

NFL Scenario – Assumptions Data Book

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1. Introduction

This Data Book compiles the demand assumptions used in the production of a spectator demand forecast for a NFL match scenario at Tottenham Hotspur FC's expanded stadium. Only assumptions that differ from the Football scenarios (150824-Data Book 1.1) are stated in this report. A more complete description of the forecasting approach, and assumptions regarding Walk, Taxi, Coach, Car, Bus and Shuttle Bus distribution of approach are also found in the Football Data Book:

- Pedestrian Network: Section 2
- Pre/Post Match Locations: Section 3
- Cycle: Section 4
- Walk: Section 5
- Rail: Section 6
- Car: Section 7
- Bus: Section 8
- Coach: Section 9
- Taxi: Section 10
- Shuttle Bus: Section 11

2. Spectator Demand

2.1. High-Level Assumptions

2.1.1. Venue Capacity

The assumed gross seating capacity of the venue upon opening is approximately 61,000. The base case forecasts are on the basis of all 61,000 seats being fully occupied, with all seats taken by spectators who arrive and leave the stadium on foot (and are therefore included within the demand forecast).

2.1.2. Kick-Off and Finish Times

The NFL match is assumed to take place on a Sunday and assumed match Kick-off and Finish times are:

Å Kick Off ĩ 14:30

Å Finish Time ĩ 18:00

2.1.3. Arrival and Departure profiles

Spectators will arrive at the stadium over the course of an extended time period in advance of the match. For the purposes of forecasting demand it is assumed that:

Å All spectators are in the stadium by the time of kick-off, and

Å The stadium arrival profile is applied irrespective of mode of transport used, and whether or not spectators are visiting other locations in the local area prior to the match.

The demand forecasts are generated in 15-minute time periods.

It is assumed that all spectators will be inside the stadium turnstiles from the time of kick-off until the time of the final whistle (i.e. no spectators arrive late or depart early).

Note that the arrival profiles reflect the time at which spectators enter through the turnstiles, and does not indicate the time at which spectators take their seat.

Table 1.1 Assumed Spectator Arrival Profiles at the Stadium Turnstiles

Minutes before kick-off	Proportion of spectators arriving - Sunday Afternoon
0-15 minutes before kick-off	15%
15-30 minutes before kick-off	35%
30-45 minutes before kick-off	20%
45-60 minutes before kick-off	10%
60-75 minutes before kick-off	10%
75-90 minutes before kick-off	5%

These assumed arrival profiles have been derived from observations of NFL Games at Wembley Stadium in 2014.

The assumed departure profiles are set out in the table below. This reflects the times at which spectators pass out of stadium building and onto the public highway. It does not refer to the times at which spectators leave their seats. This profile has been generated by the team, on the basis of understanding that retention measures would be in place to encourage spectators to remain the stadium during the post-match period.

Table 1.2 Assumed Spectator Departure Profiles from the Stadium Turnstiles

Minutes after Final Whistle	Proportion of spectators leaving - Sunday Afternoon
0-15 minutes after match	5%
15-30 minutes after match	40%
30-45 minutes after match	15%
45-60 minutes after match	10%
60-75 minutes after match	10%
75-90 minutes after match	0%

2.1.4. Distribution of Entrances and Exits

Stadium design drawings indicated that the stadium concourse will have accesses at each corner. The ticketing operation leads to the assumption that demand will be distributed between the four access points on both arrival and departure, with circulation occurring outside the stadium. The assumptions shown in the table

below are applied to spectators travelling by every mode (i.e. spectators do NOT access the stadium via the corner nearest to their point of arrival in the local area).

The distribution is therefore based on the proposition of seating capacity closest to each of the corners in NFL mode.

Table 1.3 Assumed Distribution of Demand between Stadium Entrances and Exits

Stadium Entry / Exit	Proportion of spectators using each Entrance ON ARRIVAL	Proportion of spectators using each Entrance ON DEPARTURE
North East	24%	24%
South East	26%	26%
South West	25%	25%
North West	25%	25%

2.1.5. Time in the Local Area Pre-match or Post-match

40% the spectators attending the match will arrive early to spend time in the local area, and 20% of spectators are assumed to spend time in the local area after the match before travelling home.

