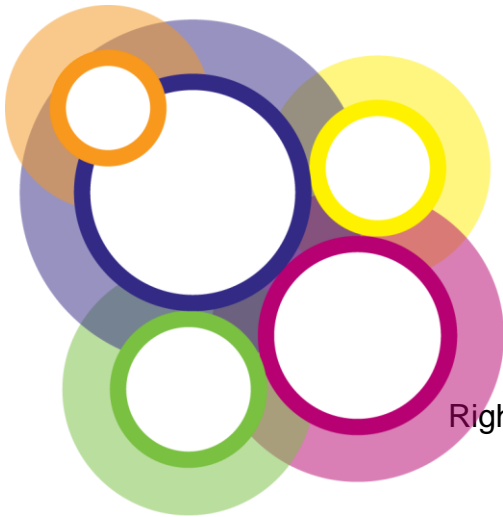




Partners in improving local health

Hospital Services Reconfiguration: Public & Private Travel Analysis



Calderdale CCG

Greater Huddersfield CCG

North Kirklees CCG

Right Care, Right Time, Right Place (RCRTRP) Programme

Meeting the Challenge (MtC) Programme

July 2017

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Report Specification

Data Protection

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Commissioning of Report

The report was commissioned by Jen Mulcahy, Programme Manager, Right Care, Right Time, Right Place (RCRTRP) Programme and Helen Severns, Meeting the Challenge Programme to assist with understanding the potential impact on patients travelling to A&E using public and private transport, of a prospective reconfiguration of Emergency Care provision across Calderdale, Greater Huddersfield and North Kirklees CCG areas.

Data description

This report uses A&E attendance data extracted from the patient administration and management systems of Calderdale Royal Hospital (CRH), Huddersfield Royal Infirmary (HRI) and Dewsbury District Hospital (DDH), covering the period from 1st April 2015 to 31st March 2016.

Geography

The study area covers the geography served by Calderdale, Greater Huddersfield and North Kirklees CCGs and also extends into the neighbouring areas of West and South Yorkshire and Lancashire and as such, uses data covering A&E attendances by patients resident in postcodes in the Calderdale, Greater Huddersfield and North Kirklees CCG areas and those in the neighbouring areas.

Production

This report was produced by Allan Worthy, Clinical Commissioning Intelligence Specialist, with analysis and mapping by Dominic Rowney, Senior Information Analyst and data manipulation, management and analysis by Chris Taylor, Data Architect.

The report was reviewed by Ian Nicholson, Head of Clinical Commissioning Intelligence.

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Please ensure this information is not taken out of context.

Executive Summary

This report provides an analysis of the modelling of potential reconfiguration options for A&E service provision, to inform the decision making process for the wider proposals for the restructure of hospital services across the Calderdale, Greater Huddersfield and North Kirklees CCG areas. In particular, the analysis examines the journeys of patients attending at A&E sites who do not arrive by ambulance, instead using either public or private transport and the impact of the proposed changes.

The methodology used combines an industry standard, multi-modal transport travel time tool which optimises journeys to the nearest A&E site in terms of the shortest time taken, by both public and private transport means, and actual A&E patient attendance data from 1st April 2015 to 31st March 2016, obtained from Calderdale Royal Hospital, Huddersfield Royal Infirmary and Dewsbury District Hospital patient management systems.

A baseline was established for the expected journey times to the actual destination sites in the study, with exclusions made for adverse data quality (2% of records). The various configuration options were then modelled to produce prospective journey times and destination sites under each scenario.

Modelling of a single A&E site at Calderdale Royal Hospital (CRH) showed that it could result in over 11,500 further hours of journey time for patients per year, under current demand levels, on the assumption that all patients use private transport to travel to the nearest A&E site. Neighbouring A&E sites at Pinderfields General Hospital (PGH), Leeds General Hospital (LGH) and St. James University Hospital (SJH) would potentially bear the burden of increased numbers of A&E patients. The average patient across the whole study area could expect to spend an extra 3.7 mins on the road, with Kirklees residents averaging an extra 6.7 mins.

On the assumption all patients instead travel to their nearest A&E site using public transport, almost 41,000 further hours of journey time might be expected with LGH and PGH experiencing increased numbers of A&E patients. The average patient across the whole study area could expect to spend an extra 13.2 mins on public transport, with Kirklees residents averaging an extra 23.1 mins.

Modelling of a single A&E site at Huddersfield Royal Infirmary (HRI) showed that it could result in around 10,500 further hours of journey time for patients per year, under current demand levels, on the assumption that all patients use private transport to travel to the nearest A&E site. Neighbouring A&E sites at PGH, LGH and SJH would potentially bear the burden of increased numbers of A&E patients. The average patient across the whole study area could expect to spend an extra 3.3 mins on the road, with Kirklees residents averaging an extra 3.8 mins and Calderdale residents an extra 5.8 mins on average.

On the assumption all patients instead travel to their nearest A&E site using public transport, around 37,500 further hours of journey time might be expected with LGH, PGH and Bradford Royal Hospital (BRH) experiencing increased numbers of A&E patients. The average patient across the whole study area could expect to spend an extra 12.1 mins on public transport, with Kirklees residents averaging an extra 12.6 mins and Calderdale residents an extra 21 mins on average.

It is recommended that the RCRTTRP and MtC Programme Boards examine the findings of this report and agree the implications on the options for the wider reconfiguration of hospital services across the Calderdale, Greater Huddersfield and North Kirklees CCG areas. Consideration should be given to discussions with neighbouring CCGs and Trusts operating A&E services as well as patient groups and organisations providing public transport services across the study area, to ensure an understanding of the potential impact on them of the proposed A&E reconfiguration options.

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Introduction

1.1 Background

Calderdale and Huddersfield NHS Foundation Trust currently operate Accident & Emergency departments at both Calderdale Royal Hospital in Halifax and Huddersfield Royal Infirmary as part of their Emergency Care provision across the Calderdale and Greater Huddersfield CCG areas. The Mid Yorkshire Hospitals NHS Trust currently operate an Accident & Emergency department at Dewsbury and District Hospital as part of their Emergency Care provision across the North Kirklees and Wakefield CCG areas. These organisations are working together to set out proposals for the future provision of hospital services across the combined geographical area of the CCGs and one piece of work which Commissioners require is a travel analysis that would identify the implications for patients travelling to A&E using public and private transport, under possible reconfiguration options for Emergency Care provision.

The CCGs are proposing to reorganise the provision of Emergency Care and wish to evaluate the following set of reconfiguration options:

1. A single emergency site at CRH, and;
2. A single emergency site at HRI.

The CCGs are seeking advice on the journey time and destination impacts of their proposals for patients using public and private transport to attend A&E.

1.2 Purpose of Report

NECS has modelled prospective and potential changes in journey times and destination A&E sites that could result from each of the configuration options under consideration. This report details the NECS modelling work and resultant analysis.

Methodology

2.1 Overview

The scope of this study was agreed with representatives of the RCRTRP and MtC programmes on behalf of the CCGs. The modelling was to focus on two configuration options:

