

# Travel Time Analysis for the Consolidation of Cardiac Surgery Services within MFT

2025-2026

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## Executive Summary

This travel analysis models the impact of consolidating cardiac surgery services onto a single site. Historically, cardiac surgery was delivered from both Manchester Royal Infirmary (MRI) and Wythenshawe. Following safety and sustainability concerns, services were centralised at Wythenshawe during the Covid-19 pandemic. This configuration of services is now awaiting final approval.

The analysis compares travel times under the previous two-site model with the current consolidated model. This compares travel times for:

- Car travel during peak weekday mornings
- Nighttime car travel as a proxy for ambulance journeys
- Public transport travel between 09:00- 17:00

This analysis shows that for patients travelling by car, the impact of consolidation is modest. Peak AM car travel times increase by a median of just 3.3 minutes for those who would now have to travel to Wythenshawe. Journeys by car at nighttime show a similar modest median increase of 3.1 minutes. Residents experiencing larger increases in travel time are those who live within central Manchester and Salford. The analysis demonstrates that travel times to cardiac services by car and minimally impacted by these changes.

The greatest impact of the changes is on travel times for those using public transport. Before the reconfiguration of services, the median time to reach the nearest site was 65 minutes. Most patients had a journey time of 77 minutes or quicker. With all patients now having to travel to Wythenshawe, the median travel time has increased to 106 minutes. The median increase in travel times on public transport is 44 minutes.

Analysis of these changes on travel times by deprivation does not show that any group is disproportionately impacted. The median increases for travel by car are similar across each deprivation decile. This indicates that the changes to services does not exacerbate existing health inequalities. Patients with the largest increase in travel times by car are in the most deprived deciles. Exploring this data demonstrates that this is for patients living within central Manchester and Salford. These patients had short journey times to the MRI when this was providing services. Whilst travelling to Wythenshawe has increased journey times, these remain lower than most across Greater Manchester and East Cheshire.

In summary, the consolidation of cardiac surgery services at Wythenshawe results in limited increases in car travel times for most of the catchment population. However, substantial increases for those reliant on public transport. Importantly, the impacts are not disproportionate across deprivation levels. Therefore, these changes do not worsen access to care inequalities.

## **1. Introduction**

A travel analysis has been undertaken to understand the impact on travel times for the Cardiac Surgery population across Greater Manchester (GM) and East Cheshire (EC). Prior to Covid-19 the services were delivered at Manchester Royal Infirmary (MRI) and Wythenshawe Hospital. Activity has been consolidated at the Wythenshawe site following safety and sustainability concerns. These changes are now awaiting final approval as the most safe and sustainable option for cardiac surgery services.

This review compares travel times for the population aged 50+ before and after the consolidation of services. These scenarios consider:

- Car travel during peak weekday mornings
- Nighttime car travel as a proxy for ambulance journeys
- Public transport travel between 09:00- 17:00

## **2. Methodology**

This travel analysis draws on modelled travel times and population data to assess the potential impact of consolidating services at Wythenshawe. The approach has been outlined below.

### **2.1 Travel Time Modelling**

Travel times were generated using TRACC, a multimodal travel time analysis tool. The analysis incorporates three travel scenarios to reflect different modes of travel and conditions. These scenarios are:

- Peak AM car travel times are based on average journey times between 07:00 – 09:00 on weekdays.
- Nighttime car travel times more closely resemble travel time via ambulance. Therefore, these travel times are used as a proxy for ambulance travel times.
- Public transport travel times, between 09:00 and 17:00. This captures typical availability and frequency of public transport during the day.

These scenarios provide a comprehensive understanding of typical travel times for patients who use the Cardiac Surgery services in GM and EC.

### **2.2 Geographical Basis**

Travel times were calculated from population-weighted centroids for each Lower Layer Super Output Area (LSOA) in the catchment area.

- LSOAs are small statistical geographic areas used in England and Wales, each typically covering between 1,500 and 3,000 residents. They provide a consistent unit of analysis for assessing population-level impacts.

- A population-weighted centroid represents the point within an LSOA where the population is most densely clustered. Rather than the simple geometric centre. Using population-weighted centroids provides more accurate travel times. These travel times reflect where people actually live rather than the geographic centre of the area.

### 2.3 Population Demographics

The analysis focuses on the population aged 50 and above. This is based on a review of the age profile of patients admitted for cardiac surgery where 89% of patients admitted under Cardiac Surgery were aged 50+ years.

Focusing on this age group will ensure that the analysis more reliably reflects the population using the service. This ensures that the analysis is not skewed by younger adults who, although technically eligible for the service, represent only a small proportion of admissions.

## 3. Travel Time

### 3.1 Travel time for peak AM car travel analysis

Figure 1 shows the travel times for peak AM car travel to the nearest site prior to Covid-19. This was when Cardiac Surgery services were operating from both MRI and Wythenshawe.

