Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Jeffrey B. Mullan, MassDOT Secretary & CEO
Richard A. Davey, General Manager
and Rail & Transit Administrator

massDOT
Massachusetts Department of Transportation
Rail & Transit Division

June 13, 2011

Received & Inspected
JUN 20 2011
FCC Mail Room

Commission Secretary
Office of the Secretary
Federal Communications Commission
Room TW-A325
445 12th Street, NW
Washington, DC

Subject: WT Docket No. 11-79 – Spectrum Needs for the Implementation of Positive Train Control Provisions of the Rail Safety Improvement Act of 2008

Dear Sir/Madame:

The Wireless Telecommunications Bureau has requested comment from Commuter Railroads and other parties regarding spectrum issues arising from the implementation of Positive Train Control as required by the Rail Safety Improvement Act (RSIA) of 2008. The Massachusetts Bay Transportation Authority (MBTA), a subsidiary of the Massachusetts Department of Transportation (MassDOT), in full compliance with 49 CFR 236 subpart I, has received approval of a PTC Implementation Plan submitted to the Federal Railroad Administration indicating how the MBTA intends to meet the requirements of the RSIA of 2008.

The MBTA intends to utilize a PTC system that relies on 220 MHz radio frequency spectrum for an integral part of its communication infrastructure. The attached document entitled, **MBTA PTC Radio Spectrum Strategy,** dated, May 24, 2011 provides the MBTA's comments for FCC consideration regarding spectrum needs and issues affecting the MBTA's PTC plans.

The MBTA appreciates the opportunity to provide input to the FCC on this significant issue which affects our complex industry. If there are any questions for the MBTA, please feel free to contact me at (617) 222-6400.

Sincerely,

Stephen A. Jones
Deputy Director of Railroad Operations

Attachment

Massachusetts Bay Transportation Authority
45 High Street, 9th Floor, Boston, MA 02110
www.mbta.com

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Massachusetts Bay Transportation Authority

MBTA

PTC Radio Spectrum Strategy

In Response to FCC WT Docket No. 11-79

Wireless Telecommunications Bureau Seeks Comment on Spectrum Needs for the Implementation of the Positive Train Control Provisions of the Rail Safety Act of 2008.

May 24, 2011

Prepared by:

LTK
LTK Engineering Services

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1 INTRODUCTION

The following information is provided in response to the request for comments as identified in WT Docket No. 11-79: Wireless Telecommunications Bureau Seeks Comments on Spectrum Needs for the Implementation of the Positive Train Control Provisions of the Rail Safety Improvement Act of 2008, released on May 5, 2011.

The Massachusetts Bay Transportation Authority (MBTA) is fully aware of the requirements of the Federal Railroad Administration (FRA) Positive Train Control Systems Final Rule and is currently in compliance with all of the requirements set forth in 49 C.F.R. Part 236.1009.

The MBTA has prepared this information for the following purposes:

- To give the FCC a general overview of the MBTA Commuter Service System;
- To provide the implementation plan of MBTA's fully interoperable PTC System;
- To provide MBTA's strategy to utilize the 220 MHz Spectrum; and
- To point to MBTA-specific challenges related to the acquisition of the 220 MHz Spectrum in its area of operations.

1.1 MBTA HISTORY AND OVERVIEW

The MBTA, often referred to as "The T", is a subdivision of the Commonwealth of Massachusetts formed in 1964 to finance and operate bus, subway, commuter rail and ferry systems in the greater Boston, Massachusetts, area. The MBTA General Manager is the administrator of rail and transit for MassDOT.

A contract operator provides operations and maintenance for the MBTA's Commuter Rail Service.

The MBTA's Commuter Rail system is the fifth-busiest commuter rail system in the country. The lines go as far south as Providence, Rhode Island, and as far north as Newburyport, MA. They run as far west as Worcester, and Fitchburg, both in Massachusetts. The trains have two terminal stops in Boston (South Station and North Station). Both transportation hubs offer connections to Amtrak, local bus and subway lines. Figure 1-1 shows the composite MBTA Commuter Rail System Map.

Figure 1-1 – MBTA Commuter Rail System Map

1.1.1 Commuter Rail Routes

The T Commuter Rail service is provided along 13 active trunk-line routes essentially split into two districts. They are:

1.1.1.1 North Side: North Station Routes:

- Eastern Route (Newburyport / Rockport Branch)
- Western Route (Haverhill Branch)
- New Hampshire Route (Lowell Branch)
- Fitchburg Route

	Train Assignment	Coach Assignment	Annual Avg. Weekday Ridership
Old Colony (Plymouth and Kingston)	4	23	10,375
Old Colony (Greenbush)	4	20	4,570
Total	**61**	**361**	**143,498**

1.1.2 MBTA Commuter Rail Statistical Highlights (FY08)

- Revenue Vehicle Fleet Size: 80 Passenger Locomotives, 410 active coaches
- Route Miles of Service: Approximately 394
  - North Side: 169
  - South Side: 225
- Approximate Typical Ridership (inbound and outbound boardings):
  - Weekday: 143,498
  - Saturday: 31,812
  - Sunday: 24,055
- Annual Ridership: 39,207,425
- Schedule Weekday One-Way Trips: 491
  - North Side: 198
  - South Side: 293
- Station and Stops: 134
  - North Side: 57
  - South Side: 77

End of Section

2 PTC IMPLEMENTATION OVERVIEW

MBTA provides the commuter service on all of its lines, manages Amtrak trains three lines, and the freight traffic on most of its lines. It is vitally important for the MBTA to work with freight railroads. The industrial base in Massachusetts is dependent upon freight railroads to provide the necessary infrastructure for economical transport of commercial goods.

