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# APPENDIX A

Proposed Ultimate Track Maintenance Requirements and Service Lanes

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# Georgetown South Corridor

## Mainline Track Requirements

The purpose of this report is to outline the requirements for mainline track expansion in the Georgetown Corridor.

The Regional Transportation Plan (RTP) outlines the GO passenger rider-ship projections and service levels required for the 2031 AM Peak Hour. The number of trains trips required to satisfy the 2031 AM Peak Hour rider-ship demands, determines the number of tracks required. Looking ahead twenty years plus to develop operating schedules is based upon assumptions of arrival/departure times and the use of current technologies for VIA and GO trains. However, the basic assumptions for track needs are as follows.

The RTP service levels calls for all day, 2-way Express Rail between Union Station and Brampton and all day, 2-way Regional Rail GO train service between Union Station and Georgetown. Express Rail is a high speed non-stop service with headways between trains as little as 5 minutes. Regional Rail trains stops at all stations with headways as little as 10 minutes.

Each 10 car GO train can carry 1,500 seated passengers. The Express trains take about 47 minutes to travel between Union Station and Brampton. The Regional Rail trains take about 28 minutes. When the 2031 AM Peak Hour rider-ship and service level demands are translated into train numbers north of Weston, 7 Express Rail, 6 Regional Rail and 1 VIA trains are required operating in the southbound direction.. The Express Rail trains cannot share the same tracks as the Regional Rail trains, as they would overtake them. For this reason, the Express Trains and the Regional Rail trains need separate dedicated tracks.

In the northbound direction (counter-peak flow), 4 Express Rail, 4 Regional Rail and 1 VIA train are required. It is also not possible to operate all these trains on one track as the Express trains would overtake the Regional Rail trains. For this reason, the Express Trains require one track and the Regional Rail and VIA trains require another track

The above analysis determines that 4 separate mainline tracks are required on the Georgetown mainline north of the Weston (See Scenario #1 below). There is 1 existing track serving Georgetown Corridor trains now, so 3 new tracks are required.

It is noted that 4 tracks are required regardless of whether the trains are electric or conventional. It is noted that electrification only marginally increases system capacity. It is the additional tracks themselves and the new higher capacity signal systems being proposed that provides most of the extra capacity needed.

The RTP anticipates a future Bolton commuter rail service using the CP Mactier Rail Corridor to immediately south of Weston. South of Weston, the Bolton trains would switch over to the Georgetown Corridor. Ridership projections for 2031 indicate that 4 southbound trains would be required during the AM Peak Hour to accommodate the Bolton demand. South of Weston, the 4 Bolton AM Peak Hour trains can be accommodated on the 4 tracks noted above. A counter-peak Bolton service is not proposed by the RTP.

At the West Toronto Diamond (e.g. Keele/Dundas), two existing Milton Corridor tracks join the Georgetown Line. The southbound and northbound trains cannot mix on one track. In the future, the 4 Georgetown Corridor tracks and the 2 Milton Corridor tracks will run in parallel in the Georgetown Corridor from the West Toronto Diamond to Bathurst Street.

In Parkdale (Landsdowne Avenue), one Barrie Corridor track currently joins the Georgetown Corridor. The RTP requires expansion of GO services on the Barrie Corridor by 2031 to full day, 2-way service with trains making all stops. The southbound and northbound trains cannot mix on the same track. This requires 1 new track to service Barrie Corridor trains. South of Parkdale, the 2 Barrie, 2 Milton and 4 Georgetown tracks run in parallel in the Georgetown Corridor to Bathurst Street.

In summary, 4 tracks in total are required to the West Toronto Diamond, 6 between the Diamond and Parkdale and 8 between Parkdale and Bathurst Street. There is only 1 CN freight train per day anticipated operating outside the peak periods. CP freight trains will operate on their own 2 existing tracks between the West Toronto Diamond and Weston and continue north of Weston on the Mactier Rail Corridor.

During the 2031 AM peak hour, it is anticipated that the 4 Union-Pearson Rail Link southbound trains will operate between the 8 Express Rail and VIA trains. This will require moving 2 of the Express Rail trains to the track carrying eastbound Regional Rail Trains and increasing the number of Regional Rail trains from 6 to 8. In addition, this will required accelerating the VIA train schedule ahead by 3 minutes.

However, the RTP calls for the electrification of the Express Rail on the Georgetown Corridor within 15 years. With electrification of the Express Rail trains, it is possible to achieve a marginal increase in capacity and accommodate all 12 trains on one track as express trains. In addition, it is anticipated that other new technologies will be introduced by 2031 that will increase capacity.

The above analysis establishes the track numbers required for a 2031 design horizon year. The RTP anticipates that rider-ship will grow rapidly for approximately 20 years and then very slowly thereafter. This assumes full build-out of the RTP, including the location and size of various population and employment centers. It is anticipated most of the structure work will be constructed as part of the initial construction. However, laying of all of the tracks will occur as other projects (e.g. Bolton, Barrie etc) add trains to the Corridor and

capacity increases must occur. The specifics of how the track expansion may be staged will be addressed in the next phase of the project (e.g. Detailed Design).

