

THFC New Stadium ï NFL scenario Tottenham Hale Interchange Analysis

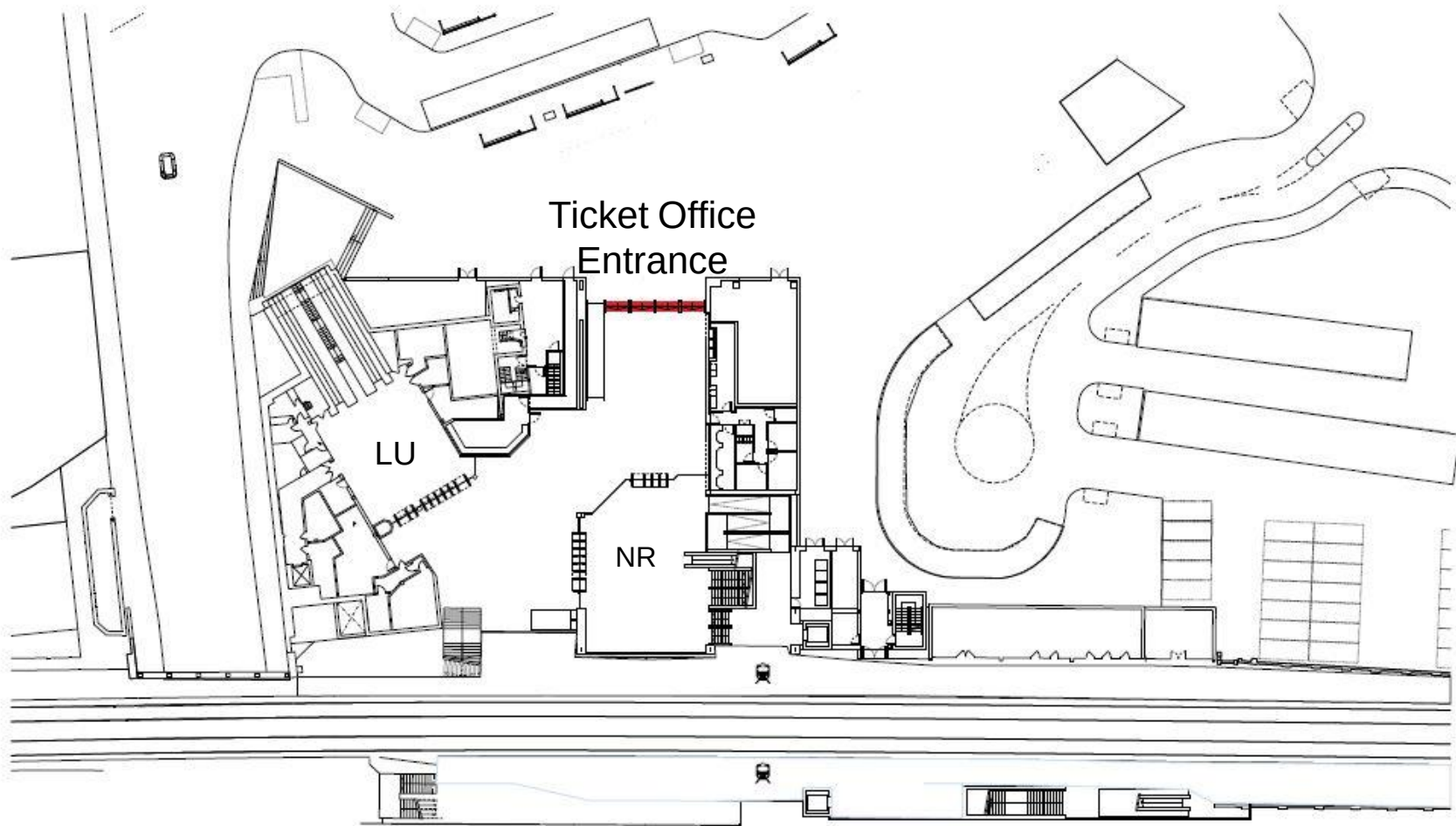
Assessment of Station Capacity

- ✍ This document contains the outcome of an assessment of capacity of Tottenham Hale Station in the light of anticipated demand associated with an expanded Tottenham Hotspur Stadium.
- ✍ The NFL Match day scenario is considered:
 - ✎ Sunday: 14:30 kick off, 18:00 final whistle.
- ✍ Spectator demand forecasts have been generated by Tim Spencer & Co, using information from existing THFC spectator surveys and analysis of demand patterns associated with spectators at NFL events at Wembley in 2014.
- ✍ Assumptions used to generate the forecasts of Spectator demand at Transport Nodes are listed in a *Data Book* (150821-563THTA-NFL Data Book - 0.2).
- ✎ A spreadsheet model of demand and capacity has been constructed to assess the performance of different parts of the infrastructure.
- ✎ The following pages summarise the performance throughout the pre- and post-match period for the Sunday NFL scenario.
- ✎ Background loading on services and at the Station is included in the assessment. 22% growth has been applied to observed background figures to represent conditions in 2021.
- ✎ Station capacities are calculated according to SPSG *Special Events* guidance, this includes those elements which are Network Rail. NR and LU guidance for Special Events are largely consistent, with a slight difference for calculating escalator capacities.

Station layout and entry points

Station re-configuration is currently underway. The plan below shows the layout as assumed in 2021.

At the time of assessment, the THFC Shuttle Bus pick-up/drop-off location was unconfirmed.

