



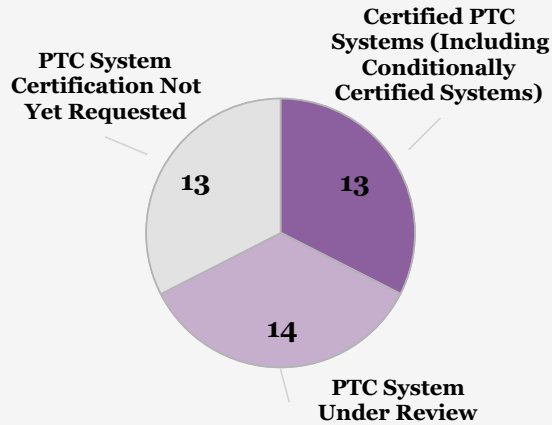
Steps Toward Full PTC System Implementation of Mandated Positive Train Control (PTC) Systems

Based on Railroads' Self-reported Progress as of March 31, 2020

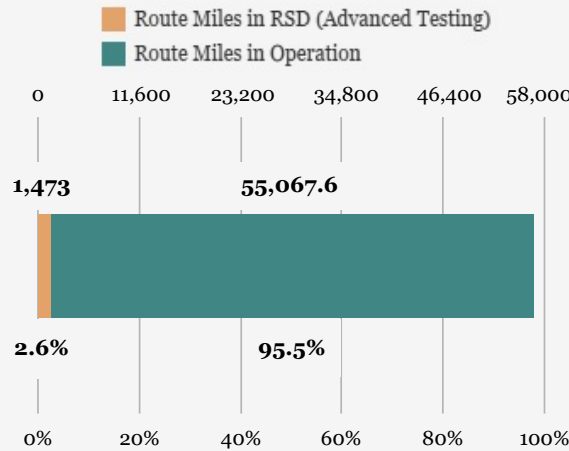
Reporting Period
2020 Q1

Railroads must implement PTC systems on the nearly 58,000 route miles subject to the statutory mandate. With all necessary PTC system hardware installed, spectrum acquired, and testing initiated by December 31, 2018, the key remaining steps for full implementation include conducting advanced testing on the general rail system, called revenue service demonstration (RSD), submitting a PTC Safety Plan and obtaining PTC System Certification from FRA, achieving interoperability between host railroads and tenant railroads, and activating the PTC system so it governs all operations on the required main lines.

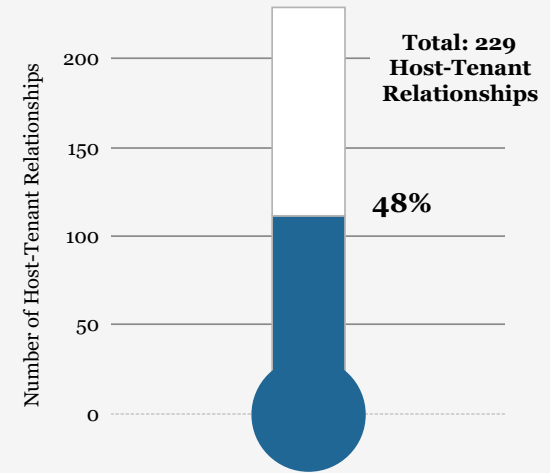
PTC System Certification Based on Host Railroads' PTC Safety Plans



Route Miles Where Host Railroads' Operations are Governed by PTC



Interoperable PTC Relationships



~\$2.6 Billion

Provided by US DOT in Grants and Loans for PTC System Implementation



December 31, 2020

Statutory Deadline for Full PTC Implementation (Unless a Railroad Specified an Earlier Deadline in Its PTC Implementation Plan)

*In a letter and revised PTCIP submitted in April 2020, Florida East Coast Railway (FECR) and Virgin Trains USA (VTUSA) confirmed VTUSA ceased passenger rail service as of March 26 and therefore FECR's lines are no longer subject to the statutory mandate. As such, FRA removed FECR from these graphics.



