

## **Appendix 3.1-D**

### **Technical Memorandum: Network Simulation Analysis of Proposed 2030 MBTA/Amtrak Operations (August 2009)**

South Coast Rail Network Simulation Analysis	
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

Massachusetts Executive Office of Transportation  
MBTA South Coast Rail Project

(MBTA/EOTPW Contract No X2PS68; SYSTRA Project C0574800)

**Technical Memorandum**  
Network Simulation Analysis  
of  
Proposed 2030 MBTA/Amtrak Operations

Prepared by:



SYSTRA Consulting, Inc.  
2 Whipple Place, Suite 300  
Lebanon, NH 03766  
(603) 448-0200 phone  
(603) 448-1750 fax

South Coast Rail Network Simulation Analysis	<b>Page i</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Massachusetts Executive Office of Transportation**  
**MBTA SOUTH COAST RAIL PROJECT (MBTA/EOTPW Contract No X2PS68)**  
**Draft Report**  
**TABLE OF CONTENTS**

**0. Revision History ..... 1**

**1. Executive Summary ..... 2**

1.1. Network Simulation Scenarios .....3

    1.1.1. Year 2030 No-Build Alternative.....3

    1.1.2. Year 2030 Attleboro SCR Build Alternative.....3

    1.1.3. Year 2030 Stoughton SCR Build Alternative.....3

1.2. Assumptions Underlying Simulations.....4

    1.2.1. Operations .....4

    1.2.2. Infrastructure.....5

    1.2.3. Rolling Stock.....5

    1.2.4. Methodology .....6

    1.2.5. Simulation Results .....6

**2. Introduction..... 12**

2.1. Project Schematic (Not To Scale).....14

**3. 2008 Capacity Utilization Analysis ..... 16**

**4. Assumptions ..... 18**

4.1. Track and Station Infrastructure .....18

    4.1.1. Study Limits .....18

    4.1.2. Simulation Model Infrastructure Changes for 2030 Under the “No-Build” Scenario.....18

    4.1.3. Simulation Model Infrastructure Changes for 2030 under the “Stoughton Build” Scenario.....18

    4.1.4. Simulation Model Infrastructure Changes for 2030 under the “Attleboro Build” Scenario.....20

    4.1.5. Assumed Civil Speeds for New Track.....21

4.2. Signaling Infrastructure.....21

4.3. Operations .....22

    4.3.1. Peak Periods .....22

    4.3.2. Stop Types.....23

    4.3.3. Amtrak Operations – All Scenarios (No-Build and Build Alternatives) .....23

    4.3.4. MBTA Operations .....25

    4.3.5. Combined MBTA and Amtrak Operating Plans.....26

    4.3.6. Equipment Manipulations at South Station .....27

4.4. Rolling Stock.....29

    4.4.1. MBTA Rolling Stock.....29

    4.4.2. Amtrak Rolling Stock.....29

**5. Sources of Technical Data ..... 31**

**6. Simulation Calibration ..... 33**

**Table of Contents**

South Coast Rail Network Simulation Analysis	<b>Page ii</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

<b>7. Simulation Randomization .....</b>	<b>34</b>
<b>8. Simulation Results .....</b>	<b>35</b>
8.1. On Time Performance Results .....	35
8.2. Signal Delay Results.....	37
8.2.1. Signal Delay Totals.....	37
8.2.2. Signal Delay Location .....	39
8.3. Running Time Results .....	41
8.4. South Station Occupancy Charts.....	41
8.5. Sub-Alternative: The “Whittenton Variant” .....	51
<b>9. Conclusions .....</b>	<b>52</b>
<b>10. Appendix .....</b>	<b>54</b>
10.1. Simulated Train Consists.....	54
10.1.1. Amtrak Acela (Summary Screen Shot from RAILSIM).....	54
10.1.2. Amtrak Regional (Summary Screen Shot from RAILSIM).....	54
10.1.3. MBTA Diesel: F40 Pulling Eight Coaches (Summary Screen Shot from RAILSIM) .....	55
10.1.4. MBTA Electric: HHP-8 Pulling Eight Coaches (Summary Screen Shot from RAILSIM) .....	55
10.2. Locomotive Attributes .....	56
10.2.1. Amtrak Acela Power Car (RAILSIM Rolling Stock Library Detail) .....	56
10.2.2. Amtrak Regional Alstom HHP-8 (RAILSIM Rolling Stock Library Detail) .....	61
10.2.3. MBTA Diesel: F40 (RAILSIM Rolling Stock Library Detail) .....	67
10.3. Train Performance Calculator (TPC) Running Time Results .....	72
10.4. Operating Plans.....	73
10.4.1. Amtrak 2020 Projected Northeast Corridor "North End" Operating Plan.....	73
10.4.2. 2030 No-Build Operating Plan, NEC and Dorchester Branch.....	74
10.4.3. 2030 No-Build Operating Plan, Old Colony Line.....	91
10.4.4. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – NEC and Dorchester Branch.....	97
10.4.5. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Whittenton Variant .....	114
10.4.6. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Old Colony Line.....	115
10.4.7. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – NEC and Dorchester Branch.....	123
10.4.8. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – Old Colony Line.....	140
10.4.9. 2030 Attleboro Alternative Operating Plan, Diesel Option — NEC and Dorchester Branch.....	146
10.4.10. 2030 Attleboro Alternative Operating Plan, Diesel Option — Old Colony Line.....	166

## Revision History

---

South Coast Rail Network Simulation Analysis	<b>Page 1</b>
August 28, 2009	Rev. Number 1.1
Approved By R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 0. Revision History

Revision	Date	Comments
1.0	August 11, 2009	Initial Release
1.1	August 28, 2009	Revision in accordance with Review Comments

---

South Coast Rail Network Simulation Analysis	<b>Page 2</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## **1. Executive Summary**

In order to assess the relative feasibilities of the two remaining corridors being considered for an extension of MBTA commuter rail service to the southern Massachusetts cities of New Bedford and Fall River - a project known as "South Coast Rail (SCR)" - network simulations of the projected operations were performed and are described in this report.

The two remaining SCR infrastructure corridors are as follows:

- The Attleboro Alternative – MBTA trains would use 29 miles of Amtrak’s Northeast Corridor (NEC) from South Station to a new NEC interlocking, CP Norton, located just north of Attleboro Station, where they would connect via a new bypass track to the Attleboro Secondary, a freight rail corridor. They would then travel via this and other substantially or entirely rebuilt existing rail corridors to reach the southern terminals at New Bedford and Fall River.
- The Stoughton Alternative – MBTA trains would use 15 miles of the NEC from South Station to Canton Junction, where they would diverge onto the MBTA Stoughton Branch, an existing MBTA service. The route would continue on an extension of the Stoughton Branch, and then via substantially or entirely rebuilt existing rail corridors to reach the southern terminals.

Figures in Section 2.1 below depict the rail corridors in schematic fashion illustrating the track, interlocking, and station configuration of the project.

These two alternative routes join at Weir Junction, in Taunton, MA, 40 miles from South Station via the Attleboro route and 35½ miles from South Station via the Stoughton route. From Weir Junction the common route follows the New Bedford Main Line (a freight corridor) for five miles to Myricks Junction, where the route forks, with the easterly branch continuing 14½ miles along the New Bedford Main Line to the city of New Bedford, and the westerly branch continuing 12½ miles along the Fall River Secondary to the city of Fall River.

The Stoughton Alternative has an associated sub-alternative, the Whittenton Variant. It is identical to the Stoughton Alternative, except that it would diverge from the proposed Stoughton alignment two miles south of the proposed station at Raynham Place to connect with the southerly portion of the Attleboro Secondary via the existing Whittenton Branch corridor. It would then proceed via the Attleboro Secondary to join the New Bedford Main Line, south of which it would again be coincident with the Stoughton Alternative.

Both diesel and electric options are being considered for each of the two corridor alternatives and one sub-alternative. The two major alternatives, with options, were simulated, as was a No-Build condition. However, the No-Build condition was assumed not to be a candidate for electrification, and only its diesel option was simulated. Finally, the Whittenton Variant was not simulated, as its results can be expected to be substantially the same as that achieved by the Stoughton Alternative.

---

South Coast Rail Network Simulation Analysis	<b>Page 3</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 1.1. Network Simulation Scenarios

### 1.1.1. Year 2030 No-Build Alternative

A conceptual Year 2030 No-Build (i.e., South Coast Rail not implemented) operating plan combining projected MBTA and Amtrak operations was developed for use as a study baseline. It was based upon estimated 2030 service volumes provided by MBTA and Amtrak. This operating plan was applied to a comprehensive RAILSIM® Network Simulation model that contains current “as in place” rail infrastructure, plus all infrastructure upgrades anticipated to be in place as of the year 2030. All upgrades identified were in the vicinity of South Station, the most significant of which was the expansion of South Station from 13 platform tracks to 18 platform tracks.

### 1.1.2. Year 2030 Attleboro SCR Build Alternative

To create the conceptual 2030 Attleboro SCR Build Alternative, trains were added to the 2030 No-Build operating plan to provide the desired level of SCR service. Critically, as there is no MBTA service today which is a candidate for extension to the SCR terminals via the Attleboro Alternative route, all of the trains providing SCR service were of necessity **new** trains, requiring new operating slots on 29 miles of the busy NEC. In order to compensate for the significant increase in NEC traffic, infrastructure upgrades were designed and implemented in the simulation model, including:

- New NEC third track from the junction of the Attleboro Bypass (CP Norton) to the point where existing third track begins at Readville Station, a distance of 20 miles; and
- Substantial reconfiguration of Mansfield, Junction, and Transfer Interlockings on the NEC.

In addition, conceptual designs of the Attleboro Alternative rail infrastructure between the NEC and the SCR terminals were prepared and implemented in the simulation model. Finally, the operating plan was applied to the completed simulation model and network simulations were performed.

### 1.1.3. Year 2030 Stoughton SCR Build Alternative

To create the conceptual 2030 Stoughton SCR Build Alternative, trains were added to the 2030 No-Build operating plan to provide the same level of SCR service as described immediately above. However, under this alternative, since it uses an existing MBTA branch - unlike the Attleboro SCR Build Alternative - existing MBTA Stoughton Branch trains could be extended or shifted and extended to the new SCR terminals to provide the required level of SCR service.

In fact, no infrastructure upgrades to the NEC were required by SCR under this alternative. Again, conceptual designs of the Stoughton Build Alternative rail infrastructure between Junction Interlocking on the NEC and the SCR terminals were prepared and implemented in the simulation model. Finally, the operating plan was applied to the completed simulation model and network simulations were performed.

---

South Coast Rail Network Simulation Analysis	<b>Page 4</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 1.2. Assumptions Underlying Simulations

### 1.2.1. Operations

#### 1.2.1.1. MBTA

Peak-period trains are defined as peak-direction trains whose South Station arrival times fall between 7:00 AM and 9:00 AM or whose South Station departure times fall between 4:00 PM and 6:30 PM. The peak direction is northbound in the morning and southbound in the evening.

As directed by the MBTA, the assumption for growth used in the design of 2030 No-Build operations was that MBTA train volumes would increase over April 2008 volumes by one peak-direction train per existing MBTA branch in each of the two daily peak periods, so long as the additions could be accommodated without requiring new infrastructure. Early in the study it was determined that the Old Colony Main Line is currently near capacity, so the assumption for the MBTA Old Colony Greenbush, Plymouth, and Middleborough Branches was that no new trains would be added for these services for 2030. (However, with the addition of five long platform tracks and the lengthening of existing platform tracks 11-13 proposed for South Station in 2030, it will be possible to run longer consists on the Old Colony Line. This will increase Old Colony Line passenger capacity by as much as 30%, even without an increase in the number of trains.) The net assumed increase in trains for the 2030 No-Build scenario was therefore one train each for the remaining MBTA branches - Worcester, Needham, Franklin, Providence (NEC), Stoughton, and Dorchester - six new peak-direction trains in each peak period, for a total of 12 new trains.

At MBTA's direction, MBTA station dwells for peak-period peak-direction trains were set at 120 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations, and 60 seconds at all other station stops. Non-peak period and reverse-peak trains were assigned dwells of 45 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations and dwells of 30 seconds at all other station stops.

#### 1.2.1.2. Amtrak

The Amtrak 2030 operating plan for simulation was assumed to be the proposed 2020 "North End" (New York – Boston) Amtrak operating plan developed by Amtrak in 2003 for application to the MTA/LIRR East Side Access Project and the Metro-North/ConnDOT New Haven Line Traction Power Study.

It was assumed that all Amtrak station dwells would be 120 seconds in length.

#### 1.2.1.3. South Coast Rail

The proposed South Coast Rail morning peak-period service plan mandates three inbound trains from New Bedford and three from Fall River, with one additional inbound train from each southern terminal falling just outside the peak period. One reverse-peak train would run outbound to each of the southerly terminals during the morning peak period. The evening peak period service would mirror the morning peak service in terms of volume, end terminals, and reverse-peak service level.

---

South Coast Rail Network Simulation Analysis	<b>Page 5</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

Off-peak SCR service would consist of one train in each direction between South Station and each of the two southerly terminals approximately every two hours.

Complete operating plans for all revenue trains for the three scenarios may be found in the Appendix to this document.

### *1.2.2. Infrastructure*

The existing infrastructure for both the NEC and the MBTA trackage is a matter of record. Grades, civil speeds, track lengths and configuration, stations, and signal system attributes and functioning were taken from existing documents and implemented in the comprehensive simulation model. Track and signal designs were prepared for the new and upgraded track required for South Coast Rail and also implemented in the model.

A complete listing of the sources of the data underlying the simulation model may be found in this document under Section 5 of this report, “Sources of Technical Data.”

### *1.2.3. Rolling Stock*

A detailed list of the attributes of the specific MBTA and Amtrak rail equipment referenced immediately below may be found in the Appendix to this document. Each train was assumed to carry a passenger load equivalent to its seated capacity, regardless of time of day.

#### **1.2.3.1. MBTA**

##### *Diesel Consists*

The assumption for MBTA diesel motive power was that which is in use today—a 3,000 horsepower F40PH or F40PH-2C locomotive. It was assumed to be pulling eight bi-level Kawasaki coaches, except in the case of the Framingham/Worcester Branch, whose trains were assigned seven bi-level Kawasaki coaches. This is because this particular service was assigned exclusive use of South Station tracks 1 and 2, which are now and will remain in 2030 capable of berthing only eight total vehicles. This diesel power assumption is very conservative, and assumes that the MBTA will not procure any new diesel locomotives prior to the year 2030 planning horizon of this project.

##### *Electric Consists*

The assumption for MBTA electric motive power was the 8,046 horsepower Amtrak HHP-8 locomotive, with coach counts equal to those of the diesel option.

A key assumption in electric scenarios was that under electrification in the Attleboro Alternative, *only* the MBTA trains providing South Coast Rail service were electrified; all other MBTA trains remain diesel-powered. The same assumption applied to the Stoughton Alternative, except that all Stoughton service, even those trains short-turning at Stoughton, was assumed to use electric motive power. Under the No-Build Scenario, only diesel motive power was simulated.

---

South Coast Rail Network Simulation Analysis	<b>Page 6</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

### **1.2.3.2. Amtrak**

Year 2030 Amtrak train consists are assumed to be substantially similar to the two primary consists being used by Amtrak in the subject territory today. They are both capable of utilizing the dual-frequency signal necessary for operation of the nine-aspect cab signal system in use on the NEC, including the so-called “Super Clear” aspect, which allows operation at very high speeds.

The first of these consists is the Acela Express, which operates through this territory at up to 150 MPH, making it the fastest passenger train in North America. The Acela Express consist is comprised of the following:

- 2-Acela Power Cars (12.5 kV)
- 1 Acela End Coach Car
- 3 Acela Coaches
- 1 Acela Bistro Car
- 1 Acela First Class Car

The second Amtrak consist in common use through the subject territory is the Amtrak Regional, a longer, less highly-powered train than the Acela (but still higher-performance than the diesel-powered MBTA trains). For the purposes of Year 2030 operation, it was assumed to be comprised of:

- 1 Amtrak HHP-8 Locomotive
- 1 Amfleet Amcafe
- 8 Amfleet II Corridor Coaches

### **1.2.4. Methodology**

With the operations, infrastructure, and rolling stock accurately implemented in the RAILSIM simulation model, it was possible to simulate the whole as a network. In network simulation, the scheduled trains operate over virtual track, responding to the track alignment and civil speeds in accordance with the performance attributes of the rolling stock, carrying out the required station stops and station dwells in accordance with the prescribed operating plan, and responding to commands given by the signal system which in turn is responding to the presence of all trains concurrently on the track. In short, the simulation parallels actual railroad operations to a very high degree.

The operator of the simulation performs work very similar to that of an actual train dispatcher. Over a period of time, by setting train priorities at interlockings and making route revisions to individual trains as required, the operator is able, in a successful simulation, to develop an operation which is smooth and keeps delay to individual trains very low.

### **1.2.5. Simulation Results**

Simulations were performed under both deterministic (unperturbed) and randomized (perturbed) conditions. Under deterministic simulation, all trains initially enter service on time and station and terminal dwell times are fixed. Under randomized simulation, terminal departure and intermediate station dwells are statistically randomized to reflect real-world variations in day-to-day operations.

---

## Executive Summary

South Coast Rail Network Simulation Analysis	<b>Page 7</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

The randomized simulation stresses the system in a realistic manner (using randomization profiles approved by the MBTA), and its response to this stress is measured quantitatively and qualitatively.

Two types of conventional quantitative analyses were undertaken using the network simulation model, measurements of simulated on time performance and signal delay.

**On time performance (OTP)** measures the degree to which trains arrive or leave late, on time or early relative to the intended schedule. On time performance is a concrete measure of service quality observable by the public. The MBTA threshold for on time performance is to arrive within 04'59"; otherwise the train is considered to be late.

Ideally, a planned operation will deliver all trains to their terminals not only within a given agency's definition of "on time," but with no lateness at all. However, in operations as intense as those simulated here, this is not a reasonable goal; hence the adoption of the 4'59" threshold. On the other hand, a network simulation that is unable, under deterministic conditions, to deliver all of its trains to their terminals within the agency's on time standard is symptomatic of a defective operation.

**Signal delay** is a measure of the time during which a train is forced to operate under signal indications less favorable than the best possible indication. Cumulative signal delay (across the entire simulation) measures traffic congestion independently of scheduled arrival and departure times. Comparing cumulative signal delay statistics under deterministic conditions and then under randomized conditions for the same infrastructure and operating plan provides insight into whether or not the network as designed is capable of absorbing the normal day-to-day variations in train performance and minor random delays. In addition, aggregate signal delay may be used to compare relative levels of traffic congestion across different infrastructure configurations or under different operating plans, providing a relative measure of schedule recoverability between alternatives.

### 1.2.5.1. On Time Performance

A summary of the simulated on-time performance of weekday revenue trains (excluding the trains in the Old Colony Line service) is shown for the arrivals at South Station (Table 1 below) and arrivals at the southern terminals (Table 2 below) respectively. The tables detail the percentage of trains whose arrival times are within the MBTA on time standard.

Under deterministic conditions, the No-Build and Stoughton Diesel and Electric Alternatives were all able to meet the MBTA on-time standard, i.e., 100% of the weekday trains arrived at South Station no more than 04'59" late. Trains arriving at the southern terminals attained the standard over 90% of the time. Much of that lateness was apparently due to insufficient running time allowed the southbound MBTA Providence (800 Series) trains, which are allowed less running time by MBTA schedules than are the northbound Providence trains.

OTP for South Station arrivals under randomization for the No-Build and Stoughton Diesel and Electric Alternatives also largely met the MBTA lateness standard, with the peak-period peak-direction trains achieving 100% conformance and no less than 95.9% of all weekday trains achieving the standard. Not surprisingly, the No-Build was slightly better than the Stoughton Electric, which in turn was slightly better than the Stoughton Diesel. The solid results for all No-Build and Stoughton

**Executive Summary**

South Coast Rail Network Simulation Analysis	<b>Page 8</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

Alternative simulations indicate the ability of any of these scenarios to resist and recover from operating anomalies.

By contrast, the Attleboro Alternative experienced exceptionally poor OTP, caused by operational congestion in the Tower 1 terminal interlocking throat. In fact, the RAILSIM Network Simulator, which is a very robust, capable, and well-tested simulation tool, was unable to complete the simulation and spontaneously failed around 5:30 PM. This is in itself a striking result, and one which points to a fatal flaw in the Attleboro Alternative operating plan.

OTP is not reported for the Attleboro Alternative for “PM Peak-Period Trains” or for “All Weekday Trains” because the simulation was unable to generate those results; the missing results are indicated by the grayed-out areas of the tables. However, results are available for the Attleboro AM Peak-Period trains, as the AM Peak Period is the less intense of the two daily peak periods. These results fall well below the 100% target, with none better than 69.4% and no randomized result better than 50%. While not as striking as the outright failure of the evening simulation, these results still indicate a fatally-flawed operation.

**Table 1: On-Time Performance - Revenue Train Arrivals at South Station\***

ALTERNATIVE	AM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	100.0%	100.0%	100.0%	98.6%
Stoughton Diesel	100.0%	100.0%	100.0%	95.9%
Stoughton Electric	100.0%	100.0%	100.0%	97.9%
Attleboro Diesel	61.1%	44.4%		
Attleboro Electric	69.4%	50.0%		

\* These results do not include Old Colony Line trains.

**Table 2: On-Time Performance - Revenue Train Arrivals at Southerly Terminals\***

Alternative	PM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
No-Build	94.9%	87.2%	97.1%	91.4%
Stoughton Diesel	93.0%	75.0%	93.3%	85.0%
Stoughton Electric	92.5%	80.0%	95.0%	87.1%
Attleboro Diesel				
Attleboro Electric				

\* These results do not include Old Colony Line trains.

**1.2.5.2. Signal Delay**

Table 3, Table 4, and Table 5 tabulate cumulative signal delay for revenue trains operated, excluding Old Colony Line service. Again, as the Attleboro Alternative simulations were unable to continue past the 5 PM to 6 PM hour, Attleboro Alternative results are limited to the AM Peak-Period trains and missing Attleboro results are grayed-out in the tables.

**Executive Summary**

South Coast Rail Network Simulation Analysis	<b>Page 9</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

“Total Trains” in Table 3 and Table 4 refers to all those trains whose scheduled times at South Station make them AM or PM Peak-Period trains, respectively. In Table 5, “Total Trains” refers to all scheduled weekday trains. Total signal delay is the sum of all the signal delay experienced by the individual trains under the defined scenario. The “Avg./Train” is the total signal delay divided by the Total Trains.

As can be seen, although the increase in Total Trains is small between the No-Build and Stoughton Alternatives, there is a substantial increase in signal delay under the Stoughton Alternative. This is due to two factors. The first is that to create the Stoughton Alternative operating plan, two early-morning and two late-evening Stoughton Branch trains (which run on a nearly-empty railroad) were removed and replaced with SCR trains which run at a busier and more congested time of day. The second is that although there is no increase in the overall number of Stoughton Branch trains between the No-Build and Stoughton Alternative, under SCR the Stoughton Branch trains have a much longer route with significant amounts of delay-causing single-track railroad.

Signal delay under the Attleboro Alternative more than doubles with respect to the Stoughton Alternative in all measures.

**Table 3: Cumulative Signal Delay  
AM Peak-Period Peak-Direction Revenue Trains Only\***

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	30	0:59:47	0:02:00	1:11:53	0:02:24
Stoughton Diesel	31	1:48:52	0:03:31	1:38:36	0:03:11
Stoughton Electric	31	1:52:10	0:03:37	1:42:39	0:03:19
Attleboro Diesel	36	4:46:19	0:07:57	6:01:42	0:10:03
Attleboro Electric	36	4:56:27	0:08:14	6:06:24	0:10:11

\* These results do not include Old Colony Line trains.

**Table 4: Cumulative Signal Delay  
PM Peak-Period Peak-Direction Revenue Trains Only\***

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	41	2:08:37	0:03:08	2:24:33	0:03:32
Stoughton Diesel	42	2:29:22	0:03:33	2:51:37	0:04:05
Stoughton Electric	42	2:29:28	0:03:34	2:55:18	0:04:10
Attleboro Diesel	48				
Attleboro Electric	48				

\* These results do not include Old Colony Line trains.

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	284	8:57:22	0:01:54	9:51:49	0:02:05
Stoughton Diesel	284	13:55:01	0:02:56	14:33:01	0:03:04
Stoughton Electric	284	13:16:34	0:02:48	13:55:45	0:02:57
Attleboro Diesel	322				
Attleboro Electric	322				

\* These results do not include Old Colony Line trains.

**1.2.5.3. South Coast Rail Running Times under Network Simulation**

Simulated running times under deterministic Network Simulation for South Coast Rail trains are shown in Table 6. These are the end-to-end times for peak-period, peak-direction trains (provided only for the morning for the Attleboro Alternative). It is clear that these running times are longer than the unimpeded Train Performance Calculator (TPC) train simulations which were reported in 2008 (and reported again in the appendix to this document). These results reflect longer dwells than those assumed for the TPC runs and delays under Network Simulation en route due both to congestion on the NEC and also due to single-track constraints on new SCR infrastructure. It is likely that continued refinement of the SCR operating plan to better “tune” its performance to the single-track constraints will lower these running times.

The 2-4 minute difference in TPC running times between the Whales Tooth route and the Fall River route has been somewhat attenuated under network simulation.

Although the Whittenton Variant did not undergo Network Simulation, the TPC running times results indicate that the Whittenton Variant would add several minutes to the Stoughton Alternative running times.

ALTERNATIVE	AM Peak Period Trains		PM Peak Period Trains	
	Whales Tooth to South Station	Fall River to South Station	South Station to Whales Tooth	South Station to Fall River
Stoughton Diesel	1:32:42	1:32:21	1:40:33	1:32:04
Stoughton Electric	1:23:37	1:23:43	1:29:16	1:26:30
Attleboro Diesel	1:38:45	1:38:48		
Attleboro Electric	1:36:59	1:35:56		

South Coast Rail Network Simulation Analysis	<b>Page 11</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

#### **1.2.5.4. Conclusions**

The detailed analysis of MBTA no-build conditions and projected SCR rail operations in the year 2030, under a variety of infrastructure and operating conditions, has led to the following conclusions:

1. The 2030 No-Build scenario is operationally feasible.
2. The 2030 Stoughton Build and Stoughton/Whittenton Build scenarios are operationally feasible. Adjustments to their operating plans during final design would further improve performance.
3. The Attleboro Build Alternative is operationally infeasible based upon its failure to achieve the MBTA on time standard in the morning peak, even under the most favorable deterministic simulation conditions, and upon the outright failure of the simulation in the evening peak due to overwhelming congestion in the Tower 1 terminal interlocking throat.
4. Terminal throat and terminal approach capacities were thoroughly evaluated in the simulation effort, with all revenue and non-revenue movements represented. It is clear from many iterative simulation variations in this area that as train volumes grow, access to and from the South Station platforms through the terminal interlocking throat becomes more difficult. Congestion in the terminal throat and back-ups south of the terminal contribute to late arrivals. Those late arrivals, in turn, prevent the expeditious clearing or filling of platform tracks. The lateness then cascades until train volumes begin to shrink after the peak periods. The Stoughton simulation, with its lower net additional train volume, was able to work through these challenges and adjust successfully. However, during the PM peak, the Attleboro Alternative simulation reached a point at which the terminal interlocking was overwhelmed and the simulation aborted, in spite of a lengthy and concerted effort to find an operational solution. This very clearly indicates that the Attleboro Alternative is infeasible due to the constraints in the immediate area about South Station, the terminal throat, and its approaches. In particular, the location of the storage facility south of the terminal interlocking throat (between the terminal itself and the terminal throat interlocking) places an insurmountable operational burden on peak period operations, as revenue trains compete for limited capacity and terminal track space with non-revenue equipment trains moving between the terminal and the yard.

South Coast Rail Network Simulation Analysis	Page 12
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 2. Introduction

The South Coast Rail (SCR) project being considered by the Massachusetts Executive Office of Transportation (EOT) and the Massachusetts Bay Transportation Authority (MBTA) would extend MBTA commuter rail service south from South Station in Boston to two new endpoints—New Bedford and Fall River, MA. Each alternative would make use of the Amtrak Northeast Corridor (NEC) and a combination of three or more of the following freight corridors: an extension of the MBTA Stoughton Line, the Attleboro Secondary, the Whittenton Branch, the New Bedford Main Line, and the Fall River Secondary.

There are two primary alternative routes under consideration for the new service:

1. Attleboro Alternative—Under this alternative, MBTA trains would use 29 miles of Amtrak’s Northeast Corridor (NEC) from South Station to a new NEC interlocking, CP Norton, located just north of Attleboro Station, where they would connect via a new bypass track to the Attleboro Secondary, a freight rail corridor. They would then travel via this and other substantially or entirely rebuilt existing rail corridors to reach the southern terminals at New Bedford and Fall River. Both diesel and electric train operating scenarios are being considered.
2. Stoughton Alternative—Under this alternative, MBTA trains would use 15 miles of the NEC from South Station to Canton Junction, where they would diverge onto the MBTA Stoughton Branch, an existing MBTA service. The route would continue on an extension of the Stoughton Branch, and then via substantially or entirely rebuilt existing rail corridors to reach the southern terminals. Both diesel and electric train operating scenarios are being considered.
  - Whittenton Variant—this variant to the Stoughton Alternative would be identical to the Stoughton Alternative, except that it would diverge from the Stoughton alignment two miles south of the proposed station at Raynham Place to connect with the southerly portion of the Attleboro Secondary, and would then proceed via the Attleboro secondary to join the New Bedford Main Line and then via the New Bedford Main Line and the Fall River Secondary to the southerly terminals. Again, diesel and electric train sub-alternatives operating scenarios are being considered.

Of the two primary alternatives under consideration, the Attleboro Alternative will have the greater impact on the busy NEC for two primary reasons:

- The Attleboro Alternative uses a longer segment of the NEC corridor (29 miles for the Attleboro Alternative compared to 15 miles for the Stoughton Alternative and Whittenton Variant);
- All of the New Bedford/Fall River trains under the Attleboro Alternative would be **new** trains, not extensions of existing trains as under the Stoughton Alternative and Whittenton Variant. By contrast, under the Stoughton Alternative and Whittenton Variant, there would be no net increase of trains in the Stoughton service over the train volume projected for the target year of 2030 without SCR (the No-Build Stoughton service). However, the Stoughton Alternative

**Introduction**

---

South Coast Rail Network Simulation Analysis	<b>Page 13</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

operating plan does shift some of the earliest and latest No-Build Stoughton trains closer to the peak periods.

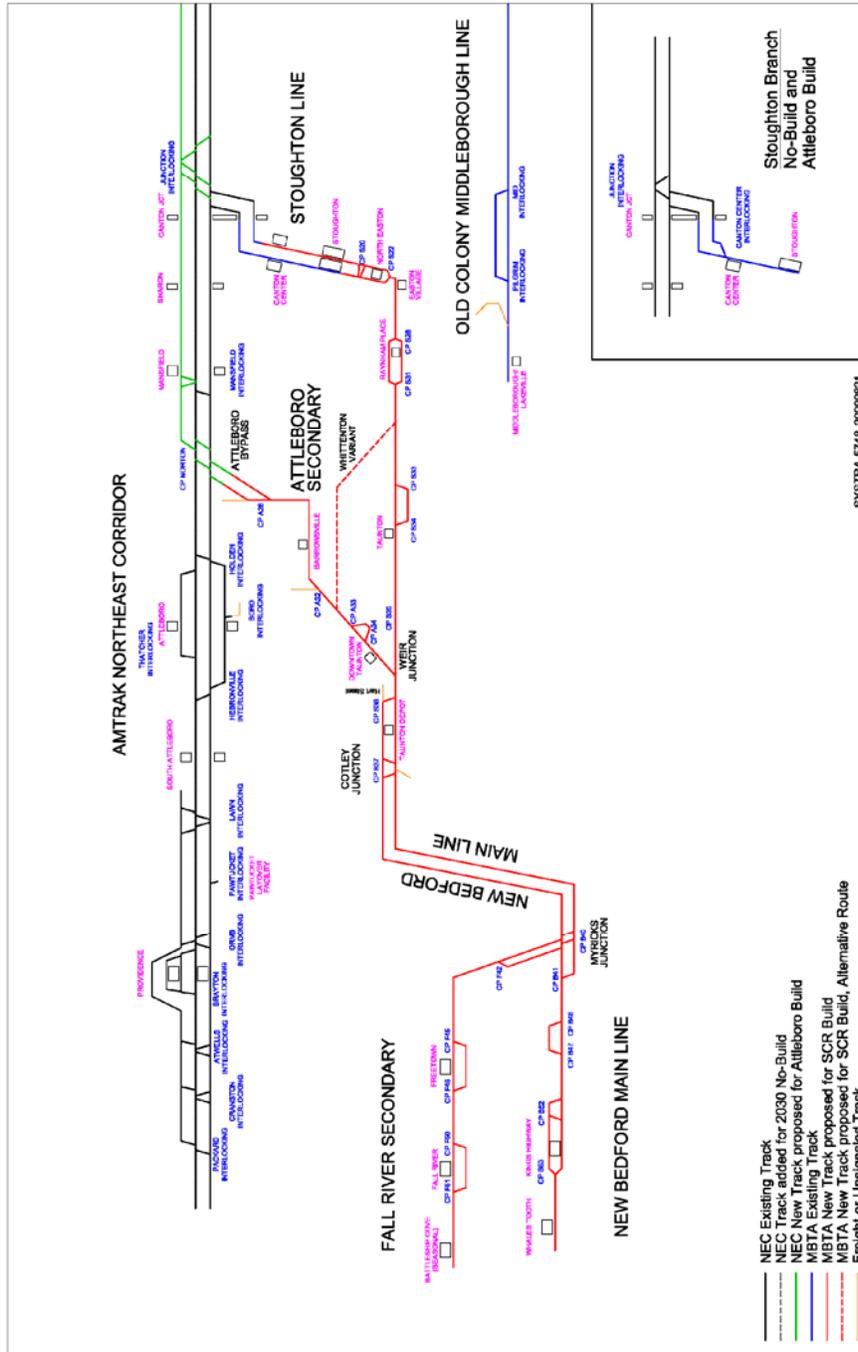
The purpose of the present study is to determine, via network simulations, the operational feasibilities of the two major alternatives, and to compare their operational stability with that which would occur under a “No-Build” scenario. The No-Build scenario reflects infrastructure and MBTA/Amtrak operations predicted for the year 2030 in the absence of SCR.

This simulation effort uses SYSTRA's RAILSIM Simulation Software Suite.

The figures in Section 2.1 below depict the rail corridors in schematic fashion illustrating the track, interlocking, and station configuration of the project.

---

## 2.1. Project Schematic (Not To Scale)





South Coast Rail Network Simulation Analysis	<b>Page 16</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

### 3. 2008 Capacity Utilization Analysis

Prior to the present network simulation study, an analysis was made of projected signal system capacity utilization within the subject territory under one 2030 No-Build and three 2030 Build scenarios. The three Build scenarios were the Attleboro and Stoughton Alternatives under consideration in the present study, and a Middleborough Alternative using the Old Colony Line, which has since been dropped. In each case, the capacity utilization analysis divided the territory into interlocking-to-interlocking segments and determined, for each segment, the percentage of practical available capacity of the proposed track and signal system that would be used by the target operating plan. Where that portion significantly exceeded 100%, the track and signal system was deemed inadequate to support the proposed operations, and infrastructure improvements were indicated.

Specifically, this analysis estimated the ability of the main MBTA trunk lines to accommodate projected 2030 traffic both with and without South Coast Rail, focusing on anticipated “peak of the peak one hour” operations in the morning and evening. The analysis made use of a comprehensive RAILSIM simulation model of:

- Amtrak’s Northeast Corridor as presently configured and signaled between Providence and South Station in Boston; and
- The Old Colony Main Line/Middleborough Branch as presently configured and signaled between Middleborough and Boston.

Single train unimpeded simulations yielded clearing times for all signals encountered. These times were aggregated and subjected to analysis, and yielded for each scenario the location and estimated severity of anticipated capacity constraints.