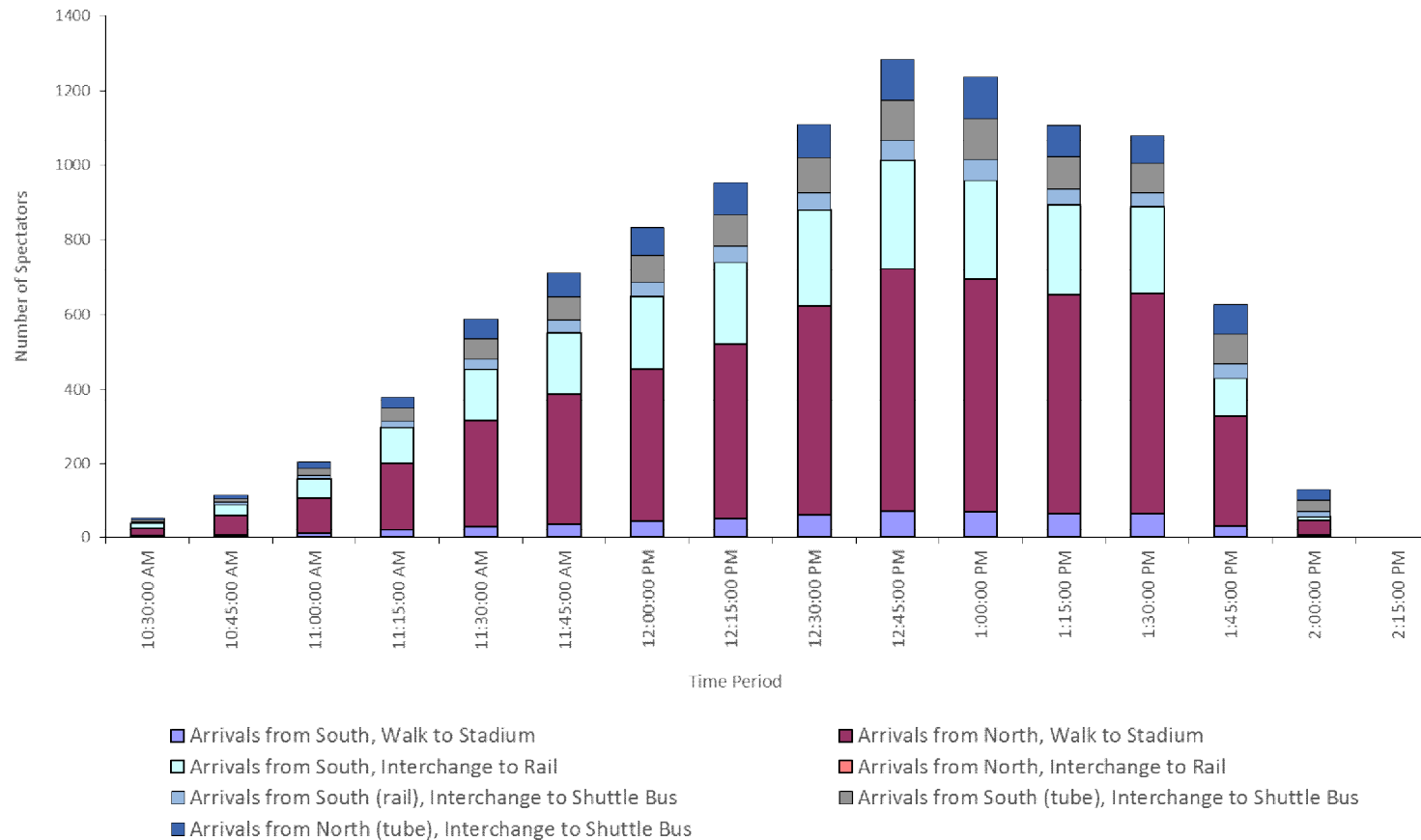




Sunday NFL Scenario

Pre-match period: Arrival profile

Spectator Arrivals at