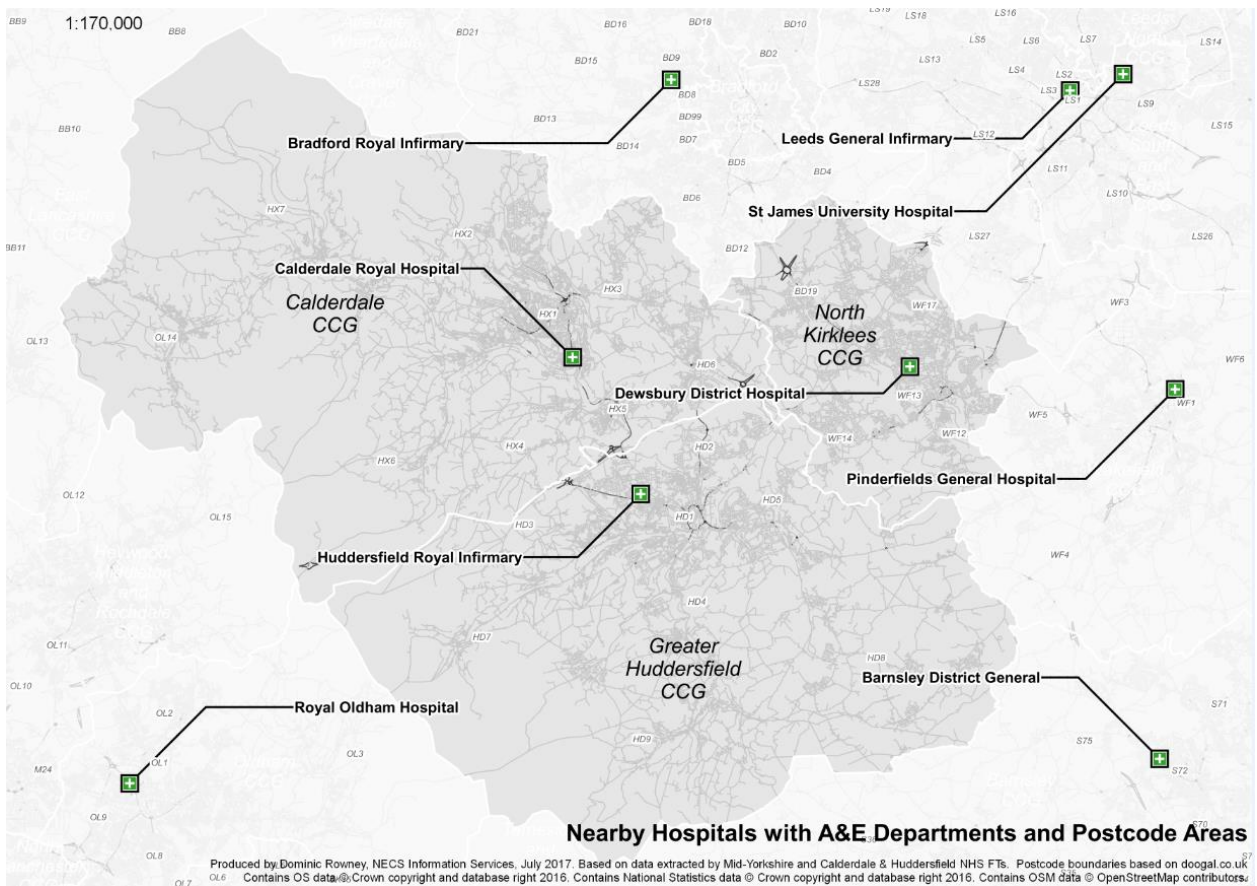
1. A single emergency site at CRH – modelling without HRI and without DDH, and;
2. A single emergency site at HRI – modelling without CRH and without DDH.

The work consists of six stages:

1. Baseline Assessment of journey times and A&E site destinations by public transport, on the assumption that all journeys were made by public transport.
2. Baseline Assessment of journey times and A&E site destinations by private transport, on the assumption that all journeys were made by private transport.
3. Modelling of prospective journey times and A&E site destinations, without HRI and without DDH as potential destination sites, on the assumption that all journeys were made by public transport.
4. Modelling of prospective journey times and A&E site destinations, without HRI and without DDH as potential destination sites, on the assumption that all journeys were made by private transport.
5. Modelling of prospective journey times and A&E site destinations, without CRH and without DDH as potential destination sites, on the assumption that all journeys were made by public transport.
6. Modelling of prospective journey times and A&E site destinations, without CRH and without DDH as potential destination sites, on the assumption that all journeys were made by private transport.

2.2 Study Area

The study area covers the geography served by Calderdale, Greater Huddersfield and North Kirklees CCGs, the area for which CRH, HRI and DDH currently provide A&E services. The analysis also extends into the neighbouring areas of West and South Yorkshire and Lancashire and as such, uses data covering A&E attendances by patients resident in postcodes in the Calderdale, Greater Huddersfield and North Kirklees CCG areas and those in the neighbouring areas, to an Emergency Department at any of CRH, HRI and DDH. It is assumed for the purposes of the study that the patient begins the journey to A&E from their home address.



2.3 Data

Included are A&E attendances where the patient is flagged as not having arrived via ambulance. Actual A&E attendance data from 1st April 2015 to 31st March 2016 was used to establish the baseline and to populate the model of future scenarios.

It was necessary to exclude some data from the study due to issues with data quality. These issues related to erroneous A&E site code flags.

The original dataset contained 189,360 records. The dataset used to establish the Baseline Assessment and for the modelling exercise contained 185,583 records. 3,777 (2%) records were excluded due to data quality issues.

2.4 Modelling using TRACC software

The modelling has been carried out using Basemap TRACC software, an industry standard, multi-modal transport travel time tool.

TRACC uses detailed speed datasets to get an accurate view of drive times for both public and private transport modes and also makes allowances for arriving at a bus stop and the onward journey after alighting from a bus, in calculating public transport journeys.

A&E attendance data as described previously and the coordinates of the destination A&E sites within the study area were uploaded to TRACC and the journey time for each patient calculated, by the quickest available private and the quickest available public transport routes, to each of the destination A&E sites.

2.5 Outputs

The Baseline outputs are established using the quickest private and public transport routes to the actual hospital attended.

The Option 1 outputs are calculated by modelling as described above, with both HRI and DDH excluded from the full list of possible A&E destination sites, using the quickest private and public transport routes to the nearest A&E destination site in terms of time taken.

The Option 2 outputs are calculated by modelling as described above, with both CRH and DDH excluded from the full list of possible A&E destination sites, using the quickest private and public transport routes to the nearest A&E destination site in terms of time taken.