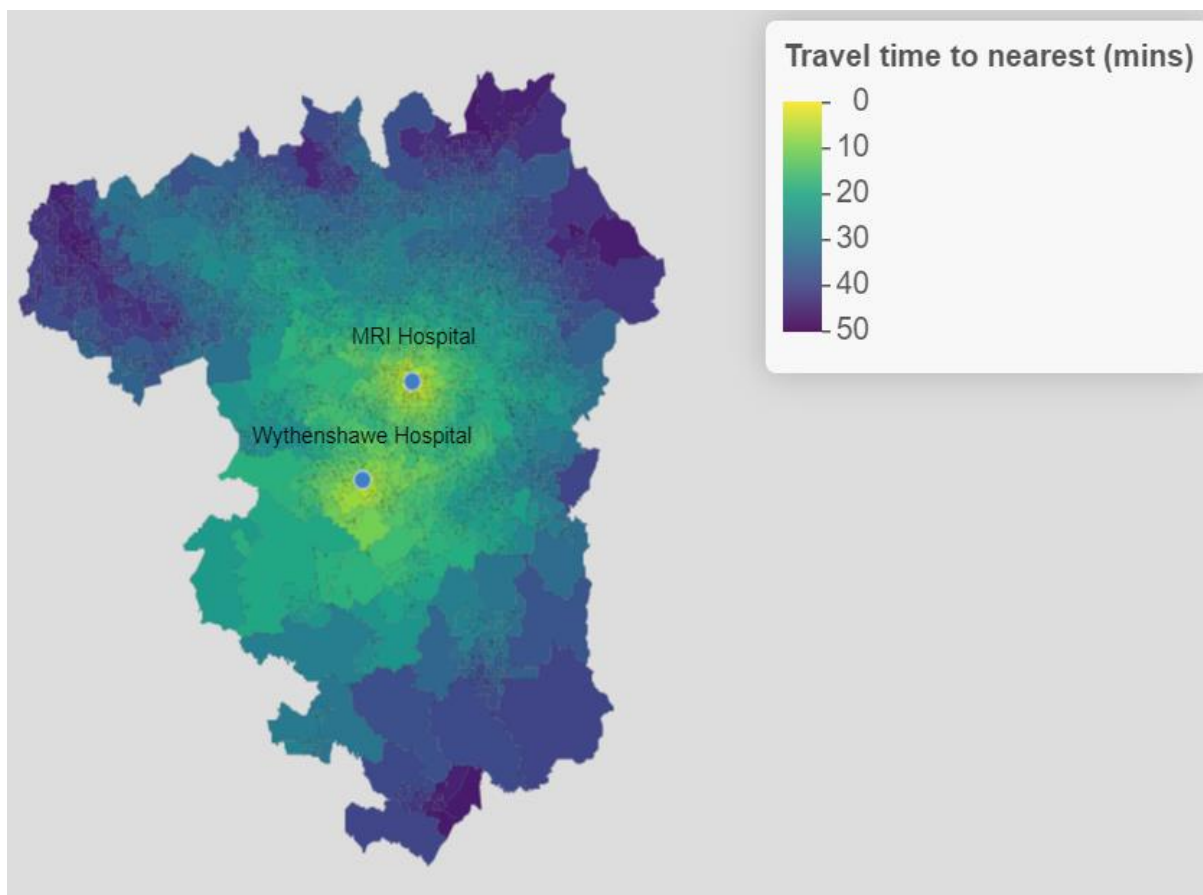


Figure 1 - Travel Times for Peak AM Car Travel prior to Covid-19 Configuration

In the map each LSOA is shaded dependent on the travel time to the nearest site. This shows that the areas closest to both the MRI and Wythenshawe hospitals have the shortest travel times. Areas further on the edges of GM and EC have longer journey times. Overall, the median travel time to the nearest site is 27 minutes.

Figure 2 shows us the travel times following consolidation of services at Wythenshawe Hospital. The map shows that patients living in central Manchester and Salford see a notable increase in travel times. Overall, the median travel time to Wythenshawe as the only site is now 30 minutes.

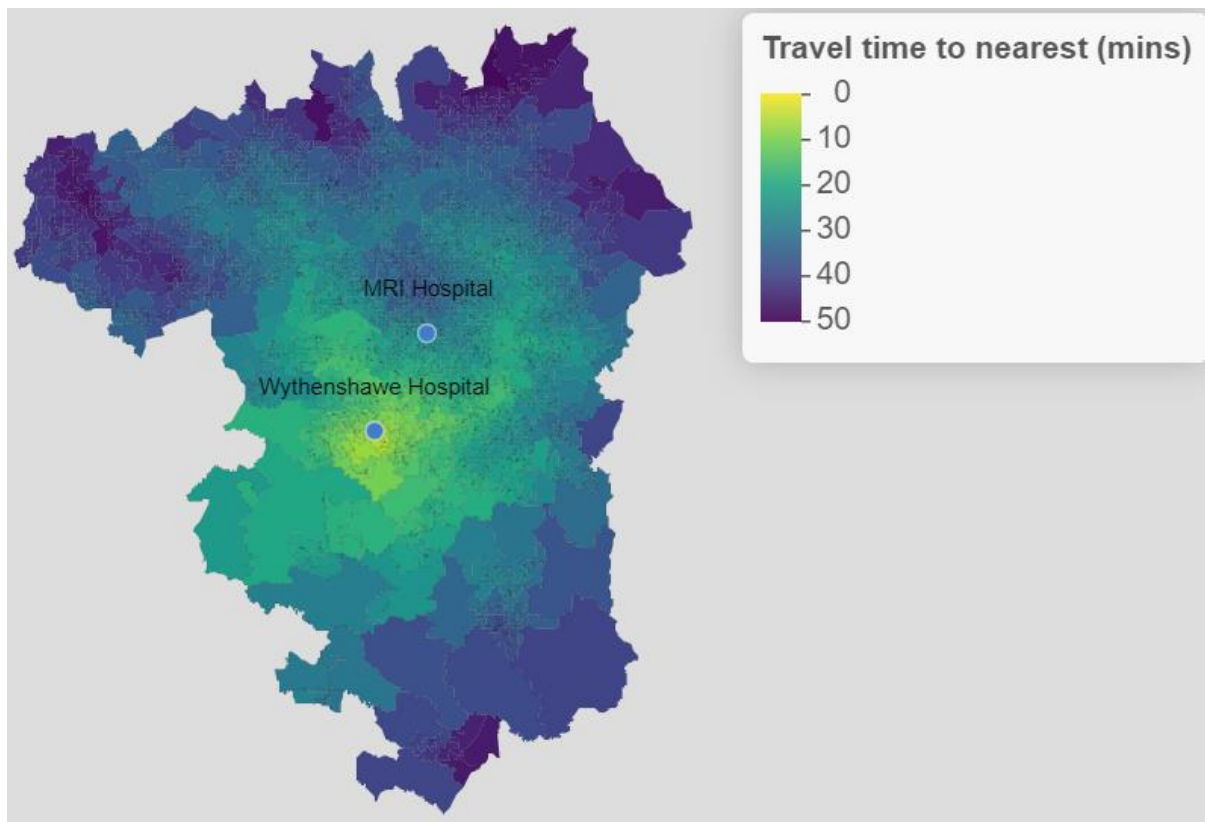
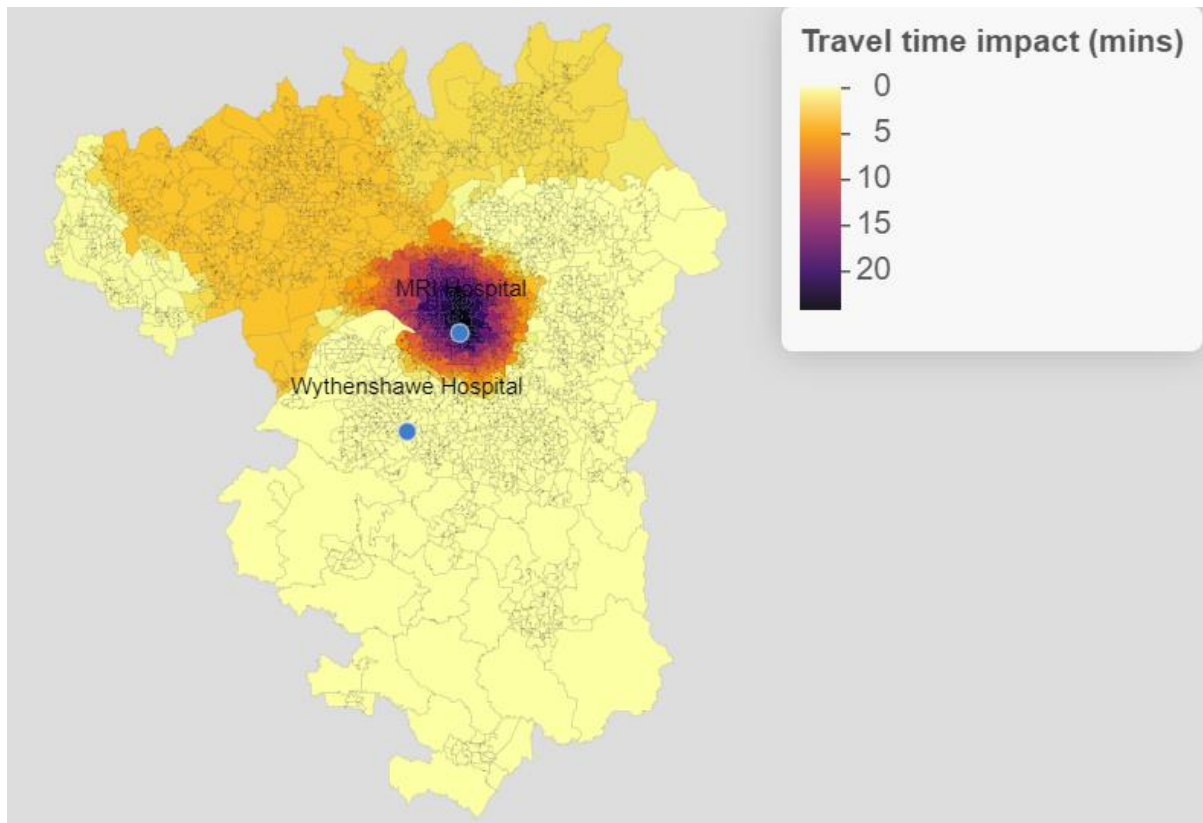


Figure 2 - Travel Times for Peak AM Car Travel following Consolidation at Wythenshawe

Whilst there is an increase in travel times, for most residents this is only a small increase. The median travel time increases by 3.3 minutes as depicted in Figure 3.



