

# Oxfordshire Transformation Programme

## Appendix 8.1: Baseline Travel and Access Analysis

## 01 Introduction

This document sets out a summary of the travel and access analysis that has been undertaken to understand current service configuration against which to model the impact of the options for future service reconfiguration. Travel implications are a key component in the development and evaluation of options. Concerns around travel have been reflected by patients, public and stakeholders during the pre-consultation work which has been undertaken across Oxfordshire.

## 02 Data Sources, Assumptions and Process

### 02a Private Transport

To analyse the travel implications of service reconfiguration in Oxfordshire the Integrated Transport Network (ITN) was used as this comprehensively covers motorways, A roads, B roads, minor roads, local streets and private roads to an exacting specification. The ITN covers some 550,000 km of roads across Great Britain and new roads and changes are continually surveyed and uploaded. Urban Paths was used to cater for walkers and cyclists as well as cars and trucks, thanks to its dataset of pedestrian routes across towns in Britain.

High resolution GPS-data is analysed to produce attributes that identify the average driving speed on each element of the network, depending on road classification, speed limit and urban/rural location. The default speeds are then adjusted by modifying the speed values until the results compare with a number of known actual journey times across the area. Those average speeds are then adjusted again by a factor (approximately +/- 4mph) to provide peak-time and off-peak speeds again by comparing with known actual journey times.

Mega urban/urban/rural areas are derived from Ordnance Survey's Meridian 2 Developed Land Use Area (DLUA) polygon dataset. For example, inner London is defined as mega urban while outer areas, smaller cities and towns are defined as urban with any remaining areas classed as rural. Speeds for roads that fall within urban/mega urban are reduced accordingly.

### 02b 'Blue-Light' Ambulance Transport

South Central Ambulance Service (SCAS) has its northern headquarters in Bicester, Oxfordshire. Emergency 999 calls received by SCAS are prioritised into categories to ensure that the most life threatening cases receive the quickest response. The categories are:

- RED 1 &2
- GREEN 1/2/3/4

The Department of Health requires that the ambulance service reaches 75% of RED 1 (life-threatening) calls within eight minutes. If onward transport to hospital is required a

suitable vehicle should arrive on the scene within 19 minutes. These waiting times have been accounted for in this analysis.

SCAS have multiple modes of transport to respond to an emergency. The call operator may send a rapid-response vehicle equipped to provide treatment at the scene of an accident, or a traditional ambulance if it is likely that the patient will need to be transported to hospital for further treatment. In addition these two modes of transport SCAS can use Community First Responders, Commercial responders, Air Ambulance, Advanced Paramedic Triage, and Operational Commanders if deemed appropriate. Times analysed in this document are for cars and ambulances only.

For our analysis it is assumed that an emergency services vehicle speed takes an uplift of 20% on the average private vehicle speed.

## 02c Public Transport

The public transport travel time is calculated using the Traveline National Dataset (TNDS) data provided by iGeolise and updated monthly with the dataset used updated in October 2016 to account for timetable changes made up to this point. TNDS is the most accurate public transport database available and is the same source that Google Maps use for their routing information. The analysis for public transport is based on journeys starting at 14:00 on a Tuesday and includes journeys up to 90 minutes. The data accounts for the walking time to and from the nearest station/stop as well as the waiting time and the duration of the journey.

## 02d Destinations

### Acute Hospitals

Acute		
Destination	Postcode	CCG Boundary
Churchill	OX3 7LE	Oxfordshire
Great Western	SN3 6BB	Swindon
Horton General	OX16 9AL	Oxfordshire
John Radcliffe	OX3 9DU	Oxfordshire
Nuffield Orthopaedic Centre	OX3 7LD	Oxfordshire
Royal Berkshire	RG1 5AN	South Reading
Stoke Mandeville	HP21 8AL	Aylesbury Vale
Wycombe General	HP11 2TT	Chiltern

## Community Hospitals

Community		
Destination	Postcode	CCG Boundary
Abingdon	OX14 1AG	Oxfordshire
Bicester	OX26 6HT	Oxfordshire
Chipping Norton War Memorial	OX7 5FA	Oxfordshire
Didcot	OX11 0AG	Oxfordshire
Townlands (Henley)	RG9 2EB	Oxfordshire
Oxford City	OX3 7JU	Oxfordshire
Wallingford	OX10 9DU	Oxfordshire
Witney	OX28 6JJ	Oxfordshire
Wantage	OX12 7AQ	Oxfordshire

### 02e Data

For analysis of the current configuration, different population estimates were used. These included the Office for National Statistics (ONS) resident mid-2014 population estimate; the March 2016 GP registered population and Oxfordshire A&E, inpatient and outpatient activity from Feb 2014 – Jan 2016. As the most recent data, the GP registered population will be referred to as the ‘population’ in this document.

