Elusen Ambiwlans Awyr CYMRU | WALES Air Ambulance Charity

GIG CYMRU NHS WALES

Gwasanaeth Casglu a Throsglwyddo Meddygol Brys

Emergency Medical Retrieval & Transfer Service

Achub Bywydau. Dros Gymru.

Serving Wales. Saving Lives.

Presentation Overview

- WAA Five-Year Strategy Objectives
- EMRTS Strategy and Commissioning
- Unmet Need
- Demand and Capacity Deep Dive Summary
- Optima Modelling

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New WAA Mission and Vision

Mission

To deliver lifesaving, advanced medical care to people across Wales, whenever and wherever they need it.

Vision

To improve the lives of patients and their families by being a world leader in advanced, time-critical care.

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WAA five-year strategy objectives informing this work

To enable the delivery of 24/7 emergency department standard care, in a pre-hospital environment to the people of Wales, wherever and whenever it is needed.

To ensure that the service is delivered in the most cost effective manner, maximising the impact of our funds across the whole of Wales.

Proactively seek out opportunities to improve patient care and outcomes.

To repay the trust that the people of Wales have placed in us by adopting the highest ethical standards, embedding sustainability and value for money in all that we do.

To recognise the unique relationship that we have with the people of Wales, celebrating our national identity and ensuring our activities are inclusive and reflect the needs of all the different communities that we serve.

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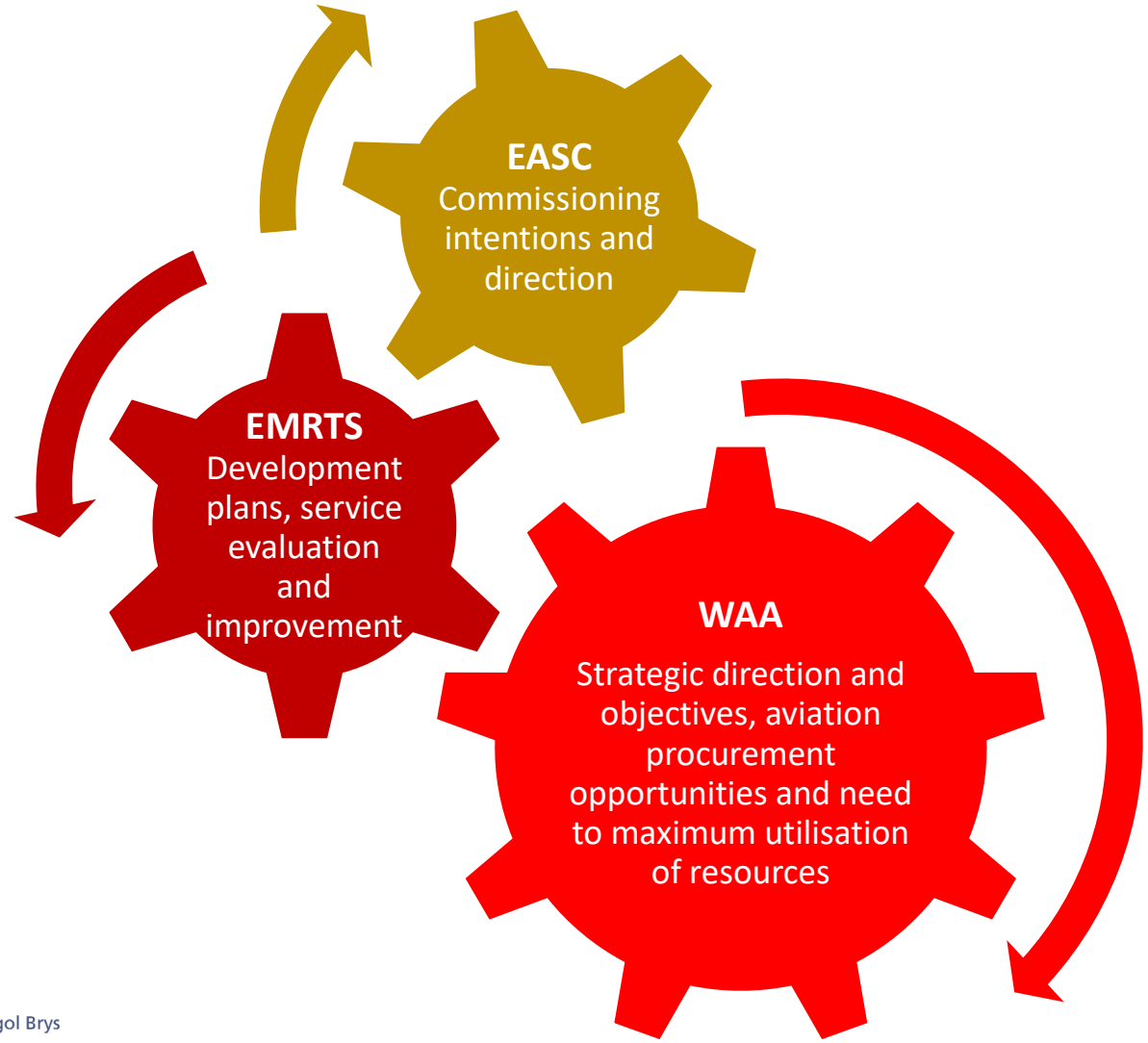
Our drivers and our joint objectives

Joint Outcome

To determine the optimal operational configuration and physical footprint for our lifesaving services that brings greatest benefit to all the people of Wales



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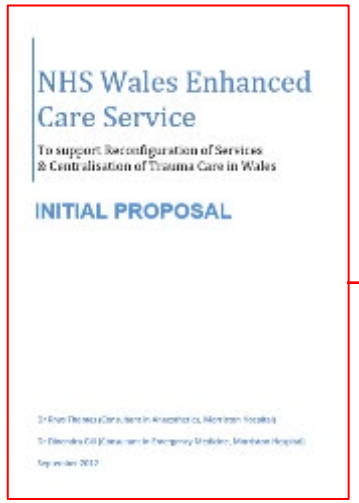
Emergency Medical Retrieval & Transfer Service

EMRTS Strategy and Commissioning

Initial Proposal 2012


NHS Wales Enhanced Care Service

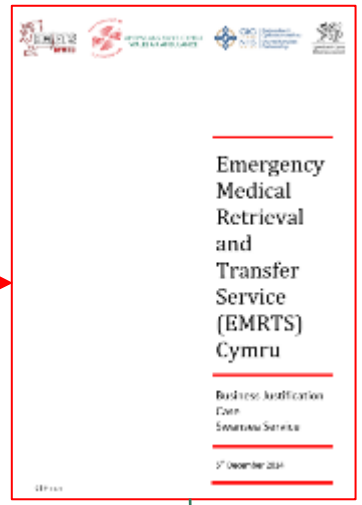
To support Reconfiguration of Services & Centralisation of Trauma Care in Wales

INITIAL PROPOSAL

Strategic Outline Programme - 2014


Strategic Outline Programme for the Emergency Medical Retrieval and Transfer Service for Wales

Business Justification Case - 2014


Emergency Medical Retrieval and Transfer Service (EMRTS) Cymru

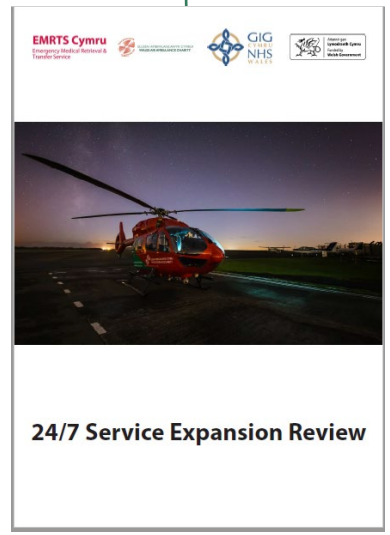
Business Justification Case

Swansea Service

1.3 Case For Change

1.3.1 Key strategic drivers for the expansion of the EMRTS are described along with details of how the project both aligns with and enables them. Key drivers are to address:

- unmet critical care need in the target population in uncovered and existing operating hours.
- the critical care and time critical transfer needs created by key service changes such as the development and requirements of the major trauma network and other national and regional planning initiatives.


EMRTS Cymru

Emergency Medical Retrieval & Transfer Service

24/7 Service Expansion Review

GIG CYMRU NHS WALES

Gwasanaeth Casglu a Throsglwyddo Meddygol Brys

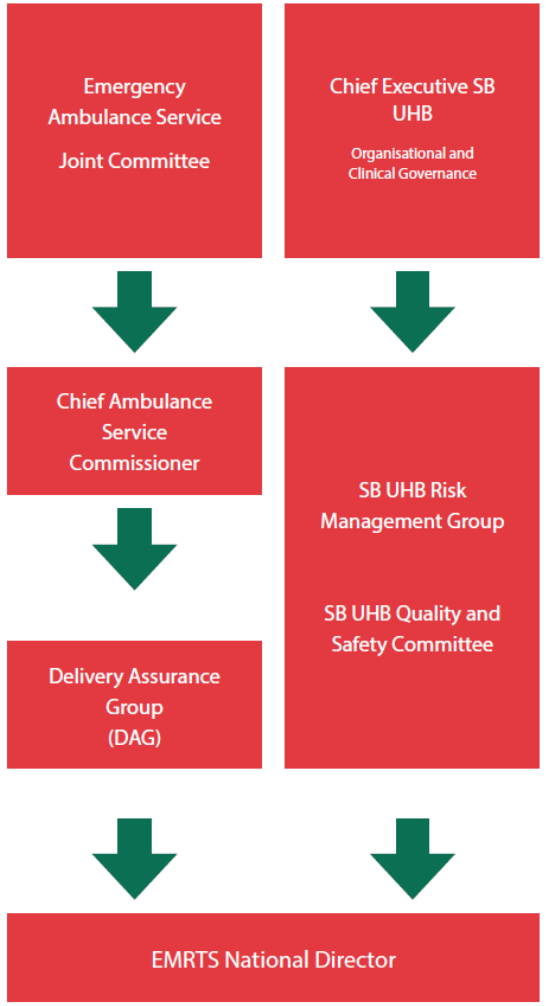
Emergency Medical Retrieval & Transfer Service

Strategy

GIG CYMRU NHS WALES

Pwyllgor Gwasanaethau Ambiwlans Brys

Emergency Ambulance Services Committee



Emergency Ambulance Services Committee – Emergency Medical Retrieval and Transfer Service Commissioning Intentions 2022-23

Service Benefits

Equity of access to emergency care across Wales

Improved patient outcomes

Enhanced clinical skills across NHS Wales

Downstream benefits for other NHS services

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Gwasanaeth Casglu a Throsglwyddo Meddygol Brys
Emergency Medical Retrieval & Transfer Service

Quality attributes of services for people who are critically ill in Wales

- Equitable
- Safe
- Effective
- Efficient
- Person centred
- Timely

GUIDANCE

Care of the critically ill: quality statement

What we are doing to improve care for people who are critically ill.