Tottenham Hale during the Pre-Match Period

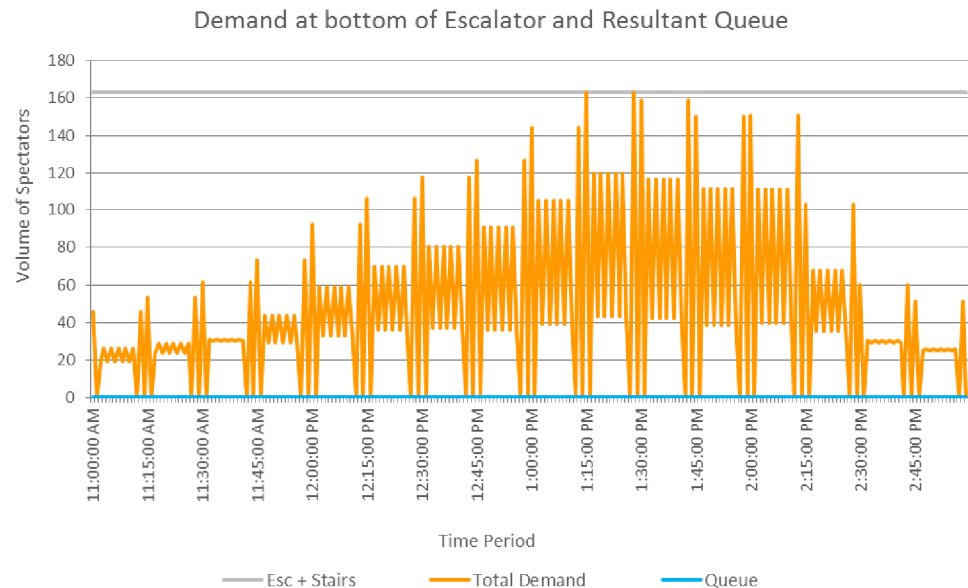
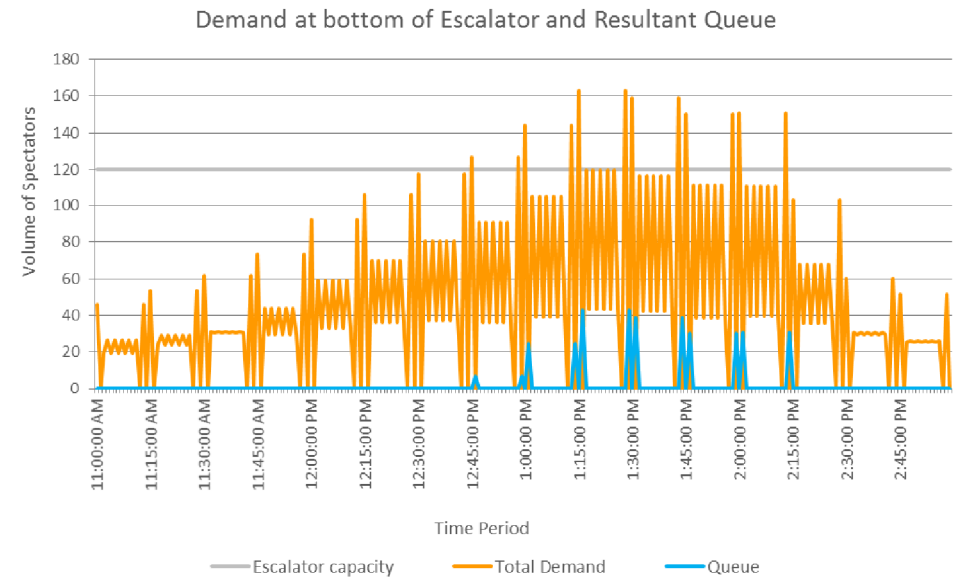