*Figure 3 - Travel Time Impact Following Consolidation*

Figure 3 shows the change in travel time, in minutes, when Cardiac Surgery is moved from the two-site model to a consolidated model at Wythenshawe. Each LSOA is shaded by the increase in travel time with services at Wythenshawe only. Lighter areas have no or small increases in travel time. Darker areas see a larger impact on travel times. The map shows that areas in the south of GM and EC experience little or no change as Wythenshawe was already their nearest site. Areas in the north of GM see small increase in travel times. The areas closest to the MRI, central Manchester and Salford, see the largest increase of 15-20 minutes.

To understand the size of the catchment population impacted we need to look at the population in each area. Figure 4 is a histogram showing the increase travel times for those who were previously closest to the MRI. Each bar shows the number of residents aged 50+ years experiencing an increase in travel times. This demonstrates that the vast majority of those impacted see a small increase between 2 and 4 minutes.

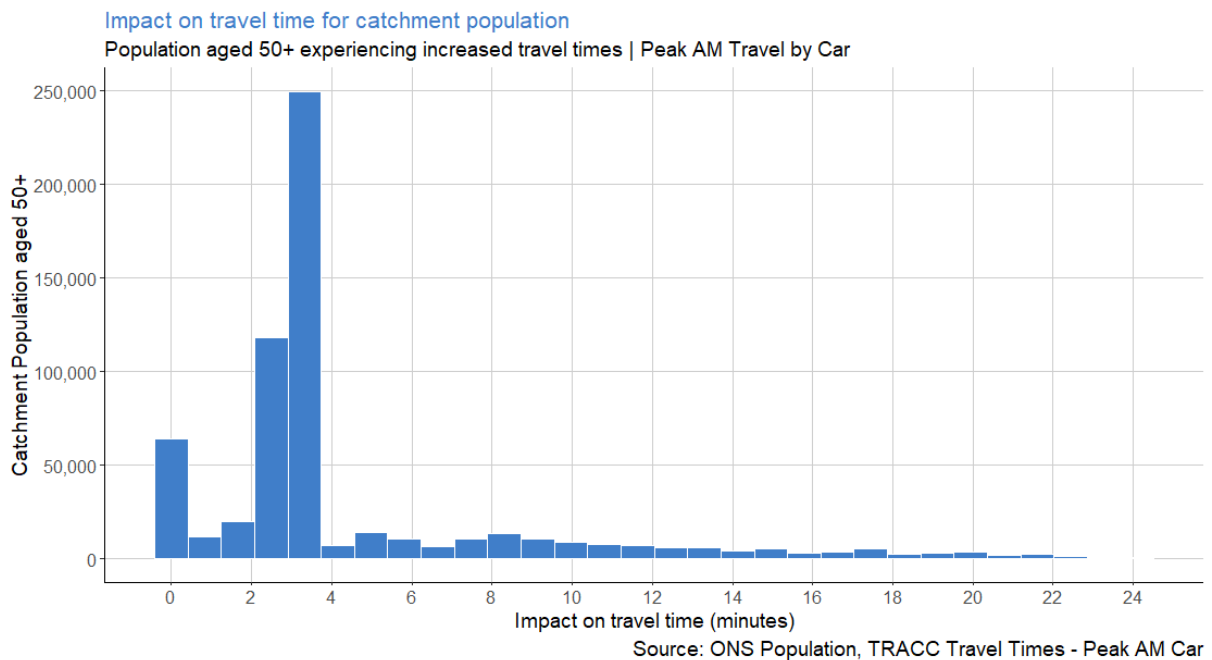


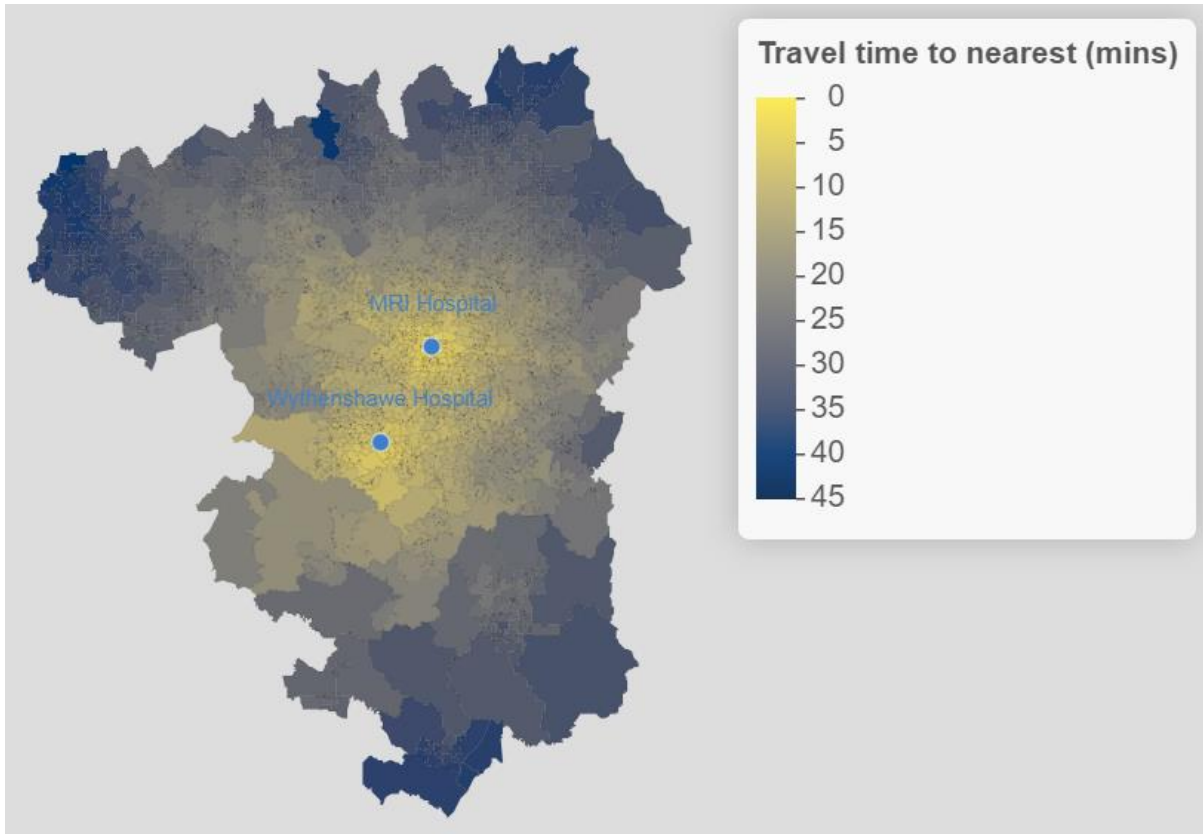
Figure 4 - Impact on Travel Time for Population Aged 50+

In summary for peak AM car travel:

- 56% of the catchment population had shorter travel times to MRI. These residents will now have an increase in travel times to go to Wythenshawe.
- Median travel times across the catchment population are 29.5 minutes (interquartile range 22.4 - 36.4 minutes)
- Of those impacted most experience a small increase in travel time of between 2-4 minutes with a median increase of 3.3. minutes.
- The areas impacted the most are in central Manchester and Salford.

