Chief Ambulance Services Commissioners Report

Emergency Medical and Retrieval Service - Service Review

Supporting Document 5

Population Coverage

GIG CYMRU NHS WALES
Uned Gomisiynu Cydweithredol Cenedlaethol
National Collaborative Commissioning Unit
esri

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Introduction

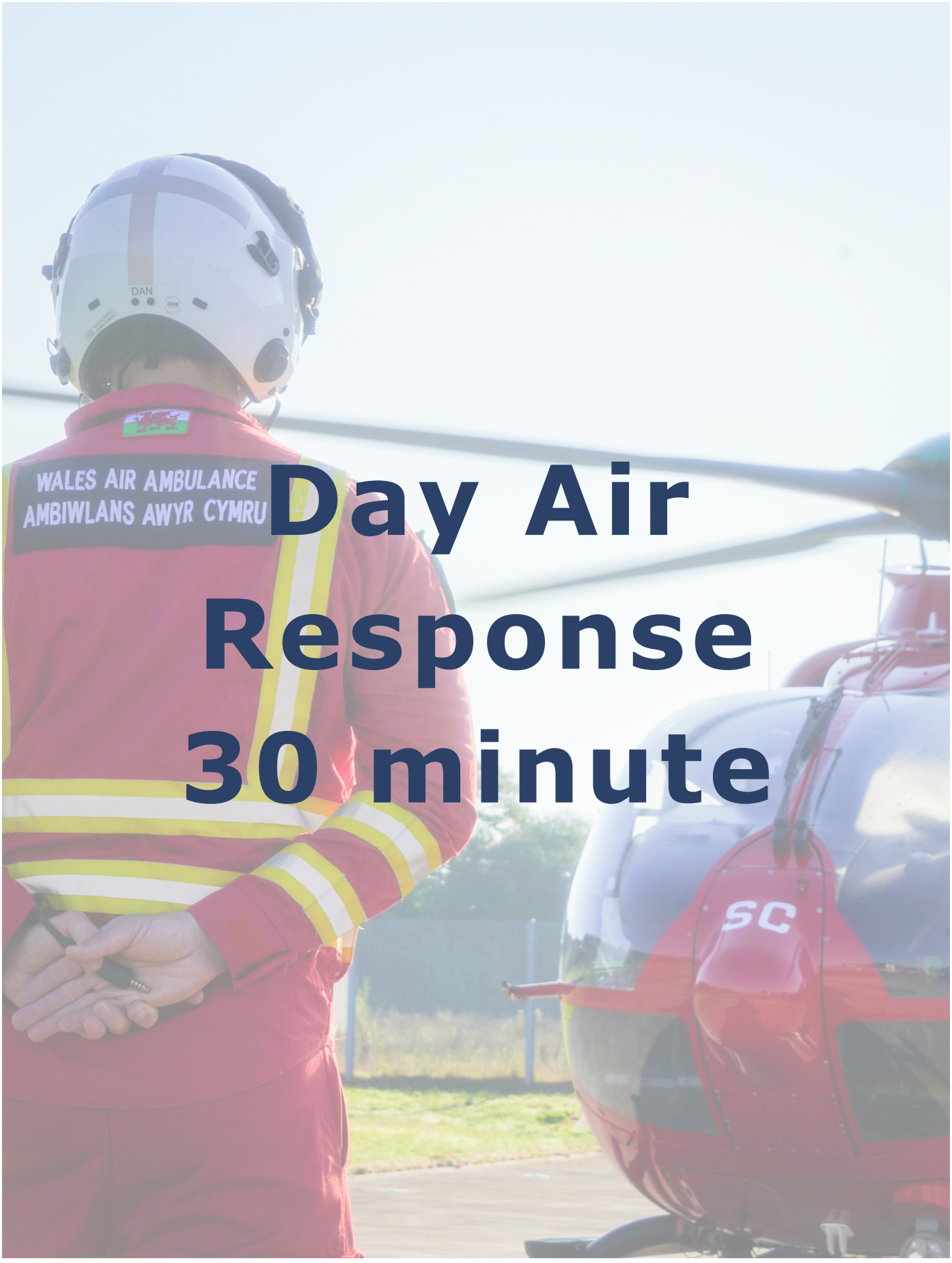
The National Collaborative Commissioning Unit Digital Services team conducted an analysis on EMRTS Cymru helicopter and road response coverage based on different time frames and 2022 population data provided by ESRI through ArcGIS Mapping and Analytical Software.

Road response were measured against a travel time of 30, 60, and 90 minutes from a base location at normal road speeds. Air Responses were measured differently as the do not follow a road based network. However, the same travel time of 30, 60, and 90 minutes parameters were used with a 6 minute deduction made to allow for startup and ground operations meaning the actual flying time measured as 24, 54, and 84 minutes.

Calculation are based on an EC145 never exceeding a speed of 145 knots, this allowed the distance to be calculated using the formula: ***Distance = Speed x Time*** as follows:

24 minute day response	54 minute day response	84 minute day response	40 minute night response
Step 1: Convert the speed from knots to miles per minute: Speed = 145 knots, 1 knot = 1.15078 miles per hour, 1 hour = 60 minutes Speed in miles per minute = (145 knots * 1.15078 miles per hour) / 60 minutes = 2.778 miles per minute			
Step 2: Multiply the speed in miles per minute by the time in minutes: Distance = Speed * Time Distance = 2.778 miles per minute * 24 minutes = 66.672 miles	**Step 2:** Multiply the speed in miles per minute by the time in minutes: Distance = Speed * Time Distance = 2.778 miles per minute * 54 minutes = 149.892 miles	**Step 2:** Multiply the speed in miles per minute by the time in minutes: Distance = Speed * Time Distance = 2.778 miles per minute * 84 minutes = 233.352 miles	**Step 2:** Multiply the speed in miles per minute by the time in minutes: Distance = Speed * Time Distance = 2.778 miles per minute * 40 minutes = 111.12 miles
Result: a helicopter never exceeding a speed of 145 knots per hour can travel approx 66.7 miles in 24 minutes.	**Result:** a helicopter never exceeding a speed of 145 knots per hour can travel approx 149.9 miles in 54 minutes.	**Result:** a helicopter never exceeding a speed of 145 knots per hour can travel approx 233.4 miles in 84 minutes.	**Result:** a helicopter never exceeding a speed of 145 knots per hour can travel approx 111.1 miles in 40 minutes.

