center in San Francisco

Consensus on Technical and Operational Requirements

In order to optimize operations of the California high-speed rail and Caltrain corridor between San Jose and San Francisco, technical staff of the Peninsula Corridor Joint Powers Board (Caltrain), the Transbay Joint Powers Authority (TJPA) and the California High-Speed Rail Authority (CHSRA) have reached a consensus that the Transbay Transit Center is the preferred San Francisco destination for Caltrain and high-speed rail service. However, in order to get the maximum number of high-speed trains into and out of San Francisco in the most cost-effective manner, planners and engineers have determined that utilizing both the Transbay Transit Center at the First/Mission Streets location and an improved facility at the existing Fourth/King Streets station is required. When the nearly 800-mile California

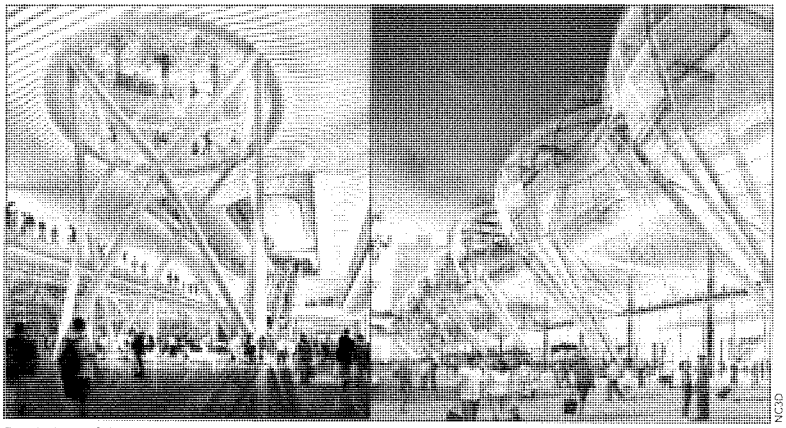
TRANSBAY TRANSIT CENTER — TRAIN LEVEL (continued)

high-speed train system is completed, the Transbay Transit Center will accommodate the majority of demand for high-speed rail service to San Francisco with additional demand accommodated, as needed, at an improved Fourth/King facility.

The technical group recommends proceeding with the current Transbay Transit Center design providing two high-speed rail platforms and one Caltrain platform; the Fourth and King site will be upgraded to support the operational and contingency requirements of Caltrain and high-speed rail services across a range of operating scenarios. The capacity of the high-speed rail platforms is dependent upon the dwell time for each train. The technical group will continue to work through the design of the Transbay Transit Center, the development of Caltrain's electrification program and the advancement of the high-speed rail project-level environmental work to optimize the Transbay Transit Center as the primary San Francisco terminus for Caltrain and high-speed rail operations.

Project Scope

The Transbay Terminal Joint Powers Authority is currently seeking funding to advance construction of the underground-level train station structure and mezzanine for the Transbay Transit Center, so that it happens concurrently with construction of the above-ground portions of the building. This would save the project an estimated $100 million compared to excavating under the completed building later on. In accordance with design



NCJD

Renderings of the new Transbay Transit Center interior and exterior

elements included in the High-Speed Rail Authority's environmental documents, the rail-level design includes four tracks for high-speed rail and two tracks for Caltrain.

Planning Completed

The Transbay Transit Center/Downtown Extension project is included in the following key planning documents:

> *California High-Speed Rail Authority Plan*;

> 2009 Transportation Improvement Program for the Nine-County San Francisco Bay Area (Metropolitan Transportation Commission); and

> Regional Transportation Plan: *Transportation 2035 Plan for the San Francisco Bay Area* (Metropolitan Transportation Commission).

Project Benefits

> Nearly 48,000 jobs will be created from the construction of the Transbay Transit Center and underground-level train station structure.