First published: 7 October 2021

Last updated: 7 October 2021

EMRTS Commissioning Intentions 2022-23

GIG CYMRU NHS WALES
Pwyllgor Gwasanaethau Ambiwlans Brys
Emergency Ambulance Services Committee

- EMRTS Commissioning Intention – CI1: Service Expansion
- EMRTS Commissioning Intention – CI2: Adult Critical Care Transfer Service (ACCTS)
- EMRTS Commissioning Intention – CI3: Service Evaluation
- EMRTS Commissioning Intention – CI4: System Transformation

EMRTS Commissioning Intention – CI1: Service Expansion

CI1a	Enhanced CCP-led response – Building on the findings of recent winter initiatives and demand and capacity planning undertaken within the service, support the implementation of an enhanced daytime response that will ensure more effective use of resources, improve service quality and the patient experience and provide opportunities for workforce development.
CI1b	Planning – Build on the implementation and consolidation of Phase 1 of the EMRTS Service Expansion project, working collaboratively with commissioners to plan the implementation of the remaining phases of the EMRTS Service Expansion programme.

EMRTS Commissioning Intention – CI2: Adult Critical Care Transfer Service (ACCTS)	
CI2a	Service Delivery – The ACCTS team will continue to manage ongoing service delivery and will ensure robust performance management with a focus on outcomes, value, quality and safety of service delivery.
CI2b	Engagement – Building on established relationships, continue to engage with all stakeholders to review and strengthen the service model(s) implemented to maximise the clinical outcomes, value, quality and safety of service delivery.
CI2c	Evaluation and Review – Undertake evaluation and review relating to the implementation of the ACCTS, reporting on lessons learned, service activity and providing the required assurance regarding the realisation of anticipated outcomes and benefits going forward.

EMRTS Commissioning Intention – CI3: Service Evaluation

CI3a	Improvement Plan – Develop and implement an improvement plan in response to the EMRTS Service Evaluation Report.

EMRTS Commissioning Intention – CI4: System Transformation

CI4a	Demand and Capacity Strategy – To continue with the work on a collaboratively developed demand and capacity strategy will set out the ongoing arrangements for proactively undertaking this work for the next decade, this will include the use of forecasting, modelling and health economic evaluations.

Work to date

24 hour service review

10 year analysis

Deep dive into base activity

Service Evaluation

Night service reviews

Comprehensive demand and capacity analysis

Review of dispatch criteria

Review of EMRTS strategy

Road & Air Isochrones

5 year forecast

Continuous monitoring and improvement

→ Strategic Review & Optima Modelling

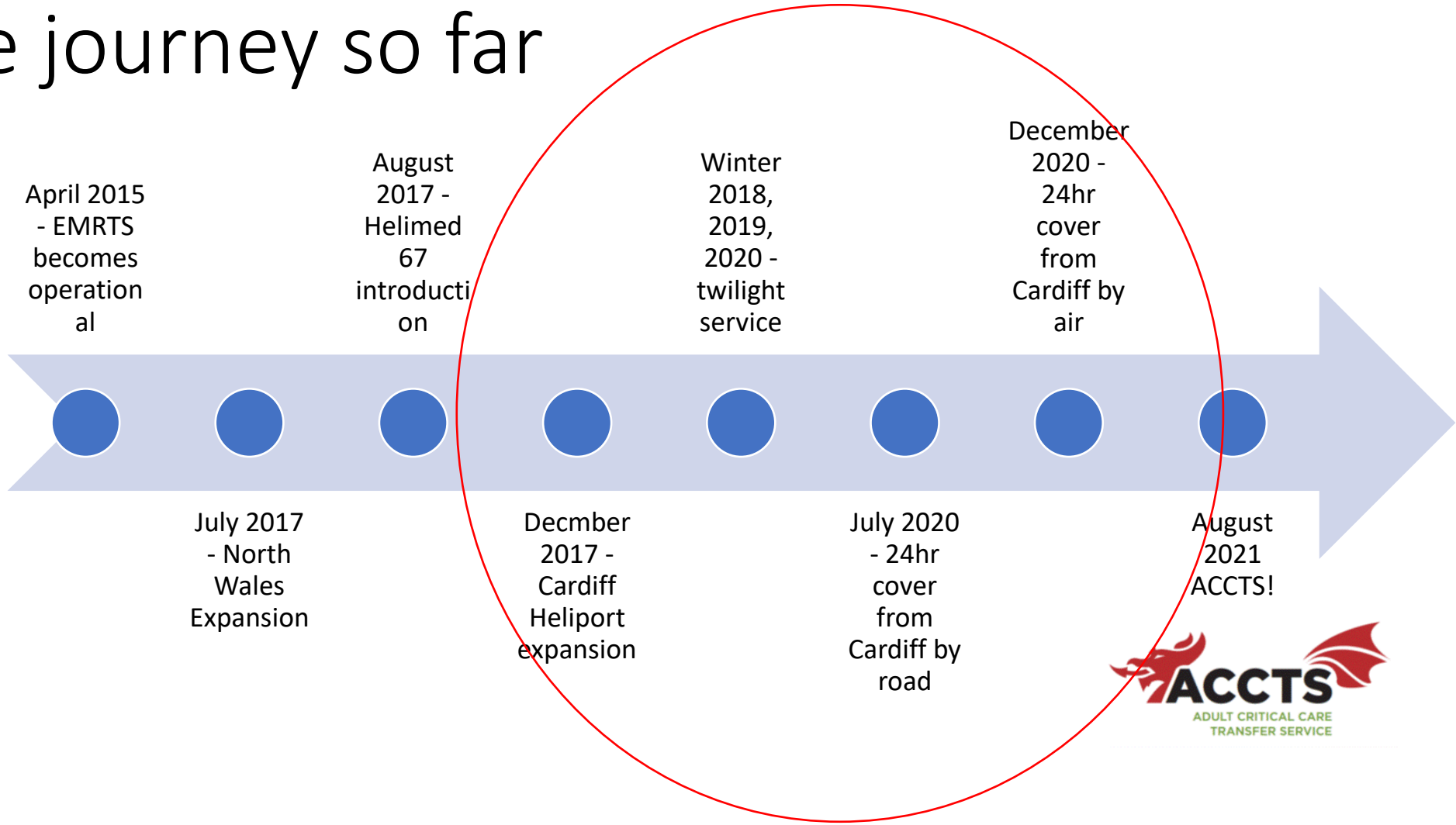
Headlines

- Under Utilisation
- Unmet need
  - Geographic
  - Overnight
  - Hours of darkness
- Analysis and modelling to date
  - Extended hours
  - Optimise location
  - Road vs Air

Current Service

Activity

The journey so far



ACCTS
ADULT CRITICAL CARE TRANSFER SERVICE

Current 4-year average actual activity

WAA BASE	1	2	3	4	5	6	7	8	9	10	11	12	Total
WAA Caernarfon (North)	**45**	**37**	**41**	**47**	**55**	**51**	**48**	**56**	**45**	**40**	**37**	**35**	**535**
Rapid Response Vehicle	18	11	8	8	6	6	7	8	7	10	13	13	**111**
Air Ambulance	27	27	34	40	51	46	42	50	39	31	24	24	**433**
WAA Welshpool (Mid-Wales)	**44**	**40**	**53**	**52**	**58**	**54**	**66**	**62**	**57**	**47**	**44**	**40**	**616**
Rapid Response Vehicle	13	10	14	8	6	6	6	5	9	10	13	16	**110**
Air Ambulance	33	32	41	45	53	50	63	59	51	38	31	26	**521**
WAA Cardiff (South East)	**83**	**88**	**87**	**77**	**88**	**77**	**82**	**83**	**82**	**74**	**73**	**96**	**989**
Air Ambulance	15	17	19	26	27	24	25	24	22	18	16	15	**248**
Rapid Response Vehicle	69	72	69	53	63	55	58	61	61	58	58	81	**757**
WAA Dafen (South)	**107**	**94**	**100**	**90**	**108**	**98**	**113**	**110**	**104**	**100**	**100**	**99**	**1,221**
Rapid Response Vehicle	65	49	43	19	23	25	29	34	30	37	47	60	**459**
Air Ambulance	44	46	61	73	88	76	87	81	77	68	56	42	**798**
Total	**261**	**244**	**265**	**246**	**283**	**262**	**285**	**286**	**269**	**242**	**237**	**251**	**3,128**

- Caernarfon + Welshpool = 968

Utilisation of current resource
4-year average actual activity

WAA BASE	Autumn	Spring	Summer	Winter
WAA Caernarfon (North)	1.3	1.6	1.7	1.3
WAA Cardiff (South East)	2.5	2.8	2.7	3.0
WAA Dafen (South)	3.4	3.3	3.6	3.3
WAA Welshpool (Mid-Wales)	1.6	1.8	2.0	1.4

Ave utilization by medical team

*

WAA BASE	Autumn	Spring	Summer	Winter
WAA Caernarfon (North)				
Air Ambulance	1.0	1.4	1.5	0.9
Rapid Response Vehicle	0.3	0.2	0.2	0.5
WAA Cardiff (South East)				
Air Ambulance	0.6	0.8	0.8	0.5
Rapid Response Vehicle	2.0	2.1	1.9	2.5
WAA Dafen (South)				
Air Ambulance	2.2	2.5	2.7	1.5
Rapid Response Vehicle	1.3	0.9	1.0	1.9
WAA Welshpool (Mid-Wales)				
Air Ambulance	1.3	1.5	1.9	1.0
Rapid Response Vehicle	0.3	0.3	0.2	0.4

Ave utilization by response mode

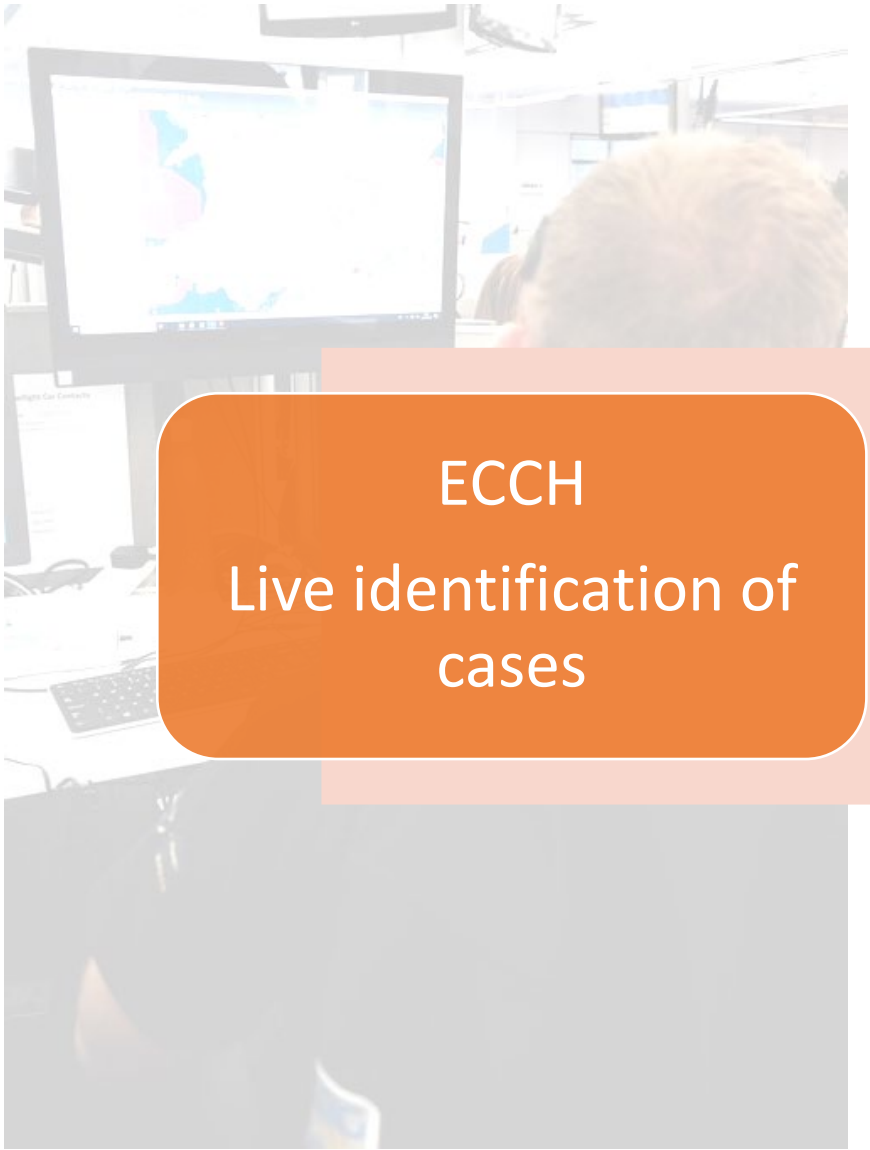
**** NB – average utilization at Cardiff (aircraft) affected by ring fencing of HM67 for transfers***