∧ 10,420 spectators in total

- 5,790 exit the Station and Walk to the Stadium
- 2,314 interchange onto a THFC Shuttle Bus
- 2,316 interchange onto National Rail services to Northumberland Park

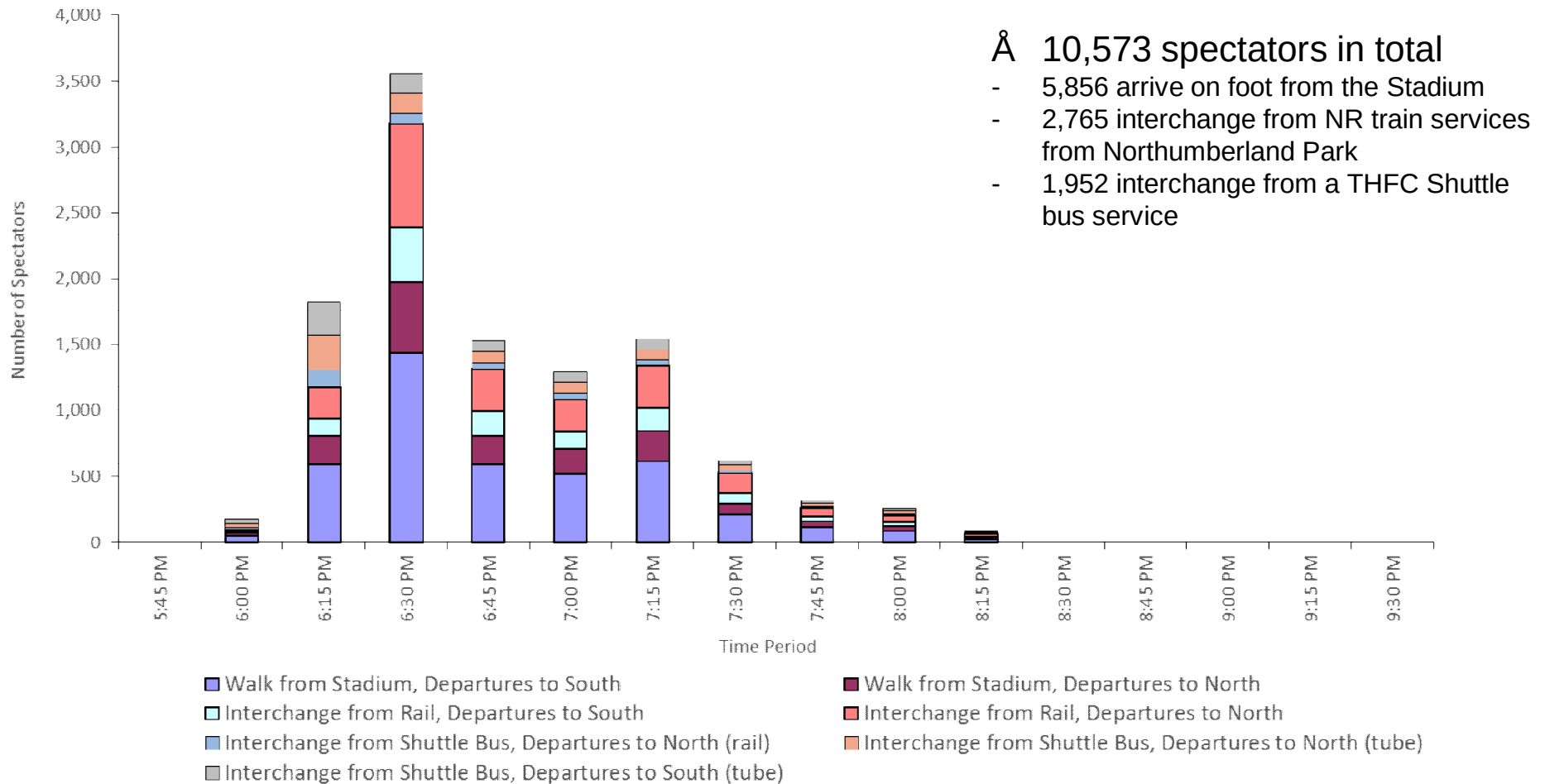
Pre-match period: Vertical Circulation from the Victoria Line