## Scenario Analysis

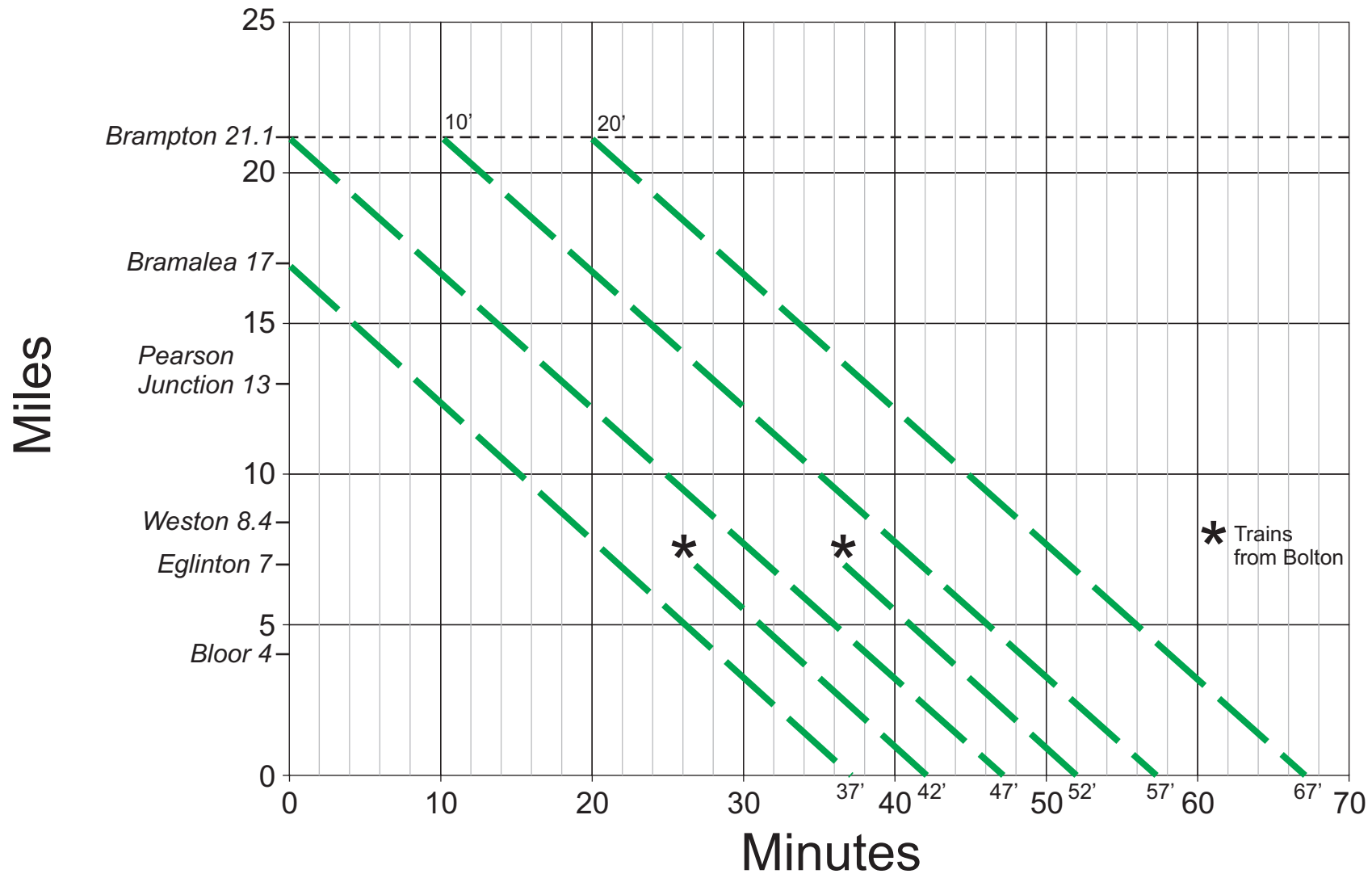
Scenario #1 demonstrates the need for 4 mainline tracks for GO trains and VIA trains north of Weston. Scenario 2 is the same as Scenario #1, except that Union-Pearson Rail Link trains are added which has some impact on Express Rail. For purposes of analysis, Scenario 3 assumes electric GO trains. Track numbers are selected via railway convention facing south in the Corridor. Track 1 is on the left hand side and Track 4 is on the right side.

| TRAINS in AM PEAK HR                    | Track 1<br>Southbound | Track 2<br>Northbound      | Track 3<br>Southbound            | Track 4<br>Northbound    |
|---|-----------------------|----------------------------|----------------------------------|--------------------------|
| Scenario #1<br>GO & VIA<br>Trains       | 6 Regional Rail       | 4 Regional Rail<br>& 1 VIA | 7 Express Rail<br>& 1 VIA        | 4 Express Rail           |
| Scenario #2<br>GO, VIA &<br>UPRL Trains | 8 Regional Rail       | 4 Regional Rail<br>& 1 VIA | 5 Express Rail,<br>1 VIA, 4 UPRL | 4 Express Rail<br>4 UPRL |
| Scenario #3<br>GO Electric<br>Trains    | 6 Regional Rail       | 4 Regional Rail<br>& 1 VIA | 7 Express Rail,<br>1 VIA, 4 UPRL | 4 Express Rail<br>4 UPRL |

### Assumptions:

- Regional Rail - Union Station to Brampton - 43 minutes + 2 minutes each for future Eglinton and a potential Woodbine stops);
- Express Rail southbound with Bramalea stop – 28 minute (20 minutes from Union Station to Bramalea + 8 minutes Bramalea to Brampton);
- VIA northbound – Union Station to Pearson - 39 minutes (37 minutes + 2 minutes for Brampton Stop);
- VIA southbound – Union Station to 32 minutes.
- Electric Express Rail -24 minutes + 2 minutes for Bramalea stop
- Electric Regional Rail -38 minutes
- Conventional or Electric UPRL – Union Station to Pearson Junction and vice versa, with two intermediate stops at Bloor and Weston, 19 minutes.
- Operating margin between trains - minimum of 4 minutes based on signal wake simulations and using a performance factor of 75%.

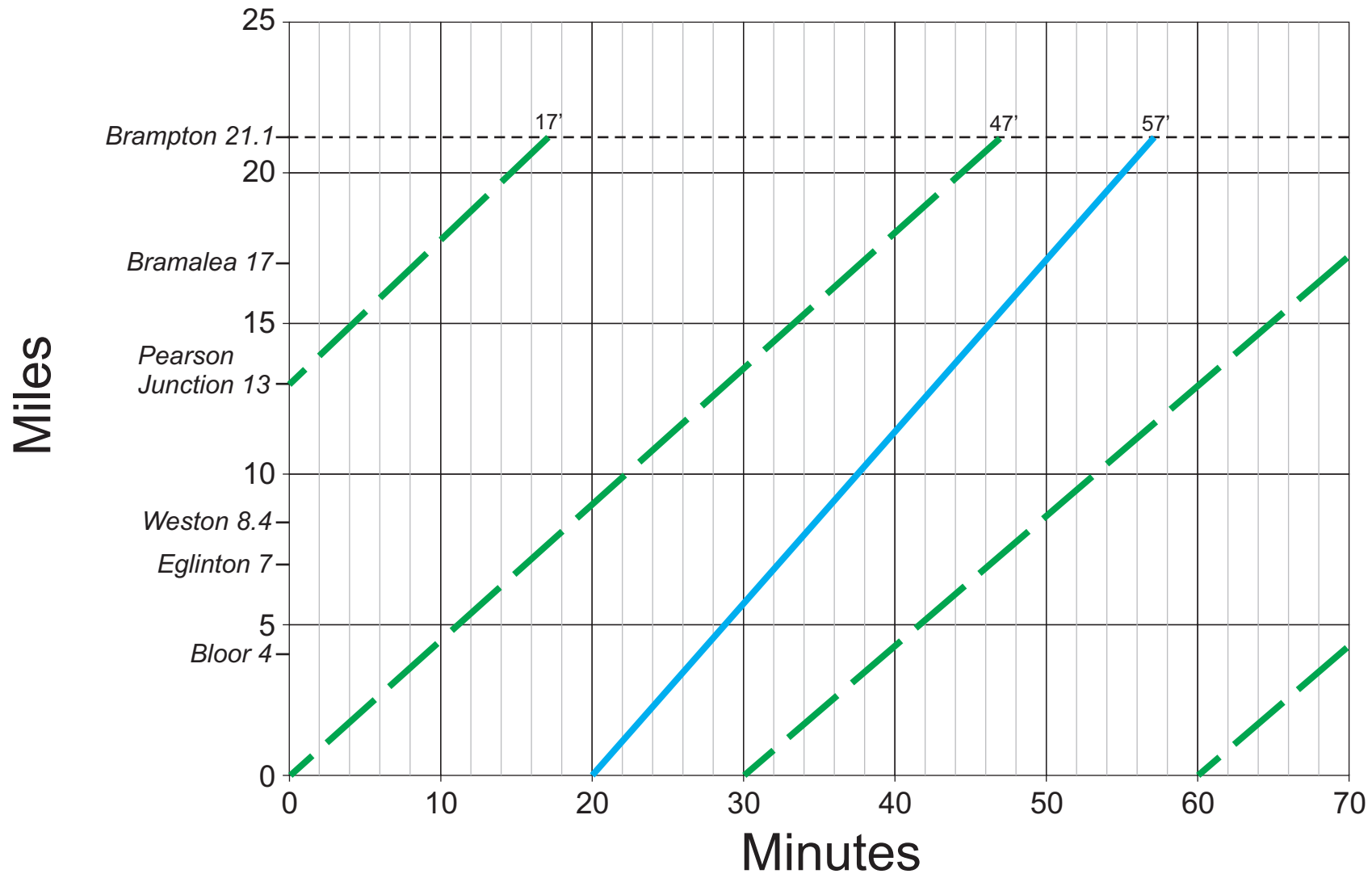
## Appendices Space-Time Diagrams for Scenarios 1, 2 and 3