### 3.2 Travel Times for Nighttime by car

Figure 5 shows the modelled nighttime car travel times to the nearest cardiac surgery site under the current two-site configuration. Night-time conditions are used as a proxy for ambulance travel, as reduced congestion more closely reflects blue-light journey speeds. Similarly to peak car travel times, the areas closest to the MRI and Wythenshawe have the shorter travel times. Travel times increase outwards to the edges of GM and EC. However, the areas furthest from the hospitals have travel times of under 45 minutes. The median travel time for residents to their nearest site is 21 minutes.



*Figure 5 - Travel Times for Nighttime by Car*

Figure 6 shows the modelled nighttime car travel times when cardiac surgery is delivered by a consolidated model at Wythenshawe. Under nighttime conditions residents closest to Wythenshawe experience the fastest travel times. This is shown by the concentrated yellow and light-blue zones in south Manchester. As distance from Wythenshawe increases, travel times increase. However, the longest travel times remain under 45 minutes. The median travel time for residents to Wythenshawe hospital is 25 minutes.

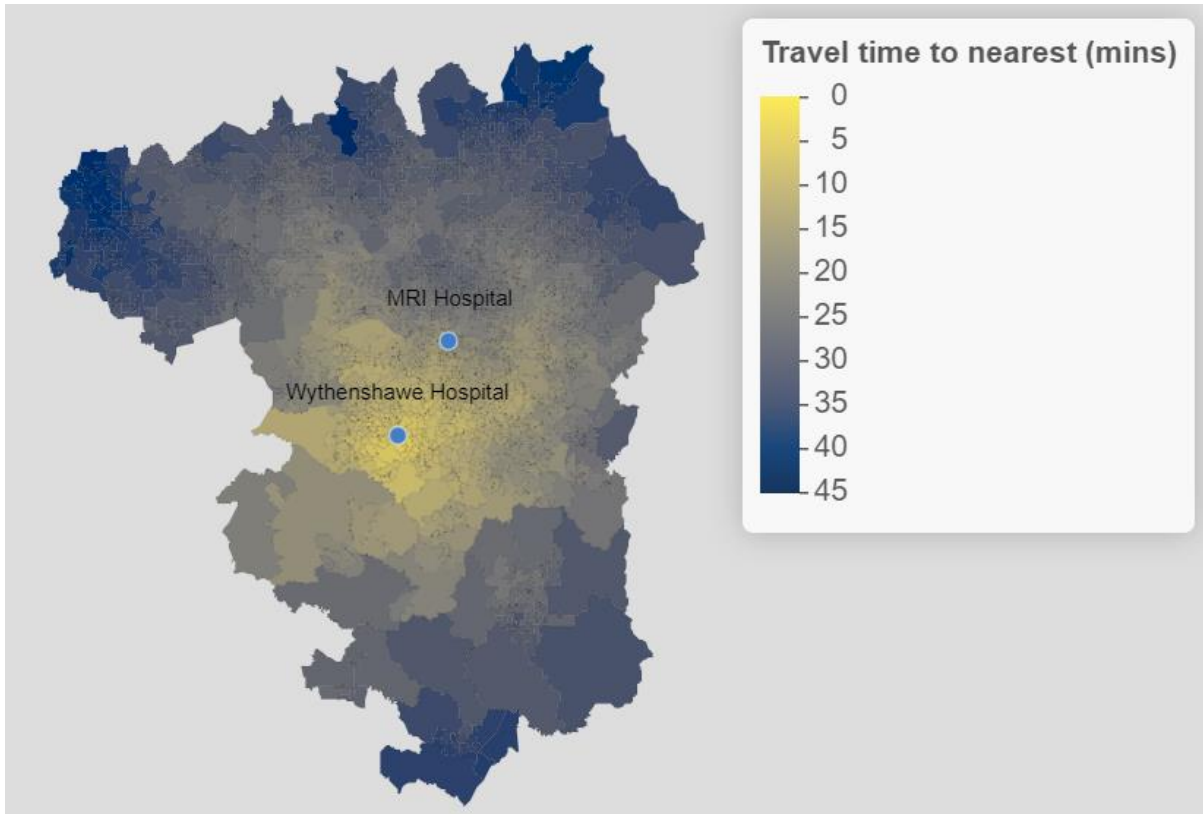
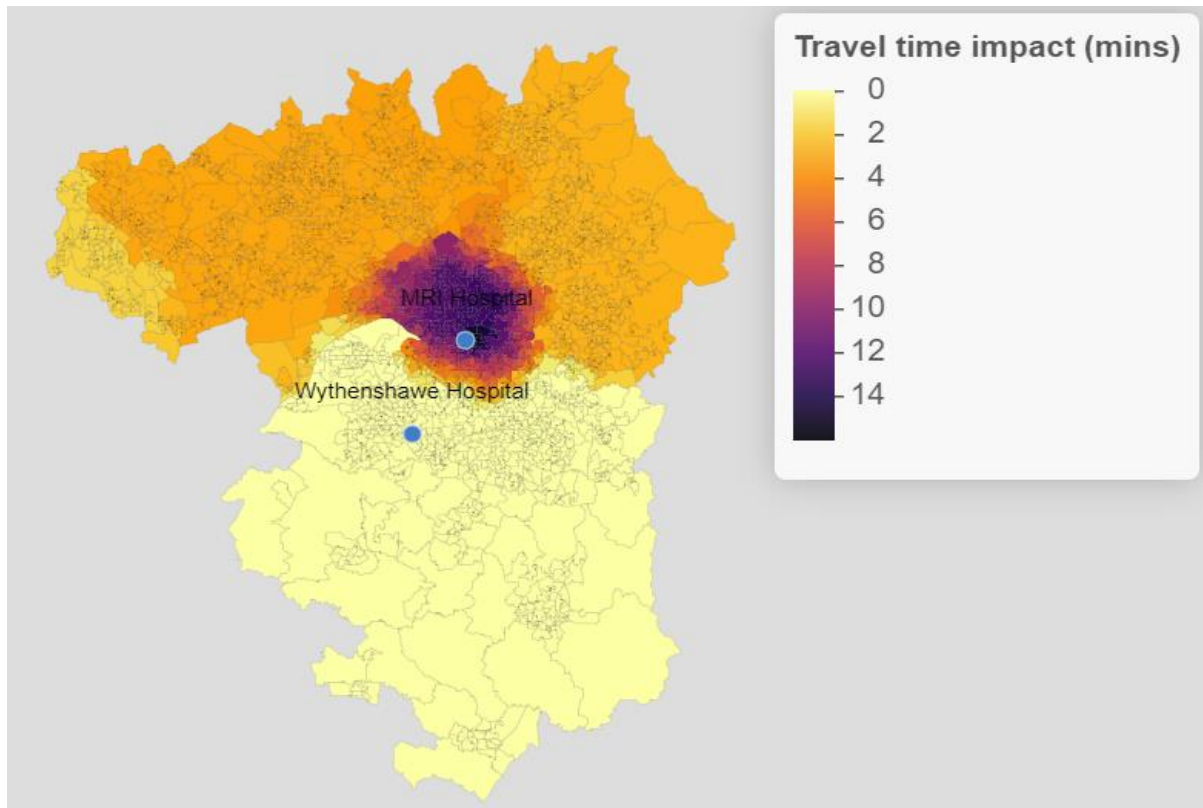