This section describes how the MBTA PTC system will provide for interoperability between the host (MBTA) and all tenant railroads (freight railroads and Amtrak) on the territory required to be equipped with a PTC system in accordance with 49 C.F.R. Part 236 Subpart I.

The following carriers are presently tenant railroads on MBTA territory:

1. National Railroad Passenger Corporation (Amtrak) (AMT)
2. CSX Transportation (CSXT)
3. Massachusetts Costal Railroad (MC)
4. Fore River Railroad (FRVT)
5. Norfolk Southern (NS)
6. Pan American Railway (PAR)
7. Providence & Worcester (PW)

The Fore River Railroad and the Massachusetts Coastal Railroad have limited services and as a result may be exempt by FRA to have PTC compliant locomotives to operate over MBTA lines.

The following railroads will be required to have PTC-equipped locomotives in order to gain access to MBTA PTC-equipped territory:

1. National Railroad Passenger Corporation (Amtrak) (AMT)
2. CSX Transportation (CSXT)
3. Norfolk Southern (NS)
4. Pan American Railway (PAR)
5. Providence & Worcester (PW)

The MBTA Positive Train Control – Interoperability Agreement for MBTA Tenant Railroads includes requirements that tenant railroads equip locomotives and cab cars that are planned for operation on MBTA-owned rail lines with on-board PTC equipment that is functionally compatible with MBTA's PTC System.

There are two scenarios to achieve interoperability between MBTA and its tenant railroads. The first solution requires all locomotives of tenant carriers entering the MBTA territory to be fully ACSES II (Automatic Civil Speed Enforcement System) and ATC (Automatic Train Control)/cab signal equipped. The second solution requires all locomotives of tenant carriers entering the MBTA territory to be fully equipped with

Class 1 railroad-defined and FRA-approved I-ETMS (Interoperable Electronic Train Management System) type PTC systems.

2.1 ACSES II AND ATC EQUIPPED TENANT LOCOMOTIVES

Similar to MBTA vehicles, tenant railroad locomotives will communicate with MBTA control office safety servers and receive all the necessary applicable temporary speed restrictions before entering MBTA PTC territory. There will be a transponder set at a safe distance prior to entering MBTA PTC territory to enforce a positive stop if switches are not lined up for normal operation. Once proper communication is established and confirmed, the tenant locomotive will enter MBTA PTC territory and follow the same logic as ATC and ACSES II equipped MBTA trains.

The following sections describe the functionality and hardware of the ACSES II technology elements comprising the MBTA PTC system.

2.2 ACSES II FUNCTIONALITY

MBTA will apply the ACSES II technology and functionality as implemented by Amtrak and type approved by FRA.

2.2.1 Permanent Speed Restrictions

The MBTA PTC system will enforce Permanent Speed Restrictions (PSR). Strategically installed wayside transponders will be encoded with site-specific track profiles and associated authorized permanent speed limits.

2.2.2 Temporary Speed Restriction

The MBTA PTC system will enforce Temporary Speed Restrictions (TSR). The TSR data will be communicated to the Train OBC via the 220 MHz data radio network.

2.2.3 Positive Train Stop

The MBTA PTC system will enforce a stop at every home signal displaying a Stop aspect. The transponder located at the distant signal will provide the information to the OBC that the train is approaching a home signal and the distance to the home signal. The OBC will use this data to generate a stop profile to be at zero speed just before the home signal as defined in the employee timetable. The Stop request is removed by train dispatcher via 220 MHz data radio.

2.3 COMMUNICATIONS SUB-SYSTEMS

The communications system required to support the MBTA PTC System is divided into the following two subsystems:

- **Data Radio Communications System** – Connects the wayside system elements to the onboard system elements.
- **Backhaul Communications System** – Connects the TSR Server to locations housing wayside system elements.