**Scenario 1 Track 1 Southbound**

- Regional Rail (Stopping) Train 

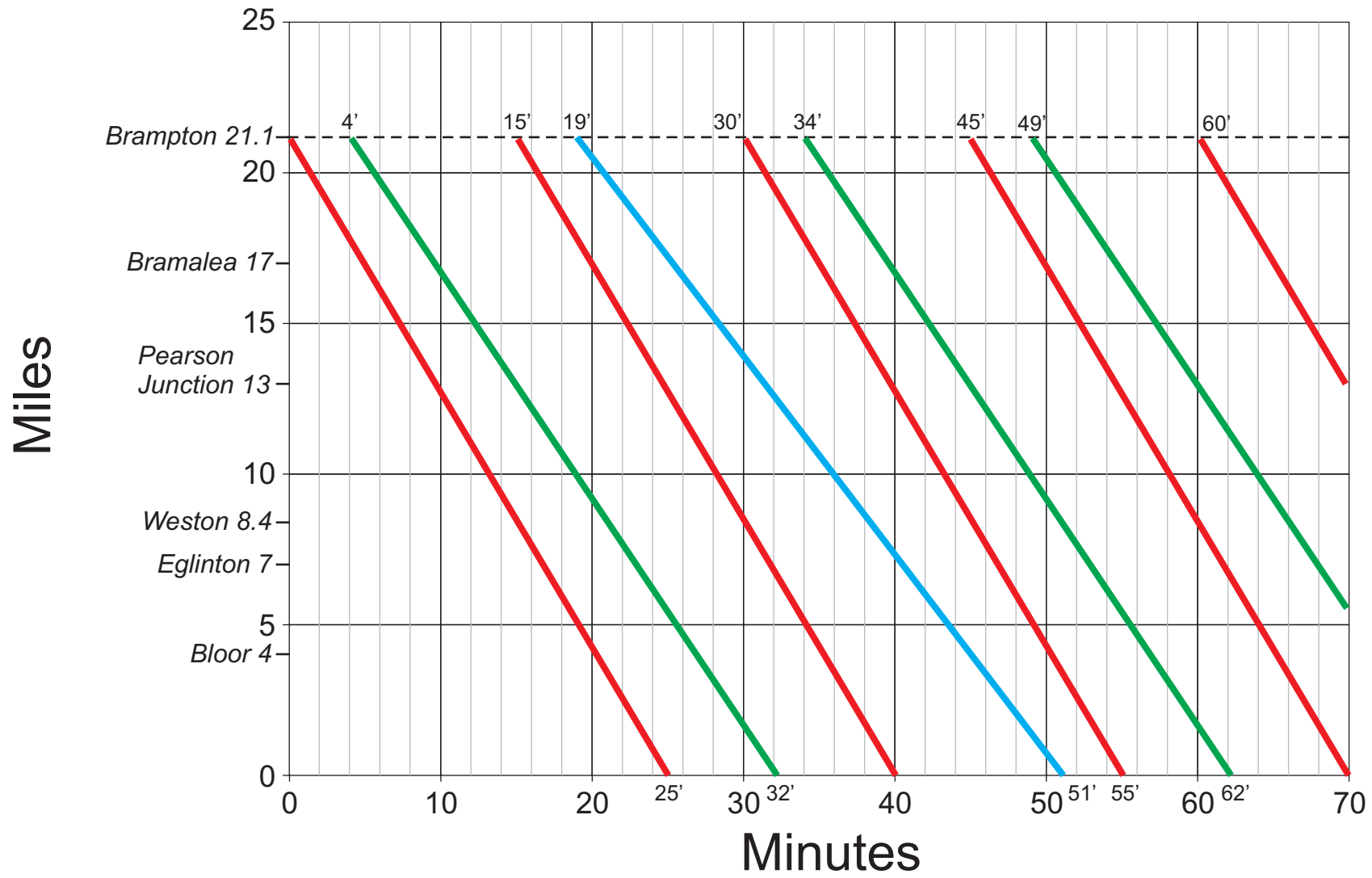
Note: Pattern repeats every 30 minutes.