Results

3.1 Baseline

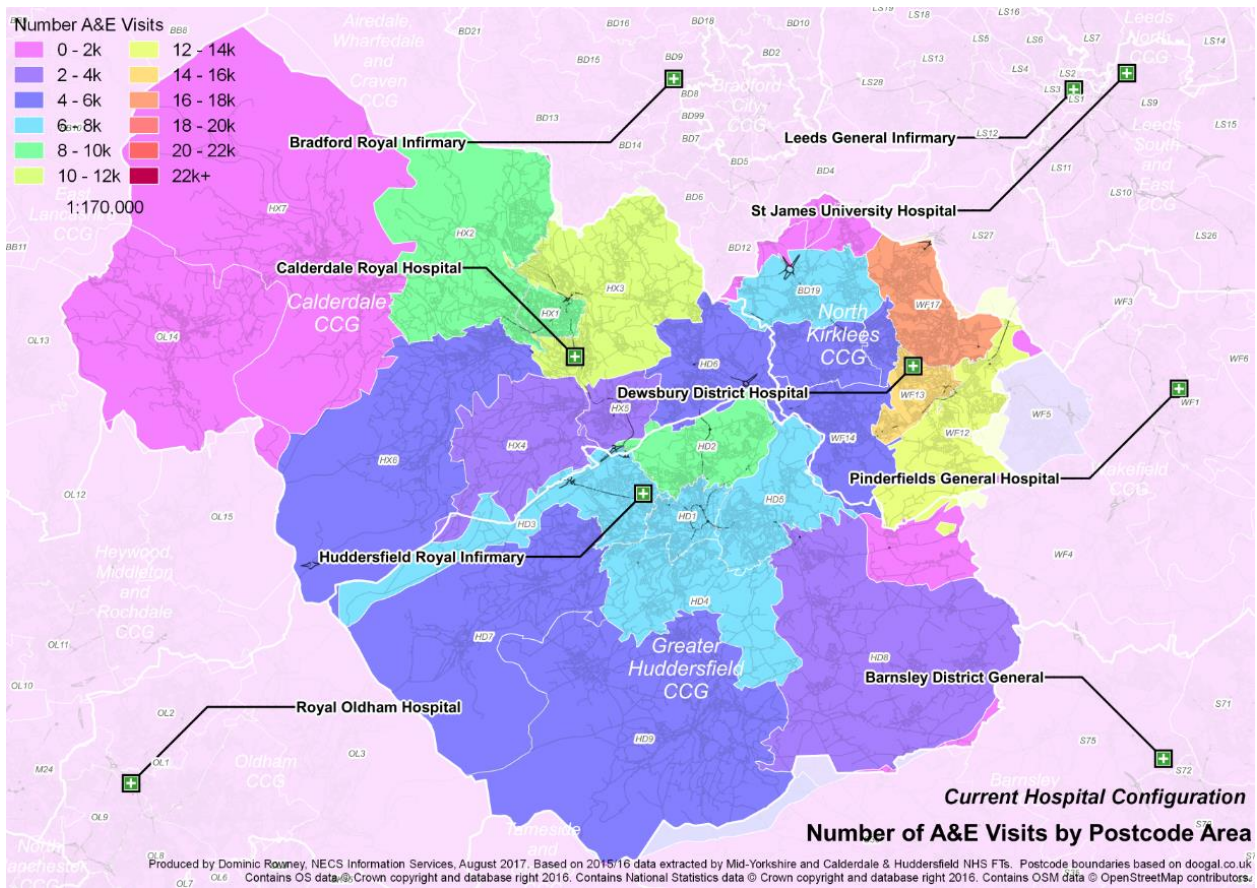
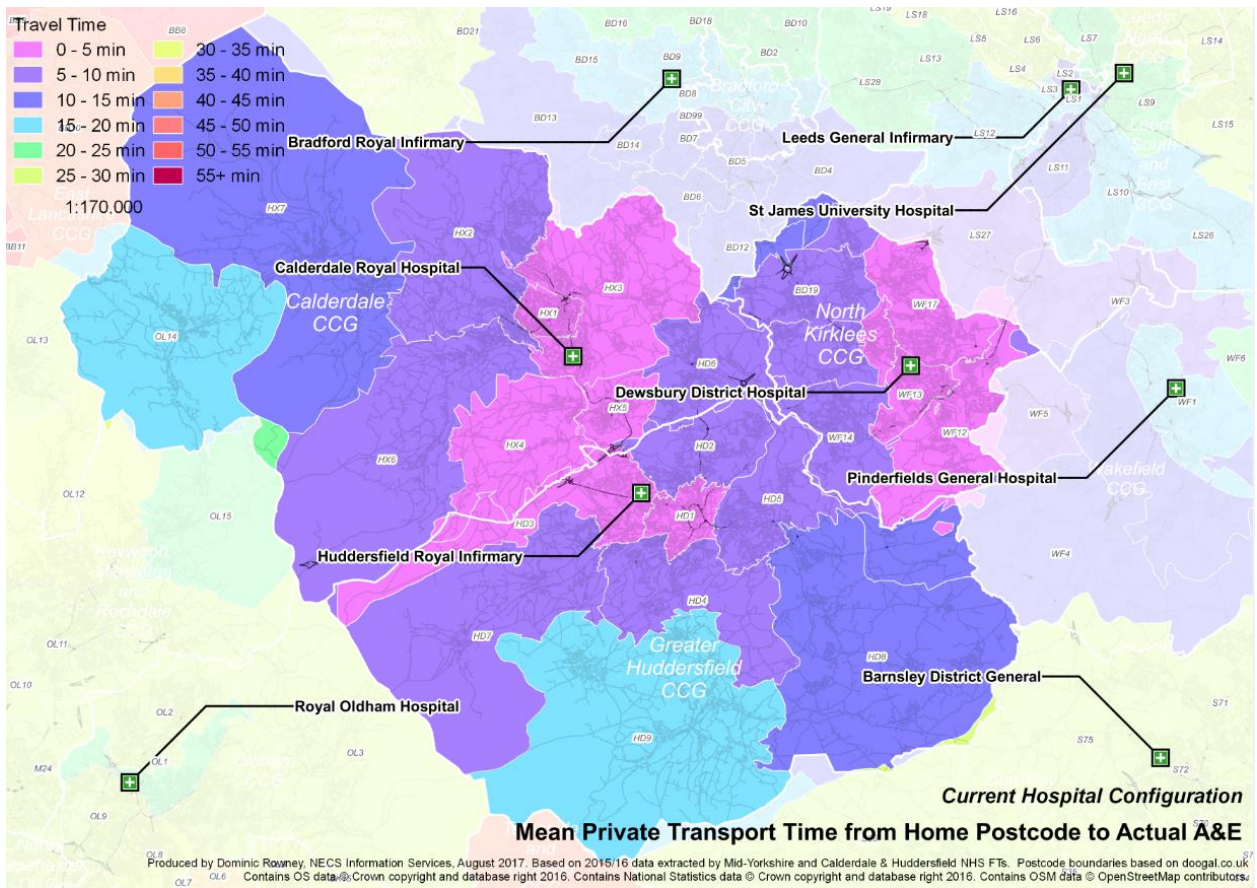
Baseline results were established as follows:

Private transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	5,912	6.8	51,901	28.0%
Calderdale Royal	6,224	6.9	54,258	29.2%
Dewsbury District	6,610	5.0	79,424	42.8%
Bradford Royal	-	-	-	-
Pinderfields General	-	-	-	-
Leeds General	-	-	-	-
St James's	-	-	-	-
Pontefract General	-	-	-	-
Barnsley	-	-	-	-
Salford Royal	-	-	-	-
Fairfield General	-	-	-	-
Royal Blackburn	-	-	-	-
Others	-	-	-	-
Total	18,746	6.1	185,583	100.0%

Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	10,265	5.1	120,744	54.8%
Wakefield	769	11.0	4,215	4.1%
Calderdale	4,475	5.6	48,184	23.9%
Leeds	708	12.8	3,328	3.8%
Bradford	1,620	12.5	7,788	8.6%
Barnsley	100	30.1	200	0.5%
East Riding	3	36.0	5	0.0%
Doncaster	44	49.2	53	0.2%
York	42	56.2	45	0.2%
Others	719	42.3	1,021	3.8%
Total	18,746	6.1	185,583	100.0%

- The total journey time in hours was 18,746 hours.
- There were 185,583 journeys included in the study.
- The average journey time was 6.1 mins.
- 29.2% of journeys were to CRH.
- 28.0% of journeys were to HRI.
- 42.8% of journeys were to DDH.

