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Memorandum

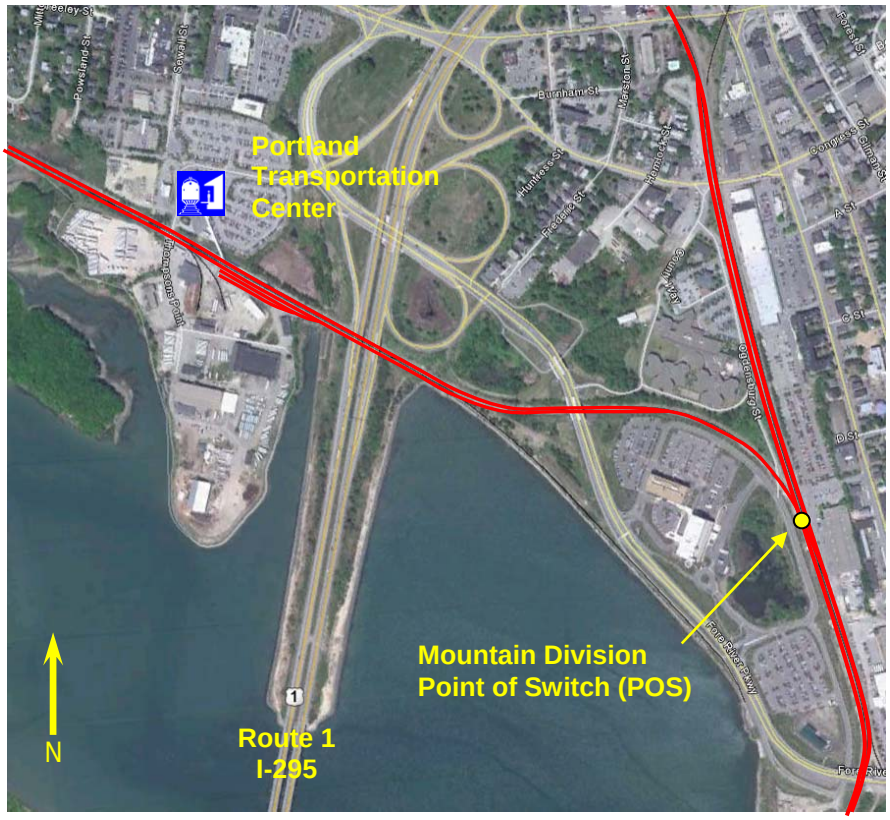
Date **11/9/2010**

To File

From Adam Streit

Subject Transfers at Portland Transportation Center

This memo identifies the proposed Brunswick service operations, the physical constraints at Thompson's Point that limit incremental improvements, and the required operating plan for passenger transfers, without making significant improvements to PTC. Within two years, the *Downeaster* will begin providing service from Portland to Brunswick. According to NNEPRA, the existing configuration at Portland Transportation Center (PTC) is sufficient for the *Downeaster* extension to Brunswick. However, NNEPRA has indicated that a terminal with an island platform will be required for any service extensions to points further north (e.g., Lewiston/Auburn, Bethel, and Montreal).



I. Brunswick *Downeaster* Operations

Boston to Brunswick Northbound Operations

The following is a step by step summary of how the *Downeaster* will operate to Brunswick while serving the Portland Transportation Center. A graphic representation is provided on the following page.

1) Trains traveling from Boston to Portland will continue to access the station as they currently do by making a diverging move from the Pan Am mainline onto the Mountain Division, and then travelling to PTC. Travel from the Mountain Division Point of Switch (POS) to PTC is estimated at 2.5 minutes.
2) A 5 – 10 minute station dwell at PTC is assumed so that passengers can board and alight the train, and also so that a Federal Railroad Administration (FRA) mandated brake test can be performed. A brake test is required whenever a train changes its direction of travel.
3) After performing the brake test, trains will travel south back to the Pan Am mainline until they are clear of the Mountain Division POS. This move is estimated to take 2.5 minutes.
4) Another brake test is performed so that the train can then head north to Brunswick. It is assumed that this brake test will take 5 – 10 minutes. During this time, switches used in the converging move back onto the mainline must be lined and set so that the train can continue onwards.
5) Once the brake test is complete, and the switches have been normaled, the train heads northward to Brunswick.

Brunswick to Boston Southbound Operations

The following is a step by step summary of how the *Downeaster* will operate from Brunswick to Boston while stopping at the Portland Transportation Center.