Utilisation of current resource – 2021

Base	Day Shift	Night Shift	Autumn	Spring	Summer	Winter
WAA Cardiff (South East)	-	37%	41%	35%	41%	32%
WAA Dafen (South)	54%	-	56%	55%	56%	50%
WAA Welshpool (Mid-Wales)	27%	-	27%	33%	33%	17%
WAA Caernarfon (North)	21%	-	18%	21%	31%	16%

Actual utilization by Shift, based on minutes from allocation to clear, and assuming 12 hour shift. Will under estimate

Monitoring of “unmet need”



ECCH

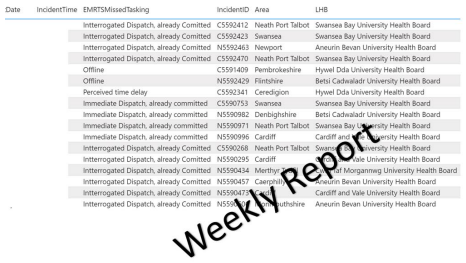
Live identification of cases

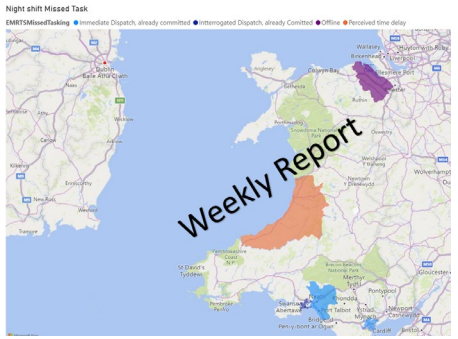
Linked data

Weekly

Power BI reports

EMRTS Ops /Babcock

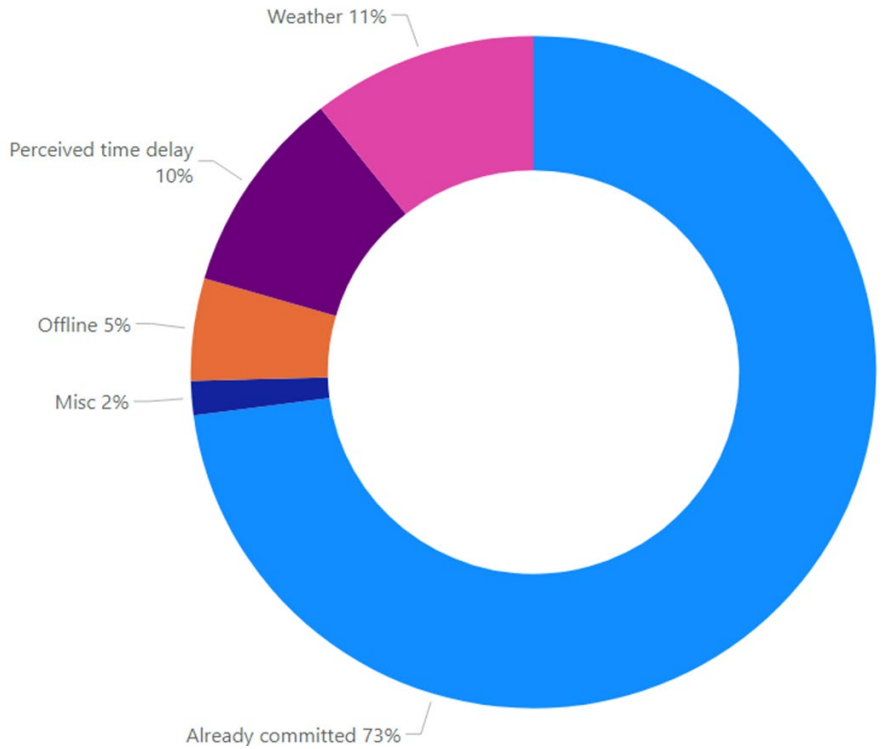


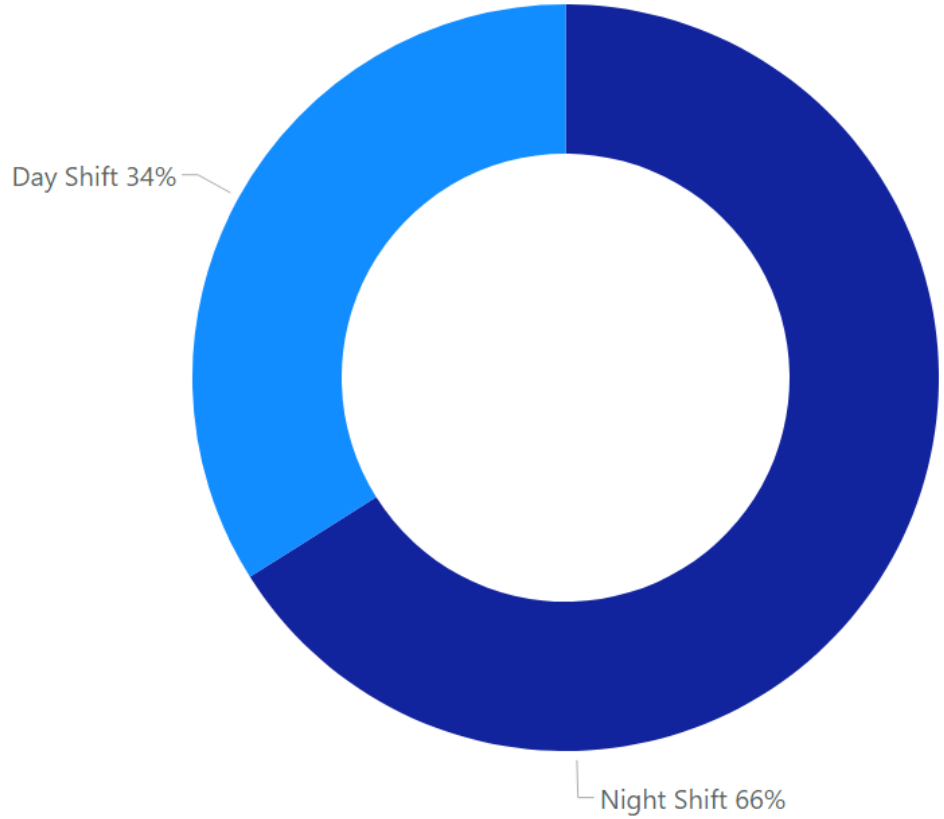


Pan-Wales overall unmet need – 2-year average

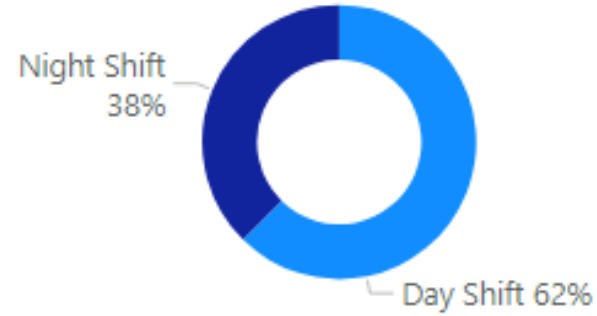
Month

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
Day Shift	61	34	21	49	33	44	47	40	42	22	21	38	**452**
Night Shift	50	58	59	75	78	108	89	95	75	72	66	54	**879**
Total	**111**	**92**	**80**	**124**	**111**	**152**	**136**	**135**	**117**	**94**	**87**	**92**	**1331**





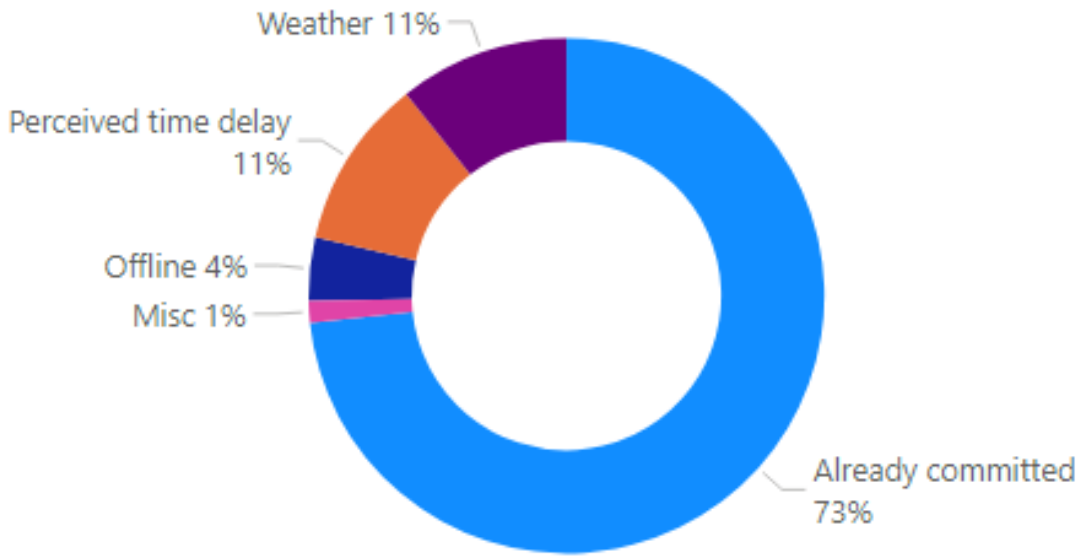
All Wales Current Demand



	Month												
Hour	1	2	3	4	5	6	7	8	9	10	11	12	Total
0	11	9	7	15	17	11	14	9	10	19	9	12	**143**
1	8	14	7	14	11	14	9	12	14	14	6	9	**132**
2	4	7	4	4	8	5	4	12	9	10	11	7	**85**
3	6	5	6	7	10	2	10	8	1	12	6	6	**79**
4	4	4	7	7	9	6	3	7	4	5	4	13	**73**
5	8	4	5	4	2	9	4	6	10	2	5	7	**66**
6	6	4	7	3	6	4	8	8	6	1	11	4	**68**
7	14	16	13	8	13	10	13	11	10	10	9	7	**134**
8	17	10	10	15	22	13	19	10	17	12	13	6	**164**
9	21	13	12	17	15	15	19	13	21	19	15	18	**198**
10	13	15	19	25	17	21	17	27	29	19	21	25	**248**
11	29	25	24	30	24	18	26	25	35	22	22	22	**302**
12	16	19	29	24	37	34	30	21	37	25	25	22	**319**
13	20	17	20	20	18	16	24	31	13	25	23	27	**254**
14	21	17	19	30	22	23	24	34	32	26	15	22	**285**
15	25	19	22	30	21	25	22	21	27	33	28	25	**298**
16	22	13	24	27	25	26	24	18	29	19	24	22	**273**
17	23	24	20	22	20	23	24	18	27	21	15	23	**260**
18	12	18	16	24	21	21	22	15	26	13	14	12	**214**
19	15	20	16	14	23	26	24	21	18	16	17	11	**221**
20	21	11	16	16	22	31	34	24	15	16	20	14	**240**
21	13	14	11	17	14	28	29	15	17	20	25	12	**215**
22	7	11	19	23	15	18	14	25	22	16	15	14	**199**
23	14	11	12	18	22	28	14	15	17	16	13	17	**197**
Total	**350**	**320**	**345**	**414**	**414**	**427**	**431**	**406**	**446**	**391**	**366**	**357**	**4667**