Industry's Progress Toward Full PTC System Implementation

Based on Railroads' Self-reported Progress as of March 31, 2020

Reporting Period
2020 Q1

Locomotives Fully Equipped and Operable

Percentage of locomotives that are equipped with PTC system hardware and software and are operational

Track Segments Completed

Percentage of track segments that are equipped with PTC

Training Completed

Percentage of employees that received the training required under FRA's PTC regulations and the railroad's program

PTC System Certification

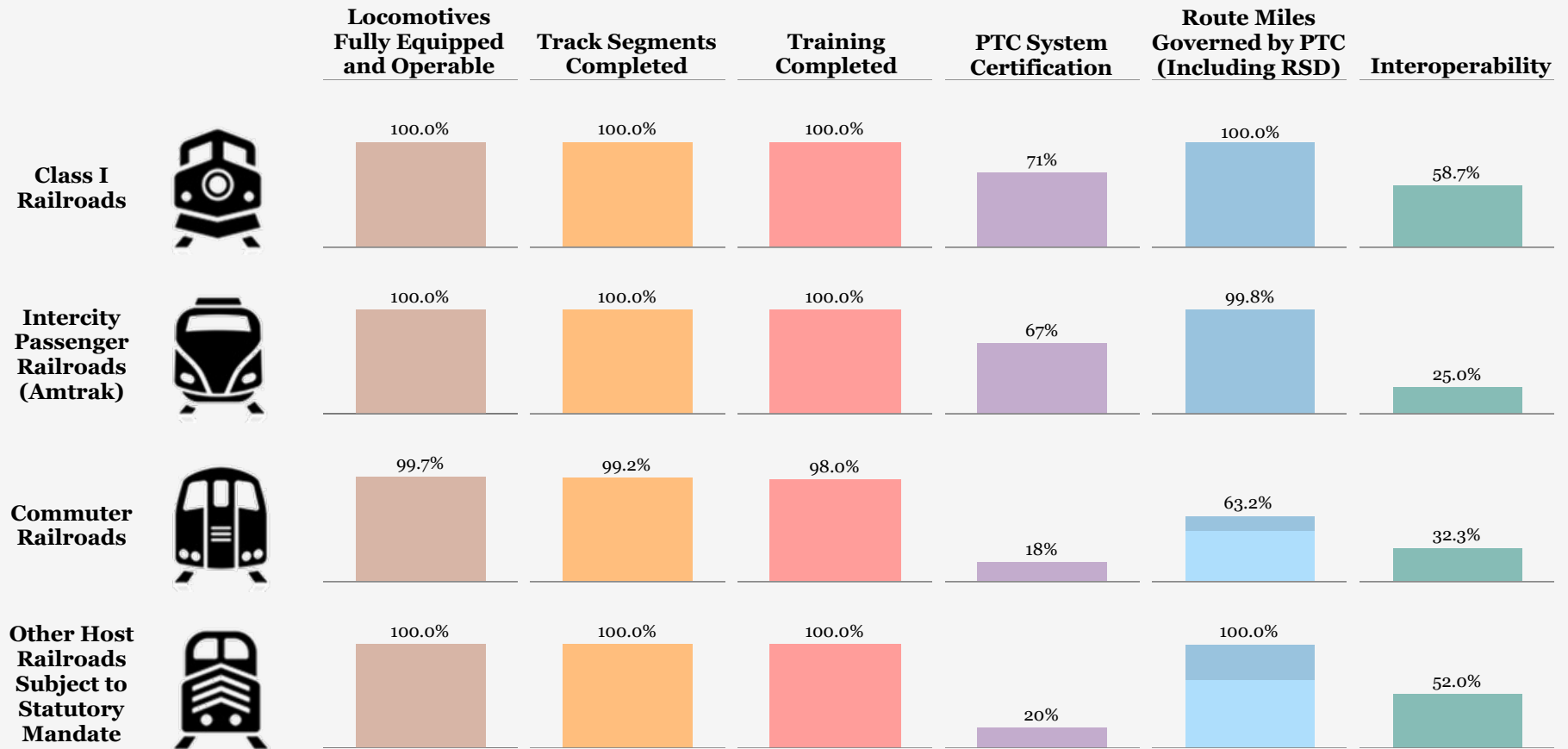
Percentage of host railroads that have received conditional PTC System Certification, based on conditional approval of a PTC Safety Plan