To identify how long spectators spend at their pre-match destinations before heading to the stadium, we have derived length of stay figures from the spectator surveys undertaken during March 2008. This included data on how long in advance of their arrival at the stadium spectators entered the local area and enabled calculation of a range of lengths of stay in the local area.

It is recognised that this survey relates to a Football match but has been used as a proxy in this scenario. Details of time spent, location and relative popularity of pre- and post- match destination can be found in the Football Data Book (*150824-Data Book 1.1*)

2.2. Spectator Types

For the purposes of generating demand forecasts, the approach adopted is to subdivide the total population into different groups to reflect the likely factors that affect their behaviour. The numbers of each type of spectator are determined based on the assumptions below, as is the pedestrian activity they generate. This then enables all types of spectator behaviour to be represented, and aggregated to give total demand forecasts.

2.2.1. Spectator Types on Arrival

The modal split assumptions are derived from the Tim Spencer & Co assumptions recorded in - *NFL and Concert versus PL at NDP* (24th June 2015) - and are used to calculate the number of each type of spectator on arrival.

The assumed modal split of spectators on arrival is as shown in Table 1.4 below.

The various types of spectators upon arrival are described below, with a summary of the proportion of each spectator type resulting from the application of the assumptions described above.

Table 1.4 Spectator Types on Arrival, and Assumed Proportions of Different Spectator Types (Arrival, Sunday Afternoon)

Description		Proportion of Total
Mode	In time for Kick-off or Early?	
Cycle	Direct to stadium	0.6%
Cycle	Arrives in local area early	0.4%
Walk	Direct to stadium	0.6%
Walk	Arrives in local area early	0.4%
Tube to Seven Sisters, then Walk	Direct to stadium	9.0%
Tube to Seven Sisters, then Walk	Arrives in local area early	6.0%
Tube to Seven Sisters, then Bus	Direct to stadium	4.2%
Tube to Seven Sisters, then Bus	Arrives in local area early	2.8%
Rail to White Hart Lane	Direct to stadium	13.8%
Rail to White Hart Lane	Arrives in local area early	9.2%
Rail to Northumberland Park	Direct to stadium	6.6%
Rail to Northumberland Park	Arrives in local area early	4.4%
Car Driver/Passenger	Direct to stadium	9.0%
Car Driver/Passenger	Arrives in local area early	6.0%
Bus	Direct to stadium	1.2%
Bus	Arrives in local area early	0.8%
Coach	Direct to stadium	3.0%
Coach	Arrives in local area early	2.0%
Taxi	Direct to stadium	1.2%
Taxi	Arrives in local area early	0.8%
Alexandra Palace Shuttle Bus	Direct to stadium	2%
Alexandra Palace Shuttle Bus	Arrives in local area early	1.6%
Tottenham Hale Shuttle Bus	Direct to stadium	2.40%
Tottenham Hale Shuttle Bus	Arrives in local area early	1.60%
Tube to Tottenham Hale, then Walk	Direct to stadium	6.0%
Tube to Tottenham Hale, then Walk	Arrives in local area early	4.0%

Additional assumptions have been generated in relation to the direction of travel of spectators arriving by rail. This is important when assessing pedestrian movements within stations. The table below sets out the assumed division of demand upon arrival at each station, based upon the *Updated Rail Assumptions – All event types* (4th June 2015).

Table 1.5 Assumed Proportions of Spectator Arrivals by Rail from each Direction

Station	Split of Demand - Sunday Afternoon	
	From Central London (incl. those interchanging at TH and SVS)	From North
White Hart Lane NR	78.3%	21.7%
Northumberland Park NR	72.7%	27.3%

* 35% of spectators alighting from NB services at White Hart Lane are assumed to have interchanged from the Victoria Line at Seven Sisters. 36% of spectators alighting from NB services at Northumberland Park are assumed to have interchanged from the Victoria Line at Tottenham Hale.

At Seven Sisters, there are several options available to spectators on how they continue their journey to the stadium having arrived on the Victoria Line. They can interchange on to bus services or National Rail services to White Hart Lane, or they can walk to the stadium. The split of direction of travel on the Victoria Line differs depending upon their final mode.