1) Trains operating from Brunswick to Portland will access PTC via the Mountain Division. Trains will head south of the junction with the Mountain Division until they are clear of the Mountain Division POS.
2) A 5 – 10 minute brake test will be performed so that the train can travel into PTC on the Mountain Division. During this time, any switches used for the through move on the mainline are now set for a diverging move off the mainline and onto the Mountain Division.
3) The diverging move from the Pan Am mainline onto the Mountain Division is estimated to take 2.5 minutes.
4) A 5 – 10 minute station dwell at PTC is assumed. During the station dwell, another FRA mandated brake test is performed so that the train can travel back down the Mountain Division.

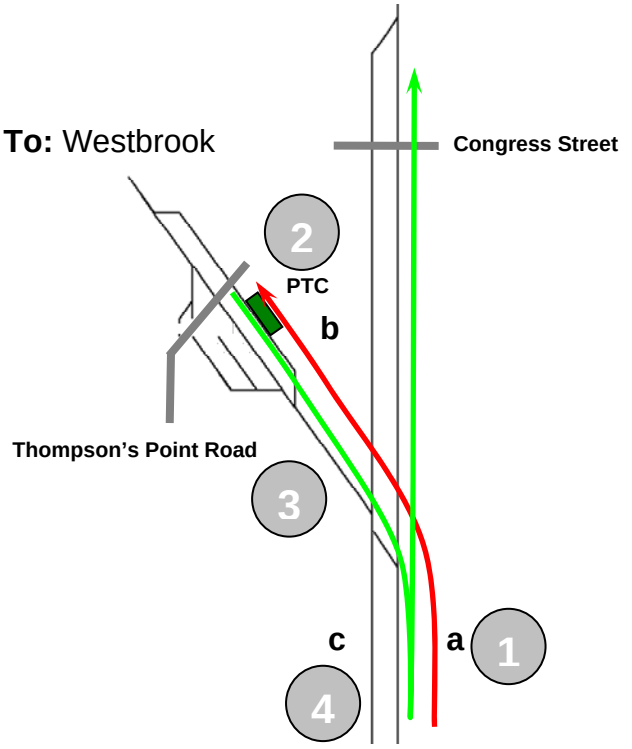
After the station stop and break test are complete, the train will travel south on the Mountain Division and make a converging move back onto the Pan Am mainline to head south to Boston. It is estimated to take 2.5 minutes for the train to depart from PTC and clear the Mountain Division POS.

A summary of each step for northbound and southbound travel is shown on the proceeding page.

	Northbound Time Summary	
1	Travel from a to b	2.5
2	PTC Dwell & Brake Test	5 – 10
3	Travel from b to c	2.5
4	Brake Test at b	5 – 10
	Total PTC Service Time	***15 - 25***

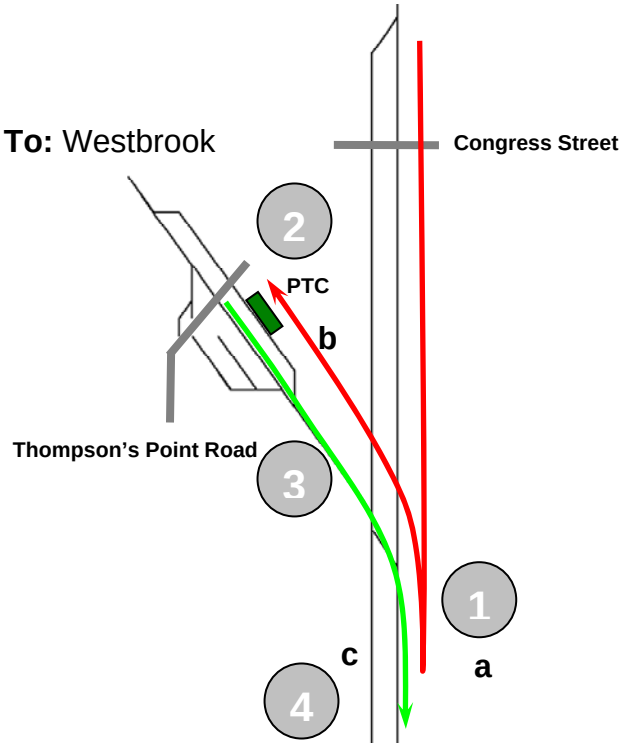
	Southbound Time Summary	
1	Brake Test at a	5 – 10
2	Travel from a to b	2.5
3	PTC Dwell & Brake Test	5 – 10
4	Travel from b to c	2.5
	Total PTC Service Time	***15 - 25***

Northbound
To: Brunswick



From: Boston

Southbound
From: Brunswick



To: Boston

Operations Impacts

Approximately 8% to 13% of the estimated one-way trip time of 3:20 from Boston to Brunswick is spent serving PTC in its existing configuration.