Route Miles Governed by PTC

Percentage of required route miles where host railroads' operations are governed by PTC (either in revenue service demonstration (RSD) or in operation)

Interoperability

Percentage of required tenant railroads that have achieved interoperability with the host railroad's PTC system



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Each Railroad's Progress Toward Full PTC System Implementation

Based on Railroads' Self-reported Progress as of March 31, 2020

Reporting Period
2020 Q1

| Railroad Type | Railroad Code | Locomotives Fully Equipped and Operable | Track Segments Completed | Training Completed | PTC System Certification | Route Miles Governed by PTC (Including RSD) | Interoperability | FRA-approved Deadline for Full PTC System Implementation | |
|--------------------|---|---|--------------------------|--------------------|--------------------------|---|------------------|--|----------------------|
| Class I Railroads | BNSF | 100.0% | 100.0% | 100.0% | Approved | 100.0% | 58.3% | December 31, 2020 | |
| | CN | 100.0% | 100.0% | 100.0% | Requested | 100.0% | 78.6% | December 31, 2020 | |
| | CP | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 10.0% | December 31, 2020 | |
| | CSX | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 76.2% | December 31, 2020 | |
| | KCS | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 25.0% | December 31, 2020 | |
| | NS | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 32.1% | December 31, 2020 | |
| | UP | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 88.0% | December 31, 2020 | |
| Amtrak | ATK | 100.0% | 100.0% | 100.0% | Conditionally Approved* | 99.8% | 25.0% | December 31, 2020 | |
| Commuter Railroads | ACEX | 100.0% | N/A | 100.0% | N/A | 100.0% | 100.0% | Fully Operational as of Dec. 2019** | |
| | ARR | 100.0% | 100.0% | 98.3% | Requested | 30.1% | N/A | December 31, 2020 | |
| | CDOT | 100.0% | N/A | N/A | N/A | 73.4% | 50.0% | December 31, 2020 (See ATK) | |
| | CFRC | 100.0% | 100.0% | 100.0% | Requested | 100.0% | 0.0% | December 31, 2020 | |
| | CMTY | 100.0% | 100.0% | 100.0% | Requested | 32.5% | 0.0% | August 10, 2020 | |
| | DCTA | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | N/A | December 31, 2020 | |
| | LIRR | 100.0% | 100.0% | 100.0% | Requested | 69.6% | 0.0% | December 31, 2020 | |
| | MARC | 100.0% | N/A | 100.0% | N/A | 100.0% [^] | 50.0% | December 31, 2020 (See ATK and CSX) | |
| | MBTA | 100.0% | 100.0% | 93.6% | Requested | 84.5% | 66.7% | December 31, 2020 | |
| | MNR | 100.0% | 100.0% | 100.0% | Requested | 74.6% | 42.9% | December 31, 2020 | |
| | NICD | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 100.0% | December 31, 2020 | |
| | NIRC | 98.1% | 88.9% | 100.0% | Requested | 54.1% | 0.0% | December 31, 2020 | |
| | NJT | 100.0% | 100.0% | 96.7% | Not Requested | 5.4% | 0.0% | December 31, 2020 | |
| | NMRX | 100.0% | 100.0% | 0.0% | Not Requested | 0.0% | 0.0% | December 31, 2020 | |
| | NSCR | 100.0% | N/A | 100.0% | N/A | 100.0% | 100.0% | Fully Implemented as of Sept. 2017** | |
| | PATH | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | N/A | Fully Implemented as of 12/31/2018 | |
| | PCMZ | 100.0% | 100.0% | 93.7% | Not Requested | 100.0% | 100.0% | December 31, 2020 | |
| | RTDC | 100.0% | 100.0% | 96.4% | Requested | 73.3% | N/A | December 31, 2020 | |
| | SCAX | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 100.0% | Fully Implemented as of 12/31/2018 | |
| | SCR | 100.0% | N/A | 100.0% | N/A | 100.0% | 100.0% | Fully Implemented as of Jun. 2017** | |
| | SDNX | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 100.0% | Fully Implemented as of 12/31/2018 | |
| | SEPTA | 100.0% | 100.0% | 100.0% | Conditionally Approved* | 100.0% | 33.3% | December 31, 2020 | |
| | SFRV | 100.0% | 100.0% | 100.0% | Requested | 100.0% | 50.0% | September 30, 2020 | |
| | SMART | 100.0% | 100.0% | 100.0% | Requested | 100.0% | 100.0% | December 31, 2020 | |
| | TEXR | 100.0% | 100.0% | 100.0% | Not Requested | 0.0% | 0.0% | December 31, 2020 | |
| | TRE | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 0.0% | September 30, 2020 | |
| | UFRC | 100.0% | 100.0% | 100.0% | Requested | 100.0% | N/A | December 31, 2020 | |
| | VREX | 100.0% | N/A | 100.0% | N/A | 100.0% | 100.0% | Fully Implemented as of Apr. 2019** | |
| | Other Host Railroads Subject to Statutory Mandate | BRC | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 100.0% | December 31, 2020*** |
| | | CR | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 66.7% | December 31, 2020 |
| KCT | | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 14.3% | December 31, 2020**** | |
| PNWR | | 100.0% | 100.0% | 100.0% | Conditionally Approved | 100.0% | 100.0% | Fully Implemented as of 12/31/2018 | |
| TRRA | | 100.0% | 100.0% | 100.0% | Not Requested | 100.0% | 28.6% | December 31, 2020 | |

