



Emergency Ambulance Services Committee

EMERGENCY MEDICAL RETRIEVAL AND TRANSFER SERVICE REVIEW

Technical Document

March 2023



**GIG
CYMRU
NHS
WALES**

Pwyllgor Gwasanaethau
Ambiwlans Brys
Emergency Ambulance
Services Committee

CONTENTS

Chronology	2
Introduction	3
Background	5
Key Development Milestones for EMRTS Cumru	6
EMRTS Service Provision	7
EMRTS Service Summary	8
Helicopter Emergency Medical Services (HEMS)	9
Response Times	10
Overview of Base Provision	13
Population Coverage	14
Rapid Response Vehicle Usage	15
Utilisation	16
Flooding	18
Unmet Need	18
Base Provision Summary	21
Modelling	21
Modelling Scenarios Process and Potential Constraints	22
Proposed Investment Objective Assessment and Weighting	24
Summary	25



CHRONOLOGY

Chronology of events at the Emergency Ambulance Services Committee

- 6 December 2022 agreed new approach to EASC Service Review and to develop engagement materials
- 8 November 2022 EMRTS Service Development proposal received at EASC, issues raised and more scrutiny requested
- 6 September 2022 EMRTS presentation at EASC meeting at the 'focus on' session suggesting opportunities to reach more critically ill or injured people with the service



INTRODUCTION

This report (was presented to the EASC meeting on 6 December 2022 <https://easc.nhs.wales/the-committee/archived-papers/december-2022/221-emrts-scrutiny-final/>) aims to explore the current provision of Emergency Medical Retrieval and Transfer Services (EMRTS) across Wales and the opportunities that exist to improve service provision.

At the 8 November 2022 meeting of the Emergency Ambulance Services Committee (EASC), Members received a proposal from EMRTS and the Wales Air Ambulance Charitable Trust (WAACT) that outlined an opportunity to develop the service provision that they believe would lead to a better service for the population of Wales.

It is clear from the initial reception and subsequent correspondence and engagement that has been undertaken that whilst a proposal has been made that aims to improve service delivery, insufficient work has been done to explain how the service currently operates and the challenges that exist within the current operating model.

At the meeting, Members agreed that additional scrutiny would be undertaken to:

- Clarify the position regarding resource implications
- Respond to the significant comments raised and views regarding the importance of response times
- Understand how the air and road response model works, recognizing that for urban and rural areas it would be different
- Undertake further work required regarding the impact of weather
- Consider the data reference period to ensure that this is appropriate and not unintentionally biased
- Understand any seasonal variation improve the understanding of the options available, including to consider whether changing bases is necessary, identify further options and understand why options have been discounted

- Work with health board colleagues to consider the modelling undertaken

Given the above and challenges raised both by EASC Committee members, politicians and members of the public, and in order to avoid protracted discussions over the process, content and transparency of the original proposal the EASC Team undertook to begin the process of this analysis afresh. This process is outlined below:

- Description of how the current service is provided
- Overview of the current issues relating to bases across Wales
- Update of Optima predict modelling to include 2022 information and integration of weather variable
- Proposed approach and sequence of modelling, including potential constraints
- Proposed investment objectives and weighting for assessing options.