The ONS resident mid-2014 population calculations are based on the geographical centre of each Lower-layer Super Output Area (LSOA) that make up the Oxfordshire CCG region (407 in total). An LSOA (Lower Super Output Area) is the government’s term for a small area averaging approximately 1,650 people and 700 households. The GP registered population is measured at a postcode level. The A&E, Inpatient and Outpatient activity calculations are based on the population weighted centroid of each Output Area which falls within the travel time zones.

The below figures and tables show the number and percentage of Oxfordshire CCG patients, population and sum of hospital activity, with access to Acute and Community Hospitals under the current configuration.

## 03 Patient Travel Times – Outputs

### 03a Blue Light Times to Acute Hospitals

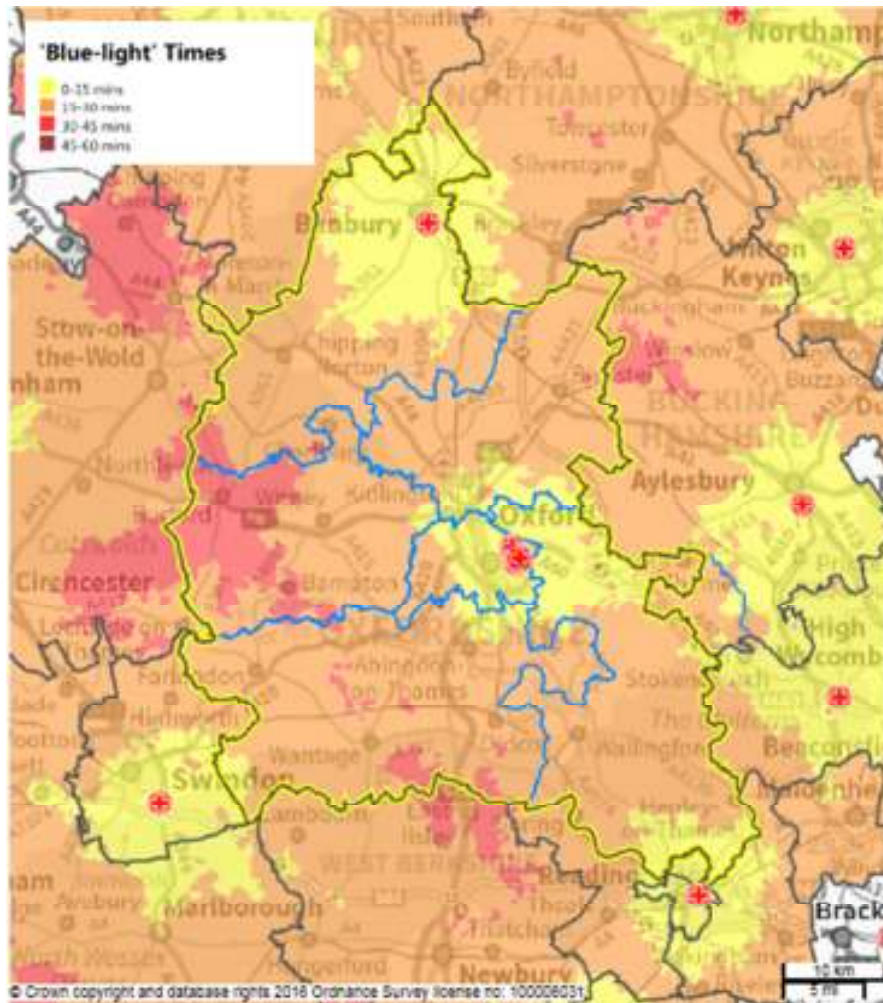


Figure 1 - Ambulance Isochrones – Acute Hospital Access

Figure 1 shows the current state where, once in an ambulance:

- 47.7% of the population could reach an acute hospital within 15 minutes from their home (the yellow isochrones). That number increases to
- 96.7% of the population are currently within 30 minutes
- ~100% are within 45 minutes of their nearest acute hospital.