- Å Of those who interchange from the Victoria Line to the Bus, 100% arrive from Central London.
- Å Of those who interchange from the Victoria Line to National Rail, 100% arrive from Central London.
- Å Of those who arrive on the Victoria Line and walk to the stadium, 90% arrive from Central London, 10% from the North.

Similar options exist at Tottenham Hale. The following assumptions have been applied with regard to direction of travel for Victoria Line alighters at Tottenham Hale:

- Å Of those who interchange from the Victoria Line to National Rail, 100% arrive from Central London.
- Å Of those who arrive on the Victoria Line and walk to the stadium, 10% arrive from Central London, 90% from the North.
- Å Of those who interchange to the Shuttle Bus, 80% come from the Victoria Line (40% from the South and 40% from the North) and 20% come from Central London via National Rail.

2.2.2. Spectator Types on Departure

The assumed modal split of Home fans on arrival is as shown in Table 1.11 below.

The various types of spectators upon departure are described below, also showing the proportions of each type resulting from the above assumptions.

Table 1.6 Spectator Types on Departure and Assumed Proportions of Different Spectator Types (Departure, Sunday Afternoon)

Description	Proportion of
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Mode?	In time for Kick-off or Early?	Total
Cycle	Leave directly	0.8%
Cycle	Stays in local area post-match	0.2%
Walk	Leave directly	1.2%
Walk	Stays in local area post-match	0.3%
Walk to Seven Sisters Tube	Leave directly	11.2%
Walk to Seven Sisters Tube	Stays in local area post-match	2.8%
Bus to Seven Sisters Tube	Leave directly	2.4%
Bus to Seven Sisters Tube	Stays in local area post-match	0.6%
Rail from White Hart Lane	Leave directly	15.2%
Rail from White Hart Lane	Stays in local area post-match	3.8%
Rail from Northumberland Park	Leave directly	13.6%
Rail from Northumberland Park	Stays in local area post-match	3.4%
Car Driver/Passenger	Leave directly	12.0%
Car Driver/Passenger	Stays in local area post-match	3.0%
Bus	Leave directly	1.6%
Bus	Stays in local area post-match	0.4%
Coach	Leave directly	4.0%
Coach	Stays in local area post-match	1.0%
Taxi	Leave directly	1.2%
Taxi	Stays in local area post-match	0.3%
Alexandra Palace Shuttle Bus	Leave directly	4.00%
Alexandra Palace Shuttle Bus	Stays in local area post-match	1.00%
Tottenham Hale Shuttle Bus	Leave directly	2.69%
Tottenham Hale Shuttle Bus	Stays in local area post-match	0.34%
Walk to Tottenham Hale Tube	Leave directly	9.6%
Walk to Tottenham Hale Tube	Stays in local area post-match	2.4%

Assumptions have been generated in relation to the direction of travel of spectators departing by rail to enable the assessment of pedestrian movements within stations. This is taken from the Indicative Transport Strategy, which was derived based upon the findings of surveys and observations made during matches in March 2008 and verified in subsequent spectator surveys in 2014.

Table 1.7 Assumed Proportions of Spectator Departures by Rail from each

Station	Split of Demand - Sunday Afternoon	
	From Central London (incl. those interchanging at TH and SVS)	From North
White Hart Lane NR	20.8%	79.2%
Northumberland Park NR	25.0%	75.0%