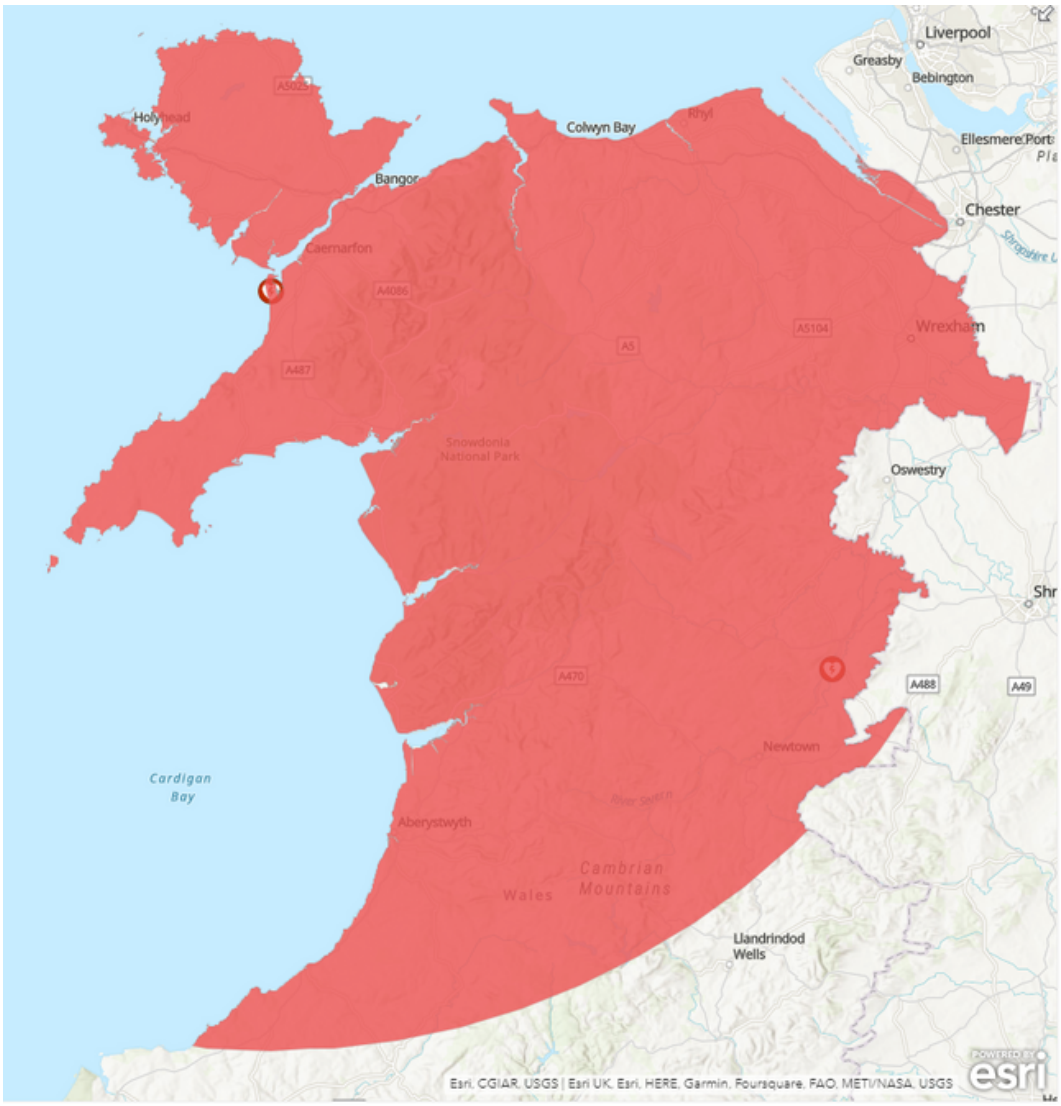
Although an 84 minutes (day) and 70 minutes (night) response was calculated it was not required as helicopters could reach all parts of Wales within 54 minutes. The distance is also determined on wind and weather conditions which have not been factored in.



Day Air Response 30 minute

Caernarfon Base

24 minutes response time

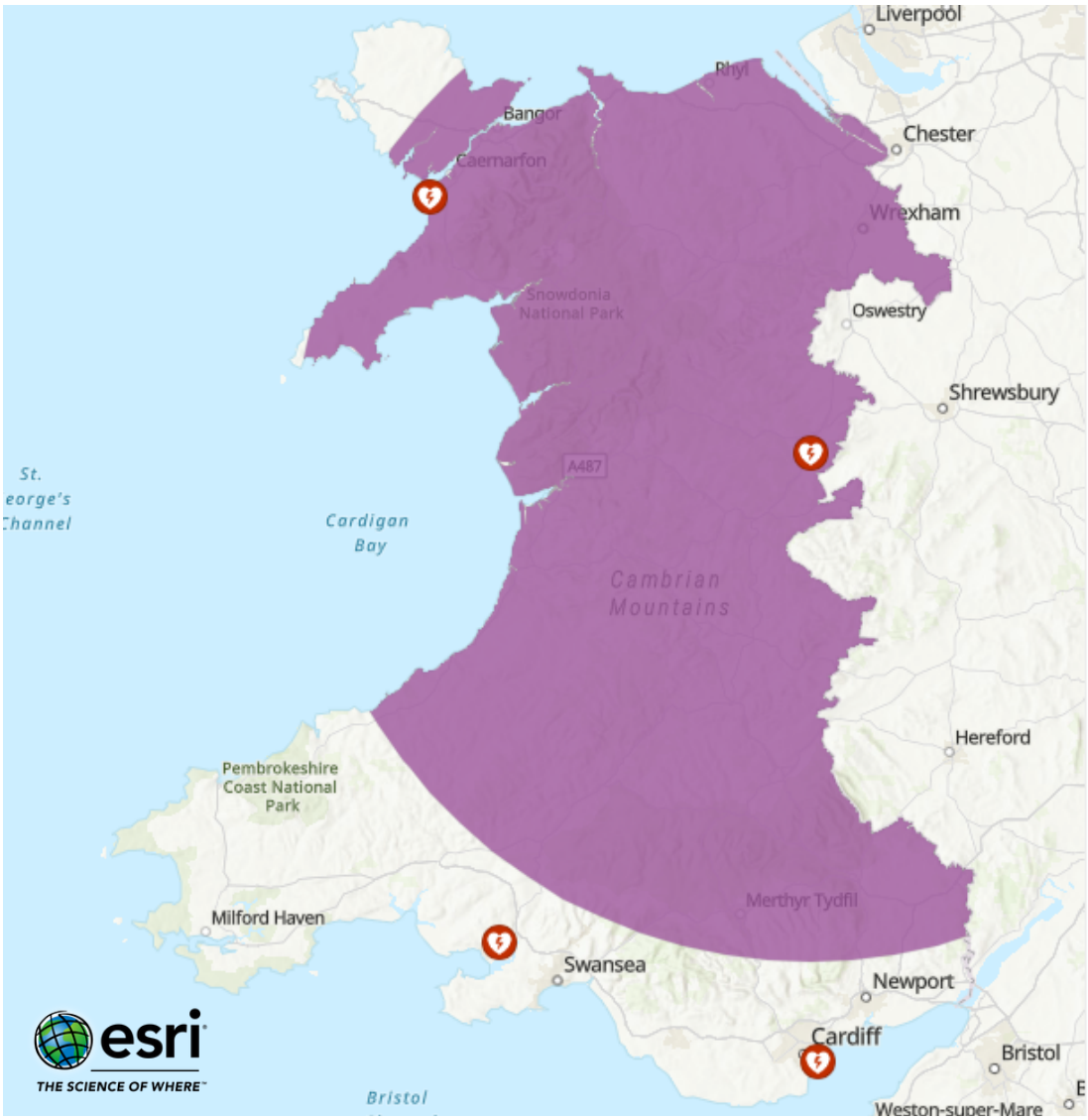


The map above shows the flight coverage area for a helicopter response from Caernarfon Base based on a on a **24** minute flying response with **6** minutes attributed to startup and daytime ground procedures making a total of **30** minutes.

In **24** minutes a helicopter flying at 145 knots per hour can travel, in any direction, approximately **66.7** miles. From Caernarfon this covers a population of **809,751** people based on ESRI 2022 population data.