*FRA has conditionally certified two of Amtrak's three PTC systems and one of SEPTA's two PTC systems.

**Please note, however, the FRA-approved deadline in the governing PTC Implementation Plan is 12/31/2020.

***Or 4 months from the completion of implementation by the final PTC tenant, whichever comes first.

****Or 6 months from the completion of implementation by the final PTC tenant, whichever comes first.

[^]MARC reports that they are operating only ACSES II on Amtrak's Penn Line as of 6/30/2019, but MARC will also operate its I-ETMS-equipped diesel locomotives and cab cars on the Penn Line in the future.

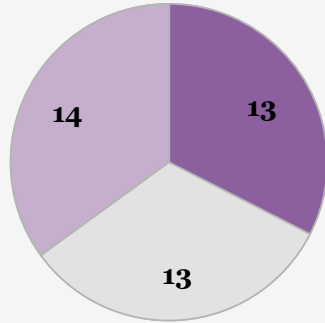
^{^^}In a letter and revised PTCIP submitted in April 2020, Florida East Coast Railway (FECR) and Virgin Trains USA (VTUSA) confirmed VTUSA ceased passenger rail service as of March 26 and therefore FECR's lines are no longer subject to the statutory mandate. As such, FRA removed FECR from these graphics.



PTC System Certification Based on Host Railroads' PTC Safety Plans as of March 31, 2020

Reporting Period
2020 Q1

Status of PTC System Certifications



Before placing a PTC system in revenue service, host railroads must submit to FRA a PTC Safety Plan (PTCSP) and receive a PTC System Certification. The PTCSP must demonstrate that the as-built PTC system can reliably execute the required functions and meets the technical regulatory requirements. Under 49 CFR 236.1009(j)(2), FRA has at least 180 days to review and respond to PTCSPs, so railroads must submit a PTCSP by June 2020 in order to fully implement an FRA-certified PTC system by the statutory deadline.



- Certified PTC Systems (Including Conditionally Certified Systems)
- PTC System Certification Not Yet Requested
- Not Applicable (Certification Covered by Host Railroad)
- PTC System Under Review