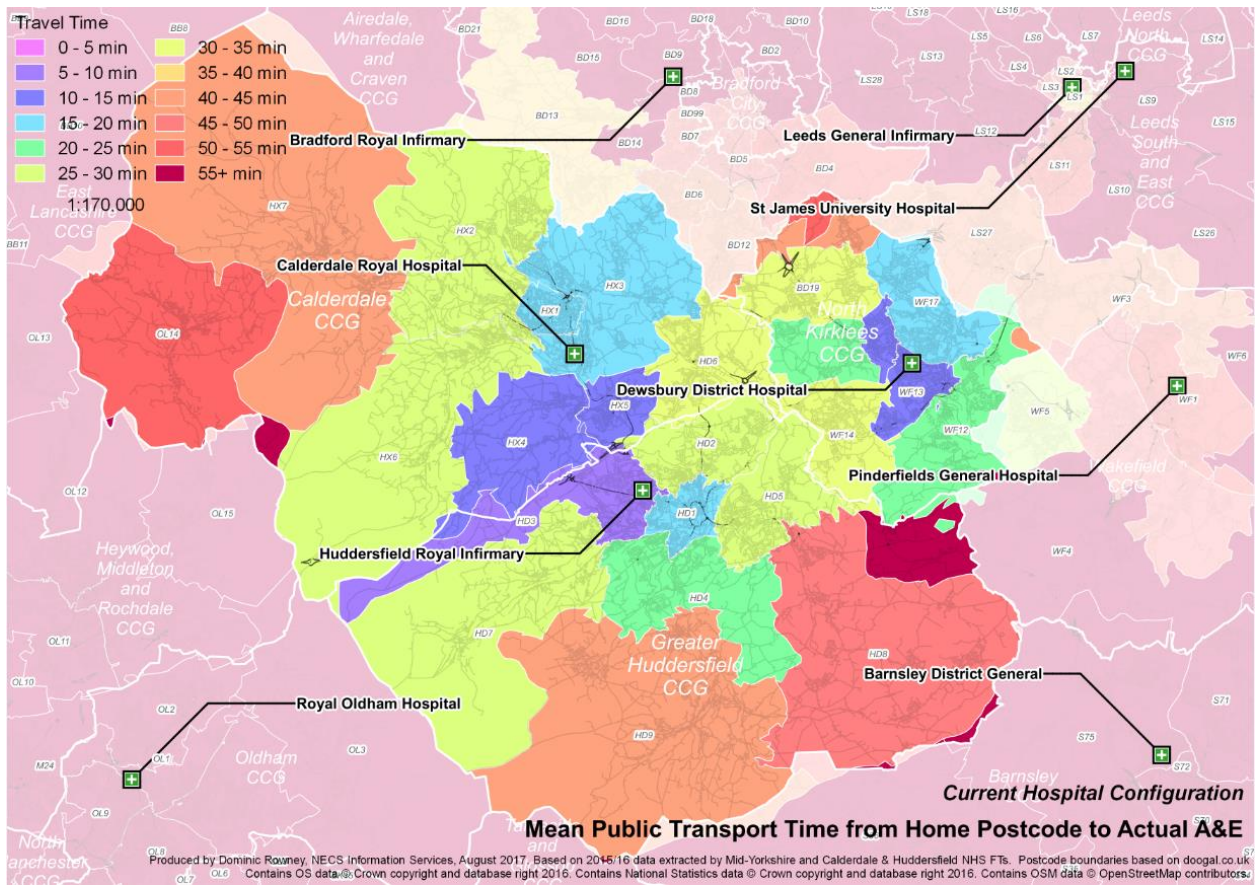


Public transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	22,116	25.6	51,901	28.0%
Calderdale Royal	24,548	27.1	54,258	29.2%
Dewsbury District	30,841	23.3	79,424	42.8%
Bradford Royal	-	-	-	-
Pinderfields General	-	-	-	-
Leeds General	-	-	-	-
St James's	-	-	-	-
Pontefract General	-	-	-	-
Barnsley	-	-	-	-
Salford Royal	-	-	-	-
Fairfield General	-	-	-	-
Royal Blackburn	-	-	-	-
Others	-	-	-	-
Total	77,504	25.1	185,583	100.0%

Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	44,431	22.1	120,744	57.3%
Wakefield	3,001	42.7	4,215	3.9%
Calderdale	19,221	23.9	48,184	24.8%
Leeds	2,722	49.1	3,328	3.5%
Bradford	5,983	46.1	7,788	7.7%
Barnsley	311	93.2	200	0.4%
East Riding	8	96.0	5	0.0%
Doncaster	94	105.8	53	0.1%
York	66	87.7	45	0.1%
Others	1,670	98.1	1,021	2.2%
Total	77,504	25.1	185,583	100.0%

- The total journey time in hours was 77,504 hours.
- The average journey time was 25.1 mins.



3.2 Option 1 – A single Emergency Site at CRH. Modelling without HRI and DDH

Option 1 results were calculated as follows:

Private transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	-	-	-	-
Calderdale Royal	15,585	9.1	102,406	55.2%
Dewsbury District	-	-	-	-
Bradford Royal	521	6.4	4,906	2.6%
Pinderfields General	7,190	11.7	36,826	19.8%
Leeds General	3,344	9.2	21,718	11.7%
St James's	2,782	10.4	16,017	8.6%
Pontefract General	69	8.7	474	0.3%
Barnsley	220	13.1	1,011	0.5%
Salford Royal	42	11.3	222	0.1%
Fairfield General	39	10.6	219	0.1%
Royal Blackburn	49	14.4	204	0.1%
Others	458	17.4	1,580	0.9%
Total	30,298	9.8	185,583	100.0%

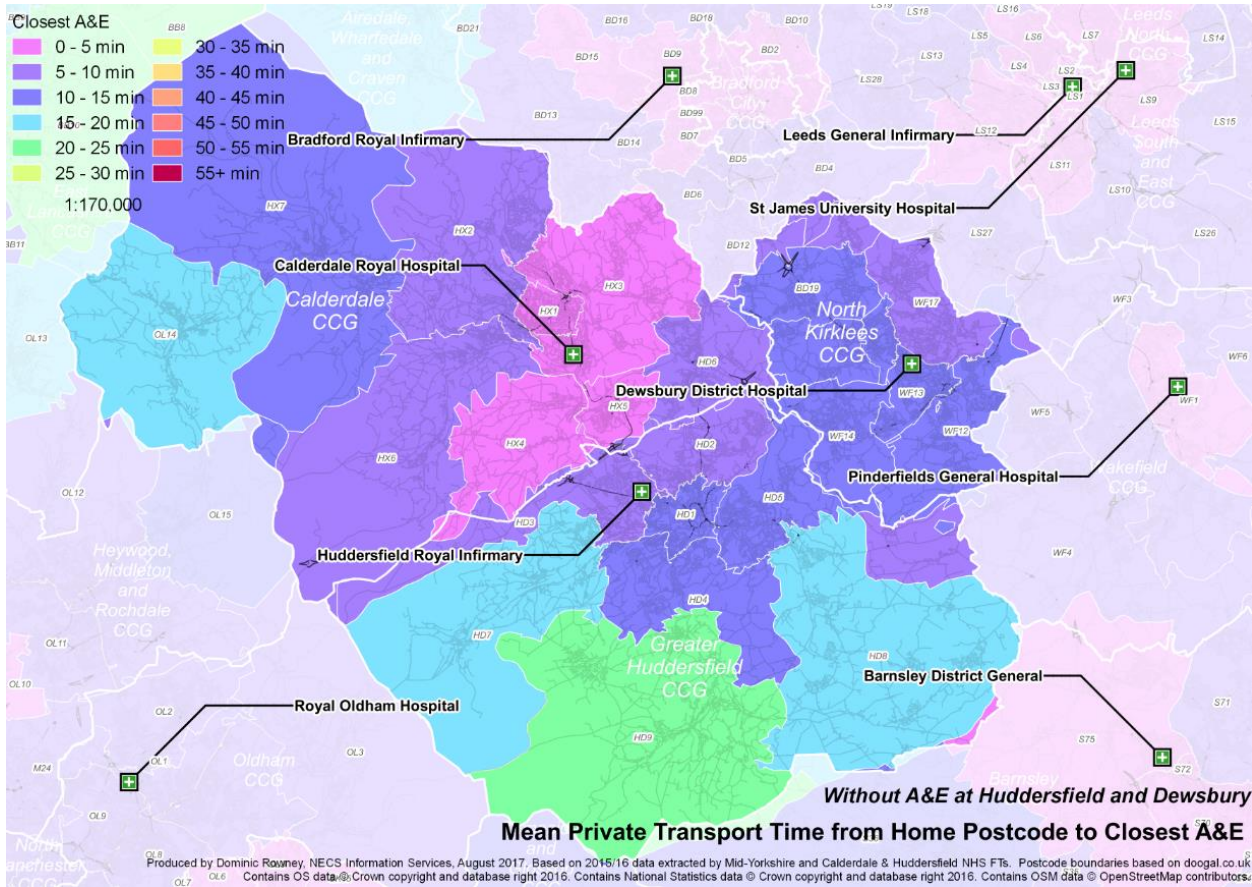
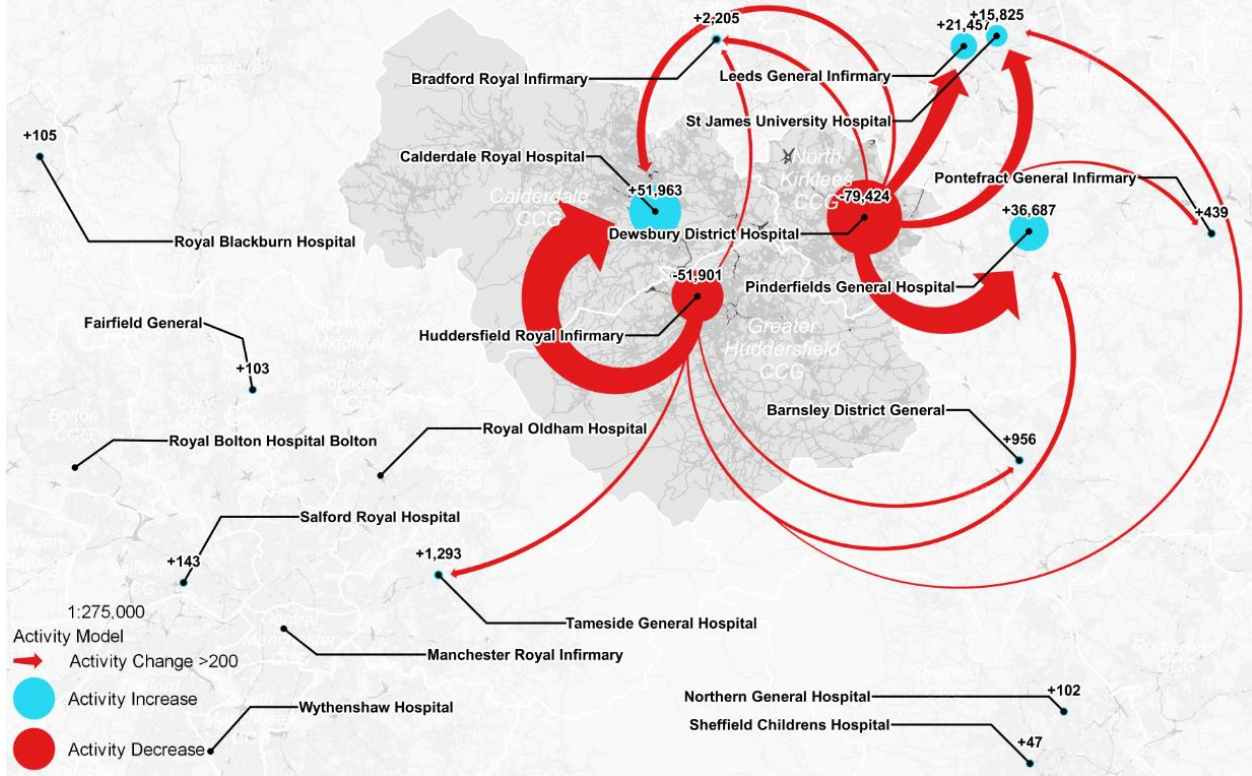
Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	23,699	11.8	120,744	78.2%
Wakefield	572	8.1	4,215	1.9%
Calderdale	4,405	5.5	48,184	14.5%
Leeds	355	6.4	3,328	1.2%
Bradford	1,019	7.9	7,788	3.4%
Barnsley	28	8.3	200	0.1%
East Riding	1	9.0	5	0.0%
Doncaster	20	22.6	53	0.1%
York	24	31.6	45	0.1%
Others	176	10.3	1,021	0.6%
Total	30,298	9.8	185,583	100.0%