The analysis’ findings were:

1. The Attleboro Alternative was projected to be feasible with third track added to the Northeast Corridor between the Attleboro Bypass connection and Readville. However, this third track was not specifically analyzed; its projected success was based upon an assumption that the third track would increase capacity of the upgraded two-track area by approximately 50%.
2. The Stoughton Alternative was projected to be feasible using current NEC infrastructure.
3. The Middleborough Alternative was found to be infeasible.

The capacity utilization analysis techniques employed, which are static by nature, are most appropriate for early planning efforts. However, these results were always subject to more detailed and authoritative analysis, which is the purpose of the current study. The aggregation of the capacity used by each passing train in a given hour to produce a total capacity used for that hour for a given segment of track does not consider the sequence, performance envelopes, and separation of the trains being delivered to that segment. The more sensitive network analysis contained herein has found this to be a critical issue for the NEC because of the intermingling of 150 MPH Amtrak Acela Expresses, 125 MPH Amtrak Regionals, 79 MPH MBTA diesels, and under electric train scenarios, 100 MPH MBTA electrics. The present network simulation captures all of the interplay between the signal

---

## 2008 Capacity Utilization Analysis

---

South Coast Rail Network Simulation Analysis	<b>Page 17</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

system, infrastructure, operating plan, and highly variable train performance at a 0.1-second simulation time step for all trains simultaneously. Dynamic network simulation of this type is the logical and appropriate follow-on to static planning analyses such as capacity utilization work.

Critically, the capacity utilization exercise did not consider operations in Tower 1 Interlocking, the South Station terminal, and non-revenue traffic between South Station and a yard location to be reached via the Fort Point Channel Bridge. The present network simulation clearly shows that capacity constraints in these areas are in fact the primary limiting conditions for the implementation of South Coast Rail.

For these reasons, the present network simulation exercise should be considered a far more definitive and authoritative analysis of South Coast Rail than was the foregoing capacity utilization exercise.

---

South Coast Rail Network Simulation Analysis	Page 18
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 4. Assumptions

### 4.1. Track and Station Infrastructure

#### 4.1.1. Study Limits

SYSTRA maintains a RAILSIM database of much of the passenger rail infrastructure of the northeastern United States. The portion of this database representing MBTA lines and Amtrak's NEC from Providence north was expanded and reviewed to ensure compliance with the latest available and most reliable data sources for the existing physical plant and for those infrastructure upgrades which are currently planned for the year 2030. This review resulted in a simulation model which reflects existing and proposed grades, track configuration, wayside signals, cab signal master locations and code change points, signal control lines and timers, station platforms, and civil speeds.

The resulting simulation model extends from Providence, RI to South Station, Boston, MA on the NEC. Also included are the northerly portions of the existing MBTA Franklin, Needham, Plymouth, and Greenbush Branches, the Dorchester Branch, the Old Colony Line to Middleboro, and a portion of the Worcester Line from Beacon Park Yard to its junction with the NEC at Back Bay (Cove Interlocking).

#### 4.1.2. Simulation Model Infrastructure Changes for 2030 Under the "No-Build" Scenario

Programmed MBTA and Amtrak capital improvements already committed for the Northeast Corridor between Providence and Boston circa Year 2030 were included in the simulation model. All of these changes to today's physical plant were at or adjacent to South Station:

- Tracks 1-10 were altered in accordance with an anticipated "platform infill" project;
- Track 13 was extended;
- Five new tracks (14-18) were added to the east side of the terminal;
- Tower 1 Interlocking was extended to the south toward the Fort Point Channel Bridge so as to incorporate two new right-handed ladders on the four tracks crossing the Bridge.

These changes were taken from data sources 11, 12, and 13 in the numbered list provided below in Section 5, "Sources of Technical Data."

#### 4.1.3. Simulation Model Infrastructure Changes for 2030 under the "Stoughton Build" Scenario

The simulation model for the Stoughton Alternative and Whittenton Variant was developed from the 2030 No-Build model in accordance with conceptual track and signal design source documents listed

---

South Coast Rail Network Simulation Analysis	<b>Page 19</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

in Section 5, “Sources of Technical Data.” The revisions to 2030 No-Build infrastructure required by this alternative were:

- The elimination of Canton Center Interlocking;
- The addition of second platforms at Canton Center and Stoughton; and
- The extension of double-track to and beyond Stoughton Station.

New SCR infrastructure elements added for this alternative were:

- The extension of the Stoughton Line (the “Stoughton Extension”) to Weir Junction (south of which the SCR infrastructure is identical for the Stoughton and Attleboro Alternatives);
- New or substantially rebuilt track along the New Bedford Main Line from Weir Junction through Cotley Junction to Myricks Junction and thence to New Bedford;
- New or substantially rebuilt track from Myricks Junction on the New Bedford Main Line to Fall River via the Fall River Secondary; and
- New or substantially rebuilt track from the Stoughton Extension south of Raynham Place at Milepost (MP) 29.6 via the Whittenton Branch to join the Attleboro Secondary at Whittenton Junction (Attleboro Secondary MP 33.1), thence along the Attleboro Secondary to join the Stoughton New Bedford Main Line at Weir Junction. This “Whittenton Variant” route is 1.6 miles longer than the Stoughton Line route and would replace the Stoughton Alternative’s Taunton Station stop with a stop at Downtown Taunton Station.

Public station stops off the NEC under the Stoughton Alternative would be as follows (from north to south):

Canton Junction  
Canton Center  
Stoughton  
North Easton  
Easton Village  
Raynham Place  
Taunton (Stoughton Alternative only)  
Downtown Taunton (Whittenton Variant only)  
Taunton Depot

(via Fall River Secondary)  
Freetown  
Fall River Depot  
Battleship Cove (seasonal)

(via New Bedford Main Line)  
Kings Highway

South Coast Rail Network Simulation Analysis	<b>Page 20</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

### Whales Tooth

#### 4.1.4. *Simulation Model Infrastructure Changes for 2030 under the “Attleboro Build” Scenario*

The simulation model for the Attleboro Alternative was developed in accordance with conceptual track and signal design source documents listed in Section 5. Very significant changes to 2030 No-Build infrastructure were required on the NEC for this alternative, as follows:

- A new NEC interlocking, CP Norton, located at MP 200.5, where new NEC third track is proposed to begin;
- The extension of the new third track to Readville, giving the NEC continuous third track from CP Norton to South Station;
- The reconfiguration of Mansfield Interlocking;
- Reconstruction of one platform and construction of a new Track 3 platform at Mansfield, Sharon, and Canton Junction Stations on the NEC;
- The substantial reconfiguration of Junction Interlocking;
- The substantial reconfiguration of Transfer Interlocking; and
- Additional reconfigurations necessitated at locations where the new third track intercepts existing spurs and sidings.

New SCR infrastructure elements required by this alternative:

- The construction of a new two-track “Attleboro Bypass” to connect CP Norton, on the NEC, with the Attleboro Secondary;
- New or substantially rebuilt track along the Attleboro Secondary from the Attleboro Bypass to Weir Junction;
- New or substantially rebuilt track along the New Bedford Main Line from Weir Junction through Cotley Junction to Myricks Junction and thence to New Bedford; and
- New or substantially rebuilt track from Myricks Junction on the New Bedford Main Line to Fall River via the Fall River Secondary.

Public station stops off the NEC under the Attleboro Alternative would be as follows (from north to south):

Barrowsville  
Downtown Taunton

---

**Assumptions**

---

Taunton Depot  
  
(via Fall River Secondary)  
Freetown  
Fall River Depot  
Battleship Cove (seasonal)  
  
(via New Bedford Main Line)  
Kings Highway  
Whales Tooth

**4.1.5. Assumed Civil Speeds for New Track**

Civil speed profiles for all tracks may be found in the data sources listed in Section 5, “Sources of Technical Data.” The new NEC third track was assumed to have a civil speed profile identical to the adjacent existing NEC track, as indicated by Amtrak’s Employee Timetable and Special Instructions, eff. 5/12/2008.

The maximum passenger civil speed in effect on South Coast Rail-exclusive infrastructure was assumed to be 70 MPH for diesel equipment and 100 MPH for electric equipment. On the NEC, MBTA diesel equipment was allowed a maximum authorized speed of 79 MPH, while MBTA electric equipment was allowed a maximum authorized speed of 100 MPH.

**4.2. Signaling Infrastructure**

Signal layouts and control lines for all existing and proposed track were taken from data sources listed in Section 5, “Sources of Technical Data.”

Train operations in existing MBTA territory off-NEC are controlled by an Automatic Train Control and Cab Signal System (ATC/CSS), which uses the following standard code (pulse) rates measured in pulses per minute (ppm) to indicate the following speeds:

<u>Code Rate</u>	<u>Speed</u>
180	Maximum Authorized Speed (MAS)
120	45 MPH
75	30 MPH
0 (No Code)	15 MPH or less

The Northeast Corridor from Providence to Tower 1 Interlocking has in place a recently-implemented dual frequency (100 Hz/250 Hz) nine-aspect Automatic Train Control and Cab Signal System (ATC/CSS) which allows some Amtrak trains (specifically, the Acela Express) to travel at speeds up to 150 MPH. It enables the high-speed trains to achieve their full potential wherever alignment conditions permit, while safely separating them from slower trains that will share the railroad. The nine code rate aspects and their associated speeds defined for this system are as follows:

---

## Assumptions

<u>Code Rate</u>	<u>Speed</u>
180/180	150 MPH
180/-	125 MPH
270/270	100 MPH
120/120	80 MPH
270/-	60 MPH
120/-	45 MPH
75/75	30 MPH
75/-	30 MPH
0 (No Code)	15 MPH or less

At this time, neither the 100 MPH nor the 60 MPH speed command is used in the subject territory.

MBTA trains are presently not capable of reading the dual-frequency code rates and are therefore limited to the four code rates (including 0 Code) that they normally encounter in MBTA-only territory. For the purposes of this study, it is assumed that MBTA diesel trains in 2030 *will not* be equipped to read the 250 Hz signal, but under electric train operating scenarios, MBTA electric trains *will* be equipped to read both frequencies. As the MBTA diesels are limited to 79 MPH on the NEC and the 60 MPH speed code is not being transmitted, MBTA diesel trains are not penalized for their inability to read the 250 Hz signal.

For the new SCR territory between Canton Junction and the stations at New Bedford and Fall River (the Stoughton Alternative and Whittenton Variant), a conceptual ATC/CSS system was designed for use in these simulations by the consulting firm Vanasse Hangen Brustlin, Inc. (VHB). A similar conceptual ATC/CSS was designed by the consulting firm HNTB, Inc, for the Attleboro Bypass and Secondary, between CP Norton on the NEC and Weir Junction. In both cases and for both diesel and electric operation, the SCR ATC/CSS system will use the four code rate/speed combinations identical to those currently in place in MBTA territory.

The functionality of all of these signal systems was incorporated into the RAILSIM simulation model, including signals, cab signal master locations and code change points, control lines, signal aspects, and code rate timers.

### 4.3. Operations

#### 4.3.1. Peak Periods

The MBTA-defined official peak periods used for this analysis were 7:00 AM to 9:00 AM in the morning and 4:00 PM to 6:30 PM in the evening. A peak period train is one which has either a morning South Station arrival or evening South Station departure time which falls within those windows.

## Assumptions

---

### 4.3.2. Stop Types

There are several types of stops assigned to trains in the Amtrak and MBTA operating plans according to the sources used for this study. Their definitions, and how they were treated in simulation, are as follows:

- “S” Stop: Regular Stop to receive or discharge passengers. Under RAILSIM, an S stop ends when both the required dwell time has elapsed and the scheduled departure time has been reached.
- “D” Stop: Stops only to discharge passengers; the train may leave early. In the present simulations, every scheduled D stop was simulated. Under RAILSIM, a D stop ends when the required dwell time has elapsed, regardless of the clock time.
- “F” Stop: Stops for boarding or departing passengers after advance notice to the conductor. In actual railroad operation these stops may be skipped if such notice does not occur. In the present simulations, every scheduled F stop was simulated, using the D stop method (in other words, it was assumed that there were passengers desiring to board or depart at all “F” stop stations).
- “L” Stop: Stops to pick up or discharge passengers, but the train may leave ahead of schedule. In the present simulations, every scheduled L stop was simulated, using the D stop method.

The simulation assumption that every indicated stop was modeled, including flag stops, lends conservatism to the study.

### 4.3.3. Amtrak Operations – All Scenarios (No-Build and Build Alternatives)

The Amtrak 2030 operating plan for all scenarios was assumed to be the projected 2020 “North End” (New York – Boston) Amtrak operating plan developed by Amtrak in 2003 for application to the MTA/LIRR East Side Access Project and the Metro-North/ConnDOT New Haven Line Traction Power Study. This is the best available representation of future Amtrak operations in the subject time frame and falls well within the limits set out in the Amtrak-MBTA Operating Agreement dated July 1, 2003. This operating plan is presented in its entirety in the Appendix to this document. Table 7 lists South Station Amtrak arrivals at and departures from Boston’s South Station for current (2008) and anticipated 2030 operations.

As shown in the table, the Amtrak operating plan projected for 2030 reflects an increase of five Acela Express round trips and one Regional round trip for a total of 12 new trains, plus movements to and from storage as required. Critically, Amtrak South Station arrivals and departures during the intense PM Peak Period grow from five in 2008 to nine in 2030.

---

**Assumptions**

South Coast Rail Network Simulation Analysis	<b>Page 24</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

<b>Table 7: AMTRAK ARRIVALS AND DEPARTURES SOUTH STATION, BOSTON</b>			
<b>2008 vs. 2030</b>			
<b>2008</b>		<b>2030</b>	
Arrivals	Departures	Arrivals	Departures
7:52	<b>5:10</b>	06:11	<b>04:16</b>
<b>10:02</b>	6:05	<b>09:23</b>	05:45
11:05	<b>6:15</b>	10:02	<b>06:16</b>
<b>11:44</b>	<b>7:15</b>	<b>10:23</b>	06:45
12:33	<b>8:20</b>	<b>11:22</b>	<b>07:16</b>
<b>13:43</b>	<b>9:15</b>	11:56	07:45
15:20	9:35	<b>12:32</b>	<b>08:16</b>
<b>15:43</b>	11:05	<b>13:19</b>	<b>09:16</b>
17:15	<b>11:15</b>	14:02	09:40
<b>17:43</b>	<b>12:15</b>	<b>14:19</b>	<b>10:16</b>
<b>18:33</b>	<b>13:15</b>	<b>15:16</b>	<b>11:16</b>
19:10	13:40	15:56	11:45
<b>19:35</b>	<b>15:15</b>	<b>16:16</b>	<b>12:16</b>
20:05	15:20	16:59	<b>13:16</b>
<b>20:38</b>	<b>16:30</b>	<b>17:16</b>	13:45
<b>21:35</b>	<b>17:20</b>	17:56	<b>14:16</b>
22:05	<b>17:35</b>	<b>18:16</b>	<b>15:16</b>
<b>22:35</b>	18:45	<b>19:16</b>	15:40
23:50	21:45	19:56	<b>16:16</b>
		<b>20:16</b>	<b>17:16</b>
		21:05	17:40
		<b>21:16</b>	<b>18:16</b>
		22:09	<b>19:16</b>
		<b>22:19</b>	19:40
		<b>23:13</b>	23:09
<b>10 Acelas</b>	<b>10 Acelas</b>	<b>15 Acelas</b>	<b>15 Acelas</b>
<b>9 Regionals</b>	<b>9 Regionals</b>	<b>10 Regionals</b>	<b>10 Regionals</b>
<b>19 Total Trains</b>	<b>19 Total Trains</b>	<b>25 Total Trains</b>	<b>25 Total Trains</b>
<b>Bold times indicate Acela Express train.</b>			
<b>Shaded cells denote arrivals and departures during MBTA peak periods.</b>			

In the development of the combined Amtrak/MBTA NEC 2030 operating plan, it was assumed that Amtrak operating slots remain as proposed by Amtrak. Therefore, no changes were made to any of the times given for Amtrak in any of the study operating plans.

South Coast Rail Network Simulation Analysis	<b>Page 25</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

### 4.3.4. MBTA Operations

#### 4.3.4.1. 2030 No-Build

Development of the 2030 MBTA No-Build operating plan was based upon April, 2008, MBTA weekday operating plans for all services to South Station. At MBTA direction, service growth in 2030 *without* South Coast Rail was assumed to consist of one additional peak-period peak-direction train per MBTA branch serving South Station in each of the two daily peak periods, *if* the additions could be accommodated without added infrastructure. There are nine branches serving South Station (the Worcester, Needham, Franklin, Providence (NEC), Stoughton, and Dorchester Branches, and the Old Colony Greenbush, Plymouth, and Middleborough Branches). As no new Old Colony trains were added, six new peak-direction trains were created per peak period, for a total of twelve additional No-Build trains.

Six new trains were inserted into the AM peak period, and six into the PM peak period of the April 2008 MBTA operating plan, making as few changes to existing train patterns as possible. However, given the increase in platform tracks under the projected 2030 infrastructure configuration and the addition of the 16 peak/near-peak period trains, it was not possible to retain the current equipment cycle plan, and therefore equipment cycling at South Station was entirely revamped. The resulting equipment dependencies are shown in the Appendix to this document, both in the tabular operating plans and on graphic charts of station occupancy for South Station.

#### 4.3.4.2. 2030 South Coast Rail Build

The morning peak-period service proposed for SCR would consist of three peak-direction (northbound) trains from New Bedford and three from Fall River, with South Station arrival times falling within the defined morning peak period of 7:00AM-9:00AM. An additional train from each southerly terminal has a South Station time falling just outside the AM peak period, for a total of four trains northbound from each of the southern terminals and arriving at South Station in or near the 7 AM - 9 AM morning peak period. Proposed SCR morning peak service would also include one reverse-peak train departing South Station during the AM peak period for New Bedford and one for Fall River. The total SCR train volume for the morning peak/near-peak period would therefore consist of eight northbound trains and two southbound trains.

The PM peak period SCR train pattern would mirror the morning peak-period pattern, with a southbound peak direction.

It was assumed that SCR trains would be stored during the midday at South Station or within the Southampton Street Yard complex and would not consume NEC capacity “deadheading” to a more distant midday storage location. This is consistent with the global assumption used for the No-Build scenario.

The total number of SCR trains in each of the “Build” alternative operating plans is 38. This includes nine round-trips between South Station and each of the southern terminals, plus one mid-day off-peak round trip short-turning at Taunton Depot.

---

South Coast Rail Network Simulation Analysis	<b>Page 26</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

Current Stoughton Branch service consists of 19 trains in each direction, including two short-turns to Canton Junction and one short-turn to Canton Center. One new train was added in each direction for assumed growth for 2030, giving a total of 40 trains for the No-Build scenario.

Under the Stoughton Build scenario, several very early and very late Stoughton trains were eliminated in accordance with direction received. The remaining Stoughton slots were extended and several new slots added as required, with the result that the Stoughton Build operating plan consists of 20 trains in each direction to and from the Stoughton Branch for a total of 40 trains. Nine trains in each direction serve each of the southern terminals. In addition there is the single mid-day round trip to Taunton Depot, bringing the total SCR service to the requisite 38 trains. Finally, there is a single short-turn to Stoughton late in the day.

Implementation of the South Coast Rail service was very different for the Attleboro Build Alternative from that for the Stoughton Build Alternative. In the case of the Stoughton Build operating plan, there was no net increase in Stoughton Branch NEC train volumes over the No-Build Alternative. By contrast, as there is no service today which could logically be extended from CP Norton south to the southerly terminals from the NEC/Attleboro Bypass junction, **all 38** of the South Coast Rail trains under the Attleboro Build alternative are new trains on the NEC.

### 4.3.4.3. Station Dwells

Per MBTA direction, MBTA station dwells for peak period trains (that is, peak direction trains with South Station arrival/departure times falling within the defined peak periods) were set at 120 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations, and 60 seconds at all other station stops. Non-peak period and reverse-peak trains were assigned dwells of 45 seconds at Attleboro, Mansfield, Sharon, and Route 128 Stations and dwells of 30 seconds at all other station stops.

It was assumed that all Amtrak station dwells would be 120 seconds in length.

### 4.3.5. Combined MBTA and Amtrak Operating Plans

Based upon the operations assumptions listed immediately above, new conceptual 24-hour operating plans were developed for the following scenarios:

- A single 2030 No-Build Operating Plan: the Amtrak 2020 Operating Plan combined with the 2008 MBTA Operating Plan with its anticipated increases for 2030.
  - A single 2030 Attleboro Build Operating Plan: the 2030 No-Build Operating Plan combined with the proposed South Coast Rail trains under the Attleboro Alternative. Under this alternative all SCR trains are “new” trains, not extensions of existing trains.
  - Two 2030 Stoughton Build Operating Plans: the 2030 No-Build Operating Plan combined with the revised Stoughton service, under which all but two of the daily Stoughton round trips are extended to the southern terminals. This operating plan was developed in diesel and electric versions.
-

South Coast Rail Network Simulation Analysis	<b>Page 27</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

The four referenced operating plans can be found in the Appendix to this report.

### 4.3.6. Equipment Manipulations at South Station

South Station has 13 platform tracks today and is assumed to gain five platform tracks on its east side by the year 2030. In addition a planned “platform infill” project is anticipated to decrease the lengths of platform tracks 1-10. Finally, a pair of parallel right-hand ladders has been assumed for the four tracks crossing the Fort Point Channel Bridge to serve the Dorchester and Old Colony Lines. All of these modifications have been implemented in the simulation model in accordance with the source documents listed in Section 5, “Sources of Technical Data.”

The resulting configuration of South Station and its terminal interlocking, Tower 1, will continue to pose a challenge to train dispatchers in 2030. RAILSIM identified 492 separate potential routes through Tower 1 Interlocking, but even with the number of available routes, there will still be routing constraints. Terminal interlocking route considerations are listed below.

- Five tracks enter Tower 1 Interlocking on its south end from NEC Cove Interlocking, numbered 7, 5, 3, 1, and 2 from west to east. Four additional tracks enter Tower 1 Interlocking from the Old Colony Line and the Dorchester Line via the Fort Point Channel Bridge. Platform access from these points of entry resulting from the proposed Tower 1 configuration will be as follows:
  - Track 7 entering Tower 1 can reach only platform tracks 1-6.
  - Tracks 5 and 3 entering Tower 1 can reach only platform tracks 1-10.
  - Tracks 1 and 2 entering Tower 1 can reach only platform tracks 1-13.
  - All four tracks entering Tower 1 via the Fort Point Channel Bridge can access all 18 platform tracks (no constraint).

In addition, for reasons of train length, Amtrak trains are limited to South Station platform tracks 8, 9, and 10, although their use of these tracks was assumed to be not exclusive. Again for reasons of train length, Tracks 1 and 2 were limited to the 8-vehicle Framingham/Worcester trains (locomotive + 7 coaches).

As they do today, the configurations of Tower 1 Interlocking and the entering service branches and the Amtrak platform requirements lend themselves to the practical division of South Station into several logical service areas in the terminal equipment manipulation plans:

1. Worcester Branch trains were almost exclusively slotted to platform tracks 1 and 2, given the direct access they enjoy to those tracks.
  2. Trains coming over the Fort Point Channel Bridge (Old Colony and Dorchester Lines) were generally routed to platform tracks 13-18, given that they have the best access to those tracks and many NEC trains cannot access these tracks at all.
  3. As described, Amtrak trains were confined to platform tracks 8-10.
-

South Coast Rail Network Simulation Analysis	<b>Page 28</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

4. Finally, the remaining NEC trains were generally routed to a total of seven platform tracks, 3-7 on the west side of the Amtrak trains and 11-12 on the east side of the Amtrak trains.

Equipment manipulation plans developed for these analyses took into account equipment types – i.e. in scenarios featuring electric motive power for select MBTA services, electric trains could only be turned for other electric trains.

MBTA trains turning at the platform at South Station were given a minimum *scheduled* turn time of 15 minutes, but a departing train was allowed to leave as little as 10 minutes after the arrival of late-arriving equipment. Analogously, Amtrak trains turning at South Station were given at least 20 minutes as a scheduled turn, but were allowed to turn in as little as 15 minutes from a late-arriving inbound train.

In addition, all required equipment moves to and from storage were modeled. Trains traveling between South Station and their midday and overnight storage location were sent over the Fort Point Channel Bridge and onto the lead tracks for Southampton Street Yard. Although Southampton Street Yard will not accommodate all stored trains, this operating assumption captured all non-revenue moves through Tower 1 and Broadway Interlockings, where such moves and their effect on interlocking capacity and terminal operational stability is the most critical.

Storage and equipment manipulations/dependencies at the outbound terminals were not modeled.

---

South Coast Rail Network Simulation Analysis	<b>Page 29</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

#### **4.4. Rolling Stock**

The RAILSIM rolling stock library is a highly detailed database of world-wide rolling stock which can be used to form virtually any needed consist. Assembling a consist in the simulation model results in a train which incorporates the attributes and performance of each of the specific rolling stock models being used, so that the assembled consist behaves very much like the real-world train.

Detailed specifications of all rolling stock described below and used in these simulations may be found in the Appendix to this report.

All trains were simulated with full seated passenger loads, regardless of time of day.

##### **4.4.1. MBTA Rolling Stock**

The assumption for MBTA operations was the use of a single 3,000 horsepower F40PH or F40PH-2C locomotive propelling seven Kawasaki bi-level coaches and one bi-level cab car. The F40PH series locomotive is a model developed from the freight GP-40 locomotive, and equipped with an auxiliary generator necessary to provide Head End Power.

Under the electrified South Coast Rail options, all non-SCR MBTA trains would remain diesel-powered, except that under the Stoughton Alternative those four remaining Stoughton Branch trains not extended to the southern SCR terminals would also be electrically-powered, giving the Stoughton Branch a homogenous electric fleet distinct from the remainder of the MBTA South Side services. Electric operation in general allows higher maximum speeds, better acceleration performance and therefore lower scheduled running times and better schedule recovery.

The locomotive assumed for the electrified simulations was a single 8,046 horsepower Amtrak HHP-8 locomotive, propelling consists identical to those for the diesel simulations.

##### **4.4.2. Amtrak Rolling Stock**

Year 2030 Amtrak train consists are assumed to be substantially similar to the two primary consists being used by Amtrak in the subject territory today. They are both capable of utilizing the dual-frequency signal for the nine-aspect cab signal system in effect on the NEC, including the so-called "Super Clear" aspect, which allows operation at very high speeds.

The first of these consists is the Acela Express, which operates through this territory at speeds of up to 150 MPH, making it the fastest passenger train in North America. The Acela Express consist is comprised of the following:

- 2-Acela Power Cars (12.5 kV)
  - 1 Acela End Coach Car
  - 3 Acela Coaches
  - 1 Acela Bistro Car
  - 1 Acela First Class Car
-

South Coast Rail Network Simulation Analysis	<b>Page 30</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Assumptions

---

The second Amtrak consist in common use in the subject territory is the Amtrak Regional, a longer, less high-performance train than the Acela (but still higher-performance than diesel-powered MBTA trains). For the purposes of Year 2030 operation, it was assumed to be comprised of:

- 1 Amtrak HHP-8 Locomotive
  - 1 Amfleet Amcafe
  - 8 Amfleet II Corridor Coaches
-

South Coast Rail Network Simulation Analysis	<b>Page 31</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Sources of Technical Data

### 5. Sources of Technical Data

The following source documents were used to develop and refine the RAILSIM® simulation models. This list is not all-inclusive; additional sources of information, including input from the MBTA and other consulting firms in the Project Team who contributed information and advice to the simulation modeling effort.

1. Amtrak Northeast Corridor Employees Timetable No. 2 Effective 12:01 AM May 12, 2008.
2. MBTA Commuter Rail Service Employee Timetable No. 6, General Order No. 601, Effective 12:01 AM, Monday, April 30, 2007.
3. Drawings: Nine-Aspect Cab Signal System, Signal Control Lines for the Northeast High-speed Rail Improvement Project, New Haven to Boston; Amtrak P.I., LS Transit Systems, Inc., marked up with as-built signal locations.
4. Drawings: Davisville to Lawn, Signal Control Lines Eastward and Westward, prepared by Amtrak Office of the Chief Engineer C&S, Dwg. No. NHBO170.0,12 sheets, undated.
5. Drawings: Northeast Corridor Signal Control Lines, Proposed Third Track, Attleboro Bypass to Transfer, prepared by HNTB, Inc., 10 sheets. Version received on May 27, 2009.
6. Drawings: Attleboro Bypass and Secondary, Signal Control Lines, Proposed, prepared by HNTB, Inc., 3 sheets, received on June 2, 2009.
7. Drawings: South Coast Rail, Aspect Charts, All Alternatives, rev. March 3, 2009, prepared by VHB, 10 sheets (“marked-up” version received March 25, 2009).
8. Drawings: South Coast Rail, Aspect Charts, Fall River, rev. March 3, 2009, prepared by VHB, 3 sheets (“marked-up” version received March 25, 2009).
9. Drawings: South Coast Rail, Aspect Charts, Stoughton-Whittenton Alternative, rev. February 2, 2009, prepared by VHB, 3 sheets (“marked-up” version received March 25, 2009).
10. Drawings: MBTA Track Master Plan, South Station – Southampton – Back Bay, prepared by STV Group, August 8, 1994.
11. Drawings: TUDC/HINES, South Station Phase I Track Layout Concept, September, 2007, prepared by VHB, Inc., 3 sheets.
12. Drawing: Sketch of Proposed Track Easement, Future USPS 6 Track Expansion, prepared by HNTB, Inc., September 25, 2007, 1 sheet.
13. Drawing: Informal CADD drawing, Boston South Station with 5 Track Expansion, Modification 1 + 2, prepared by VHB, Inc., 1 sheet, Spring, 2009.
14. Drawing: Tower 1 Interlocking Aspect Chart, Issue Date, April 16, 1995.
15. Drawing: Amtrak Cove & Tower 1 Signal Aspects, 1 sheet, December 10, 1990.
16. Drawing: MBTA South Bay Complex, Route and Aspect Sheet, prepared by STV, Inc., 1 sheet, August, 1995.

South Coast Rail Network Simulation Analysis	<b>Page 32</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Sources of Technical Data**

---

17. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Middleborough Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 5 sheets, last dated May 29, 1996.
  18. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Middleborough Line Control Lines, prepared by Thomas K Dyer, Inc., 8 sheets, last dated July 27, 1993.
  19. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Main Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 2 sheets, last dated May 29, 1996.
  20. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Main Line Control Lines, prepared by Thomas K Dyer, Inc., 6 sheets, last dated June 13, 1996.
  21. Drawing: MBTA Old Colony Railroad Rehabilitation Project, Green Interlocking Location Plan, prepared by Safetran Systems Corporation, 1 sheet, dated January 26, 1999.
  22. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Plymouth Line Track and Signal Layout, prepared by Thomas K Dyer, Inc., 5 sheets, last dated May 29, 1996.
  23. Drawings: MBTA Old Colony Railroad Rehabilitation Project, Plymouth Line Control Lines, prepared by Thomas K Dyer, Inc., 9 sheets, last dated February 8, 1994.
-

South Coast Rail Network Simulation Analysis	<b>Page 33</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 6. Simulation Calibration

Calibration is the means by which a network simulation model is demonstrated to accurately represent real world rail operations. It normally entails the observation of signal clearing times (the time required for an Automatic Block Signal or Cab Signal to restore to best aspect after passage of a train) at selected locations, and the collection of point-to-point running time and station dwell time data samples. Typically, a threshold correlation of simulated operation to within 10% of observed (field) operations is considered credible given day-to-day variations in train performance, station dwells, weather conditions, and so forth.

RAILSIM network simulations of MBTA operations have been performed since 1995, at which time a successful calibration of their F40PH/GP40/Kawasaki bi-level coach consist was performed. Early in the present simulations, simulated unimpeded running times which included a 5% Schedule Margin or “pad” were calculated with this calibrated consist for end-to-end runs on the Stoughton and Middleborough branches. Station dwells were set in accordance with MBTA direction as outlined in Section 4.3.4.3 above. The simulated running times were compared with off-peak MBTA schedule times and found to agree within 5%, a very good result which lends confidence to the reliability of the simulation techniques being employed here.

Amtrak Acela and conventional electric locomotive-hauled performance calibration has been repeatedly verified by simulations involving Amtrak’s Northeast Corridor west of Penn Station New York, where RAILSIM simulation experience extends back to 1992, and so has not been repeated here as part of the present study.

Infrastructure that does not exist cannot be observed. This applies to the entire proposed railroad between NEC departure points Canton Junction and CP Norton and the southern terminals at Fall River and New Bedford. The railroad between these points will be completely reconstructed and although conceptual designs of track and signal systems have been prepared, they are only provisional at this time. Therefore, this simulation serves only as a *predictor* of likely South Coast Rail train performance given assumptions such as:

- Maximum operating speeds of 70 MPH for diesel (although 79 MPH for MBTA diesel on the NEC) and 100 MPH for electric operation;
  - Civil speed restrictions;
  - Station stops and stopping pattern;
  - Likely or anticipated station dwell times given Kawasaki bi-level cars to be used, extent of high-level station platforms (which speed boarding) and ridership demand; and
  - Other Northeast Corridor traffic unrelated to New Bedford and Fall River service.
-

## 7. Simulation Randomization

A randomized (perturbed) simulation analysis was performed for each of the three simulation models to evaluate the stability of the schedule under realistic conditions. Randomized simulation analysis mimics real-world terminal departure delays and intermediate station dwell-related delays, as it is based on historical on-time performance data. Large changes in on time performance and total minutes of signal delay in response to small perturbations (statistically controlled delay events) likely indicate a fragile Operating Plan that would potentially have difficulty overcoming minor challenges. On the other hand, a railroad operation that exhibits an ability to recover from real-world fluctuations in performance without a tendency toward cascading delays is likely to be more viable under actual conditions.

Two elements of the operation were randomized, train put-ins (i.e., times of train entry into service), and station dwells. Table 8 lists the MBTA-approved parameters used. They are identical for MBTA and Amtrak trains, except that the Amtrak put-in randomization is more severe. This reflects the fact that the northbound Amtrak trains putting in at the south end of the model have already been operation for some time and, for those trains that are late, have accumulated a larger relative degree of lateness.

**Table 8: Simulation Randomization Parameters**

	Maximum Early (seconds)	Maximum Late (seconds)	Mean (seconds)	Standard Deviation (seconds)
<b>Train Put-In, MBTA</b>	120	300	75	120
<b>Train Put-In, Amtrak</b>	120	600	75	120
<b>Station Dwell, MBTA</b>	10	60	20 (late)	10
<b>Station Dwell, Amtrak</b>	10	60	20 (late)	10

South Coast Rail Network Simulation Analysis	Page 35
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 8. Simulation Results

Two types of conventional quantitative analyses were undertaken using the network simulation – *on time performance* and *signal delay*.

On time performance and signal delay results were generated for both deterministic and randomized operations. Under deterministic simulation, all equipment initially enters service on time and station and terminal dwell times are fixed. Under perturbed simulation, terminal departure and intermediate station dwells are statistically randomized to reflect real-world variations in day-to-day operations. For example, an MBTA or Amtrak train could experience an unpredictable delay leaving Providence Station for any number of reasons ranging from a minor mechanical problem to unusual travel demand or a passenger requiring assistance. The randomized simulation stresses the system and its response to this is measured quantitatively.

### 8.1. On Time Performance Results

On time performance measures the extent to which trains arrived or left late, on time, or early relative to the intended operating plan. On time performance is a concrete measure of service quality observable by the public. The public does not necessarily know that a schedule may allow a certain amount of “recovery” time to overcome a delay en route and still arrive at destination on time. Patrons will perceive that their train is “late” if it does not arrive or depart when the published schedule says it should. This is “on time performance” and is the measure of delay as it is perceived by the public.

The MBTA standard, and in fact a common standard in the commuter rail industry for on time performance is that a train arriving more than 0:04:59 (h:mm:ss) late with respect to its scheduled arrival time is defined as a “late train”; otherwise the train is considered on time.

On time performance was measured and reported at South Station for northbound trains and at Providence, Roslindale, Endicott, Stoughton, Back Bay, Fall River and New Bedford for southbound trains.