2.3.1 System-wide Communications Network

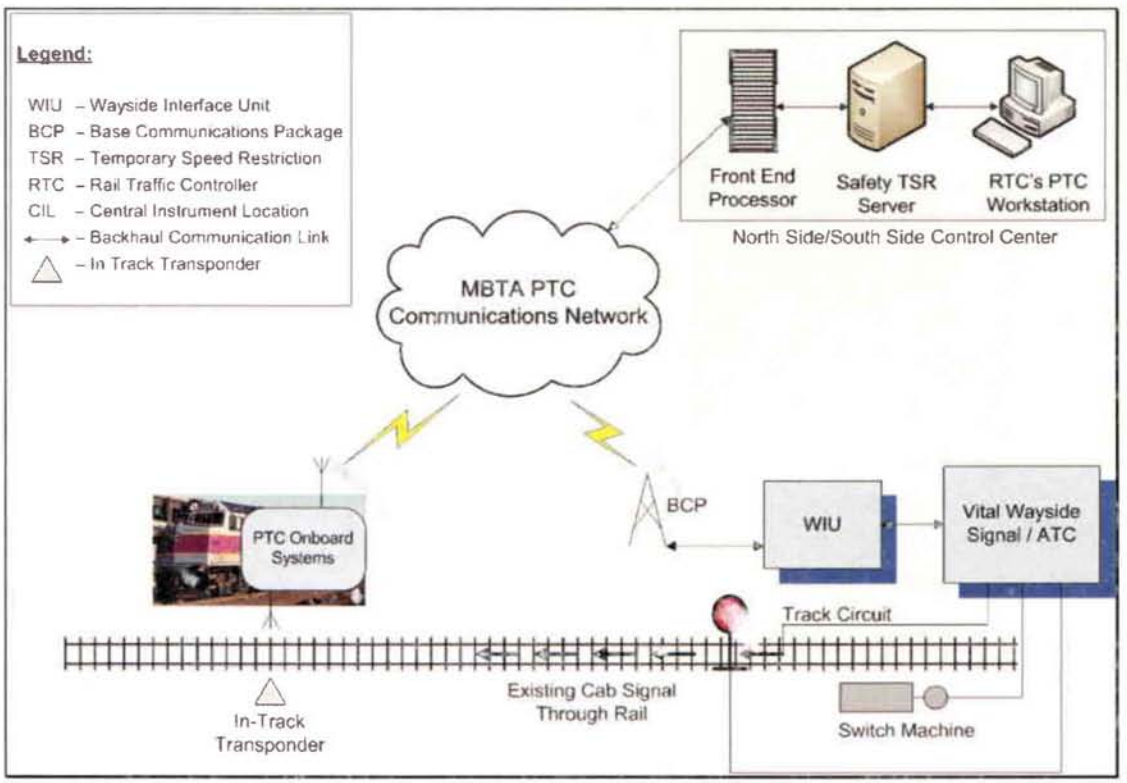
The backhaul communications system will connect both control centers housing the TSR Servers to the wayside locations via MBTA's existing System-Wide Communications Network. This system is equipped to transport a variety of communications and protocol platforms, including TCP/IP over Ethernet. As part of the system design each PTC wayside location will be evaluated to determine what additional communications links, if any, must be enhanced and where additional wayside PTC components shall be located.

2.4 PTC WAYSIDE SUBSYSTEMS

2.4.1 Wayside Sub-System

The MBTA wayside PTC system will consist of two main areas of operation: interlocking limits and automatic block territory. Within these two areas, the wayside PTC system will provide civil speed enforcement and positive stop enforcement where required. The wayside PTC system requires, at minimum, wayside interface units, base communication radio packages, and transponders (refer to PTC Wayside System).

Figure 2-1 – PTC Wayside (Field) System



2.4.2 PTC Wayside Equipment

2.4.2.1 Wayside Interface Units

Wayside Interface Units (WIU) will be installed at every interlocking on MBTA PTC operating territory and at every automatic signal location in ABS territories without ATC.

2.4.2.2 Transponders (existing, Shore Line)

Transponders are passive devices mounted between the rails installed in sets of from 2 to 4. The transponders require no energy source other than that transmitted from a passing train. All transponders are physically identical. The programmable EPROMs within the transponders contain the unique safety critical site-specific data.

Transponders are located at all interlocking home signals and then at master locations, cut sections and grade crossings as necessary to meet the requirements of the MBTA PTC system. Transponders presently exist on the Shore Line for use by Amtrak's NEC service.

2.4.2.3 Base Communication Package

The BCP data radio system provides a wireless communication path from the wayside interface unit to a locomotive when reporting the status of the wayside device. Communication with more than one WIU through a common BCP will be supported. In addition, the BCP is providing a link between the locomotive and the safety TSR server at one of the control centers for current TSR information flow through the backhaul communication network and the designated wireless radio network.

2.5 WAYSIDE SUMMARY

The lines requiring PTC installation and corresponding locations are summarized in Table 2-1 below.

Table 2-1 – PTC Installation Locations

	ROUTE / LINE	I/A/H		CP/ INTLG	TOTAL LOCATIONS
NORTH	EAST	28		22	50
	WEST	27		11	38
	NEW HAMPSHIRE	15		9	24
	Wildcat Branch	1		2	3
	FITCHBURG	7		16	23
SOUTH	FRAMINGHAM/WORCESTER				
	NEEDHAM	4		7	11
	FRANKLIN	9		6	15
	STOUGHTON	1		2	3
	DORCHESTER	8		1	9
	MIDDLEBOROUGH/LAKEVILLE	28		16	44
	PLYMOUTH/KINGSTON	22		12	34
	GREENBUSH	16		11	27

The column headings represent the following types of locations:

- I/A/H are Intermediate, Approach or Holding Signals
- CP/INTLG are Control Points or Interlockings

It should be noted that the above matrix indicates number of Installation Locations. The actual quantity of Wayside Interface Units (WIUs) required per line for PTC implementation is shown in Table 2-18 below.