II. Physical Constraints

The following physical constraints limit the type of upgrades required to offer reasonable transfer service at PTC:

1) Not enough space between Thompson's Point Road and I-295 bridge embankment to allow for ~1,000 foot platform that could berth two *Downeaster* consists simultaneously. *(Limits platform extension to the south).*
2) Layover facility tracks are immediately adjacent to Mountain Division and near a private business (*Limits the construction of an island platform on the existing station site*.)
3) Thompson's Point Road Grade Crossing (*Limits platform extension to the north.*)
4) Single track access to Mountain Division (*Limits the potential for trains to pass off of the PAR mainline*.)
5) No northern leg connection from the Mountain Division to Pan Am mainline. (*Forces trains to reverse direction on the PAR mainline which results in the 5 – 10 minute required brake test*.)

III. Proposed Transfer Service from Points North to *Downeaster* Service

PTC Transfers between Downeaster Trains and Points North (PN) trains

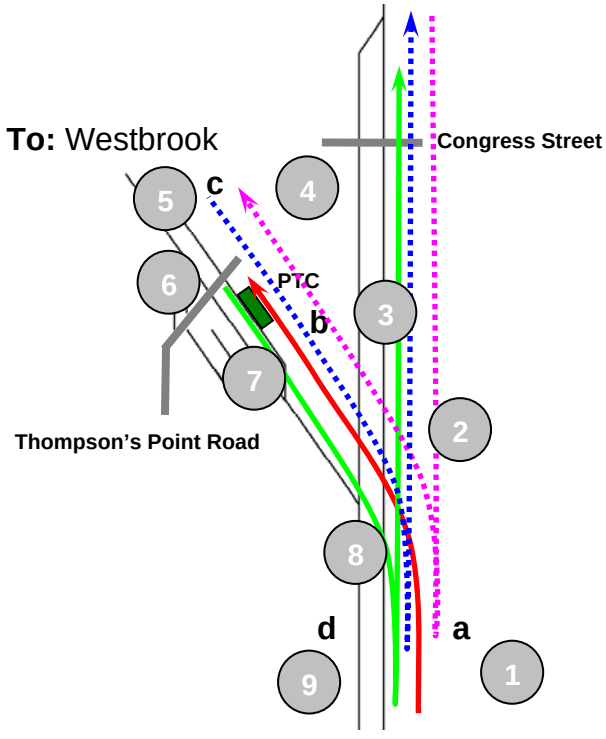
The following is a step by step summary of how PN trains could provide transfers to *Downeaster* service with the existing Portland Transportation Center layout. A graphic of each operation step in the operation is provided following the description. It is assumed that Brunswick trains are scheduled to arrive at PTC ~5 minutes later than PN train.

1) PN Trains heading to Portland will access PTC in the same manner as described in Boston *Brunswick to Boston Southbound Operations* Steps 1 – 3.
2) Passengers transferring to a southbound or northbound *Downeaster* train will alight from the train at PTC. A 5 minute station dwell is assumed. Once passengers have alighted the PN train, it will then move beyond Thompson's Point Road and wait for the Brunswick train to access PTC. The move beyond Thompson's Point Road is estimated to take 1 minute.
3) Depending on whether the train is heading north or south, Brunswick trains will access PTC in the same manner as described in *Brunswick to Boston Southbound Operations* Steps 1 – 5 or *Boston to Brunswick Northbound Operations* Steps 1 – 5. It is estimated to take 15 – 25 minutes to complete the entire operation. Once the *Downeaster* train is in the station, passengers from PN train waiting at PTC will then proceed to board the *Downeaster* train.
4) After the Brunswick train has departed from PTC, the PN train waiting beyond Thompson's Point Road will head back in to PTC to collect any passengers. This move is estimated to take 1 minute.
5) After a 5 minute station dwell, the PN train will follow *Boston to Brunswick Northbound Operations* Steps 3 – 5 to head back north.

A summary of the time required for transfers is shown below.

