

**1.258J/11.541J/ESD.226J**  
**Public Transportation Service and Operations Planning**  
**Spring 2006**

**Assignment 3**

**Due: Lecture 17**

**Notes:** This assignment deals with service on the MBTA Blue Line and will require four individuals per "team."  
A single submission should be made by each team.

Students in the class have been provided with an AM and a PM data set from the Blue Line Operation Control System (OCS), which includes: scheduled and actual departure times and arrival times at each terminal, and scheduled and actual run time for each one-way trip. The Blue Line timetables for the relevant time periods can be found on the MBTA website.

**Data Collection Activity**

The team should be stationed at the Aquarium subway stop (one person observing each car). Data should be collected either in the morning or in the evening peak i.e., for 1.5 hours from 7:30 to 9:00 AM or from 4:30 to 6 PM. Each team should do a 30 minutes pilot data collection before collecting the real data.

You are collecting data in order to understand the dwell time process for Blue Line trains and you should collect the data which you feel is appropriate for this. It is likely that minimum data requirements will be:

- train arrival and departure times
- passenger loads
- number of passengers boarding and alighting

Clearly passenger loads (or even boardings and alightings) may be difficult to estimate but an approximation should be possible. Arrival times should be based on first door opening and departure times on last door closing. You should also note any unusual circumstances affecting any train.

Please let me know at least 48 hours in advance about the time and day you have chosen to collect data so as to avoid duplication and so I can notify the Blue Line superintendent.

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**Analysis**

There are a range of issues which should be addressed using the available data for the time period in which you did your data collection (i.e. AM or PM peak period).

1. Passenger Wait Time: Estimate the hypothetical mean passenger waiting times for the following sets of passengers:

- passengers boarding at Wonderland heading for Bowdoin.
- passengers boarding at Bowdoin heading for Wonderland.

Compare and interpret the results.

2. Train Dwell Times: Compare your Aquarium dwell time observations with those in the Puong memo (attached). Suggest a revised dwell time model based on the data you collected at Aquarium.

3. Train Running Times: Estimate one (or more) train running time functions for Wonderland - Bowdoin and Bowdoin - Wonderland. Critically assess your models.

4. Analyze the train recovery and departure time practices at Wonderland and Bowdoin. Comment on the results.

5. Compare actual Blue Line performance with the 2004 Service Policy in terms of on-time performance and crowding. Comment on the results.