

## Stroke Services Reconfiguration: Travel and Access Analysis

**APPENDIX 3** Summary

Currently four trusts provide stroke services across seven sites: 1) Darent Valley Hospital; 2) Kent and Canterbury Hospital; 3) Maidstone Hospital; 4) Medway Maritime Hospital; 5) Queen Elizabeth Queen Mother Hospital; 6) Tunbridge Wells Hospital; 7) William Harvey Hospital.

The proposed change is to deliver stroke care for Kent and Medway in three Hyperacute Stroke Units (HASU). Table 1 outlines the short listed proposals.

**Table 1.** Shortlisted proposals.

Proposal	A HASU at:
A	Darent Valley Hospital Medway Maritime Hospital William Harvey Hospital
B	Darent Valley Hospital Maidstone Hospital William Harvey Hospital
C	Maidstone Hospital Medway Maritime Hospital William Harvey Hospital
D	Tunbridge Wells Hospital Medway Maritime Hospital William Harvey Hospital
E	Darent Valley Hospital Tunbridge Wells Hospital William Harvey Hospital

The Mott MacDonald report states that Proposal D has the least negative impact upon accessibility as 84 per cent of patients can still access stroke services within 30 minutes and proposal B has the most negative impact with only 79 per cent of patients able to access stroke services within 30 minutes; see page 26 of the Mott MacDonald report. It is important to note that the Mott MacDonald report does not include analysis for proposal E as this was introduced at a later stage.

The analysis completed by the Medway Public Health Intelligence Team also found that proposal D has the least negative impact upon accessibility as 87 per cent of residents can still access stroke services within 30 minutes. However, this analysis found that proposal A has the most negative impact, with only 80 per cent of residents able to access stroke services within 30 minutes.

#### [Mott MacDonald Report Methodology](#)

The Mott MacDonald report presents travel and access impacts for blue light ambulance (BLA) as the journeys by patients for the services assessed would typically be made by this mode of transport.

Travel time data has been provided by Carnall Farrar and 'off peak car' has been used to represent travel times by BLA. The baseline travel time has been calculated based upon the patient data and calculates the travel time from the patients' residential LSOA to the hospital based upon the service site they are currently using. The future travel time for these patients under each proposal has then been calculated; see page 25 of the Mott MacDonald report for further details.

The Mott MacDonald report used activity data for 2015/16 for patients who accessed services within Kent and Medway and who are also resident in the study area.

## Stroke Services Reconfiguration: Travel and Access Analysis

## Medway Public Health Intelligence Team Analysis

Based on current stroke service locations, 100 per cent of Kent and Medway residents have access to stroke services by BLA within 30 minutes and 60 minutes. Across all of the shortlisted proposals there is a reduction in accessibility within 30 minutes by BLA for Kent and Medway residents. This ranges from a reduction to 80 per cent in proposal A to 87 per cent in proposal D. Accessibility within 60 minutes by BLA is in line with the baseline as 100 per cent of all Kent and Medway residents can access stroke services under each shortlisted proposal. This is shown in Table 2 below.

**Table 2.** Estimated percentage of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in all shortlisted proposals.

	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Current (baseline)	40%	88%	100%	100%	100%
Proposal A	20%	48%	80%	98%	100%
Proposal B	16%	51%	85%	98%	100%
Proposal C	20%	46%	85%	98%	100%
Proposal D	19%	44%	87%	98%	100%
Proposal E	15%	42%	84%	98%	100%

**Table 3.** Percentage point change from baseline for BLA journey times for Kent and Medway residents for all shortlisted proposals.