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
⊞ Day Shift	233	206	228	272	255	245	264	244	303	244	224	231	**2949**
⊞ Night Shift	117	114	117	142	159	182	167	162	143	147	142	126	**1718**
Total	**350**	**320**	**345**	**414**	**414**	**427**	**431**	**406**	**446**	**391**	**366**	**357**	**4667**

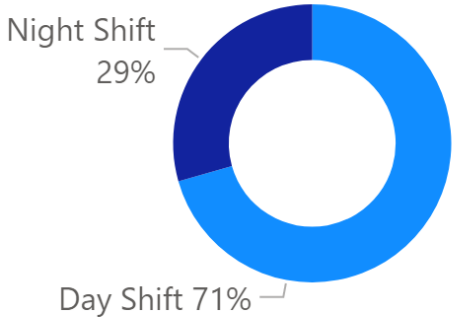
Missed Task Breakdown



3472
Attended

Betsi Cadwaladr

Current Demand

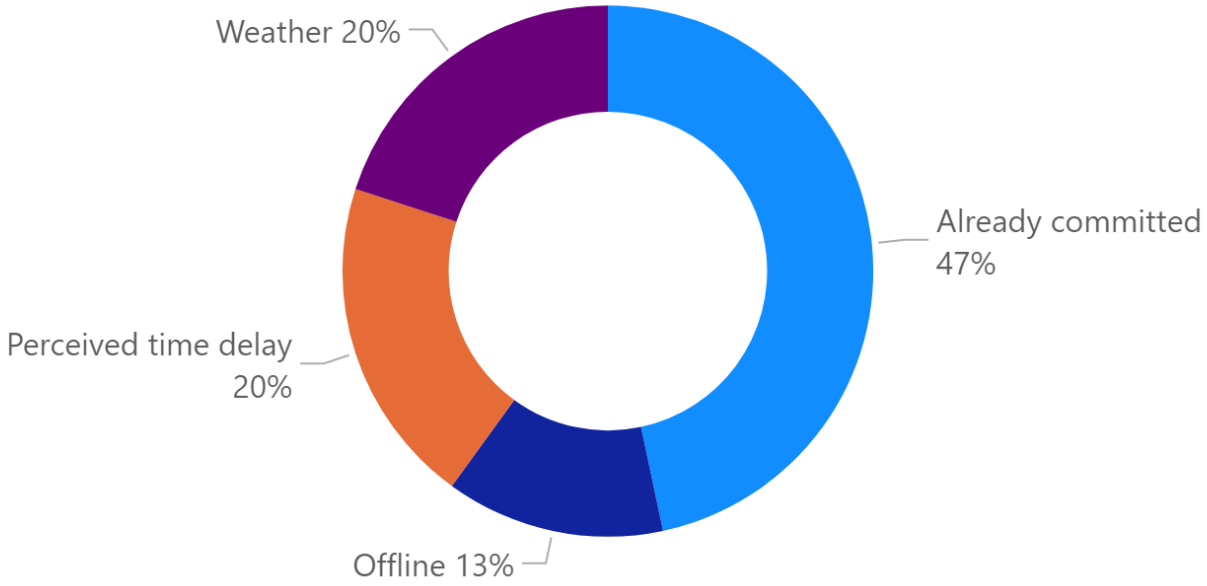


Month

Hour	1	2	3	4	5	6	7	8	9	10	11	12	Total
0	1		1	4	1	4		2	1	4	3	1	**22**
1	1	4		2	1	5	2	3	4	3	3	2	**30**
2	1	1				1		2		1	1		**7**
3	1			1	3		2	1		1	2	1	**12**
4	1				2	2		2		2		1	**10**
5	2	1	1	1			2	1	2	1		1	**12**
6	3		2		1		1	2	2		2		**13**
7	4	4	2	1	3	3	3	3	1	2			**26**
8	5	3	3	2	8	2	4	4	5	2	2	1	**41**
9	3	1	4	4	6	1	7	2	3	4	4	7	**46**
10	4	3	2	7	3	2	5	5	6	7	2	7	**53**
11	6	5	3	4	4	5	3	6	9	2	5	2	**54**
12	1	2	7	7	6	11	10	6	9	6	4	4	**73**
13	4	3	3	5	3	4	7	10	4	8	10	4	**65**
14	5	3	4	9	8	9	7	14	5	5	5	5	**79**
15	6	3	1	7	5	8	9	7	7	8	9	7	**77**
16	5	2	5	7	10	7	7	1	12	6	8	6	**76**
17	3	4	1	3	8	10	6	4	3	7	3	10	**62**
18	4	4	5	5	6	4	6	2	5	4	2	2	**49**
19	2	4	1	2	8	6	4	3	1	4	1	2	**38**
20	2	1	5	4	4	4	4	8	5	1	2	2	**42**
21	2	2	2	3	3	5	4	6	5	5	4	3	**44**
22		1	2	5		2	2	5	4	2	2	3	**28**
23	1	5	1	4	3	2	4	5	1	1	1	4	**32**
Total	**67**	**56**	**55**	**87**	**96**	**97**	**99**	**104**	**94**	**86**	**75**	**75**	**991**

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
⊞ Day Shift	50	37	40	61	70	66	74	64	69	61	54	55	**701**
⊞ Night Shift	17	19	15	26	26	31	25	40	25	25	21	20	**290**
Total	**67**	**56**	**55**	**87**	**96**	**97**	**99**	**104**	**94**	**86**	**75**	**75**	**991**

Missed Task Breakdown



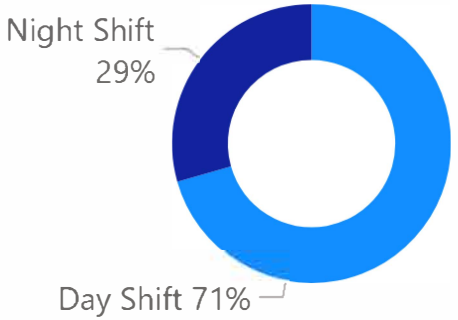
665
Attended

Betsi Cadwaladr

Unmet need

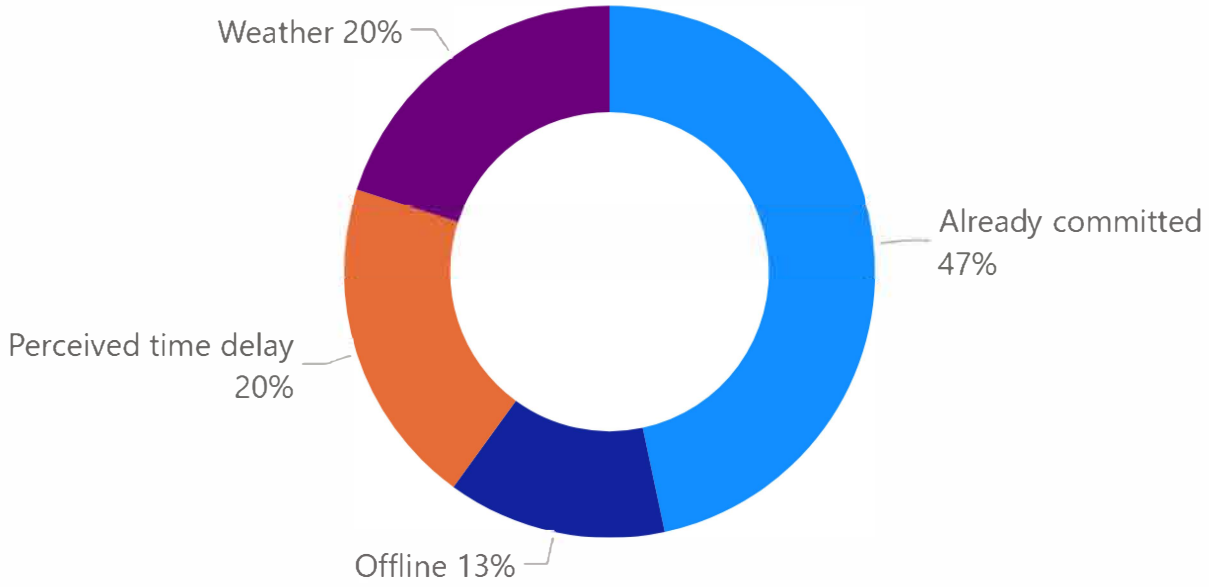
Month

Hour	1	2	3	4	5	6	7	8	9	10	11	12	Total
0	1		1	3	1	4		2	1	4	3	1	**21**
1	1	4		2	1	5	1	3	4	2	2	2	**27**
2		1				1		2		1	1		**6**
3	1			1	3		1	1		1	2	1	**11**
4	1				2	2		2		2		1	**10**
5	2	1	1	1			2	1	2	1		1	**12**
6	2		1		1		1	2	2		2		**11**
7	3	3	1	1	1	2	3	1		1			**16**
8						1		1					**2**
9			1			1	1					1	**4**
10									1			1	**2**
11				2		2		2	1				**7**
12			1	1			1		2				**5**
13					1			1	1				**3**
14				2		2	1	2	1				**8**
15	3	1		1					3	1		1	**10**
16	2				2	1	1		2	1		2	**11**
17	1	1		1	2	3			1	1		3	**13**
18				1		1	3	1		1			**7**
19		2			2	2	1			4		2	**13**
20	2		4	4	4	2	3	6	4	1	2	1	**33**
21	2	2	1	2	2	5	4	4	5	3	4	3	**37**
22		1	2	5		2	2	5	4	2	2	2	**27**
23	1		1	3	3	2	4	4	1	1	1	4	**30**
Total	**22**	**21**	**14**	**30**	**25**	**38**	**29**	**40**	**35**	**27**	**19**	**26**	**326**
Total	**22**	**21**	**14**	**30**	**25**	**38**	**29**	**40**	**35**	**27**	**19**	**26**	**326**



Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
⊞ Day Shift	9	5	3	9	6	13	10	8	12	5		8	**88**
⊞ Night Shift	13	16	11	21	19	25	19	32	23	22	19	18	**238**
Total	**22**	**21**	**14**	**30**	**25**	**38**	**29**	**40**	**35**	**27**	**19**	**26**	**326**

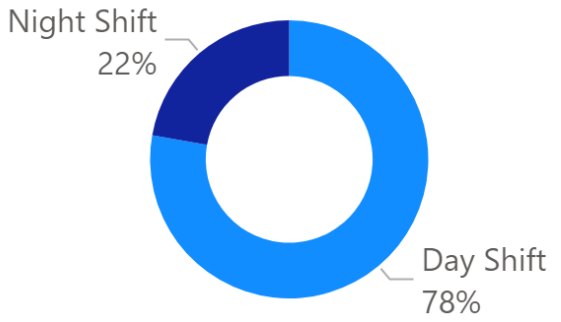
Missed Task Breakdown



665
Attended

Powys

Current Demand

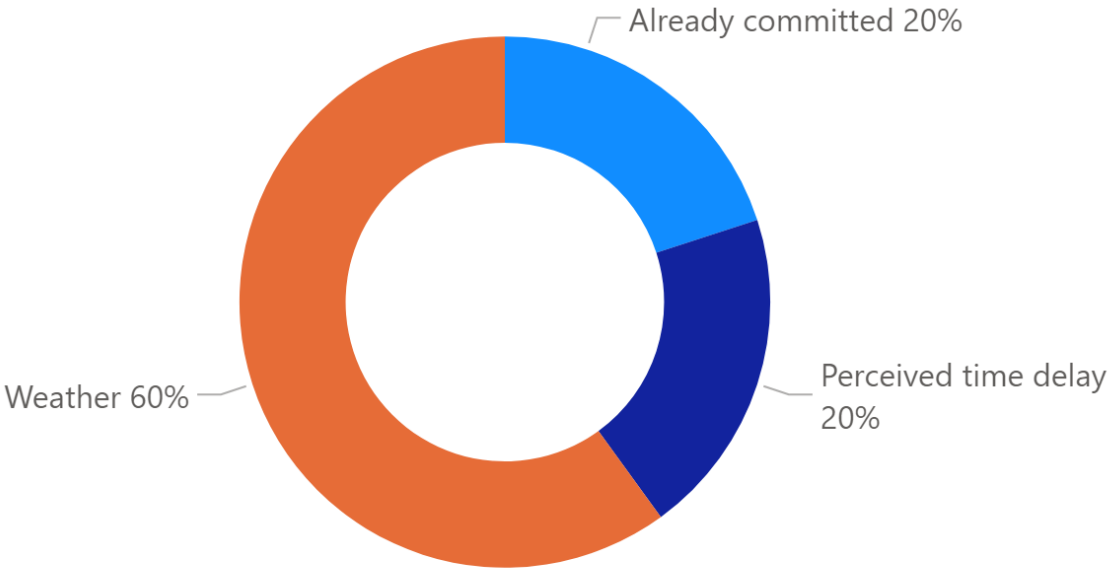


Month

Hour	1	2	3	4	5	6	7	8	9	10	11	12	Total
0	1	1											**2**
1	2	1							2				**5**
2					2								**2**
3			1		1		1						**3**
4			1			1		1		1		1	**5**
5			1					1	1				**3**
6							1						**1**
7	1	3	1		1								**6**
8	2	1		2			1	1	2	1	1		**11**
9	5	2	1	2		4	2		1	3		1	**21**
10			1	1	4	2		1	3	1	2	1	**16**
11		2	2	3	1	2	4	2	4		4	1	**25**
12	1	1	1	2	2	1	2	2	3	2	1	2	**20**
13	3	1	1	2	3	1	1	3				1	**16**
14			1	4	2	3	2	2	3	2	1		**20**
15	1	2	1	3	1	3			4	6		1	**22**
16	1	1	2	2	2	4	1	2	3	1	1	2	**22**
17	2	1	3	1	1		1	1	2			1	**13**
18		1	1	1	2		3	2	4				**14**
19					1	1	2		3				**7**
20					1	3	2	1		1			**8**
21						1			1	1	2	1	**6**
22			1	2	1			3	1	1			**9**
23				1	1	2	1	1		1	1	1	**9**
Total	**19**	**17**	**19**	**26**	**26**	**28**	**24**	**23**	**37**	**21**	**13**	**13**	**266**

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
⊞ Day Shift	16	15	15	23	19	20	17	16	29	16	10	10	**206**
⊞ Night Shift	3	2	4	3	7	8	7	7	8	5	3	3	**60**
Total	**19**	**17**	**19**	**26**	**26**	**28**	**24**	**23**	**37**	**21**	**13**	**13**	**266**

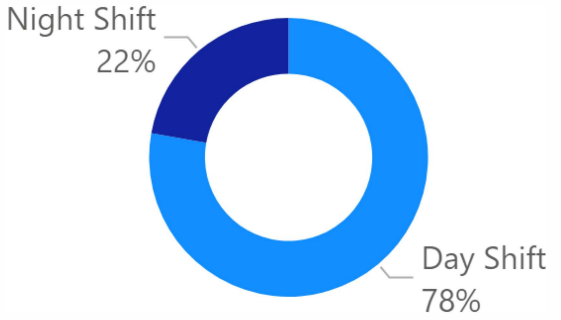
Missed Task Breakdown



204
Attended

Powys

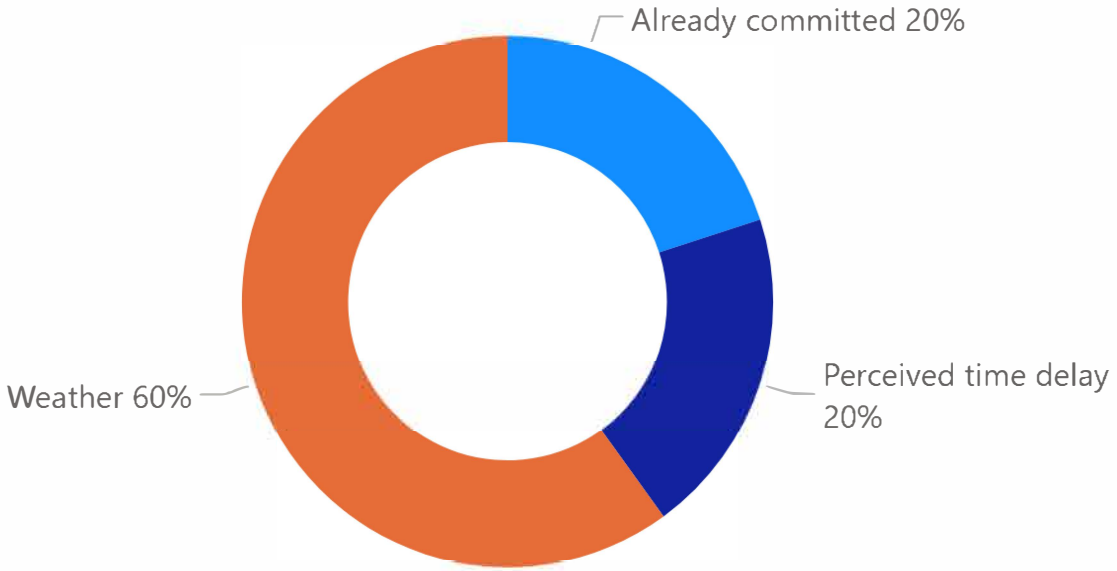
Unmet need



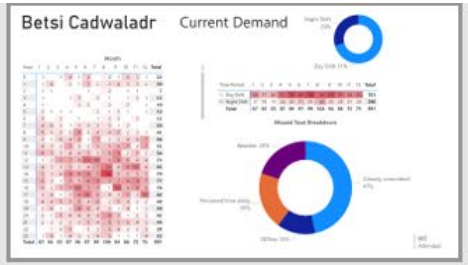
Hour	Month 1	2	3	4	5	6	7	8	9	10	11	12	Total
0	1	1											**2**
1	1	1							1				**3**
2					2								**2**
3			1		1		1						**3**
4										1		1	**2**
5			1					1					**2**
6							1						**1**
7	1	2											**3**
8								1					**1**
9	1						1						**2**
10									1				**1**
11											1		**1**
12					1				1				**2**
13						1		1					**2**
14				1				1	1				**3**
15						1							**1**
16						1					1		**2**
17	1	1										1	**3**
18					1				1				**2**
19							2		1				**3**
20						1	2	1					**4**
21						1					2		**3**
22			1	1	1				1				**7**
23				1		2	1	1		1		1	**7**
Total	**5**	**5**	**3**	**3**	**6**	**7**	**8**	**9**	**7**	**2**	**4**	**3**	**62**

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
⊞ Day Shift	3	3		1	2	3	1	3	4		2	1	**23**
⊞ Night Shift	2	2	3	2	4	4	7	6	3	2	2	2	**39**
Total	**5**	**5**	**3**	**3**	**6**	**7**	**8**	**9**	**7**	**2**	**4**	**3**	**62**

Missed Task Breakdown



204
Attended



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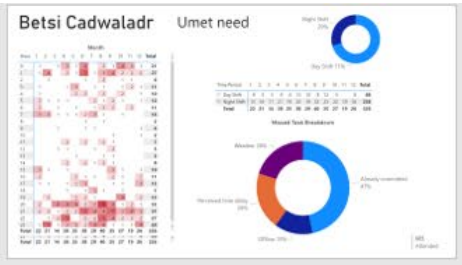
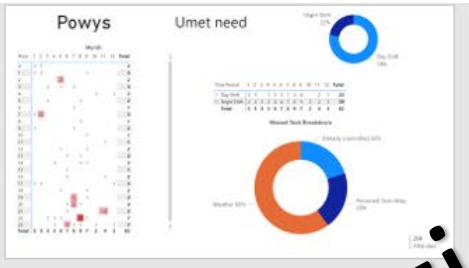


27

28



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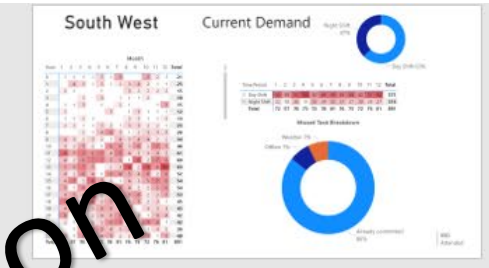

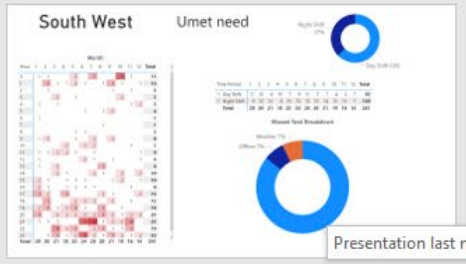

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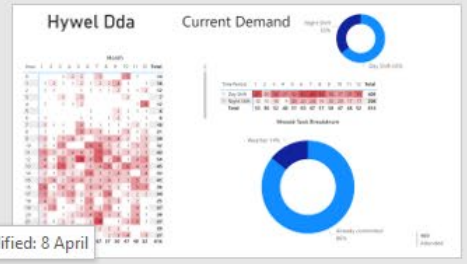