- Å With 27tph, the total demand exceeds escalator capacity on several occasions, creating small, shuffling queues of up to 40 people that remain within the reservoir area capacity at the bottom of the escalator.
- Å The peak period for this would be between 1pm and 2:15pm.
- Å Queuing would be avoided if the stair capacity were fully used in addition to the escalator – although observations suggest that this is not the natural behavior given the steepness of the stairs.



Post match period - Arrival Profiles over time

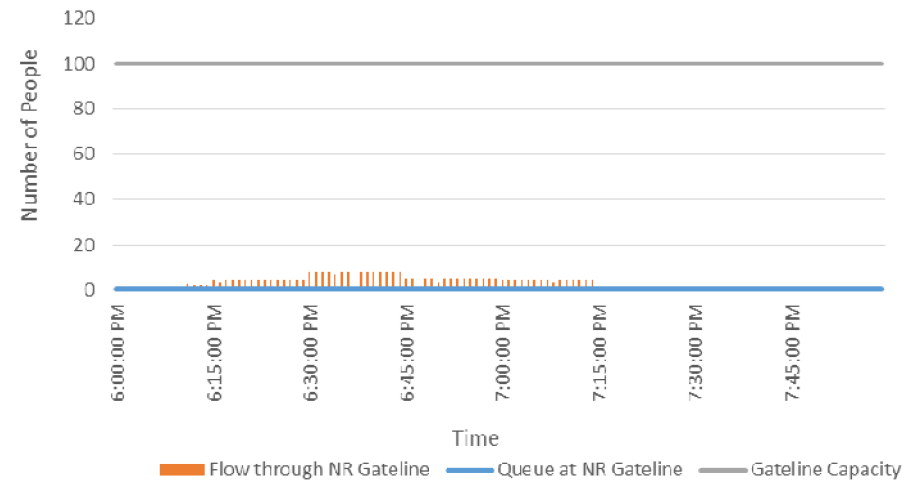
Spectator Departures from Tottenham Hale during the Post-Event Period