Individual Railroad System Certification Status

| | | | | | |
|------|---------------------------------|------|---------------------------------|-------|--------------------------------|
| ACEX | I-ETMS (Certification by Host) | KCS | I-ETMS | PCMZ | I-ETMS (Submission Due 6/2020) |
| ARR | I-ETMS | KCT | I-ETMS (Submission Due 6/2020) | PNWR | E-ATC |
| ATK | ACES II | LIRR | ACES II | RTDC | I-ETMS |
| | I-ETMS - Update Expected | MARC | ACES II (Certification by Host) | SCAX | I-ETMS |
| | ITCS | | I-ETMS (Certification by Host) | SCR | I-ETMS (Certification by Host) |
| BNSF | I-ETMS | MBTA | ACES II | SDNX | I-ETMS |
| BRC | I-ETMS (Submission Due 5/2020) | MNR | ACES II | SEPTA | ACES II |
| CDOT | ACES II (Certification by Host) | NICD | I-ETMS (Submission Due 6/2020) | SFRV | I-ETMS |
| CFRC | I-ETMS | NIRC | I-ETMS | SMART | E-ATC |
| CMTY | E-ATC | NJT | ASES II (Submission Due 6/2020) | TEXR | I-ETMS (Submission Due 7/2020) |
| CN* | I-ETMS - Update Expected | | I-ETMS (Submission Due 6/2020) | TRE | I-ETMS (Submission Due 4/2020) |
| CP | I-ETMS | NMRX | I-ETMS (Submission Due 6/2020) | TRRA | I-ETMS (Submission Due 6/2020) |
| CR | ACES II (Submission Due 6/2020) | NS | I-ETMS | UFRC | E-ATC |
| | I-ETMS (Submission Due 6/2020) | NSCR | I-ETMS (Certification by Host) | UP | I-ETMS |
| CSX | ACES II (Certification by Host) | PATH | CBTC | VREX | I-ETMS (Certification by Host) |
| | I-ETMS | | | | |
| DCTA | E-ATC (Submission Due 6/2020) | | | | |

*FRA conditionally authorized CN to commence provisional PTC operations on October 11, 2018

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Rail Network Route Miles in PTC Operation

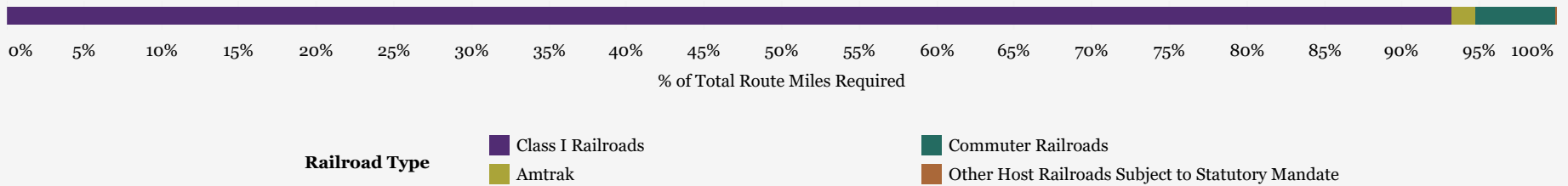
Based on Railroads' Self-reported Progress as of March 31, 2020

Reporting Period
2020 Q1

The full implementation of a PTC system requires multiple phases of testing, and initial phases may include lab testing and verification and validation testing. Before a railroad may commence field testing or advanced field testing, called revenue service demonstration (RSD), of an uncertified PTC system on the general rail system, a railroad must submit a request to FRA and obtain FRA's written approval. RSD is the advanced stage of PTC system field testing when FRA permits a railroad to operate a set of PTC-equipped locomotives, locomotive consists, or trains in revenue service under specific test conditions applicable to the railroad and its PTC system. Once a railroad's PTCSP has been approved and FRA has certified the PTC system, the host railroad (and its tenant railroads following interoperability testing) may operate the PTC system in revenue service throughout its network.

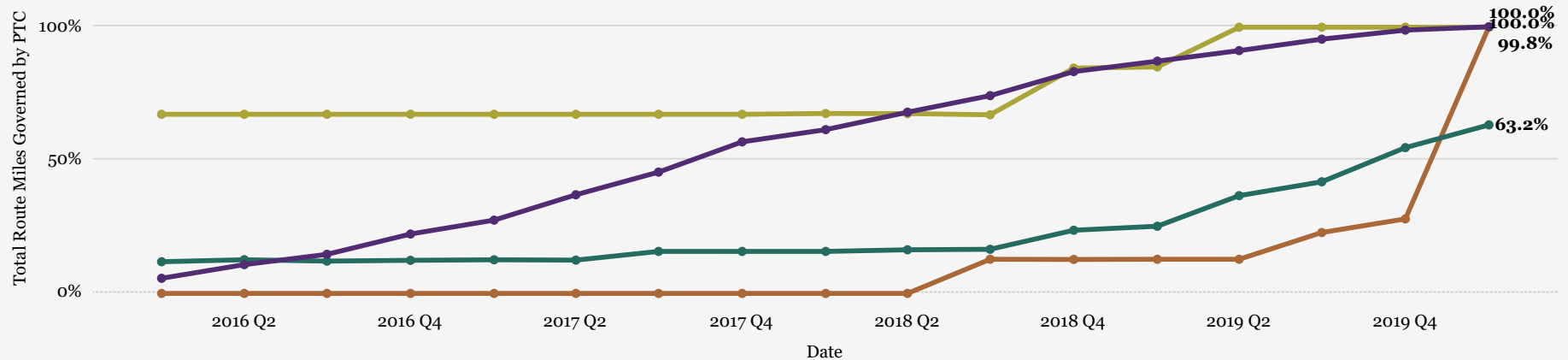
Host Railroad Route Miles Required to be Governed by PTC

