

---

<b>Project:</b>	SWL Travel Analysis Phase 1		
<b>Prepared by:</b>	Craig Walley	<b>Date:</b>	14/06/2018
<b>Approved by:</b>	Neil Hurst	<b>Checked by:</b>	Charlotte Reynolds
<b>Subject:</b>	Technical Note		

---

## 1 Phase 1 Methodology

### Area definition

The CCGs of Sutton, Merton, and Surrey Downs were defined as the study area for the assessment. A 15km buffer was created around the study area to create a wider catchment area for the purposes of modelling travel.

Population weighted centroids were extracted for each lower super output area (LSOA) within the 15km buffer area.

The hospitals / site locations for the study were extracted from NHS Choices using the co-ordinates provided in the dataset. These were:

- Epsom Hospital
- St Helier Hospital
- Sutton Hospital
- Croydon University Hospital
- East Surrey Hospital
- Kingston Hospital
- Royal Surrey County Hospital
- St George's Hospital
- St Peter's Hospital

A map was produced showing the site locations, the study area, and the 15km buffer.

### TRACC Public transport (PT) model generation

Timetables from the Traveline National Dataset and Association of Train Operating Companies (ATOC) were imported into the TRACC model for the South West area. The timetables were from quarter two 2018, and included the following modes:

- Bus
- Coach
- National Rail

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

- Light rail
- Tram
- Tube
- Ferry

The LSOA centroids for the wider study area were added to the model as origin points. As the maximum external connection distance was set to 800 metres, it was necessary to move a small number of centroids to their nearest PT stop, to ensure they had the potential to return travel times if possible in that time period. Centroids that required moving were mostly rural and outside of the three CCGs in the study area. These were:

- Sutton 025D (E01004114)
- Reigate and Banstead 004C (E01030567)
- Tandridge 004A (E01030828)
- Waverley 012D (E01030942)
- Mid Sussex 007C (E01031697)
- Mole Valley 012C (E01030557)
- Runnymede 008A (E01030677)
- Tandridge 004F (E01030861)
- Waverley 012D (E01030942)
- Chichester 002A (E01031517)
- Chichester 002B (E01031518)
- Chichester 002C (E01031544)
- Chichester 002D (E01031545)
- Horsham 010A (E01031611)
- Horsham 001D (E01031676)

Some moved centroids still had no PT access to a hospital in certain time periods. All centroids had access in one of the time periods indicating possible access.

The 9 hospital locations were then added to the model as the destination points. The TRACC program was run to create estimated travel times between each possible combination of LSOA and hospital. The following parameters were used:

- 800m maximum external connection distance (the distance representing a possible walk to a first stop location)
- 400m internal connection distance (the distance possible to walk when changing services mid-journey)
- Walk speed of 4.8kmph
- 5 minute interchange penalty (a minimum wait value to stop over-optimistic service changes)
- All PT modes were included

The model was run four times for the following time periods:

- AM Peak – 07:00 to 10:00 hrs
- Inter Peak – 10:00 to 16:00 hrs
- PM Peak – 16:00 to 19:00 hrs
- Off Peak – 19:00 to 23:59 hrs

### **Car and Blue Light Ambulance (BLA) model generation**

TM-Speeds data (derived from Trafficmaster 2017) was used as the network for the car and BLA model. The dataset utilises speed data returned from Satnav devices, with over 12 billion data counts for England and Wales included per annum. The data includes detailed Road Routing Information (RRI) including one way systems, banned turns and access restrictions.

The LSOA centroids and hospital locations were again used as the origins and destinations for the modelling. A small number of centroids would not return a travel time, due to their location being adjacent to a motorway or restricted link. These centroids were manually moved to the closest link where it was possible to start a journey. These LSOAs were:

- Hounslow 004C (E01002626)
- Lambeth 013C (E01003039)
- Runnymede 009C (E01030660)
- Runnymede 008A (E01030677)
- Spelthorne 004C (E01030736)

The car model was run for the time periods above, with the exception of the AM peak time which is set in the dataset to 07:00 to 09:00 hrs, and off-peak period which is set to 00:00 to 04:00 hrs. The calculation was set to return the fastest path between origins and destinations.

BLA travel times were estimated by multiplying the car travel time outputs by 0.9 to create a value 10% faster than the car travel time.

### **Output generation**

Origin Destination travel time matrices were exported from the model for the three modes, for each time period (a total of 12). From here, analysis was conducted to return the minimum travel time from an LSOA to a hospital and the name of the closest hospital (in terms of travel time) to each LSOA. Maps and summary data tables were produced to present the results.