Figure 6 - Nighttime Car Travel following Consolidation of Services

Similarly to the peak AM travel times, Figure 7 shows the change in travel times. As previously seen areas in the south of GM and EC see no change in travel times as Wythenshawe was already their closest site. Areas in central Manchester and Salford that previously had short journey times to the MRI see the largest increases of 10-15 minutes.



*Figure 7 - Impact on Travel Time for Nighttime Travel by Car*

To understand the size of the catchment population impacted we need to look at the population in each area. Figure 8 is a histogram showing the increase travel times for those who were previously closest to the MRI. Each bar shows the number of residents aged 50+ years experiencing an increase in travel times. This demonstrates that the vast majority of those impacted see a small increase between 2 and 4 minutes.

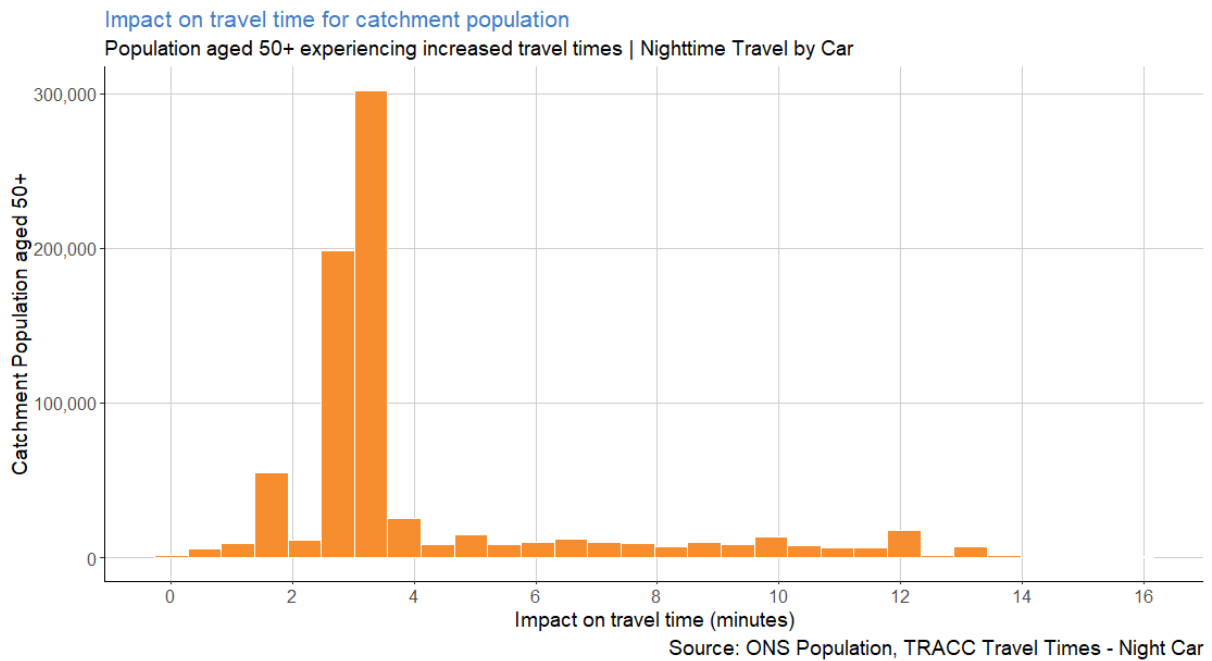


Figure 8 - Impact on Travel Time for Population aged 50+

In summary for nighttime car travel:

- 71% of the catchment population had shorter travel times to MRI. These residents will now have an increase in travel times to go to Wythenshawe.
- Median travel times across the catchment population are 24.5 minutes (interquartile range 18.1 - 30 minutes)
- Of those impacted most experience a small increase in travel time of between 2-4 minutes with a median increase of 3.1 minutes.
- The areas impacted the most are in central Manchester and Salford.

### 3.3 Public Transport Travel Times

The public transport analysis shows that consolidating cardiac surgery services has a much greater impact on travel times for patients travelling by car during the AM peak or at nighttime.

Under the two-site configuration patients had a median travel time of 68 minutes to their nearest hospital. However, some patients experienced much longer travel times with some 10% of patients having a travel time of longer than 89 minutes.