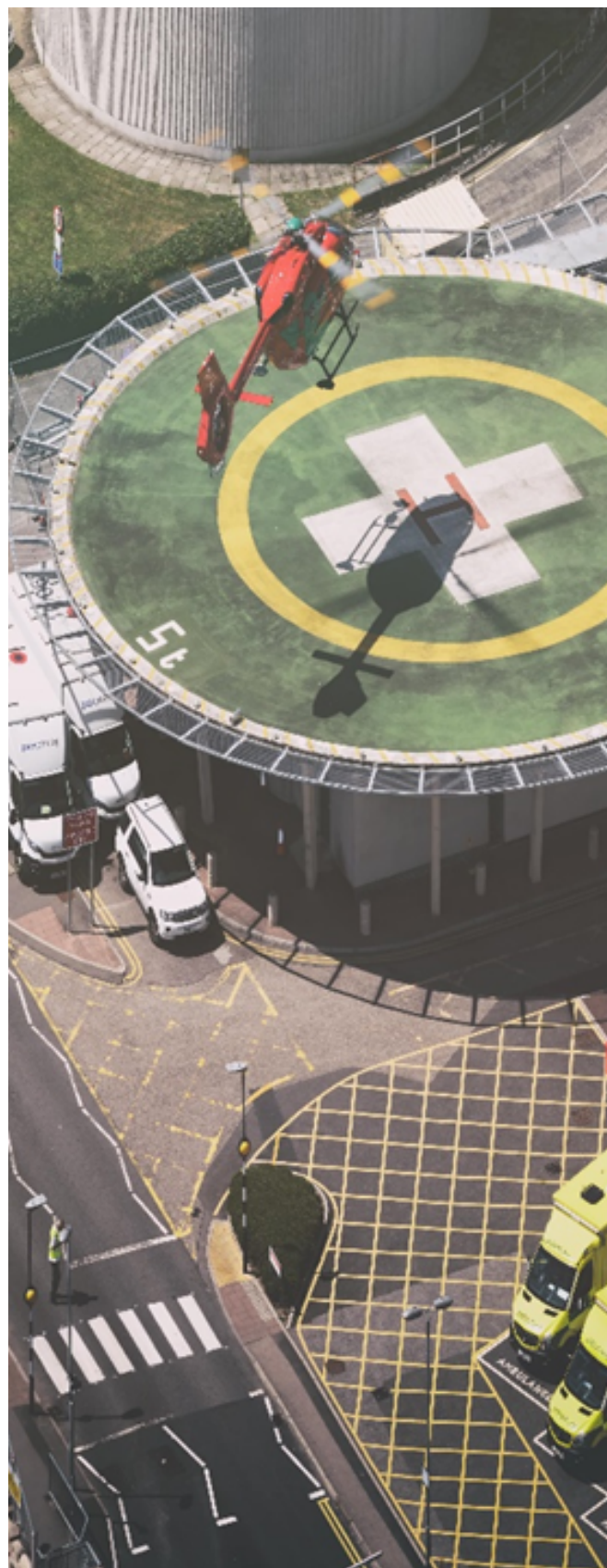
BACKGROUND

The EMRT Service was established on 27 April 2015 and the service began operating from two of the three Wales Air Ambulance bases with the Consultant and Critical Care Practitioner (CCP) model launching from Swansea and Welshpool bases (12-hour day air and road response).

The North Wales Air Ambulance Implementation Group led the project to expand EMRTS into the third WAACT base at Caernarfon airport, commencing in the summer of 2017. This included Caernarfon and Welshpool sharing a hybrid model rota of one Consultant-led crew and one CCP-led crew, both with a 12-hour day air and road response.

A single EMRTS Critical Care Hub (ECCH) (formally known as the Air Support Desk) is located at the Welsh Ambulance Services NHS Trust site in Vantage Point House, Cwmbran. The ECCH tasks all bases for EMRTS missions and is the single point of contact for logistics, communication and coordination.

EMRTS has continually evolved as a service, the key development milestones are included in the following table.



KEY DEVELOPMENT MILESTONES FOR EMRTS CYMRU

Year	Month	Milestone
2015	April	EMRTS becomes operational (Swansea Airport, Welshpool Airport – Wales Air Ambulance pre-existing bases) 12-hour day, air and road response
2016	June	South Wales base moves from Swansea Airport to a purpose-built site in Dafen, Llanelli
2017	July	Introduction of North Wales EMRTS base at Caernarfon Airport 12-hour day, air and road response
	August	Introduction of Helimed 67 fourth aircraft (initially in Dafen)
	December	Helimed 67 from Cardiff Heliport
2018/2019/2020		Temporary road-based twilight service pilots
2020	July	24-hour cover from Cardiff Heliport 12-hour night, road response
	December	24-hour cover from Cardiff Heliport 12-hour night, air and road response
2021	August	ACCTS South Wales (12-hour day, from Cardiff Heliport)
	October	ACCTS North Wales (24-hour on-call from Ysbyty Gwynedd, Bangor)
2022	April	Introduction of CCP-response from Cardiff Heliport day shift)

Note: Adult Critical Care Transfer Service (ACCTS) has been included for context as there is a degree of crossover in work, with both teams attending a number of time-critical transfers, freeing up the EMRTS teams for primary (999) calls or other transfers.