When trains are moderately late in a deterministic model, it is an indication that scheduled running times may be inadequate and that before service is implemented, schedules should be adjusted. This is to be expected for a railroad and operation that has not yet been designed to the 100% level.

Table 9 and Table 10 display on-time performance statistics for arrivals at South Station and the southerly terminals, respectively, for both deterministic and randomized simulations for all three infrastructure scenarios, and for both the SCR diesel and electrified options. These results are for revenue trains only, with Old Colony Line trains excluded.

**Simulation Results**

South Coast Rail Network Simulation Analysis	<b>Page 36</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Table 9: On-Time Performance - Revenue Train Arrivals at South Station\***

ALTERNATIVE	AM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
<b>No-Build</b>	100.0%	100.0%	100.0%	98.6%
<b>Stoughton Diesel</b>	100.0%	100.0%	100.0%	95.9%
<b>Stoughton Electric</b>	100.0%	100.0%	100.0%	97.9%
<b>Attleboro Diesel</b>	61.1%	44.4%		
<b>Attleboro Electric</b>	69.4%	50.0%		

\* These results do not include Old Colony Line trains.

**Table 10: On-Time Performance - Revenue Train Arrivals at Southerly Terminals\***

ALTERNATIVE	PM PEAK-PERIOD TRAINS		ALL WEEKDAY TRAINS	
	Deterministic	Randomized	Deterministic	Randomized
<b>No-Build</b>	94.9%	87.2%	97.1%	91.4%
<b>Stoughton Diesel</b>	93.0%	75.0%	93.3%	85.0%
<b>Stoughton Electric</b>	92.5%	80.0%	95.0%	87.1%
<b>Attleboro Diesel</b>				
<b>Attleboro Electric</b>				

\* These results do not include Old Colony Line trains.

The deterministic simulations for the No-Build and both Stoughton Alternative options (diesel and electric) achieved 100% conformance with the MBTA lateness standard for South Station arrivals, with the AM Peak-Period trains achieving the standard even under randomization. Deterministic OTP for arrivals at the southern terminals was consistently lower than that of South Station arrivals, although for the No-Build and Stoughton Alternatives the results are above 90% in all cases, with the electric option yielding (again) equal or slightly better results. Much of this outbound lateness is apparently due to insufficient running time allowed MBTA Providence (800 Series) trains. These trains were consistently unable to meet their scheduled times on this run, even when unimpeded by other traffic. The same result was not seen in the northbound direction, as the MBTA operating plan provides the northbound Providence-to-Boston service with approximately 10 extra minutes more running time than is allowed the southbound run.

Such positive results for the No-Build and Stoughton Alternatives are clear predictors of a successful future operation.

By contrast, the Attleboro Alternative, simulated under deterministic conditions and using electric locomotives for the SCR service, was unable to meet the MBTA on time performance standard for AM South Station arrivals. Furthermore, the simulation was unable to process the PM period at all, failing at between 5 PM and 6 PM. The material increase in NEC trains (eight peak-direction trains in or near each peak period, and a total of 38 **all new** NEC trains) is simply more that the system is capable of accommodating under the assumed simulated infrastructure.

OTP is not reported for the Attleboro Alternative for “PM Peak-Period Trains” or for “All Weekday Trains” because the simulation was unable to generate those results; the missing results are indicated

South Coast Rail Network Simulation Analysis	<b>Page 37</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Simulation Results

by the grayed-out areas of the tables. However, results are available for the Attleboro AM Peak-Period trains, as the AM Peak Period is the less intense of the two daily peak periods. These results fall well below the 100% target, with none better than 69.4% and no randomized result better than 50%. While not as striking as the outright failure of the evening simulation, these results still indicate a fatally-flawed operation.

The Attleboro Alternative simulations included exhaustive failed attempts to find routing, interlocking priority and/or timing changes that would enable the PM Peak operation to succeed. As the simulations progressed, the principal issue became very clear: an intractable conflict between the equally-important non-revenue equipment movements inbound over the Fort Point Channel Bridge and the outbound PM Peak train service departing South Station.

From approximately 5:00 to 5:30 PM, catastrophic delays occur in the Tower 1 terminal interlocking throat as:

- Some westbound PM Peak revenue trains cannot leave the station platforms on time because of the high volume of conflicting non-revenue equipment movements coming from storage, and
- Other westbound PM Peak revenue trains cannot leave on time because those PM Peak revenue movements out of the station that are successful have prevented their equipment from reaching the assigned platform from storage.

This tension between the inbound equipment moves and the outbound revenue trains is not resolvable in the Attleboro Build scenario given the desired train volume coupled with limited storage options available at South Station, which place the storage facility on the opposite side of the terminal interlocking from the terminal itself. Such a design lacks the “pull through” capability implemented at some other large successful rail terminals, such as New York’s Penn Station, and forces passenger-carrying revenue trains to compete for limited terminal interlocking throat capacity with non-revenue trains which are necessary to support later departures.

## 8.2. Signal Delay Results

### 8.2.1. Signal Delay Totals

Signal delay is a measure of the time during which a train is forced to operate under signal indications less favorable than the best possible indication. When more trains are operated over a line in a fixed period of time than the system will easily support, signal delays will accrue because following trains will receive downgraded signals. Signal delay time, it should be noted, is not equivalent to lateness, as a train can be accruing signal delay while it is moving. In fact, the train might still be on time while operating under less than most favorable signals, depending on the amount of recovery time built into its schedule.

Cumulative signal delay (across the entire simulation) measures aggregate traffic congestion independently of scheduled arrival and departure times (which can be improved relatively arbitrarily by incorporating more recovery time in schedules). Comparing cumulative signal delay statistics under deterministic conditions and then under randomized conditions for the same infrastructure and

## Simulation Results

operating plan provides insight into whether or not the network as designed is capable of absorbing normal day-to-day variations in train performance and minor random delays. In addition, signal delay statistics may be used to compare relative levels of traffic congestion across different infrastructure configurations or under different operating plans, to provide a relative measure of schedule recoverability between alternatives. If train operations recover quickly from day-to-day variations in train performance and minor random delays, the tested operating plan is likely fundamentally sound; this will be reflected by little change from deterministic to randomized simulations in accrued signal delay, or even a reduction and vice versa.

Signal delay minutes were computed and totaled for all non-Old Colony Line revenue trains in the simulation and are shown in Table 11, Table 12, and Table 13. Again, as the Attleboro Alternative simulations were unable to continue past the 5 PM to 6 PM hour, Attleboro Alternative results are limited to the AM Peak-Period trains and missing Attleboro results are grayed-out in the tables.

“Total Trains” in Table 11 and Table 12 refers to all those trains whose scheduled times at South Station make them AM or PM Peak-Period trains, respectively. In Table 13, “Total Trains” refers to all scheduled weekday trains. Total signal delay is the sum of all the signal delay experienced by the individual trains under the defined scenario. The “Avg./Train” is the total signal delay divided by the Total Trains.

As can be seen, although the increase in Total Trains is small between the No-Build and Stoughton Alternatives, there is a substantial increase in signal delay under the Stoughton Alternative. This is due to two factors. The first is that to create the Stoughton Alternative operating plan, two early-morning and two late-evening Stoughton Branch trains (which run on a nearly-empty railroad) were removed and replaced with SCR trains which run at a busier and more congested time of day. The second is that although there is no increase in the overall number of Stoughton Branch trains between the No-Build and Stoughton Alternative, under SCR the Stoughton Branch trains have a much longer route with significant amounts of delay-causing single-track railroad.

Signal delay under the Attleboro Alternative more than doubles with respect to the Stoughton Alternative in all measures.

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	30	0:59:47	0:02:00	1:11:53	0:02:24
Stoughton Diesel	31	1:48:52	0:03:31	1:38:36	0:03:11
Stoughton Electric	31	1:52:10	0:03:37	1:42:39	0:03:19
Attleboro Diesel	36	4:46:19	0:07:57	6:01:42	0:10:03
Attleboro Electric	36	4:56:27	0:08:14	6:06:24	0:10:11

\* These results do not include Old Colony Line trains.

## Simulation Results

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	41	2:08:37	0:03:08	2:24:33	0:03:32
Stoughton Diesel	42	2:29:22	0:03:33	2:51:37	0:04:05
Stoughton Electric	42	2:29:28	0:03:34	2:55:18	0:04:10
Attleboro Diesel	48				
Attleboro Electric	48				

\* These results do not include Old Colony Line trains.

ALTERNATIVE	TOTAL TRAINS	DETERMINISTIC		RANDOMIZED	
		Total	Avg./Train	Total	Avg./Train
No-Build	284	8:57:22	0:01:54	9:51:49	0:02:05
Stoughton Diesel	284	13:55:01	0:02:56	14:33:01	0:03:04
Stoughton Electric	284	13:16:34	0:02:48	13:55:45	0:02:57
Attleboro Diesel	322				
Attleboro Electric	322				

\* These results do not include Old Colony Line trains.

### 8.2.2. Signal Delay Location

By querying the simulation results, it is possible to determine the approximate locations where congestion occurs. Figure 1 below plots the aggregate signal delay from 4 AM to 11 AM for the two No Build simulations, for the two Stoughton Build electric option simulations, and for the two Attleboro Build electric option simulations on an interlocking-by-interlocking basis against the Northeast Corridor Milepost system. Table 14 immediately below the chart lists the NEC interlockings and their milepost stationings for reference. This chart is limited to the morning because only in the morning is a complete set of results available for all alternatives.

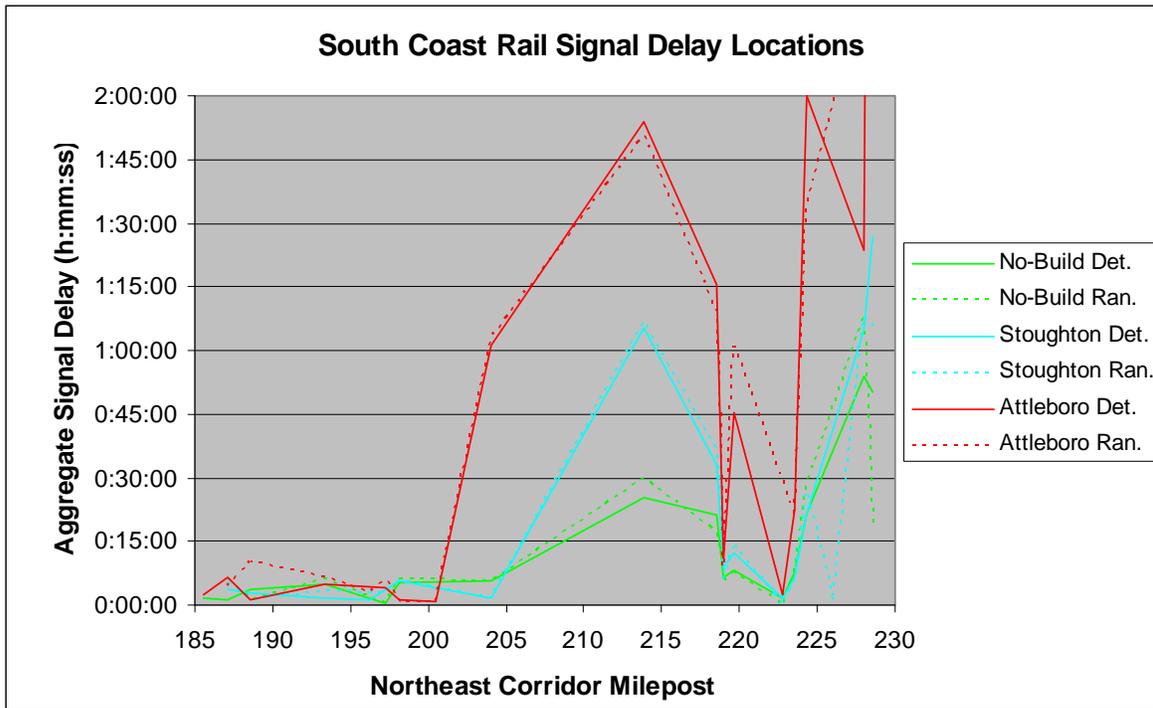
Signal delay is almost non-existent in the southern portion of the territory. Delay for the Attleboro Alternative begins climbing at approximately MP 200, the location of CP Norton Interlocking (junction of the Attleboro Bypass), and at approximately MP 214, corresponding to Junction Interlocking, signal delay spikes in all scenarios. The Attleboro Alternative in particular reaches very high levels of signal delay, with a substantial increase at this location with the application of randomization. The Stoughton Alternative shows an increase over the No-Build here as well. Interestingly, for both the Stoughton Alternative and the No-Build, the level of signal delay at Junction Interlocking does not increase with randomization, indicating that the system was able to absorb the perturbation without ill effects in both cases.

Signal delay spikes again at approximately MP 225, in the area of Plains Interlocking. Again, the Attleboro Alternative sees very high levels, this in an area in which three tracks already exist today. Signal delay levels for the No-Build and Stoughton Alternatives are similar and again demonstrate

**Simulation Results**

resilience in the face of randomization (i.e., do not vary much with randomization). Of particular note are the Attleboro Alternative spikes at the east end of the chart – they are literally “off the chart”, and are indicative of the overwhelming congestion that occurs close in to the Tower 1 terminal interlocking throat under the Attleboro scenarios.

As with the on time performance results, the use of electric motive power for the South Coast Rail trains has a very minor positive effect on signal delay results.



**Figure 1: Locations of Simulated Signal Delay**

NEC Interlocking	NEC Milepost
ORMS	185.6
PAWTUCKET	187.1
LAWN	188.6
HEBRONVILLE	193.3
THATCHER	196.2
BORO	197.2
HOLDEN	198.1
NORTON	200.5
MANSFIELD	204.0
JUNCTION	213.9
TRANSFER	218.5

## Simulation Results

READ	219.6
FOREST	223.5
PLAINS	224.3
COVE	228.0
TOWER 1	228.5

### 8.3. Running Time Results

Simulated running times under deterministic Network Simulation for South Coast Rail trains are shown in Table 15. These are the end-to-end times for peak-period, peak-direction trains (provided only for the morning for the Attleboro Alternative). It is clear that these running times are longer than the unimpeded Train Performance Calculator (TPC) train simulations which were reported in 2008 (and reported again in the appendix to this document). These results reflect longer dwells than those assumed for the TPC runs plus delays en route due both to congestion on the NEC and also due to single-track constraints on new SCR infrastructure. It is likely that continued refinement of the SCR operating plan to better “tune” its performance to the single-track constraints will lower these running times.

The 2-4 minute difference in TPC running times between the Whales Tooth route and the Fall River route has been somewhat attenuated by network simulation.

Although not simulated, the TPC running times indicate that the Whittenton Variant would add several minutes to the Stoughton Alternative running times.

ALTERNATIVE	AM Peak Period Trains		PM Peak Period Trains	
	Whales Tooth to South Station	Fall River to South Station	South Station to Whales Tooth	South Station to Fall River
Stoughton Diesel	1:32:42	1:32:21	1:40:33	1:32:04
Stoughton Electric	1:23:37	1:23:43	1:29:16	1:26:30
Attleboro Diesel	1:38:45	1:38:48		
Attleboro Electric	1:36:59	1:35:56		

### 8.4. South Station Occupancy Charts

The following two Station Occupancy Charts illustrate the simulated equipment manipulations at South Station for the No-Build and Stoughton Alternatives, SCR diesel version only. The Station Occupancy Charts for the SCR electric versions of these two alternatives are not appreciably different, and the Attleboro versions are not available due to the failure of the simulation during the PM Peak period.

South Coast Rail Network Simulation Analysis	<b>Page 42</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## Simulation Results

---

Each chart covers a four-hour period enclosing either the AM or PM peak period, with the actual peak period shaded gray. These Occupancy Charts are generated by the simulation model and depict actual operations. The time of day is shown along the X axis, and the South Station platform track number along the Y axis.

Arriving trains are shown in red and departing trains in blue. Train numbers ending with a “Q” designate non-revenue trains that have either come from or are going to the yard; all other trains are revenue trains. Train names that begin with “AA” are Amtrak Acela trains and those beginning with “AR” are Amtrak Regional trains. MBTA train numbering is by branch, as follows:

- 1-99 Trains—Old Colony Line
- 500 Trains—Framingham/Worcester Branch
- 600 Trains—Needham Branch
- 700-739 Trains—Franklin Branch via NEC
- 740-789 Trains—Dorchester Branch
- 790-799 Trains—Franklin Branch via Dorchester Branch
- 800 Trains—Providence (NEC)
- 900 Trains—Stoughton Branch Trains
- 1900 Trains—Stoughton Alternative SCR Trains

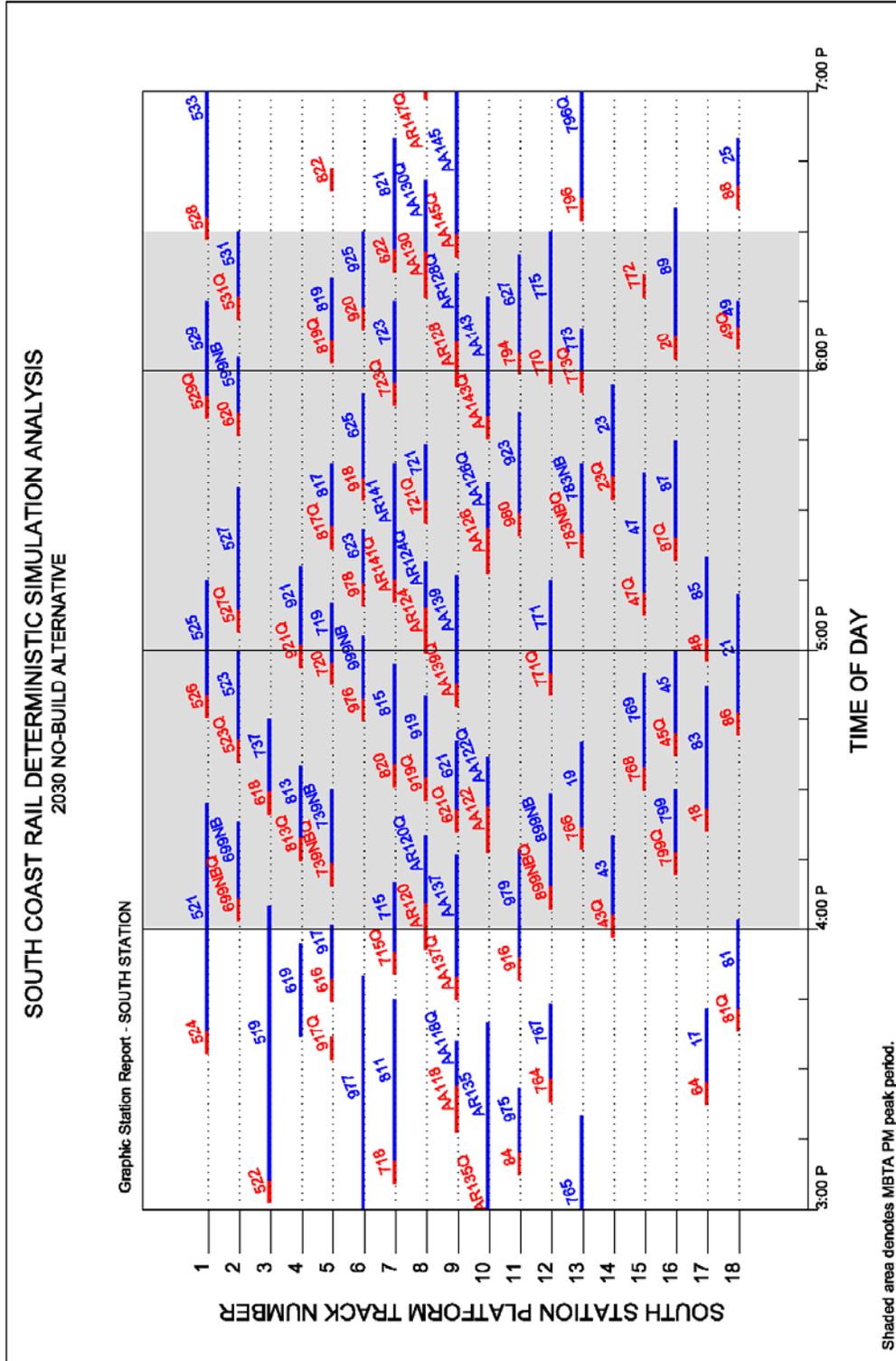
These charts illustrate how the simulated operation was staged in South Station. As has been previously noted, Amtrak trains were confined to platform tracks 8-10, although those tracks were occasionally used by an MBTA train where appropriate (and where there was no conflicting Amtrak need). The pattern of usage is clear to see: Worcester Branch trains use Tracks 1, 2, and sometimes 3; Amtrak trains use Tracks 8-10; trains coming over the Fort Point Channel Bridge generally use Tracks 13-18, and the MBTA NEC trains use Tracks 3-7 and 11-12.

---



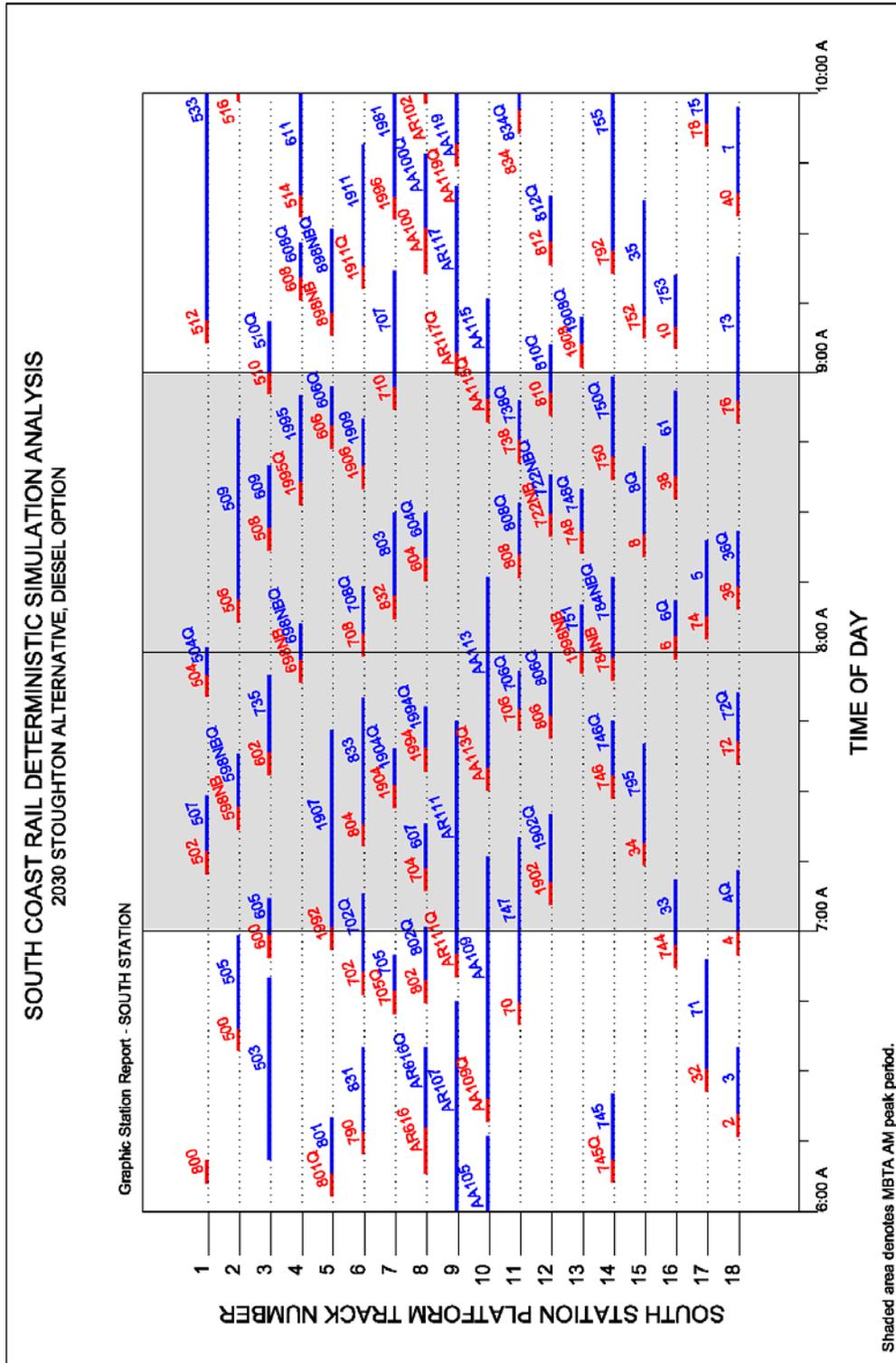
Simulation Results

South Coast Rail Network Simulation Analysis	Page 44
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



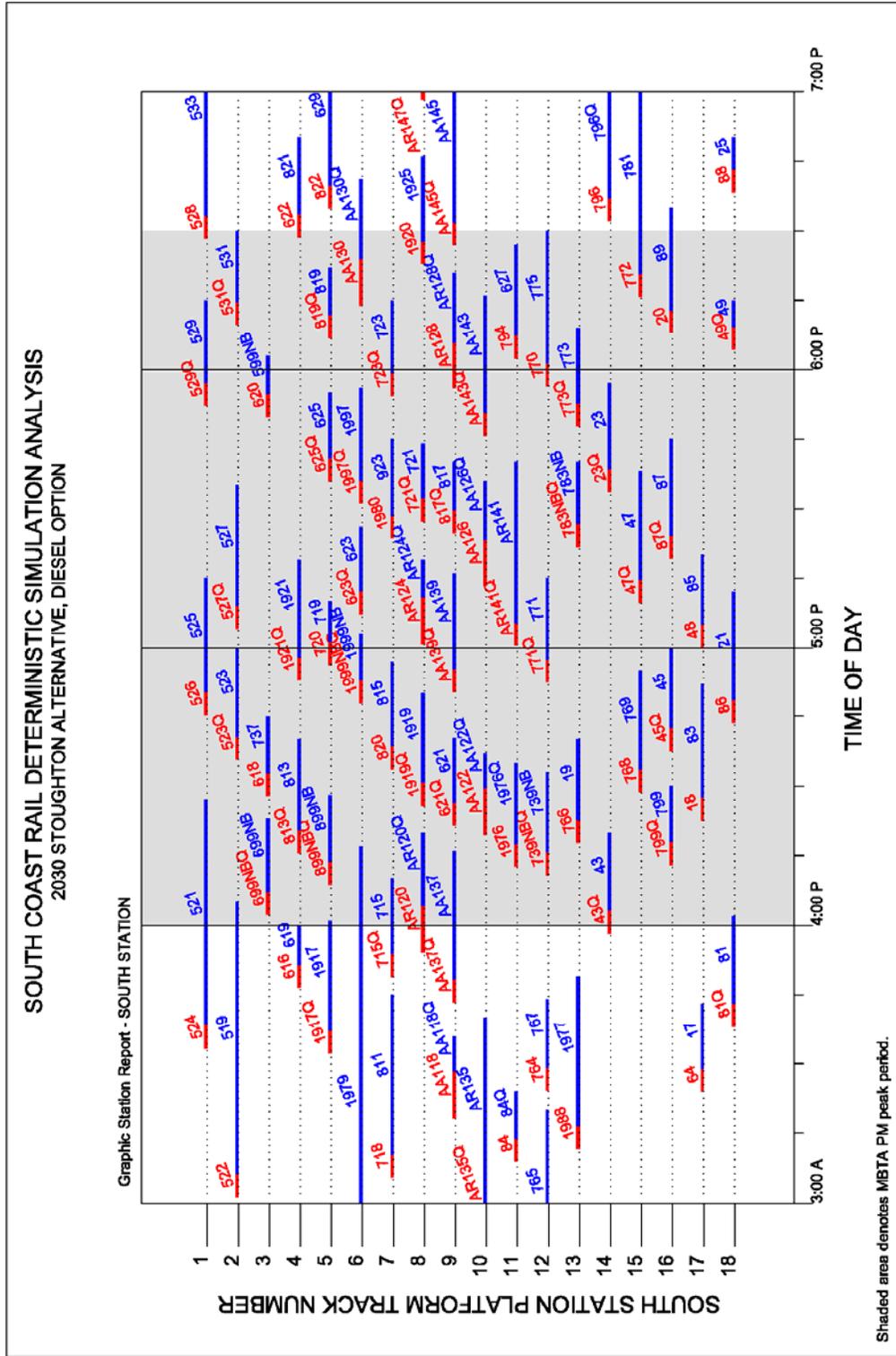
Simulation Results

South Coast Rail Network Simulation Analysis	Page 45
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



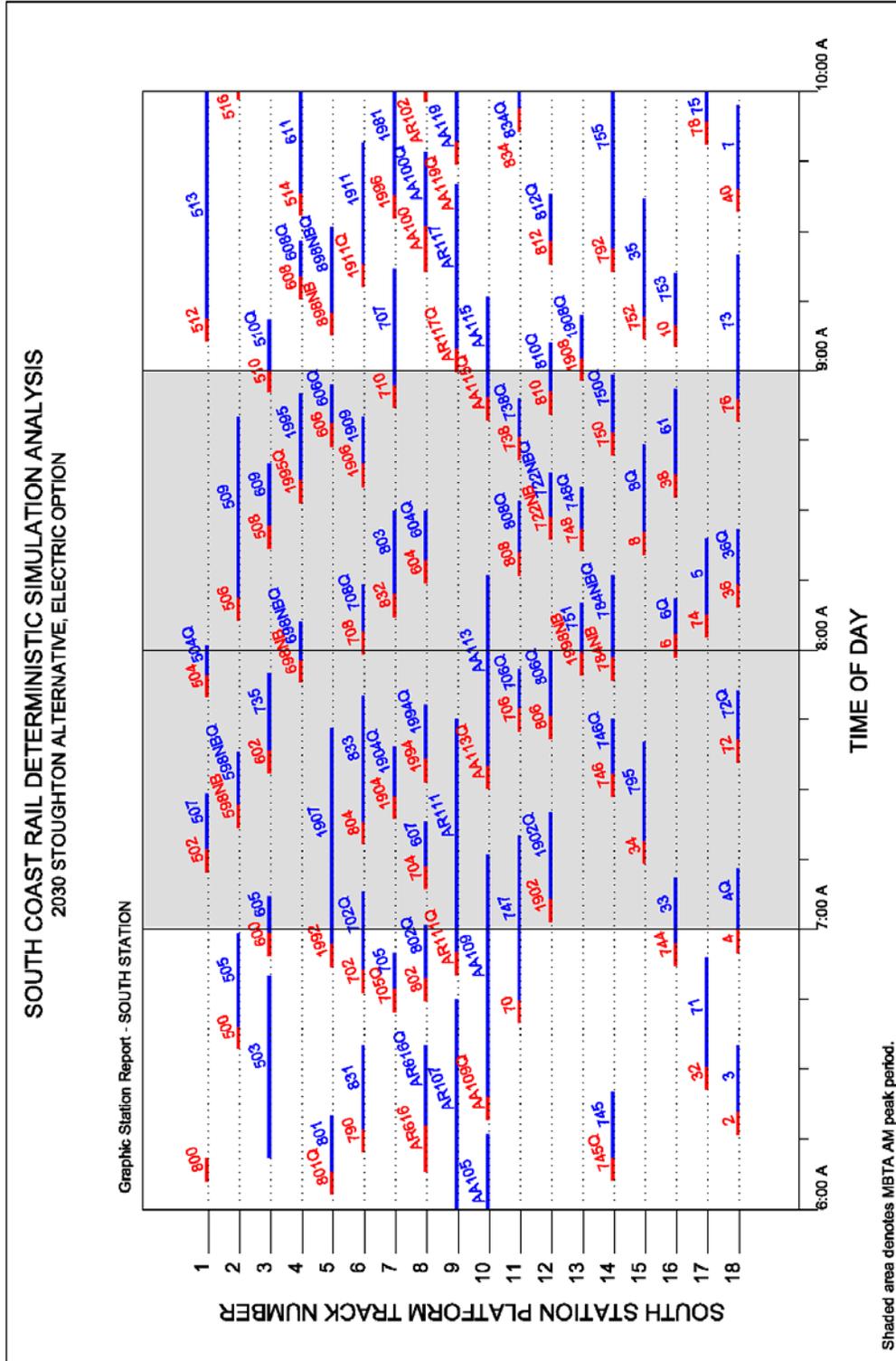
Simulation Results

South Coast Rail Network Simulation Analysis	Page 46
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



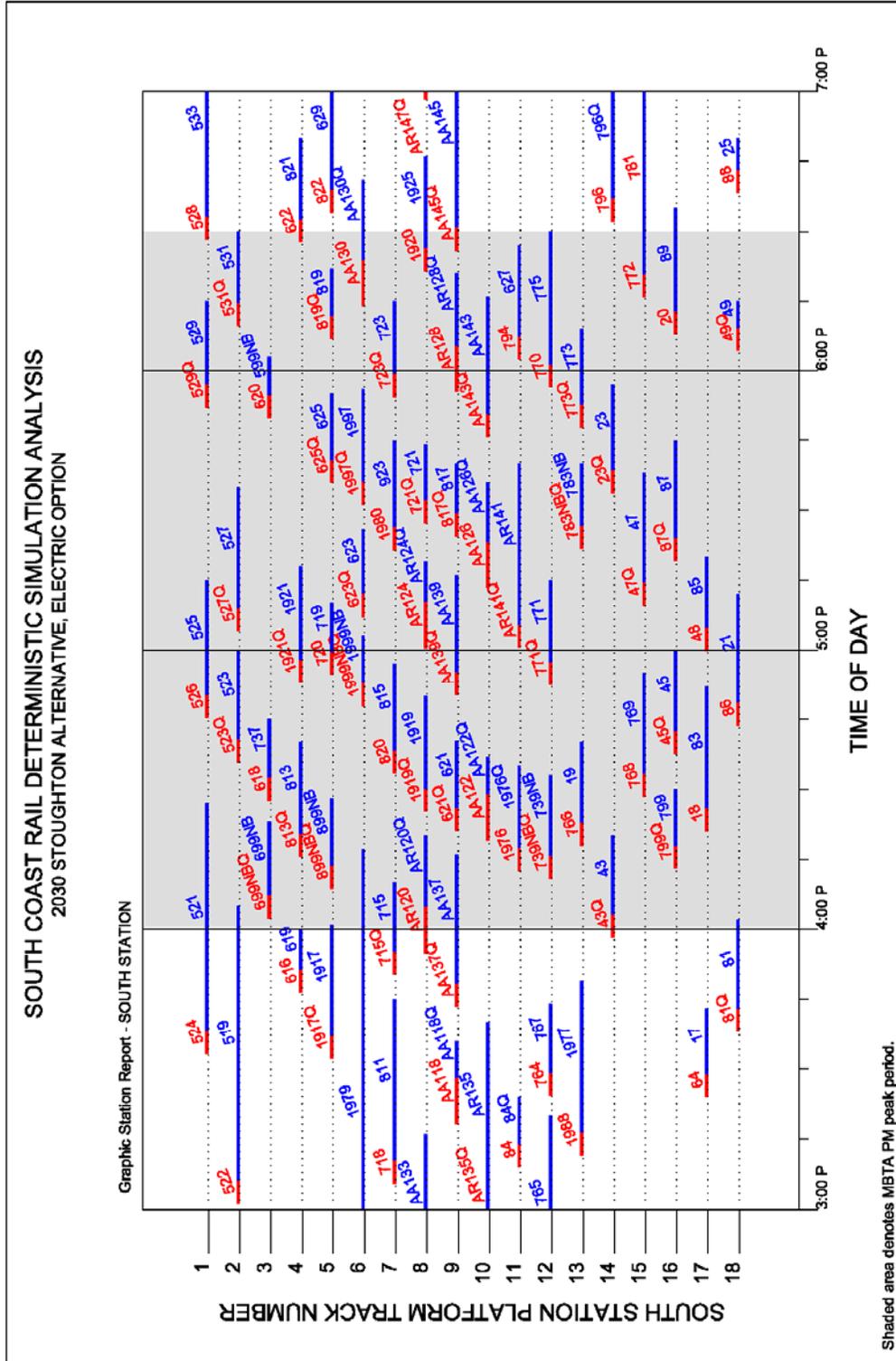
Simulation Results

South Coast Rail Network Simulation Analysis	Page 47
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