### 03b Blue Light Times to Community Hospitals

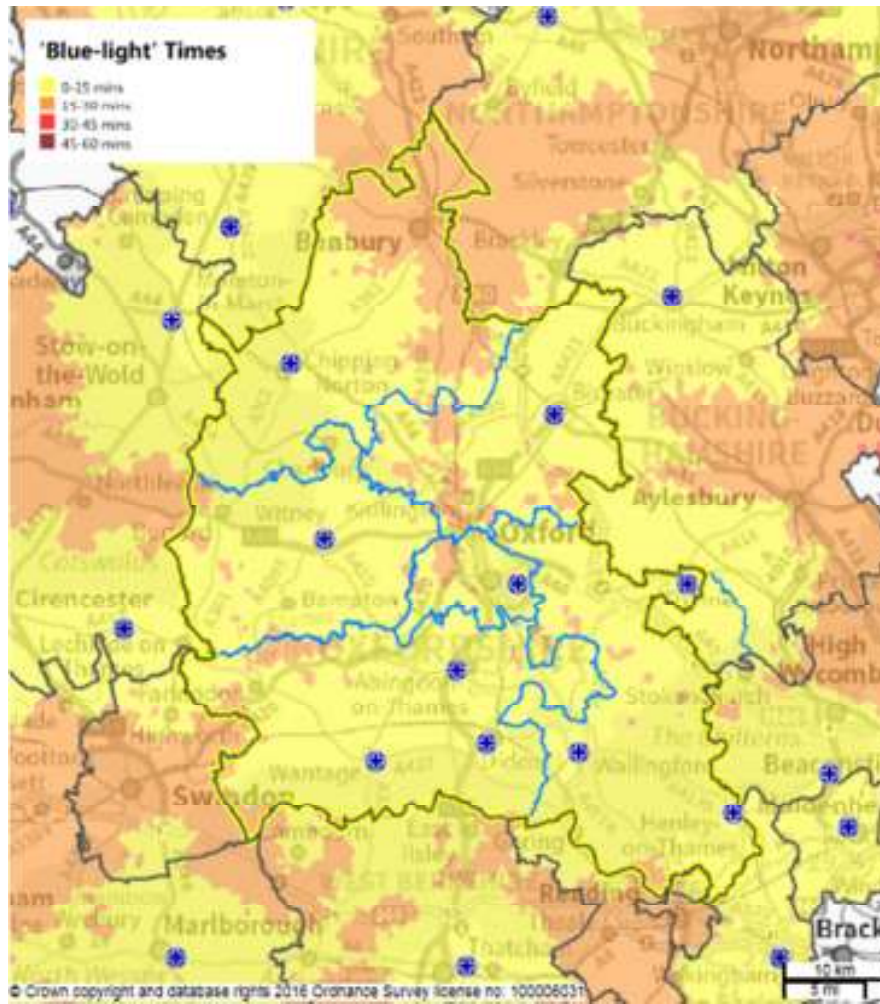


Figure 2 - Ambulance Isochrones – Community Hospital Access

Figure 2 shows that:

- 87.5% of the population could reach their nearest community hospital within 15 minutes by blue light transport (the yellow isochrones)
- ~100% are within 30 minutes.

**Table 1 - Number and Percentage of Oxfordshire CCG patients with access to Acute Hospitals (Blue-Light)**

Cumulative Travel Time including a 19 minute wait on average ('Blue-Light')	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-34 mins	295,226	44.8	336,046	47.7	144,705	46.8	137,628	44.3	505,416	46.3
0-49 mins	631,204	95.8	681,967	96.7	299,454	96.8	300,418	96.6	1,054,580	96.7
0-64 mins	658,674	100.0	704,776	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 64 mins			108	<0.02						

**Table 2 - Number and Percentage of Oxfordshire CCG patients with access to Community Hospitals (Blue-Light)**

Cumulative Travel Time including a 19 minute wait on average ('Blue-Light')	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-34 mins	578,351	87.8	616,938	87.5	264,162	85.4	271,903	87.5	953,611	87.4
0-49 mins	658,674	100.0	704,776	100.0	309,305	93.3	310,919	100.0	1,090,964	100.0
Over 49 mins			108	<0.02						

**Table 3 - Number and Percentage of Oxfordshire CCG patients with access to Acute and Community Hospitals (Blue-Light)**

Cumulative Travel Time including a 19 minute wait on average ('Blue-Light')	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-34 mins	649,919	98.7	697,103	98.9	307,407	99.4	308,679	99.3	1,082,807	99.3
0-49 mins	658,674	100.0	704,778	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 49 mins			106	<0.02						