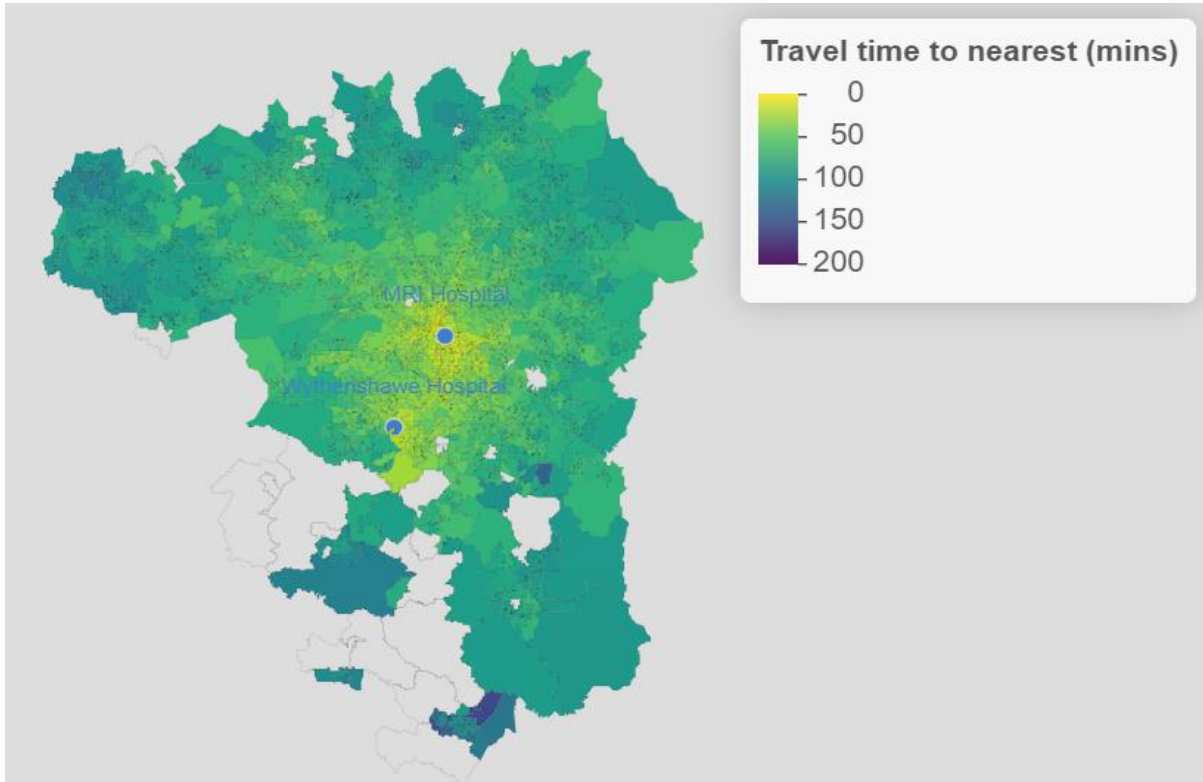
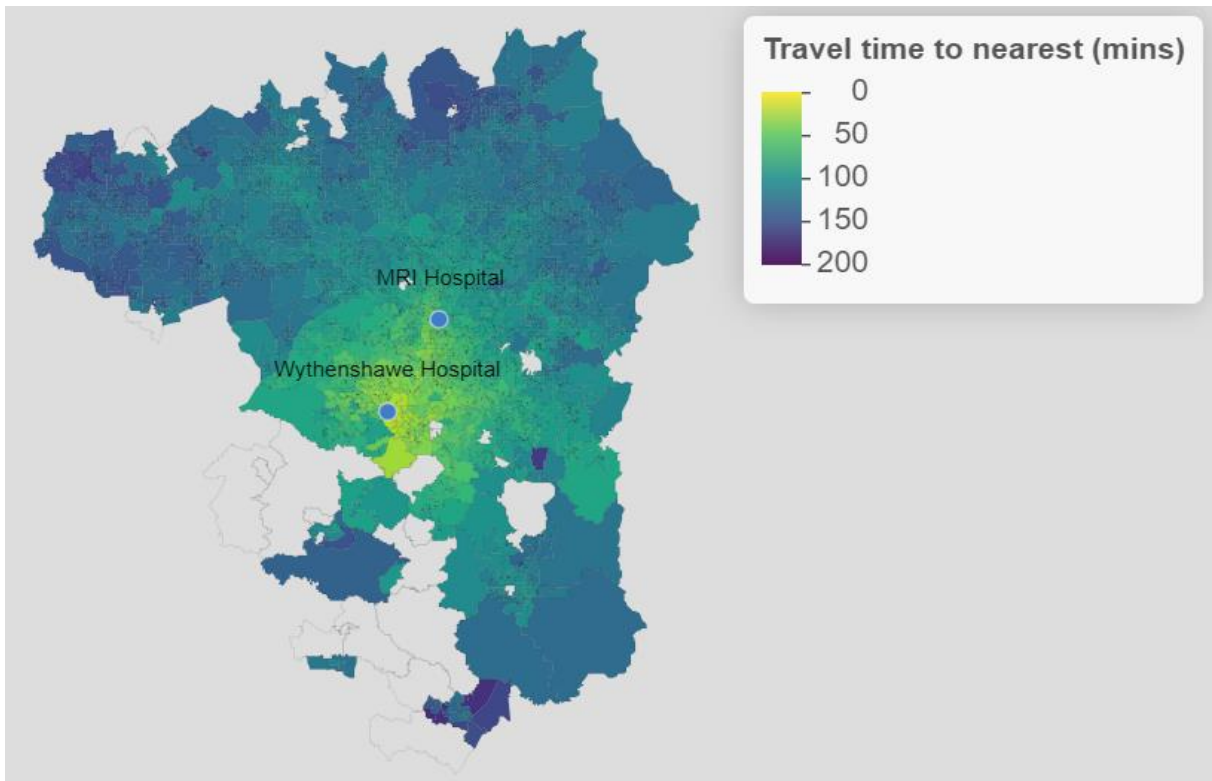


Figure 9 - Public Transport Travel Times before Consolidation

However, Figure 10 shows that following consolidation, there is a significant increase in travel times for a large portion of the catchment area. Many patients would experience substantially longer journeys. The median travel time increases to 108 minutes with 10% of patients experiencing travel times more than 135 minutes.



*Figure 10 - Public Transport Travel Times following Consolidation*

Figure 11 shows the impact on public transport travel times for all patients now attending Wythenshawe. This demonstrates significant increases of 50+ minutes for patients in the north of GM and increase of 30+ minutes for patients in EC.

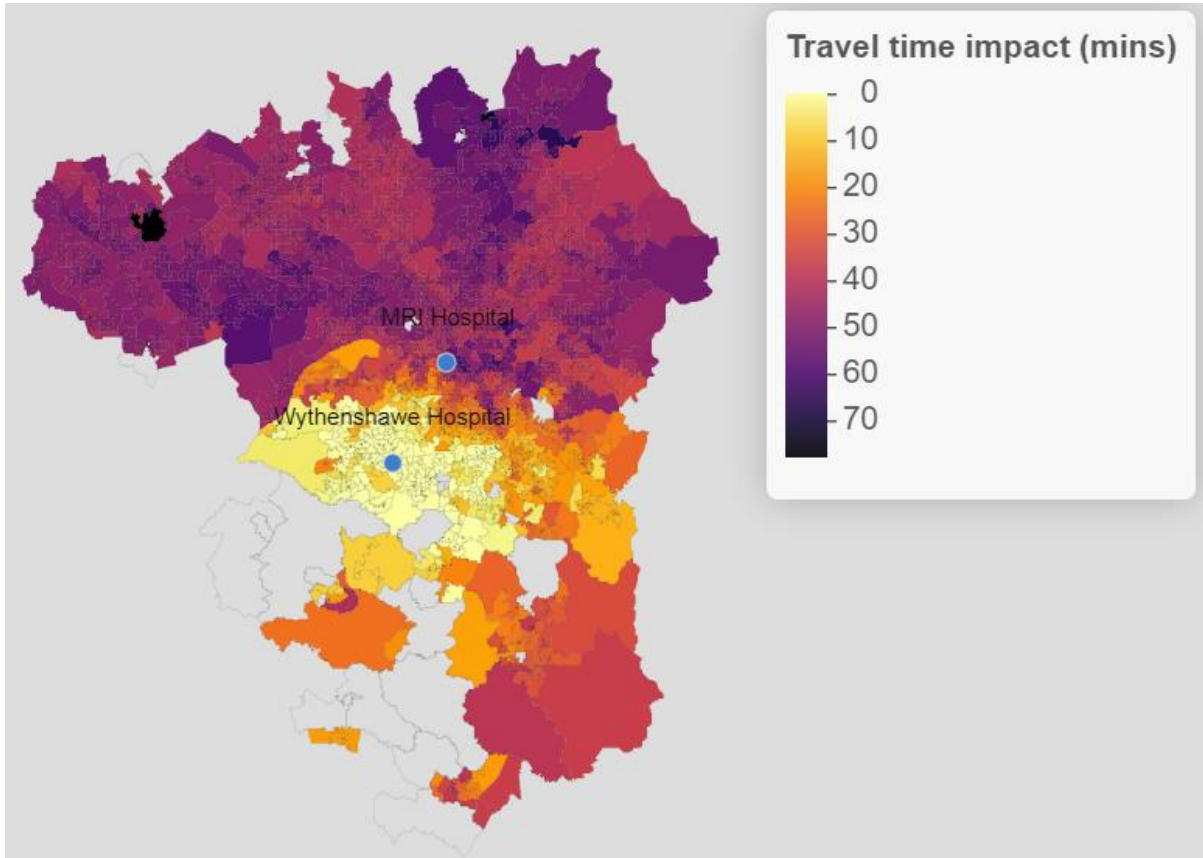


Figure 11 - Distribution of Increase Public Transport Travel Times

When we consider the size of the population impacted, we can see that a significant proportion face an increase in travel times of between 40 and 55 minutes.

