

Spring 2010

Assignment #3

Out: March 30, 2010

Due: April 15, 2010

This assignment deals with service on the MBTA Green Line and will require four individuals per “team”. A single submission should be made by each team.

Data Collection Activity

Data should be collected at Government Center in either the morning or evening peak, i.e., for 2 hours from 7:30 to 9:30 AM, or from 4:45 to 6:45 PM. Data collection at Copley should begin 15 minutes earlier and end 15 minutes later so as to get a full 2 hours of trip running time data.

One person should be stationed on each platform at Copley, whilst the other two should be at Government Center (one outbound, one inbound.)

You are collecting data in order to estimate models of waiting time, running time, and dwell time, and you should collect the data which you feel is appropriate. It is likely that minimum data requirements will be:

- lead car number and route for all trains passing through the stations (in both directions). (Note: on the C Line the train reverses at North Station, so you should note both car numbers at Government Center.)
- train arrival and departure times
- approximate passenger departure loads
- approximate number of passengers boarding and alighting

Clearly passenger loads, boardings, and alightings will be difficult to measure, but estimates should be possible. Arrival times should be based on first door opening and departure times on last door closing. You should also note any control action affecting any train -- i.e. holding, short-turning, expressing or deadheading.

If you would like to pool data with other teams, feel free to do so. I suggest that you discuss this before collecting, since the data you collect will, of course, need to be compatible. Please let us know by 5 PM on April 1 about the time and day you have chosen to collect, to avoid duplication and so we can notify the Green Line superintendent.

Green Line Schedules

You may find useful the following figures from the current Green line schedule:

		Scheduled Headway
Line	Route	Peak Periods
B	Boston College-Government Center	6
C	Cleveland Circle-North Station	7
D	Riverside-Government Center	5
E	Heath Street-Lechmere	6

Segment	Scheduled Run Time
Copley-Government Center	6
Government Center-Copley	6

Analysis

There are a range of issues which should be addressed using the data which you have collected.

1. Passenger Wait Time: Estimate the hypothetical mean passenger waiting times for the following sets of passengers:
 - Passengers boarding at Copley heading for Government Center
 - Passengers boarding at Copley heading for Lechmere
 - Passengers boarding at Government Center heading for Copley
 - B, C, D, and E Line passengers boarding at Government Center heading westbound to surface destinations
2. Train Dwell Times: Compare your dwell time observations with those in the Wilson/Lin paper in the readings. Comment on the results.
3. Train Running Times: Estimate one (or more) train running time functions for the Copley-Government Center section of the Green Line in each direction. Critically assess your models.
4. Critically assess the effectiveness of any real time control interventions which you observed in your data set -- e.g. impacts of the intervention.
5. Compare actual Green Line performance with the 2009 Service Delivery Policy in terms of on-time performance and crowding. Comment on the results.

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