Welshpool Base

24 minutes response time

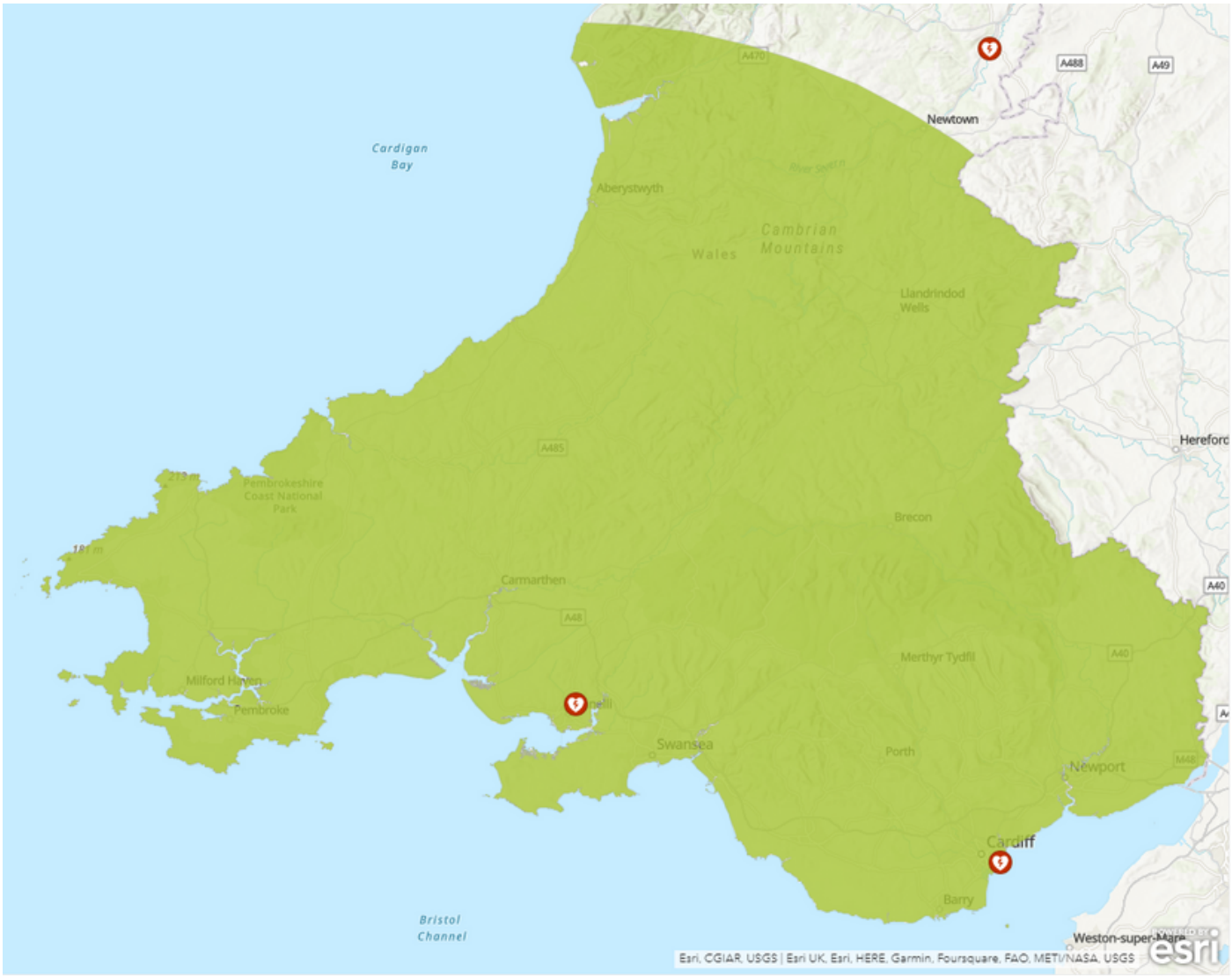


The map above shows the flight coverage area for a helicopter response from Welshpool Base based on a on a **24** minute flying response with **6** minutes attributed to startup and daytime ground procedures making a total of **30** minutes.

In **24** minutes a helicopter flying at 145 knots per hour can travel, in any direction, approximately **66.7** miles. From Welshpool this covers a population of **1,258,626** people based on ESRI 2022 population data.

Dafen Base

24 minutes response time

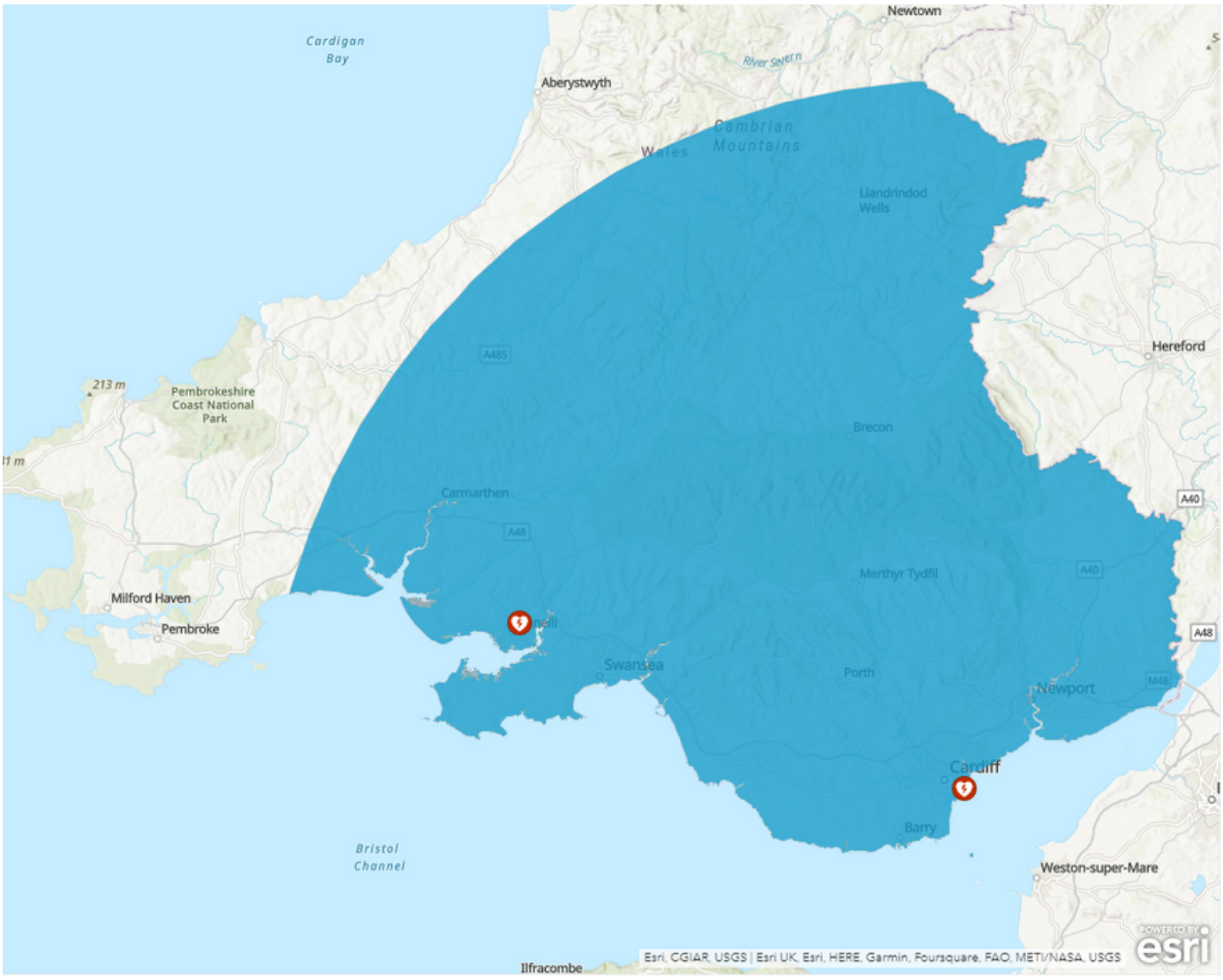


The map above shows the flight coverage area for a helicopter response from Dafen Base based on a on a **24** minute flying response with **6** minutes attributed to startup and daytime ground procedures making a total of **30** minutes.

In **24** minutes a helicopter flying at 145 knots per hour can travel, in any direction, approximately **66.7** miles. From Dafen this covers a population of **2,408,162** people based on ESRI 2022 population data.