**Scenario 1 Track 2 Northbound**

- Regional Rail (Stopping) Train 
- VIA Train 

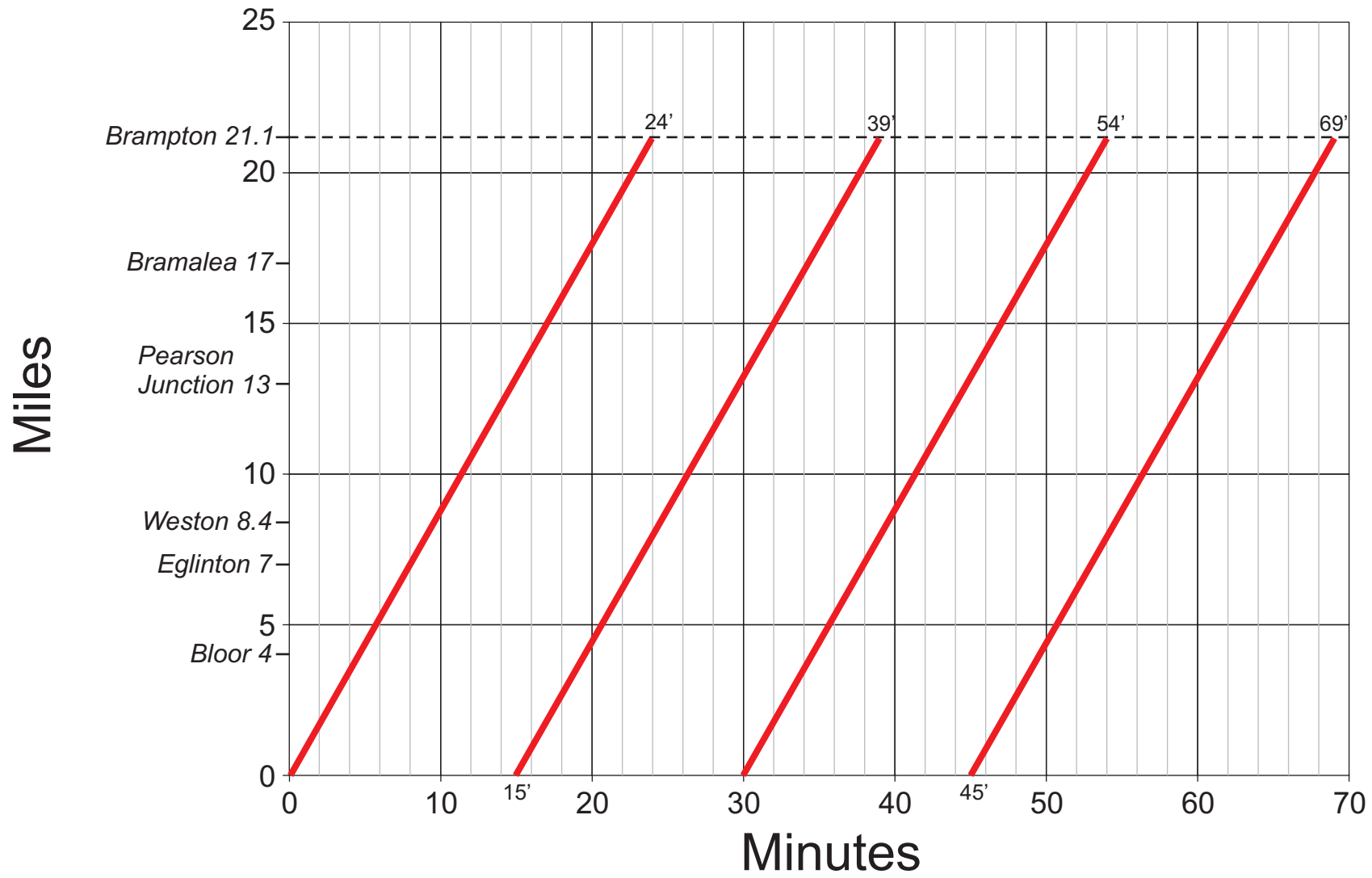
Note: Pattern repeats hourly.



**Scenario 1 Track 3 Southbound**

- Regional Rail Train —————
- Express Rail Train —————
- VIA Train —————

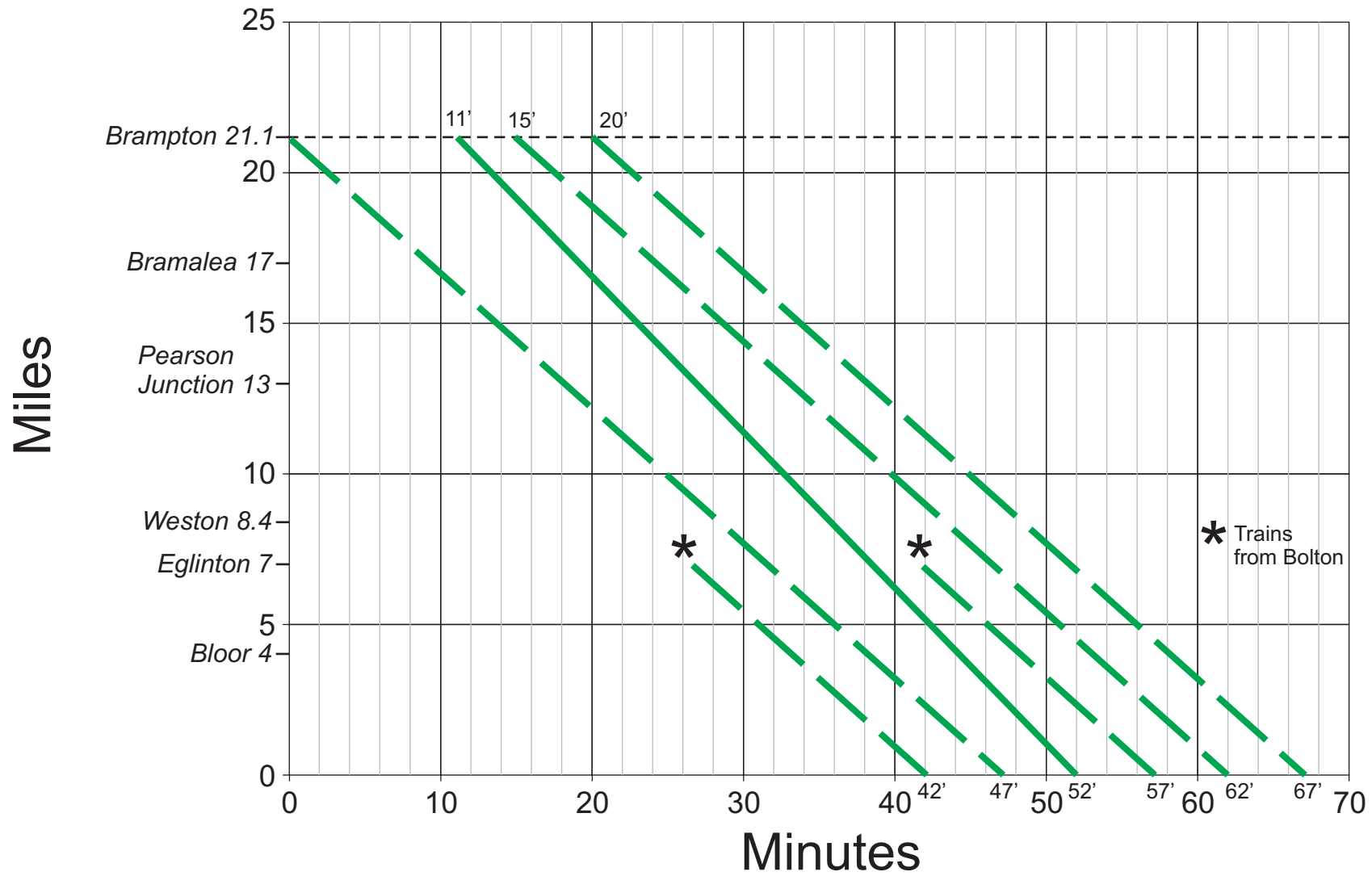
Notes: One Minute added to Express Rail Schedule to maintain headways.  
 Pattern repeats after one hour.