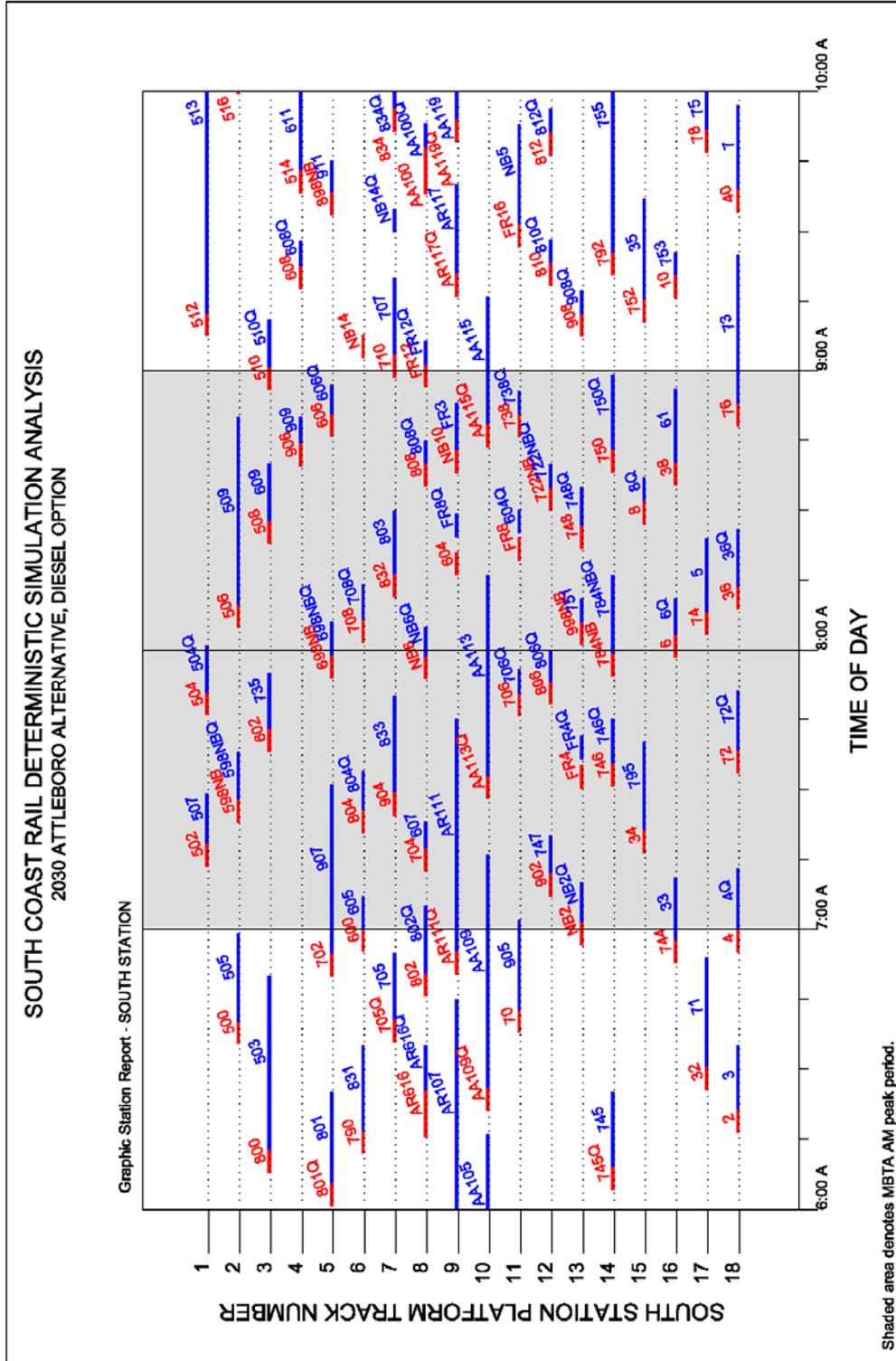
Simulation Results

South Coast Rail Network Simulation Analysis	Page 48
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



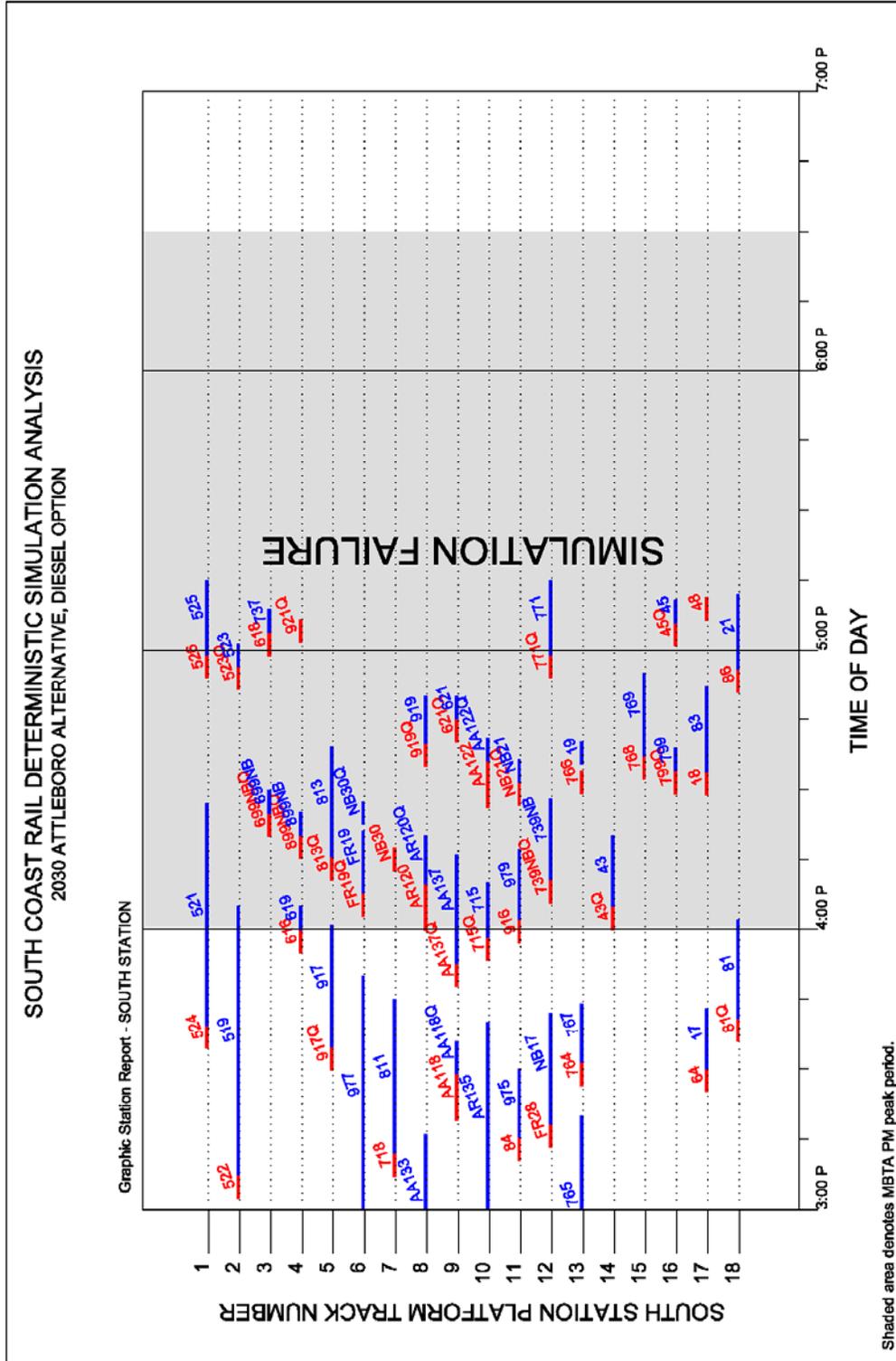
Simulation Results

South Coast Rail Network Simulation Analysis	Page 49
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



Simulation Results

South Coast Rail Network Simulation Analysis	Page 50
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	



South Coast Rail Network Simulation Analysis	<b>Page 51</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

---

### 8.5. Sub-Alternative: The “Whittenton Variant”

This operating variant is identical to the Stoughton Alternative, except that it diverges from the Stoughton alignment approximately two miles south of the proposed station at Raynham Place to connect with the southern portion of the Attleboro Secondary, and then proceeds via the Attleboro secondary to join the New Bedford Main Line and then via the New Bedford Main Line and the Fall River Secondary to the southern terminals. It replaces the Stoughton Alternative’s Taunton Station stop with a stop at Downtown Taunton, on what would be the Attleboro alignment.

The Whittenton route is approximately 1.6 miles longer, with more severe speed restrictions, than the Stoughton Alternative route. RAILSIM Train Performance Calculator (single train) simulations using both diesel and electric locomotives were performed to quantify the travel time difference between the two routes. Regardless of motive power, the Stoughton route could potentially save as much as five minutes running time over the Stoughton/Whittenton Variant Route.

The performance of the Whittendon Variant on the NEC will be nearly identical to that achieved by the Stoughton Build Alternative, and was therefore not subjected to full network simulation analysis.

---

South Coast Rail Network Simulation Analysis	<b>Page 52</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

## 9. Conclusions

The foregoing memorandum has detailed a very complex study of rail operations, following up on a late-2008 Capacity Utilization Analyses conducted over the same territory. It has brought a very robust simulation tool – the RAILSIM Network Simulator – to bear on the issues now being considered by the Massachusetts EOT. This exercise has led to the following conclusions:

1. The 2030 No-Build scenario is operationally feasible. This is indicated by its consistent ability to deliver trains on time, under deterministic simulation, 100% of the time to South Station and well over 90% of the time to the southern terminals. In addition, AM peak period arrivals at South Station achieve the 100% target even under randomization.
2. The Stoughton scenario (and its Whittenton Variant) is operationally feasible. Refinements to their operating plans during final design would further improve the outcome. Results for the Stoughton scenario were only marginally less favorable than for the No-Build. Again, deterministic results were 100% OTP at South Station and over 90% at the southern terminals.
3. The following conservative assumptions lend validity to the positive findings for the No-Build and Stoughton:
  - a. The use of eight fully-loaded bi-level coaches at all times for all MBTA trains except the Framingham/Worcester Branch;
  - b. The continued use of the F40 locomotive by MBTA in 2030, whose design will be 50 to 60 years old at that point;
  - c. Generous two-minute peak period dwells at four NEC stations;
  - d. Simulation of all F and L stops in the MBTA schedule as full scheduled stops.
4. The Attleboro Alternative, as configured, has been found to be unworkable and operationally infeasible. This result was indicated by the following findings:
  - a. Although the simulation was able to process the AM operations, on time performance under deterministic conditions was far from adequate. The simulation operation fell well short of the minimum target of 100% on time performance, even in the less-intense AM Peak Period and before the imposition of randomization.
  - b. Despite a lengthy and concerted effort by very experienced operators of RAILSIM, it was not possible to force the simulation to complete the proposed weekday operation, to say nothing of achieving the on-time standard. The proposed MBTA electric consist, using a high performance 8,046 horsepower HHP-8 locomotive, was used for this effort. The ability of this locomotive to recover from delay substantially exceeds the ability of the diesel F40 locomotive; the intent was to give the Attleboro Alternative the best possible chance of succeeding.

## Conclusions

---

South Coast Rail Network Simulation Analysis	<b>Page 53</b>
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

- c. The simulation failure in the PM Peak indicates that catastrophic delays, related to fatal flaw-level terminal throat interlocking congestion, may be expected under this scenario even under the most favorable conditions, and demonstrates that the Attleboro Alternative is conceptually defective. In short, the desired train volumes cannot be supported at Tower 1 Interlocking and its approaches.
  5. The limiting condition in all scenarios (and the fatal flaw in the case of the Attleboro Build scenarios) was found to be the terminal throat interlocking capacity and terminal approach capacity at South Station, which were thoroughly evaluated in the simulation. From the many iterative attempts to optimize the simulations in this area it is clear that as train volumes grow, capacity is quickly reached and then, in the case of the Attleboro Alternative, overwhelmed by the train volumes. Congestion in the terminal throat causes late arrivals. These in turn further exacerbate the problem of clearing or loading platform tracks expeditiously, and the problem persists until train volumes begin to shrink after the peak periods.
  6. The electric option for the Stoughton and Attleboro has only a very slight positive effect on simulation results, as measured by on time performance and signal delay. Its primary benefit will be in providing modestly shorter end-to-end running times, and in providing an enhanced ability to recover from routine minor delays, such as door problems or unexpected excess passenger loading.
-

Appendix

## 10. Appendix

### 10.1. Simulated Train Consists

#### 10.1.1. Amtrak Acela (Summary Screen Shot from RAILSIM)

The screenshot shows the 'Train Composition Editor' window for a train named '5748 Acela (Library)'. The 'Train Composition' list contains the following items:

- 1 Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5k
- 1 Amtrak 1999-2002 Bombardier/ALSTOM Acela End Coach Car
- 3 Amtrak 1999-2002 Bombardier/ALSTOM Acela Coach
- 1 Amtrak 1999-2002 Bombardier/ALSTOM Acela Bistro
- 1 Amtrak 1999-2002 Bombardier/ALSTOM Acela 1st Class Car
- 1 Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5k

The 'List of cars' section is set to 'North American Freight Cars' and shows a list of car types, with 'Auto Rack - Closed Tri-Level (FA) - Empty' selected. The 'Number' field is set to 1. The 'Current Statistics' section displays the following data:

Type:	AC
Length:	663.73 feet
Weight:	
Trailing:	387.79 tons
Total:	588.03 tons
Power:	12500.00 HP
Max Speed:	150.00 mph
Power to Weight Ratio:	21.2573 HP/Ton

#### 10.1.2. Amtrak Regional (Summary Screen Shot from RAILSIM)

The screenshot shows the 'Train Composition Editor' window for a train named '5748 Amtrak Regional (Library)'. The 'Train Composition' list contains the following items:

- 1 Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz
- 1 Amtrak Amfleet Amcafe
- 8 Amtrak Amfleet II Corridor Coach

The 'List of cars' section is set to 'North American Freight Cars' and shows a list of car types, with 'Auto Rack - Closed Tri-Level (FA) - Empty' selected. The 'Number' field is set to 1. The 'Current Statistics' section displays the following data:

Type:	AC
Length:	834.80 feet
Weight:	
Trailing:	487.44 tons
Total:	598.44 tons
Power:	8046.00 HP
Max Speed:	125.00 mph
Power to Weight Ratio:	13.4450 HP/Ton

**Appendix**

**10.1.3. MBTA Diesel: F40 Pulling Eight Coaches (Summary Screen Shot from RAILSIM)**

The screenshot shows the 'Train Composition Editor' window. The 'Train' dropdown is set to '5748 MBTA F40 + 8 Bi-Level Cars'. The 'Train Composition' list contains three items: 1 F40PH-2C (MBTA), 7 5748 - MBTA 1991 Kawasaki Bi-Level Class BTC Coach (50), and 1 5748 - MBTA 1991 Kawasaki Bi-Level Class CTC Cab Car (25). The 'List of cars' dropdown is set to 'North American Locomotives', and the 'Number' field is set to 1. The 'Current Statistics' panel shows: Type: Diesel, Length: 746.70 feet, Weight: Trailing 485.70 tons, Total 615.70 tons, Power: 3000.00 HP, Max Speed: 100.00 mph, Power to Weight Ratio: 4.8725 HP/Ton.

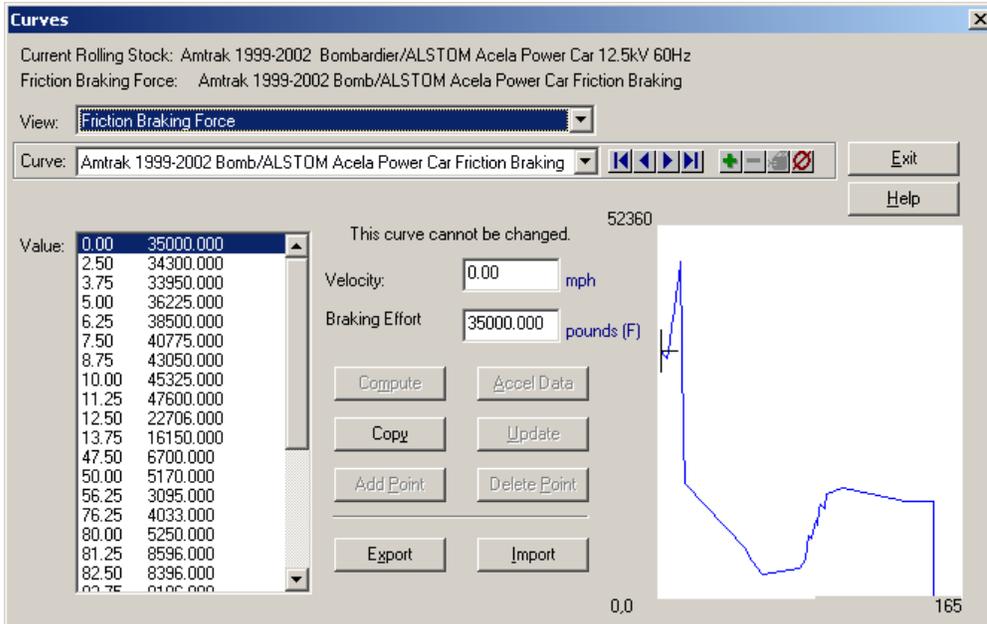
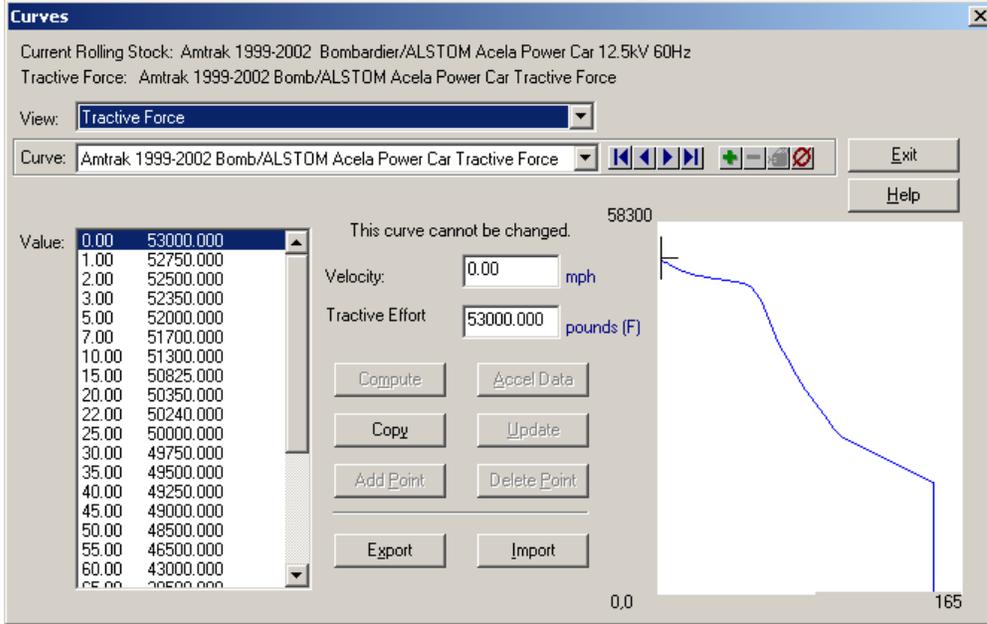
**10.1.4. MBTA Electric: HHP-8 Pulling Eight Coaches (Summary Screen Shot from RAILSIM)**

The screenshot shows the 'Train Composition Editor' window. The 'Train' dropdown is set to '5748 MBTA HHP-8 + 8 cars (1.6 MPHPS CBR)'. The 'Train Composition' list contains three items: 1 5748 - Amtrak 1999 HHP-8 - 25 kV, 60Hz (1.6 MPHPS CBR), 7 5748 - MBTA 1991 Kawasaki Bi-Level Class BTC Coach (50), and 1 5748 - MBTA 1991 Kawasaki Bi-Level Class CTC Cab Car (25). The 'List of cars' dropdown is set to 'North American Freight Cars', and the 'Number' field is set to 1. The 'Current Statistics' panel shows: Type: AC, Length: 749.50 feet, Weight: Trailing 485.70 tons, Total 596.70 tons, Power: 8046.00 HP, Max Speed: 100.00 mph, Power to Weight Ratio: 13.4842 HP/Ton.

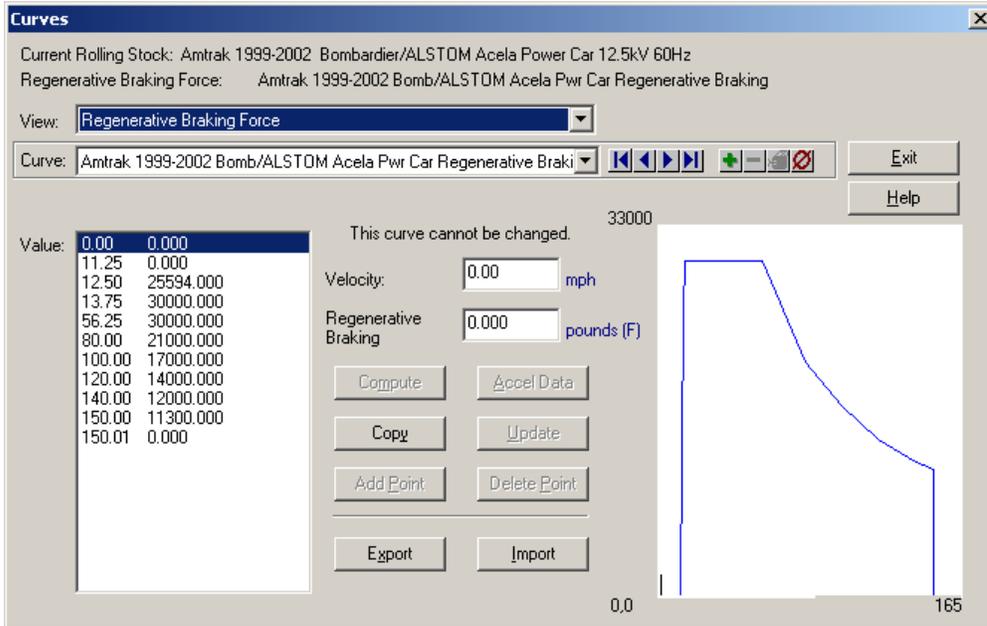
**Appendix**

**10.2. Locomotive Attributes**

**10.2.1. Amtrak Acela Power Car (RAILSIM Rolling Stock Library Detail)**



**Appendix**



**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Length:  feet

Weight:  pounds

Number of Axles:

Maximum Adhesion:  percent

Continuous Power:  HP

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 58
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Motor Efficiency: 85.000 percent

Derate Tractive Power for Auxiliary Load: No

Auxiliary kW Load: 156.77 kW

Power Factor (Auxiliaries): 0.97

Minimum Continuous Rating: 0.0000 mph

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Maximum Speed (Light): 60.0000 mph

Maximum Speed: 150.0000 mph

Initial Acceleration Limit: 1.5000 mph/s

Service Brake Rate: 1.5900 mph/s

Emergency Brake Rate: 1.8660 mph/s

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 59
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Maximum Acceleration: 2.0000 mph/s

Maximum Deceleration: 2.5000 mph/s

Max Jerk Rate (Acceleration): 1.0000 mph/s<sup>2</sup>

Max Jerk Rate (Braking): 1.0000 mph/s<sup>2</sup>

Acceleration Reaction Time: 3.000 seconds

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Braking Reaction Time (Wayside): 3.000 seconds

Braking Reaction Time (Cab): 3.000 seconds

Braking Reaction Time (Transponder): 3.000 seconds

Brakepipe Propagation Time: 0.100 seconds

Power Consumed During Dynamic Brake: 40.00 kW

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Nominal Line Voltage: 12500.00 AC

Number of Pantographs: 1.00

Rotational Mass: 5.00 percent

Frontal Area: 147.5695 square feet

Davis Flange Coeff.: 0.030000 pounds (F)/(tons × mph)

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

Davis Air (Drag) Coeff. - Lead: 0.001600 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Davis Air (Drag) - Trailing: 0.001400 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

M. Davis Air (Drag) - Lead: 0.070000 pounds (F)/mph<sup>2</sup>

M. Davis Air (Drag) - Trailing: 0.070000 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor: 0.8500

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/ALSTOM Acela Power Car 12.5kV 60Hz

Show:  Data  Photo

M. Davis Air (Drag) - Trailing  
 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor

Totten Streamlined Design Factor  
 pounds (F)/mph<sup>2</sup>

CN Air (Drag) Coeff. - Lead  
 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

CN Air (Drag) Coeff. - Trailing  
 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**10.2.2. Amtrak Regional Alstom HHP-8 (RAILSIM Rolling Stock Library Detail)**

**Curves**

Current Rolling Stock: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz  
 Tractive Force: HHP-8 Tractive Force

View: Tractive Force

Curve: HHP-8 Tractive Force

Value:

0.00	71230.000
10.00	68341.000
20.00	65977.000
30.00	63350.000
40.00	60000.000
50.00	58000.000
60.00	50260.000
61.00	49436.000
70.00	43080.000
80.00	37695.000
90.00	33507.000
100.00	30156.000
110.00	27415.000
120.00	25130.000
125.00	24125.000
125.01	0.000

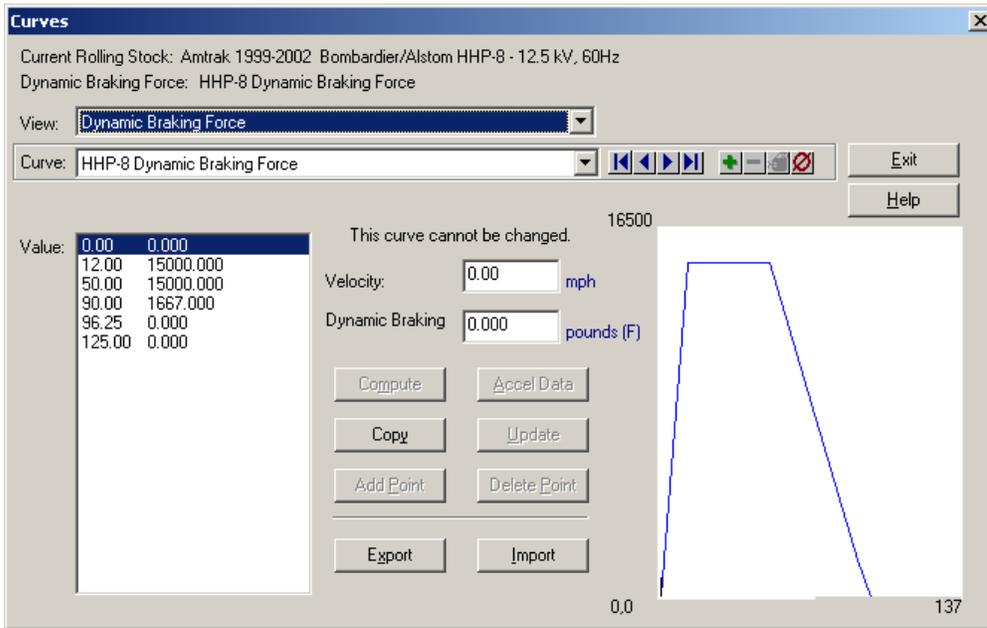
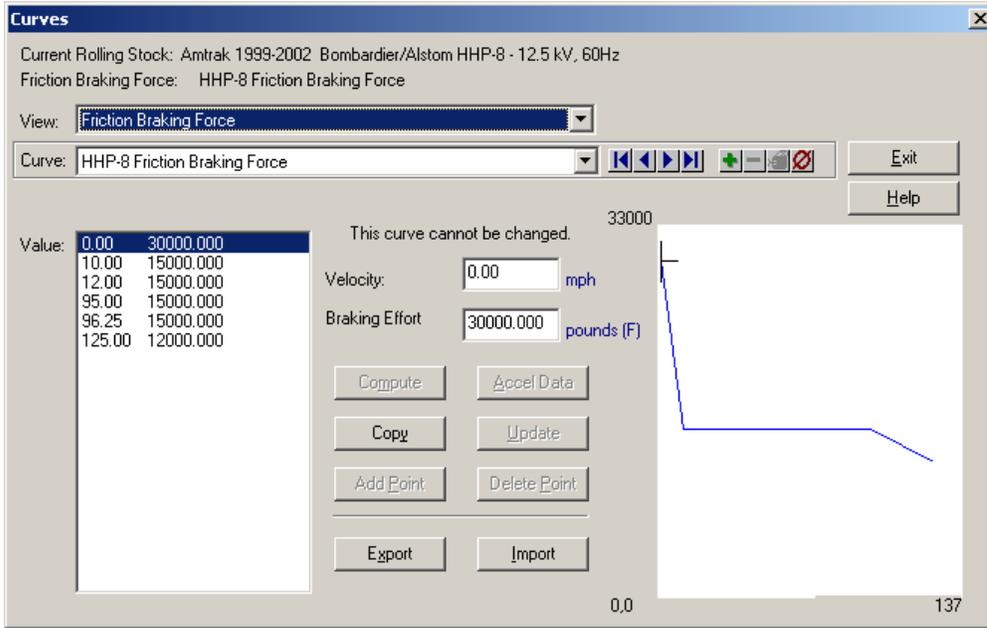
This curve cannot be changed.

Velocity:  mph

Tractive Effort:  pounds (F)

Buttons: Compute, Accel Data, Copy, Update, Add Point, Delete Point, Export, Import

Appendix



**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Length: 67.100 feet

Weight: 222000.000 pounds

Number of Axles: 4.00

Maximum Adhesion: 25.50 percent

Continuous Power: 8046.000 HP

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Motor Efficiency: 85.000 percent

Derate Tractive Power for Auxiliary Load: No

Auxiliary kW Load: 123.00 kW

Power Factor (Auxiliaries): 0.80

Minimum Continuous Rating: 0.0000 mph

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 64
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Maximum Speed (Light): 60.0000 mph

Maximum Speed: 125.0000 mph

Initial Acceleration Limit: 2.0000 mph/s

Service Brake Rate: 1.8000 mph/s

Emergency Brake Rate: 2.5000 mph/s

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Maximum Acceleration: 2.5000 mph/s

Maximum Deceleration: 2.5000 mph/s

Max Jerk Rate (Acceleration): 1.0000 mph/s<sup>2</sup>

Max Jerk Rate (Braking): 1.0000 mph/s<sup>2</sup>

Acceleration Reaction Time: 3.000 seconds

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 65
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Braking Reaction Time (Wayside): 3.000 seconds

Braking Reaction Time (Cab): 3.000 seconds

Braking Reaction Time (Transponder): 3.000 seconds

Brakepipe Propagation Time: 0.100 seconds

Power Consumed During Dynamic Brake: 120.00 kW

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Nominal Line Voltage: 12500.00 AC

Number of Pantographs: 1.00

Rotational Mass: 5.00 percent

Frontal Area: 150.6700 square feet

Davis Flange Coeff.: 0.030000 pounds (F)/(tons × mph)

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

Davis Air (Drag) Coeff. - Lead: 0.002400 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Davis Air (Drag) - Trailing: 0.002000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

M. Davis Air (Drag) - Lead: 0.070000 pounds (F)/mph<sup>2</sup>

M. Davis Air (Drag) - Trailing: 0.070000 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor: 0.8500

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: Amtrak 1999-2002 Bombardier/Alstom HHP-8 - 12.5 kV, 60Hz

Show:  Data  Photo

M. Davis Air (Drag) - Trailing: 0.070000 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor: 0.8500

Totten Streamlined Design Factor: 0.005000 pounds (F)/mph<sup>2</sup>

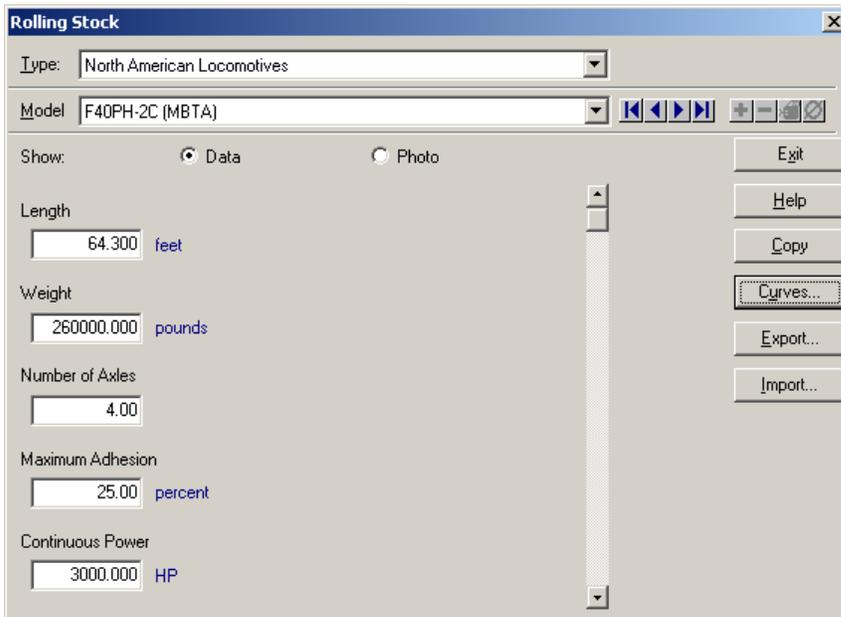
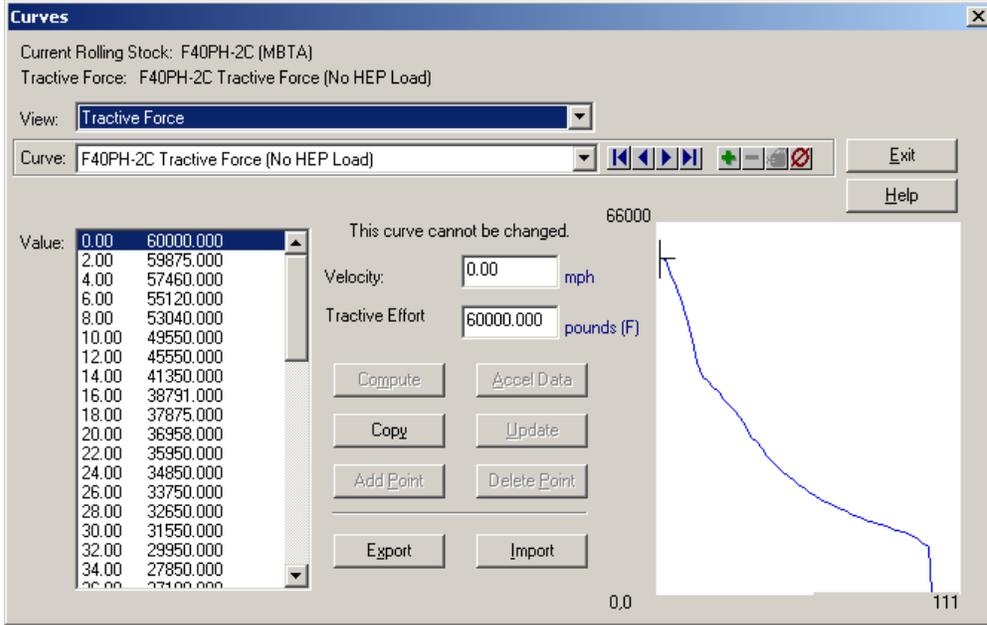
CN Air (Drag) Coeff. - Lead: 24.000000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

CN Air (Drag) Coeff. - Trailing: 5.500000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Appendix**

**10.2.3. MBTA Diesel: F40 (RAILSIM Rolling Stock Library Detail)**



**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Motor Efficiency: 80.000 percent

Derate Tractive Power for Auxiliary Load: No

Auxiliary kW Load: 29.00 kW

Power Factor (Auxiliaries): 0.00

Minimum Continuous Rating: 14.7000 mph

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Maximum Speed (Light): 50.0000 mph

Maximum Speed: 102.0000 mph

Initial Acceleration Limit: 1.5000 mph/s

Service Brake Rate: 1.5000 mph/s

Emergency Brake Rate: 1.5000 mph/s

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 69
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Maximum Acceleration: 2.0000 mph/s

Maximum Deceleration: 2.0000 mph/s

Max Jerk Rate (Acceleration): 1.0000 mph/s<sup>2</sup>

Max Jerk Rate (Braking): 1.0000 mph/s<sup>2</sup>

Acceleration Reaction Time: 3.000 seconds

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Braking Reaction Time (Wayside): 3.000 seconds

Braking Reaction Time (Cab): 3.000 seconds

Braking Reaction Time (Transponder): 3.000 seconds

Brakepipe Propagation Time: 0.100 seconds

Power Consumed During Dynamic Brake: 120.00 kW

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Appendix**

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Nominal Line Voltage: 0.00 (DIESEL)

Number of Pantographs: 0.00

Rotational Mass: 5.00 percent

Frontal Area: 147.5000 square feet

Davis Flange Coeff.: 0.030000 pounds (F)/(tons × mph)

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

Davis Air (Drag) Coeff. - Lead: 0.002400 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Davis Air (Drag) - Trailing: 0.002000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

M. Davis Air (Drag) - Lead: 0.070000 pounds (F)/mph<sup>2</sup>

M. Davis Air (Drag) - Trailing: 0.070000 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor: 0.8500

Buttons: Exit, Help, Copy, Curves..., Export..., Import...