Table 2-18 – Required Number of WIUs

	ROUTE / LINE	REQUIRED WIUs
NORTH	EAST	147
	WEST	79
	NEW HAMPSHIRE	46
	Wildcat Branch	3
	FITCHBURG	80
SOUTH	FRAMINGHAM/WORCESTER	N/A
	NEEDHAM	11
	FRANKLIN	22
	STOUGHTON	6
	DORCHESTER	6
	MIDDLEBOROUGH/LAKEVILLE	23
	PLYMOUTH	24
	KINGSTON	2
	GREENBUSH	27
	GRAND TOTAL	**476**

As shown in Table 2-18 above, a total of 476 WIUs will be required to implement PTC on MBTA territory.

2.6 PTC ONBOARD SUB-SYSTEMS

The MBTA rolling stock fleet is comprised of 80 diesel road locomotives, 4 switcher locomotives, 86 cab control coaches and 324 trailer coaches which are used in push pull service to support the needs of service.

The following section describes the onboard components of the MBTA PTC system only.

2.6.1 PTC System Components

2.6.1.1 Onboard Computer

The Onboard Computer (OBC) is a vital system. It employs both hardware and software crosschecking techniques to ensure vital operation. The OBC processes the data obtained from the transponders and via a data radio (MCP) to enforce permanent and temporary speed restrictions. The OBC also provides the vital signal to enforce positive stop where required.

2.6.1.2 Scanner Antenna System

The system consists of under car mounted scanner antenna, cable box (CTV), and transmission and receiver circuits. When the vehicle is in motion, the scanner antenna is turned on. The CTV generates 27.115 MHz carrier frequency for the scanner antenna to

continuously transmit this sweep frequency downwards to the tracks. When the train passes over the transponder, this carrier signal powers the transponder. The transponder sends a 4.5 MHz signal back to the train via the same MBTA ACSES II system scanner antenna with coded information representing the restrictions ahead.

2.6.1.3 Mobile Communication Package

The MCP consists of data radio and roof mounted antenna. The MCP communicates with the BCP radio system to receive upcoming TSRs and interlocking route status. This is a solid-state transceiver that operates from its own regulated power supply. Primary power comes from vehicle battery system. The radio is c[illegible]fied to meet all FCC requirements for frequency stability, power level, harmo[illegible]nd Electromagnetic Interference (EMI).