**Scenario 1 Track 4 Northbound**

- Express Rail Train —————

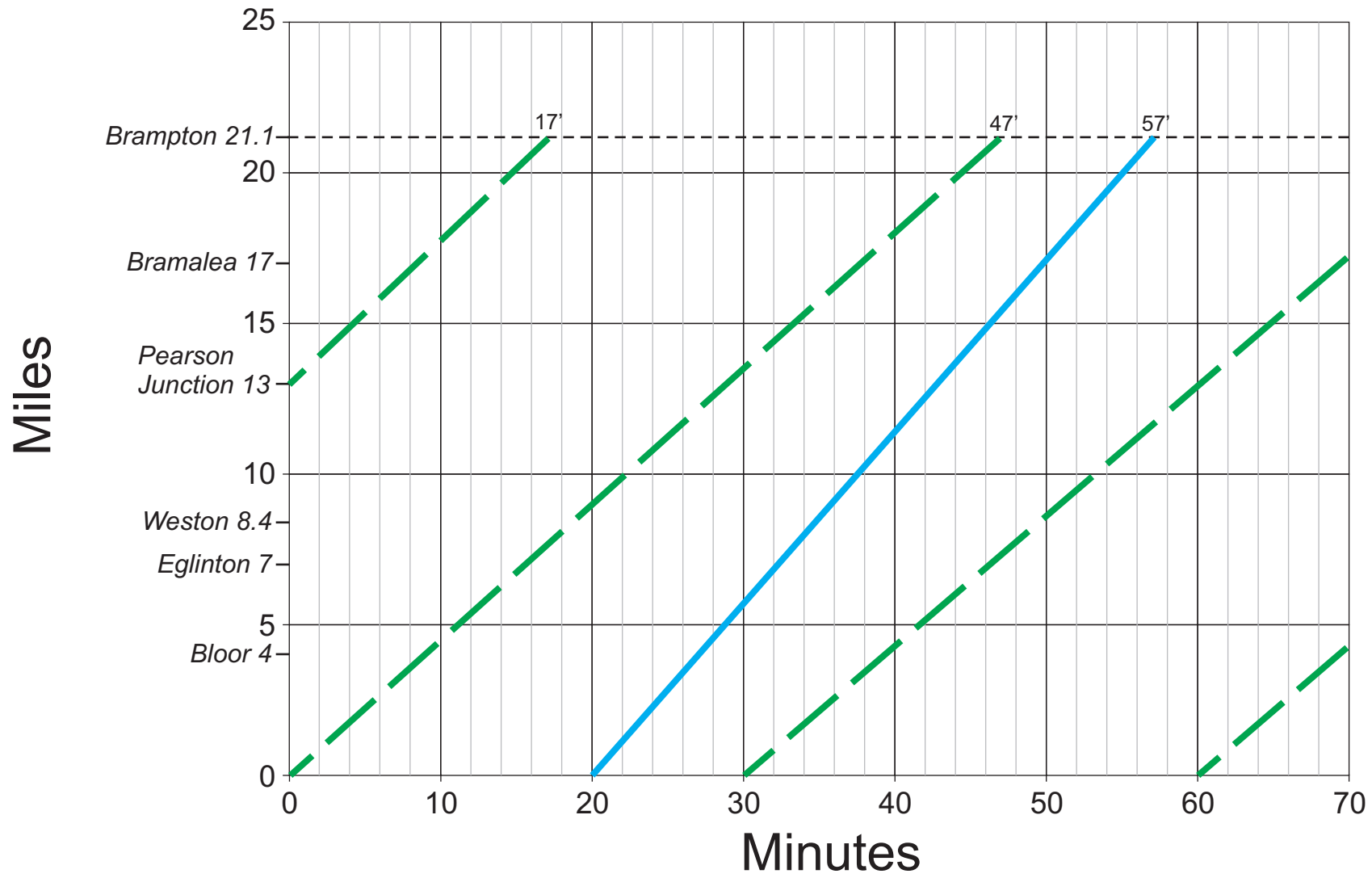
Note: Pattern repeats after 15 minutes.





**Scenario 2 Track 1 Southbound**

- Regional Rail (Stopping) Train 
- Regional Rail Train 

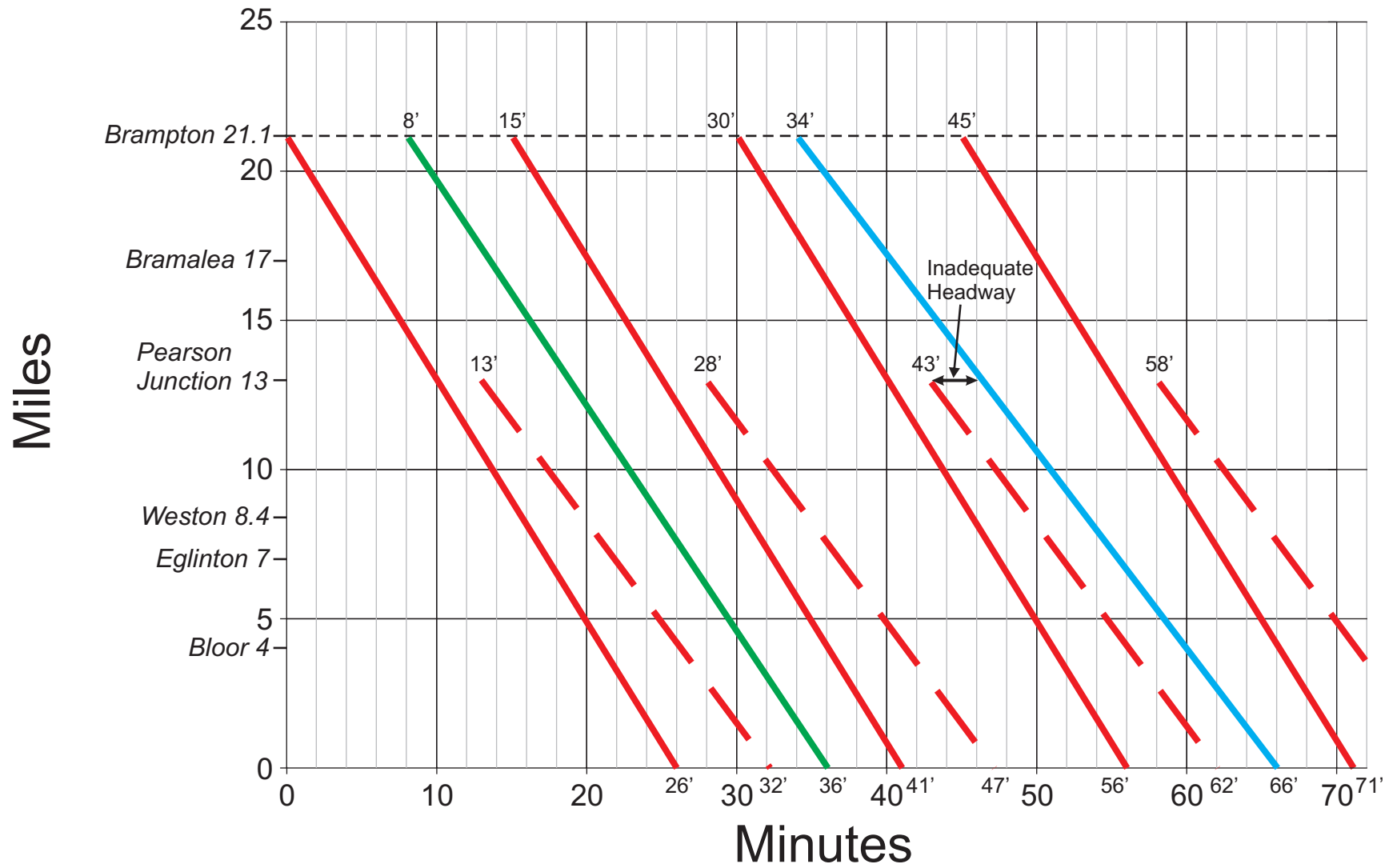
Note: Pattern repeats every 15 minutes.