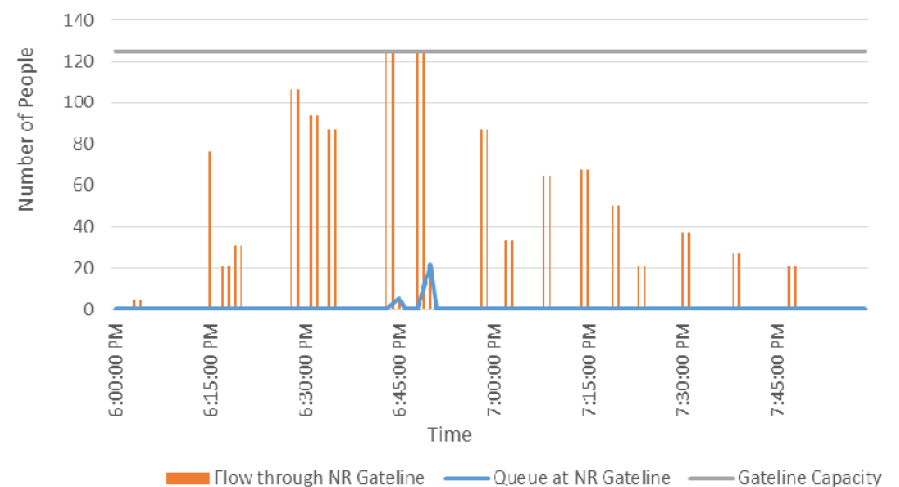
Post-match period: use of National Rail Gateline

- Assuming 4 entry gates and 5 exit gates
- A small queue is anticipated the exit gateline
- Peak entry flows are forecast between 18:15 and 19:00
- All alighters from National Rail services are able to clear through the gateline within two minutes of the train arrival

Demand at NR Gateline (entry) and Resultant Queues

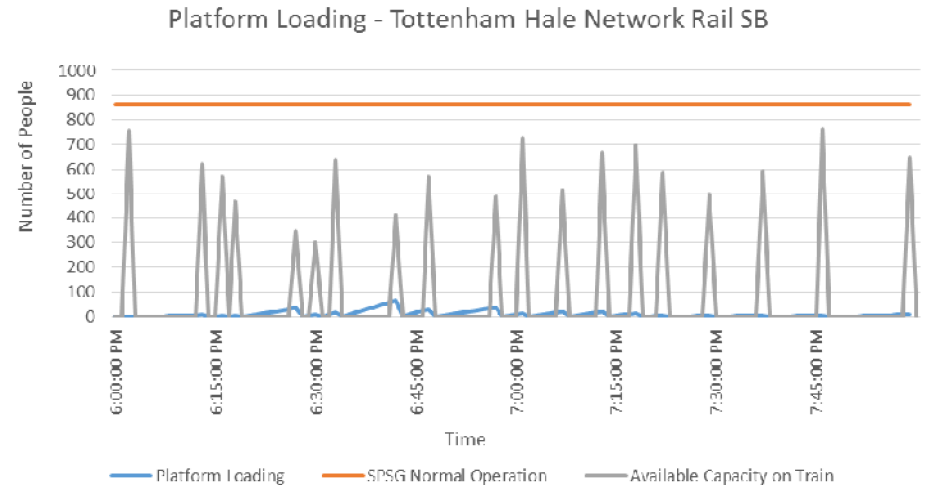


Demand at NR Gateline (exit) and Resultant Queues



Post-match period: NR SB platform

- Ⓐ Some passengers alighting from the Shuttle Bus will board National Rail services arriving from Northumberland Park.
- Ⓐ The analysis shows that all of these spectators will be able to board the next available train after their arrival.
 - Ⓜ Although the trains will leave Northumberland Park at capacity the number of people alighting at Tottenham Hale (to interchange to LU) exceeds those wishing to board
- Ⓐ The number of people waiting on the Platform to board will peak at approximately 65 – there is no capacity issue anticipated.



Post-match period: Ticket Office and access to LU

Å The entrance to the Ticket Office provides sufficient capacity to accommodate all flows entering the station.