Cost and Funding

Project Cost	$1.59 billion
	Committed Revenues
Local	$498 million
State	$457 million
Federal	$235 million (includes TIFIA loan)
Subtotal	$1.19 billion
Additional Funding Need	$400 million

Project Status and Schedule

Phase	Start	Complete
Concept Planning	August 2000	February 2005
Environmental Clearance (NEPA, CEQA)	August 2000	February 2005
Preliminary Engineering	August 2000	December 2009
Final Design	November 2007	July 2010
Construction	November 2008	March 2014

TRANSBAY TRANSIT CENTER — EXTENSION OF TRAIN PLATFORMS

Project Scope

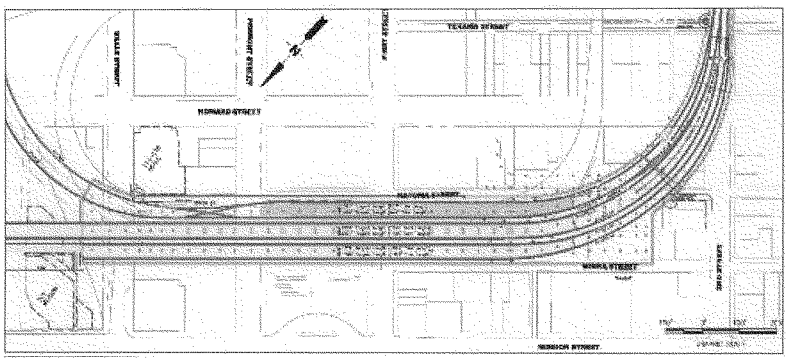
The Transbay Joint Powers Authority (TJPA) is currently seeking funding to incorporate modifications to the design of the new Transbay Transit Center in San Francisco. The modifications are necessary to accommodate the platform design recommended by the California High-Speed Rail Authority (CHSRA). The current design required the use of train platforms that are on a curve to accommodate the length of the high-speed trains. CHSRA has requested that the platforms accommodating its trains be a minimum straight dimension of 1,312 feet. The only way to accommodate this requirement is to extend the train box approximately 250 feet to the east, bringing the total length of the train station to approximately 1,750 feet.

In addition, CHSRA's ridership projections have highlighted the need to provide expanded functionality at the below-grade level of the Transbay Transit Center to incorporate a taxi queuing area and provide connections to shuttle bus and intercity bus services. Preliminary designs have been developed that include these functions on the rail concourse level immediately above the train platform level. This design change involves extending the rail concourse level to provide a ramp down from Howard Street that would accommodate vehicle movements.

Construction of the extension of the rail platforms will be most cost-effective if completed concurrent with the construction of the underground-level train station structure.

NC3D

New high-speed rail station in the train level of the planned Transbay Transit Center



High-speed train tracks (in yellow) in the underground-level train station at the Transbay Transit Center will be extended, to eliminate curved platforms.

Cost and Funding

Project Cost	$205 million
	Committed Revenues
Local	$0
State	$0
Federal	$0
Subtotal	$0
Additional Funding Need	$205 million

Project Status and Schedule

Phase	Start	Complete
Concept Planning	August 2000	February 2005
Environmental Clearance (NEPA, CEQA)	August 2000	February 2009
Preliminary Engineering	August 2000	December 2009
Final Design	November 2007	July 2010
Construction	November 2008	March 2014

Planning Completed

The Transbay Transit Center/Downtown Extension project is included in the following key planning documents:

> *California High-Speed Rail Authority Plan*;

> 2009 Transportation Improvement Program for the Nine-County San Francisco Bay Area (Metropolitan Transportation Commission); and

> Regional Transportation Plan: *Transportation 2035 Plan for the San Francisco Bay Area* (Metropolitan Transportation Commission).

Project Benefits

> More than 6,000 jobs will be created by the platform extension project.

TRANSBAY TRANSIT CENTER — DOWNTOWN EXTENSION (DTX) DESIGN

The Downtown Extension is a key component of the Transbay Center Project in San Francisco. It will provide a 1.3-mile underground connection along Second Street, between the current train terminal at 4th and King Streets and the new Transbay Transit Center at Mission and First Streets.

Project Scope

The Transbay Terminal Joint Powers Authority (TJPA) is seeking funding to complete the engineering design for the Downtown Extension. ARRA funding would allow completion of the design of the tunnel structures and of the interface with the Transbay Transit Center building, so as to prepare the extension for construction.

Planning Completed

The Transbay Transit Center/Downtown Extension project is included in the following key planning documents:

> *California High-Speed Rail Authority Plan*;

> 2009 Transportation Improvement Program for the Nine-County San Francisco Bay Area (Metropolitan Transportation Commission); and

> Regional Transportation Plan: *Transportation 2035 Plan for the San Francisco Bay Area* (Metropolitan Transportation Commission).