**Scenario 2 Track 2 Northbound**

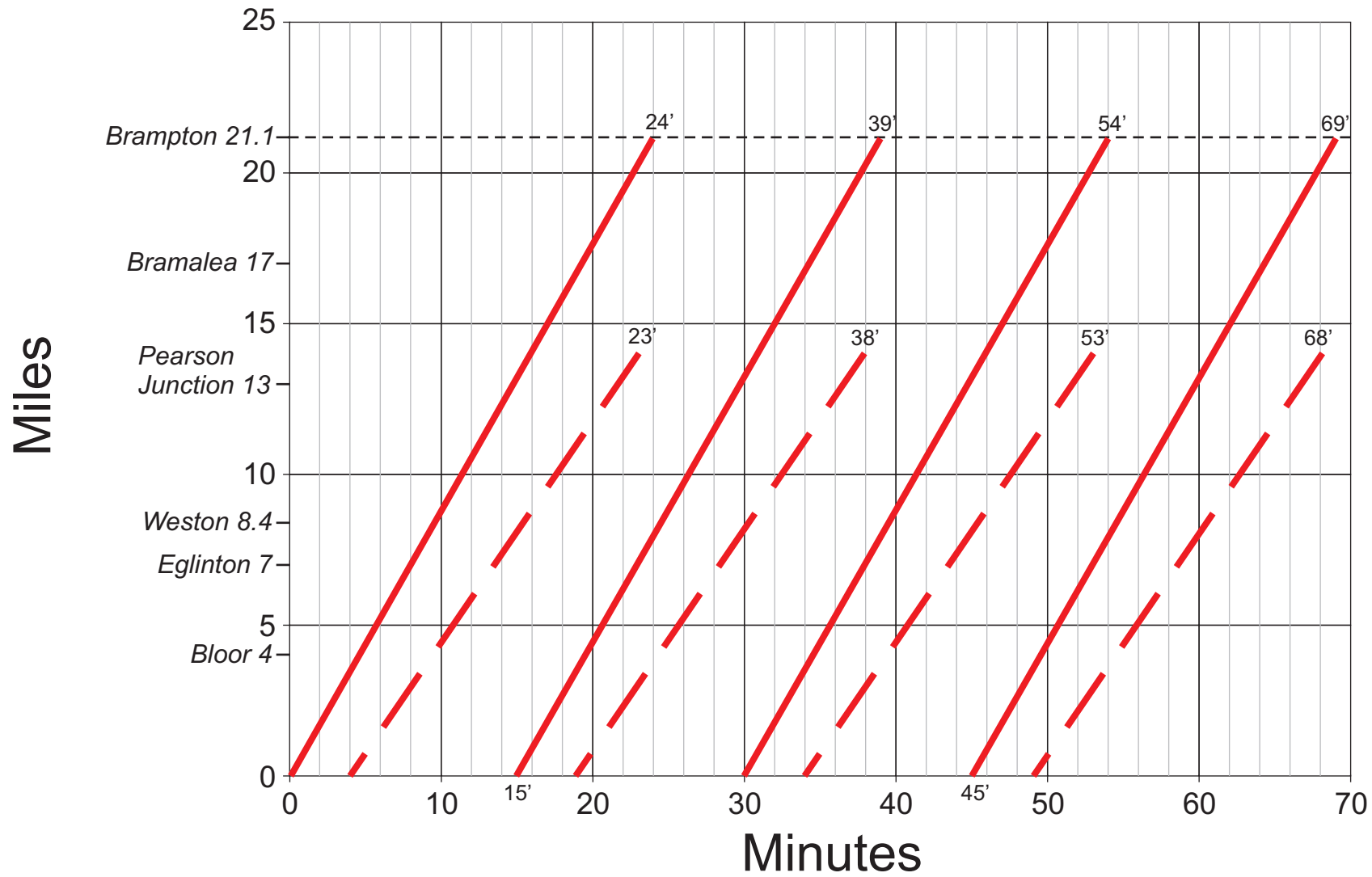
- Regional Rail (Stopping) Train 
- VIA Train 

Note: Pattern repeats hourly.



**Scenario 2 Track 3 Southbound**

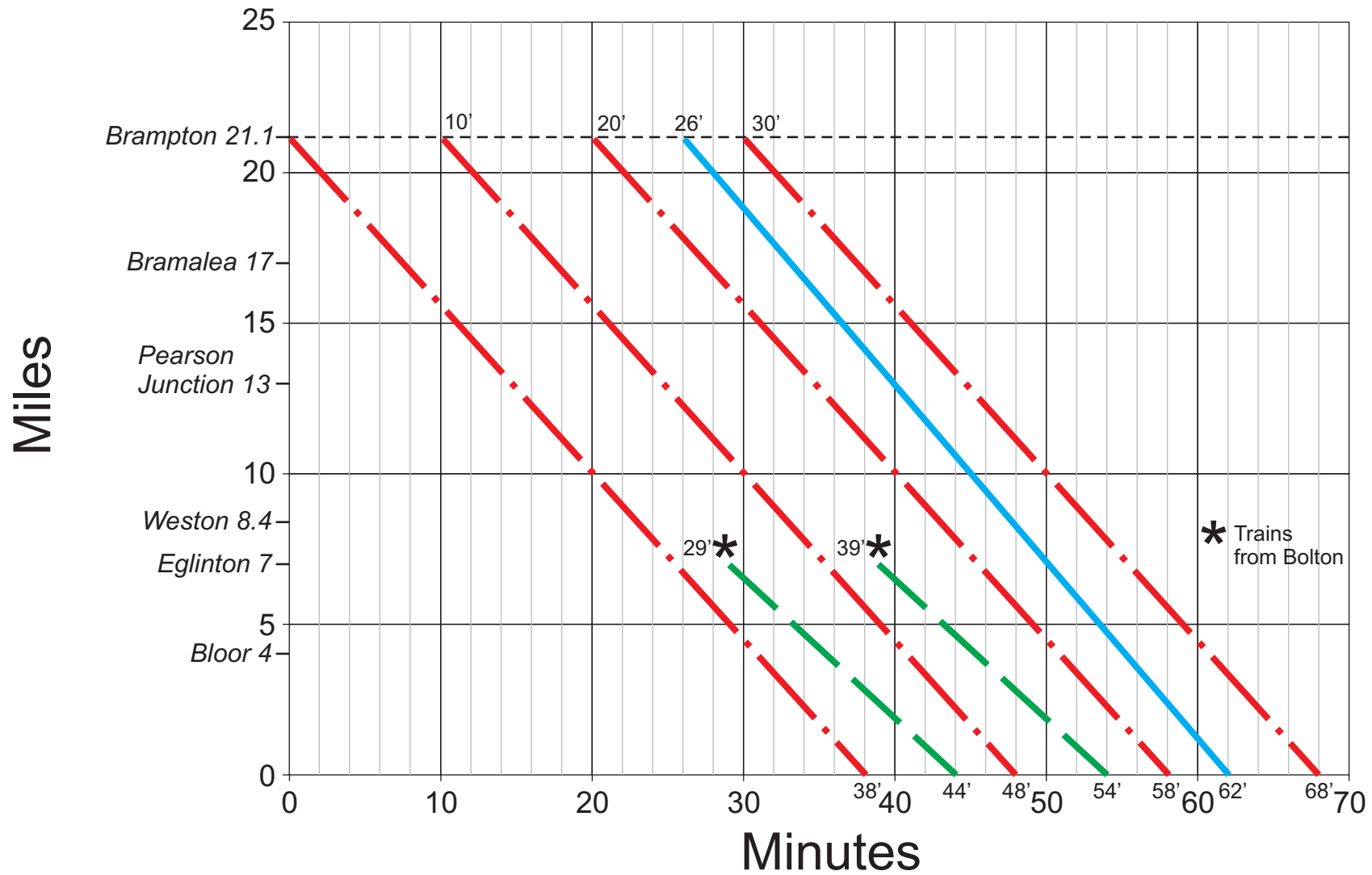
- Regional Rail Train
- Union-Pearson Rail Link Train
- Express Rail Train
- VIA Train