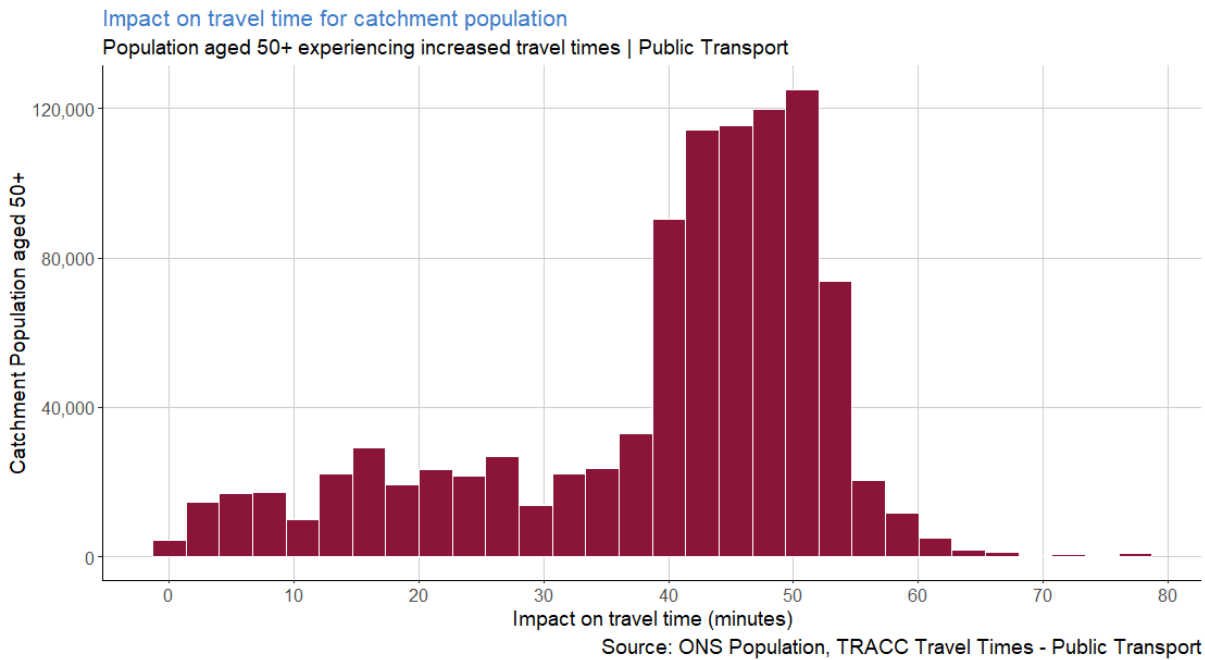


Figure 12 - Impact on Travel Time for Catchment Population

In summary for public transport:

- 90% of the catchment population had shorter travel times to MRI. These residents will now have an increase in travel times to go to Wythenshawe.
- Median travel times across the catchment population are 108 minutes (interquartile range 85 - 124 minutes)
- Of those impacted most experience a significant increase in travel time of between 40-55 minutes with a median increase of 44 minutes.
- The areas impacted the most are across the north of GM.

### **3.4 Deprivation Impact**

The analysis also sought to understand the impact of travel times on health inequalities. This considered if travel time changes disproportionately impacted populations based on deprivation.

Figure 13 shows the increase in AM peak car travel times for those who experience them. This splits these changes in travel times for the Index of Multiple Deprivation (IMD) decile. Those in decile 1 represent the most deprived areas. Those in decile 10 represent the least deprived areas. The point on the chart shows the median increase in travel times for residents in that deprivation decile. The bar around each point represents the interquartile range (the gap between the lower quartile and upper quartile). The most deprived areas, decile 1, show slightly greater variation, with a larger interquartile range, indicating more variability in travel time increases across these communities. This is due to deprived areas near to the MRI that will now see a large increase in travel times now they can no longer attend the MRI. Overall, the chart suggests that consolidation does not disproportionately impact any population based on deprivation.

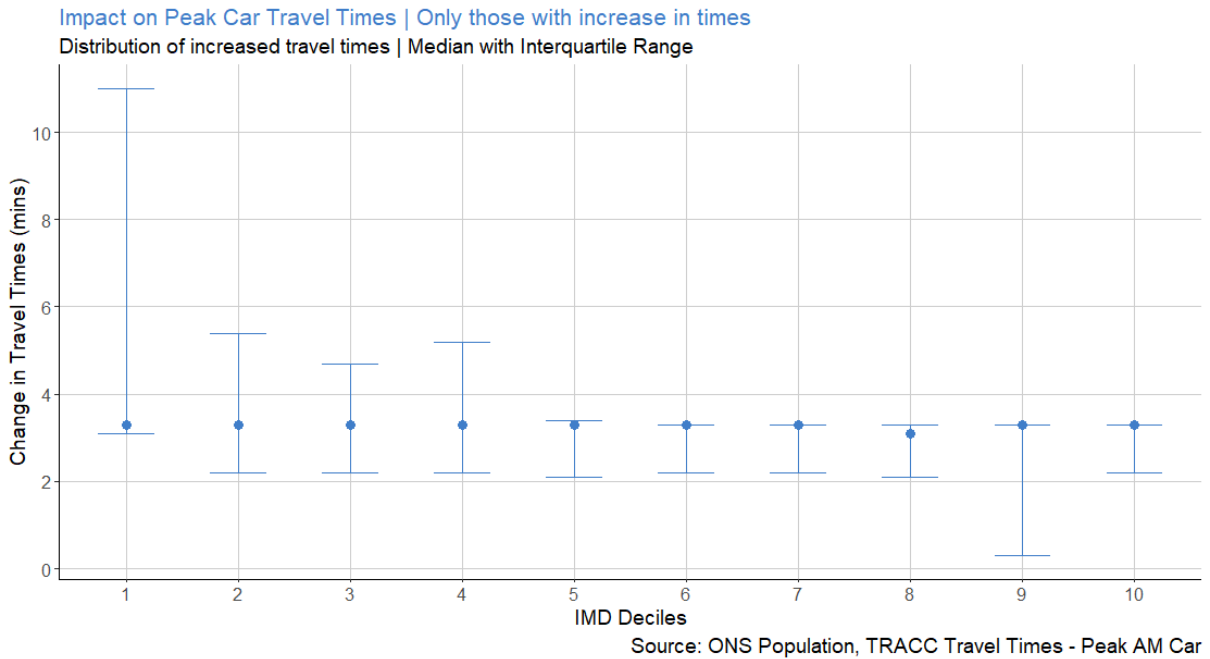


Figure 13 - Impact on Peak Car Travel Times

**Error! Reference source not found.** above shows the increases in travel time by deprivation decile for nighttime travel. As with peak AM car travel times, there is little difference in the median travel time changes by deprivation decile. Again, there is greater variation in the impact on travel times for decile 1.