Project Benefits

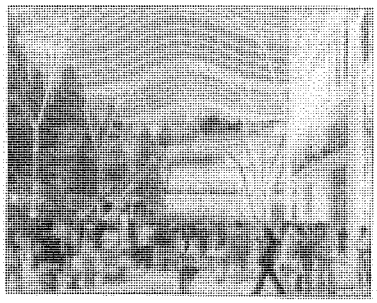
> Some 1,500 jobs will be created during the design phase of the track extension.

Cost and Funding

Project Cost	$52 million
	Committed Revenues
Local	$0
State	$0
Federal	$0
Subtotal	$0
Additional Funding Need	$52 million

Project Status and Schedule

Phase	Start	Complete
Concept Planning	August 2000	February 2005
Environmental Clearance (NEPA, CEQA)	August 2000	February 2005
Preliminary Engineering	August 2000	June 2010
Final Design	July 2010	August 2012
Construction	July 2011	August 2020



NC3D

Rendering of the interior of Mission Plaza at the new Transbay Transit Center

CALTRAIN — 4TH AND KING STREET STATION

The 4th and King Streets station currently is the north terminus for the Caltrain system and provides access to the South of Market area of San Francisco that is undergoing tremendous redevelopment and growth. The station is conveniently located adjacent to the San Francisco Giants ballpark, and is heavily used.

In the future, this facility will serve as an overflow station for the California high-speed rail (HSR) service. This station coupled with the Transbay Transit Center will be able to accommodate the full HSR build-out service plans as well as Caltrain's future service profile.

Project Scope

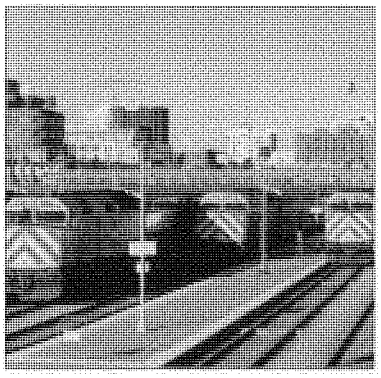
Upgrades to the 4th and King Street station are required to accommodate both high-speed rail and upgraded Caltrain service. The project includes new platforms, track and signal reconfiguration, and minor modifications to the station building.

Project Benefits

> 3,000 jobs will be created.

Cost and Funding

Project Cost	$100 million
	Committed Revenues
Local	$2 million
State	$0
Federal	$0
Subtotal	$2
Additional Funding Need	$98 million



Trains at the Caltrain station at Fourth and King Streets in San Francisco

Project Status and Schedule

Phase	Start	Complete
Selection of Preferred Alternative	July 2009	January 2010
Complete Preliminary Engineering	January 2010	June 2010
Environmental Clearance	January 2010	June 2011
Final Design	July 2011	April 2012
Track Improvement Construction	November 2012	January 2015

SAN JOSE DIRIDON STATION AND TRANSIT HUB DESIGN

The San Jose Diridon Station is the transit hub of Silicon Valley, located adjacent to the HP Pavillion at the western edge of Downtown San Jose, and two miles from Mineta San Jose International Airport. The station currently serves Caltrain, Amtrak Capitols trains, Amtrak Coast Starlight, Altamont Commuter Express trains and regional bus services, as well as local Valley Transportation Authority (VTA) light-rail and bus lines. The Diridon Station complex is slated for significant expansion to accommodate direct connections with BART, VTA bus rapid transit and high-speed rail. The land area surrounding the station has strong potential for redevelopment as a vibrant, high-density, urban center.

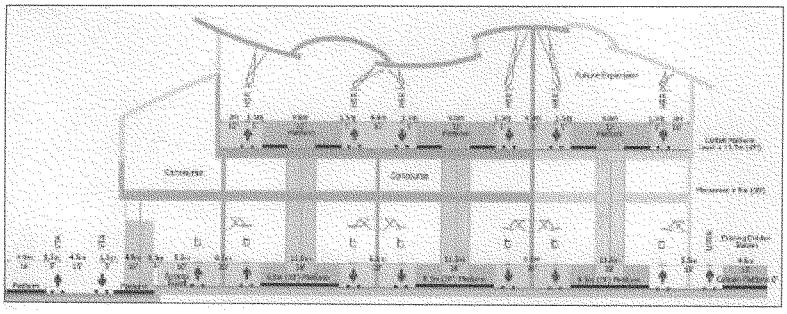
Currently, 130 trains a day roll through the Diridon Station; when the station is built out, over 600 trains will pass through each day, nearly a five-fold increase. With the facility projected to serve 4.1 million high-speed rail riders and 2.7 million Caltrain riders annually by 2030, the area and station will emerge as a key regional transportation hub for the entire Bay Area.