**Scenario 2 Track 4 Northbound**

- Express Rail Train 
- Union-Pearson Rail Link Train 

Note: Pattern repeats after 15 minutes.

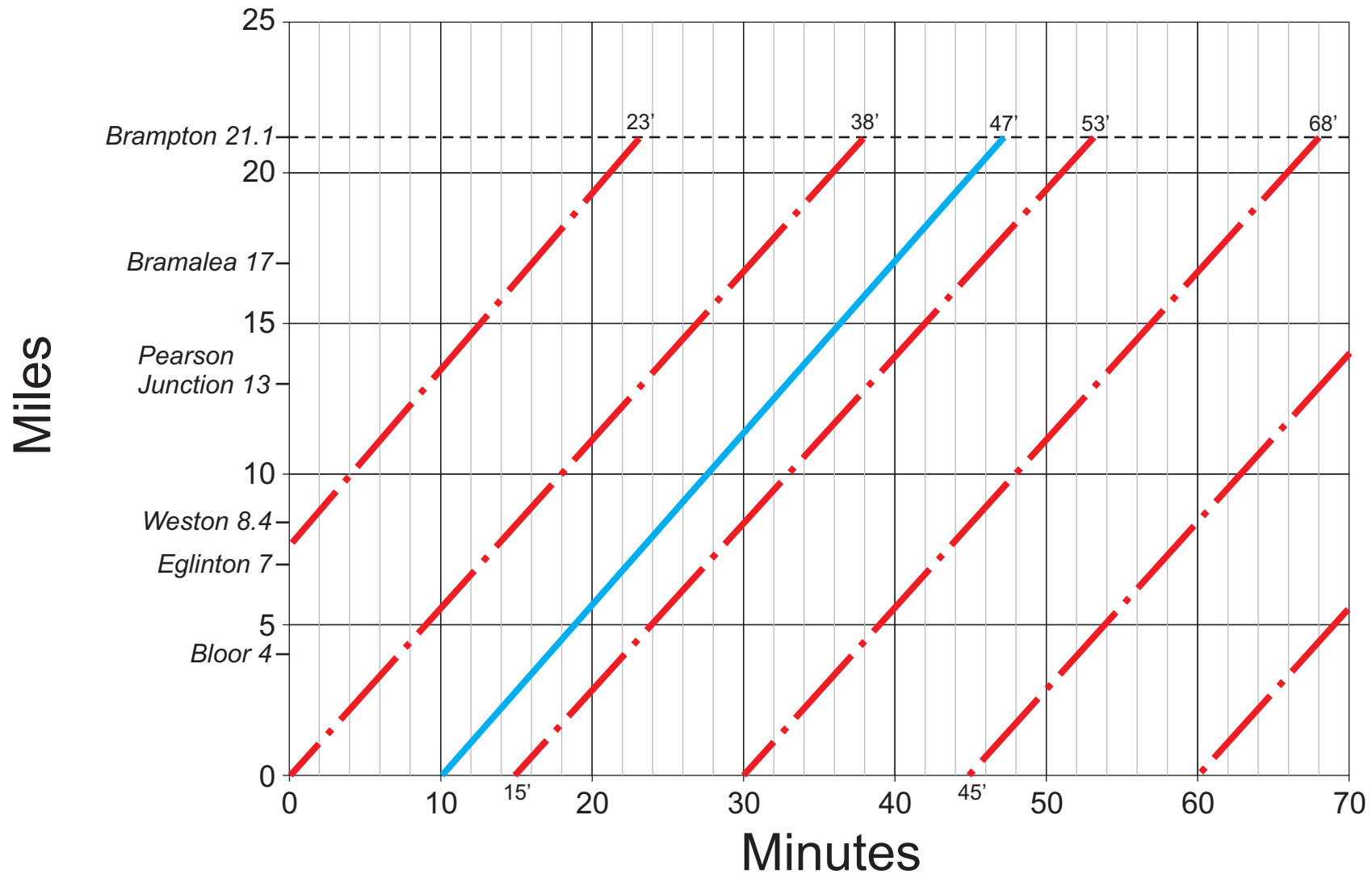


**Scenario 3 Track 1 Southbound**

- Regional Rail (Bolton) Train
- VIA Train
- Regional Rail (Stopping) Train



Note: Pattern repeats after 30 minutes except for VIA Train.