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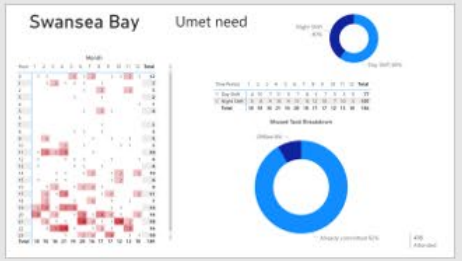
33

34



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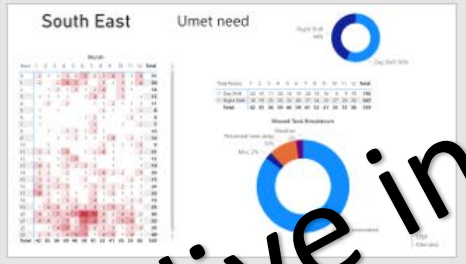
36



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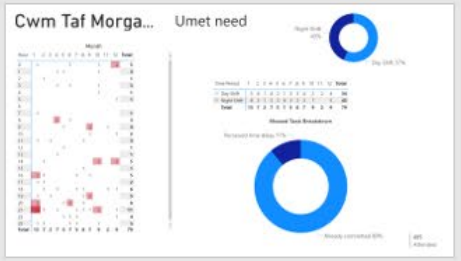
38



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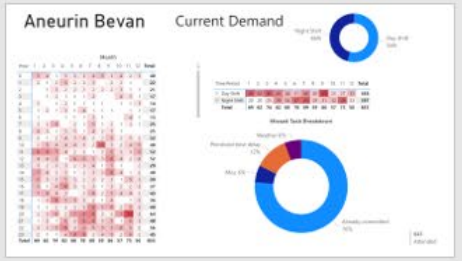

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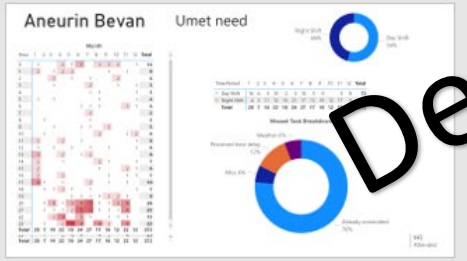
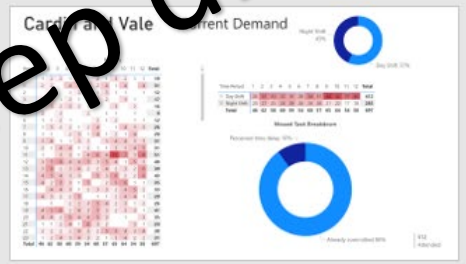


41



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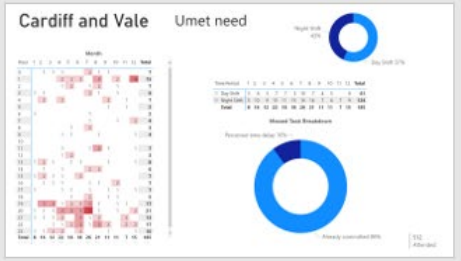


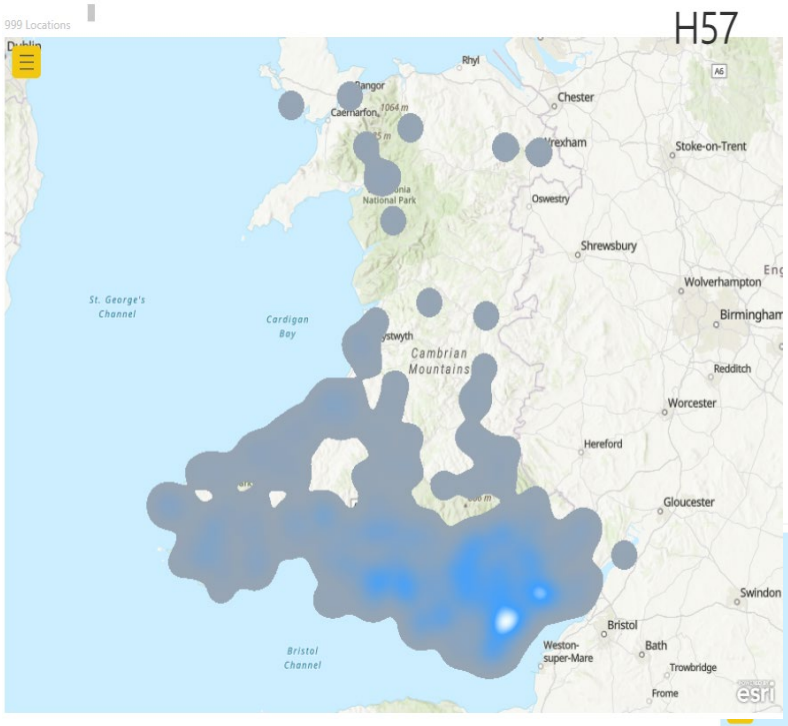
43

Presentation last modified: 8 April

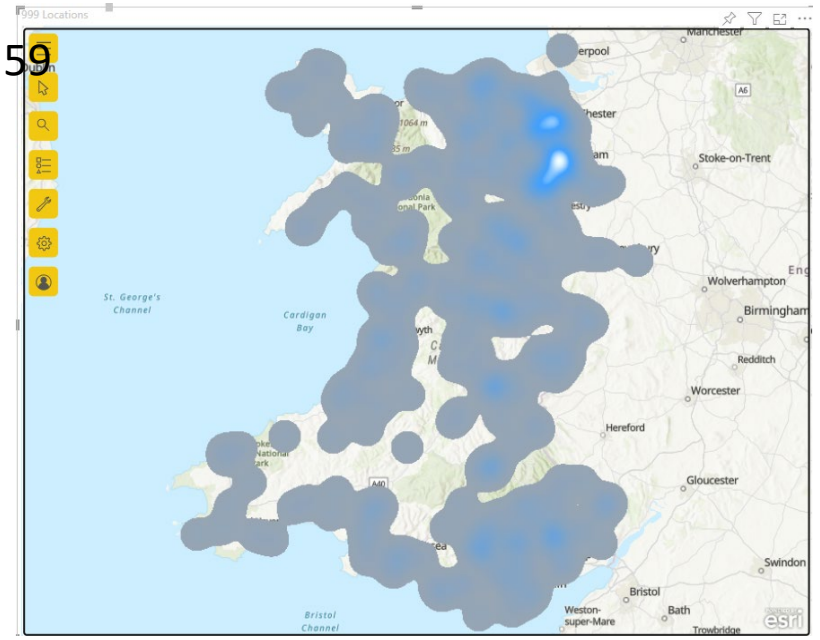
Deep dive into each LHB @ Region

Current pattern of aircraft deployment

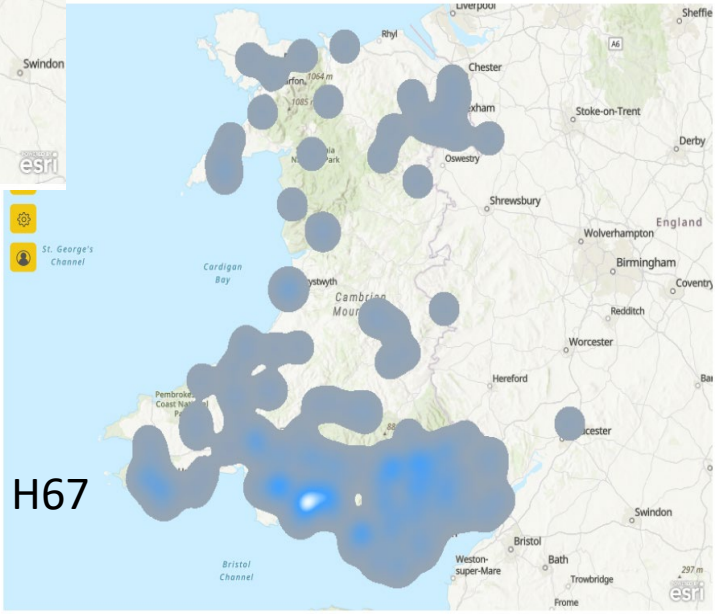
H57



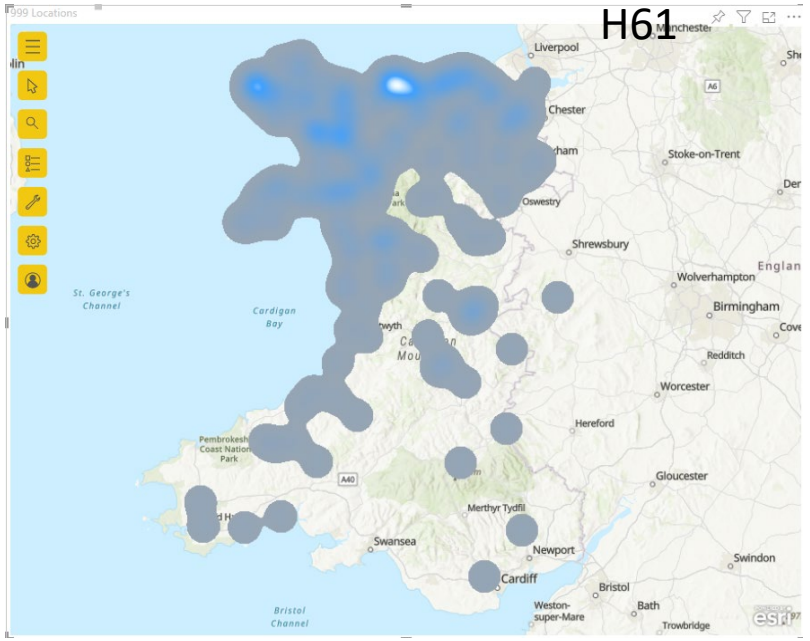
H59



H67



H61



Nb. Density relative to volume of each asset

Summary

- Air: Dafen 50%, Welshpool / Caernarfon 25% each
- Cardiff: Transfer / Childrens AA – small numbers. Car activity very high
- Welshpool poor coverage / poor infrastructure / difficult recruitment
- Combine Welshpool / Caernarfon – better / maintained coverage

17

Dafen Base

Historical Activity (18-20)

- 1356 Cases per year
- 62% Air
- 38% Road
- 19.6% Air Stand Down rate

Planning data

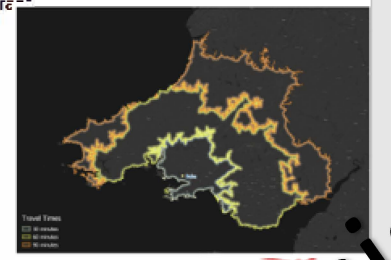
- 1554 cases per year estimated
- Road population coverage
  - 30 Mins : 19%
  - 60 Mins: 67%
  - 90 Mins: 76%