	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Proposal A	-20pp	-40pp	-20pp	-2pp	No change
Proposal B	-24pp	-37pp	-15pp	-2pp	No change
Proposal C	-20pp	-42pp	-15pp	-2pp	No change
Proposal D	-21pp	-44pp	-13pp	-2pp	No change
Proposal E	-25pp	-45pp	-16pp	-2pp	No change

In summary Tables 2 and 3 show:

- Proposal A has the most negative impact upon accessibility as only 80 per cent of residents would be able to access stroke services by blue light ambulance within 30 minutes, which is a reduction of 20 percentage points.
- Proposal D has the least negative impact upon accessibility as 87 per cent of residents would be able to access stroke services by blue light ambulance within 30 minutes.
- Proposals B and C both provide 85 per cent of residents accessibility to stroke services by blue light ambulance within 30 minutes. However, proposal B has a more negative impact on accessibility as only 16 per cent of residents would be able to access stroke services within 10 minutes.
- It is also important to note that proposal E has the most negative impact upon shorter travel times to stroke services. Only 15 per cent of residents would have access to stroke services by blue light ambulance within 10 minutes and 42 per cent of residents within 20 minutes, which are the largest reductions at 25 percentage points and 45 percentage points respectively.

## Stroke Services Reconfiguration: Travel and Access Analysis

## Medway Public Health Intelligence Team Methodology

Medway Public Health Intelligence Team used Public Health England's [Strategic Health Asset Planning and Evaluation](#) (SHAPE) tool to complete the travel and access analysis. SHAPE is a web-enabled, evidence-based application, which informs and supports the strategic planning of services. The application is built around a mapping tool and supports travel time analyses for existing and possible future sites.

SHAPE uses the [Route360°](#) catchment generation API created by Motion Intelligence to generate access catchments for walk, cycle, car and public transport, for one or many sites and then provides detailed population demographics for any specific catchment area.

The following parameters were selected for the stroke services reconfiguration travel and access analysis:

**Mode of transport:** Car off peak was used to represent travel times by blue light ambulance in line with the methodology used in the Mott MacDonald report.

- The SHAPE tool calculates travel times using the normal speed limits but takes into account junctions, crossings and traffic lights.
- The SHAPE tool has validated these travel times with similar data on Google Maps.

**Included population:** Estimated number of Kent and Medway residents that live within the specified travel time.

- For a specified travel time, the SHAPE tool determines a catchment area.
- Each Lower Super Output Area (LSOA) has a Population Weighted Centroid (PWC).
- If the PWC of an LSOA is inside the specified travel time catchment area, then the SHAPE tool counts the LSOAs entire population in the included population calculation.
- The SHAPE tool determines the LSOA population from ONS Small Area Population Estimates Mid-2015.

**Excluded population:** Estimated number of Kent and Medway residents that do not live within the specified travel time.

- If an LSOAs PWC is not inside the specified travel time catchment area, then the SHAPE tool counts the LSOAs entire population in the excluded population calculation.

\*There is one LSOA North West of Faversham that is not included in any of the travel time analysis. This LSOAs PWC is not inside any of the specified travel time catchment areas, which is likely due to issues with the SHAPE tool's road definitions in that area and the travel time algorithm. The population of this LSOA is 1,695 residents.

**Total population:** Estimated total number of Kent and Medway residents.

- The sum of both the included and excluded populations.

**Percentage within travel time:** The estimated percentage of the total Kent and Medway residents that live within the specified travel time:

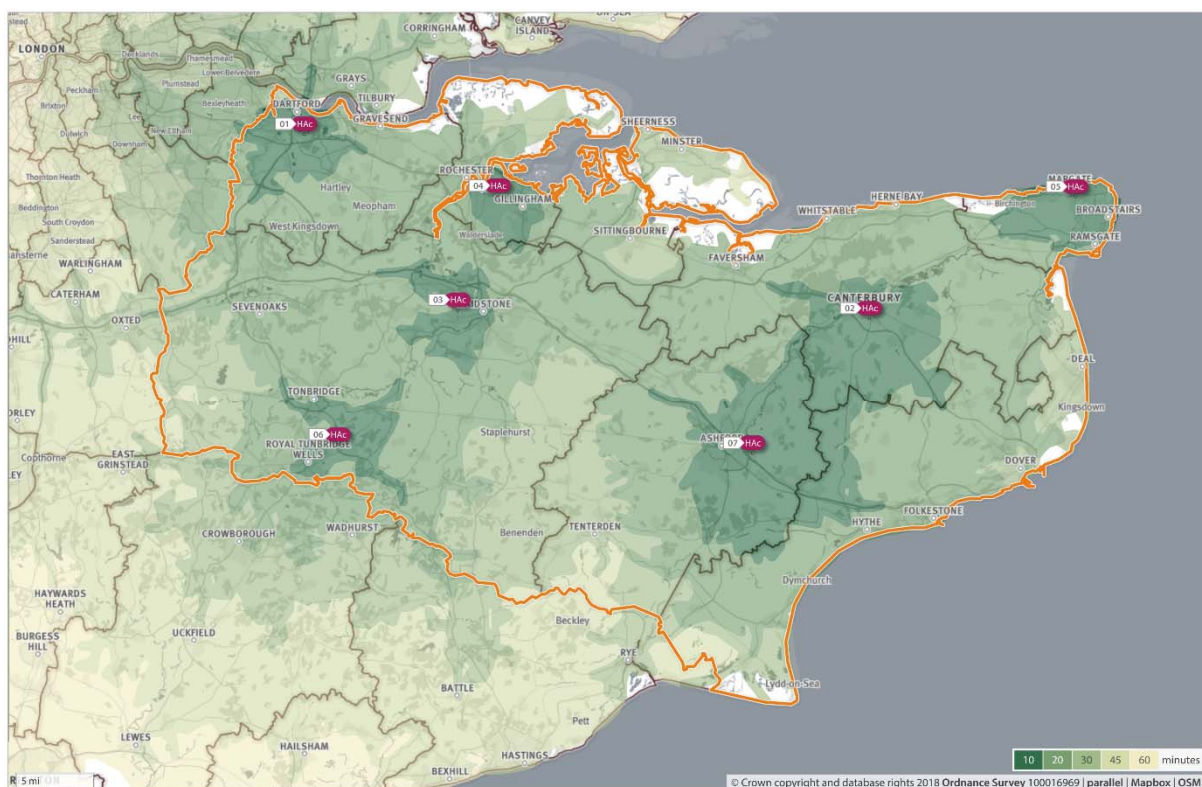
$$\frac{\text{Included population}}{\text{Total population}} * 100$$

Stroke Services Reconfiguration: Travel and Access Analysis

Current

**Table 4.** Map index of the current stroke service locations.

Hospital	Map Index
Darent Valley Hospital	01 HAC
Kent and Canterbury Hospital	02 HAC
Maidstone Hospital	03 HAC
Medway Maritime Hospital	04 HAC
Queen Elizabeth Queen Mother Hospital	05 HAC
Tunbridge Wells Hospital	06 HAC
William Harvey Hospital	07 HAC



**Figure 1.** Kent and Medway residents that currently live within a 10 to 60 minute BLA journey of a stroke service. **Source:** PHE; SHAPE Place. **Date Accessed:** 22/01/2018.

**Table 5.** Estimated number of Kent and Medway residents that currently live within a 10 to 60 minute BLA journey of a stroke service.

Current locations	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	723,953	1,580,616	1,794,047	1,799,516	1,799,516
Excluded population	1,077,258	220,595	7,164	1,695	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	40%	88%	100%	100%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 24/01/2018.