Appendix

South Coast Rail Network Simulation Analysis	Page 71
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

**Rolling Stock**

Type: North American Locomotives

Model: F40PH-2C (MBTA)

Show:  Data  Photo

M. Davis Air (Drag) - Trailing  
0.070000 pounds (F)/mph<sup>2</sup>

Adjusted Davis Factor  
0.8500

Totten Streamlined Design Factor  
0.005000 pounds (F)/mph<sup>2</sup>

CN Air (Drag) Coeff. - Lead  
24.000000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

CN Air (Drag) Coeff. - Trailing  
5.500000 pounds (F)/(mph<sup>2</sup> × feet<sup>2</sup>)

Exit  
Help  
Copy  
Curves...  
Export...  
Import...

Appendix

### 10.3. Train Performance Calculator (TPC) Running Time Results

MBTA South Coast Rail RAILSIM® Train Performance Calculator Results						Including Dwells		Without Dwells		
	Departure From:	To Arrival At:	Distance (Miles)	Inter-mediate Stops	Alternative	Run Time (h:mm:ss)	Avg. Speed (MPH)	Run Time (h:mm:ss)	Average Speed (MPH)	Maximum Speed Attained (MPH)
INBOUND DIESEL	Fall River	South Station	56.6	7	Attleboro	1:23:39	40.6	1:19:26	42.8	75.2
	Fall River	South Station	51.3	12	Stoughton Local	1:21:51	37.6	1:15:16	40.9	75.2
	Fall River	South Station	51.3	7	Stoughton Zone Express	1:12:20	42.5	1:08:39	44.8	75.2
	New Bedford	South Station	59.8	7	Attleboro	1:27:10	41.2	1:22:58	43.3	75.2
	New Bedford	South Station	54.5	12	Stoughton Local	1:25:20	38.3	1:18:46	41.5	75.2
	New Bedford	South Station	54.5	7	Stoughton Zone Express	1:15:50	43.1	1:12:09	45.3	75.2
	East Taunton	Raynham	9.1	1	Whittenton Route	0:17:00	32.1	0:16:28	33.2	55.2
	East Taunton	Raynham	7.5	1	Stoughton Branch Route	0:11:49	38.0	0:11:18	39.8	42.6
	<i>Whittenton Route time minus Stoughton Route time</i>						<b>0:05:10</b>	-	<b>0:05:10</b>	-
OUTBOUND DIESEL	South Station	Fall River	56.8	7	Attleboro	1:24:08	40.5	1:19:55	42.6	75.2
	South Station	Fall River	51.1	13	Stoughton Local	1:24:32	36.3	1:17:26	39.6	71.6
	South Station	Fall River	51.1	7	Stoughton Zone Express	1:12:41	42.2	1:09:00	44.5	75.2
	South Station	New Bedford	60.0	7	Attleboro	1:26:07	41.8	1:21:54	43.9	75.2
	South Station	New Bedford	54.3	13	Stoughton Local	1:26:31	37.7	1:21:46	39.9	71.6
	South Station	New Bedford	54.3	7	Stoughton Zone Express	1:14:40	43.7	1:10:59	45.9	75.2
	Raynham	East Taunton	9.1	1	Whittenton Route	0:16:22	33.4	0:15:50	34.5	57.1
	Raynham	East Taunton	7.5	1	Stoughton Branch Route	0:11:28	39.2	0:10:56	41.1	66.7
	<i>Whittenton Route time minus Stoughton Route time</i>						<b>0:04:54</b>	-	<b>0:04:54</b>	-
INBOUND ELECTRIC	Fall River	South Station	56.6	7	Attleboro	1:11:59	47.2	1:07:47	50.1	95.2
	Fall River	South Station	51.3	12	Stoughton Local	1:09:49	44.1	1:03:15	48.6	95.2
	Fall River	South Station	51.3	7	Stoughton Zone Express	1:01:31	50.0	0:57:50	53.2	95.2
	New Bedford	South Station	59.8	7	Attleboro	1:13:17	49.0	1:09:00	52.0	95.2
	New Bedford	South Station	54.5	12	Stoughton Local	1:11:53	45.5	1:05:11	50.2	95.2
	New Bedford	South Station	54.5	7	Stoughton Zone Express	1:03:14	51.7	0:59:30	55.0	95.2
	East Taunton	Raynham	9.1	1	Whittenton Route	0:15:24	35.5	0:14:53	36.7	75.5
	East Taunton	Raynham	7.5	1	Stoughton Branch Route	0:09:56	45.2	0:09:24	47.8	95.2
	<i>Whittenton Route time minus Stoughton Route time</i>						<b>0:05:28</b>	-	<b>0:05:29</b>	-
OUTBOUND ELECTRIC	South Station	Fall River	56.8	7	Attleboro	1:12:55	46.7	1:08:43	49.6	95.2
	South Station	Fall River	51.1	13	Stoughton Local	1:13:23	41.8	1:06:16	46.3	95.2
	South Station	Fall River	51.1	7	Stoughton Zone Express	1:02:40	48.9	0:59:00	52.0	95.2
	South Station	New Bedford	60.0	7	Attleboro	1:12:08	49.9	1:07:55	53.0	95.2
	South Station	New Bedford	54.3	13	Stoughton Local	1:12:35	44.9	1:05:29	49.8	95.2
	South Station	New Bedford	54.3	7	Stoughton Zone Express	1:01:53	52.7	0:58:12	56.0	95.2
	Raynham	East Taunton	9.1	1	Whittenton Route	0:15:04	36.3	0:14:32	37.6	76.3
	Raynham	East Taunton	7.5	1	Stoughton Branch Route	0:09:30	47.3	0:08:58	50.1	95.2
	<i>Whittenton Route time minus Stoughton Route time</i>						<b>0:05:34</b>	-	<b>0:05:34</b>	-
NOTES: 5% Schedule Margin applied; 0% Comfort Braking; Full Seated Load of 1,475 pass. in 7 MBTA Kawasaki Bi-Level coaches and 1 Bi-Level Cab Car.										
MOTIVE POWER: Diesel - One GP40LH-2 (MBTA/AMF) ; Electric - One Amtrak 1999 HHP-8 - 25 kV, 60Hz								SYSTRA 5748_20090624_0001		

### 10.4. Operating Plans

The following applies to all of the operating plan data:

- Peak Period trains are shaded gray.
- Any train name ending in “NB” is a train added for assumed MBTA service growth for 2030.
- An “AA” Amtrak train is an Acela Express; an “AR” Acela train is a Regional.

#### 10.4.1. Amtrak 2020 Projected Northeast Corridor "North End" Operating Plan

EB TRAIN	WB TRAIN	Notes	P AR	P DP	ORMS	LAWN	HEB	HOL	M'FLD	JCT	RT128	T'FER	BBAY	COVE	Boston
616		Amtrak Night Owl	05:25	05:27	05:28	05:31	05:35	05:38	05:41	05:53	D 05:57	05:59	D 06:07	06:08	D 06:11
100		Amtrak Acela Express	08:43	08:45	08:46	08:49	08:52	08:55	08:57	09:05	D 09:09	09:10	D 09:19	09:20	D 09:23
102		Amtrak Acela Regional	09:16	09:18	09:19	09:22	09:26	09:29	09:32	09:44	D 09:48	09:50	D 09:58	09:59	D 10:02
104		Amtrak Acela Express	09:43	09:45	09:46	09:49	09:52	09:55	09:57	10:05	D 10:09	10:10	D 10:19	10:20	D 10:23
106		Amtrak Acela Express	10:42	10:44	10:45	10:48	10:51	10:54	10:56	11:04	D 11:08	11:09	D 11:18	11:19	D 11:22
108		Amtrak Acela Regional	11:10	11:12	11:13	11:16	11:20	11:23	11:26	11:38	D 11:42	11:44	D 11:52	11:53	D 11:56
110		Amtrak Acela Express	11:52	11:54	11:55	11:58	12:01	12:04	12:06	12:14	D 12:18	12:19	D 12:28	12:29	D 12:32
112		Amtrak Acela Express	12:39	12:41	12:42	12:45	12:48	12:51	12:53	13:01	D 13:05	13:06	D 13:15	13:16	D 13:19
114		Amtrak Acela Regional	13:16	13:18	13:19	13:22	13:26	13:29	13:32	13:44	D 13:48	13:50	D 13:58	13:59	D 14:02
116		Amtrak Acela Express	13:39	13:41	13:42	13:45	13:48	13:51	13:53	14:01	D 14:05	14:06	D 14:15	14:16	D 14:19
118		Amtrak Acela Express	14:36	14:38	14:39	14:42	14:45	14:48	14:50	14:58	D 15:02	15:03	D 15:12	15:13	D 15:16
120		Amtrak Acela Regional	15:10	15:12	15:13	15:16	15:20	15:23	15:26	15:38	D 15:42	15:44	D 15:52	15:53	D 15:56
122		Amtrak Acela Express	15:36	15:38	15:39	15:42	15:45	15:48	15:50	15:58	D 16:02	16:03	D 16:12	16:13	D 16:16
124		Amtrak Acela Regional	16:13	16:15	16:16	16:19	16:23	16:26	16:29	16:41	D 16:45	16:47	D 16:55	16:56	D 16:59
126		Amtrak Acela Express	16:36	16:38	16:39	16:42	16:45	16:48	16:50	16:58	D 17:02	17:03	D 17:12	17:13	D 17:16
128		Amtrak Acela Regional	17:10	17:12	17:13	17:16	17:20	17:23	17:26	17:38	D 17:42	17:44	D 17:52	17:53	D 17:56
130		Amtrak Acela Express	17:36	17:38	17:39	17:42	17:45	17:48	17:50	17:58	D 18:02	18:03	D 18:12	18:13	D 18:16
132		Amtrak Acela Express	18:36	18:38	18:39	18:42	18:45	18:48	18:50	18:58	D 19:02	19:03	D 19:12	19:13	D 19:16
134		Amtrak Acela Regional	19:10	19:12	19:13	19:16	19:20	19:23	19:26	19:38	D 19:42	19:44	D 19:52	19:53	D 19:56
136		Amtrak Acela Express	19:36	19:38	19:39	19:42	19:45	19:48	19:50	19:58	D 20:02	20:03	D 20:12	20:13	D 20:16
138		Amtrak Acela Regional	20:19	20:21	20:22	20:25	20:29	20:32	20:35	20:47	D 20:51	20:53	D 21:01	21:02	D 21:05
140		Amtrak Acela Express	20:36	20:38	20:39	20:42	20:45	20:48	20:50	20:58	D 21:02	21:03	D 21:12	21:13	D 21:16
142		Amtrak Acela Regional	21:23	21:25	21:26	21:29	21:33	21:36	21:39	21:51	D 21:55	21:57	D 22:05	22:06	D 22:09
144		Amtrak Acela Express	21:39	21:41	21:42	21:45	21:48	21:51	21:53	22:01	D 22:05	22:06	D 22:15	22:16	D 22:19
146		Amtrak Acela Express	22:33	22:35	22:36	22:39	22:42	22:45	22:47	22:55	D 22:59	23:00	D 23:09	23:10	D 23:13
	201	Amtrak Acela Express	04:56	04:54	04:53	04:50	04:47	04:44	04:42	04:34	S 04:30	04:29	S 04:20	04:19	S 04:16
	103	Amtrak Acela Regional	06:31	06:29	06:28	06:25	06:21	06:18	06:15	06:03	S 05:59	05:57	S 05:49	05:48	S 05:45
	105	Amtrak Acela Express	06:56	06:54	06:53	06:50	06:47	06:44	06:42	06:34	S 06:30	06:29	S 06:20	06:19	S 06:16
	107	Amtrak Acela Regional	07:31	07:29	07:28	07:25	07:21	07:18	07:15	07:03	S 06:59	06:57	S 06:49	06:48	S 06:45
	109	Amtrak Acela Express	07:56	07:54	07:53	07:50	07:47	07:44	07:42	07:34	S 07:30	07:29	S 07:20	07:19	S 07:16
	111	Amtrak Acela Regional	08:31	08:29	08:28	08:25	08:21	08:18	08:15	08:03	S 07:59	07:57	S 07:49	07:48	S 07:45
	113	Amtrak Acela Express	08:56	08:54	08:53	08:50	08:47	08:44	08:42	08:34	S 08:30	08:29	S 08:20	08:19	S 08:16
	115	Amtrak Acela Express	09:56	09:54	09:53	09:50	09:47	09:44	09:42	09:34	S 09:30	09:29	S 09:20	09:19	S 09:16
	117	Amtrak Acela Regional	10:26	10:24	10:23	10:20	10:16	10:13	10:10	09:58	S 09:54	09:52	S 09:44	09:43	S 09:40
	119	Amtrak Acela Express	10:56	10:54	10:53	10:50	10:47	10:44	10:42	10:34	S 10:30	10:29	S 10:20	10:19	S 10:16
	121	Amtrak Acela Express	11:56	11:54	11:53	11:50	11:47	11:44	11:42	11:34	S 11:30	11:29	S 11:20	11:19	S 11:16
	123	Amtrak Acela Regional	12:31	12:29	12:28	12:25	12:21	12:18	12:15	12:03	S 11:59	11:57	S 11:49	11:48	S 11:45
	125	Amtrak Acela Express	12:56	12:54	12:53	12:50	12:47	12:44	12:42	12:34	S 12:30	12:29	S 12:20	12:19	S 12:16
	127	Amtrak Acela Express	13:56	13:54	13:53	13:50	13:47	13:44	13:42	13:34	S 13:30	13:29	S 13:20	13:19	S 13:16
	129	Amtrak Acela Regional	14:31	14:29	14:28	14:25	14:21	14:18	14:15	14:03	S 13:59	13:57	S 13:49	13:48	S 13:45
	131	Amtrak Acela Express	14:56	14:54	14:53	14:50	14:47	14:44	14:42	14:34	S 14:30	14:29	S 14:20	14:19	S 14:16
	133	Amtrak Acela Express	15:56	15:54	15:53	15:50	15:47	15:44	15:42	15:34	S 15:30	15:29	S 15:20	15:19	S 15:16
	135	Amtrak Acela Regional	16:26	16:24	16:23	16:20	16:16	16:13	16:10	15:58	S 15:54	15:52	S 15:44	15:43	S 15:40
	137	Amtrak Acela Express	16:56	16:54	16:53	16:50	16:47	16:44	16:42	16:34	S 16:30	16:29	S 16:20	16:19	S 16:16
	139	Amtrak Acela Express	17:56	17:54	17:53	17:50	17:47	17:44	17:42	17:34	S 17:30	17:29	S 17:20	17:19	S 17:16
	141	Amtrak Acela Regional	18:26	18:24	18:23	18:20	18:16	18:13	18:10	17:58	S 17:54	17:52	S 17:44	17:43	S 17:40
	143	Amtrak Acela Express	18:56	18:54	18:53	18:50	18:47	18:44	18:42	18:34	S 18:30	18:29	S 18:20	18:19	S 18:16
	145	Amtrak Acela Express	19:56	19:54	19:53	19:50	19:47	19:44	19:42	19:34	S 19:30	19:29	S 19:20	19:19	S 19:16
	147	Amtrak Acela Regional	20:26	20:24	20:23	20:20	20:16	20:13	20:10	19:58	S 19:54	19:52	S 19:44	19:43	S 19:40
	613	Amtrak Night Owl	23:55	23:53	23:52	23:49	23:45	23:42	23:39	23:27	S 23:23	23:21	S 23:13	23:12	S 23:09

Appendix

South Coast Rail Network Simulation Analysis	Page 74
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

10.4.2. 2030 No-Build Operating Plan, NEC and Dorchester Branch

MBTA 2030 No-Build Operating Plan  
NEC and Dorchester Branch  
(Page 1 of 17)

Station Code:	800			790			500			902			702			600			744			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
PROVIDENCE	S	04:56	30							S	05:31	30										
ORM		04:57									05:32											
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30										
ATT	S	05:16	45							S	05:51	45										
MANSFIELD	S	05:25	45							S	06:01	45										
SHARON	S	05:33	45							S	06:10	45										
STOUGHTON																						
CANTON CENTER																						
CANTON JCT	S	05:40	30							S	06:17	30										
JUNCTION		05:42									06:18											
ROUTE 128	S	05:45	45							S	06:22	45										
ENDICOTT				S	05:48	30							S	06:26	30							
READVILLE				S	05:51	30							S	06:29	30					S	06:31	30
READ		05:48									06:25			06:30								
FAIRMOUNT				D	05:54	30														S	06:34	30
MORTON ST				D	05:58	30														D	06:38	30
UPHAM'S CORNER				D	06:04	30														D	06:44	30
HYDE PARK	S	05:50	30							S	06:27	30										
ROSLINDALE															S	06:35	30					
FOREST HILLS															S	06:38	30					
PLAINS		05:54									06:31			06:37		06:39						
RUG										S	06:37	30			S	06:42	30					
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:46	30				
COV		06:03						06:31			06:42			06:44			06:47					
TOWER 1		06:06			06:12						06:45			06:47			06:49				06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:50	300	D	06:55	300	

Station Code:	730			934			501			903Q			743Q			745Q			801Q			
	Stop	Time	Dwell																			
SOUTH STATION	S	04:00	300	S	05:15	300	S	05:30	300	S	05:35	300	S	05:40	300	S	06:25	300	S	06:25	300	
TOWER 1		04:01			05:16						05:36			05:42			06:27				06:26	
BROADWAY-CABOT														05:44			06:29					
COV		04:02			05:17			05:34			05:37										06:28	
BACK BAY							S	05:36	30	S	05:40	30								S	06:30	30
RUG																				S	06:33	30
PLAINS		04:06			05:21						05:43										06:36	
FOREST HILLS																						
ROSLINDALE																						
HYDE PARK																						
UPHAM'S CORNER													D	05:50	30	D	06:35	30				
MORTON ST													D	05:56	30	D	06:41	30				
FAIRMOUNT													D	06:00	30	D	06:45	30				
READ		04:11			05:26						05:47										06:42	
READVILLE													D	06:04	30	D	06:49	30				
ENDICOTT	D	04:18	30																			
ROUTE 128										S	05:51	45								S	06:45	45
JUNCTION											05:54										06:46	
CANTON JCT																						
CANTON CENTER				S	05:38	30				S	05:59	30										
STOUGHTON				D	05:46	30				D	06:10	30										
SHARON																					06:54	45
MANSFIELD																					07:01	45
HOLDEN																					07:05	
ATT																				S	07:10	45
SOUTH ATTLEBORO																					07:16	30
ORM																					07:24	
PROVIDENCE																				D	07:25	30















MBTA 2030 No-Build Operating Plan  
 NEC and Dorchester Branch  
 (Page 9 of 17)

Station Code:	758			816			716			520			614			760			762			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell										
PROVIDENCE				S	11:41	30																
ORM					11:42																	
SOUTH ATTLEBORO				S	11:51	30																
ATT					12:01	45																
MANSFIELD				S	12:09	45																
SHARON				S	12:17	45																
STOUGHTON																						
CANTON CENTER																						
CANTON JCT				S	12:24	30																
JUNCTION					12:25																	
ROUTE 128				S	12:29	45																
ENDICOTT							S	12:46	30													
READVILLE	S	12:11	30				S	12:49	30						S	13:19	30		S	14:06	30	
READ						12:33		12:50														
FAIRMOUNT	D	12:14	30												D	13:22	30		D	14:09	30	
MORTON ST	D	12:18	30												D	13:26	30		D	14:13	30	
UPHAM'S CORNER	D	12:24	30												D	13:32	30		D	14:19	30	
HYDE PARK				S	12:34	30																
ROSLINDALE													S	13:17	30							
FOREST HILLS													S	13:20	30							
PLAINS					12:39			12:56						13:21								
RUG				S	12:44	30	S	12:57	30				S	13:24	30							
BACK BAY				S	12:49	30	S	13:01	30	S	13:09	30	S	13:28	30							
COV					12:50			13:02			13:10			13:29								
TOWER 1		12:31			12:53			13:04					13:32			13:39				14:26		
SOUTH STATION	D	12:35	300	D	12:54	300	D	13:06	300	D	13:15	300	D	13:33	300	D	13:43	300	D	14:30	300	

Station Code:	622			715Q			916			699NBQ			624			899NBQ			799Q				
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell		
SOUTH STATION	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:29	300	S	16:30	300		
TOWER 1					16:11			16:18			16:24			16:27			16:30			16:31			
BROADWAY-CABOT																				16:32			
COV		16:09			16:14			16:21			16:27			16:31			16:33						
BACK BAY	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:34	60					
RUG				S	16:19	60	S	16:26	60	S	16:32	60		N	16:37								
PLAINS					16:21			16:28			16:36			16:40									
FOREST HILLS										S	16:37	60											
ROSLINDALE										D	16:40	60											
HYDE PARK							S	16:32	60														
UPHAM'S CORNER																				S	16:41	60	
MORTON ST																				S	16:48	60	
FAIRMOUNT																				S	16:53	60	
READ						16:27		16:35								16:44							
READVILLE				S	16:29	60														D	16:57	60	
ENDICOTT				D	16:32	60														D	17:01	1	
ROUTE 128								S	16:40	120													
JUNCTION									16:41								16:48						
CANTON JCT							S	16:47	60														
CANTON CENTER																							
STOUGHTON																							
SHARON																S	16:55	120					
MANSFIELD															S	17:04	120						
HOLDEN																17:11							
ATT															S	17:15	120						
SOUTH ATTLEBORO															S	17:24	60						
ORM																17:32							
PROVIDENCE															D	17:33	60						

Appendix

South Coast Rail Network Simulation Analysis	Page 83
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
NEC and Dorchester Branch  
(Page 10 of 17)

Station Code:	918			914			522			718			764			524			616			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
PROVIDENCE	S	13:28	30																			
ORM		13:29																				
SOUTH ATTLEBORO	S	13:38	30																			
ATT	S	13:48	45																			
MANSFIELD	S	13:56	45																			
SHARON	S	14:04	45																			
STOUGHTON				S	14:20	30																
CANTON CENTER				S	14:27	30																
CANTON JCT				S	14:30	30																
JUNCTION		14:09			14:32																	
ROUTE 128	S	14:13	45																			
ENDICOTT										S	14:46	30										
READVILLE										S	14:49	30	S	15:02	30							
READ		14:17			14:37						14:50											
FAIRMOUNT													D	15:05	30							
MORTON ST													D	15:09	30							
UPHAM'S CORNER													D	15:15	30							
HYDE PARK				S	14:39	30																
ROSLINDALE																				S	15:30	30
FOREST HILLS																				S	15:34	30
PLAINS		14:22			14:44						14:56										15:35	
RUG	S	14:27	30																			
BACK BAY	S	14:32	30	S	14:49	30	S	14:57	30	S	15:00	30			S	15:29	30	S	15:40	30		
COV		14:33			14:50			14:58			15:01					15:30					15:41	
TOWER 1		14:36			14:53						15:04										15:44	
SOUTH STATION	D	14:37	300	D	14:54	300	D	15:03	300	D	15:05	300	D	15:26	300	D	15:35	300	D	15:45	300	

Station Code:	739NBQ			813Q			621Q			618			919Q			768			820				
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell		
SOUTH STATION	S	16:30	300	S	16:35	300	S	16:40	300	S	16:45	300	S	16:50	300	S	16:55	300	S	16:57	300		
TOWER 1		16:31			16:36			16:41			16:46			16:51			16:56			16:58			
BROADWAY-CABOT																	16:57						
COV		16:34			16:39			16:44			16:49			16:54							17:01		
BACK BAY	S	16:35	60	S	16:40	60	S	16:45	60	S	16:50	60	S	16:55	60					S	17:02	60	
RUG	S	16:39	60	S	16:43	60	S	16:49	60	S	16:54	60	S	16:59	60					S	17:06	60	
PLAINS		16:42			16:46			16:53			16:57			17:02							17:09		
FOREST HILLS								S	16:54	60													
ROSLINDALE								D	16:57	60													
HYDE PARK											S	17:03	60										
UPHAM'S CORNER															S	17:06	60						
MORTON ST															S	17:13	60						
FAIRMOUNT															S	17:18	60						
READ		16:47			16:51						17:06			17:06							17:13		
READVILLE	D	16:49	60							D	17:07	60			D	17:22	60						
ENDICOTT	D	16:52	1							D	17:11	60											
ROUTE 128				S	16:54	120							S	17:10	120								
JUNCTION					16:55									17:11							17:17		
CANTON JCT													S	17:17	60								
CANTON CENTER													S	17:20	60								
STOUGHTON													D	17:30	60								
SHARON				S	17:05	120															S	17:24	120
MANSFIELD				S	17:14	120															S	17:33	120
HOLDEN					17:22																	17:39	
ATT				S	17:24	120															S	17:47	120
SOUTH ATTLEBORO				S	17:33	60															S	17:54	60
ORM					17:41																	18:03	
PROVIDENCE				D	17:42	60															D	18:04	60









MBTA 2030 No-Build Operating Plan  
 NEC and Dorchester Branch  
 (Page 15 of 17)

Station Code:	926			534			628			778			798			536			826			
	Stop	Time	Dwell																			
PROVIDENCE																			S	19:53	30	
ORM																					19:54	
SOUTH ATTLEBORO																			S	20:03	30	
ATT																			S	20:13	45	
MANSFIELD																			S	20:22	45	
SHARON																			S	20:31	45	
STOUGHTON	S	19:35	30																			
CANTON CENTER																						
CANTON JCT	S	19:45	30																S	20:39	30	
JUNCTION		19:47																			20:40	
ROUTE 128																			S	20:45	45	
ENDICOTT														D	20:19	30						
READVILLE										S	20:15	30	S	20:22	30							
READ		19:52																			20:47	
FAIRMOUNT										D	20:18	30										
MORTON ST										D	20:22	30										
UPHAM'S CORNER										D	20:28	30										
HYDE PARK	S	19:54	30																S	20:48	30	
ROSLINDALE																						
FOREST HILLS							S	20:23	30													
PLAINS		19:59						20:24														20:53
RUG							S	20:27	30													
BACK BAY	S	20:04	30	S	20:28	30	S	20:31	30							S	20:56	30	S	20:58	30	
COV		20:05			20:29			20:32									20:57				20:59	
TOWER 1		20:06						20:35													21:02	
SOUTH STATION	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300	D	21:02	300	D	21:03	300	

Station Code:	924			626			532			776			824			926			798					
	Stop	Time	Dwell																					
SOUTH STATION	S	20:10	300	S	20:15	300	S	20:20	300	S	20:49	300	S	20:50	300	S	20:55	300	S	21:05	300			
TOWER 1		20:11			20:16						20:50			20:51			20:56				21:06			
BROADWAY-CABOT											20:51													
COV		20:12			20:17			20:24						20:52			20:57				21:07			
BACK BAY	S	20:15	30	S	20:20	30	S	20:26	30				S	20:55	30	S	21:00	30	S	21:10	30			
RUG	S	20:18	30	S	20:23	30							S	20:58	30	S	21:03	30	S	21:13	30			
PLAINS		20:22			20:27									21:00			21:06				21:17			
FOREST HILLS	S	20:23	30																					
ROSLINDALE	D	20:26	30																					
HYDE PARK				S	20:33	30										S	21:13	30	S	21:23	30			
UPHAM'S CORNER											D	20:59	30											
MORTON ST											D	21:05	30											
FAIRMOUNT											D	21:09	30											
READ					20:35										21:05			21:15			21:25			
READVILLE											D	21:13	30	S	21:08	30								
ENDICOTT													D	21:12	30									
ROUTE 128				S	20:38	45													S	21:18	45	S	21:28	45
JUNCTION					20:40																21:30			
CANTON JCT				S	20:43	30											S	21:24	30	S	21:33	30		
CANTON CENTER																S	21:27	30						
STOUGHTON																D	21:35	30						
SHARON				S	20:49	45													S	21:39	45			
MANSFIELD				S	20:57	45															S	21:47	45	
HOLDEN					21:03																	21:52		
ATT				S	21:05	45														S	21:55	45		
SOUTH ATTLEBORO				S	21:12	30														S	22:02	30		
ORM					21:19																	22:09		
PROVIDENCE				D	21:21	30														D	22:11	30		



MBTA 2030 No-Build Operating Plan  
 NEC and Dorchester Branch  
 (Page 17 of 17)

Station Code:	782			728			934			730			538			540		
	Stop	Time	Dwell															
PROVIDENCE																		
ORM																		
SOUTH ATTLEBORO																		
ATT																		
MANSFIELD																		
SHARON																		
STOUGHTON							S	23:54	30									
CANTON CENTER																		
CANTON JCT							D	00:04	30									
JUNCTION								00:05										
ROUTE 128							D	00:09	45									
ENDICOTT				D	22:47	30				D	00:20	30						
READVILLE	S	22:31	30															
READ					22:50			00:12			00:23							
FAIRMOUNT	D	22:34	30															
MORTON ST	D	22:38	30															
UPHAM'S CORNER	D	22:44	30															
HYDE PARK																		
ROSLINDALE																		
FOREST HILLS																		
PLAINS					22:57			00:17			00:31							
RUG																		
BACK BAY				S	23:01	30	S	00:21	30	S	00:36	30	S	01:17	30	S	01:24	30
COV					23:02			00:22			00:37			01:18			01:25	
TOWER 1					22:50			00:25			00:40							
SOUTH STATION	D	22:55	300	D	23:06	300	D	00:26	300	D	00:41	300	D	01:23	300	D	01:30	300

Station Code:	539			632			828		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1					23:51			00:00	
BROADWAY-CABOT									
COV		23:29			23:52			00:01	
BACK BAY	S	23:31	30	S	23:55	30	S	00:04	30
RUG				S	23:58	30	S	00:07	30
PLAINS					00:01			00:11	
FOREST HILLS									
ROSLINDALE									
HYDE PARK							S	00:16	30
UPHAM'S CORNER									
MORTON ST									
FAIRMOUNT									
READ					00:06			00:18	
READVILLE				S	00:08	30			
ENDICOTT				D	00:11	30			
ROUTE 128							S	00:21	45
JUNCTION								00:23	
CANTON JCT							S	00:26	30
CANTON CENTER									
STOUGHTON									
SHARON							S	00:31	45
MANSFIELD							S	00:39	45
HOLDEN								00:44	
ATT							S	00:48	45
SOUTH ATTLEBORO							S	00:56	30
ORM								01:03	
PROVIDENCE							D	01:06	30



Appendix

South Coast Rail Network Simulation Analysis	Page 92
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
Old Colony Line  
Page 2 of 6

Station Code:	74			36			8			38			76			10			40		
	Stop	Time	Dwell																		
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:52	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Station Code:	40			78			764			80			42			14			82		
	Stop	Time	Dwell																		
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46								N	12:57							
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

Appendix

South Coast Rail Network Simulation Analysis	Page 93
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
Old Colony Line  
Page 3 of 6

Station Code:	78			12			60			80			42			14			82		
	Stop	Time	Dwell																		
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30				D	11:51	30	D	12:32	30
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04				12:44
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05				12:45
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:46	300	D	12:07	300	D	12:48	300

Station Code:	62			16			44			64			81Q			43Q			766		
	Stop	Time	Dwell																		
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

Appendix

South Coast Rail Network Simulation Analysis	Page 94
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
Old Colony Line  
Page 4 of 6

Station Code:	62			16			44			84			64			18			86		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell									
MIDDLEBOROUGH				S	13:08	30										S	15:25	30			
BRIDGEWATER				S	13:18	30										S	15:35	30			
CAMPELLO				S	13:26	30										S	15:43	30			
BROCKTON				S	13:30	30										S	15:47	30			
MONTELLO				S	13:33	30										S	15:50	30			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30			D	15:05	30	D	16:03	30				
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21				16:41
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22				16:43
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:26	300	D	16:24	300	D	16:46	300

Station Code:	18			45Q			86			48			47Q			87Q			23Q		
	Stop	Time	Dwell																		
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

Appendix

South Coast Rail Network Simulation Analysis	Page 95
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
Old Colony Line  
Page 5 of 6

Station Code:	49			20			88			22			52			90			54			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
MIDDLEBOROUGH				S	16:54	30				S	17:57	30										
BRIDGEWATER				S	17:04	30				D	18:10	30										
CAMPELLO				D	17:11	30				D	18:18	30										
BROCKTON				D	17:15	30				D	18:22	30										
MONTELLO				D	17:18	30				D	18:26	30										
HOLBROOK/RANDOLPH				D	17:23	30				S	18:32	30										
SOUTH WEYMOUTH	S	16:31	30										S	19:03	30					S	20:17	30
BRAINTREE	D	16:38	30	D	17:31	30							D	19:11	30					D	20:25	30
GREENBUSH PUTIN							N	18:05							N	19:46						
QUINCY CENTER							D	18:21	30						D	19:52	30					
JFK/UMASS																						
BROADWAY-CABOT		16:56			18:03			18:32			18:54			19:26			20:02				20:43	
TOWER 1		18:57			18:04			18:33			18:55			19:27			20:03				20:44	
SOUTH STATION	D	18:59	300	D	18:06	300	D	18:34	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300	

Station Code:	49Q			20			88			22			52			90			54				
	Stop	Time	Dwell																				
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300		
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26				21:31		
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27				21:32		
JFK/UMASS							S	18:48	30	S	19:03	30		S	20:13	30	S	20:38	30		S	21:36	30
QUINCY CENTER							N	18:51						S	20:21	30	N	20:41					
GREENBUSH PUTIN																							
BRAINTREE	S	18:33	60							S	19:47	30								S	21:48	30	
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30								D	21:55	30	
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30								
MONTELLO							S	19:20	30				S	20:39	30								
BROCKTON							S	19:23	30				S	20:42	30								
CAMPELLO							S	19:27	30				S	20:46	30								
BRIDGEWATER							D	19:35	30				D	20:54	30								
MIDDLEBOROUGH							D	19:48	30				D	21:05	30								

Appendix

South Coast Rail Network Simulation Analysis	Page 96
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 No-Build Operating Plan  
Old Colony Line  
Page 6 of 6

Station Code:	Train: 92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Station Code:	Prev Trn: 92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			





MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
 NEC and Dorchester Branch  
 Page 3 of 17