### 03c Peak Times to Acute Hospitals

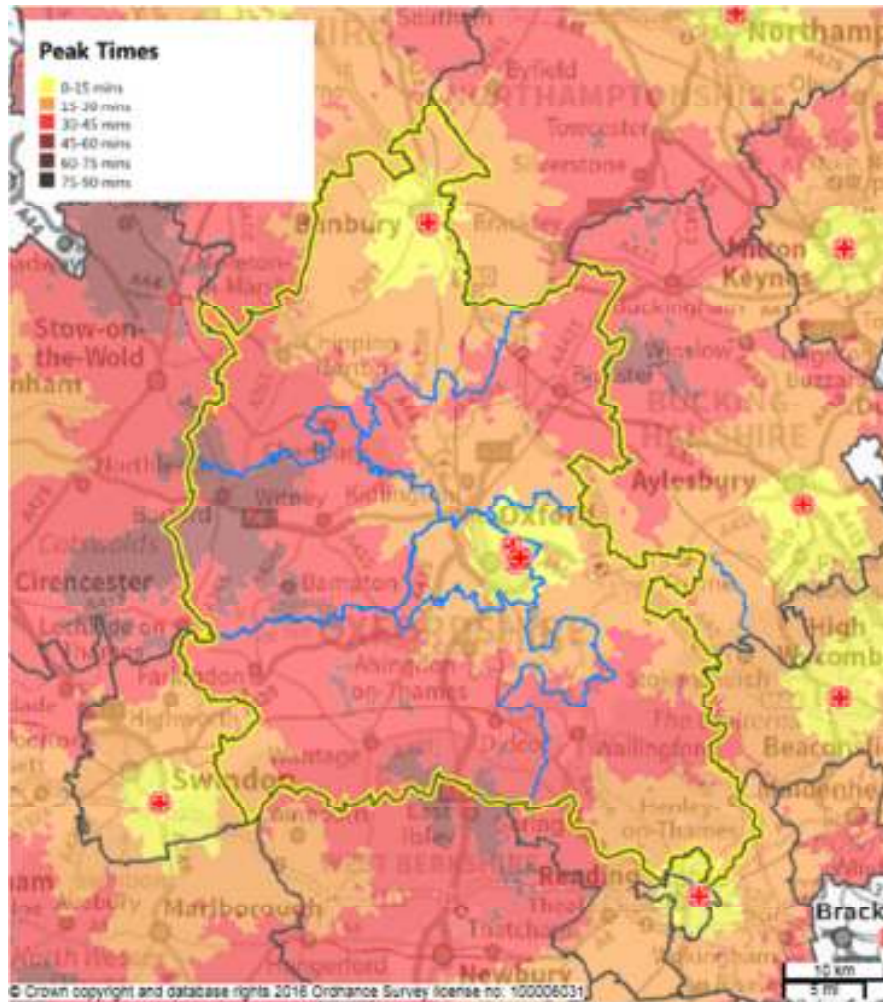


Figure 3 – Peak Time Isochrones – Acute Hospital Access

Figure 3 shows that:

- 62% of those travelling by private vehicle (either patients being driven by family or friends to an acute hospital, those driving to visit a friend or family member in hospital or those attending an outpatient appointment) have a journey time of less than 30 minutes.
- 97% have a journey time of less than 45 minutes in peak traffic conditions.