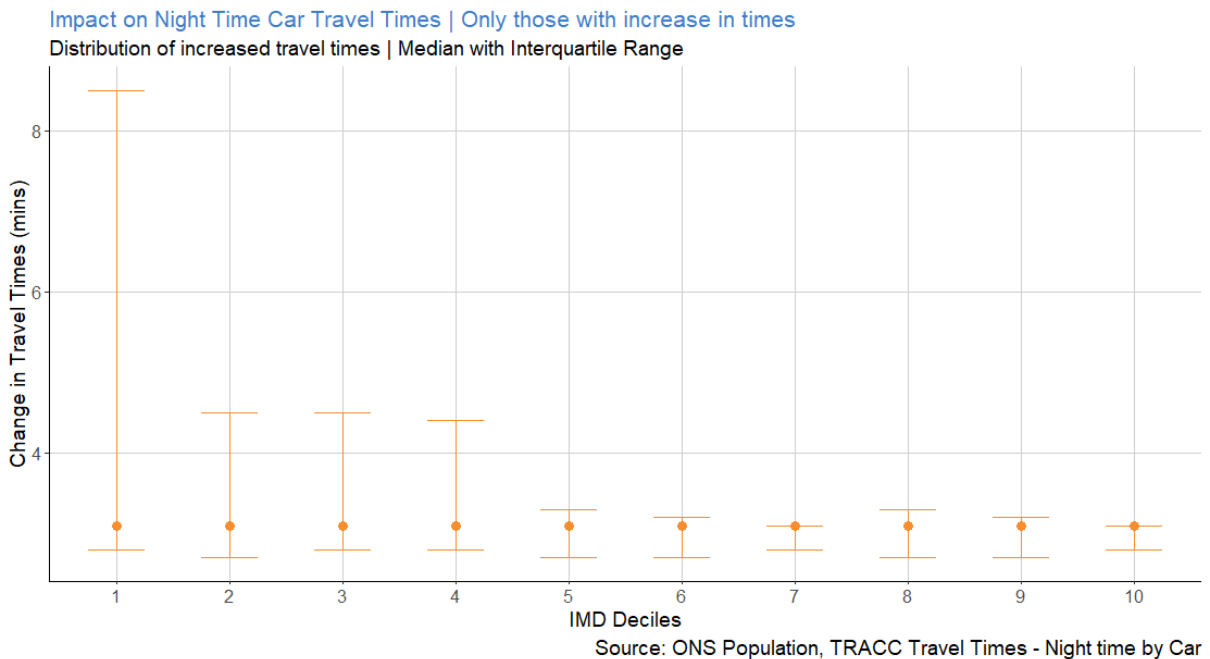


Figure 14 - Impact on Nighttime Car Travel Times

Overall, the chart demonstrates that nighttime travel impacts do not disproportionately fall on any particular deprivation group.

Figure 15 shows the increase in travel times by public transport by deprivation decile.

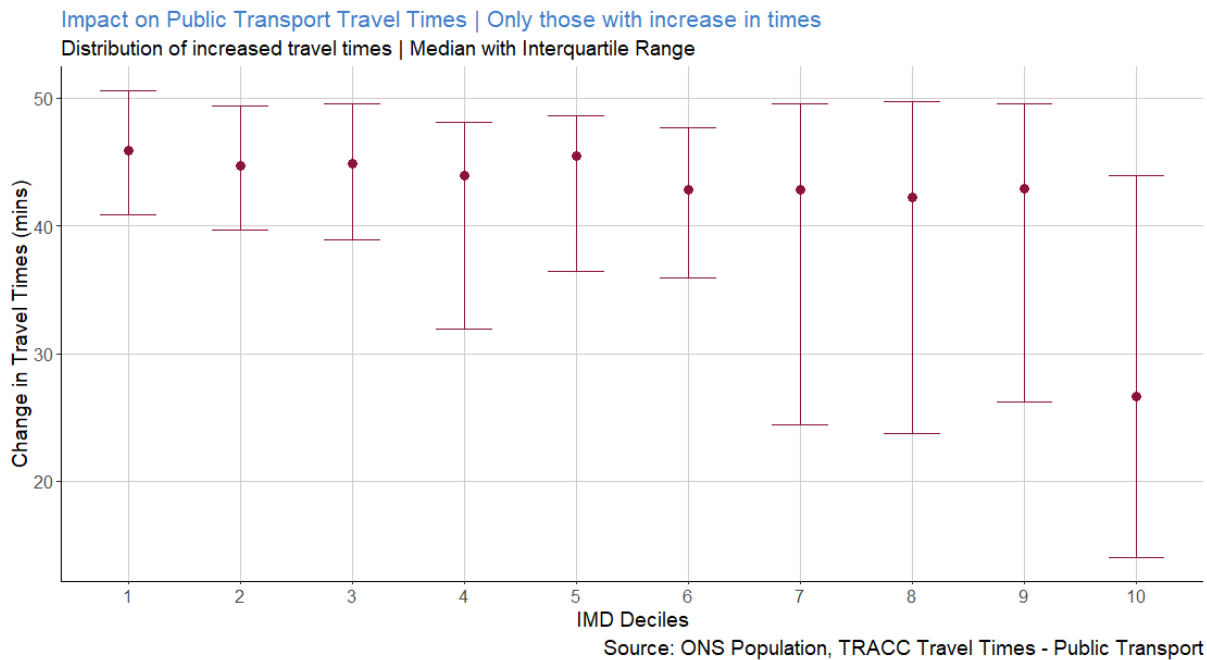


Figure 15 - Impact on Public Transport Travel Times

Figure 15 shows that for all but one deprivation decile the median impact on travel times are similar (between 42 and 48 minutes). There is greater variability in the less deprived deciles on the impact of travel times. This is potentially due to the more rural nature of some of these communities. The least deprived decile does see the smallest increase in public transport travel times.

Overall, the analysis of travel times by deprivation decile does not show any particular group being disproportionately impacted. There is no evidence to suggest these changes will drive greater health inequalities by impacting access to services.

#### 4. Conclusion

Overall, the findings show that consolidating cardiac surgery services at Wythenshawe only has a modest impact on car travel for most patients but leads to substantial increases in travel time for those reliant on public transport. Importantly, these impacts do not disproportionately affect any deprivation decile, suggesting that the change does not exacerbate health inequalities linked to socio-economic status. The table below summarises the key statistics from this analysis.

Travel Time	Median Time to Nearest Site – Pre-Covid (Interquartile Range)	Population Impacted	Median time to Wythenshawe (Interquartile Range)	Median increase (Interquartile Range)
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Peak AM	26.8 (19 – 34.5)	608,683 (56.2%)	29.5 (22.4 – 36.4)	3.3 (2.2 – 3.4)
Nighttime	20.6 (14.7 – 27.3)	773,153 (71.4%)	24.5 (18.1 – 30)	3.1 (2.8 – 3.3)
Public Transport	67.8 (53.7 – 88.6)	978,316 (90.4%)	107.8 (84.7 – 123.5)	43.9 (34.3 – 49.2)