18

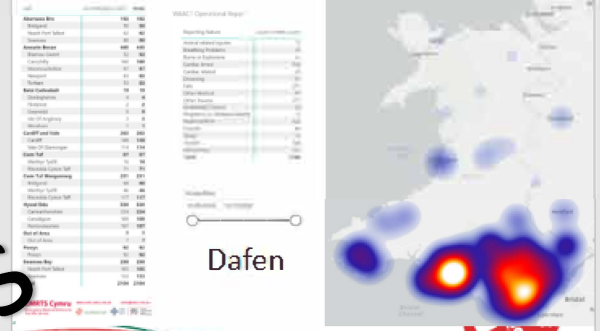
Dafen Base

Road population coverage

- 30 Mins : 19%
- 60 Mins: 67%
- 90 Mins: 76%



19



20

Caernarfon Base

Historical Activity (18-20)

- 567 Cases per year
- 80% Air
- 20% Road
- 13.7% Air Stand Down rate

Planning data

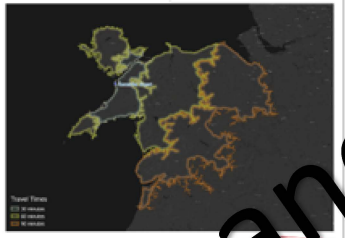
- 666 cases per year estimated
- Road population coverage
  - 30 Mins : 3%
  - 60 Mins: 11%
  - 90 Mins: 24%

21

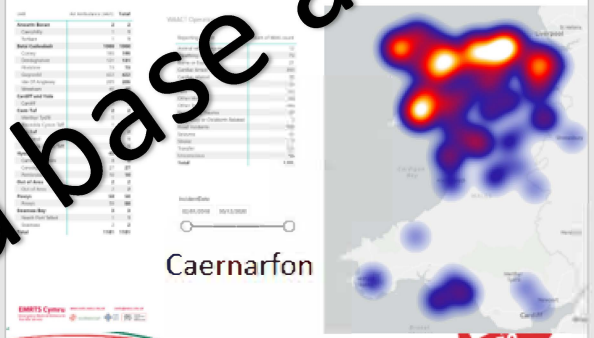
Caernarfon Base

Road population coverage

- 30 Mins : 3%
- 60 Mins: 11%
- 90 Mins: 24%

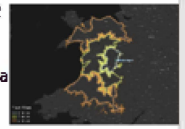


22



23

Welshpool Base



Historical Activity (18-20)

- 649 Cases per year
- 82% Air
- 18% Road
- 20.9% Air Stand Down rate

Planning data

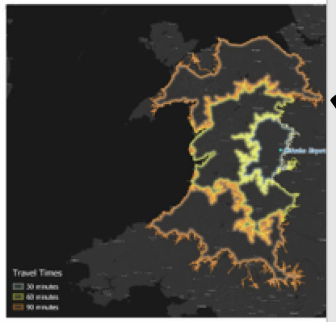
- 786 cases per year estimated
- Road population coverage
  - 30 Mins : 2%
  - 60 Mins: 5%
  - 90 Mins: 28%

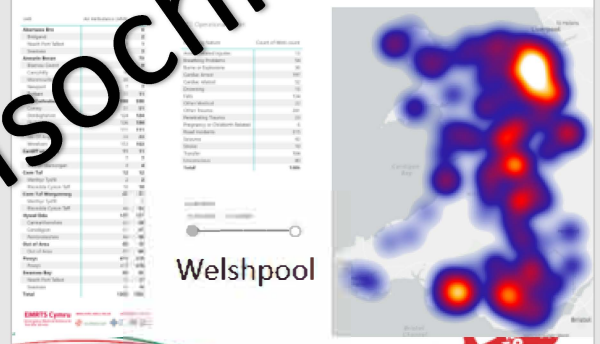
24

Welshpool Base

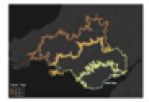
Road population coverage

- 30 Mins : 2%
- 60 Mins: 5%
- 90 Mins: 28%





Cardiff Base



Historical Activity (18-20)

- Air
  - 377 Transfer Cases
  - 24 Primary Responses
- Road
  - 1945 Primary responses
    - 48% of RRV activity for whole period
  - 1322 during 2020
    - 65% of RRV activity

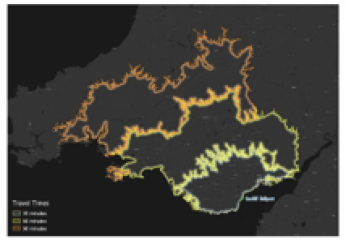
Planning data

- 1788 cases per year estimated
- Road population coverage
  - 30 Mins :39%
  - 60 Mins:65%
  - 90 Mins: 69%

Cardiff Base

Road population coverage

- 30 Mins :39%
- 60 Mins:65%
- 90 Mins: 69%



Isochrone and base analysis

Road population coverage

Scenario	30 mins	%	60 mins	%	90 mins	%
Glan Clwyd, Cardiff, Dafen	2136070	69%	2892550	93%	3087190	99%
Caernarfon, Dafen, Cardiff	1915320	62%	2600620	84%	3059750	98%
Caernarfon	106064	3%	354833	11%	731599	24%
Glan Clwyd	326813	10%	646759	21%	733470	24%
Cardiff	1217530	39%	2023200	65%	2145440	69%
Dafen	603183	19%	2087130	67%	2353720	76%
Welshpool	51948	2%	162614	5%	869642	28%

What are we achieving?

Time Period	Attended	n unmet	met %
Day Shift	2549	452	85%
Night Shift	923	879	51%
Total	**3472**	**1331**	**72%**

Hour	Attended	n unmet	met %
0	76	75	50%
1	58	80	42%
2	54	36	60%
3	44	42	51%
4	42	33	56%
5	39	30	57%
6	46	24	66%
7	107	27	80%
8	148	19	89%
9	170	36	83%
10	229	20	92%
11	264	40	87%
12	294	35	89%
13	224	33	87%
14	244	47	84%
15	262	44	86%
16	225	50	82%
17	208	58	78%
18	174	43	80%
19	152	80	66%
20	114	139	45%
21	95	127	43%
22	108	105	51%
23	95	108	47%
Total	**3472**	**1331**	**72%**

Shift & area met need %

Time Period	1	2	3	4	5	6	7	8	9	10	11	12	Total
Day Shift	**78%**	**83%**	**91%**	**84%**	**88%**	**85%**	**82%**	**85%**	**87%**	**93%**	**94%**	**85%**	**86%**
Mid	81%	80%	100%	96%	89%	85%	94%	81%	86%	100%	80%	90%	**89%**
North	77%	88%	93%	86%	92%	82%	88%	89%	84%	92%	100%	86%	**88%**
South East	78%	85%	90%	80%	87%	89%	78%	82%	89%	93%	91%	83%	**86%**
South West	78%	74%	88%	83%	83%	82%	78%	84%	85%	90%	94%	87%	**84%**
Night Shift	**63%**	**57%**	**54%**	**52%**	**54%**	**47%**	**51%**	**46%**	**52%**	**55%**	**56%**	**60%**	**54%**
Mid	33%		25%	33%	43%	50%		14%	63%	60%	33%	33%	**35%**
North	33%	18%	27%	24%	35%	22%	27%	21%	10%	19%	13%	13%	**22%**
South East	75%	74%	64%	63%	63%	55%	62%	58%	68%	68%	71%	72%	**65%**
South West	59%	44%	46%	47%	53%	48%	53%	58%	48%	50%	48%	74%	**53%**
Total	**73%**	**74%**	**78%**	**73%**	**75%**	**68%**	**70%**	**69%**	**76%**	**78%**	**79%**	**76%**	**74%**

Optima Data Analysis

GIG CYMRU NHS WALES

Gwasanaeth Casglu a Throsglwyddo Meddygol Brys

Emergency Medical Retrieval & Transfer Service

Elusen Ambiwlans Awyr CYMRU

WALES Air Ambulance Charity

optima PREDICT

www.csamhealth.com/solutions/public-safety

Optima

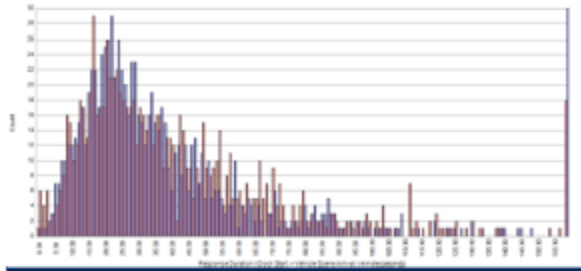
Workplan

EMRTS Commissioning Intention – CI4: System Transformation	
CI4a	Demand and Capacity Strategy – To continue with the work on a collaboratively developed demand and capacity strategy will set out the ongoing arrangements for proactively undertaking this work for the next decade, this will include the use of forecasting, modelling and health economic evaluations.

Optima tuning

- Using WAST base model
- Adjustments for EMRTS RRV and WAA Helicopter
- 2021
- AVL data tuning
- Travel to scene
- Scene to hospital
- WAST vs EMRTS
  - E.g. abandoned calls
  - Joint working
  - Transport “Normal”

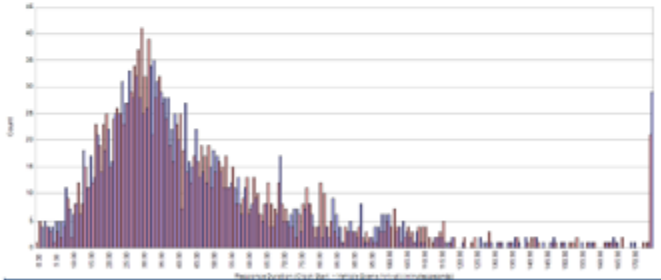
4.1.1 ECAR Responses



	Historical Data	Simulated Data	Difference	% Difference
Count	947	907	-40	-4.22%
Average	0:44:00	0:42:03	-0:01:57	-4.42%
50th Percentile	0:33:07	0:29:16	-0:03:51	-11.63%
90th Percentile	1:22:41	1:20:34	-0:02:07	-2.55%