Project Scope

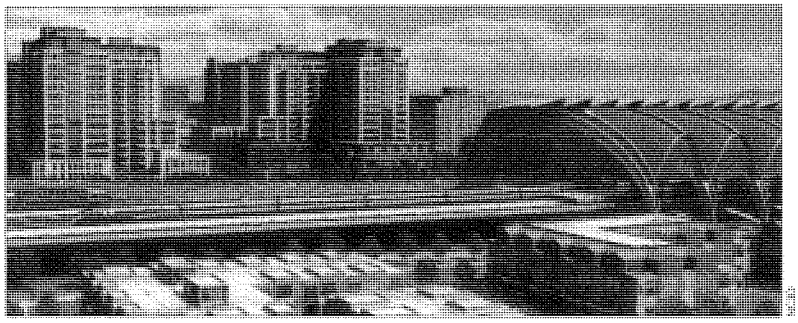
The project includes the design and construction of a new multimodal transit station terminal (adjoining the existing historic station building), along with trackside improvements to support a passenger mezzanine, eight platforms and a canopy structure for high-speed rail.

Integration With High-Speed Rail

At present, the Caltrain Joint Powers Board is implementing commuter rail service enhancements on an incremental basis to serve only their commuter patrons, while the High-Speed Rail Authority has released preliminary plans that address only its initial deployment phase. The BART-to-San Jose extension is on yet another planning track. The focus of the Diridon Station Design Integration Project is to establish a strong but flexible planning and design framework that incorporates all the anticipated uses proposed for the station. This project recognizes that Diridon Station is emerging as one of the most intensive transit hubs in the Western United States.



Cross section of platforms at new Diridon train station in San Jose



New Diridon train station and transit hub planned for downtown San Jose

Planning Completed

This Diridon Station Design Integration Project will be compatible with previous planning studies, including:

1. San Jose General Plan Update
2. High-Speed Rail EIR/EIS
3. San Jose Downtown Strategy, and
4. Diridon Area Masterplan of 2001

The recently awarded and MTC-sponsored 2009 Diridon Station Plan is also a complementary part of the proposed design project.

Project Benefits

The project is expected to create approximately 4,500 professional, technical, trade and labor jobs during the engineering and construction phases.

The completed project will provide a modern and efficient multimodal transit hub in Downtown San Jose, the urban center of Silicon Valley. In addition, the project will serve as a magnet for high-density, walkable communities.

Cost and Funding

Project Cost	**$150 million**
	Committed Revenues
Local	$0.75 million
State	0
Federal	0
Subtotal	$0.75 million
Additional Funding Need	$149.25 million

Project Status and Schedule

Phase	Start	Complete
Conceptual Design Update ($1 million)	June 2009	March 2010
Environmental Clearance (NEPA, CEQA)	January 2009	January 2012
Engineering/Design ($49 million)	July 2010	July 2012
Phase 1 Construction: Trackside Improvements ($100 million)	July 2012	June 2014

POSITIVE TRAIN CONTROL

A federal mandate requires the installation of positive train control (PTC) on all commuter railroads and some freight railroads by 2015 to reduce the risk of train-to-train collisions and prevent trains from exceeding authorized speed limits.

Caltrain has made great progress in working on the design for this safer signal system. However, to keep this vital project moving forward, additional funding is needed.