### 03d Off-peak Times to Acute Hospitals

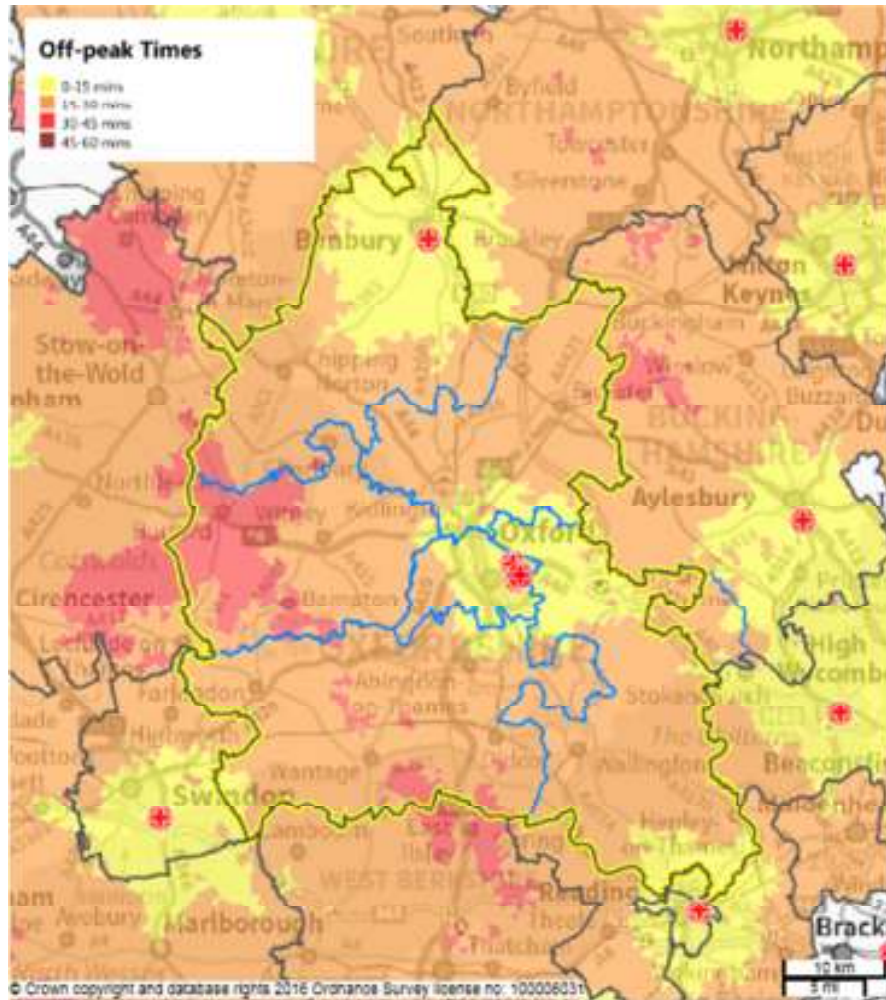


Figure 4 – Off-peak Time Isochrones – Acute Hospital Access

Figure 4 shows:

- For those travelling off-peak 97% have a journey time less than 30 minutes.
- ~100% of the population can reach their closest acute hospital from home in less than or equal to 45 minutes by private transport with minimal traffic.

### 03e Public Transport to Acute Hospitals

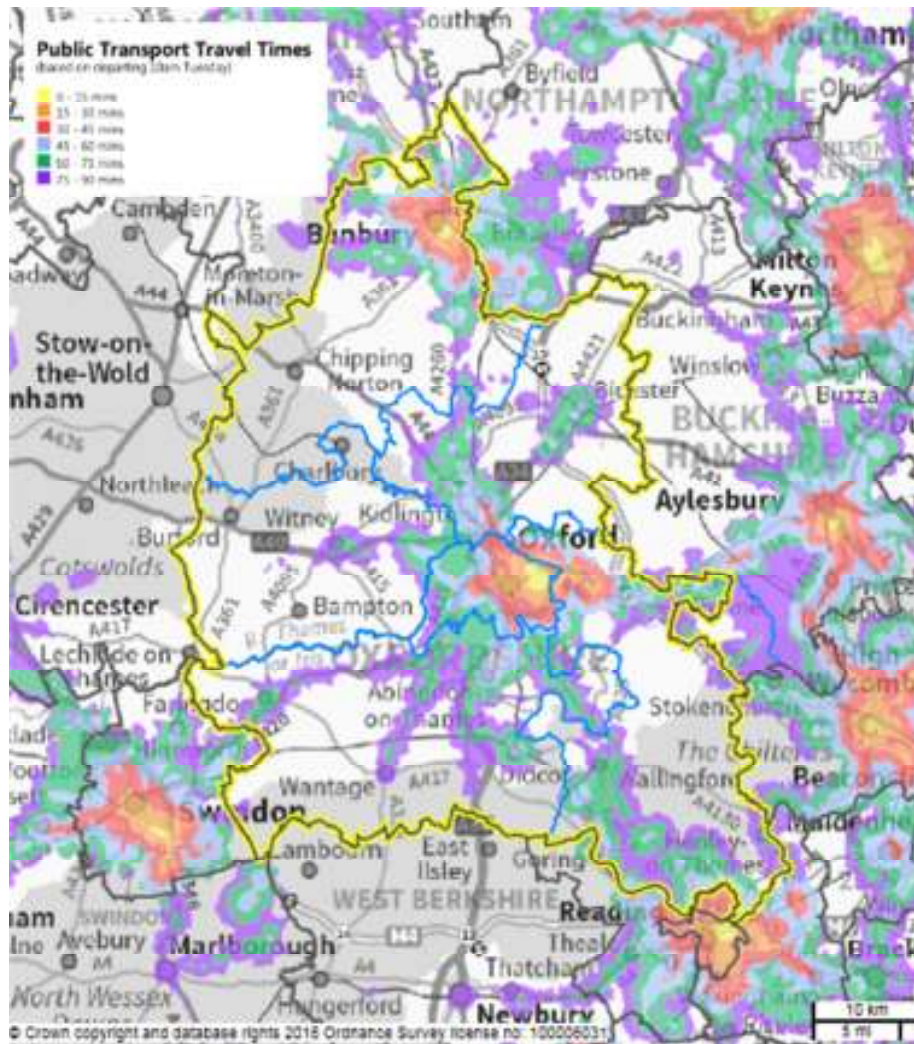


Figure 5 – Public Transport Isochrones – Acute Hospital Access

Figure 5 shows that:

- Public transport represents significantly longer journey times for the population.
- 22% are within 30 minutes.
- 51.1% are within 60 minutes.
- 82.4% are within 90 minutes of their closest acute hospital.
- That means that based on current service configuration, 17.6% of the population are more than 90 minutes from an acute hospital if they were reliant on public transport.