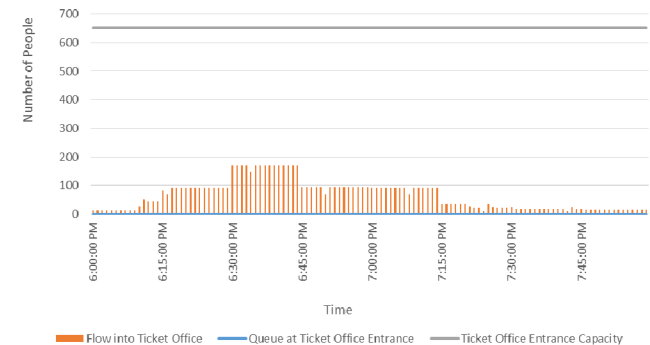
Å It is assumed that entry into the London Underground part of the station would be via **6 automated ticket gates + 1 Wide Aisle Gate**.

Å This is matched to the vertical circulation capacity within the station, and therefore prevents any queue formation at the head of the stairs/escalator or in the gateline run-off area. This does suggest that use of the stair capacity is required in addition to the escalator and therefore may need to be encouraged.

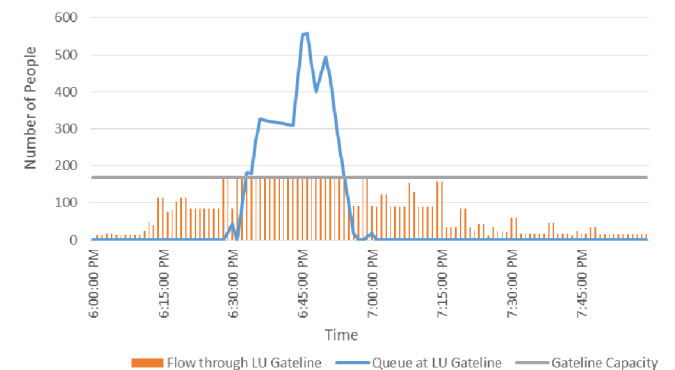
Å Some queuing is anticipated at the gateline

- ï Maximum queue duration of **25 mins**
- ï Maximum queue size of circa **558 people**
- ï Maximum delay for any individual of **3minutes**
- ï The majority of passengers do not experience any delay

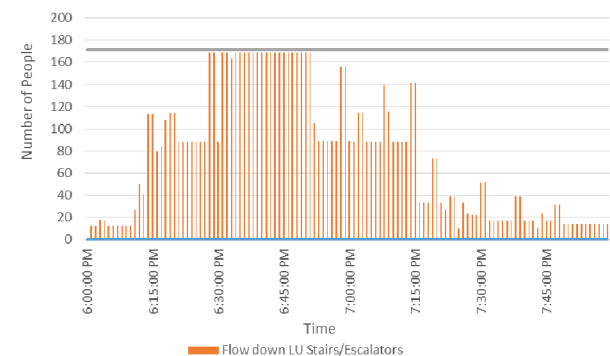
Demand into Ticket Office and Resultant Queues



Demand at LU Gateline and Resultant Queues



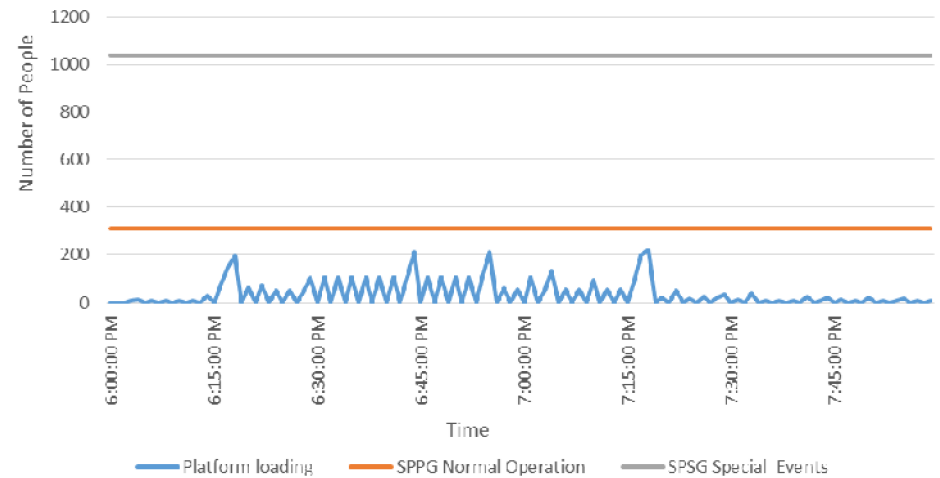
Demand at LU Stairs/Escalators and Resultant Queues