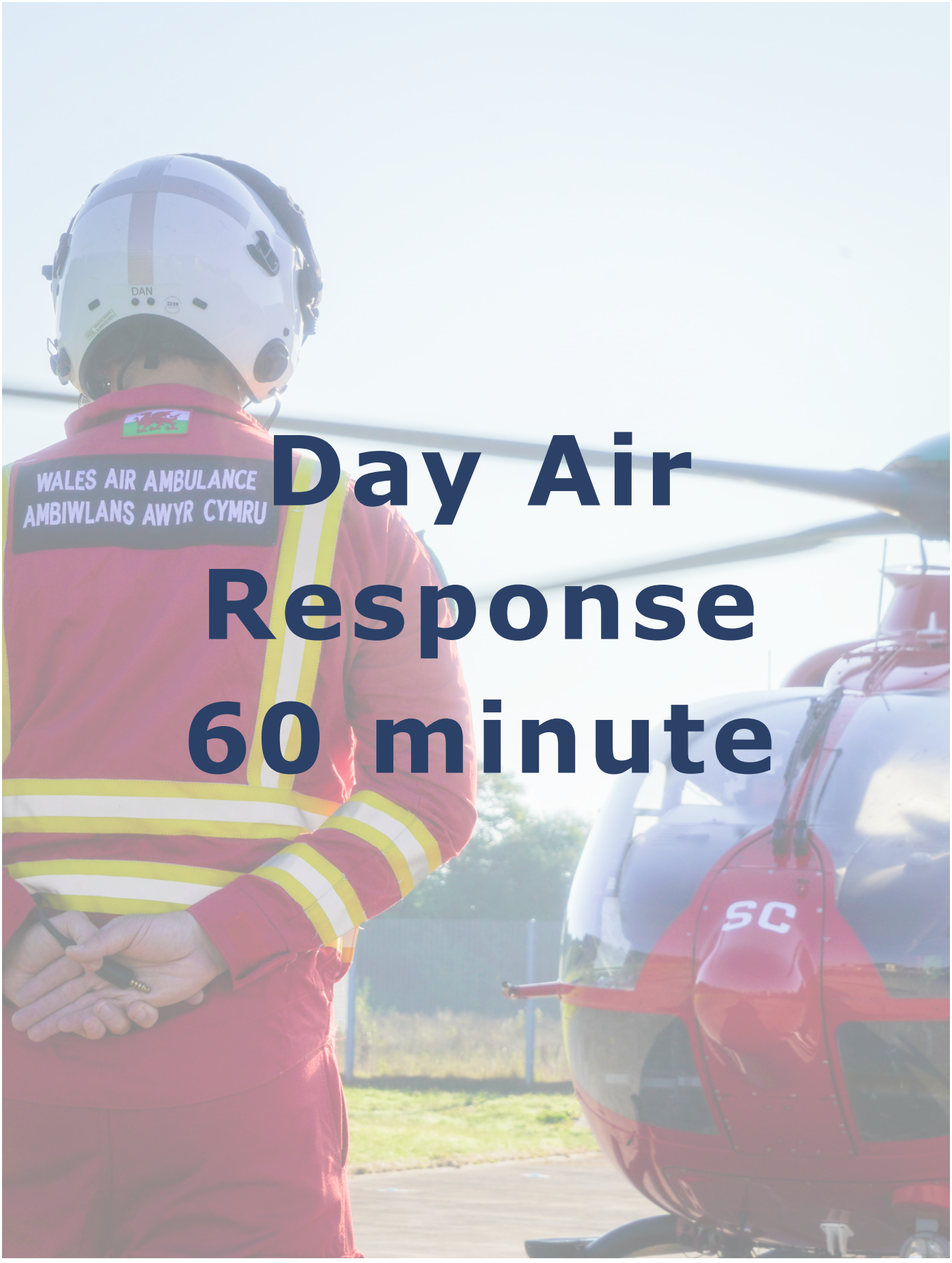
Cardiff Base

24 minutes response time



The map above shows the flight coverage area for a helicopter response from Cardiff Base based on a on a **24** minute flying response with **6** minutes attributed to startup and daytime ground procedures making a total of **30** minutes.

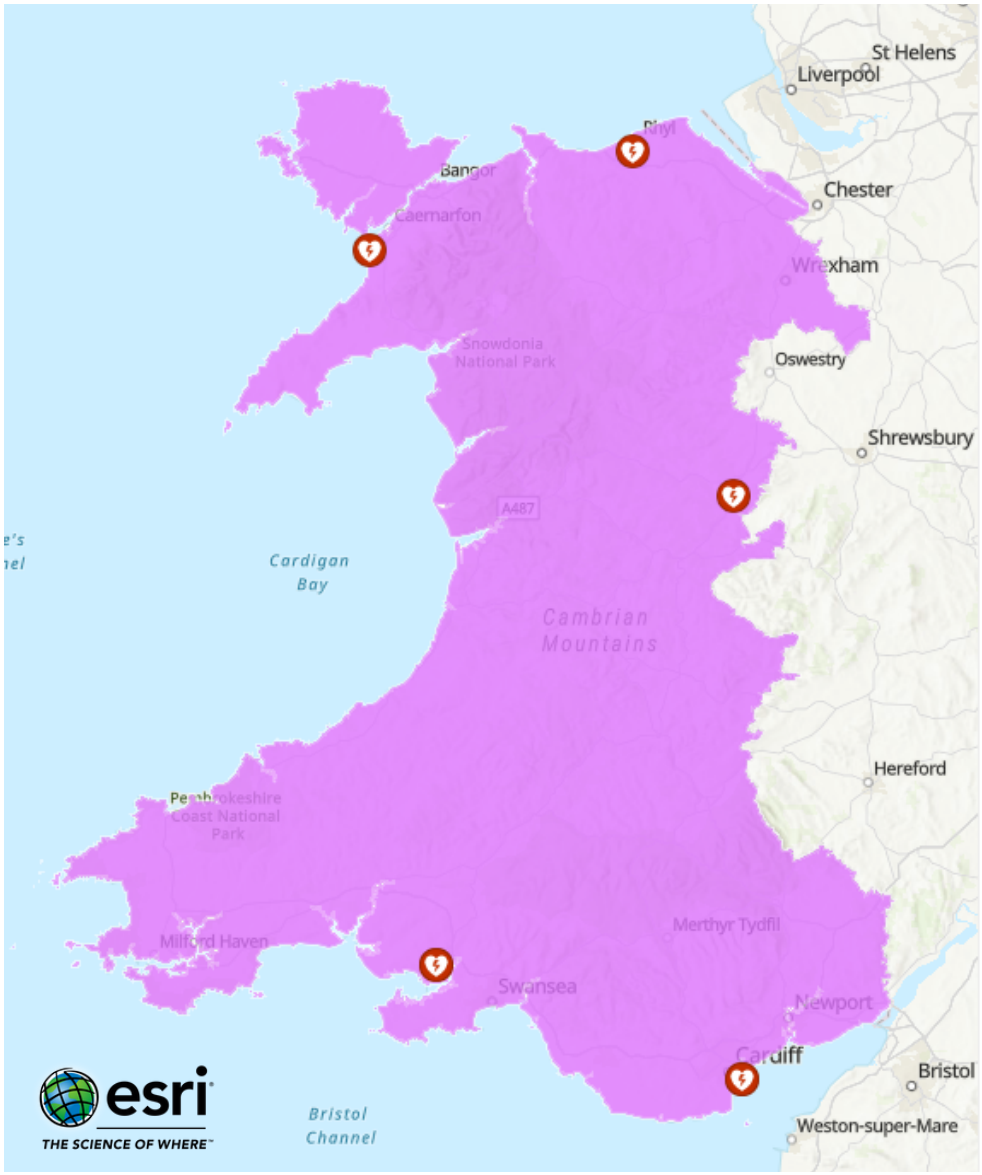
In **24** minutes a helicopter flying at 145 knots per hour can travel, in any direction, approximately **66.7** miles. From Cardiff this covers a population of **2,187,688** people based on ESRI 2022 population data.