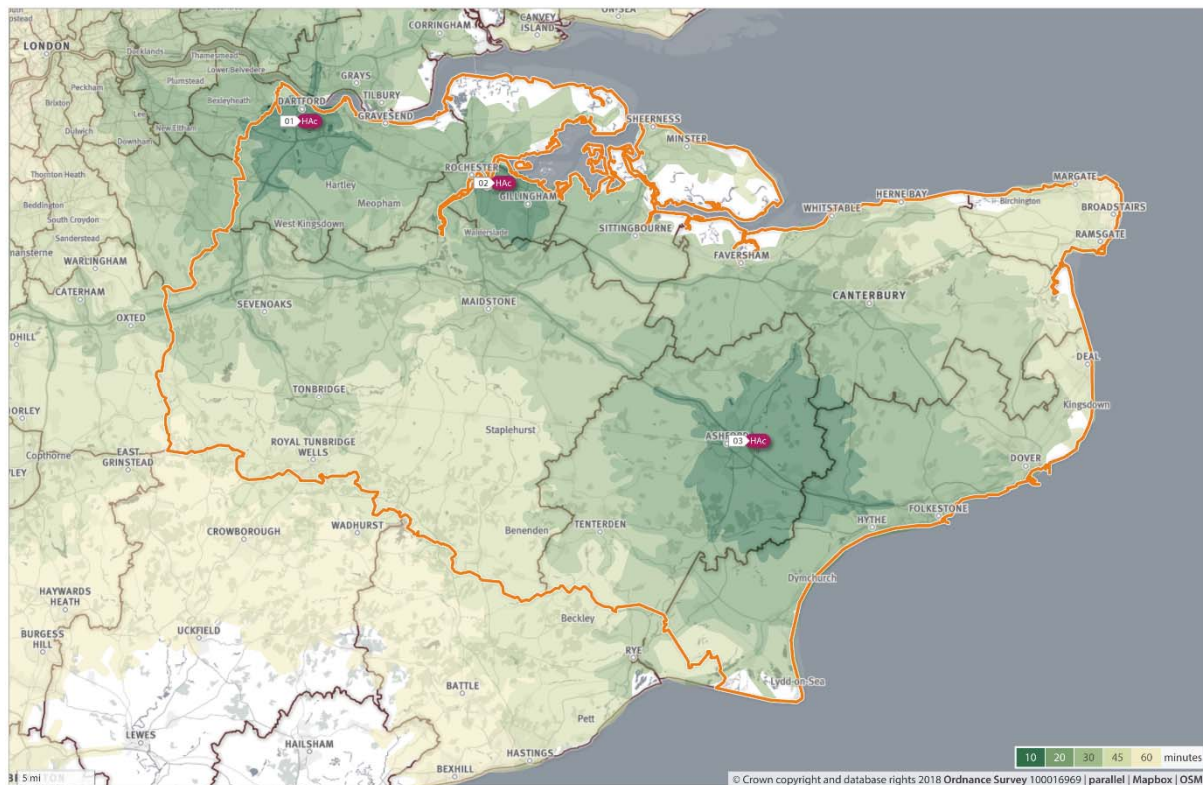
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Proposal A

**Locations:** 1) Darent Valley Hospital; 2) Medway Maritime Hospital; 3) William Harvey Hospital.

**Table 6.** Map index for the HASU locations in proposal A.

Hyperacute Stroke Units	Map Index
Darent Valley Hospital	01 HAC
Medway Maritime Hospital	02 HAC
William Harvey Hospital	03 HAC



**Figure 2.** Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal A. **Source:** PHE; SHAPE Place. **Date Accessed:** 22/01/2018.

**Table 7.** Estimated number of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal A.

Proposal A	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	358,194	862,273	1,441,593	1,765,715	1,799,516
Excluded population	1,443,017	938,938	359,618	35,496	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	20%	48%	80%	98%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 24/01/2018.