Direction

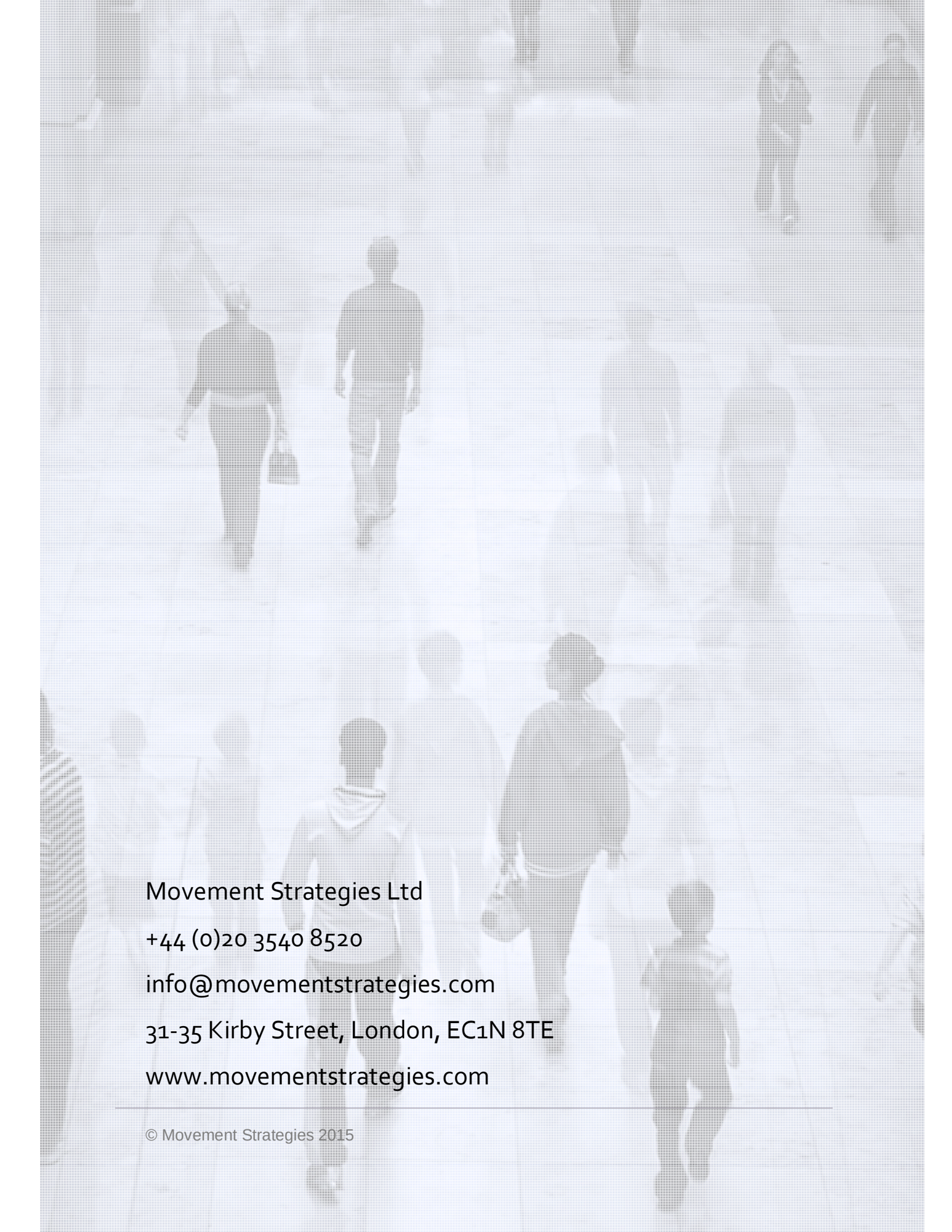
* 37% of spectators boarding the SB services at White Hart Lane are assumed to interchange onto the Victoria Line at Seven Sisters. 41% of spectators boarding the SB services at Northumberland Park are assumed to interchange onto the Victoria Line at Tottenham Hale.

At Seven Sisters, there are several options available to spectators on how they reach the Victoria Line from the Stadium during the Post-match period. They can interchange from bus services or National Rail services from White Hart Lane, or they can walk directly to the station. The split of direction of travel on the Victoria Line differs depending upon their initial travel mode.

- Å Of those who interchange from the Bus to the Victoria Line, 100% travel towards Central London.
- Å Of those who interchange from National Rail to the Victoria Line, 100% travel towards Central London.
- Å Of those who walk from the Stadium and board the Victoria Line, 100% travel towards Central London.

Similar options exist at Tottenham Hale. The following assumptions have been applied with regard to direction of travel for Victoria Line boarders at Tottenham Hale:

- Å Of those who interchange from National Rail to the Victoria Line, 35% travel towards Central London, 65% travel to the North.
- Å Of those who walk from the Stadium and board the Victoria Line, 73% travel towards Central London, 27% travel to the North.
- Å Of those who interchange from the Shuttle Bus, 80% go to the Victoria Line (40% to the South and 40% to the North) and 20% use National Rail (10% go North and 10% go South)



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