Table 4 – Number and Percentage of Oxfordshire CCG patients with access to Acute Hospitals (Private vehicle - Peak time)

Cumulative Travel Time (Peak time)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	214,538	32.6	249,955	35.5	110,633	35.8	98,779	31.8	368,916	33.8
0-30 mins	405,933	61.6	437,012	62.0	194,800	63.0	191,135	61.5	678,570	62.2
0-45 mins	631,204	95.8	682,426	96.8	299,524	96.8	300,510	96.7	1,054,870	96.7
0-60 mins	658,674	100.0	704,776	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 60 mins			108	<0.02						

Table 5 – Number and Percentage of Oxfordshire CCG patients with access to Acute Hospitals (Private vehicle - Off-peak time)

Cumulative Travel Time (Off-peak time)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	293,694	44.6	335,349	47.6	144,530	46.7	137,465	44.2	504,527	46.2
0-30 mins	631,204	95.8	681,707	96.7	299,185	96.7	300,095	96.5	1,053,589	96.6
0-45 mins	658,674	100.0	704,776	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 45 mins			108	<0.02						

Table 6 – Number and Percentage of Oxfordshire CCG patients with access to Acute Hospitals (Public Transport)

Cumulative Travel Time (Public Transport)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	27,102	4.1	28,916	4.1	14,790	4.8	13,501	4.3	52,248	4.8
0-30 mins	121,680	18.5	154,868	22.0	66,301	21.4	55,887	18.0	209,901	19.2
0-45 mins	213,936	32.5	264,283	37.5	114,702	37.1	105,164	33.8	391,984	35.9
0-60 mins	307,089	46.6	360,103	51.1	157,197	50.8	150,659	48.5	550,259	50.5
0-75 mins	429,618	65.2	495,856	70.3	221,005	71.5	216,647	69.7	768,447	70.5
0-90 mins	518,481	78.7	580,977	82.4	258,565	83.6	254,302	81.8	895,983	82.1
Over 90 mins	140,193	21.3	123,907	17.6	50,740	16.4	56,617	18.2	194,981	17.9

## 03f Peak Times to Community Hospitals

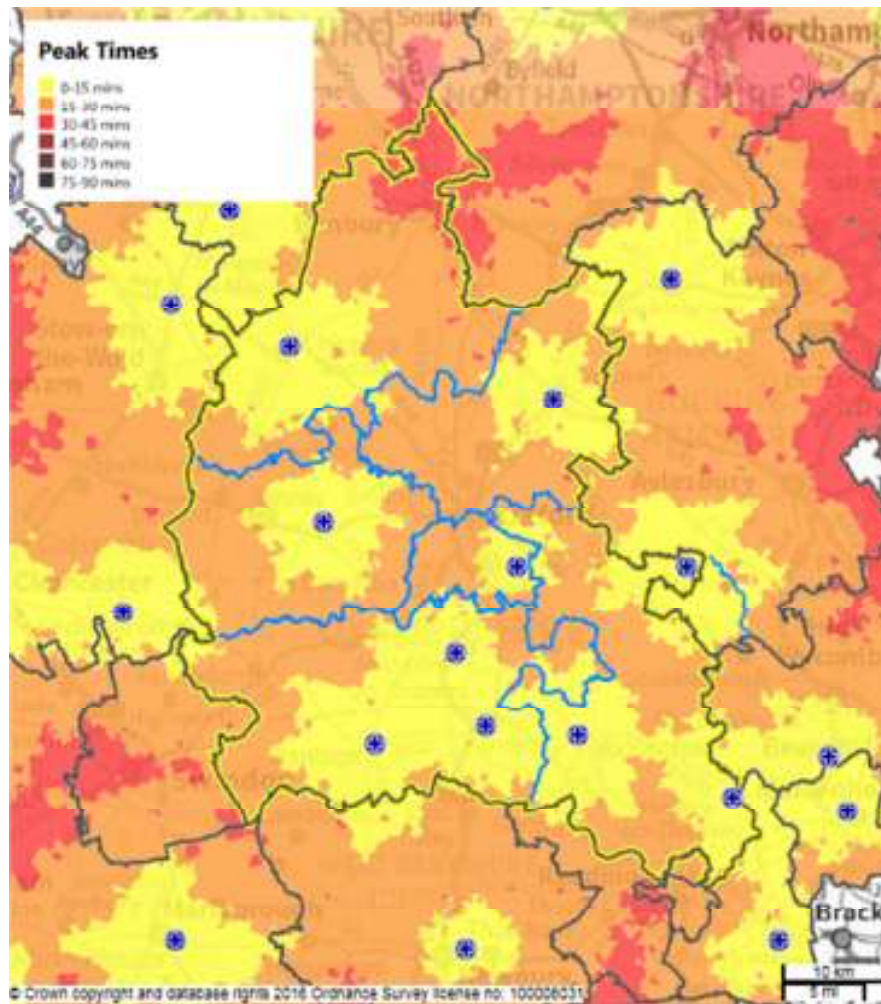


Figure 6 – Peak Time Isochrones – Community Hospital Access

Figure 6 shows that:

- For private transport (those being driven to the hospital for an outpatient appointment or a trip to MIU) 62% could be there in 15 minutes in peak traffic.
- 95% of the population have a journey time of less than or equal to 30 minutes in peak time conditions.