Station Code:	746			602			1994			708			806			604			698NB					
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell												
PROVIDENCE												S	06:33	60										
ORM												S	06:34	60										
SOUTH ATTLEBORO												S	06:42	60										
ATT												S	06:52	120										
MANSFIELD												S	07:04	120										
SHARON												S	07:13	120										
WHALES TOOTH																								
KINGS HIGHWAY							S	06:04	60															
FALL RIVER							S	06:12	60															
FREETOWN								06:23																
CP B40							S	06:25	60															
TAUNTON DEPOT							S	06:30	60															
DEAN ST							S	06:39	60															
RAY							S	06:39	60															
EASTON VILLAGE							S	06:47	60															
NORTH EASTON							S	06:51	60															
STOUGHTON							S	06:55	60															
CANTON CENTER							S	07:04	60															
CANTON JCT							S	07:08	60															
JUNCTION								07:09						S	07:19									
ROUTE 128								07:14	120				S	07:24	120									
ENDICOTT										S	07:18	60												
READVILLE	S	07:06	60							S	07:21	60												
READ								07:18				07:22												
FAIRMOUNT	S	07:09	60									07:28												
MORTON ST	D	07:13	60																					
UPHAM'S CORNER	D	07:19	60																					
HYDE PARK							S	07:19	60											S	07:35	30		
ROSLINDALE							S	07:19	60											S	07:38	30		
FOREST HILLS																								
PLAINS								07:20				07:29			07:33						07:39			
RUG							S	07:23	60			S	07:33	60						S	07:42	30		
BACK BAY							D	07:27	60			D	07:37	60						S	07:46	30		
COV								07:28					07:38								07:47			
BROADWAY-CABOT																								
TOWER 1		07:27						07:31													07:49			
SOUTH STATION	D	07:30	300	D	07:32	300	D	07:33	300	D	07:41	300	D	07:44	300	D	07:45	300	D	07:46	300	D	07:51	300

Station Code:	34			1992			804			602			1998NB			832			508			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
TOWER 1	S	07:40	300	S	07:43	300	S	07:50	300	S	07:55	300	S	08:10	300	S	08:30	300	S	08:40	300	
BROADWAY-CABOT		07:42			07:44			07:51			07:58			08:11			08:31			08:41		
COV		07:44											08:12									
BACK BAY					07:47			07:54			07:58					08:34				08:42		
RUG					S	07:48	30	S	07:55	30	S	08:00	30			S	08:35	30	S	08:45	30	
PLAINS								S	07:58	30					S	08:38	30					
FOREST HILLS						07:51			08:02			08:03				08:41				08:50		
ROSLINDALE																						
HYDE PARK																				D	08:59	30
UPHAM'S CORNER	D	07:50	30											D	08:20	30						
MORTON ST	D	07:56	30											D	08:26	30						
FAIRMOUNT	D	08:00	30											D	08:30	30						
READ						07:55			08:06			08:11				08:45						
READVILLE	D	08:04	30								D	08:14	30	D	08:34	30						
ENDICOTT	D	08:08	30								D	08:18	30									
ROUTE 128					S	08:00	45	S	08:10	45						S	08:49	45				
JUNCTION						08:01			08:11							08:50						
CANTON JCT					S	08:06	30	S	08:15	30					S	08:54	30					
CANTON CENTER					S	08:09	30															
STOUGHTON					S	08:17	30															
NORTH EASTON					S	08:23	30															
EASTON VILLAGE					S	08:27	30															
RAY					S	08:35	30															
DEAN ST					S	08:44	30															
TAUNTON DEPOT					S	08:49	30															
CP B40						08:51																
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY					S	09:07	30															
WHALES TOOTH					D	09:12	30															
SHARON																				S	09:02	45
MANSFIELD									S	08:28	45				S	09:10	45					
HOLDEN									08:36							09:15						
ATT									D	08:39	45				S	09:19	45					
SOUTH ATTLEBORO															S	09:26	30					
ORM																09:34						
PROVIDENCE															D	09:35	30					









MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
 NEC and Dorchester Branch  
 Page 8 of 17

Station Code:	712		610		1910		754		814		1912		766					
	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time				
PROVIDENCE									S	09:32	30							
ORM									S	09:33	30							
SOUTH ATTLEBORO									S	09:44	30							
ATT									S	09:51	45							
MANSFIELD									S	09:59	45							
SHARON									S	10:08	45							
WHALES TOOTH											S	09:43	30					
KINGS HIGHWAY											S	09:48	30					
FALL RIVER					S	08:49	60											
FREETOWN					S	08:57	60											
CP B40						09:08						10:04						
TAUNTON DEPOT					S	09:10	60				S	10:06	30					
DEAN ST					S	09:15	60				S	10:11	30					
RAY					S	09:24	60				S	10:20	30					
EASTON VILLAGE					S	09:32	60				S	10:28	30					
NORTH EASTON					S	09:36	60				S	10:32	30					
STOUGHTON					S	09:41	30				S	10:39	30					
CANTON CENTER					S	09:43	30				S	10:45	30					
CANTON JCT					S	09:52	30		S	10:15	30	S	10:49	30				
JUNCTION						09:53					10:16		10:50					
ROUTE 128						09:57	45		S	10:20	45	S	10:56	45				
ENDICOTT	S	09:44	30															
READVILLE	S	09:47	30					S	09:55	30				S	11:03	30		
READ		09:48				10:00				10:24		10:59			D	11:06	30	
FAIRMOUNT								D	09:58	30					D	11:10	30	
MORTON ST								D	10:02	30					D	11:10	30	
UPHAM'S CORNER								D	10:08	30					D	11:16	30	
HYDE PARK						S	10:02	30		S	10:25	30	S	11:03	30			
ROSLINDALE					S	10:02	30											
FOREST HILLS						09:59	30											
PLAINS		09:55				10:03		10:07			10:30		11:06					
RUG	S	09:59	30	S	10:07	30				S	10:35	30						
BACK BAY	S	10:03	30	S	10:11	30	S	10:12	30		S	10:39	30	S	11:12	30		
COV		10:04			10:12			10:14			10:40		11:13					
BROADWAY-CABOT																		
TOWER 1		10:07			10:15			10:15			10:43		11:16			11:23		
SOUTH STATION	D	10:08	300	D	10:16	300	D	10:17	300	D	10:19	300	D	10:44	300	D	11:27	300

Station Code:	1989Q		818		762		764		718		1988		816				
	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time			
SOUTH STATION	S	14:49	300	S	15:00	300	S	15:20	300	S	15:44	300	S	15:49	300		
TOWER 1		14:50			15:01			15:21			15:45			16:01			
BROADWAY-CABOT								15:22			15:46						
COV		14:51			15:02					15:49			16:04				
BACK BAY	S	14:54	30	S	15:05	30			S	15:50	30	S	15:54	30	S	16:05	60
RUG	S	14:57	30	S	15:08	30			S	15:53	30	S	15:57	30	S	16:08	60
PLAINS	S	15:00			15:12					15:56			16:01			16:12	
FOREST HILLS					S	15:13	30								S	16:13	60
ROSLINDALE					D	15:18	30								D	16:18	60
HYDE PARK	S	15:05	30								S	16:05	30				
UPHAM'S CORNER						D	15:30	30	S	15:54	30						
MORTON ST						D	15:38	30		16:00	30						
FAIRMOUNT						D	15:40	30		16:04	30						
READ		15:07								16:01			16:07				
READVILLE						D	15:44	30	D	16:08	30						
ENDICOTT																	
ROUTE 128	S	15:10	45								S	16:11	45				
JUNCTION		15:11								16:05			16:12				
CANTON JCT	S	15:14	30								S	16:18	30				
CANTON CENTER	S	15:17	30								S	16:21	30				
STOUGHTON	S	15:26	30								S	16:30	30				
NORTH EASTON	S	15:32	30								S	16:36	30				
EASTON VILLAGE	S	15:38	30								S	16:40	30				
RAY	S	15:44	30								S	16:48	30				
DEAN ST	S	15:53	30								S	16:57	30				
TAUNTON DEPOT	S	15:58	30								S	17:02	30				
CP B40		16:00										17:04					
FREETOWN	S	16:11	30								S	17:15	30				
FALL RIVER	S	16:19	30								S	17:23	30				
KINGS HIGHWAY																	
WHALES TOOTH																	
SHARON										S	16:12	45					
MANSFIELD										S	16:21	45					
HOLDEN											16:29						
ATT										S	16:31	45					
SOUTH ATTLEBORO										S	16:37	30					
ORM											16:45						
PROVIDENCE										D	16:46	30					

Appendix

South Coast Rail Network Simulation Analysis	Page 105
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 9 of 17

Station Code:	612			714			518			758			816			716			520			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
PROVIDENCE													S	11:40	30							
ORM														11:41								
SOUTH ATTLEBORO													S	11:50	30							
ATT													S	12:00	45							
MANSFIELD													S	12:08	45							
SHARON													S	12:16	45							
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER																						
FREETOWN																						
CP B40																						
TAUNTON DEPOT																						
DEAN ST																						
RAY																						
EASTON VILLAGE																						
NORTH EASTON																						
STOUGHTON																						
CANTON CENTER																						
CANTON JCT													S	12:23	30							
JUNCTION														12:24								
ROUTE 128													S	12:28	45							
ENDICOTT				S	11:26	30				S	12:11	30				S	12:46	30				
READVILLE				S	11:29	30										S	12:49	30				
READ					11:30												12:50					
FAIRMOUNT										D	12:14	30										
MORTON ST										D	12:18	30										
UPHAM'S CORNER										D	12:24	30										
HYDE PARK	S	11:17	30										S	12:33	30							
ROSLINDALE	S	11:20	30																			
FOREST HILLS																						
PLAINS	S	11:21			11:37											12:38			12:56			
RUG	S	11:24	30	S	11:39	30							S	12:43	30	S	12:57	30				
BACK BAY	S	11:28	30	S	11:43	30	S	11:59	30				S	12:48	30	S	13:01	30	S	13:09	30	
COV					11:45			12:00									13:02				13:10	
BROADWAY-CABOT																						
TOWER 1	S	11:32			11:47								D	12:31								
SOUTH STATION	D	11:33	300	D	11:48	300	D	12:05	300	D	12:35	300	D	12:52	300	D	13:05	300	D	13:15	300	

Station Code:	1917Q			522			715Q			1988			699NBQ			524			899NBQ				
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell		
SOUTH STATION	S	16:01	300	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:28	300		
TOWER 1		16:02						16:11						16:24							16:29		
BROADWAY-CABOT																							
COV		16:05			16:00			16:14			16:21			16:27			16:31				16:32		
BACK BAY	S	16:06	60	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:33	60		
RUG	S	16:09	60				S	16:19	60	S	16:26	60	S	16:32	60				S	16:36	60		
PLAINS								16:21			16:28			16:36						16:39			
FOREST HILLS													S	16:37	60								
ROSLINDALE													D	16:40	60								
HYDE PARK	S	16:17	60							S	16:32	60											
UPHAM'S CORNER																							
MORTON ST																							
FAIRMOUNT																							
READ		16:19						16:27			16:35										16:43		
READVILLE								S	16:29	60													
ENDICOTT								D	16:32	60													
ROUTE 128	S	16:23	120							S	16:40	120											
JUNCTION		16:24									16:41										16:47		
CANTON JCT	S	16:29	60								16:47	60											
CANTON CENTER	S	16:32	60								16:50	60											
STOUGHTON	N	16:41								N	16:59												
NORTH EASTON	S	16:47	60							S	17:05	60											
EASTON VILLAGE	S	16:51	60							S	17:09	60											
RAY	S	16:59	60							S	17:17	60											
DEAN ST	S	17:11	60							S	17:26	60											
TAUNTON DEPOT	S	17:16	60							S	17:31	60											
CP B40		17:18									17:33												
FREETOWN											S	17:44	60										
FALL RIVER											S	17:52	60										
KINGS HIGHWAY	S	17:34	60																				
WHALES TOOTH	D	17:39	60																				
SHARON																					S	16:54	120
MANSFIELD																					S	17:03	120
HOLDEN																						17:13	
ATT																					S	17:14	120
SOUTH ATTLEBORO																					S	17:23	60
ORM																						17:31	
PROVIDENCE																					D	17:32	60







Appendix

South Coast Rail Network Simulation Analysis	Page 109
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 13 of 17

Station Code:	770			794			772			1920			622			528			822				
	Stop	Time	Dwell																				
PROVIDENCE																			S	17:22	30		
ORM																			S	17:23			
SOUTH ATTLEBORO																			S	17:31	30		
ATT																			S	17:44	45		
MANSFIELD																			S	17:53	45		
SHARON																			S	18:01	45		
WHALES TOOTH																							
KINGS HIGHWAY										S	16:46	30											
FALL RIVER										S	16:54	30											
FREETOWN											17:05												
CP B40																							
TAUNTON DEPOT										S	17:07	30											
DEAN ST										S	17:12	30											
RAY										S	17:22	30											
EASTON VILLAGE										S	17:30	30											
NORTH EASTON										S	17:37	30											
STOUGHTON										S	17:44	30											
CANTON CENTER										S	17:50	30											
CANTON JCT										S	17:54	30								S	18:08	30	
JUNCTION																						18:09	
ROUTE 128										S	18:01	45								S	18:13	45	
ENDICOTT				D	17:41	30																	
READVILLE	S	17:35	30					S	17:55	30													
READ											18:04											18:17	
FAIRMOUNT	D	17:38	30					D	17:58	30													
MORTON ST	D	17:42	30					D	18:02	30													
UPHAM'S CORNER	D	17:48	30					D	18:08	30													
HYDE PARK										S	18:08	30									S	18:20	30
ROSLINDALE																							
FOREST HILLS													S	18:14	30								
PLAINS											18:11			18:15								18:25	
RUG																							
BACK BAY										S	18:17	30	S	18:21	30	S	18:24	30	S	18:29	30		
COV											18:18			18:22			18:25					18:30	
BROADWAY-CABOT					18:07																		
TOWER 1		17:54							18:14					18:25								18:33	
SOUTH STATION	D	17:59	300	D	18:08	300	D	18:19	300	D	18:27	300	D	18:26	300	D	18:30	300	D	18:34	300		

Station Code:	1997Q			620			773Q			529Q			723Q			819Q			794			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	17:56	300	S	18:03	300	S	18:09	300	S	18:15	300	S	18:15	300	S	18:22	300	S	18:27	300	
TOWER 1		17:57						18:10						18:16			18:23					18:28
BROADWAY-CABOT								18:11														
COV		18:00			18:07						18:10			18:10			18:26					18:31
BACK BAY	S	18:02	60	S	18:09	60				S	18:21	60	S	18:20	60	S	18:27	60	S	18:32	60	
RUG	S	18:07	60										S	18:24	60	S	18:31	60	S	18:36	60	
PLAINS		18:09												18:27			18:34					18:40
FOREST HILLS																				S	18:41	60
ROSLINDALE																				D	18:44	60
HYDE PARK																						
UPHAM'S CORNER								S	18:20	60												
MORTON ST								S	18:27	60												
FAIRMOUNT								S	18:32	60												
READ		18:13																				
READVILLE								D	18:36	60					18:31			18:38				
ENDICOTT														S	18:32	60						
ROUTE 128													D	18:36	60							
JUNCTION	S	18:19	120													S	18:41	120				
CANTON JCT		18:20															18:42					
CANTON CENTER	S	18:25	60																			
STOUGHTON	S	18:28	60																			
NORTH EASTON	S	18:37	60																			
EASTON VILLAGE	S	18:43	60																			
RAY	S	18:47	60																			
DEAN ST	S	18:55	60																			
TAUNTON DEPOT	S	19:04	60																			
CP B40	S	19:09	60																			
FREETOWN	S	19:11																				
FALL RIVER	S	19:22	60																			
KINGS HIGHWAY	S	19:30	60																			
WHALES TOOTH																						
SHARON																			S	18:49	120	
MANSFIELD																			S	18:58	120	
HOLDEN																						19:05
ATT																			S	19:08	120	
SOUTH ATTLEBORO																			S	19:15	60	
ORM																						19:22
PROVIDENCE																			D	19:23	60	





MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 16 of 17

Station Code:	826		1928		630		726		780		1930		632		
	Stop	Time	Stop	Time	Stop	Time									
PROVIDENCE	S	19:53													
ORM	S	19:54													
SOUTH ATTLEBORO	S	20:04	S	20:45											
ATT	S	20:14	S	20:45											
MANSFIELD	S	20:22	S	20:45											
SHARON	S	20:30	S	20:45											
WHALES TOOTH											S	20:38	S	20:38	
KINGS HIGHWAY											S	20:43	S	20:43	
FALL RIVER			S	19:45	S	20:06									
FREETOWN			S	19:53	S	20:11									
CP B40				20:04								20:59			
TAUNTON DEPOT			S	20:06	S	20:20					S	21:01	S	21:01	
DEAN ST			S	20:11	S	20:20					S	21:06	S	21:06	
RAY			S	20:20	S	20:30					S	21:15	S	21:15	
EASTON VILLAGE			S	20:28	S	20:30					S	21:23	S	21:23	
NORTH EASTON			S	20:32	S	20:30					S	21:27	S	21:27	
STOUGHTON			S	20:39	S	20:30					S	21:34	S	21:34	
CANTON CENTER			S	20:45	S	20:45					S	21:40	S	21:40	
CANTON JCT	S	20:37	S	20:49	S	20:50					S	21:44	S	21:44	
JUNCTION	S	20:38	S	20:50							S	21:45			
ROUTE 128	S	20:42	S	20:56	S	20:56					S	21:51	S	21:51	
ENDICOTT							S	21:27	S	21:23					
READVILLE									S	21:23					
READ		20:46		20:59				21:30			21:54				
FAIRMOUNT									D	21:26					
MORTON ST									D	21:30					
UPHAM'S CORNER									D	21:36					
HYDE PARK	S	20:49	S	21:03	S	21:22	S	21:22			S	21:58	S	22:30	
ROSLINDALE					S	21:25	S	21:25					S	22:33	
FOREST HILLS					S	21:26		21:36					S	22:34	
PLAINS		20:54		21:06								22:01		S	22:37
RUG					S	21:29	S	21:29						S	22:37
BACK BAY	S	20:58	S	21:12	S	21:33	S	21:40	S	21:40		S	22:07	S	22:41
COV		20:59		21:13		21:34		21:41				22:08		S	22:42
BROADWAY-CABOT															
TOWER 1		21:02		21:16		21:37		21:44				21:42			22:44
SOUTH STATION	D	21:03	D	21:17	D	21:38	D	21:45	D	21:47	D	22:12	D	22:45	

Station Code:	1928		798		628		772		634		780		726	
	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time
SOUTH STATION	S	20:55	S	21:05	S	21:15	S	21:57	S	22:20	S	22:25	S	22:30
TOWER 1	S	20:56	S	21:06	S	21:16	S	21:58	S	22:20	S	22:26	S	22:31
BROADWAY-CABOT							21:59							
COV		20:57		21:07		21:17			S	22:24		22:27		22:32
BACK BAY	S	21:00	S	21:10	S	21:20			S	22:26	S	22:30	S	22:35
RUG	S	21:03	S	21:13	S	21:23					S	22:33	S	22:38
PLAINS	S	21:06	S	21:17	S	21:27								22:42
FOREST HILLS					S	21:28							S	22:43
ROSLINDALE					D	21:31							D	22:46
HYDE PARK	S	21:11	S	21:23							S	22:43		
UPHAM'S CORNER							D	22:07						
MORTON ST							D	22:13						
FAIRMOUNT							D	22:17						
READ		21:13		21:25							22:45			
READVILLE							D	22:21						
ENDICOTT														
ROUTE 128	S	21:16	S	21:26	S	21:36					S	22:48	S	22:50
JUNCTION	S	21:17	S	21:30										
CANTON JCT	S	21:20	S	21:33							S	22:53		
CANTON CENTER	S	21:23												
STOUGHTON	S	21:32												
NORTH EASTON	S	21:38												
EASTON VILLAGE	S	21:42												
RAY	S	21:50												
DEAN ST	S	21:59												
TAUNTON DEPOT	S	22:04												
CP B40		22:06												
FREETOWN														
FALL RIVER														
KINGS HIGHWAY	S	22:22												
WHALES TOOTH	D	22:27												
SHARON			S	21:39	S	21:47					S	22:59	S	23:07
MANSFIELD			S	21:52									S	23:13
HOLDEN					S	21:55							S	23:15
ATT			S	21:55	S	22:02					S	23:22	S	23:22
SOUTH ATTLEBORO			S	22:02	S	22:09					S	23:29	S	23:29
ORM														
PROVIDENCE			D	22:11	D	22:11					D	23:32	D	23:32

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 17 of 17

Station Code:	782			828			728			730			538			540			
	Stop	Time	Dwell																
PROVIDENCE				S	21:47	30													
ORM					21:48														
SOUTH ATTLEBORO				S	21:57	30													
ATT				S	22:13	45													
MANSFIELD				S	22:22	45													
SHARON				S	22:29	45													
WHALES TOOTH																			
KINGS HIGHWAY																			
FALL RIVER																			
FREETOWN																			
CP B40																			
TAUNTON DEPOT																			
DEAN ST																			
RAY																			
EASTON VILLAGE																			
NORTH EASTON																			
STOUGHTON																			
CANTON CENTER																			
CANTON JCT																			
JUNCTION					22:30														
ROUTE 128				S	22:40	45													
ENDICOTT							D	22:47	30		D	00:20	30						
READVILLE	S	22:31	30																
READ					22:43			22:50			00:23								
FAIRMOUNT	D	22:34	30																
MORTON ST	D	22:38	30																
UPHAM'S CORNER	D	22:44	30																
HYDE PARK				S	22:45	30													
ROSLINDALE																			
FOREST HILLS																			
PLAINS					22:50			22:57			00:31								
RUG																			
BACK BAY				S	22:55	30	S	23:01	30	S	00:36	30	S	01:17	30	S	01:24	30	
COV					22:58			23:02			00:37			01:18			01:25		
BROADWAY-CABOT																			
TOWER 1		22:50			22:59			23:05			00:40								
SOUTH STATION	D	22:55	300	D	23:00	300	D	23:06	300	D	00:41	300	D	01:23	300	D	01:30	300	

Station Code:	729			536			632			828		
	Stop	Time	Dwell									
SOUTH STATION	S	22:35	300	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1		22:36						23:51			00:00	
BROADWAY-CABOT												
COV		22:37			23:29			23:52			00:01	
BACK BAY	S	22:40	30	S	23:31	30	S	23:55	30	S	00:04	30
RUG	S	22:43	30				S	23:58	30	S	00:07	30
PLAINS		22:46						00:01			00:11	
FOREST HILLS												
ROSLINDALE												
HYDE PARK	S	22:52	30							S	00:16	30
UPHAM'S CORNER												
MORTON ST												
FAIRMOUNT												
READ		22:54						00:06			00:18	
READVILLE	S	22:55	30				S	00:08	30			
ENDICOTT	D	23:00	30				D	00:11	30			
ROUTE 128										S	00:21	45
JUNCTION											00:23	
CANTON JCT										S	00:26	30
CANTON CENTER												
STOUGHTON												
NORTH EASTON												
EASTON VILLAGE												
RAY												
DEAN ST												
TAUNTON DEPOT												
CP B40												
FREETOWN												
FALL RIVER												
KINGS HIGHWAY												
WHALES TOOTH												
SHARON										S	00:31	45
MANSFIELD										S	00:39	45
HOLDEN											00:44	
ATT										S	00:48	45
SOUTH ATTLEBORO										S	00:56	30
ORM											01:03	
PROVIDENCE										D	01:06	30

Appendix

10.4.5. MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option – Whittenton Variant

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
Whittenton Variant  
(Page 1 of 3)

Station Code:	Train:	1992			1902			1904			1994			1996NB			1906			1908			
		Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
WHALES TOOTH	S	05:17	30				S	05:49	60				S	06:18	60				S	07:21	60		
KINGS HIGHWAY	S	05:22	30				S	05:54	60				S	06:23	60				S	07:26	60		
FALL RIVER				S	05:31	60					S	05:59	60			S	06:52	60					
FREETOWN				S	05:39	60					S	06:07	60			S	07:00	60					
TAUNTON DEPOT	S	05:40	30				S	06:12	60				S	06:41	60	S	07:13	60	S	07:44	60		
DOWNTOWN TAUNTON	S	05:45		S	05:57		S	06:17		S	06:25		S	06:46		S	07:18		S	07:49			
RAY	S	05:59	30	S	06:11	60	S	06:31	60	S	06:39	60	S	07:00	60	S	07:32	60	S	08:03	60		
EASTON VILLAGE	S	06:07	30	S	06:19	60	S	06:39	60	S	06:47	60	S	07:08	60	S	07:40	60	S	08:11	60		
NORTH EASTON	S	06:11	30	S	06:23	60	S	06:43	60	S	06:51	60	S	07:12	60	S	07:44	60	S	08:15	60		
STOUGHTON	S	06:16	30	S	06:28	60	S	06:48	60	S	06:56	60	S	07:17	60	S	07:48	60	S	08:21	60		
CANTON CENTER	S	06:24	30	S	06:36	60	S	06:56	60	S	07:04	60	S	07:26	60	S	07:57	60	S	08:28	60		
CANTON JCT	S	06:28	30	S	06:39	60	S	07:00	60	S	07:08	60	S	07:29	60	S	08:01	60	S	08:33	60		
JUNCTION		06:29			06:40			07:01			07:09			07:30			08:02			08:34			
ROUTE 128	S	06:34	45	S	06:44	120	S	07:06	120	S	07:14	120	S	07:34	120	S	08:07	120	S	08:39	120		
READ		06:38			06:47			07:10			07:18			07:38			08:10			08:41			
HYDE PARK	S	06:39	30	S	06:48	30	S	07:11	60	S	07:19	60	S	07:38	60	S	08:13	60	S	08:43	60		
PLAINS		06:45			06:53			07:17			07:25			07:41			08:19			08:51			
RUG																S	08:23	60					
BACK BAY	D	06:48	30	D	06:57	30	D	07:20	60	D	07:28	60	S	07:48	60	D	08:27	60	D	08:55	60		
COV		06:49			06:58			07:21			07:29			07:49			08:28			08:58			
TOWER 1		06:52			07:01			07:24			07:32			07:50			08:31			08:59			
SOUTH STATION	D	06:53	300	D	07:02	300	D	07:25	300	D	07:33	300	D	07:52	300	D	08:32	300	D	09:00	300		

Station Code:	Prev Trn:	Train:	1992			1906			1995Q			1911Q			1996			1912				
			5501	1907	1909	1909	1995	1995	1911	1911	1981	1981	1983									
TOWER 1		S	04:45	300	S	07:43	300	S	08:50	300	S	08:55	300	S	09:49	300	S	10:48	300	S	11:44	300
COV						07:44			08:51			09:01			09:50			10:47			11:45	
BACK BAY		N	04:50		S	07:48	30	S	08:54	30	S	09:04	30	S	09:54	30	S	10:51	30	S	11:49	30
PLAINS						07:51			08:58			09:08			09:57	30	S	10:54	30	S	11:52	30
HYDE PARK														S	10:00			10:57			11:55	
READ						07:55			09:02			09:12			10:05	30	S	11:02	30	S	12:00	30
ROUTE 128						08:00	45	S	09:07	45	S	09:17	45	S	10:07	45	S	11:07	45	S	12:05	45
JUNCTION						08:01			09:08			09:18			10:07			11:04			12:02	
CANTON JCT						08:06	30	S	09:13	30	S	09:23	30	S	10:14	30	S	11:11	30	S	12:09	30
CANTON CENTER						08:09	30	S	09:16	30	S	09:26	30	S	10:17	30	S	11:14	30	S	12:12	30
STOUGHTON						08:17	30	D	09:24	30	D	09:34	30	S	10:26	30	S	11:23	30	S	12:21	30
NORTH EASTON						08:23	30	S	09:30	30	S	09:40	30	S	10:32	30	S	11:29	30	S	12:27	30
EASTON VILLAGE						08:27	30	S	09:34	30	S	09:44	30	S	10:36	30	S	11:33	30	S	12:31	30
RAY						08:35	30	S	09:42	30	S	09:52	30	S	10:44	30	S	11:41	30	S	12:39	30
DOWNTOWN TAUNTON						08:49			09:56			10:06			10:58			11:55			12:53	
TAUNTON DEPOT						08:54	30	S	10:01	30	S	10:11	30	D	11:03	30	S	12:00	30	S	12:58	30
FREETOWN									10:14	30							S	12:13	30			
FALL RIVER									10:22	30							S	12:21	30			
KINGS HIGHWAY						S	09:12	30				S	10:29	30						S	13:16	30
WHALES TOOTH						D	09:17	30				D	10:34	30						D	13:21	30



Appendix

South Coast Rail Network Simulation Analysis	Page 116
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
Whittenton Variant  
(Page 2 of 3)

Station Code:	1996			1910			1912			1984			1986			1988			1976			
	Stop	Time	Dwell																			
WHALES TOOTH							S	09:38	30							S	13:33	30				
KINGS HIGHWAY							S	09:43	30							S	13:38	30				
FALL RIVER	S	07:59	30	S	08:44	60							S	12:40	30				S	14:36	30	
FREETOWN	S	08:07	30	S	08:52	60							S	12:48	30				S	14:44	30	
TAUNTON DEPOT	S	08:20	30	S	09:05	60	S	10:01	30	S	12:01	30	S	13:01	30	S	13:58	30	S	14:57	30	
DOWNTOWN TAUNTON	S	08:25		S	09:10		S	10:06		S	12:06		S	13:06		S	14:01		S	15:02		
RAY	S	08:39	30	S	09:24	60	S	10:20	30	S	12:20	30	S	13:20	30	S	14:15	30	S	15:16	30	
EASTON VILLAGE	S	08:47	30	S	09:32	60	S	10:28	30	S	12:28	30	S	13:28	30	S	14:23	30	S	15:24	30	
NORTH EASTON	S	08:51	30	S	09:36	60	S	10:32	30	S	12:32	30	S	13:32	30	S	14:27	30	S	15:28	30	
STOUGHTON	S	08:56	30	S	09:41	30	S	10:39	30	S	12:39	30	S	13:39	30	S	14:34	30	S	15:35	30	
CANTON CENTER	N	09:04		S	09:49	30	S	10:45	30	S	12:45	30	S	13:45	30	S	14:40	30	S	15:41	30	
CANTON JCT	S	09:08	30	S	09:52	30	S	10:49	30	S	12:49	30	S	13:49	30	S	14:44	30	S	15:45	30	
JUNCTION		09:09			09:53			10:50			12:50			13:50			14:45			15:46		
ROUTE 128	S	09:14	45	S	09:57	45	S	10:56	45	S	12:56	45	S	13:56	45	S	14:51	45	S	15:52	45	
READ		09:18			10:00			10:59			12:59			13:59			14:54			15:55		
HYDE PARK	S	09:19	30	S	10:02	30	S	11:03	30	S	13:03	30	S	14:03	30	S	14:58	30	S	15:59	30	
PLAINS		09:25			10:07			11:06			13:06			14:06			15:01			16:02		
RUG																						
BACK BAY	S	09:28	30	S	10:12	30	S	11:12	30	S	13:12	30	S	14:12	30	S	15:07	30	S	16:04	30	
COV		09:29			10:14			11:13			13:13			14:13			15:08			16:05		
TOWER 1		09:32			10:15			11:16			13:16			14:16			15:11			16:08		
SOUTH STATION	D	09:33	300	D	10:17	300	D	11:17	300	D	13:17	300	D	14:17	300	D	15:12	300	D	16:09	300	

Station Code:	1995Q			1984			1989Q			1988			1917Q			1986			1919Q			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	12:49	300	S	13:49	300	S	14:49	300	S	15:49	300	S	16:01	300	S	16:17	300	S	16:50	300	
TOWER 1		12:50			13:50			14:50			15:50			16:02			16:18			16:51		
COV		12:51			13:51			14:51			15:51			16:05			16:21			16:54		
BACK BAY	S	12:54	30	S	13:54	30	S	14:54	30	S	15:54	30	S	16:06	60	S	16:22	60	S	16:55	60	
RUG	S	12:57	30	S	13:57	30	S	14:57	30	S	15:57	30	S	16:09	60	S	16:26	60	S	16:59	60	
PLAINS		13:00			14:00			15:00			16:01			16:12			16:28			17:02		
HYDE PARK	S	13:05	30	S	14:05	30	S	15:05	30	S	16:05	30	S	16:17	60	S	16:32	60				
READ		13:07			14:07			15:07			16:07			16:19			16:35			17:06		
ROUTE 128	S	13:10	45	S	14:10	45	S	15:10	45	S	16:11	45	S	16:23	120	S	16:40	120	S	17:10	120	
JUNCTION		13:11			14:11			15:11			16:12			16:24			16:41			17:11		
CANTON JCT	S	13:14	30	S	14:14	30	S	15:14	30	S	16:18	30	S	16:29	60	S	16:47	60	S	17:17	60	
CANTON CENTER	S	13:17	30	S	14:17	30	S	15:17	30	S	16:21	30	S	16:32	60	S	16:50	60	S	17:20	60	
STOUGHTON	S	13:26	30	S	14:26	30	S	15:26	30	S	16:30	30	N	16:41		N	16:59		S	17:30	60	
NORTH EASTON	S	13:32	30	S	14:32	30	S	15:32	30	S	16:36	30	S	16:47	60	S	17:05	60	S	17:36	60	
EASTON VILLAGE	S	13:36	30	S	14:36	30	S	15:36	30	S	16:40	30	S	16:51	60	S	17:09	60	S	17:40	60	
RAY	S	13:44	30	S	14:44	30	S	15:44	30	S	16:48	30	S	16:59	60	S	17:17	60	S	17:48	60	
DOWNTOWN TAUNTON	S	13:58		S	14:58		S	15:58		S	17:02		S	17:13		S	17:31		S	18:02		
TAUNTON DEPOT	S	14:03	30	S	15:03	30	S	16:03	30	S	17:07	30	S	17:18	60	S	17:36	60	S	18:07	60	
FREETOWN	S	14:16	30				S	16:16	30	S	17:20	30				S	17:49	60				
FALL RIVER	S	14:24	30				S	16:24	30	S	17:28	30				S	17:57	60				
KINGS HIGHWAY				S	15:21	30										S	17:36	60		S	18:25	60
WHALES TOOTH				D	15:26	30									D	17:41	60		D	18:30	60	

Appendix

South Coast Rail Network Simulation Analysis	Page 117
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
Whittenton Variant  
(Page 3 of 3)

Station Code:	1980			1920			1926			1922			1930		
	Stop	Time	Dwell												
WHALES TOOTH	S	15:43	30				S	18:37	60				S	20:33	30
KINGS HIGHWAY	S	15:48	30				S	18:42	60				S	20:38	30
FALL RIVER				S	16:42	30				S	19:40	30			
FREETOWN				S	16:50	30				S	19:48	30			
TAUNTON DEPOT	S	18:08	30	S	17:03	30	S	19:00	60	S	20:01	30	S	20:58	30
DOWNTOWN TAUNTON	S	18:11		S	17:08		S	19:05		S	20:06		S	21:01	
RAY	S	18:25	30	S	17:22	30	S	19:19	60	S	20:20	30	S	21:15	30
EASTON VILLAGE	S	18:33	30	S	17:30	30	S	19:27	60	S	20:28	30	S	21:23	30
NORTH EASTON	S	18:37	30	S	17:37	30	S	19:31	60	S	20:32	30	S	21:27	30
STOUGHTON	S	18:44	30	S	17:44	30	S	19:36	30	S	20:39	30	S	21:34	30
CANTON CENTER	S	18:50	30	S	17:50	30				S	20:45	30	S	21:40	30
CANTON JCT	S	18:54	30	S	17:54	30	S	19:45	30	S	20:49	30	S	21:44	30
JUNCTION		18:55			17:55			19:47			20:50			21:45	
ROUTE 128	S	17:01	45	S	18:01	45				S	20:58	45	S	21:51	45
READ		17:04			18:04			19:52			20:59			21:54	
HYDE PARK	S	17:08	30	S	18:08	30	S	19:54	30	S	21:03	30	S	21:58	30
PLAINS		17:11			18:11			19:59			21:08			22:01	
RUG															
BACK BAY	S	17:17	30	S	18:17	30	S	20:04	30	S	21:12	30	S	22:07	30
COV		17:18			18:18			20:05			21:13			22:08	
TOWER 1		17:21			18:21			20:08			21:16			22:11	
SOUTH STATION	D	17:22	300	D	18:22	300	D	20:09	300	D	21:17	300	D	22:12	300