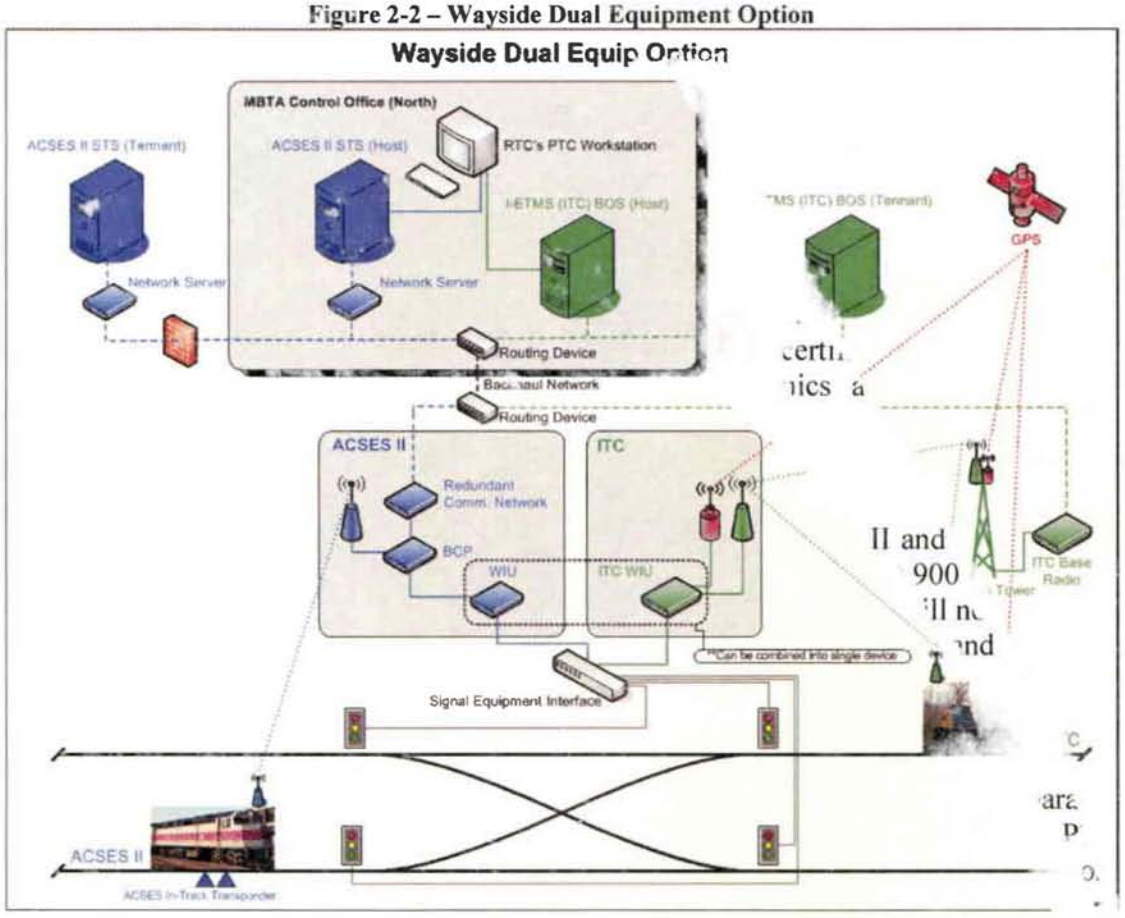
2.6.1.4 220 MHz Spectrum

MBTA plans to deploy the 220 MHz band for use in both ACSES [illegible] ACSES II in ABS Mode message exchanges. This will be a change from the current [illegible] MHz ATCS band used for ACSES II radio traffic. The change of the radio medium w[illegible]t affect the ACSES II message structure or the logic governing ACSES II requests a[illegible] requests' responses.

2.7 DETAILED DESCRIPTION OF DUAL-EQUIPPED WAYSIDE

Both ACSES II and I-ETMS systems will be deployed in mutually independent, p[illegible]llel configurations. MBTA intends to use ACSES II and I-ETMS as two autonomous [illegible]TC systems to provide complete PTC enforcement on the North side of the MBTA operati[illegible]n. The only mutually shared components will include the communication backhaul network and the office servers' dispatch system (Figure 2-2). Additionally, the ACSES II WIU and the I-ETMS WIU can be optionally combined as a single WIU device.

Figure 2-2 – Wayside Dual Equipment Option



2.7.1 Wayside Segment

The Wayside segment consists of signaling equipment located in the field whose status is simultaneously available to both ACSES II WIUs and I-ETMS WIUs impacting their respective PTC system operation. Such signaling equipment includes: interlocking controllers, signal controllers, switch circuit controllers, track circuits, track/route hazard detectors, and train defect detectors among other field devices. Only the signaling equipment whose status is required by the I-ETMS and/or ACSES II Systems will be equipped as such. This means, for example, that in some signal locations only an I-ETMS WIU will be installed.

In areas where dual-standard equipment installation is necessary, the signal equipment will be connected in a parallel connection to both the ITC WIU and the ACSES II WIU to allow the transmitting of data about device statuses.

2.7.2 Back Office Segment

The Back Office segment will be responsible for delivering data provided by the MBTA Rail Traffic Controllers (RTC) to both ACSES II and I-ETMS equipped locomotives. The BOS is also responsible for routing information to/from a tenant railroad's BOS.

verification in accordance with 49 CFR 236, Subpart I. The Routing Device is responsible for routing data over the backhaul network based on the destination address of the data messages. A backhaul connection can be established between the I-ETMS BOS and the I-ETMS WIU; however, this is an optional connection.