### 03g Off-peak Times to Community Hospitals

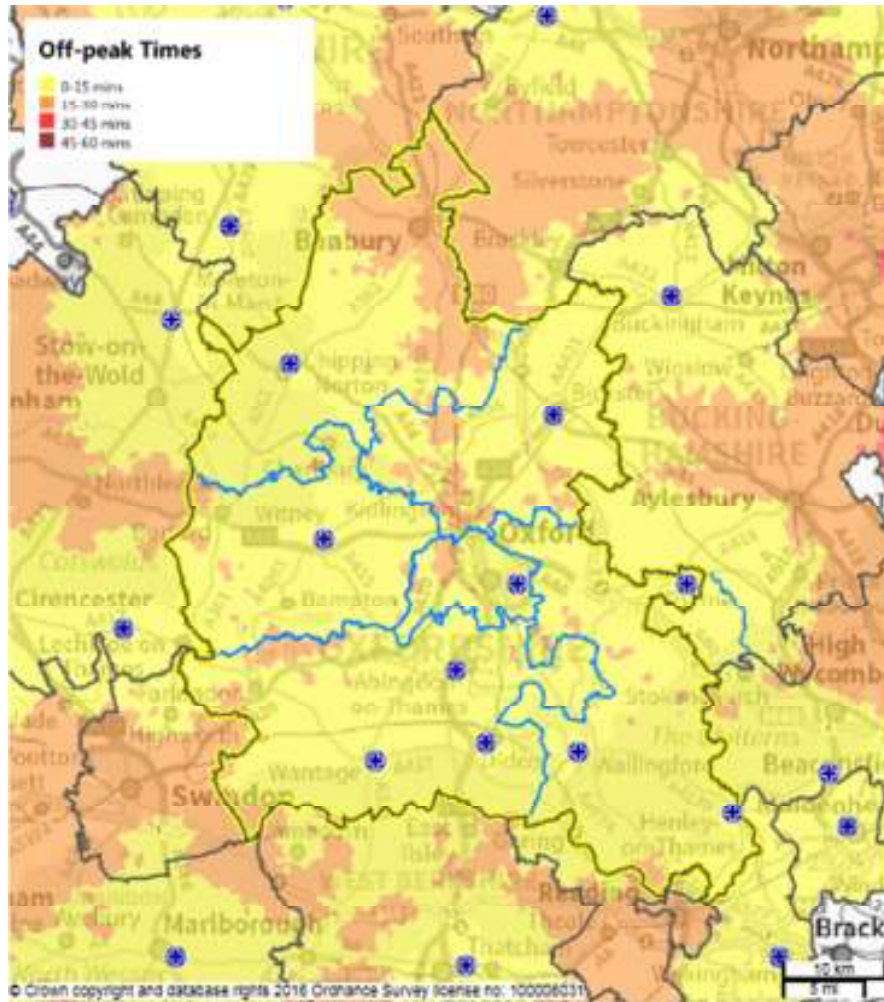


Figure 7 – Off-peak isochrones – Community Hospital Access

Figure 7 shows that:

- 88% of the population have journey of less than or equal to 15 minutes.
- Almost 100% are within 30 minutes in off-peak road conditions.