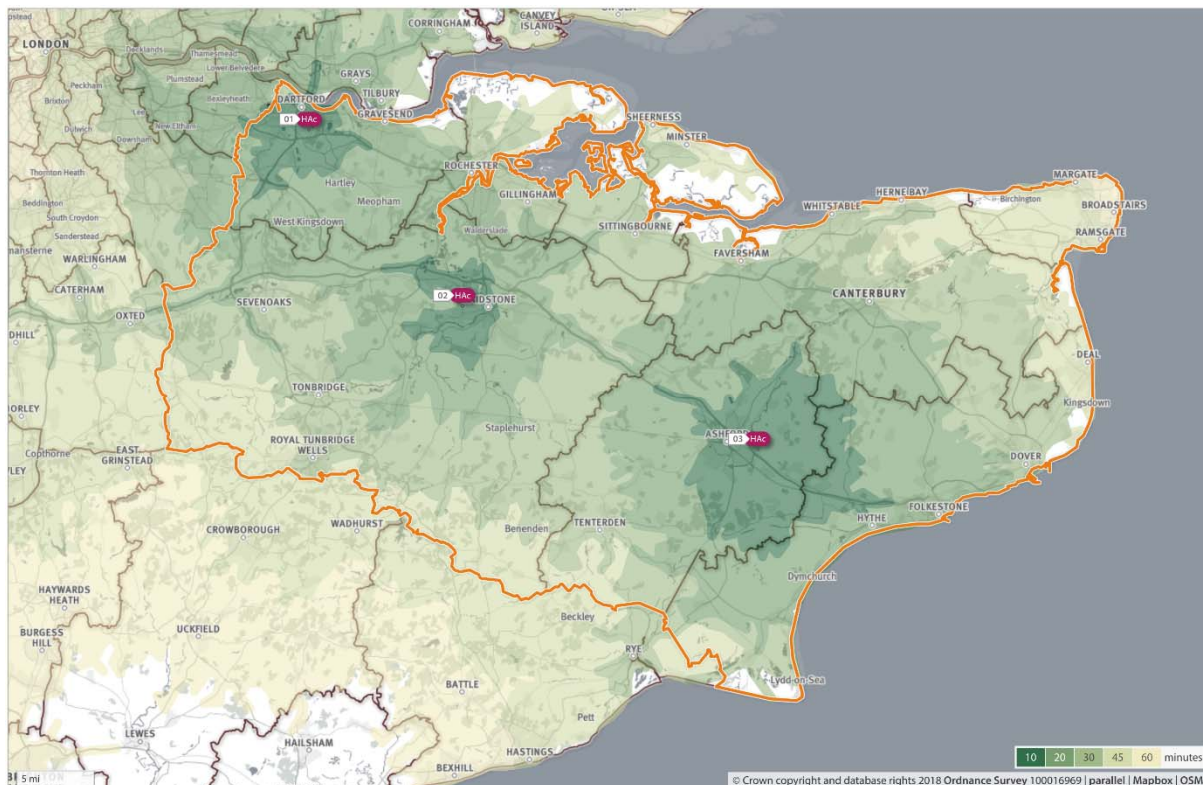
Stroke Services Reconfiguration: Travel and Access Analysis

Proposal B

**Locations:** 1) Darent Valley Hospital; 2) Maidstone Hospital; 3) William Harvey Hospital.

**Table 8.** Map index for the HASU locations in proposal B.

Hyperacute Stroke Units	Map Index
Darent Valley Hospital	01 HAC
Maidstone Hospital	02 HAC
William Harvey Hospital	03 HAC



**Figure 3.** Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal B. **Source:** PHE; SHAPE Place. **Date Accessed:** 22/01/2018.

**Table 9.** Estimated number of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal B.

Proposal B	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	289,719	914,731	1,523,907	1,765,715	1,799,516
Excluded population	1,511,492	886,480	277,304	35,496	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	16%	51%	85%	98%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 24/01/2018.