- The total journey time in hours was 30,298 hours, an increase of 11,552 hours.
- The average journey time was 9.8 mins.
- The average journey time for a Kirklees patient increased by 6.7 mins
- The average journey time for a Calderdale patient decreased by 0.1 mins
- 55.2% of journeys were to CRH.
- 19.8% of journeys (38,826 patients) were to PGH.
- 11.7% of journeys (21,718 patients) were to LGH.
- 8.6% of journeys (16,017 patients) were to SJH

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Change in Non-Ambulance A&E Activity without Huddersfield and Dewsbury

Modelled Private Transport Time from Home Address to Closest A&E



Public transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	-	-	-	-
Calderdale Royal	56,269	34.6	97,478	52.5%
Dewsbury District	-	-	-	-
Bradford Royal	3,666	32.3	6,801	3.7%
Pinderfields General	15,291	42.9	21,373	11.5%
Leeds General	40,235	43.2	55,838	30.1%
St James's	110	23.0	288	0.2%
Pontefract General	175	24.5	428	0.2%
Barnsley	447	48.1	557	0.3%
Salford Royal	215	53.1	243	0.1%
Fairfield General	122	40.8	180	0.1%
Royal Blackburn	97	41.6	140	0.1%
Others	1,709	45.4	2,257	1.2%
Total	118,335	38.3	185,583	100.0%

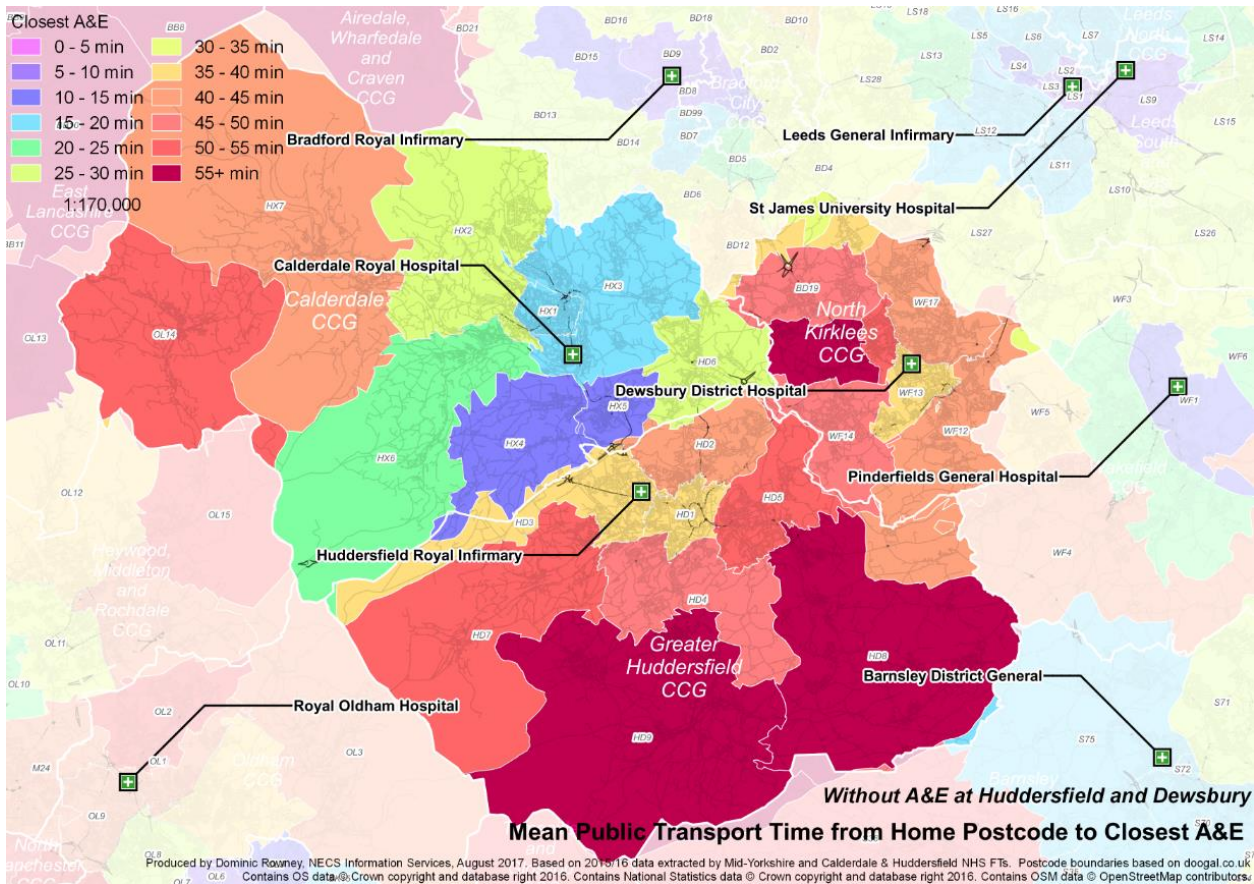
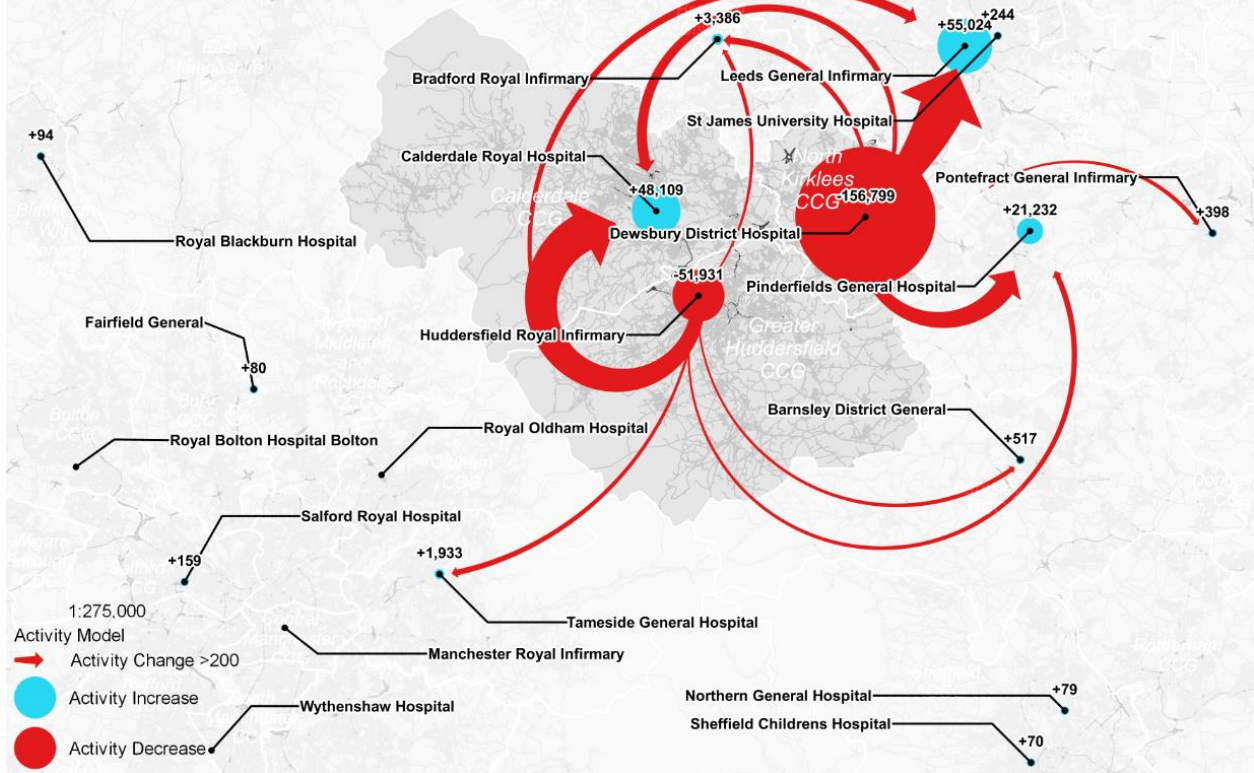
Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	90,877	45.2	120,744	76.8%
Wakefield	2,376	33.8	4,215	2.0%
Calderdale	18,490	23.0	48,184	15.6%
Leeds	1,738	31.3	3,328	1.5%
Bradford	3,933	30.3	7,788	3.3%
Barnsley	101	30.3	200	0.1%
East Riding	4	43.0	5	0.0%
Doncaster	53	60.1	53	0.0%
York	41	54.3	45	0.0%
Others	723	42.5	1,021	0.6%
Total	118,335	38.3	185,583	100.0%