| Class I Railroads | Amtrak | Commuter Railroads | Other Host Railroads Subject to Statutory Mandate | Grand Total |
|-------------------|------------|--------------------|---|---------------|
| 53,712 | 901 | 2,989 | 41 | 57,642 |



Host Railroad Route Miles Where Operations are Governed by PTC (Including RSD)

| Class I Railroads | Amtrak | Commuter Railroads | Other Host Railroads Subject to Statutory Mandate | Grand Total |
|-------------------|------------|--------------------|---|---------------|
| 53,712 | 899 | 1,889 | 41 | 56,541 |



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Railroads at Risk of Not Fully Implementing a PTC System by the Statutory Deadline

Based on Railroads' Self-reported Quarterly PTC Progress Reports

Reporting Period
2020 Q1

A key requirement of the statutory mandate is that PTC systems must be interoperable, meaning that the controlling locomotives and/or cab cars of any host railroad and tenant railroad operating on the same PTC-equipped main line will communicate with and respond to the PTC system, including uninterrupted movements over property boundaries.

An interoperability relationship describes a unique relationship between one host railroad and one tenant railroad. Depending on railroad operations, a railroad can be the host railroad in one relationship but also a tenant railroad in a different relationship, and several railroads subject to the statutory mandate operate on multiple host railroads. Although there are approximately 229, the number of unique tenant railroads that operate on PTC-required main lines is approximately 101.