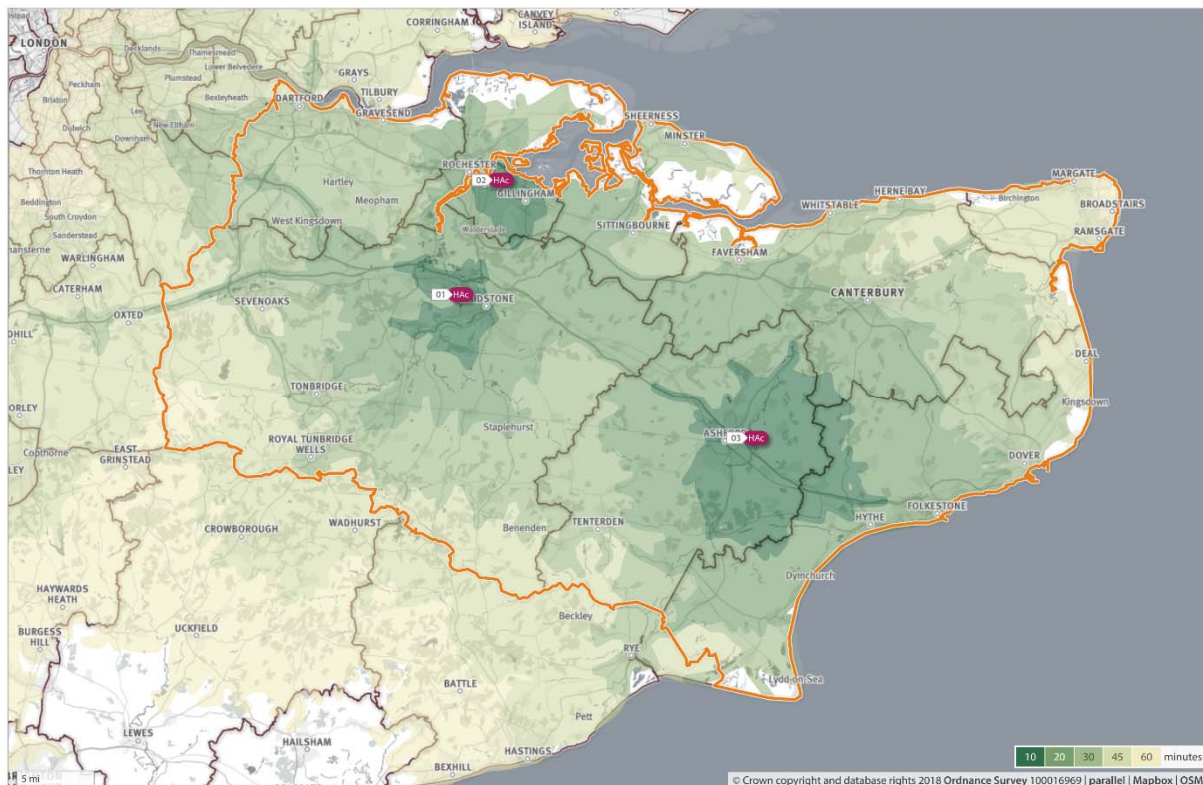
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Proposal C

**Locations:** 1) Maidstone Hospital; 2) Medway Maritime Hospital; 3) William Harvey Hospital.

**Table 10.** Map index for the HASU locations in proposal C.

Hyperacute Stroke Units	Map Index
Maidstone Hospital	01 HAC
Medway Maritime Hospital	02 HAC
William Harvey Hospital	03 HAC



**Figure 4.** Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal C. **Source:** PHE; SHAPE Place. **Date Accessed:** 22/01/2018.

**Table 11.** Estimated number of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal C.

Proposal C	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	354,049	825,358	1,531,039	1,762,102	1,799,516
Excluded population	1,447,162	975,853	270,172	39,109	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	20%	46%	85%	98%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 24/01/2018.