EMRTS SERVICE PROVISION

Resources	2021	Resources	Current
1x Consultant & 1x CCP or 2x CCP*	Welshpool 12-hour day	1x Consultant & 1x CCP or 2x CCP*	Welshpool 12-hour day
	Caernarfon 12-hour day		Caernarfon 12-hour day
1x Consultant & 1x CCP	Dafen 12-hour day	1x Consultant & 1x CCP	Dafen 12-hour day
1x Consultant & 1x CCP	Night Cardiff 12-hour	1x Consultant & 1x CCP	Night Cardiff 12-hour
		2x CCP or 1x CCP & 1x HTP**	Cardiff 12-hour day (April 2022)

Note: *Agreed hybrid model with one Consultant and a CCP at the North or Mid Wales base and two CCPs at the other. ** HTP = Helicopter Transfer Practitioner.

The hybrid response model was agreed as part of the work of the North Wales Air Ambulance Implementation Group in the establishment of the EMRTS base at Caernarfon Airport.

This model has now been introduced in South Wales with a Consultant and a CCP based at Dafen and a CCP-led resource from Cardiff Heliport.



EMRTS SERVICE SUMMARY

2021	Current
36-hour day cover (Welshpool, Caernarfon and Dafen)	48-hour day cover (Welshpool, Caernarfon, Dafen and Cardiff)
12-hour night cover (Cardiff)	12-hour night cover (Cardiff)
2x Consultant & CCP shifts (Welshpool or Caernarfon and Dafen)	2x Consultant & CCP shifts (Welshpool or Caernarfon and Dafen)
1x CCP-led shift (Welshpool or Caernarfon)	2x CCP-led shifts (Welshpool or Caernarfon and Cardiff)
1x Consultant & 1x CCP shift at night (Cardiff)	1x Consultant & 1x CCP shift at night (Cardiff)
3 EMRTS (air and road) crews by day 1 EMRTS (air and road) crew by night	Increase of 12-hour day cover (from April 2022) 4 EMRTS (air and road) crews by day 1 EMRTS (air and road) crew by night



HELICOPTER EMERGENCY MEDICAL SERVICES (HEMS)

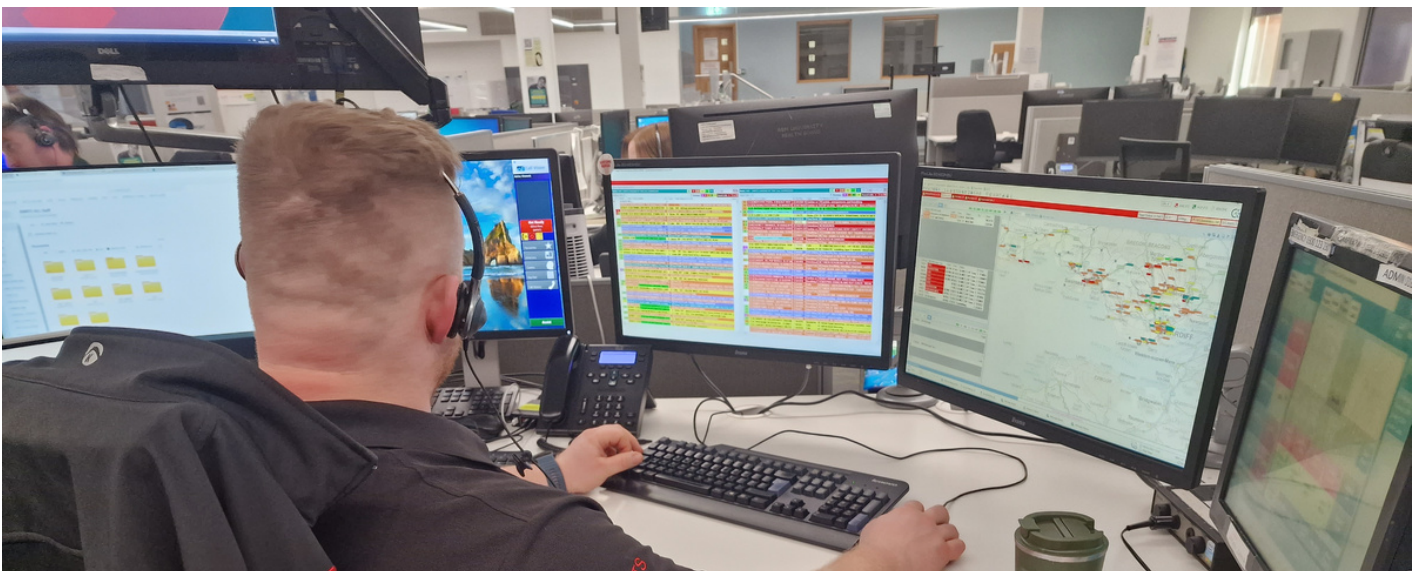
The EMRT Service undertake flights under two types of operation:

- *Helicopter Emergency Medical Services (HEMS)* – this type of flight allows for specific risk alleviations to be granted in recognition of an emergency situation
- *Air Ambulance* – this type of flight is considered a normal transport task and so does not attract any of the alleviations present in HEMS Flights.

To provide a road ambulance analogy:

- If called to an emergency: an ambulance would proceed at great speed, sounding its siren and proceeding against traffic lights - thus matching the risk of operation to the risk of a potential death (= HEMS operations)
- For a transfer of a patient (or equipment) where life and death (or consequential injury of ground transport) is not an issue: the journey would be conducted without sirens and within normal rules of motoring - once again matching the risk to the task (= air ambulance operations).

It is for the medical professional to decide between HEMS or air ambulance and not the pilot.



RESPONSE TIMES

Response times have been a repeated concern raised during the pre-engagement phase. Whilst speed of response is of course important when considering life and limb threatening illness or injury, EMRTS is not designed or commissioned to provide a primary response to these incidents, that role remains with the Welsh Ambulance Services NHS Trust.

It must be recognised that EMRTS provide a specialised secondary response to these incidents and their response time should be considered in this context and cannot be measured against the traditional metric of ambulance response.

Road ambulance response time clock start and clock stop points are well defined. The clock time start regardless of the availability of an asset to respond:

- Red – Identification of chief complaint (Clock Start) to on Scene (Auto or Manual)
- Amber – Final MPDS Disposition (Clock Start) to on scene (Auto or Manual).

For EMRTS clock start and stop times are less defined and could be applied to a number of unique episodes within the patients care episode, but overall the definition of response time for EMRTS requires the allocation of an EMRTS resource, examples are provided below:

Clock Start:

- Identification of incident by the EMRTS Critical Care Hub (ECCH)
- Allocation of resource by ECCH
- Take off /mobilisation of resource.

Clock Stop:

- Auto geo-fence (automatic applied when resource is within a set distance of the incident, this may include still being in the air)
- Manual input once landed
- Manual input once at the patient's location.

There are a number of additional nuances that apply to EMRTS air response that would not usually apply to road-based ambulance resources, including:

- Daytime planning time of up to 6 minutes prior to take off
- Night-time planning time of up to 45 minutes prior to take off
- Aircraft landing locations can be significant distances from patient locations, requiring the crew to travel on foot or access secondary road-based transport to the patient's location.

The tables on the next page provide an overview of average response time for air and road-based (RRV) assets using 'allocation by the ECCH' to 'at scene' (auto or manual).



EMRTS Air Only	2019	2020	2021	2022
January	43	39	47	42
February	60	46	52	49
March	39	39	51	52
April	40	36	48	46
May	43	39	51	48
June	43	48	56	46
July	40	58	45	44
August	40	46	49	48
September	41	56	47	38
October	39	44	52	-
November	43	48	45	-
December	43	52	64	-
Year Average	42	47	50	46

EMRTS RRV Only	2019	2020	2021	2022
January	25	43	43	39
February	29	34	45	37
March	31	34	41	38
April	30	27	38	44
May	27	31	43	36
June	38	32	35	34
July	28	35	53	31
August	30	46	47	36
September	25	38	46	37
October	34	38	42	-
November	33	41	49	-
December	38	51	41	-
Year Average	31	38	43	37