End of Section

3 MBTA PTC RADIO SPECTRUM – STRATEGY

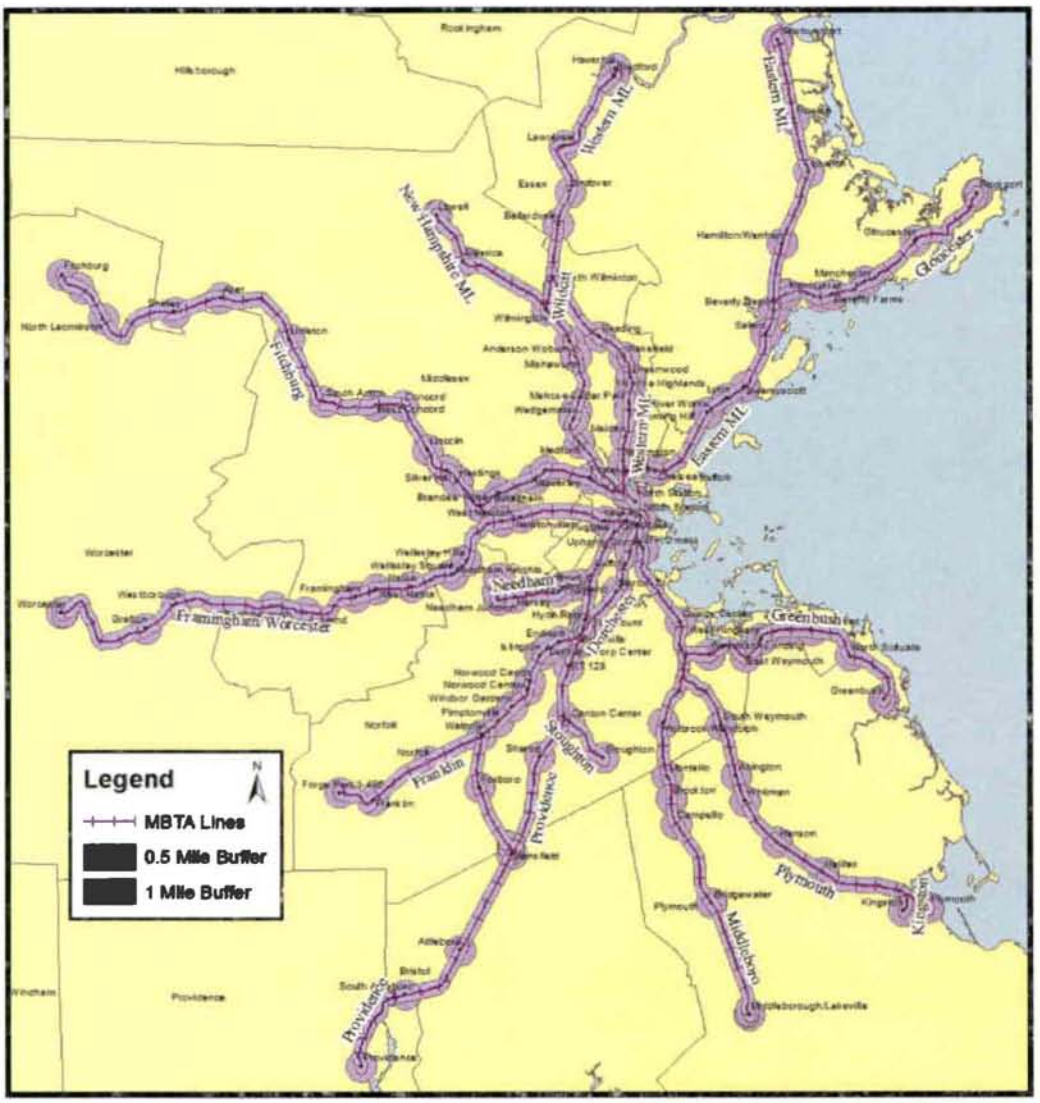
3.1 GENERAL

Communications is a critical component of the PTC system. The major criterion for successful PTC operations is that a train must reliably receive accurate and up-to-date information about its movement authorities as well as database updates. To achieve the required reliability, a proper frequency spectrum must be secured.

Currently, there is no 220 MHz spectrum in MBTA's possession. Both ACSES II and I-ETMS (ITC) systems will use their respective radio communications segments' architecture. For a radio medium, both ACSES II and I-ETMS (ITC) systems will rely on the 220 MHz band to transmit PTC related messages between a locomotive and a wayside segment; and uniquely to I-ETMS, from the locomotive and wayside segments to the Back Office through an ITC base station.

To maintain the independence of the two systems, and to avoid any interference, intermodulation or other RF channel related issues, MBTA plans to use the Class 1's PTC-220 LLC frequencies (220-222 MHZ) for I-ETMS radio traffic, and the AMTS A band (217.5-218 and 219.5-220 MHz) for ACSES II PTC radio traffic. Frequency planning, vertical antenna separation and hardware devices such as duplexers and filters will be used to further isolate the two bands. In addition, since high radio service reliability will be required to achieve required performance of the PTC system to minimize headways and maximize train throughput, MBTA is planning on full radio coverage redundancy and 99% link availability for the entire MBTA ROW plus a 0.5 mile margin from track center line and 1 mile buffer surrounding stations, terminals and layover facilities. Figure 3-1 shows the geographic map of the MBTA area of operations.

Figure 3-1



3.2 220-222 MHZ SPECTRUM

The PTC data radio component is expected to be deployed on VHF 217-222 MHz. The Class 1 RR's RF Group (PTC-220 LLC) acquired 14 nationwide channels in the 220-222 MHz spectrum, which are governed by FCC 47 CFR part 90 rules. In addition, the AAR owns 2 additional channels in the 220 MHz band which are used for Remote Locomotive Control and may not be available for PTC. Each channel is 25 kHz, accounting for overall 400 kHz of bandwidth. These channels will predominantly serve the freight rail services nationwide, leaving limited channel allocation for commuter rail usage, especially in the densely populated area such as Boston.

3.3 217-220 MHZ SPECTRUM

Part of the 217-220 MHz spectrum is the AMTS (Automated Maritime Telecommunications System), which is governed by FCC 47 CFR part 80 rules. This spectrum has similar characteristics to the 220-222 MHz spectrum and is desirable for the MBTA PTC implementation. The particular importance of this band to MBTA is that for Dual–Equipped wayside option discussed in section 2, two data radios operating in the 220 MHz band for ACSES II and I-ETMS will be installed at every PTC Control Point location; and therefore, there is a need for a maximum reasonable frequency separation.