## 03h Public Transport Times to Community Hospitals

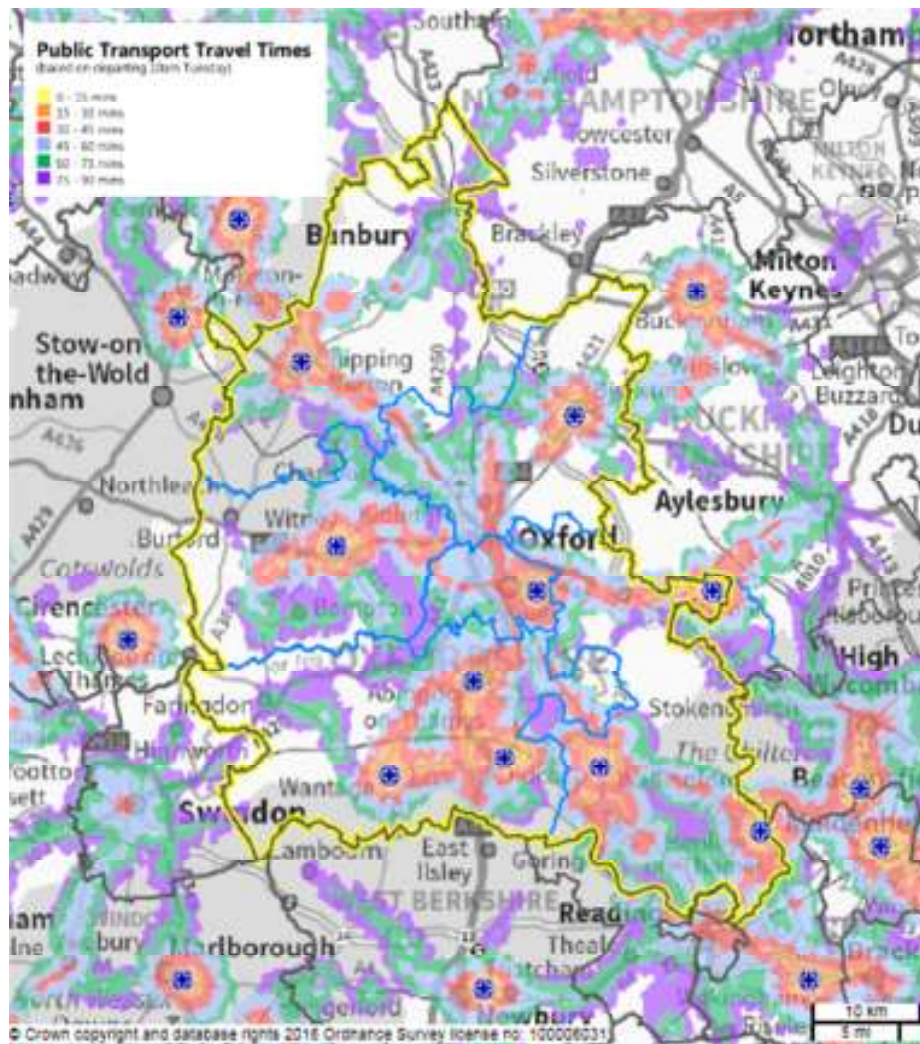


Figure 8 – Public Transport Isochrones – Community Hospital Access

Figure 8 shows that:

- For access by public transport 36.1% of the population is within 30 minutes.
- 80.8% are within 60 minutes.
- 94% of the population are within 90 minutes of their nearest community hospital.

Table 7 – Number and Percentage of Oxfordshire CCG patients with access to Community Hospitals (Private vehicle - Peak time)

Cumulative Travel Time (Peak time)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	396,834	60.2	435,454	61.8	190,124	61.5	189,108	60.8	660,682	60.6
0-30 mins	627,592	95.3	666,979	94.6	288,809	93.4	294,946	94.9	1,035,143	94.9
0-45 mins	658,674	100.0	704,778	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 45 mins			106	<0.02						

Table 8 - Number and Percentage of Oxfordshire CCG patients with access to Community Hospitals (Private vehicle - Off-peak time)

Cumulative Travel Time (Off-peak time)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	577,674	87.6	616,522	87.5	264,027	85.4	271,710	87.4	952,975	87.4
0-30 mins	658,674	100.0	704,778	100.0	309,305	100.0	310,919	100.0	1,090,964	100.0
Over 30 mins			106	<0.02						



Table 9 - Number and Percentage of Oxfordshire CCG patients with access to Community Hospitals (Public Transport)

Cumulative Travel Time (Public Transport)	ONS Mid 2014 Population		GP Registered Population (Mar16)		A&E Activity		Inpatient Activity		Outpatient Activity	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
0-15 mins	53,432	8.1	58,670	8.3	30,528	9.9	32,449	10.4	105,859	9.7
0-30 mins	228,572	34.7	254,234	36.1	115,790	37.4	112,246	36.1	391,300	35.9
0-45 mins	416,590	63.2	471,370	66.9	204,611	66.2	205,300	66.0	725,769	66.5
0-60 mins	515,366	78.2	569,301	80.8	251,107	81.2	250,701	80.6	884,874	81.1
0-75 mins	573,905	87.1	635,755	90.2	284,086	91.8	282,992	91.0	992,576	91.0
0-90 mins	608,430	92.4	662,673	94.0	294,535	95.2	293,199	94.3	1,029,342	94.4
Over 90 mins	50,244	7.6	42,211	6.0	14,770	4.8	17,720	5.7	61,622	5.6

N.B Not able to comment on the impact on Patient Transport Services as this has not yet been identified.