- The total journey time in hours was 118,335 hours, an increase of 40,831 hours.
- The average journey time was 38.3 mins.
- The average journey time for a Kirklees patient increased by 23.1 mins
- The average journey time for a Calderdale patient decreased by 0.9 mins
- 52.5% of journeys were to CRH.
- 30.1% of journeys (55,838 patients) were to LGH.
- 11.5% of journeys (21,373 patients) were to PGH.

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Change in Non-Ambulance A&E Activity without Huddersfield and Dewsbury

Modelled Public Transport Time from Home Address to Closest A&E



3.3 Option 2 – A single Emergency Site at HRI. Modelling without CRH and DDH

Option 2 results were calculated as follows:

Private transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	15,558	8.7	106,937	57.6%
Calderdale Royal	-	-	-	-
Dewsbury District	-	-	-	-
Bradford Royal	1,067	8.2	7,826	4.2%
Pinderfields General	6,652	11.5	34,736	18.7%
Leeds General	2,885	9.1	18,967	10.2%
St James's	2,431	10.1	14,442	7.8%
Pontefract General	69	8.7	474	0.3%
Barnsley	118	11.7	607	0.3%
Salford Royal	42	11.3	222	0.1%
Fairfield General	149	16.3	547	0.3%
Royal Blackburn	158	20.4	466	0.3%
Others	52	8.7	359	0.2%
Total	29,181	9.4	185,583	100.0%

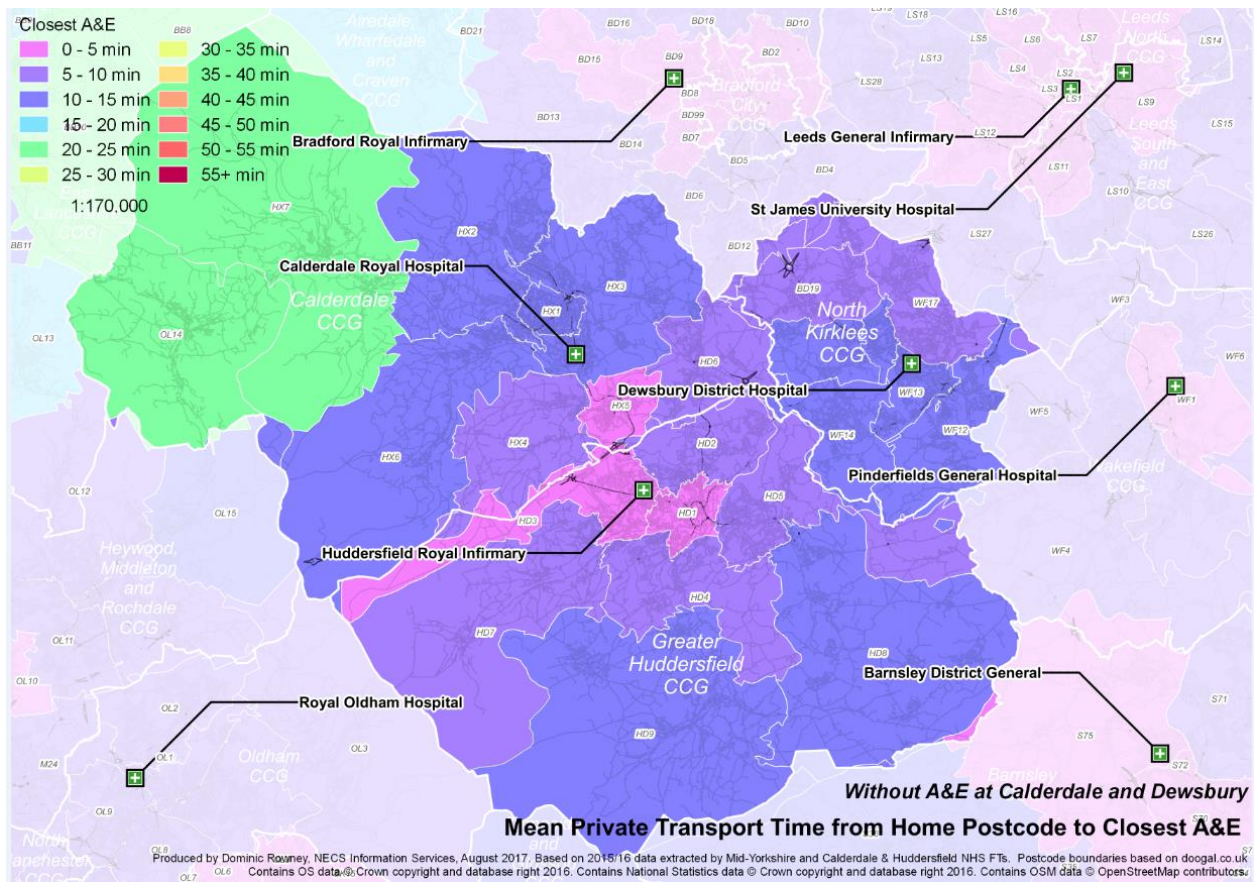
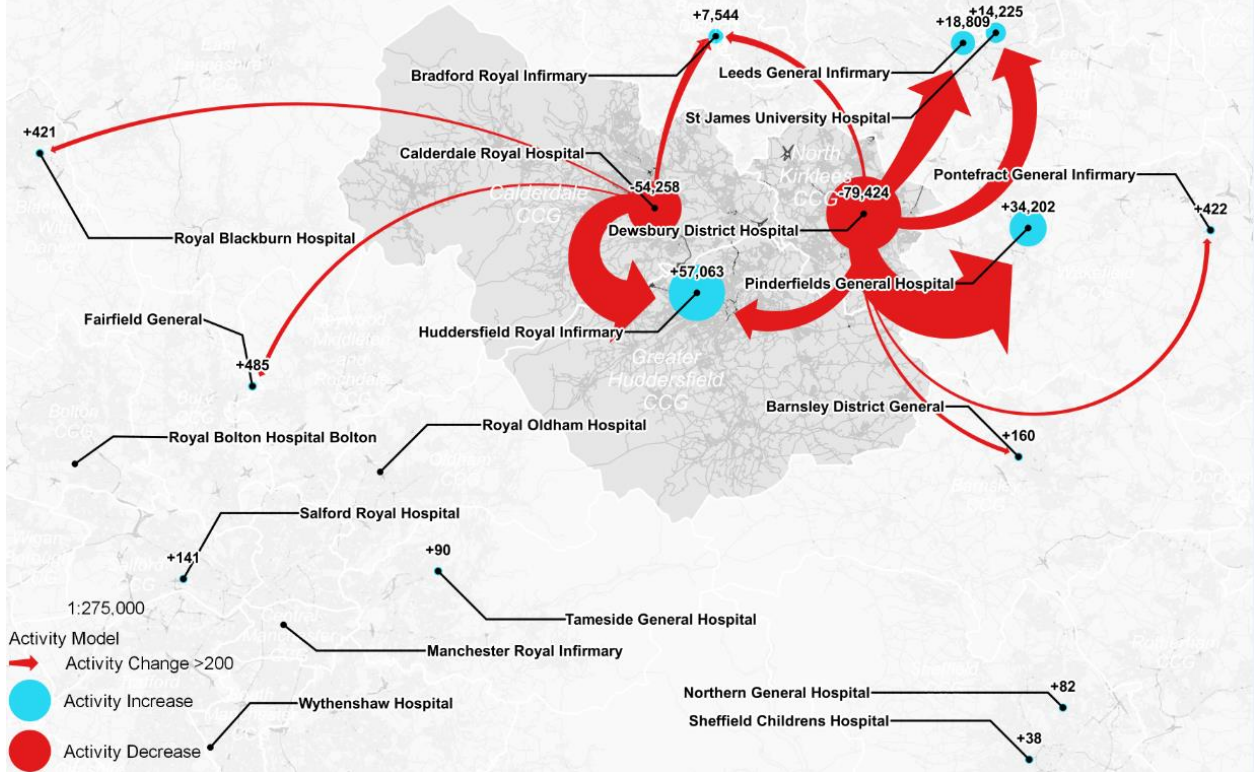
Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	17,871	8.9	120,744	61.2%
Wakefield	556	7.9	4,215	1.9%
Calderdale	9,123	11.4	48,184	31.3%
Leeds	355	6.4	3,328	1.2%
Bradford	1,028	7.9	7,788	3.5%
Barnsley	28	8.3	200	0.1%
East Riding	1	9.0	5	0.0%
Doncaster	20	22.6	53	0.1%
York	24	31.6	45	0.1%
Others	176	10.3	1,021	0.6%
Total	29,181	9.4	185,583	100.0%