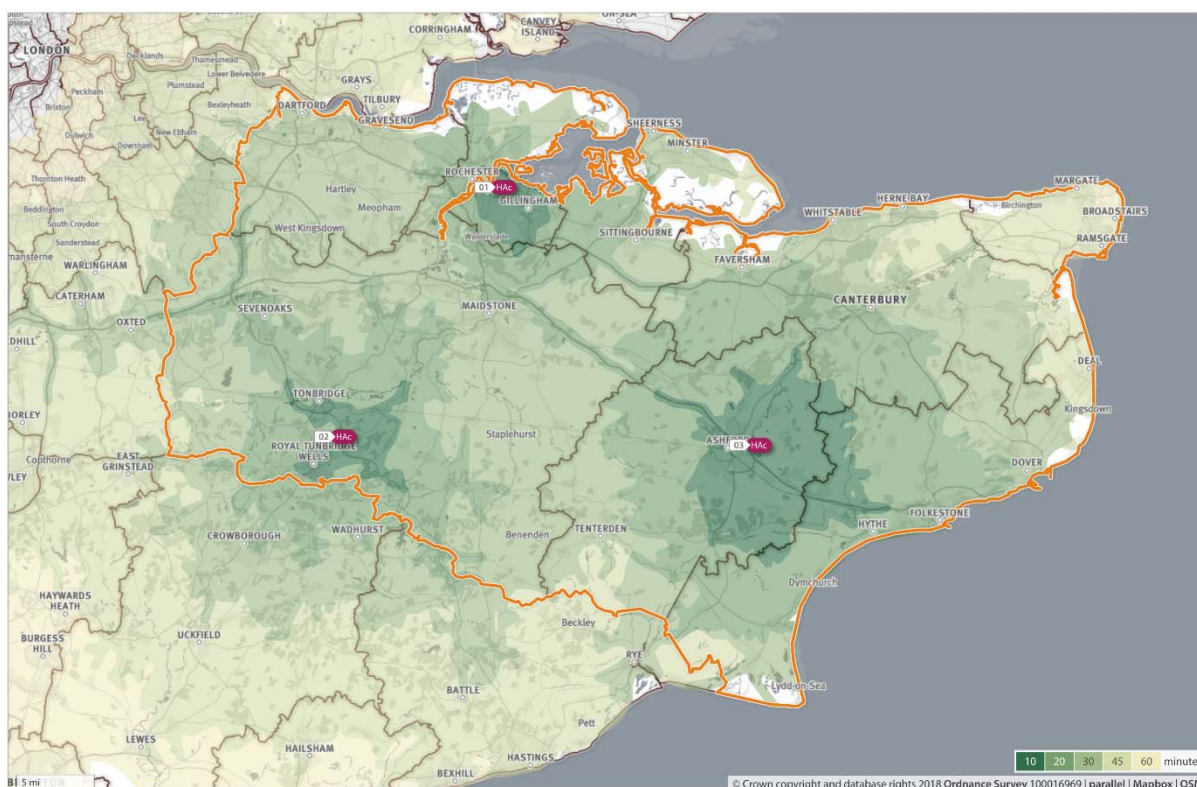
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Proposal D

**Locations:** 1) Tunbridge Wells Hospital; 2) Medway Maritime Hospital; 3) William Harvey Hospital.

**Table 12.** Map index for the HASU locations in proposal D.

Hyperacute Stroke Units	Map Index
Medway Maritime Hospital	01 HAC
Tunbridge Wells Hospital	02 HAC
William Harvey Hospital	03 HAC



**Figure 5.** Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal D. **Source:** PHE; SHAPE Place. **Date Accessed:** 22/01/2018.

**Table 13.** Estimated number of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal D.

Proposal D	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	335,522	791,794	1,568,314	1,765,715	1,799,516
Excluded population	1,465,689	1,009,417	232,897	35,496	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	19%	44%	87%	98%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 24/01/2018.