Day Air Response 60 minute

All Bases

54 minutes response time



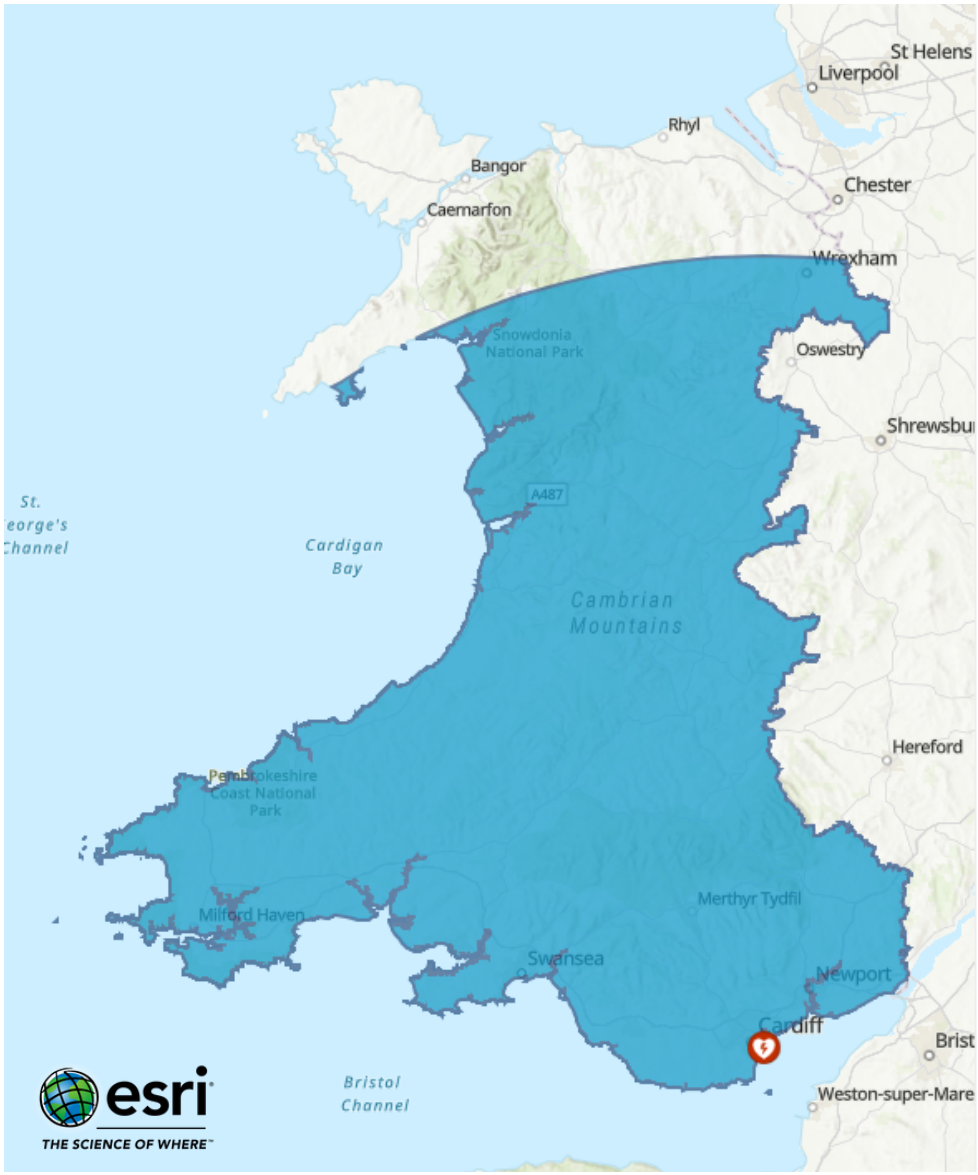
The map above shows the flight coverage area for a helicopter response from any base based on a on a **54** minute flying response with **6** minutes attributed to startup and daytime ground procedures making a total of **60** minutes.

In **54** minutes a helicopter flying at 145 knots per hour can travel, in any direction approximately **149.9** miles. Any Base, current or proposed covers the total population of Wales: **3,137,127** based on ESRI 2022 population data.

Cardiff Night 60 minute

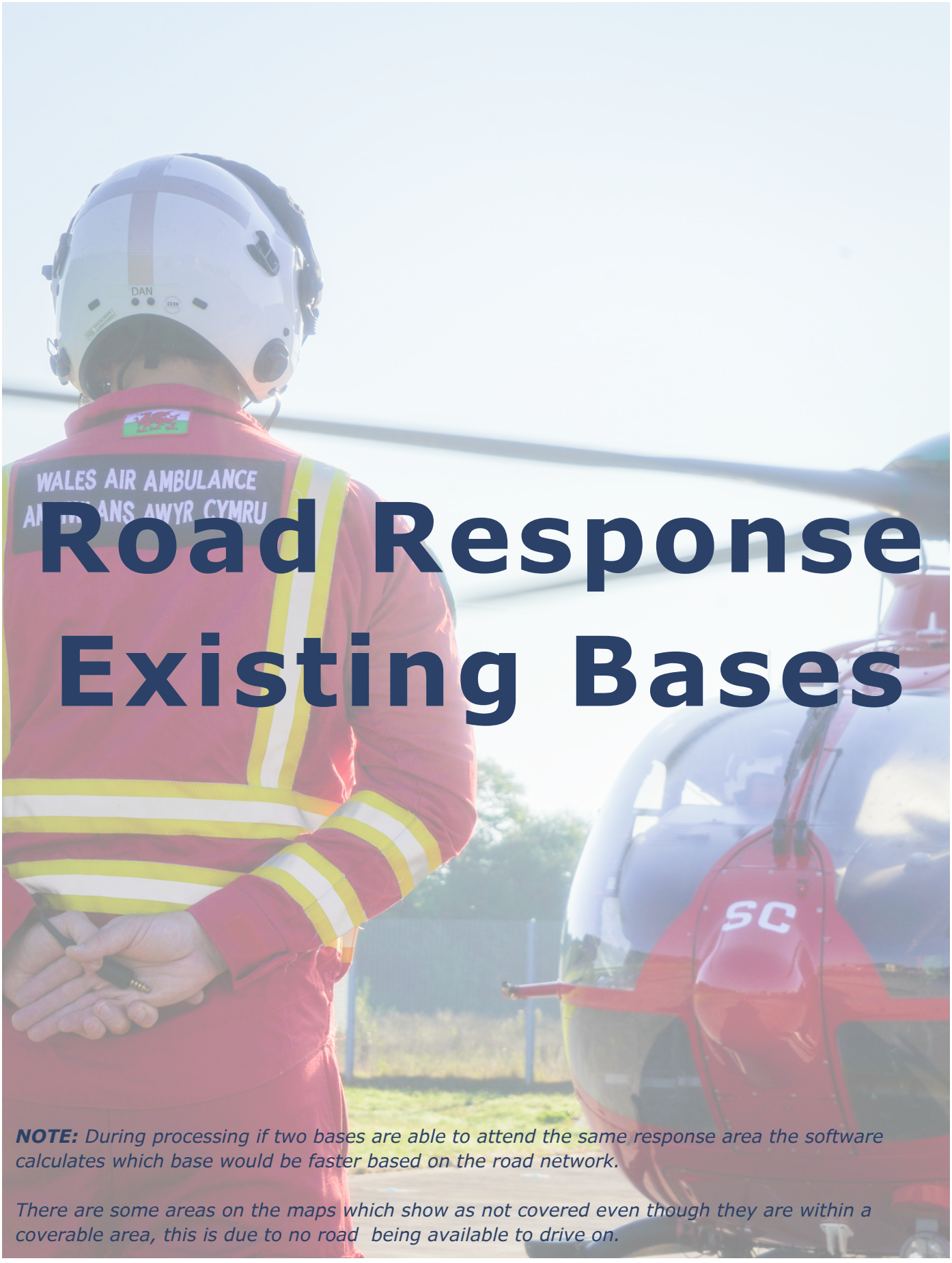
Cardiff Night

40 minutes response time



The map above shows the flight coverage area for a helicopter response from Cardiff base during the hours of darkness based on a **40** minute flying response with **20** minutes attributed to night startup and ground procedures making a total of **60** minutes.

In **40** minutes a helicopter flying at 145 knots per hour can travel, in any direction approximately **111.12** miles and covers a population of 2,606,214 based on ESRI 2022 population data.