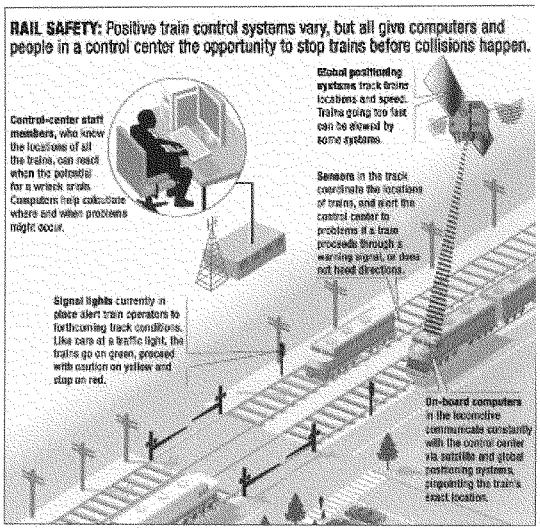
Project Scope

Caltrain is currently working on developing specifications for a new signaling system overlay that will:

- Increase the safety of the current signal system;
- Enable more frequent and dependable passenger service;
- Improve grade crossing warning functions (Caltrain currently crosses dozens of at-grade streets along its 77-mile route); and
- Accommodate the unique requirements of future high-speed trains in the Caltrain corridor.

Integration With High-Speed Rail

Since California voters approved the high-speed rail bond proposition on Nov. 4, 2008, Caltrain has been preparing for the introduction of high-speed trains in its corridor. Caltrain has undertaken an extensive investigation of existing signaling and train control technologies in order to define the requirements for a new signal system. Positive train control will be designed to differentiate between the unique operating characteristics (train length, speed, braking distance, etc.) of both commuter and high-speed trains. This



Chris Ramos | The Press-Enterprise

Diagram of how positive train control works

will enable optimal performance for the different types of train technologies that will operate on the corridor.

Co-Benefit: Energy/Fuel Savings and Security

Increased safety is a compelling reason to implement positive train control. However, an added benefit to this safety enhancement is that the new controls also will reduce fuel consumption by automobiles at grade crossings along the corridor by reducing crossing gate down times and idling.

In terms of employment impacts, the project will create 6,930 jobs.

Cost and Funding

Estimated cost:	**$231 million**
	Committed Revenues
Local	$1 million
State	0
Federal	0
Subtotal	$1 million
Additional Funding Need	$230 million

Project Status and Schedule

Phase	Start	Complete
Preliminary Design	January 2008	September 2009
Environmental Clearance (NEPA, CEQA)	January 2008	September 2009
Final Design	May 2010	September 2011
Construction/ Installation	December 2011	June 2013
System Testing and Integration	December 2013	December 2014

Caltrain by the Numbers

Passengers:	11.9 million annually
Trains:	98 weekday 32 Saturday 28 Sunday
Stations:	32
Track miles:	52 mainline and an additional 27 commute-hour only
Terminals:	San Francisco San Jose Gilroy

CORRIDOR ELECTRIFICATION

While required for high-speed rail, electrification will also pay immediate dividends for existing Caltrain patrons and for corridor residents.

Project Scope

This project requires the installation of two traction-power substations and eight auto-transformer stations, with capacity for 172 trains at peak five-minute headways. Work will occur along the length of the rail corridor to string wires for the overhead contact system, which will provide power to trains traveling at up to 90 mph, with the capability to support state voter-approved high-speed rail.

As part of this project and during the same timeframe, electric locomotives or electric multiple-unit train sets will be purchased and brought into revenue service.

Project Benefits

Electrifying will result in a faster, more efficient and more environmentally friendly rail system than the current diesel-powered system. Because electric trains can accelerate and decelerate faster than diesel trains, the improvements are anticipated to provide a savings of 13 percent in Caltrain travel time between San Francisco and San Jose. Ridership has grown as Caltrain has decreased travel time through other operational improvements, and is anticipated to continue to grow with additional time savings. Greater ridership would reduce congestion on Bay Area freeways, decrease auto emissions and reduce the demand for parking space in local cities.

Electric-powered trains are significantly quieter, which will benefit neighbors residing along the corridor.

Additionally, the switch to electric locomotives will reduce air pollutant emissions from the trains by up to 90 percent, and decrease power consumption significantly.

This project is one of the largest job generators in the investment package, involving 23,550 workers.

Project Limits

52-mile rail corridor from San Francisco to San Jose.