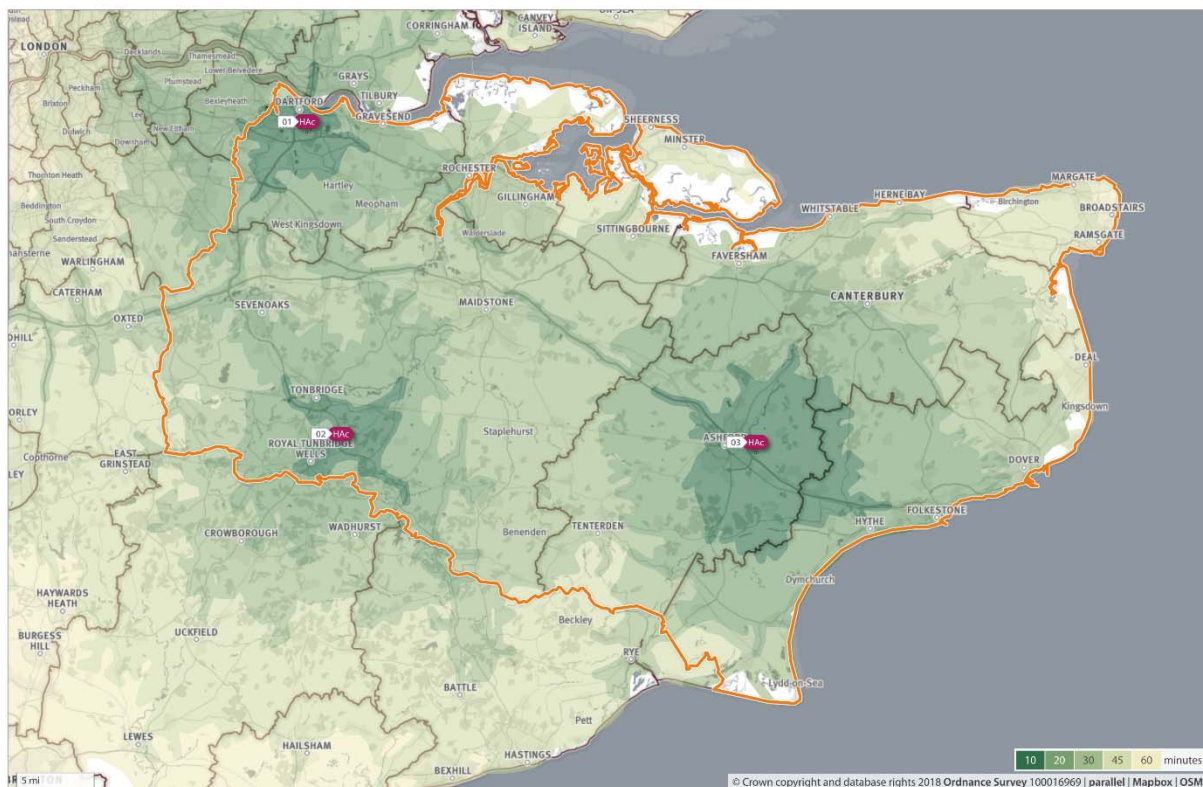
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Proposal E

**Locations:** 1) Darent Valley Hospital; 2) Tunbridge Wells Hospital; 3) William Harvey Hospital.

**Table 14.** Map index for the HASU locations in proposal E.

Hyperacute Stroke Units	Map Index
Darent Valley Hospital	01 HAC
Tunbridge Wells Hospital	02 HAC
William Harvey Hospital	03 HAC



**Figure 6.** Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal E. **Source:** PHE; SHAPE Place. **Date Accessed:** 29/01/2018.

**Table 15.** Estimated number of Kent and Medway residents that would live within a 10 to 60 minute BLA journey based on the HASU locations in proposal E.

Proposal E	Travel time within				
	10 minutes	20 minutes	30 minutes	45 minutes	60 minutes
Included population	271,192	762,997	1,512,929	1,765,715	1,799,516
Excluded population	1,530,019	1,038,214	288,282	35,496	1,695*
Total population	1,801,211	1,801,211	1,801,211	1,801,211	1,801,211
Percentage within travel time	15%	42%	84%	98%	100%

**Source:** PHE; SHAPE Place. **Date Accessed:** 29/01/2018.

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