OVERVIEW OF BASE PROVISION

This element of the report aims to provide a high-level overview of the base activity in Wales as a basis for demonstrating the case for exploring improvement opportunities. It will focus on 4 specific areas that will demonstrate the variation in service delivery from each base:

- Population Coverage
- Rapid Response Vehicle (RRV) Usage
- Underutilisation
- Unmet Need



POPULATION COVERAGE

The ability for EMRTS resources to be accessible to as much of the population as possible is a clear and desirable expectation of the service and, whilst the whole of the population has access to air based assets the timeliness of road based assets to reach incidents locations is more complex due to the physical capabilities of response cars and the road network.

As part of the EMRTS 24/7 Service Expansion Review, EMRTS undertook work with Swansea University to understand population coverage. Geographic Information System (GIS) modelling was conducted to identify the distance that could be reached by road response from current air ambulance bases within a specific time period (isochrones).

The population coverage was then calculated for 30, 60 and 90 minute isochrones. Population coverage based on a total population of 3,113,150 are detailed in the following table:

Base	30 minutes	%	60 minutes	%	90 minutes	%
Caernarfon	106,064	3%	354,833	11%	731,599	24%
Cardiff	1,217,530	39%	2,023,200	65%	2,145,440	69%
Dafen	603,183	19%	2,087,130	67%	2,353,720	76%
Welshpool	51,948	2%	162,614	5%	869,642	28%

As can be seen clearly in the table above, population coverage by road for both Caernarfon and Welshpool is significantly below that of the South Wales bases. Whilst this is of course a reflection of the geographical distribution of the population in Wales, it is nevertheless a clear opportunity to explore if and how population coverage could be improved.

RAPID RESPONSE VEHICLE USAGE

During the pre-engagement phase the availability of the Rapid Responses Vehicle has been a common theme of concern, particularly in rural areas. The tables below show the historical usage of the RRV for each base, both by unique days and incidents:

RRV Activations (Unique Days)

Base	2018	2019	2020	2021	2022*
Caernarfon	47	66	60	64	41
Cardiff	83	129	286	318	292
Dafen	134	178	189	165	104
Welshpool	50	78	63	64	40

As can be demonstrated from the tables left, there is inconsistency in the utilisation of the road assets across bases in Wales, with significantly higher usage in more urbanised base areas.

RRV Activations (Incidents)

Base	2018	2019	2020	2021	2022*
Caernarfon	56	79	66	83	44
Cardiff	133	218	762	840	739
Dafen	256	335	336	288	140
Welshpool	61	90	72	77	48

Bases with less population coverage are more reliant on an air response than road.

Therefore, there are opportunities to explore how improvement could be made to service provision across Wales.

UTILISATION

Utilisation is a measure how active a given resource is during the time it is available. For the purposes of providing an emergency response utilisation is a balance between availability of resources against the efficiency and effectiveness of service delivery:

- Too low utilisation and the service becomes inefficient, costly and potentially disengages staff
- Too high utilisation and the services becomes ineffective by not being available when patients need it.

The calculation below has been used:

Utilisation = Total Minutes from Allocation to Clear / Available shift minutes

With the following assumptions included:

- A shift is assumed to be 12 hours, with no meal break, and therefore 720 minutes total
- Overruns are included in the activity.

‘Overruns’ are periods where a crew continues to be active beyond the end of their shift. Overruns have a number of adverse impacts, including staff wellbeing, reduced cover for following shifts, and on occasion can result in an aircraft being stranded at a site away from its home base.



The following table captures utilisation data (% utilisation of available shifts) for EMRTS by base and calendar year (taken from the WAST Computer Aided Dispatch system), combined with electronic Patient Clinical Record data to define shift frequency for Cardiff base, where there were multiple teams operating:

Shift / Base	2018	2019	2020	2021	2022*
Swansea/Dafen	32%	44%	47%	51%	40%
Welshpool	20%	25%	19%	27%	23%
Caernarfon	15%	18%	16%	21%	21%
Cardiff Transfer (ex-local solo RRV response)	4%	10%	5%	10%	11%
Cardiff Day EMRTS	-	-	-	-	40%
Cardiff Nights EMRTS	-	-	56%	39%	37%
Cardiff Twilight**	-	26%	33%	-	-
**Number of shifts	-	53	131	-	-

*Partial year – data to 20/11/2022.