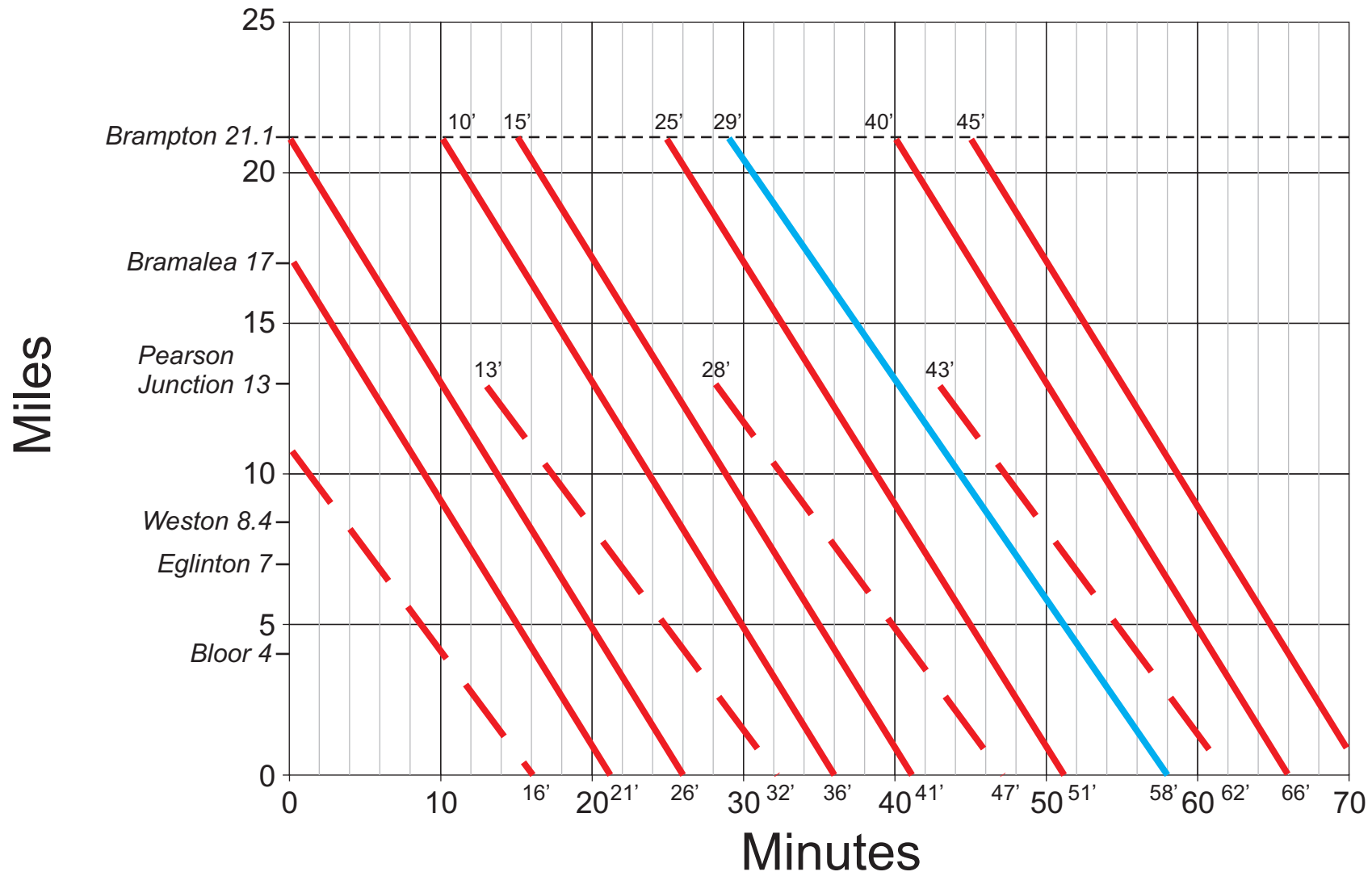


**Scenario 3 Track 2 Northbound**

- VIA Train
- Regional Rail (Stopping) Train



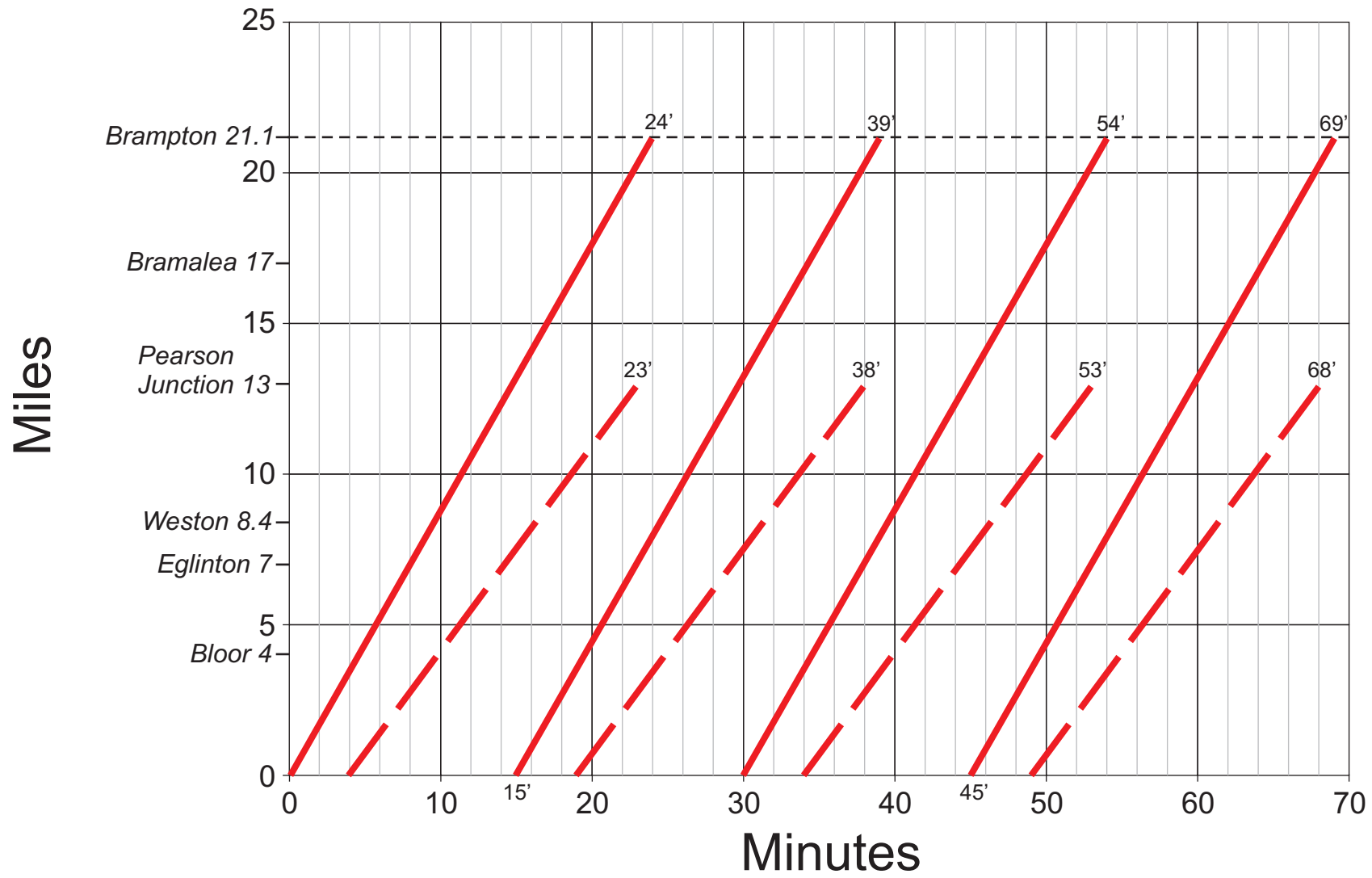
Note: Pattern repeats hourly.



**Scenario 3 Track 3 Southbound**

- VIA Train ————— (accelerated)
- Express Rail Train ————— (with Bramalea stop)
- Union-Pearson Rail Link Train - - - - -

Note: Pattern repeats hourly.



**Scenario 3 Track 4 Northbound**

- Express Rail Train
- Union-Pearson Rail Link Train

Note: Pattern repeats every 15 minutes.