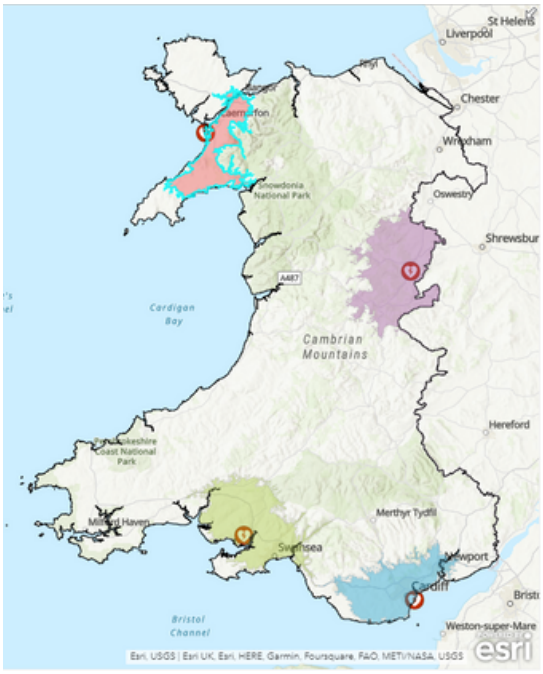


Road Response Existing Bases

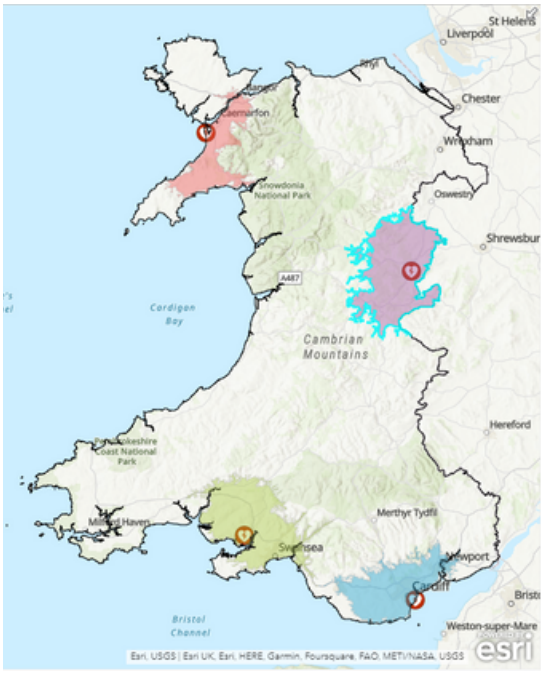
NOTE: *During processing if two bases are able to attend the same response area the software calculates which base would be faster based on the road network.*

There are some areas on the maps which show as not covered even though they are within a coverable area, this is due to no road being available to drive on.

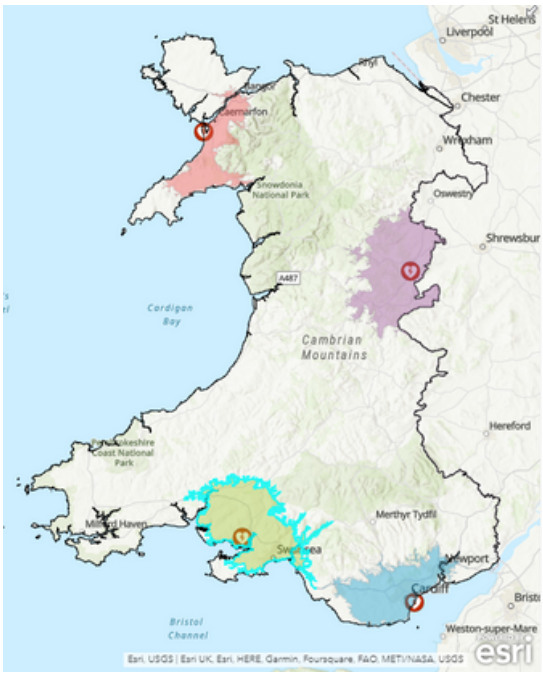
Existing Bases 30 minutes



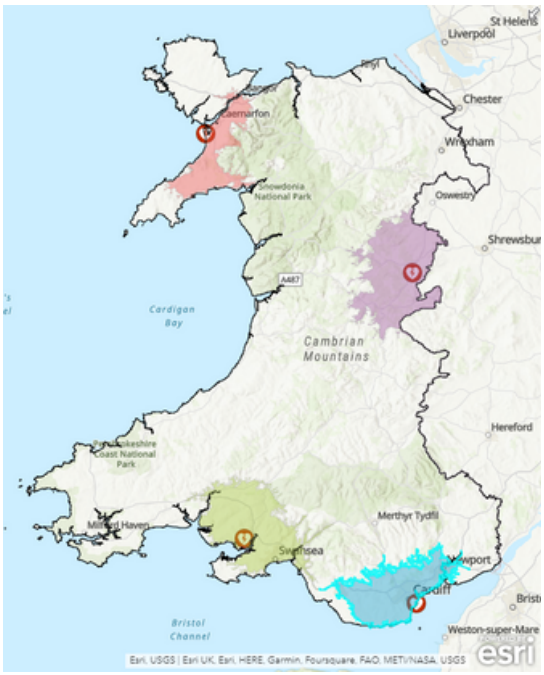
Caernarfon covers a population base of ***77,031*** *people*



Welshpool covers a population base of ***48,976*** *people*



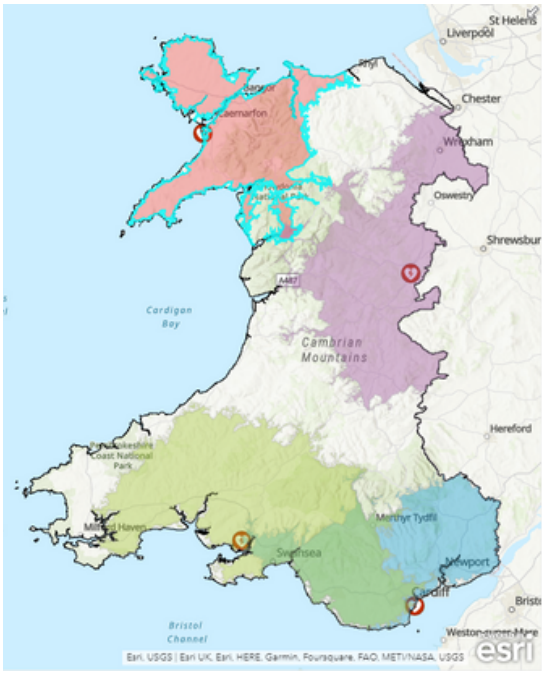
Dafen covers a population base of ***491,114*** *people*



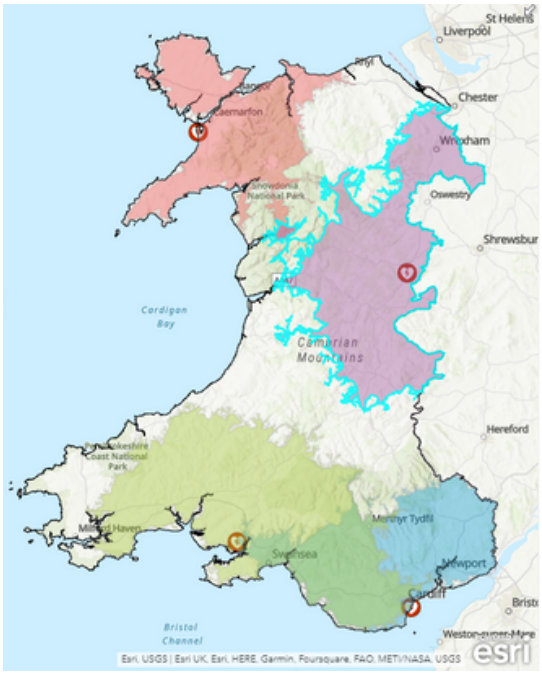
Cardiff covers a population base of ***860,339*** *people*

Population totals above represent an EMRTS RRV response within 30 minutes based on ESRI 2022 population data. Population base also includes those people within overlap areas shown above as a blue outline.