Station Code:	1999NBQ			1921Q			1997Q			1920			922			1926		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	17:03	300	S	17:19	300	S	17:56	300	S	18:46	300	S	19:49	300	S	20:55	300
TOWER 1		17:04			17:20			17:57			18:47			19:50			20:56	
COV		17:07			17:23			18:00			18:48			19:51			20:57	
BACK BAY	S	17:08	60	S	17:24	60	S	18:02	60	S	18:51	30	S	19:54	30	S	21:00	30
RUG	S	17:12	60	S	17:28	60	S	18:07	60	S	18:54	30	S	19:57	30	S	21:03	30
PLAINS		17:15			17:31			18:09			18:57			20:00			21:06	
HYDE PARK				S	17:38	60				S	19:02	30	S	20:05	30	S	21:11	30
READ		17:19			17:40			18:13			19:04			20:07			21:13	
ROUTE 128	S	17:23	120	S	17:44	120	S	18:19	120	S	19:07	45	S	20:10	45	S	21:16	45
JUNCTION		17:24			17:45			18:20			19:08			20:11			21:17	
CANTON JCT	S	17:30	60	S	17:52	60	S	18:25	60	S	19:11	30	S	20:14	30	S	21:20	30
CANTON CENTER	S	17:33	60	S	17:56	60	S	18:28	60	S	19:14	30	S	20:17	30	S	21:23	30
STOUGHTON	S	17:42	60	S	18:05	60	S	18:37	60	S	19:23	30	S	20:26	30	S	21:32	30
NORTH EASTON	S	17:48	60	S	18:11	60	S	18:43	60	S	19:29	30	S	20:32	30	S	21:38	30
EASTON VILLAGE	S	17:52	60	S	18:15	60	S	18:47	60	S	19:33	30	S	20:36	30	S	21:42	30
RAY	S	18:00	60	S	18:23	60	S	18:55	60	S	19:41	30	S	20:44	30	S	21:50	30
DOWNTOWN TAUNTON	S	18:14		S	18:37		S	19:09		S	19:55		S	20:58		S	22:04	
TAUNTON DEPOT	S	18:19	60	S	18:42	60	S	19:14	60	S	20:00	30	S	21:03	30	S	22:09	30
FREETOWN	S	18:32	60				S	19:27	60				S	21:16	30			
FALL RIVER	S	18:40	60				S	19:35	60				S	21:24	30			
KINGS HIGHWAY				S	19:00	60				S	20:18	30				S	22:27	30
WHALES TOOTH				D	19:05	60				D	20:23	30				D	22:32	30

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option

Old Colony Line

Page 2 of 6

Station Code:	Train: 74			36			8			38			76			10			40		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Station Code:	Prev Trn: 40			78			764			80			42			14			82		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option

Old Colony Line

Page 3 of 6

Station Code:	78			12			60			90			42			14			82		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell												
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30			D	11:51	30	D	12:32	30	
JFKUMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04				12:44
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05				12:45
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:48	300	D	12:07	300	D	12:48	300

Station Code:	62			16			44			64			81Q			43Q			766		
	Stop	Time	Dwell																		
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFKUMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

Appendix

South Coast Rail Network Simulation Analysis	Page 120
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option

Old Colony Line

Page 4 of 6

Station Code:	62			16			44			84			64			18			86			
	Stop	Time	Dwell																			
MIDDLEBOROUGH				S	13:08	30										S	15:25	30				
BRIDGEWATER				S	13:18	30										S	15:35	30				
CAMPELLO				S	13:26	30										S	15:43	30				
BROCKTON				S	13:30	30										S	15:47	30				
MONTELLLO				S	13:33	30										S	15:50	30				
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30				
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30							
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	30				
GREENBUSH PUTIN										N	14:49								N	16:24		
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30	
JFKUMASS	D	12:57	30																			
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21				16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22				16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:28	300	D	16:24	300	D	16:46	300	

Station Code:	18			45Q			86			48			47Q			87Q			23Q		
	Stop	Time	Dwell																		
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFKUMASS				S	17:06	60				S	17:26	60				S	18:03	60			
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:06								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option

Old Colony Line

Page 5 of 6

Station Code:	46			20			88			22			52			90			54			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
MIDDLEBOROUGH				S	16:54	30				S	17:57	30										
BRIDGEWATER				S	17:04	30				D	18:10	30										
CAMPELLO				D	17:11	30				D	18:18	30										
BROCKTON				D	17:15	30				D	18:22	30										
MONTELLLO				D	17:18	30				D	18:26	30										
HOLBROOK/RANDOLPH				D	17:23	30				S	18:32	30										
SOUTH WEYMOUTH	S	16:31	30										S	19:03	30					S	20:17	30
BRAINTREE	D	16:38	30	D	17:31	30							D	19:11	30				D	20:25	30	
GREENBUSH PUTIN							N	18:05								N	19:46					
QUINCY CENTER							D	18:21	30						D	19:52	30					
JFKUMASS																						
BROADWAY-CABOT		16:56			18:03			18:33			18:54			19:26			20:02				20:43	
TOWER 1		16:57			18:04			18:34			18:55			19:27			20:03				20:44	
SOUTH STATION	D	16:59	300	D	18:06	300	D	18:35	300	D	18:58	300	D	19:28	300	D	20:06	300	D	20:45	300	

Station Code:	49Q			20			88			22			52			90			54					
	Stop	Time	Dwell	Stop	Time	Dwell																		
SOUTH STATION	S	19:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300			
TOWER 1		19:16			18:36			18:51			19:30			20:08			20:26				21:31			
BROADWAY-CABOT		19:17			18:37			18:52			19:31			20:09			20:27				21:32			
JFKUMASS							S	18:48	30	S	19:03	30		S	20:13	30		S	20:38	30		S	21:36	30
QUINCY CENTER							N	18:51						S	20:21	30	N	20:41						
GREENBUSH PUTIN																								
BRAINTREE	S	19:33	60							S	19:47	30									S	21:48	30	
SOUTH WEYMOUTH	D	19:40	60							D	19:54	30									D	21:55	30	
HOLBROOK/RANDOLPH								S	19:15	30				S	20:34	30								
MONTELLLO								S	19:20	30				S	20:39	30								
BROCKTON								S	19:23	30				S	20:42	30								
CAMPELLO								S	19:27	30				S	20:46	30								
BRIDGEWATER								D	19:35	30				D	20:54	30								
MIDDLEBOROUGH								D	19:48	30				D	21:06	30								

Appendix

South Coast Rail Network Simulation Analysis	Page 122
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Diesel Option  
Old Colony Line  
Page 6 of 6

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH					S	22:56	30		
MONTELLO					S	23:01	30		
BROCKTON					S	23:04	30		
CAMPELLO					S	23:08	30		
BRIDGEWATER					D	23:16	30		
MIDDLEBOROUGH					D	23:27	30		

10.4.7. MBTA 2030 Stoughton Alternative Operating Plan, Electric Option – NEC and  
Dorchester Branch

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
NEC and Dorchester Branch  
Page 1 of 17

Station Code:	800			790			500			802			702			600			1992			
	Stop	Time	Dwell																			
PROVIDENCE	S	04:56	30							S	05:31	30										
ORM		04:57									05:32											
SOUTH ATTLEBORO	S	05:06	30							S	05:41	30										
ATT	S	05:16	45							S	05:51	45										
MANSFIELD	S	05:25	45							S	06:01	45										
SHARON	S	05:33	45							S	06:10	45										
WHALES TOOTH																			S	05:29	30	
KINGS HIGHWAY																			S	05:34	30	
FALL RIVER																						
FREETOWN																				S	05:48	30
TALINTON DEPOT																				S	05:53	30
DEAN ST																				S	05:59	30
RAY																				S	06:06	30
EASTON VILLAGE																				S	06:10	30
NORTH EASTON																				S	06:16	30
STOUGHTON																				S	06:16	30
CANTON CENTER																				S	06:24	30
CANTON JCT	S	05:40	30							S	06:17	30								S	06:28	30
JUNCTION		05:42									06:18										06:29	
ROUTE 128	S	05:45	45							S	06:22	45								S	06:34	45
ENDICOTT				S	05:48	30							S	06:26	30							
READVILLE				S	05:51	30							S	06:29	30							
READ		05:48									06:25		S	06:30							06:38	
FAIRMOUNT				D	06:54	30																
MORTON ST				D	06:58	30																
UPHAM'S CORNER				D	06:04	30																
HYDE PARK	S	05:50	30							S	06:27	30								S	06:39	30
ROSLINDALE																S	06:37	30				
FOREST HILLS																S	06:40	30				
PLAINS		05:54									06:31			06:37			06:41				06:45	
RUG										S	06:37	30				S	06:44	30				
BACK BAY	D	06:02	30				S	06:30	30	D	06:41	30	D	06:43	30	D	06:48	30	D	06:48	30	
COV		06:03						06:31			06:42			06:44			06:49				06:49	
BROADWAY-CABOT					06:12																	
TOWER 1		06:06									06:45			06:47			06:51				06:52	
SOUTH STATION	D	06:07	300	D	06:15	300	D	06:36	300	D	06:46	300	D	06:48	300	D	06:52	300	D	06:53	300	

Station Code:	703			5501			501			743Q			801Q			745Q			790			
	Stop	Time	Dwell																			
SOUTH STATION	S	04:00	300	S	04:45	300	S	05:30	300	S	05:40	300	S	06:20	300	S	06:25	300	S	06:35	300	
TOWER 1		04:01									05:42			06:21			06:27				06:36	
BROADWAY-CABOT											05:44						06:29					
COV		04:02			04:49			05:34						06:23							06:39	
BACK BAY				N	04:50		S	05:36	30				S	06:25	30				S	06:40	30	
RUG													S	06:28	30							
PLAINS		04:06												06:31							06:45	
FOREST HILLS																						
ROSLINDALE																						
HYDE PARK																						
UPHAM'S CORNER											D	05:50	30			D	06:35	30				
MORTON ST											D	05:56	30			D	06:41	30				
FAIRMOUNT											D	06:00	30			D	06:45	30				
READ		04:11												06:37							06:49	
READVILLE											D	06:04	30			D	06:49	30				
ENDICOTT	D	04:18	30																			
ROUTE 128													S	06:40	45						06:53	
JUNCTION														06:41								
CANTON JCT																						
CANTON CENTER																						
STOUGHTON																						
NORTH EASTON																						
EASTON VILLAGE																						
RAY																						
DEAN ST																						
TALINTON DEPOT																						
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY																						
WHALES TOOTH																						
SHARON																	06:52	45				
MANSFIELD																	07:00	45		S	07:08	45
HOLDEN																	07:04					
ATT													S	07:09	45							
SOUTH ATTLEBORO																	07:16	30				
ORM																	07:24					
PROVIDENCE													D	07:25	30							



MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
 NEC and Dorchester Branch  
 Page 3 of 17

Station Code:	746			602			1994			706			806			504			696NB			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
PROVIDENCE													S	06:33	60							
ORM															06:34							
SOUTH ATTLEBORO													S	06:42	60							
ATT													S	06:52	120							
MANSFIELD													S	07:04	120							
SHARON													S	07:13	120							
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER							S	06:11	60													
FREETOWN							S	06:18	60													
TAUNTON DEPOT							S	06:29	60													
DEAN ST							S	06:34	60													
RAY							S	06:40	60													
EASTON VILLAGE							S	06:47	60													
NORTH EASTON							S	06:51	60													
STOUGHTON							S	06:56	60													
CANTON CENTER							S	07:04	60													
CANTON JCT							S	07:08	60													
JUNCTION							S	07:09							07:19							
ROUTE 128							S	07:14	120				S	07:24	120							
ENDICOTT										S	07:18	60										
READVILLE	S	07:06	60							S	07:21	60										
READ								07:18			07:22			07:28								
FAIRMOUNT	S	07:09	60																			
MORTON ST	D	07:13	60																			
UPHAM'S CORNER	D	07:19	60																			
HYDE PARK							S	07:19	60													
ROSLINDALE				S	07:16	60														S	07:35	30
FOREST HILLS				S	07:19	60														S	07:38	30
PLAINS								07:25			07:29			07:33								07:39
RUG				S	07:23	60				S	07:33	60										S 07:42 30
BACK BAY				D	07:27	60		D	07:28	60	D	07:37	60		D	07:40	60	S	07:40	60	S	07:46 30
COV					07:28				07:29			07:38			07:41			07:41				S 07:47 30
BROADWAY-CABOT																						
TOWER 1		07:27													07:40							07:49
SOUTH STATION	D	07:30	300	D	07:32	300	D	07:33	300	D	07:41	300	D	07:45	300	D	07:48	300	D	07:51	300	

Station Code:	34			1992			804			602			1996NB			832			508			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell										
SOUTH STATION	S	07:40	300	S	07:43	300	S	07:50	300	S	07:55	300	S	08:10	300	S	08:30	300	S	08:40	300	
TOWER 1		07:42			07:44			07:51			07:56			08:11			08:31			08:41		
BROADWAY-CABOT		07:44												08:12								
COV					07:47			07:54			07:58						08:34				08:42	
BACK BAY				S	07:48	30		S	07:55	30	S	08:00	30			S	08:35	30	S	08:45	30	
RUG							S	07:58	30						S	08:38	30					
PLAINS					07:51			08:02			08:03					08:41					08:50	
FOREST HILLS																						
ROSLINDALE																				D	08:59	30
HYDE PARK																						
UPHAM'S CORNER	D	07:50	30										D	08:20	30							
MORTON ST	D	07:56	30										D	08:26	30							
FAIRMOUNT	D	08:00	30										D	08:30	30							
READ					07:55			08:06			08:11					08:45						
READVILLE	D	08:04	30								D	08:14	30	D	08:34	30						
ENDICOTT	D	08:08	30								D	08:18	30									
ROUTE 128				S	08:00	45		S	08:10	45					S	08:49	45					
JUNCTION					08:01			08:11							S	08:50						
CANTON JCT				S	08:06	30		S	08:15	30				S	08:54	30						
CANTON CENTER				S	08:09	30																
STOUGHTON				S	08:17	30																
NORTH EASTON				S	08:22	30																
EASTON VILLAGE				S	08:26	30																
RAY				S	08:33	30																
DEAN ST				S	08:39	30																
TAUNTON DEPOT				S	08:44	30																
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY				S	08:59	30																
WHALES TOOTH				D	09:05	30																
SHARON																	S	09:02	45			
MANSFIELD								S	08:28	45				S	09:10	45						
HOLDEN								S	08:35							S	09:15					
ATT							D	08:39	45						S	09:19	45					
SOUTH ATTLEBORO															S	09:26	30					
ORM																09:34						
PROVIDENCE																D	09:35	30				









MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
 NEC and Dorchester Branch  
 Page 8 of 17

Station Code:	1910			712			610			764			814			1912			766			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell										
PROVIDENCE													S	09:32	30							
ORM														09:33								
SOUTH ATTLEBORO													S	09:41	30							
ATT													S	09:51	45							
MANSFIELD													S	09:59	45							
SHARON													S	10:08	45							
WHALES TOOTH																S	09:52	30				
KINGS HIGHWAY																S	09:57	30				
FALL RIVER	S	08:46	60																			
FREETOWN	S	08:53	60																			
TAUNTON DEPOT	S	09:04	60													S	10:11	30				
DEAN ST	S	09:09	60													S	10:16	30				
RAY	S	09:15	60													S	10:22	30				
EASTON VILLAGE	S	09:22	60													S	10:29	30				
NORTH EASTON	S	09:26	60													S	10:33	30				
STOUGHTON	S	09:31	30													S	10:39	30				
CANTON CENTER	S	09:39	30													S	10:45	30				
CANTON JCT	S	09:42	30										S	10:15	30	S	10:49	30				
JUNCTION		09:43												10:16			10:50					
ROUTE 128	S	09:47	45										S	10:20	45	S	10:56	45				
ENDICOTT				S	09:44	30																
READVILLE				S	09:47	30				S	09:55	30							S	11:03	30	
READ		09:50			09:48								10:24			10:59						
FAIRMOUNT										D	09:58	30							D	11:06	30	
MORTON ST										D	10:02	30							D	11:10	30	
UPHAM'S CORNER										D	10:08	30							D	11:16	30	
HYDE PARK	S	09:52	30										S	10:26	30	S	11:03	30				
ROSLINDALE							S	09:59	30													
FOREST HILLS							S	10:02	30													
PLAINS		09:57			09:55								10:30			11:06						
RUG				S	09:59	30	S	10:07	30				S	10:35	30							
BACK BAY	S	10:02	30	S	10:03	30	S	10:11	30				S	10:39	30	S	11:12	30				
COV		10:04			10:04			10:12					10:40			11:13						
BROADWAY-CABOT																						
TOWER 1		10:05			10:07			10:15				10:15					11:16			11:23		
SOUTH STATION	D	10:07	300	D	10:08	300	D	10:16	300	D	10:19	300	D	10:44	300	D	11:17	300	D	11:27	300	

Station Code:	1989Q			818			762			764			718			1988			616		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	14:49	300	S	15:00	300	S	15:20	300	S	15:44	300	S	15:45	300	S	15:49	300	S	16:00	300
TOWER 1		14:50			15:01			15:21			15:45			15:46			15:50			16:01	
BROADWAY-CABOT																					
COV		14:51			15:02									15:49			15:51			16:04	
BACK BAY	S	14:54	30	S	15:05	30							S	15:50	30	S	15:54	30	S	16:05	60
RUG	S	14:57	30	S	15:08	30							S	15:53	30	S	15:57	30	S	16:08	60
PLAINS		15:00			15:12									15:56			16:01			16:12	
FOREST HILLS				S	15:13	30													S	16:13	60
ROSLINDALE				D	15:16	30													D	16:16	60
HYDE PARK	S	15:05	30													S	16:05	30			
UPHAM'S CORNER							D	15:30	30	S	15:54	30									
MORTON ST							D	15:36	30		16:00	30									
FAIRMOUNT							D	15:40	30		16:04	30									
READ		15:07												16:01			16:07				
READVILLE							D	15:44	30	D	16:08	30									
ENDICOTT																					
ROUTE 128	S	15:10	45													S	16:11	45			
JUNCTION		15:11																			
CANTON JCT	S	15:14	30											16:05		S	16:12	30			
CANTON CENTER	S	15:17	30													S	16:15	30			
STOUGHTON	S	15:26	30													S	16:20	30			
NORTH EASTON	S	15:30	30													S	16:34	30			
EASTON VILLAGE	S	15:34	30													S	16:38	30			
RAY	S	15:41	30													S	16:45	30			
DEAN ST	S	15:47	30													S	16:51	30			
TAUNTON DEPOT	S	15:52	30													S	16:56	30			
FREETOWN	S	16:04	30													S	17:08	30			
FALL RIVER	S	16:12	30													S	17:16	30			
KINGS HIGHWAY																					
WHALES TOOTH																S	16:12	45			
SHARON													S	16:21	45						
MANSFIELD														16:29							
HOLDEN																					
ATT													S	16:31	45						
SOUTH ATTLEBORO													S	16:37	30						
ORM														16:45							
PROVIDENCE													D	16:46	30						

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
 NEC and Dorchester Branch  
 Page 9 of 17

Station Code:	612			714			518			768			816			716			520			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell										
PROVIDENCE													S	11:40	30							
ORM														11:41								
SOUTH ATTLEBORO													S	11:50	30							
ATT													S	12:00	45							
MANSFIELD													S	12:08	45							
SHARON													S	12:16	45							
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER																						
FREETOWN																						
TAUNTON DEPOT																						
DEAN ST																						
RAY																						
EASTON VILLAGE																						
NORTH EASTON																						
STOUGHTON																						
CANTON CENTER																						
CANTON JCT													S	12:23	30							
JUNCTION														12:24								
ROUTE 128													S	12:28	45							
ENDICOTT				S	11:26	30										S	12:48	30				
READVILLE				S	11:29	30				S	12:11	30				S	12:49	30				
READ					11:30								12:32				12:50					
FAIRMOUNT										D	12:14	30										
MORTON ST										D	12:18	30										
UPHAM'S CORNER										D	12:24	30										
HYDE PARK													S	12:33	30							
ROSLINDALE	S	11:17	30																			
FOREST HILLS	S	11:20	30																			
PLAINS		11:21			11:37									12:38			12:56					
RUG	S	11:24	30	S	11:39	30							S	12:43	30	S	12:57	30				
BACK BAY	S	11:28	30	S	11:43	30	S	11:59	30				S	12:48	30	S	13:01	30	S	13:09	30	
COV		11:29			11:45			12:00						12:49			13:02				13:10	
BROADWAY-CABOT																						
TOWER 1		11:32			11:47							12:31				12:52			13:04			
SOUTH STATION	D	11:33	300	D	11:48	300	D	12:05	300	D	12:35	300	D	12:53	300	D	13:08	300	D	13:15	300	

Station Code:	1917Q			522			715Q			1986			699NBQ			524			899NBQ			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	16:01	300	S	16:05	300	S	16:10	300	S	16:17	300	S	16:23	300	S	16:27	300	S	16:28	300	
TOWER 1		16:02			16:11			16:18			16:24			16:29			16:29			16:29		
BROADWAY-CABOT		16:05			16:09			16:14			16:21			16:27			16:31			16:32		
COV		16:06	60	S	16:11	60	S	16:15	60	S	16:22	60	S	16:28	60	S	16:33	60	S	16:33	60	
BACK BAY	S	16:09	60				S	16:19	60	S	16:26	60	S	16:32	60				S	16:36	60	
PLAINS		16:12						16:21			16:28			16:36						16:39		
FOREST HILLS													S	16:37	60							
ROSLINDALE													D	16:40	60							
HYDE PARK	S	16:17	60							S	16:32	60										
UPHAM'S CORNER																						
MORTON ST																						
FAIRMOUNT																						
READ		16:19						16:27			16:35									16:43		
READVILLE							S	16:29	60													
ENDICOTT							D	16:32	60													
ROUTE 128	S	16:23	120							S	16:40	120										
JUNCTION		16:24									16:41									16:47		
CANTON JCT	S	16:28	60							S	16:47	60										
CANTON CENTER	S	16:32	60							S	16:50	60										
STOUGHTON	N	16:41								N	16:59											
NORTH EASTON	S	16:48	60							S	17:03	60										
EASTON VILLAGE	S	16:50	60							S	17:07	60										
RAY	S	16:57	60							S	17:14	60										
DEAN ST	S	17:03	60							S	17:20	60										
TAUNTON DEPOT	S	17:08	60							S	17:25	60										
FREETOWN										S	17:37	60										
FALL RIVER										S	17:45	60										
KINGS HIGHWAY	S	17:23	60																			
WHALES TOOTH	D	17:29	60																			
SHARON																				S	16:54	120
MANSFIELD																				S	17:03	120
HOLDEN																					17:13	
ATT																				S	17:14	120
SOUTH ATTLEBORO																				S	17:23	60
ORM																					17:31	
PROVIDENCE																				D	17:32	60







MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
 NEC and Dorchester Branch  
 Page 13 of 17

Station Code:	770			794			772			1920			622			528			822					
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell			
PROVIDENCE																			S	17:22	30			
ORM																					17:23			
SOUTH ATTLEBORO																			S	17:31	30			
ATT																			S	17:44	45			
MANSFIELD																			S	17:53	45			
SHARON																			S	18:01	45			
WHALES TOOTH																								
KINGS HIGHWAY																								
FALL RIVER										S	16:59	30												
FREETOWN										S	17:06	30												
TAUNTON DEPOT										S	17:17	30												
DEAN ST										S	17:22	30												
RAY										S	17:28	30												
EASTON VILLAGE										S	17:35	30												
NORTH EASTON										S	17:39	30												
STOUGHTON										S	17:44	30												
CANTON CENTER										S	17:50	30												
CANTON JCT										S	17:54	30							S	18:08	30			
JUNCTION											17:55										18:09			
ROUTE 128											S	18:01	45						S	18:13	45			
ENDICOTT				D	17:41	30				S	17:55	30												
READVILLE	S	17:35	30																					
READ												18:04										18:17		
FAIRMOUNT		D	17:38	30						D	17:58	30												
MORTON ST		D	17:42	30						D	18:02	30												
UPHAM'S CORNER		D	17:48	30						D	18:08	30												
HYDE PARK													S	18:08	30					S	18:20	30		
ROSLINDALE																								
FOREST HILLS													S	18:14	30									
PLAINS											18:11			18:15								18:25		
RUG													S	18:17	30	S	18:21	30	S	18:24	30	S	18:29	30
BACK BAY													18:18		18:22		18:25					18:30		
COV																								
BROADWAY-CABOT					18:07																			
TOWER 1		17:54						18:14		18:21		18:25										18:33		
SOUTH STATION	D	17:59	300	D	18:08	300	D	18:19	300	D	18:22	300	D	18:26	300	D	18:30	300	D	18:34	300			

Station Code:	1997Q			620			773Q			529Q			723Q			819Q			794			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	17:56	300	S	18:03	300	S	18:09	300	S	18:15	300	S	18:15	300	S	18:22	300	S	18:27	300	
TOWER 1		17:57						18:10						18:16			18:23			18:28		
BROADWAY-CABOT								18:11														
COV		18:00			18:07					18:19		18:19		18:26							18:31	
BACK BAY	S	18:02	60	S	18:09	60				S	18:21	60	S	18:20	60	S	18:27	60	S	18:32	60	
RUG	S	18:07	60								S	18:24	60	S	18:31	60	S	18:36	60			
PLAINS		18:09										18:27		18:34								
FOREST HILLS																			S	18:41	60	
ROSLINDALE																		D	18:44	60		
HYDE PARK																						
UPHAM'S CORNER								S	18:20	60												
MORTON ST								S	18:27	60												
FAIRMOUNT								S	18:32	60												
READ		18:13										18:31		18:38								
READVILLE							D	18:36	60			S	18:32	60								
ENDICOTT												D	18:36	60								
ROUTE 128	S	18:19	120												S	18:41	120					
JUNCTION		18:20														18:42						
CANTON JCT	S	18:25	60																			
CANTON CENTER	S	18:28	60																			
STOUGHTON	S	18:37	60																			
NORTH EASTON	S	18:42	60																			
EASTON VILLAGE	S	18:46	60																			
RAY	S	18:53	60																			
DEAN ST	S	18:59	60																			
TAUNTON DEPOT	S	19:04	60																			
FREETOWN	S	19:16	60																			
FALL RIVER	S	19:24	60																			
KINGS HIGHWAY																						
WHALES TOOTH																			S	18:49	120	
SHARON																			S	18:58	120	
MANSFIELD																					19:05	
HOLDEN																						
ATT																			S	19:08	120	
SOUTH ATTLEBORO																			S	19:15	60	
ORM																					19:22	
PROVIDENCE																			D	19:23	60	





MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
 NEC and Dorchester Branch  
 Page 16 of 17

Station Code:	826			1928			630			726			780			1930			632			
	Stop	Time	Dwell																			
PROVIDENCE	S	19:53	30																			
ORM		19:54																				
SOUTH ATTLEBORO	S	20:04	30																			
ATT	S	20:14	45																			
MANSFIELD	S	20:22	45																			
SHARON	S	20:30	45																			
WHALES TOOTH																S	20:47	30				
KINGS HIGHWAY																S	20:52	30				
FALL RIVER				S	19:54	30																
FREETOWN				S	20:01	30																
TAUNTON DEPOT				S	20:12	30										S	21:06	30				
DEAN ST				S	20:17	30										S	21:11	30				
RAY				S	20:23	30										S	21:17	30				
EASTON VILLAGE				S	20:30	30										S	21:24	30				
NORTH EASTON				S	20:34	30										S	21:28	30				
STOUGHTON				S	20:39	30										S	21:34	30				
CANTON CENTER				S	20:45	30										S	21:40	30				
CANTON JCT	S	20:37	30	S	20:49	30										S	21:44	30				
JUNCTION		20:38			20:50												21:45					
ROUTE 128	S	20:42	45	S	20:56	45										S	21:51	45				
ENDICOTT										S	21:27	30										
READVILLE													S	21:23	30							
READ		20:46			20:59						21:30						21:54					
FAIRMOUNT													D	21:26	30							
MORTON ST													D	21:30	30							
UPHAM'S CORNER													D	21:36	30							
HYDE PARK	S	20:49	30	S	21:03	30										S	21:58	30				
ROSLINDALE							S	21:22	30										S	22:30	30	
FOREST HILLS							S	21:25	30										S	22:33	30	
PLAINS		20:54			21:06						21:36						22:01					
RUG							S	21:29	30											S	22:37	30
BACK BAY	S	20:58	30	S	21:12	30	S	21:33	30	S	21:40	30				S	22:07	30	S	22:41	30	
COV		20:59			21:13			21:34			21:41						22:08					22:42
BROADWAY-CABOT																						
TOWER 1		21:02			21:16			21:37			21:44			21:42			22:11					22:44
SOUTH STATION	D	21:03	300	D	21:17	300	D	21:38	300	D	21:45	300	D	21:47	300	D	22:12	300	D	22:45	300	

Station Code:	1926			798			628			772			634			780			726			
	Stop	Time	Dwell																			
SOUTH STATION	S	20:55	300	S	21:05	300	S	21:15	300	S	21:57	300	S	22:20	300	S	22:25	300	S	22:30	300	
TOWER 1		20:56			21:06			21:16			21:58			22:26			22:26			22:31		
BROADWAY-CABOT											21:59											
COV		20:57			21:07			21:17						22:24			22:27					22:32
BACK BAY	S	21:00	30	S	21:10	30	S	21:20	30				S	22:26	30	S	22:30	30	S	22:35	30	
RUG	S	21:03	30	S	21:13	30	S	21:23	30							S	22:33	30	S	22:38	30	
PLAINS		21:06			21:17			21:27									22:37					22:42
FOREST HILLS							S	21:28	30											S	22:43	30
ROSLINDALE							D	21:31	30										D	22:46	30	
HYDE PARK	S	21:11	30	S	21:23	30										S	22:43	30				
UPHAM'S CORNER											D	22:07	30									
MORTON ST											D	22:13	30									
FAIRMOUNT											D	22:17	30									
READ		21:13			21:25												22:45					
READVILLE											D	22:21	30									
ENDICOTT																						
ROUTE 128	S	21:16	45	S	21:28	45										S	22:48	45				
JUNCTION		21:17			21:30												22:50					
CANTON JCT	S	21:20	30	S	21:33	30										S	22:53	30				
CANTON CENTER	S	21:23	30																			
STOUGHTON	S	21:32	30																			
NORTH EASTON	S	21:37	30																			
EASTON VILLAGE	S	21:41	30																			
RAY	S	21:48	30																			
DEAN ST	S	21:54	30																			
TAUNTON DEPOT	S	21:59	30																			
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY	S	22:14	30																			
WHALES TOOTH	D	22:20	30																			
SHARON				S	21:39	45										S	22:59	45				
MANSFIELD				S	21:47	45										S	23:07	45				
HOLDEN					21:52																	23:13
ATT				S	21:55	45										S	23:15	45				
SOUTH ATTLEBORO				S	22:02	30										S	23:22	30				
ORM					22:09												23:29					
PROVIDENCE				D	22:11	30										D	23:32	30				

Appendix

South Coast Rail Network Simulation Analysis	Page 139
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
NEC and Dorchester Branch  
Page 17 of 17

Station Code:	762			828			728			730			538			540			
	Stop	Time	Dwell																
PROVIDENCE				S	21:47	30													
ORM					21:48														
SOUTH ATTLEBORO				S	21:57	30													
ATT				S	22:13	45													
MANSFIELD				S	22:22	45													
SHARON				S	22:29	45													
WHALES TOOTH																			
KINGS HIGHWAY																			
FALL RIVER																			
FREETOWN																			
TAUNTON DEPOT																			
DEAN ST																			
RAY																			
EASTON VILLAGE																			
NORTH EASTON																			
STOUGHTON																			
CANTON CENTER																			
CANTON JCT																			
JUNCTION					22:30														
ROUTE 128				S	22:40	45													
ENDICOTT							D	22:47	30	D	00:20	30							
READVILLE	S	22:31	30																
READ					22:43			22:50			00:23								
FAIRMOUNT	D	22:34	30																
MORTON ST	D	22:38	30																
UPHAM'S CORNER	D	22:44	30																
HYDE PARK				S	22:45	30													
ROSLINDALE																			
FOREST HILLS																			
PLAINS					22:50			22:57			00:31								
RUG																			
BACK BAY				S	22:55	30	S	23:01	30	S	00:36	30	S	01:17	30	S	01:24	30	
COV					22:56			23:02			00:37			01:18			01:25		
BROADWAY-CABOT																			
TOWER 1		22:50			22:59			23:05			00:40								
SOUTH STATION	D	22:55	300	D	23:00	300	D	23:06	300	D	00:41	300	D	01:23	300	D	01:30	300	

Station Code:	630			536			632			828		
	Stop	Time	Dwell									
SOUTH STATION	S	22:35	300	S	23:25	300	S	23:50	300	S	23:59	300
TOWER 1		22:36						23:51			00:00	
BROADWAY-CABOT												
COV		22:37			23:29			23:52			00:01	
BACK BAY	S	22:40	30	S	23:31	30	S	23:55	30	S	00:04	30
RUG	S	22:43	30				S	23:58	30	S	00:07	30
PLAINS		22:46						00:01			00:11	
FOREST HILLS												
ROSLINDALE												
HYDE PARK	S	22:52	30							S	00:16	30
UPHAM'S CORNER												
MORTON ST												
FAIRMOUNT												
READ		22:54						00:06			00:18	
READVILLE	S	22:55	30				S	00:08	30			
ENDICOTT	D	23:00	30				D	00:11	30			
ROUTE 128										S	00:21	45
JUNCTION											00:23	
CANTON JCT										S	00:26	30
CANTON CENTER												
STOUGHTON												
NORTH EASTON												
EASTON VILLAGE												
RAY												
DEAN ST												
TAUNTON DEPOT												
FREETOWN												
FALL RIVER												
KINGS HIGHWAY												
WHALES TOOTH												
SHARON										S	00:31	45
MANSFIELD										S	00:33	45
HOLDEN											00:44	
ATT										S	00:48	45
SOUTH ATTLEBORO										S	00:56	30
ORM											01:03	
PROVIDENCE										D	01:06	30



Appendix

South Coast Rail Network Simulation Analysis	Page 141
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
Old Colony Line  
Page 2 of 6

Station Code:	74		36		8		38		76		10		40		
	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	
MIDDLEBOROUGH					S	07:20	60					S	08:07	30	
BRIDGEWATER					S	07:30	60					S	08:17	30	
CAMPELLO					S	07:38	60					S	08:25	30	
BROCKTON					S	07:42	60					S	08:29	30	
MONTELLO					S	07:45	60					S	08:32	30	
HOLBROOK/RANDOLPH					S	07:50	60					S	08:37	30	
SOUTH WEYMOUTH			S	07:42	60			S	08:06	60			S	09:06	30
BRAINTREE			D	07:50	60			D	08:14	60			D	08:14	30
GREENBUSH PUTIN	N	07:42								N	08:29				
QUINCY CENTER	D	07:46	60		D	08:01	60			D	08:32	60			
JFK/UMASS			D	08:03	60	D	08:11	60	D	08:28	60	D	08:58	30	
BROADWAY-CABOT		07:59		08:07			08:15			08:32			08:44		
TOWER 1		08:00		08:08			08:16			08:33			08:45		
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:40	300

Station Code:	40		78		764		80		42		14		82			
	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time	Stop	Time		
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	
TOWER 1		09:58		10:31		10:51		11:58		12:09		12:42		13:19		
BROADWAY-CABOT		09:59		10:32		10:52		11:59		12:10		12:43		13:20		
JFK/UMASS																
QUINCY CENTER	S	10:10	30	S	10:43	30		S	12:10	30		S	12:54	30		
GREENBUSH PUTIN			N	10:46						N	12:57					
BRAINTREE					S	11:08	30			D	12:26	30		S	13:36	30
SOUTH WEYMOUTH					D	11:15	30			D	12:33	30		D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30					S	12:23	30						
MONTELLO	S	10:27	30					S	12:28	30						
BROCKTON	S	10:30	30					S	12:31	30						
CAMPELLO	S	10:34	30					S	12:35	30						
BRIDGEWATER	S	10:42	30					S	12:43	30						
MIDDLEBOROUGH	D	10:53	30					D	12:55	30						

Appendix

South Coast Rail Network Simulation Analysis	Page 142
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
Old Colony Line  
Page 3 of 6