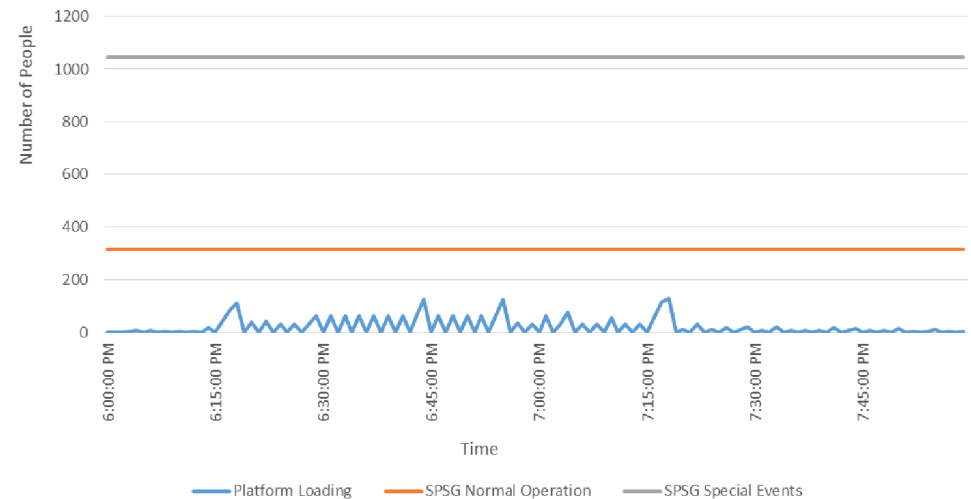
Post-match period: LU Platforms

- ⚠ Under SPSG Special Events guidance, each LU Platform has capacity for approximately 1,000 people.
- ⚠ As indicated in the adjacent charts, the peak anticipated occupancy is approximately 220 passengers for Southbound services and 120 passengers for Northbound.
- ⚠ For both platforms, densities experienced are below the planning standards for Normal Operations, suggesting that conditions on the Platform during the post-match should operate safely without management intervention.
- ⚠ In both directions, all passengers would be expected to board the first train after they arrived on the Platform.

Platform Loading - Tottenham Hale Victoria Line SB



Platform Loading - Tottenham Hale Victoria Line NB



Conclusions

- Tottenham Hale Station in its future configuration has the capacity to accommodate the forecast Spectator demand in addition to regular use of the station. This includes an uplift in demand of >20% to 2021.
- During the pre-match period, the critical capacity constraint is the vertical circulation between the Victoria Line platform level and the ticket office, with the limited area at the base of the escalator/stairs before the queues form back as far as the platform. Calculations suggest that to avoid extensive queuing in this area it is important that high train frequencies are maintained (to spread demand across more trains) and that use of the stairs is encouraged.
- In the post-match period, there is some queuing anticipated as a result of the surge of demand associated with clearance of the stadium. Again, the vertical circulation is the key constraining factor, however it is anticipated that from a management perspective, it would be better to introduce a constraint at either the gateline or in the Ticket Office, depending upon space and operational preference. The peak queue would be circa 500 people, and it is not anticipated that any individual would be delayed for more than 3 minutes.

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