The AMTS A-Block spectrum in MBTA area (under BEA003) of operations is owned by Intelligent Transportation & Monitoring Wireless LLC (WQGF310) and Skybridge Spectrum Foundation (WQJW650). The AMTS B-block is currently owned by Environmentel LLC (WQCP810). All these companies are affiliated with Mr. Warren Havens. MBTA is particularly concerned with the incumbent Maritime Communications/Land Mobile, LLC license (WRV374) that has incumbent protection in the Boston Area. MBTA is concerned that legal proceedings between Mr. Warren Havens and MC/LM and the recent FCC Order regarding MC/LM dated April 19, 2011 complicate the potential spectrum transfer and jeopardize the MBTA's timely compliance with RSIA regulation. MBTA is also depending on the cooperation of current AMTS license holders which is required to execute a timely license transfer.

3.4 INTEROPERABILITY

Interoperability is one of the PTC requirements that will guide the acquisition and use of the 220 MHz spectrum. The host-tenant PTC scheme will apply to radio communication segments where the visiting or tenant locomotive will have the ability to "talk" to the host's wayside equipment and base stations. As discussed in Section 3-2, freight railroads have already acquired portions of the 220-222 MHz spectrum and this spectrum will be utilized in the Class 1's portion of the wayside dual equip solution.

3.5 FREQUENCY PLANNING

The PTC radio will use the CSMA/TDMA communication protocol in cellular-type deployment. The use of this protocol will allow maximum frequency utilization (estimated to be 90%). The cell structure will be based on the amount of different channels available. This means, the more channels (spectrum) that are available, the better resultant channel utilization is achieved with less cell-to-cell interference. The cell radius will depend on the expected maximum occupancy of a combination of locomotives and wayside devices in the specific cell. The greater the distance between the same frequency base stations, the less interference. The PTC cellular structure for the MBTA region is expected to use a 7 to 9 channels cellular structure.

3.6 CAPACITY

The size of each cell will depend on the worst case scenario of data throughput. Preliminary estimates show that in a worst case scenario, one base station transmitter will need to provide a minimum of simultaneous data paths with 24 locomotives, 30 wayside devices, and 2 locomotives that are in the process of initialization, independent of the cell coverage radius. This will account for 56 simultaneous data paths plus a guard band.

4 SUMMARY

MBTA has a transportation infrastructure that requires significant capital investment to maintain a state-of-good-repair. The availability of capital is severely limited by the financial climate thereby creating significant competition for funds. MBTA is a vital component in socio-economic structure of Massachusetts and is required to direct significant available capital on system maintenance and upgrade to remain a reliable source of public transportation. The acquisition of the 220 MHz spectrum necessary to implement PTC adds an additional financial burden to MBTA and its beneficiaries – the people and guests of the Commonwealth of Massachusetts.

217-222 MHz spectrum is a critical component of the MBTA PTC system, mandatory for interoperability, and compliance with RSIA'08.

Available spectrum is limited and subject to third parties' interests. The decision about spectrum acquisition is time-sensitive and currently is at the critical point for PTC implementation. Failure to secure adequate spectrum will significantly reduce technical flexibility and complicate interoperability solutions, since 217-222 MHz spectrum is the foundation of the interoperability protocols. According to existing capacity, MBTA will need no more than 1000 kHz of 220 MHz spectrum, and a minimum of 450 kHz, based on a nine-cell coverage model.

MBTA looks to the FCC for assistance in this matter and welcomes any action that will favor the prompt implementation of the RSIA'08.

End of Section

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

2011 INTERNATIONAL RAIL RODEO
JUNE 7th TO JUNE 12th

HOSTED BY: Massachusetts Bay Transportation Authority MBTA

SCHEDULE FOR COMMITTEE & CONTESTANTS

RODEO & CONFERENCE HOTEL:	**Boston Marriott Copley Place** **110 Huntington Avenue** **Boston, MA 02116**
RODEO & OPERATOR TRAINING SITE:	**Orient Helghts Maintenance Facility** **1069 Bennington St / Rear** **East Boston, MA 02128**

Tuesday	***All:***	**June 7**
	Travel Day for Rodeo Committee	

Wednesday	***All:***	**June 8**
	Travel day for Rodeo Participants	
7:30 – 9:00 a.m. & 5:00 – 7:00 p.m.	Morning Registration Afternoon Registration **Boston Marriott Copley Place, *Registration Desk B***	
9:00 a.m. – 12 p.m.	Rail Rodeo Committee Meeting **Boston Marriott Copley Place, *Salons C – D***	
1:00 – 3:00p.m.	Committee Welcoming and Tour of Orient Heights MBTA Shuttle Bus to Orient Heights (Rodeo Site)	

Thursday	***All:***	**June 9**
6:45 - 7:30 a.m.	Registration for Rodeo **Boston Marriott Copley Place, *Registration Desk B***	
9:30 – 11:00 a.m.	Spouse/Guest Information Session This session will be conducted by a MBTA representative and will include Points of Interest, Directions, Things to Do, and Sights to See **Boston Marriott Copley Place, Salon D**	

Thursday	*Operations:*	June 9
7:30 a.m. Depart Hotel	Operators and Operations Committee Members MBTA shuttle bus to Orient Heights (Rodeo Site)	
8:00 a.m. – 5:00 p.m.	Operators and Operations Committee Members Training and Operator Lottery Selections **Location: Orient Heights Maintenance Facility**	

Operators must bring APTA rodeo handbook and MBTA operating rule book. Uniforms not required.