Total Number of Relationships Implementing PTC by Applicable Statutory Deadline

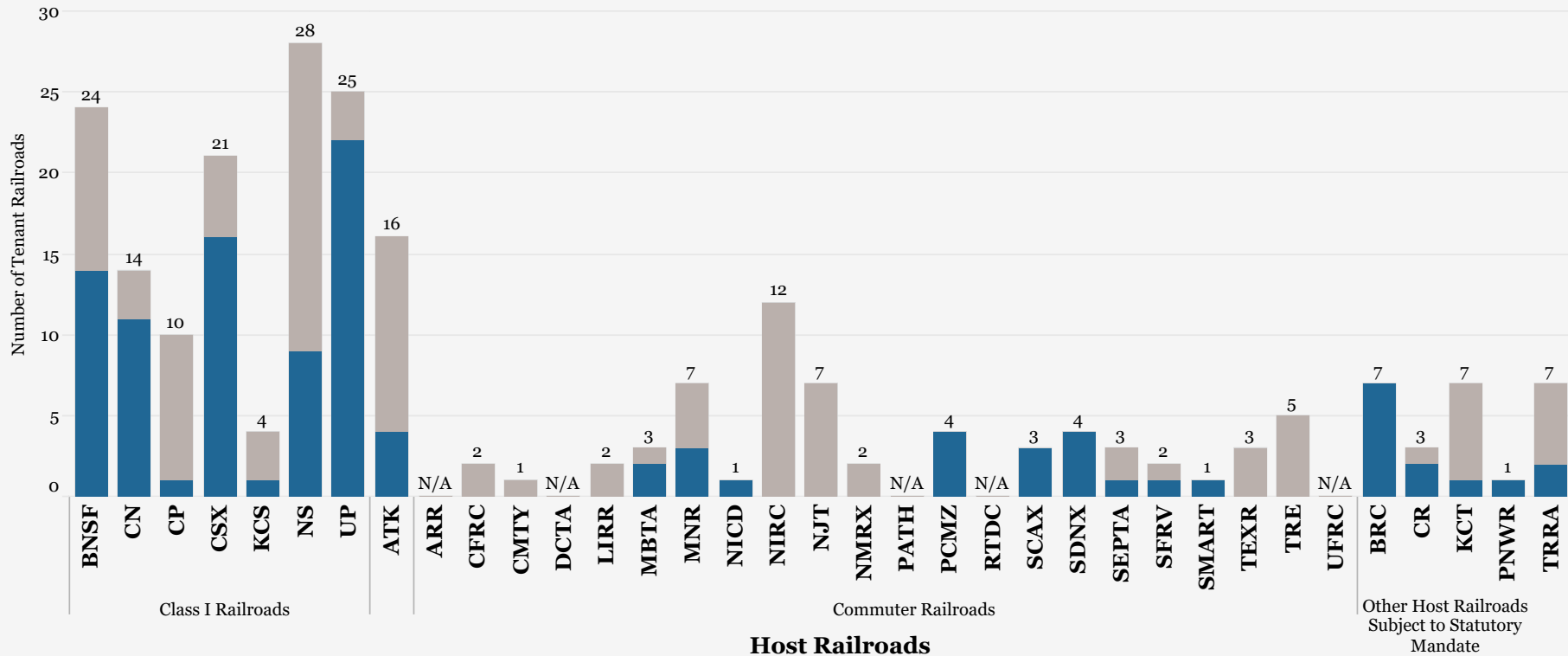
229

Number of Host-tenant Railroad Relationships Where PTC System Interoperability Has Been Achieved

111

Interoperability Status

Not Complete Operational



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Railroads at Risk of Not Fully Implementing a PTC System by the Statutory Deadline

Based on Railroads' Self-reported Quarterly PTC Progress Reports

Date of Risk Determination
3/31/2020

| Criteria | Railroad | Route Miles Governed by PTC | Technical Issues | Interoperable Tenant Railroads | PTCSP Submission |
|---|--|-----------------------------|----------------------------|--------------------------------|----------------------------|
| <p>1 Route Miles Governed by PTC</p> <p>The full implementation of a PTC system requires multiple phases of testing, including lab, field, and advanced field testing (known as revenue service demonstration (RSD)), to demonstrate the safety functions work as designed. By law, all PTC-mandated route miles must be governed by a PTC system by the statutory deadline.</p> | 1 New Jersey Transit | <p>5% 17/317.3</p> | <p>Technical Issues</p> | <p>0% 0/7</p> | <p>Expected 6/30/2020</p> |
| <p>2 Technical Issues and Roll-out Schedule</p> <p>As railroads test their PTC systems to ensure they perform reliably, technical challenges may arise. These issues range in their severity and effect on a railroad's implementation schedule. FRA's PTC Specialists work closely with railroads to provide technical assistance and monitor railroads' progress toward meeting the deadline for full PTC system implementation.</p> | 2 TEXRail | <p>0% 0/25.3</p> | <p>No Technical Issues</p> | <p>0% 0/4</p> | <p>Expected 7/1/2020</p> |
| <p>3 Interoperability</p> <p>The statutory mandate requires a PTC system to be interoperable, meaning that the controlling locomotives and/or cab cars of any host railroad and tenant railroad operating on the same PTC-equipped main line will communicate with and respond to the PTC system, including uninterrupted movements over property boundaries.</p> | 3 Northeast Illinois Regional Corporation "Metra" | <p>54% 119.1/220.34</p> | <p>Technical Issues</p> | <p>0% 0/12</p> | <p>Submitted 1/10/2020</p> |
| <p>4 PTC System Certification</p> <p>The statutory mandate requires FRA to certify each host railroad's PTC system before it is placed in revenue service. To obtain PTC System Certification from FRA, a host railroad must submit, and obtain FRA's approval of, a PTC Safety Plan (PTCSP). Under 49 CFR § 236.1009(j)(2), FRA has at least 180 days to review and respond to a PTCSP.</p> | 4 New Mexico Rail Runner Express "Rio Metro" | <p>0% 0/95.8</p> | <p>No Technical Issues</p> | <p>0% 0/2</p> | <p>Expected 6/30/2020</p> |

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