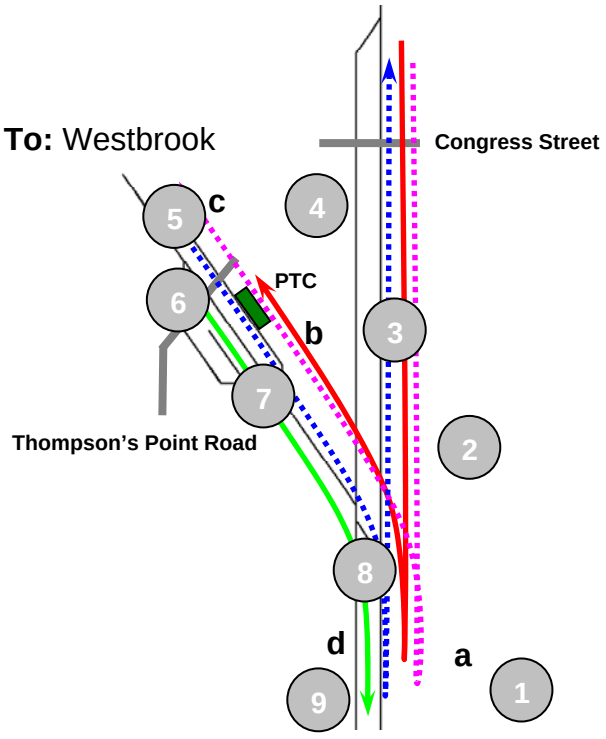
1	PN: Brake Test at a	5 – 10
2	PN: Travel from a to b	2.5
3	PN: PTC Dwell (1)	5
4	PN: Move from b to c	1
5	PN: Wait for BRN Train to depart	15 – 25
6	PN: Move from c to b	1
7	PN: PTC Dwell (2)	5
8	PN: Travel from b to d	2.5
9	PN: Brake Test at d	5 – 10
	Total PTC Service Time	***42 - 62***

Northbound
To: Brunswick & Points North



From: Boston

Southbound
From: Brunswick to Points North



To: Boston

Note: dashed lines are PN trains.

Operations Impacts

From this analysis, several important points about offering transfer service at PTC can be surmised:

a) The estimated time for the entire operation is 42 – 62 minutes.

b) Of the estimated 42 to 62 minutes required per transfer, two brake tests per train, or four brake tests need to be performed on the PAR mainline, resulting in mainline occupancy of 20 – 40 minutes per scheduled meet.

c) *Downeaster* trains will foul the PAR mainline for 20-40 minutes per scheduled meet.

d) In order to meet more than half of the proposed seven *Downeaster* roundtrips (four Boston-bound trips and four Brunswick-bound trips for a total of eight daily meets), the PAR mainline will be occupied between for 160 to 320 minutes (or 2:40 to 5:20) per day.

e) It is estimated that it will take passengers heading to a Brunswick *Downeaster* train from a PN train approximately 20 to 30 minutes to go from the Mountain Division POS to PTC and back to the POS. Of this total time, approximately 12.5 to 20 minutes will be spent waiting for the transfer.

A summary of the transfer time is provided below is provided below.

	Passenger Transfer Time
1 **PN**: PTC Dwell[1]	2.5
2 **PN**: Wait at PTC[2]	5 – 10
3 **BRN**: Brake test at a	
4 **BRN**: a to b	2.5
5 **BRN**: Dwell & Brake Test[3]	2.5 - 5
Total PTC X-fer and Wait Time	***12.5 - 20***

[1] Assume half of a five minute dwell
[2] PN b to c performed during passenger wait time at PTC
[3] Assume half of the dwell time

IV. Trip Time Reduction Strategies

There are several options that can be employed to reduce the amount of time required to access the Portland Transportation Center. These strategies can be employed in unison, or individually. While each of these strategies will increase railroad access to PTC and simplify the existing operations, they all will require substantial capital investment in the rail infrastructure. Such strategies include:

1) Completing the northern leg of the wye between the Mountain Division and the PA mainline without impacting the existing prison located adjacent to the tracks. This will require relocating portions of the PA mainline over the Congress Street Bridge, and may necessitate improvements to the bridge. *Estimated incremental time savings: 5 – 10 minutes per trip.*

2) Double track the wye leg(s). This may necessitate improvements to the Congress Street Bridge. *Estimated incremental time savings: 2.5 – 5 minutes per trip.*

3) Build a center island platform at PTC. This will require relocating the existing *Downeaster* layover facility to another location in Portland. *Estimated incremental time savings: 2 minutes per trip.* When completed in combination with Item #1 would, this option yields an *estimated time savings of 7 to 12 minutes per trip.*

   Additionally, all brake tests would be performed on the Mountain Division and off of the PAR mainline.