Classroom Instruction

- Safety Orientation
- Classroom training
- Vehicle Familiarization
- Signal System Overview & Radio Clearances

Yard Instruction

- Exterior Vehicle Familiarization
- Interior Vehicle Familiarization
- Hands-On Vehicle Training
- Question and Answer Session

12:00 p.m. – 1:00 p.m.	Lunch provided for Operators and Committee members Lunch provided by MBTA **Location: Dining Tent (Orient Heights)**
5:15 p.m.	Operators Return to Hotel MBTA Shuttle Bus to Boston Copley Marriot
5:15 p.m.	Operations Committee – Debrief meeting at Orient Heights MBTA Shuttle Bus to Boston Copley Marriot

Thursday	*Maintenance:*	June 9
8:30 a.m. – 12:00 p.m.	Maintainers Orientation and Training Sessions **Boston Marriott Copley Place, *Salon C***	
12:30 p.m.	Depart Hotel Vendors and Maintainers Committee Members Setup of Maintainers events Board MBTA Shuttle Bus to Orient Heights	

Friday	*All:*	June 10
7:30 - 8:30 a.m.	Registration for Rodeo **Boston Marriott Copley Place, *Registration Desk B***	
7:00 – 7:30 a.m.	Continental Breakfast for Operators and Maintainers **Boston Marriott Copley Place, *Salons A – C***	
11:45 a.m. – 12:45 p.m.	Lunch provided by MBTA **Location: Dining Tent (Orient Heights)**	

Friday	*Operations:*	June 10
7:45 a.m.	Depart Hotel Operators and Operations Committee Members MBTA Shuttle Bus to Orient Heights	
8:30 a.m. – 4:30 p.m.	Operators and Judges Hands-On Training <u>Course Training</u> • Course Overview • Hands on Vehicle Operation • Customer Service Training • Question and Answer Session	
4:30 p.m. – 5:00 p.m.	Operator Question & Answer session **Location: Orient Heights Maintenance Facility**	
5:15 p.m.	Operators Return to Hotel MBTA Shuttle Bus to Boston Copley Marriot	
5:15 p.m.	Operations Committee – Debrief meeting at Orient Heights MBTA Shuttle Bus to Boston Copley Marriot	

Friday	*Maintenance:*	June 10
8:00 – 11:00 a.m.	Maintainers take written/safety test **Boston Marriot Copley Place, *Salons H – K***	
11:15 a.m.	Depart Hotel MBTA Shuttle Bus to Orient Heights	
12:45 p.m. – 3:00 p.m.	Maintainers tour Rodeo Site Receive Right-of-Way Safety Training. MBTA Shuttle Bus to Boston Copley Marriot	

Saturday	*All:*	June 11
7:00 a.m. – 8:00 a.m.	Breakfast served - Courtesy of MBTA **Location: Dining Tent (Orient Heights)**	
7:40 a.m.	Judges report to competition areas	
8:00 a.m.	2011 International Rail Rodeo Competition begins	
9 a.m. – 5:00 p.m.	Shuttle bus to/from Hotel and Rodeo Site – every 15 minutes	
12:00 p.m. – 3:00 p.m.	Lunch **Location: Dining Tent (Orient Heights)**	
6:00– 7:30 p.m.	Rodeo Reception and Swap Meet **Boston Marriot Copley Place, *Simmons***	

Saturday	*Operations:*	June 11
5:15 a.m.	Judges (Operations) board shuttle bus to Orient Heights	
5:30 a.m.	Depart Hotel Operators & Operations Committee Members MBTA Shuttle Bus to Orient Heights	
5:45 a.m.	Judges receive tour of operator course	
6:00 a.m.	Operators Uniform Inspection **Orient Heights Training Trailer**	
6:30 a.m.	Operators Written Test **Orient Heights Training Trailer**	

Saturday	*Maintenance:*	June 11
6:30 a.m.	Maintainers, Vendors & Committee Members MBTA Shuttle Bus to Orient Heights	

Saturday	*Committee:*	June 11
5:00 p.m. – 5:45 p.m.	Rail Rodeo De-Briefing Meeting **Boston Marriot Copley Place, *Provincetown***	

Sunday	*All:*	June 12
7:00 p.m. – 9:30 p.m.	Rail Rodeo Awards Dinner **Boston Marriot Copley Place, *Salons G – K***	

Congratulations and Thank You!