Both Caernarfon and Welshpool bases have utilisations levels below the South Wales bases. Therefore, an opportunity exists to review the operating model of both bases to increase their usage and deliver higher levels of utilisation.



FLOODING

There is an additional complication to the utilisation levels of the Welshpool base related to flooding caused by proximity to the River Severn. Since the start of 2021, the base has been vacated three times.

We see an average of 5 days impact per flooding event, based on preparation to move the vehicles, aircraft and backup supplies, and then recovery. Longer term river data shows 2-3 events per year, so we can expect around 15 days of disruption in future years.

UNMET NEED

An essential aspect of the EMRTS service is to have resource available when patients require them, and to minimise any occasion where an EMRTS resource is not available for a patient who could benefit from the service they provide.

The tables on the following page outline the level of total need, those attended and unmet need across Wales.



Total need is the number of incidents triaged and assessed by the EMRTS Critical Care Hub (ECCH) as appropriate for an EMRTS response

	2019	2020	2021	2022
January	308	307	439	438
February	282	290	395	348
March	351	259	429	388
April	307	220	502	377
May	300	335	539	410
June	274	340	530	414
July	314	472	547	406
August	327	506	495	409
September	276	289	493	369
October	239	440	433	-
November	240	445	395	-
December	318	463	398	-

Total need is the number of incidents triaged and assessed by the EMRTS Critical Care Hub (ECCH) as appropriate for an EMRTS response

	2019	2020	2021	2022
January	308	307	317	306
February	282	290	288	260
March	351	259	326	300
April	307	220	359	310
May	300	329	411	329
June	274	313	343	323
July	314	375	376	332
August	327	391	334	346
September	276	366	341	290
October	239	307	314	-
November	240	321	281	-
December	318	332	281	-

Unmet need is the number of incidents triaged and assessed by the EMRTS Critical Care Hub (ECCH) as appropriate for an EMRTS response but where no EMRTS resource is available. *

	2019	2020	2021	2022
January	-	-	122	132
February	-	-	107	88
March	-	-	103	88
April	-	-	142	67
May	-	6	128	81
June	-	27	187	91
July	-	97	171	74
August	-	115	161	63
September	-	123	152	79
October	-	133	119	89
November	-	124	114	41
December	-	131	117	-

**As part of the development of the service and the expansion of the ECCH to 24/7 operations, unmet need data collection started on 28/05/2020. The above includes data up to and incl 13/11/2022.*

There is a level of unmet need for the population, whilst not all of these patients will require critical care, and there has been a reduction in the level of unmet need due to previous changes to service provision, including the expansion of the service to Cardiff Heliport in April 2022, there remains patients who are unable to access the service when required.

As commissioners of these services, opportunities for continual improvement and reductions to the level of unmet need for the population of Wales should be explored.



BASE PROVISION SUMMARY

This section has explored 4 areas related to the efficiency of service provision from each base, all areas indicate that there are opportunities for the Committee to explore if and how improvements can be made to ensure more of the population benefit from the service.

MODELLING

Much of the feedback and challenge around the initial proposal presented to the EAS Committee on the 8 November 2022 centred on the outputs of the modelling by Optima.

Members should note that the purpose of modelling is to provide an additional level of scrutiny alongside a range of other analyses and evidence to support decision making. Modelling cannot and will not be used as the sole determinant of a decision.

In order to address some of the concerns raised around the modelling process, the EASC team has worked with the modelling provider to integrate 2022 activity information as well as weather probability, based on real world data, into the model to enhance the modelling process.



MODELLING SCENARIOS PROCESS AND POTENTIAL CONSTRAINTS

The development of modelling scenarios will be an iterative process, designed to test and explore the options for maximising service provision within the current operational set up, followed by a wide range of additional scenarios to provide the Committee with a broad view of the potential options that exist to deliver enhance service provision for the population.

In order to develop these scenarios, it is essential that a set of constraints that should be adhered to in developing the assumptions for scenario planning are agreed.