- The total journey time in hours was 29,181 hours, an increase of 10,435 hours.
- The average journey time was 9.4 mins.
- The average journey time for a Kirklees patient increased by 3.8 mins
- The average journey time for a Calderdale patient increased by 5.8 mins
- 57.6% of journeys were to HRI.
- 18.7% of journeys (34,736 patients) were to PGH.
- 10.2% of journeys (18,967 patients) were to LGH.
- 7.8% of journeys (14,442 patients) were to SJH

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Change in Non-Ambulance A&E Activity without Calderdale and Dewsbury

Modelled Private Transport Time from Home Address to Closest A&E



Public transport:

Destination	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Journeys
Huddersfield Royal	62,187	34.3	108,869	58.7%
Calderdale Royal	-	-	-	-
Dewsbury District	-	-	-	-
Bradford Royal	9,586	38.6	14,887	8.0%
Pinderfields General	13,114	41.1	19,155	10.3%
Leeds General	26,902	41.7	38,733	20.9%
St James's	110	23.0	288	0.2%
Pontefract General	175	24.5	428	0.2%
Barnsley	112	31.0	217	0.1%
Salford Royal	215	53.1	243	0.1%
Fairfield General	1,229	59.7	1,234	0.7%
Royal Blackburn	1,258	64.6	1,169	0.6%
Others	225	37.5	360	0.2%
Total	115,112	37.2	185,583	100.0%