Cost and Funding

Project Cost	**$785 million**
	Committed Revenues
Local	$191 million
State	$62 million
Federal	$16 million
Subtotal	$269 million
Additional Funding Need	$516 million

Project Status and Schedule

Phase	Start	Complete
Agreements With Utility Supply	September 2008	December 2010
Environmental Clearance: CEQA Cleared; NEPA	March 2009	August 2009
Final Design	September 2009	March 2011
Construction	November 2011	December 2015
Revenue Service		January 2016

SAN BRUNO GRADE SEPARATION PROJECT

The San Bruno Grade Separation Project has been recognized on the California Public Utilities Commission (CPUC) Grade Separation Priority List throughout the past decade as a high-priority grade separation project, primarily due to the accident history at the site. Within the past 10 years, there have been six separate accidents resulting in four fatalities.

There is a Citizens Advisory Committee (CAC) comprised of key San Bruno stakeholders focused on addressing community concerns while advancing the project. Over 10 CAC meetings were conducted in addition to presentations at City Council and public meetings to solicit community input. The city of San Bruno is anxious to implement the project to address one of the largest safety concerns in its jurisdiction.

Project Scope

The project includes grade separation of three existing at-grade street crossings, new pedestrian tunnels and a reconstructed San Bruno Caltrain Station.

Project Limits

City of San Bruno, from Interstate 380 (north) to San Felipe Avenue (south). The project area is immediately adjacent to the city's central business district, as well as an elementary school and local park.

Project Benefits

There are approximately 25,000 average daily trips that traverse the subject crossings. In addition to creating 8,250 jobs during construction, the grade separations will:

- Improve safety by eliminating conflicts between trains and vehicular and pedestrian traffic;
- Improve vehicle circulation;
- Improve emergency service response times; and
- Eliminate local impact during Caltrain incidents.

Cost and Funding

Estimated Project Cost	**$275 million**
	Committed Revenues
Local	$23 million
State	$40 million
Federal	0
Subtotal	$63 million
Additional Funding Need	$212 million

Project Status and Schedule

Preliminary Design (35 percent) has been completed.

Phase	Start	Complete
Environmental Clearance: CEQA Cleared; NEPA	April 2009	December 2009
Funding Is Needed for:		
Final Design	July 2009	December 2009
Construction	July 2010	July 2013

AKNOWLEDGMENTS

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June 23, 2015

The Honorable Jeff Denham
Chairman
House Committee on Transportation & Infrastructure, Subcommittee on Railroads, Pipelines and Hazardous Materials
B-329
Washington, DC 20515

The Honorable Michael Capuano
Ranking Member
House Committee on Transportation & Infrastructure, Subcommittee on Railroads, Pipelines and Hazardous Materials
B-329
Washington, DC 20515

Dear Chairman Denham and Ranking Member Capuano:

I write in my capacity as Mayor of Los Angeles and as Chair of the Los Angeles County Metropolitan Transportation Authority (MTA) to express my appreciation for the hearing entitled, "The State of Positive Train Control Implementation in the United States." I strongly support increasing the level of federal support for Positive Train Control (PTC), and encourage Congress to adopt the Positive Train Control Safety Act introduced by U.S. Senator Dianne Feinstein.

In 2008 a Metrolink accident in Chatsworth, California took the lives of 25 commuters. Since then, MTA has dedicated a significant amount of resources to ensure PTC on the Southern California Regional Rail Authority's (Metrolink) extensive rail network is fully implemented. I have strongly supported MTA's effort to direct local resources to Metrolink's PTC program because all levels of government should make every effort to prioritize the safety of rail commuters. Metrolink leads the nation in implementing PTC and will be one of the only commuter rail systems to meet the December 31, 2015 PTC deadline set by the Rail Safety Improvement Act of 2008 (RSIA).

It is clear that PTC will not be implemented by the vast majority of railroads and passenger rail systems by the deadline set in the RSIA. With that in mind, a solution to extend the deadline should be memorialized and system owners should be held accountable for implementing a PTC system that is nationally interoperable. Senator

Feinstein's Positive Train Control Safety Act offers a practical and workable solution on this issue, especially after the recent Amtrak incident in Philadelphia, which demands attention and action.

Specifically, there are three critical goals that should be addressed to move PTC forward. First, the legislation should safeguard high standards for PTC. Second, any Congressional action should ensure that interoperability of PTC remains a priority for the federal government. Finally, any legislative action should create incentives to encourage timely implementation of PTC systems.

Thank you for your consideration.

Sincerely,

ERIC GARCETTI
Mayor

○