The table below demonstrates the constraints that were applied during the consideration of the expansion for 24/7 operations in 2018, alongside the suggested constraints for this service development.

As part of the engagement process with the public, health boards and the Wales Air Ambulance Charity Trust the appropriateness of these constraints will be explored.

Constraint	Constraint used as part of EMRTS Service Expansion Review (2018)	Proposed Constraint
Operational	A commitment to a model that utilises the existing operational bases	A commitment to a model that maximises the operational efficiency and effectiveness of the service
Geographical Coverage	The need to provide an equitable service to the whole population of Wales	The need to provide an equitable service to the whole population of Wales
Transport / Response Model	A greater reliance on road response at night and the need to ensure the agreed model provides effective population coverage even by road	A greater reliance on road response during the hours of darkness and the need to ensure the agreed model provides effective population coverage even by road

Constraint	Constraint used as part of EMRTS Service Expansion Review (2018)	Proposed Constraint
Phased Approach	The need for a phased implementation, working towards the optimal solution / preferred option	The need for a planned implementation, working towards the optimal solution / preferred option
Workforce	Recruitment of the required workforce	The retention of the current workforce should be maximised
Service Continuity	The need to maintain delivery of core EMRTS services during the implementation period	The need to maintain delivery of core EMRTS services during the implementation period
Civil Aviation Authority Approvals	There is a need for CAA approval for HEMS night operations	There is a need for CAA approval for HEMS night operations
Aircraft Availability at Night	Initially, the preferred option will include one aircraft provided from one base by the Charity overnight with other responses provided by road	There should be increased availability of aircraft across Wales during hours of darkness
Finance	Not applicable	Any proposed model should be delivered as far as possible within the existing financial envelope



PROPOSED INVESTMENT OBJECTIVE ASSESSMENT AND WEIGHTING

The table below outlines the investment objectives present in both the original EMRTS business case and the EMRTS 24/7 Service Expansion Review. These objectives describe what the project is seeking to achieve and provide a basis for post-project evaluation. To assist in the option appraisal process, as part of the EMRTS 24/7 Service Expansion Review, stakeholders were asked through the EMRTS Delivery Assurance Group to provide the weighting that should be applied against each objective.

As part of the engagement process with the public, health boards and the Wales Air Ambulance Charity Trust the appropriateness of these weightings will be explored.

Ref	Objective	Key Priorities	Weighting
1	Health Gain	Improving quality of care and patient outcomes. Meeting a high proportion of unmet demand. Addressing the main peak of unmet demand. Meeting forecast changes in demand	25
2	Affordability	Given the long-term revenue assumptions, there should be an explicit reference to reducing revenue costs.	15
3	Clinical & Skills Sustainability	Reducing service and workforce vulnerabilities. Demonstrating workforce solutions that are flexible and robust to a range of future scenarios. Achievable in terms of recruitment.	15
4	Equity	Effective population coverage. Geographic equity. Standardisation of clinical practice 24/7.	25
5	Value for Money	Demonstrating the least costly way of generating the anticipated benefits.	20
Total Weighting			100

SUMMARY

At the meeting on 6 December 2022, the Emergency Ambulance Services Committee (EASC) Members:

- **NOTED** the high-level overview provided and the variation in service delivery from the existing bases
- **AGREED** that the issues highlighted in the report required further exploration and options appraisal process to deliver improvements
- **APPROVED** the service development constraints to be engaged upon
- **APPROVED** the EMRTS key investment objectives and weightings to be engaged upon
- **APPROVED** the commencement of a formal public engagement process as agreed
- **APPROVED** the use of the agreed constraints to inform subsequent modelling and development of options
- **APPROVED** the use of agreed EMRTS key investment objectives and weightings in the options appraisal process.





Emergency Ambulance Services Committee
Unit 1, Charnwood Court
Billingsley Road
Parc Nantgarw
Cardiff
CF15 7QZ



GIG
CYMRU
NHS
WALES

Pwyllgor Gwasanaethau
Ambylans Brys
Emergency Ambulance
Services Committee



Uned Gomislynu Gydweithredol Genedlaethol
GWASANAETHAU DIGIDOL
DIGITAL SERVICES
National Collaborative Commissioning Unit