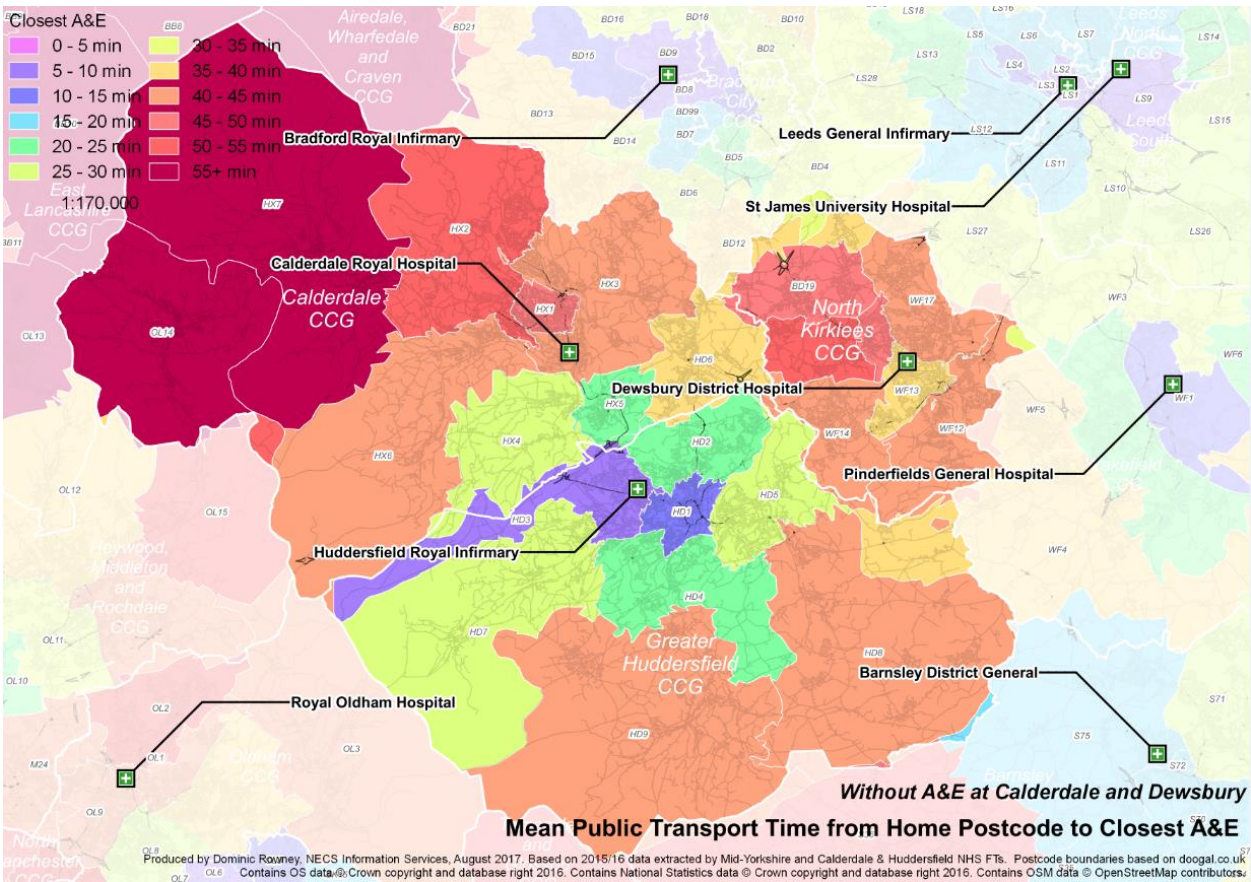
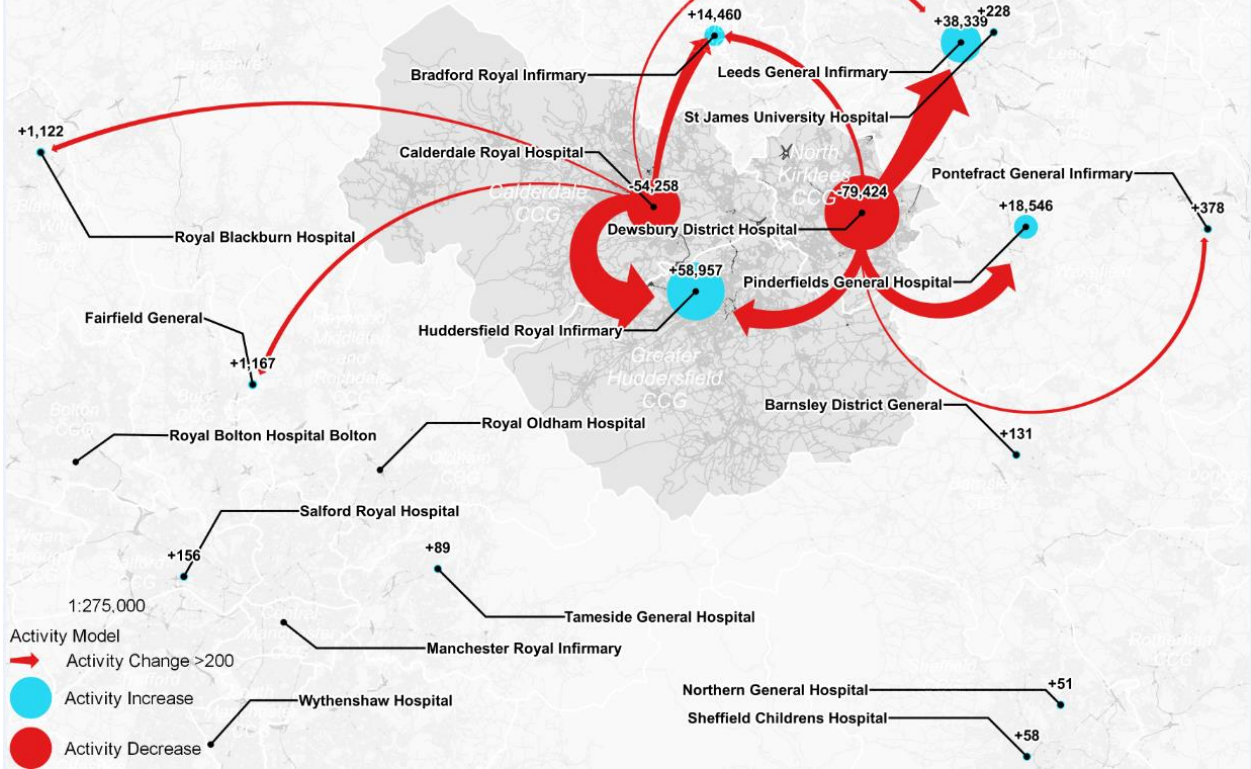
Home Postal Town	Total Journey Time (hrs)	Average Journey Time (mins)	Number of Journeys	% Total of Time
Kirklees	69,826	34.7	120,744	60.7%
Wakefield	2,360	33.6	4,215	2.1%
Calderdale	36,096	44.9	48,184	31.4%
Leeds	1,738	31.3	3,328	1.5%
Bradford	4,170	32.1	7,788	3.6%
Barnsley	101	30.3	200	0.1%
East Riding	4	43.0	5	0.0%
Doncaster	53	60.1	53	0.0%
York	41	54.3	45	0.0%
Others	724	42.5	1,021	0.6%
Total	115,112	37.2	185,583	100.0%

- The total journey time in hours was 115,112 hours, an increase of 37,608 hours.
- The average journey time was 37.2 mins.
- The average journey time for a Kirklees patient increased by 12.6 mins
- The average journey time for a Calderdale patient increased by 21.0 mins
- 58.7% of journeys were to HRI.
- 20.9% of journeys (38,733 patients) were to LGH.
- 10.3% of journeys (19,155 patients) were to PGH.
- 8.0% of journeys (14,887 patients) were to BRH.

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Change in Non-Ambulance A&E Activity without Calderdale and Dewsbury

Modelled Public Transport Time from Home Address to Closest A&E



Conclusions & Recommendations

4.1 Impact on patient journey times.

A reconfiguration of Emergency Care provision across Calderdale, Greater Huddersfield and North Kirklees which resulted in a single A&E site at CRH could potentially result in over 11,500 hours of increased journey time for patients per year, under current demand within the system, should all patients travel to their nearest A&E site using private transport. It is likely that an increased burden in terms of A&E patients could fall on neighbouring hospitals providing A&E services, with the potential for significant increases at PGH, LGH and SJH. On average, a patient might expect to spend 3.7 extra mins on the road, with Kirklees residents' journeys likely to increase by 6.7 mins on average and Calderdale residents' travel time expected to remain static, decreasing by 0.1 mins on average.

On the assumption all patients travel to their nearest A&E site using public transport, a reconfiguration resulting in a single A&E site at CRH could potentially result in 40,831 hours of increased journey time for patients per year, under current demand in the system. It is likely that the increased burden in terms of A&E patients under this scenario could fall on LGH and PGH, who might experience significant increases. On average, a patient may expect to spend 13.2 extra mins on the road, with Kirklees residents' journeys likely to increase by 23.1 mins on average and Calderdale residents' travel time expected to decrease by 0.9 mins on average.

A reconfiguration which resulted in a single A&E site at HRI could potentially result in around 10,500 hours of increased journey time for patients per year, under current demand within the system, should all patients travel to their nearest A&E site using private transport. It is likely that an increased burden in terms of A&E patients could fall on neighbouring hospitals providing A&E services, with the potential for significant increases at PGH, LGH and SJH. On average, a patient might expect to spend 3.3 extra mins on the road, with Kirklees residents' journeys likely to increase by 3.8 mins on average and Calderdale residents' travel time expected to increase by 5.8 mins on average.

On the assumption all patients travel to their nearest A&E site using public transport, a reconfiguration resulting in a single A&E site at HRI could potentially result in 37,608 hours of increased journey time for patients per year, under current demand in the system. It is likely that the increased burden in terms of A&E patients under this scenario could fall on LGH, PGH and BRH, who might experience significant increases. On average, a patient may expect to spend 12.1 extra mins on the road, with Kirklees residents' journeys likely to increase by 12.6 mins on average and Calderdale residents' travel time expected to increase by 21 mins on average.

In practice, it is expected that the number of patients attending at A&E who have not arrived via ambulance and have used public transport, will be very small. This modelling and subsequent analysis is intended merely to stimulate discussion around the wider implications for patients travelling to hospital by public transport and should be read in this context. It follows that, as the expectation is that the vast majority of non-ambulance patients attending at A&E will have travelled by some form of private transport, then this modelling and analysis offers a more robust basis for inference around private transport patterns and behaviours.

A further analysis, at the more granular, postcode sector level is available as an appendix to this report and allows closer scrutiny of potential travel impacts at lower levels of geography than those discussed in the main report.

It is recommended that the RCRTRP and MtC Programme Boards examine the findings of this report and agree the implications on the options for the wider reconfiguration of hospital services across the Calderdale, Greater Huddersfield and North Kirklees CCG areas. Consideration should be given to discussions with neighbouring CCGs and Trusts operating A&E services as well as patient groups and organisations providing public transport services across the study area, to ensure an understanding of the potential impact on them of the proposed A&E reconfiguration options.