Station Code:	78			12			60			80			42			14			82			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
MIDDLEBOROUGH				S	09:38	30										S	11:10	30				
BRIDGEWATER				S	09:48	30										S	11:20	30				
CAMPELLO				S	09:56	30										S	11:28	30				
BROCKTON				S	10:00	30										S	11:32	30				
MONTELLO				S	10:03	30										S	11:35	30				
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30				
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30							
BRAINTREE							D	10:51	30				D	11:27	30							
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29		
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30			D	11:51	30	D	12:32	30		
JFK/UMASS																						
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44		
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45		
SOUTH STATION	D	09:40	300	D	10:38	300	D	11:11	300	D	11:34	300	D	11:48	300	D	12:07	300	D	12:48	300	

Station Code:	62			16			44			64			81Q			43Q			766		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell												
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:41	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:45			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30						D	16:47	60				
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

Appendix

South Coast Rail Network Simulation Analysis	Page 143
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
Old Colony Line  
Page 4 of 6

Station Code:	62			16			44			84			64			18			86		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell									
MIDDLEBOROUGH				S	13:08	30										S	15:25	30			
BRIDGEWATER				S	13:18	30										S	15:35	30			
CAMPELLO				S	13:26	30										S	15:43	30			
BROCKTON				S	13:30	30										S	15:47	30			
MONTELLO				S	13:33	30										S	15:50	30			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	30			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30			D	15:05	30	D	16:03	30				
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	30
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:06	300	D	14:14	300	D	15:09	300	D	15:28	300	D	16:24	300	D	16:46	300

Station Code:	18			45Q			86			43			47Q			87Q			23Q		
	Stop	Time	Dwell																		
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:35	60

Appendix

South Coast Rail Network Simulation Analysis	Page 144
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
Old Colony Line  
Page 5 of 6

Station Code:	48		20		88		22		62		90		54	
	Stop	Time												
MIDDLEBOROUGH			S	16:54			S	17:57						
BRIDGEWATER			S	17:04			D	18:10						
CAMPELLO			D	17:11			D	18:18						
BROCKTON			D	17:15			D	18:22						
MONTELLO			D	17:18			D	18:26						
HOLBROOK/RANDOLPH			D	17:23			S	18:32						
SOUTH WEYMOUTH	S	16:31							S	19:03			S	20:17
BRAINTREE	D	16:38	D	17:31					D	19:11			D	20:25
GREENBUSH PUTIN					N	18:05					N	19:46		
QUINCY CENTER					D	18:21					D	19:52		
JFK/UMASS														
BROADWAY-CABOT		16:56		18:03		18:33		18:54		19:26		20:02		20:43
TOWER 1		16:57		18:04		18:34		18:55		19:27		20:03		20:44
SOUTH STATION	D	16:50	D	18:06	D	18:36	D	18:58	D	19:28	D	20:06	D	20:46

Station Code:	49Q		20		88		22		62		90		54	
	Stop	Time												
SOUTH STATION	S	18:15	S	18:35	S	18:50	S	19:29	S	20:07	S	20:25	S	21:30
TOWER 1		18:16		18:36		18:51		19:30		20:08		20:26		21:31
BROADWAY-CABOT		18:17		18:37		18:52		19:31		20:09		20:27		21:32
JFK/UMASS									S	20:13			S	21:36
QUINCY CENTER			S	18:48	S	19:03			S	20:21	S	20:38		
GREENBUSH PUTIN			N	18:51							N	20:41		
BRAINTREE	S	18:33					S	19:47					S	21:48
SOUTH WEYMOUTH	D	18:40					D	19:54					D	21:56
HOLBROOK/RANDOLPH					S	19:15			S	20:34				
MONTELLO					S	19:20			S	20:39				
BROCKTON					S	19:23			S	20:42				
CAMPELLO					S	19:27			S	20:46				
BRIDGEWATER					D	19:35			D	20:54				
MIDDLEBOROUGH					D	19:48			D	21:05				

MBTA 2030 Stoughton Alternative Operating Plan, Electric Option  
Old Colony Line  
Page 6 of 6

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			









MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 5 of 20

Station Code:	FR8			748			908			608			722NB			NB10			906				
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell		
PROVIDENCE							S	07:16	60														
ORM								07:17															
SOUTH ATTLEBORO							S	07:26	60														
HEBRONVILLE								07:29															
ATT							S	07:36	120														
WHALES TOOTH															S	07:00	60						
KINGS HIGHWAY															S	07:05	60						
FALL RIVER	S	06:43	60																				
FREETOWN	S	06:50	60																				
CP B40		06:54																					
TAUNTON DEPOT	S	07:03	60													07:14							
DOWNTOWN TAUNTON	S	07:10	60												S	07:23	60						
BARROWSVILLE	S	07:25	60												S	07:30	60						
MANSFIELD	S	07:25	60												S	07:45	60						
SHARON	S	07:38	120				S	07:48	120						S	07:58	120						
STOUGHTON																					S	07:48	60
CANTON CENTER																					S	07:57	60
CANTON JCT																					S	08:01	60
JUNCTION INT.		07:49						07:57								08:09						08:02	
ROUTE 128	S	07:53	120												S	08:13	120			S	08:07	120	
ENDICOTT															S	07:58	60						
READVILLE						S	07:56	60						S	08:01	60							
READ		07:56						08:01						S	08:03						08:16		08:11
FAIRMOUNT						S	07:59	60															
MORTON ST.						D	08:03	60															
UPHAMS CORNER						D	08:09	60															
HYDE PARK																					S	08:13	60
ROSLINDALE VILLAGE																							
FOREST HILLS																							
PLAINS		08:00						08:05							08:10						08:20		08:18
RUG														S	08:14	60					S	08:23	60
BACK BAY	S	08:06	60				D	08:15	60	S	08:17	60	D	08:19	60	S	08:26	60	D	08:27	60	08:27	
COV		08:07						08:16			08:19			08:20			08:27					08:28	
TOWER 1		08:10				08:17		08:19			08:22			08:22			08:30					08:31	
SOUTH STATION	D	08:11	300	D	08:20	300	D	08:20	300	D	08:23	300	D	08:23	300	D	08:31	300	D	08:32	300	08:32	

Station Code:	10			898NB			FR16			514			712			792			910			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	09:21	300	S	09:45	300	S	09:53	300	S	10:00	300	S	10:25	300	S	10:29	300	S	10:50	300	
TOWER 1		09:22			09:46			09:54			10:01			10:26			10:30				10:51	
BROADWAY-CABOT		09:23															10:31					
COV					09:47			09:57			10:02			10:27								10:52
BACK BAY					S	09:50	30	S	09:59	30	S	10:05	30	S	10:30	30				S	10:55	30
RUG																						
PLAINS					09:53			10:01			10:09			10:36								10:59
FOREST HILLS										S	10:12	30										
ROSLINDALE VILLAGE										D	10:15	30										
HYDE PARK													S	10:41	30							
UPHAMS CORNER	D	09:31	30													D	10:39	30				
MORTON ST.	D	09:37	30													D	10:45	30				
FAIRMOUNT	D	09:41	30													D	10:49	30				
READ					09:58			10:06						10:42								11:04
READVILLE	D	09:45	30													D	10:53	30	S	11:05	30	
ENDICOTT																				D	11:08	30
ROUTE 128							S	10:12	45				S	10:46	45							
JUNCTION INT.					10:03			10:13						10:48								
CANTON JCT					S	10:07	30															
CANTON CENTER					S	10:10	30															
STOUGHTON					D	10:18	30															
SHARON															S	10:57	45					
MANSFIELD							S	10:27	45				S	11:05	45							
BARROWSVILLE							S	10:40	30													
DOWNTOWN TAUNTON							S	10:55	30													
TAUNTON DEPOT							S	11:02	30													
CP B40								11:11														
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY							S	11:20	30													
WHALES TOOTH							D	11:25	30													
HOLDEN																						
ATT														11:12								
SOUTH ATTLEBORO														S	11:14	45						
ORM														S	11:21	30						
PROVIDENCE															11:29							
														D	11:30	30						







Appendix

South Coast Rail Network Simulation Analysis	Page 154
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 9 of 20

Station Code:	610			910			754			814			FR20			912			766			
	Stop	Time	Dwell																			
PROVIDENCE										S	09:49	30										
ORM										S	09:50											
SOUTH ATTLEBORO										S	09:58	30										
HEBRONVILLE											10:01											
ATT										S	10:08	45										
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER													S	09:44	30							
FREETOWN													S	09:51	30							
CP B40														09:55								
TAUNTON DEPOT													S	10:04	30							
DOWNTOWN TAUNTON													S	10:11	30							
BARROWSVILLE													S	10:26	30							
MANSFIELD										S	10:16	45	S	10:39	45							
SHARON										S	10:25	45										
STOUGHTON				S	09:40	30										S	10:40	30				
CANTON CENTER				S	09:49	30										S	10:49	30				
CANTON JCT				S	09:52	30				S	10:32	30				S	10:52	30				
JUNCTION INT.					09:53						10:32			10:50			10:53					
ROUTE 128				S	09:57	45				S	10:37	45	S	10:54	45	S	10:57	45				
ENDICOTT																						
READVILLE							S	09:55	30											S	11:03	30
READ					10:01						10:41			10:57			11:01					
FAIRMOUNT							D	09:58	30											D	11:06	30
MORTON ST.							D	10:02	30											D	11:10	30
UPHAMS CORNER							D	10:08	30											D	11:16	30
HYDE PARK				S	10:02	30				S	10:42	30				S	11:02	30				
ROSLINDALE VILLAGE	S	09:59	30																			
FOREST HILLS	S	10:02	30																			
PLAINS		10:03			10:07						10:47			11:01			11:07					
RUG	S	10:07	30							S	10:52	30				S	11:12	30				
BACK BAY	S	10:11	30	S	10:12	30				S	10:56	30	S	11:07	30	S	11:15	30				
COV		10:12			10:14						10:57			11:08			11:16					
TOWER 1		10:15			10:15			10:15			11:00			11:11			11:19				11:23	
SOUTH STATION	D	10:16	300	D	10:17	300	D	10:19	300	D	11:01	300	D	11:12	300	D	11:20	300	D	11:27	300	

Station Code:	818			762			84			FR28			764			718			914			
	Stop	Time	Dwell																			
SOUTH STATION	S	15:00	300	S	15:20	300	S	15:30	300	S	15:42	300	S	15:44	300	S	15:45	300	S	15:50	300	
TOWER 1		15:01			15:21			15:31			15:43			15:45			15:46			15:51		
BROADWAY-CABOT					15:22									15:46								
COV		15:02						15:32			15:46						15:49			15:52		
BACK BAY	S	15:05	30				S	15:35	30	S	15:48	60				S	15:50	30	S	15:55	30	
RUG	S	15:08	30				S	15:38	30							S	15:53	30	S	15:58	30	
PLAINS		15:12						15:41			15:50						15:56			16:02		
FOREST HILLS	S	15:13	30																			
ROSLINDALE VILLAGE	D	15:16	30																			
HYDE PARK							S	15:46	30											S	16:06	30
UPHAMS CORNER				D	15:30	30							S	15:54	30							
MORTON ST.				D	15:36	30								16:00	30							
FAIRMOUNT				D	15:40	30								16:04	30							
READ								15:48			15:55						16:01			16:08		
READVILLE				D	15:44	30							D	16:06	30							
ENDICOTT																						
ROUTE 128							S	15:52	45	S	16:01	120								S	16:12	45
JUNCTION INT.								15:55			16:02						16:05			16:13		
CANTON JCT							S	15:58	30											S	16:19	30
CANTON CENTER							D	16:01	30													
STOUGHTON																						
SHARON																S	16:12	45				
MANSFIELD										S	16:16	120				S	16:21	45				
BARROWSVILLE										S	16:31	60										
DOWNTOWN TAUNTON										S	16:46	60										
TAUNTON DEPOT										S	16:53	60										
CP B40											17:02											
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY										S	17:11	60										
WHALES TOOTH							D	17:16	60													
HOLDEN																	16:29					
ATT																S	16:31	45				
SOUTH ATTLEBORO																S	16:37	30				
ORM																	16:45					
PROVIDENCE																D	16:46	30				



Appendix

South Coast Rail Network Simulation Analysis	Page 156
August 28, 2009	Rev. Number 1.1
Approved By: R. W. Thrall	
SYSTRA Job No. C0574800	
Project Name: South Coast Rail	

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 11 of 20

Station Code:	520			614			760			TD26			762			818			914			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell													
PROVIDENCE																S	13:31	30				
ORM																	13:32					
SOUTH ATTLEBORO																S	13:43	30				
HEBRONVILLE																	13:46					
ATT																S	13:52	45				
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER																						
FREETOWN																						
CP B40																						
TAUNTON DEPOT										S	13:04	30										
DOWNTOWN TAUNTON										S	13:11	30										
BARROWSVILLE										S	13:26	30										
MANSFIELD										S	13:39	45				S	13:59	45				
SHARON															S	14:07	45					
STOUGHTON																			S	14:20	30	
CANTON CENTER																			S	14:27	30	
CANTON JCT																			S	14:30	30	
JUNCTION INT.											13:50						14:10				14:32	
ROUTE 128										S	13:54	45				S	14:17	45				
ENDICOTT																						
READVILLE							S	13:19	30				S	14:06	30							
READ											13:57						14:21				14:36	
FAIRMOUNT							D	13:22	30				D	14:09	30							
MORTON ST.							D	13:26	30				D	14:13	30							
UPHAMS CORNER							D	13:32	30				D	14:19	30							
HYDE PARK																				S	14:39	30
ROSLINDALE VILLAGE				S	13:17	30																
FOREST HILLS				S	13:20	30																
PLAINS					13:21						14:01						14:25				14:44	
RUG				S	13:24	30									S	14:30	30					
BACK BAY	S	13:09	30	S	13:28	30				S	14:07	30			S	14:34	30	S	14:49	30		
COV		13:10			13:29						14:08					14:35					14:50	
TOWER 1					13:32			13:39			14:11			14:26			14:37				14:53	
SOUTH STATION	D	13:15	300	D	13:33	300	D	13:43	300	D	14:12	300	D	14:30	300	D	14:39	300	D	14:54	300	

Station Code:	899NBQ			524			739NBQ			799Q			NB21Q			813Q			621Q			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	16:24	300	S	16:27	300	S	16:28	300	S	16:30	300	S	16:36	300	S	16:39	300	S	16:40	300	
TOWER 1		16:25						16:29			16:31			16:37							16:41	
BROADWAY-CABOT											16:32											
COV		16:28			16:31			16:32					16:40			16:43					16:44	
BACK BAY	S	16:29	60	S	16:33	60	S	16:33	60			S	16:41	60	S	16:44	60	S	16:45	60		
RUG	S	16:32	60			S	16:37	60					S	16:47	60	S	16:47	60	S	16:49	60	
PLAINS		16:35					16:40						16:43			16:50					16:53	
FOREST HILLS																				S	16:54	60
ROSLINDALE VILLAGE																				D	16:57	60
HYDE PARK																						
UPHAMS CORNER										S	16:41	60										
MORTON ST.										S	16:48	60										
FAIRMOUNT										S	16:53	60										
READ		16:39					16:45						16:48			16:55						
READVILLE						D	16:47	60	D	16:57	60											
ENDICOTT						D	16:50	1	D	17:01	1											
ROUTE 128													S	16:54	120	S	16:58	120				
JUNCTION INT.		16:43												16:55			16:59					
CANTON JCT																						
CANTON CENTER																						
STOUGHTON																						
SHARON	S	16:50	120													S	17:09	120				
MANSFIELD	S	16:59	120										S	17:09	120	S	17:18	120				
BARROWSVILLE													S	17:22	60							
DOWNTOWN TAUNTON													S	17:37	60							
TAUNTON DEPOT													S	17:44	60							
CP B40														17:53								
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY													S	18:02	60							
WHALES TOOTH													D	18:07	60							
HOLDEN		17:08															17:26					
ATT	S	17:10	120													S	17:28	120				
SOUTH ATTLEBORO	S	17:19	60													S	17:37	60				
ORM		17:27															17:45					
PROVIDENCE	D	17:28	60													D	17:46	60				











Appendix

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
 NEC and Dorchester Branch

Page 17 of 20

Station Code:	924			626			926			534			628			778			798			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell										
PROVIDENCE																						
ORM																						
SOUTH ATTLEBORO																						
HEBRONVILLE																						
ATT																						
WHALES TOOTH																						
KINGS HIGHWAY																						
FALL RIVER																						
FREETOWN																						
CP B40																						
TAUNTON DEPOT																						
DOWNTOWN TAUNTON																						
BARROWSVILLE																						
MANSFIELD																						
SHARON																						
STOUGHTON	S	19:19	30				S	19:35	30													
CANTON CENTER																						
CANTON JCT							S	19:45	30													
JUNCTION INT.		19:29						19:47														
ROUTE 128	S	19:33	45																			
ENDICOTT																				D	20:19	1
READVILLE															S	20:15	30			S	20:22	30
READ		19:37						19:51														
FAIRMOUNT															D	20:18	30					
MORTON ST.															D	20:22	30					
UPHAMS CORNER															D	20:28	30					
HYDE PARK							S	19:54	30													
ROSLINDALE VILLAGE				S	19:42	30																
FOREST HILLS				S	19:45	30						S	20:23	30								
PLAINS		19:41			19:46			19:59														
RUG				S	19:49	30						S	20:27	30								
BACK BAY	S	19:44	30	S	19:53	30	S	20:04	30	S	20:28	30	S	20:31	30							
COV		19:45			19:54			20:05			20:29			20:32								
TOWER 1		19:48			19:56			20:08						20:35			20:34				20:39	
SOUTH STATION	D	19:49	300	D	19:58	300	D	20:09	300	D	20:34	300	D	20:36	300	D	20:39	300	D	20:45	300	

Station Code:	774			922			NB33Q			924			626			532			824			
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	
SOUTH STATION	S	19:41	300	S	19:43	300	S	19:53	300	S	20:10	300	S	20:15	300	S	20:20	300	S	20:48	300	
TOWER 1		19:42			19:44			19:54			20:11			20:16							20:49	
BROADWAY-CABOT		19:43																				
COV					19:45			19:57			20:12			20:17			20:24				20:50	
BACK BAY				S	19:48	30	S	19:59	30	S	20:15	30	S	20:20	30	S	20:26	30	S	20:53	30	
RUG				S	19:51	30				S	20:18	30	S	20:23	30				S	20:56	30	
PLAINS					19:54			20:01			20:22			20:27							20:58	
FOREST HILLS										S	20:23	30										
ROSLINDALE VILLAGE										D	20:26	30										
HYDE PARK				S	20:01	30							S	20:33	30							
UPHAMS CORNER	D	19:51	30																			
MORTON ST.	D	19:57	30																			
FAIRMOUNT	D	20:01	30																			
READ					20:03			20:06						20:35							21:03	
READVILLE	D	20:05	30																	S	21:06	30
ENDICOTT																				D	21:10	30
ROUTE 128				S	20:06	45	S	20:12	45				S	20:38	45							
JUNCTION INT.					20:09			20:13						20:40								
CANTON JCT					S	20:12	30						S	20:43	30							
CANTON CENTER					S	20:17	30															
STOUGHTON					D	20:24	30															
SHARON													S	20:49	45							
MANSFIELD							S	20:27	45			S	20:57	45								
BARROWSVILLE							S	20:40	30													
DOWNTOWN TAUNTON							S	20:55	30													
TAUNTON DEPOT							S	21:02	30													
CP B40								21:11														
FREETOWN																						
FALL RIVER																						
KINGS HIGHWAY							S	21:20	30													
WHALES TOOTH							D	21:25	30													
HOLDEN																						
ATT																						
SOUTH ATTLEBORO														S	21:05	45						
ORM														S	21:12	30						
PROVIDENCE															21:19							
														D	21:21	30						





MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
NEC and Dorchester Branch

Page 20 of 20

Station Code:	Train: 934			730			538			540		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
PROVIDENCE												
ORM												
SOUTH ATTLEBORO												
HEBRONVILLE												
ATT												
WHALES TOOTH												
KINGS HIGHWAY												
FALL RIVER												
FREETOWN												
CP B40												
TAUNTON DEPOT												
DOWNTOWN TAUNTON												
BARROWSVILLE												
MANSFIELD												
SHARON												
STOUGHTON	S	23:53	30									
CANTON CENTER												
CANTON JCT	D	00:03	30									
JUNCTION INT.		00:04										
ROUTE 128	D	00:08	45									
ENDICOTT				D	00:20	1						
READVILLE												
READ		00:12			00:23							
FAIRMOUNT												
MORTON ST.												
UPHAMS CORNER												
HYDE PARK												
ROSLINDALE VILLAGE												
FOREST HILLS												
PLAINS		00:16			00:31							
RUG												
BACK BAY	S	00:20	30	S	00:36	30	S	01:17	30	S	01:24	30
COV		00:21			00:37			01:18			01:25	
TOWER 1		00:24			00:40							
SOUTH STATION	D	00:25	300	D	00:41	300	D	01:23	300	D	01:30	300

Station Code:	Prev Trn: 632			828		
	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	23:50	300	S	23:59	300
TOWER 1	S	23:51			00:00	
BROADWAY-CABOT						
COV		23:52			00:01	
BACK BAY	S	23:55	30	S	00:04	30
RUG	S	23:58	30	S	00:07	30
PLAINS		00:01			00:11	
FOREST HILLS						
ROSLINDALE VILLAGE						
HYDE PARK				S	00:16	30
UPHAMS CORNER						
MORTON ST.						
FAIRMOUNT						
READ		00:06			00:18	
READVILLE	S	00:08	30			
ENDICOTT	D	00:11	30			
ROUTE 128				S	00:21	45
JUNCTION INT.					00:23	
CANTON JCT				S	00:26	30
CANTON CENTER						
STOUGHTON						
SHARON				S	00:31	45
MANSFIELD				S	00:39	45
BARROWSVILLE						
DOWNTOWN TAUNTON						
TAUNTON DEPOT						
CP B40						
FREETOWN						
FALL RIVER						
KINGS HIGHWAY						
WHALES TOOTH						
HOLDEN					00:46	
ATT				S	00:48	45
SOUTH ATTLEBORO				S	00:56	30
ORM					01:03	
PROVIDENCE				D	01:06	30

10.4.10. 2030 Attleboro Alternative Operating Plan, Diesel Option — Old Colony Line

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line

Page 1 of 6

Station Code:	2			32			70			4			34			72			6		
	Stop	Time	Dwell																		
MIDDLEBOROUGH	S	05:20	30							S	06:00	30							S	06:58	60
BRIDGEWATER	S	05:30	30							S	06:10	30							S	07:08	60
CAMPELLO	S	05:37	30							S	06:18	30							S	07:16	60
BROCKTON	S	05:41	30							S	06:22	30							S	07:20	60
MONTELLO	S	05:44	30							S	06:25	30							S	07:23	60
HOLBROOK/RANDOLPH	S	05:49	30							S	06:30	30							S	07:28	60
SOUTH WEYMOUTH				S	06:01	30							S	06:49	60						
BRAINTREE	D	05:56	30										D	06:57	60						
GREENBUSH PUTIN							N	06:19								N	07:16				
QUINCY CENTER							D	06:22	30	D	06:42	30							D	07:39	60
JFK/UMASS	D	06:10	30	D	06:21	30	D	06:30	30							D	07:27	60	D	07:48	60
BROADWAY-CABOT		06:14			06:25			06:34			06:55			07:14			07:32			07:52	
TOWER 1		06:15			06:26			06:35			06:56			07:15			07:33			07:54	
SOUTH STATION	D	06:17	300	D	06:29	300	D	06:38	300	D	06:58	300	D	07:17	300	D	07:36	300	D	07:56	300

Station Code:	2			32			744			74			38			76			752		
	Stop	Time	Dwell																		
SOUTH STATION	S	06:35	300	S	06:54	300	S	07:11	300	S	08:24	300	S	08:56	300	S	09:25	300	S	09:37	300
TOWER 1		06:38			06:55			07:12			08:25			08:57			09:26			09:38	
BROADWAY-CABOT		06:38			06:56			07:13			08:26			08:58			09:27			09:39	
JFK/UMASS																					
QUINCY CENTER	D	06:49	30										S	09:09	30	S	09:38	30			
GREENBUSH PUTIN				N	07:10											N	09:41				
BRAINTREE	D	06:55	30				D	07:32	30	D	08:43	30	S	09:15	30					09:55	30
SOUTH WEYMOUTH							D	07:39	30				D	09:22	30				D	10:02	30
HOLBROOK/RANDOLPH	D	07:03	30							S	08:51	30									
MONTELLO	D	07:08	30							S	08:56	30									
BROCKTON	D	07:12	30							S	08:59	30									
CAMPELLO	S	07:20	30							S	09:03	30									
BRIDGEWATER	D	07:38	30							S	09:11	30									
MIDDLEBOROUGH	D	07:50	30							D	09:23	30									

**MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line**

Page 2 of 6

Station Code:	Train: 74			36			8			36			76			10			40		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	07:20	60							S	08:07	30			
BRIDGEWATER							S	07:30	60							S	08:17	30			
CAMPELLO							S	07:38	60							S	08:25	30			
BROCKTON							S	07:42	60							S	08:29	30			
MONTELLO							S	07:45	60							S	08:32	30			
HOLBROOK/RANDOLPH							S	07:50	60							S	08:37	30			
SOUTH WEYMOUTH				S	07:42	60				S	08:06	60							S	09:06	30
BRAINTREE				D	07:50	60				D	08:14	60				D	08:44	30	D	09:14	30
GREENBUSH PUTIN	N	07:42											N	08:29							
QUINCY CENTER	D	07:46	60				D	08:01	60				D	08:32	60						
JFK/UMASS				D	08:03	60	D	08:11	60	D	08:28	60				D	08:58	30	D	09:27	30
BROADWAY-CABOT		07:59			08:07			08:15			08:32			08:44			09:01			09:31	
TOWER 1		08:00			08:08			08:16			08:33			08:45			09:03			09:32	
SOUTH STATION	D	08:02	300	D	08:10	300	D	08:18	300	D	08:35	300	D	08:49	300	D	09:05	300	D	09:34	300

Station Code:	Prev Trn: 40			78			754			80			42			14			82		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	09:57	300	S	10:30	300	S	10:50	300	S	11:57	300	S	12:08	300	S	12:41	300	S	13:18	300
TOWER 1		09:58			10:31			10:51			11:58			12:09			12:42			13:19	
BROADWAY-CABOT		09:59			10:32			10:52			11:59			12:10			12:43			13:20	
JFK/UMASS																					
QUINCY CENTER	S	10:10	30	S	10:43	30				S	12:10	30				S	12:54	30			
GREENBUSH PUTIN				N	10:46											N	12:57				
BRAINTREE							S	11:08	30				D	12:26	30				S	13:36	30
SOUTH WEYMOUTH							D	11:15	30				D	12:33	30				D	13:43	30
HOLBROOK/RANDOLPH	S	10:22	30							S	12:23	30									
MONTELLO	S	10:27	30							S	12:28	30									
BROCKTON	S	10:30	30							S	12:31	30									
CAMPELLO	S	10:34	30							S	12:35	30									
BRIDGEWATER	S	10:42	30							S	12:43	30									
MIDDLEBOROUGH	D	10:53	30							D	12:55	30									

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line

Page 3 of 6

Station Code:	78			12			60			80			42			14			82		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell												
MIDDLEBOROUGH				S	09:38	30										S	11:10	30			
BRIDGEWATER				S	09:48	30										S	11:20	30			
CAMPELLO				S	09:56	30										S	11:28	30			
BROCKTON				S	10:00	30										S	11:32	30			
MONTELLO				S	10:03	30										S	11:35	30			
HOLBROOK/RANDOLPH				S	10:08	30										S	11:40	30			
SOUTH WEYMOUTH							S	10:43	30				S	11:20	30						
BRAINTREE							D	10:51	30				D	11:27	30						
GREENBUSH PUTIN	N	09:29								N	11:15								N	12:29	
QUINCY CENTER	D	09:32	30	D	10:20	30				D	11:18	30			D	11:51	30	D	12:32	30	
JFK/UMASS																					
BROADWAY-CABOT		09:45			10:33			11:08			11:30			11:43			12:04			12:44	
TOWER 1		09:46			10:34			11:09			11:31			11:44			12:05			12:45	
SOUTH STATION	D	09:49	300	D	10:36	300	D	11:11	300	D	11:34	300	D	11:48	300	D	12:07	300	D	12:48	300

Station Code:	62			16			44			64			81Q			43Q			766		
	Stop	Time	Dwell																		
SOUTH STATION	S	14:10	300	S	14:27	300	S	14:47	300	S	15:43	300	S	16:02	300	S	16:20	300	S	16:40	300
TOWER 1		14:11			14:28			14:48			15:44			16:03			16:21			16:41	
BROADWAY-CABOT		14:12			14:29			14:49			15:45			16:04			16:22			16:42	
JFK/UMASS							S	14:53	30	S	15:49	30	S	16:08	60	S	16:26	60			
QUINCY CENTER	S	14:23	30	S	14:40	30				S	15:57	30							S	16:53	60
GREENBUSH PUTIN				N	14:43								N	16:18							
BRAINTREE							S	15:07	30							S	16:40	60			
SOUTH WEYMOUTH							D	15:14	30							D	16:47	60			
HOLBROOK/RANDOLPH	S	14:36	30							S	16:10	30							S	17:06	60
MONTELLO	S	14:41	30							S	16:15	30							S	17:11	60
BROCKTON	S	14:44	30							S	16:18	30							S	17:14	60
CAMPELLO	S	14:48	30							S	16:22	30							S	17:18	60
BRIDGEWATER	D	14:56	30							D	16:30	30							D	17:26	60
MIDDLEBOROUGH	D	15:10	30							D	16:41	30							D	17:38	60

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line

Page 4 of 6

Station Code:	Train: 62			16			44			84			64			18			86		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH				S	13:08	30										S	15:25	60			
BRIDGEWATER				S	13:18	30										S	15:35	60			
CAMPELLO				S	13:26	30										S	15:43	60			
BROCKTON				S	13:30	30										S	15:47	60			
MONTELLO				S	13:33	30										S	15:50	60			
HOLBROOK/RANDOLPH				S	13:38	30										S	15:55	60			
SOUTH WEYMOUTH	S	12:37	30				S	13:47	30				S	14:57	30						
BRAINTREE	D	12:44	30	D	13:44	30	D	13:54	30				D	15:05	30	D	16:03	60			
GREENBUSH PUTIN										N	14:49								N	16:24	
QUINCY CENTER				D	13:49	30				D	14:52	30							D	16:28	60
JFK/UMASS	D	12:57	30																		
BROADWAY-CABOT		13:01			14:03			14:11			15:05			15:23			16:21			16:41	
TOWER 1		13:02			14:04			14:12			15:06			15:24			16:22			16:43	
SOUTH STATION	D	13:04	300	D	14:08	300	D	14:14	300	D	15:09	300	D	15:28	300	D	16:24	300	D	16:48	300

Station Code:	Prev Trn: 18			46Q			86			48			47Q			87Q			23Q		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	16:52	300	S	17:00	300	S	17:12	300	S	17:20	300	S	17:38	300	S	17:45	300	S	17:57	300
TOWER 1		16:53			17:01			17:13			17:21			17:39			17:46			17:58	
BROADWAY-CABOT		16:54			17:02			17:14			17:22			17:40			17:47			17:59	
JFK/UMASS				S	17:06	60				S	17:26	60							S	18:03	60
QUINCY CENTER	S	17:05	60				S	17:25	60				S	17:51	60	S	17:58	60	S	18:11	60
GREENBUSH PUTIN	N	17:08								N	17:37					N	18:01				
BRAINTREE				S	17:19	60							S	17:57	60						
SOUTH WEYMOUTH				D	17:26	60							D	18:04	60						
HOLBROOK/RANDOLPH							S	17:37	60										S	18:23	60
MONTELLO							S	17:42	60										S	18:28	60
BROCKTON							S	17:45	60										S	18:31	60
CAMPELLO							S	17:49	60										S	18:35	60
BRIDGEWATER							D	17:57	60										D	18:43	60
MIDDLEBOROUGH							D	18:10	60										D	18:55	60

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line

Page 5 of 6

Train:	48			20			88			22			52			90			54		
Station Code:	Stop	Time	Dwell																		
MIDDLEBOROUGH				S	16:54	60				S	17:57	30									
BRIDGEWATER				S	17:04	60				D	18:10	30									
CAMPELLO				D	17:11	60				D	18:18	30									
BROCKTON				D	17:15	60				D	18:22	30									
MONTELLO				D	17:18	60				D	18:26	30									
HOLBROOK/RANDOLPH				D	17:23	60				S	18:32	30									
SOUTH WEYMOUTH	S	18:31	60										S	19:03	30				S	20:17	30
BRAINTREE	D	18:38	60	D	17:31	60							D	19:11	30				D	20:25	30
GREENBUSH PUTIN							N	18:05								N	19:46				
QUINCY CENTER							D	18:21	30							D	19:52	30			
JFK/UMASS																					
BROADWAY-CABOT		16:56			18:03			18:32			18:54			19:26			20:02			20:43	
TOWER 1		16:57			18:04			18:33			18:55			19:27			20:03			20:44	
SOUTH STATION	D	18:59	300	D	18:06	300	D	18:34	300	D	18:56	300	D	19:28	300	D	20:06	300	D	20:45	300

Prev Trn:	49Q			20			88			22			52			90			54		
Train:	49			89			25			51			27			91			55		
Station Code:	Stop	Time	Dwell																		
SOUTH STATION	S	18:15	300	S	18:35	300	S	18:50	300	S	19:29	300	S	20:07	300	S	20:25	300	S	21:30	300
TOWER 1		18:16			18:36			18:51			19:30			20:08			20:26			21:31	
BROADWAY-CABOT		18:17			18:37			18:52			19:31			20:09			20:27			21:32	
JFK/UMASS													S	20:13	30				S	21:36	30
QUINCY CENTER				S	18:48	30	S	19:03	30				S	20:21	30	S	20:38	30			
GREENBUSH PUTIN				N	18:51											N	20:41				
BRAINTREE	S	18:33	60							S	19:47	30							S	21:48	30
SOUTH WEYMOUTH	D	18:40	60							D	19:54	30							D	21:55	30
HOLBROOK/RANDOLPH							S	19:15	30				S	20:34	30						
MONTELLO							S	19:20	30				S	20:39	30						
BROCKTON							S	19:23	30				S	20:42	30						
CAMPELLO							S	19:27	30				S	20:46	30						
BRIDGEWATER							D	19:35	30				D	20:54	30						
MIDDLEBOROUGH							D	19:48	30				D	21:05	30						

MBTA 2030 Attleboro Alternative Operating Plan, Diesel Option  
Old Colony Line

Page 6 of 6

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
MIDDLEBOROUGH							S	21:25	30
BRIDGEWATER							S	21:35	30
CAMPELLO							S	21:42	30
BROCKTON							S	21:46	30
MONTELLO							S	21:49	30
HOLBROOK/RANDOLPH							S	21:54	30
SOUTH WEYMOUTH				S	21:22	30			
BRAINTREE				D	21:29	30	D	22:00	30
GREENBUSH PUTIN	N	20:46							
QUINCY CENTER	D	20:49	30				D	22:05	30
JFK/UMASS									
BROADWAY-CABOT		21:02			21:46			22:18	
TOWER 1		21:04			21:47			22:19	
SOUTH STATION	D	21:07	300	D	21:49	300	D	22:22	300

Station Code:	92			56			28		
	Stop	Time	Dwell	Stop	Time	Dwell	Stop	Time	Dwell
SOUTH STATION	S	22:00	300	S	22:30	300	S	22:40	300
TOWER 1		22:01			22:31			22:41	
BROADWAY-CABOT		22:02			22:32			22:42	
JFK/UMASS							S	22:46	30
QUINCY CENTER	S	22:13	30	S	22:43	30			
GREENBUSH PUTIN	N	22:16							
BRAINTREE							S	22:59	30
SOUTH WEYMOUTH							D	23:06	30
HOLBROOK/RANDOLPH				S	22:56	30			
MONTELLO				S	23:01	30			
BROCKTON				S	23:04	30			
CAMPELLO				S	23:08	30			
BRIDGEWATER				D	23:16	30			
MIDDLEBOROUGH				D	23:27	30			