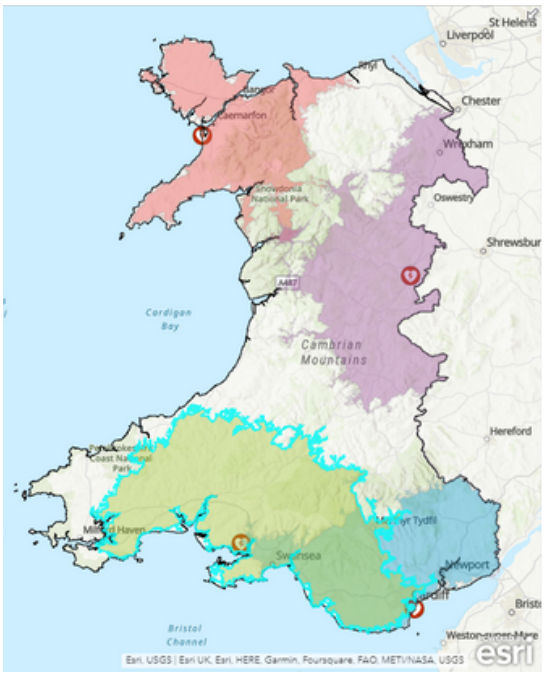
Existing Bases 60 minutes



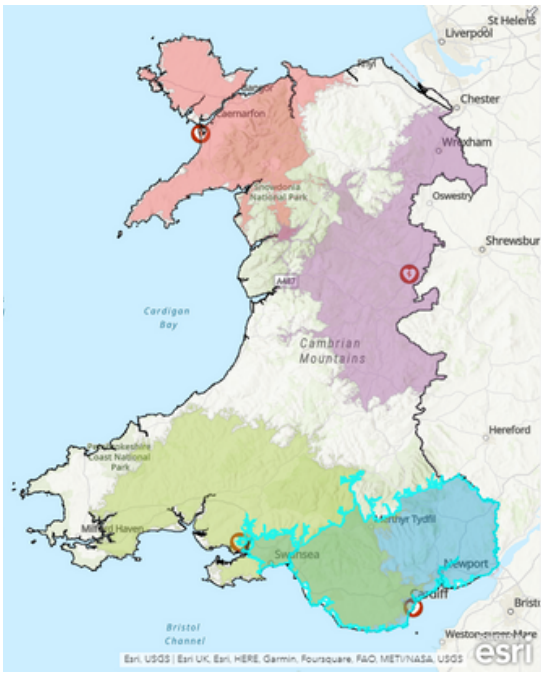
Caernarfon covers a population base of ***279,307*** *people*



Welshpool covers a population base of ***279,306*** *people*



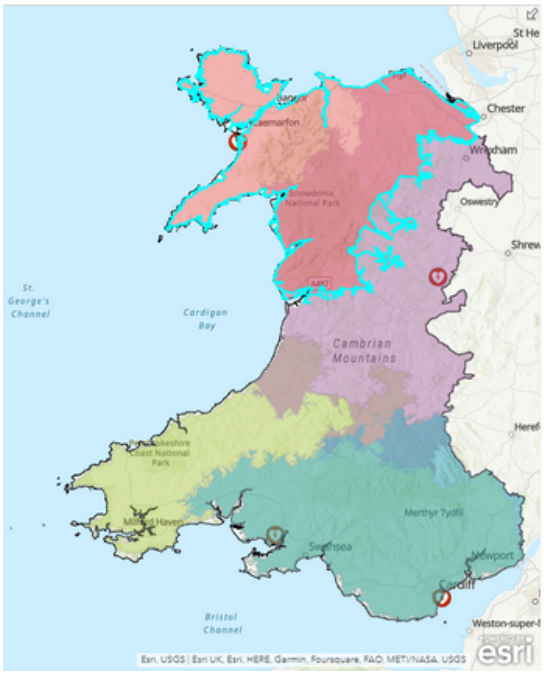
Dafen covers a population base of ***1,490,063*** *people*



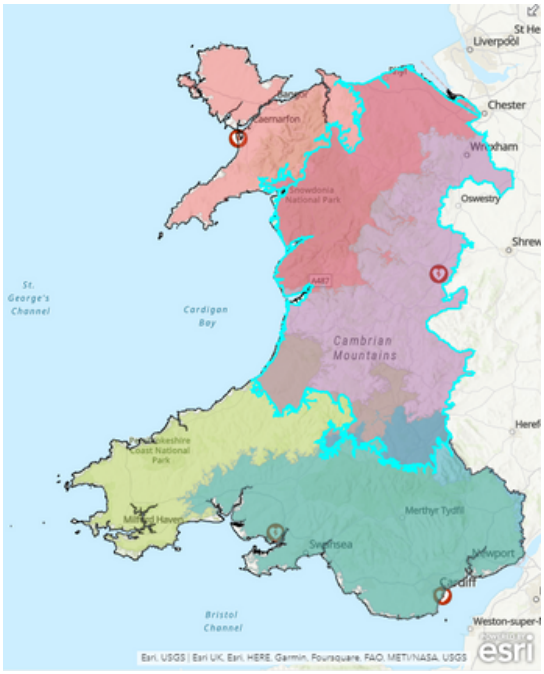
Cardiff covers a population base of ***1,870,263*** *people*

Population totals above represent an EMRTS RRV response within 60 minutes based on ESRI 2022 population data. Population base also includes those people within overlap areas shown above as a blue outline.

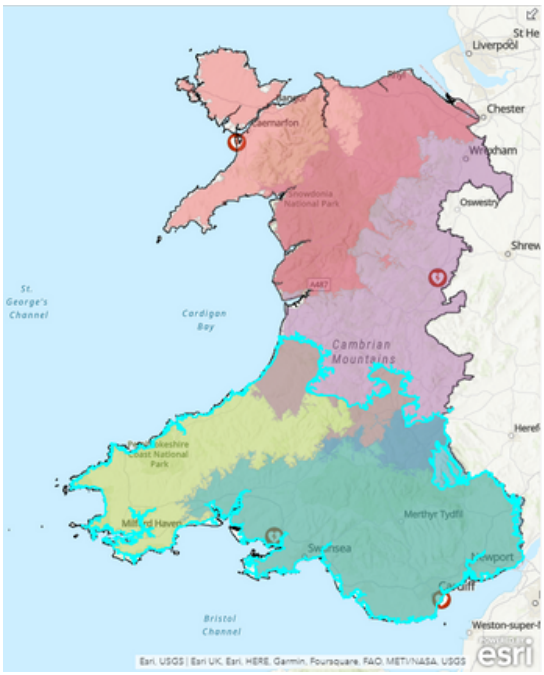
Existing Bases 90 minutes



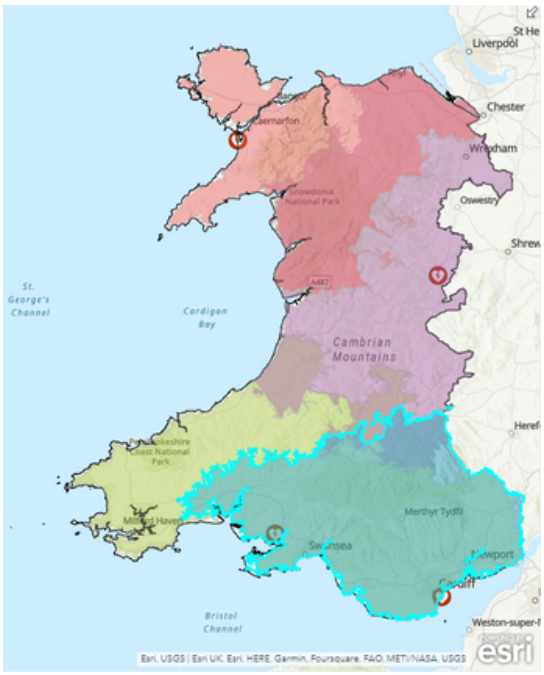
Caernarfon covers a population base of ***553,336*** *people*



Welshpool covers a population base of ***619,439*** *people*



Dafen covers a population base of ***2,330,024*** *people*



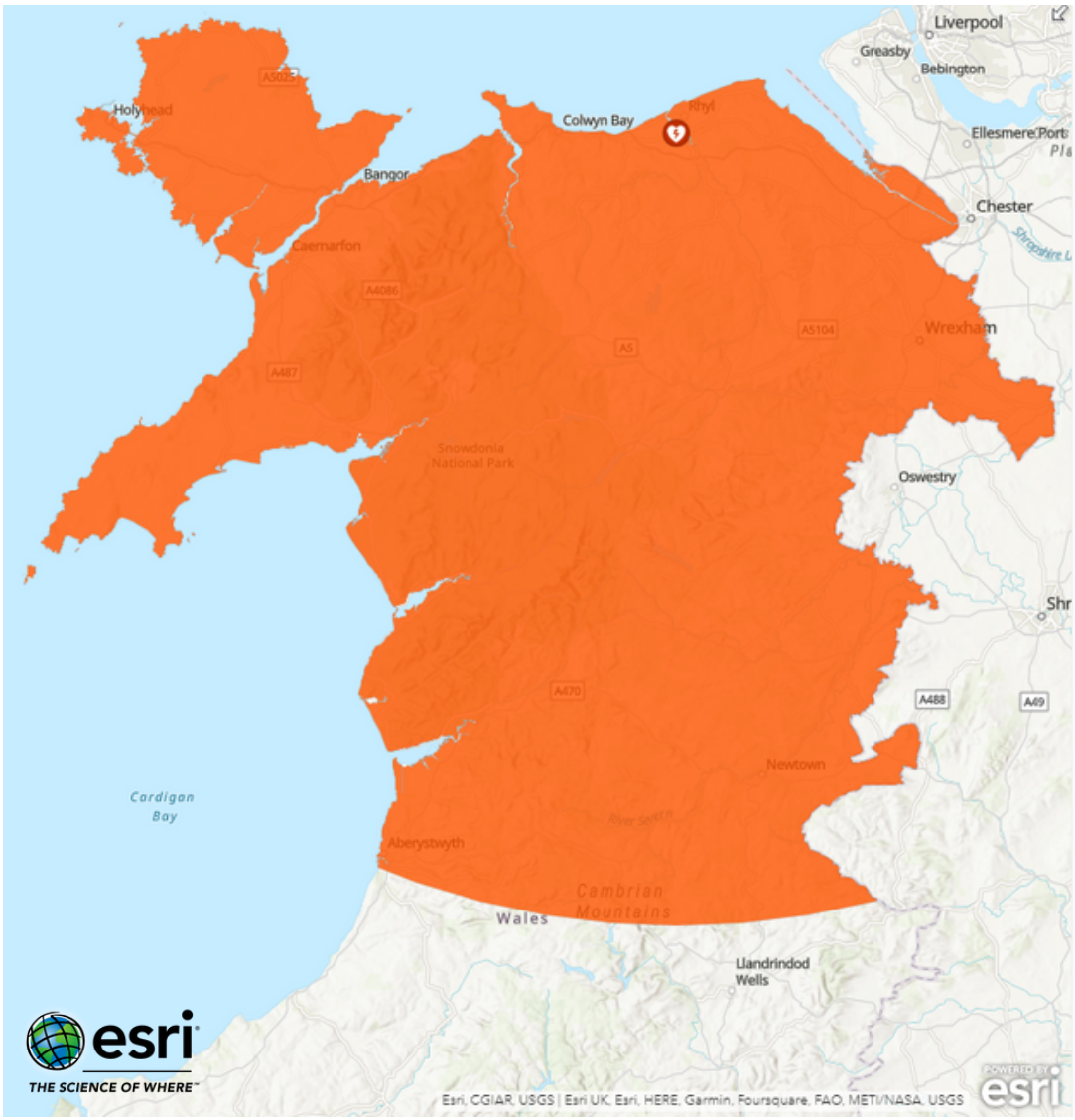
Cardiff covers a population base of ***2,129,128*** *people*

Population totals above represent an EMRTS RRV response within 90 minutes based on ESRI 2022 population data. Population base also includes those people within overlap areas shown above as a blue outline.

Air / Road Response Rhuddlan

Rhuddlan Base - Air

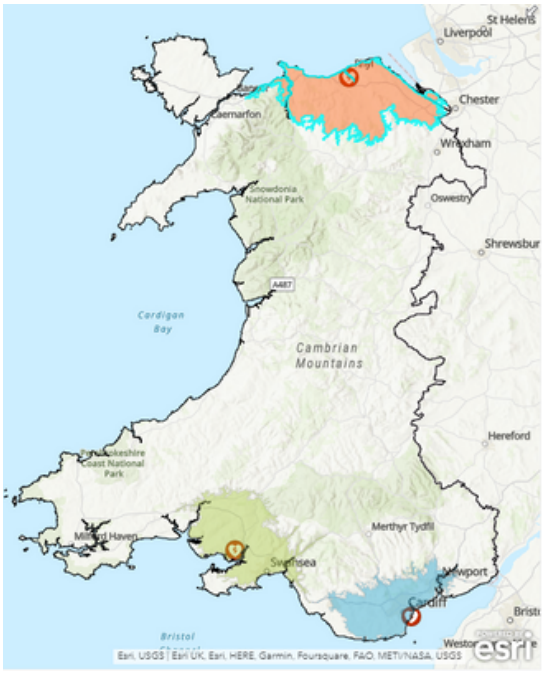
24 minutes response time



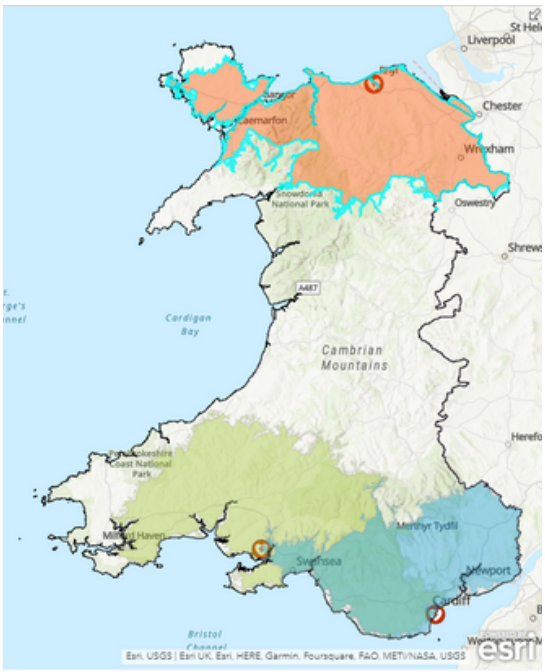
The map above shows the flight coverage area for a helicopter response from the North Wales Police decommissioned helicopter base, based on a on a **24** minute flying response with **6** minutes attributed to daytime startup and ground procedures making a total of **30** minutes.

In **24** minutes a helicopter flying at 145 knots per hour can travel, in any direction, approximately **66.7** miles. From the North Wales Police decommissioned helicopter base, this covers a population of **787,641** people based on ESRI 2022 population data.

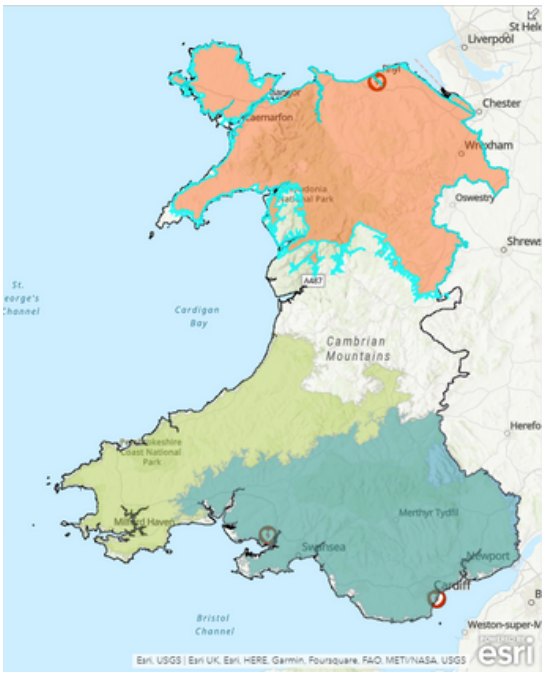
Rhuddlan Base - Road



*The North Wales Police decommissioned helicopter base covers a population base of **324,348** people within 30 minutes*



*The North Wales Police decommissioned helicopter base covers a population base of **624,477** people within 60 minutes*



*The North Wales Police decommissioned helicopter base covers a population base of **707,959** people*

Population totals above represent an EMRTS RRV response within 30 minutes based on ESRI 2022 population data. Population base also includes those people within overlap areas shown above as a blue outline.

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