Figure 4 Response Times for ECAR Responses

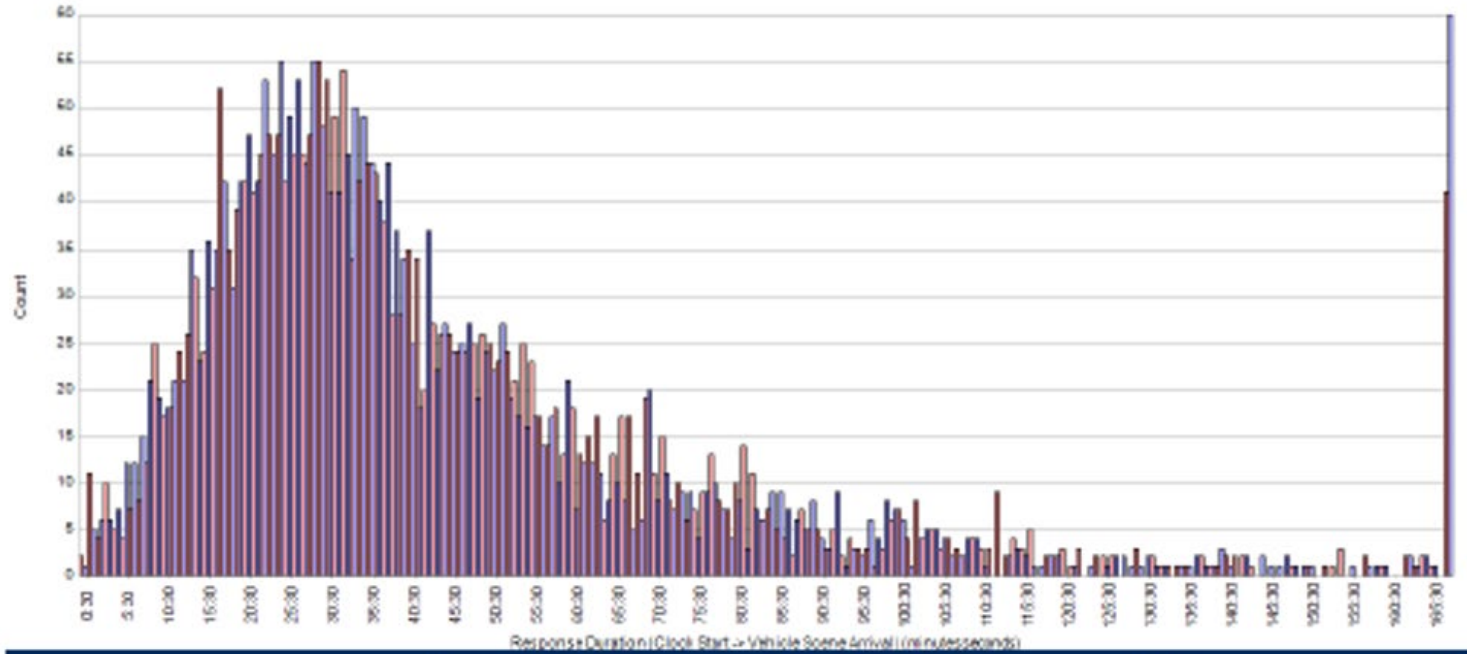
4.1.2 AIR Responses



	Historical Data	Simulated Data	Difference	% Difference
Count	1,359	1,325	-34	-2.50%
Average	0:49:14	0:49:27	0:00:13	0.43%
50th Percentile	0:37:55	0:36:43	-0:01:12	-3.16%
90th Percentile	1:30:43	1:31:39	0:00:56	1.02%

Figure 5 Response Times for AIR Responses

4.1.3 All EMRTS Calls



	Historical Data	Simulated Data	Difference	% Difference
Count	2,238	2,199	-39	-1.74%
Average	0:46:28	0:46:28	0:00:00	-0.00%
50th Percentile	0:35:33	0:33:53	-0:01:40	-4.69%

Model performance

Modelling

- Assumptions

- Cardiff day shift doesn't exist in baseline data (started 2022)
- 3 aircraft initially
- 12-hour shifts, no break, available full shift
- Unmet need data included
- Assume same number of clinical teams available irrespective of transport method

- Outputs

1. Number of incidents responded to
2. Change in incident numbers for all bases for each scenario (impact)
3. Utilisation % of shift
4. Incident by locality – change
5. Proportion of total demand met (inc. unmet need)
6. median/ mean response times

Scenarios

1. Add a day shift to Cardiff Heliport 07:00-19:00
2. Merging of Welshpool and Caernarfon into the following locations as a single shift (08:00-20:00)
    a. Caernarfon (LL54)
    b. Welshpool (SY21)
    c. North Central Conwy County (LL32)
    d. North Central Denbighshire (LL18)
3. Adding a “twilight” shift to 2a,b,c,d – within the hours of 8am – 02:00 – 12-hour shift (we are considering 12-12, 13:00-01:00, 14:00-02:00 as options but want to find the optimum)
    a. With this additional shift if an additional aircraft were available to the teams, what would be the optimum timing and location be
4. Additional question, following optimum placement of item 2/3 latest finish 02:00.
    a. Adding a twilight to Cardiff base,
    b. or shifting the start time to the right

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Results

Results of part 1

Caution: Relative change vs absolute numbers

Summary of best-performing scenario variations

North –Central (#)

14:00-02:00 Extended hours shifts

Scenario	Dispatches	Scene Arrivals	Crew Utilisation	Response Duration (avg)
Adjusted Baseline	3,620	2,743	39%	1:05:35
Scenario 1: first, add one daily 07:00 - 19:00 crew (can use car or helicopter) to Cardiff Heliport:				
1) Add shift to Cardiff	3,787	2,906	34%	58:09
Scenario 2: then merge the two crews of Welshpool and Caernarfon into one crew at:				
2A) Caernarfon	3,681	2,802	41%	1:04:00
2B) Welshpool	3,674	2,794	40%	1:03:36
2C) [redacted]	3,677	2,797	40%	1:02:34
2D) [redacted]	3,671	2,791	40%	1:02:20
Scenario 3 (car): then add a second 14h - 02h crew shift (car-only) to the merged base of scenario 2:				
3A car) Caernarfon	3,781	2,903	34%	1:00:07
3B car) Welshpool	3,737	2,857	34%	1:01:33
3C car) [redacted]	3,834	2,954	34%	58:39
3D car) [redacted]	3,840	2,960	34%	58:41
Scenario 3 (air): or allow the second 14h - 02h crew to also respond with a second helicopter:				
3A air) Caernarfon	3,964	3,083	36%	57:17
3B air) Welshpool	3,972	3,090	36%	57:27
3C air) [redacted]	3,954	3,073	36%	57:14
3D air) [redacted]	3,955	3,074	36%	56:40
Scenario 4 (change): continuing on scenario 3C/3D (car), change start time of Cardiff day shift to 14h:				
4A) [redacted] car + change Cardiff	4,027	3,147	37%	58:53 **
4B) [redacted] car + change Cardiff	4,034	3,153	37%	58:33 **
Scenario 4 (car): continuing on scenario 3C/3D (car), add a 14h - 02 crew shift (car-only) to Cardiff:				
4A) [redacted] car + Cardiff car	4,099	3,217	32%	54:13
4B) [redacted] car + Cardiff car	4,110	3,229	32%	54:35

** = The maximum number of scene arrivals in scenario 4 (change) is achieved by changing the Cardiff daytime shift to 14:00 hours. However, faster average response durations are achieved when changing the start time to 10:00 hours.

Merged base and extended hours (3 helicopters)

Headlines
impact

- keeping same clinical staffing
- 100% aircraft availability
- 490 incidents, resulting in 486 additional patients attended
- Average response time improved 1:05 minutes to 54 minutes
- 86% of total demand met

EMRTS identified limitations

- Hospital Transports via WAST
- Coding
- Seasonality (e.g. for additional helicopter)
- Aircraft availability e.g. weather, technical, staffing
- Recruitment & Retention, Resource envelope
- Factor in road population coverage from previous work

Best performing

Scenario 4B (car): [redacted] car at 14:00 hours + Cardiff car at 14:00 hours.				
Locality	Dispatches (count)	Scene Arrivals (count)	Response Duration (avg, minutes)	Veh. Reflex Duration (avg, minutes)
Blaenau Gwent	101	70	58	26
Bridgend	174	137	54	21
Caerphilly	202	150	53	22
Cardiff	424	332	44	14
Carmarthenshire	268	212	51	25
Ceredigion	99	75	63	38
Conwy	163	130	48	22
Denbighshire	133	106	55	22
Flintshire	163	125	54	25
Gwynedd	256	216	66	35
Isle of Anglesey	110	91	75	40
Merthyr Tydfil	87	69	56	23
Monmouthshire	113	85	59	27
Neath Port Talbot	183	137	55	23
Newport	191	146	48	19
Pembrokeshire	148	112	70	41
Powys	268	227	60	37
Rhondda Cynon Taf	294	220	49	21
Swansea	338	276	54	24
The Vale Of Glamorgan	147	115	41	17
Torfaen	93	75	54	21
Wrexham	156	123	62	31

Videos of the model

EMRTS vs WAST

Drag and Drop a base

Part 2

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UNMET NEED SCENARIOS:

SCENARIOS 05 - 09

EMERGENCY MEDICAL RETRIEVAL AND TRANSFER SERVICE

Version 2.0
30 May 2022

Created by: Tef Jansma
Optima Predict version: 22.4.0.54394

Questions

- Combined scenarios
- Expectations vs reality?
  - Weather/ Unavailability
  - Hours of darkness “in the day”
    - 1 day shift 285 flying hours lost (9%)
    - Extended hours (8am – 02:00) = 2430 flying hours lost (37%)
    - 2 shifts 2915 flying hours lost (north) (46%)
    - 3 shift 3400 flying hours lost (36%)
- How to test?
  - Assume no flying possible in dark
  - Assume aircraft unavailable
  - Worst case- work backwards

Abbreviation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Aircraft start time	08:00	08:00	07:00	07:00	06:00	05:00	05:00	05:00	06:00	07:00	07:00	08:00
Aircraft end time	17:00	18:00	20:00	21:00	22:00	22:00	22:00	21:00	19:00	18:00	16:00	16:00

Caution!

- No air response = road, and shorter response distance/ duration
- Reflex vs response
  - Response = 999 call → on scene
  - Reflex = Allocation → on scene

Summary of Scenarios 5 - 9:

- Best performing +
- 5 = Second North Wales central Helicopter
- 6 = Heli for 6 months
- 7 = Daylight flying
- 8 = Permanent aircraft unavailability (moving Cardiff shift to right)
- 9 = Permanent aircraft unavailability (+Twilight Cardiff Car)

Scenario 5 & 6 – Additional helicopter in North Central (14:00-02:00)

6 months (April – Sep)

+64 scene arrivals

6 months (Oct – Mar)

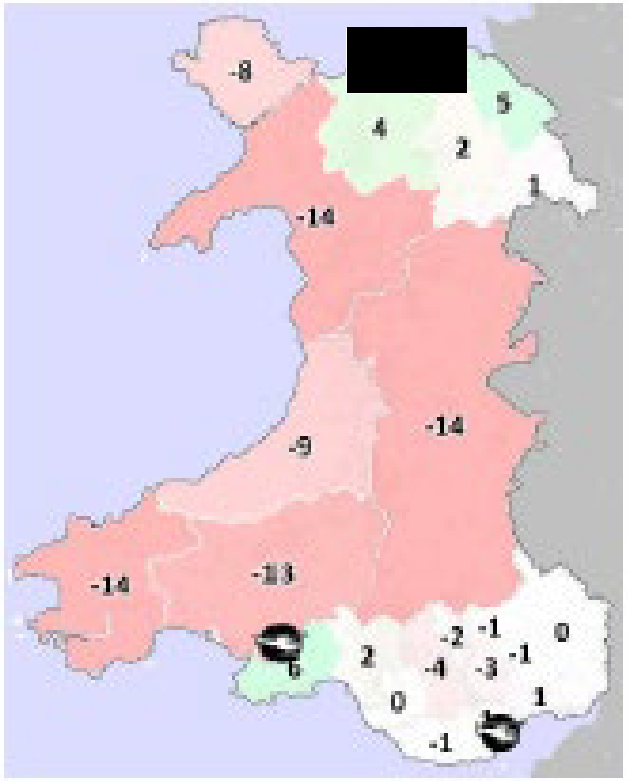
+27 scene arrivals

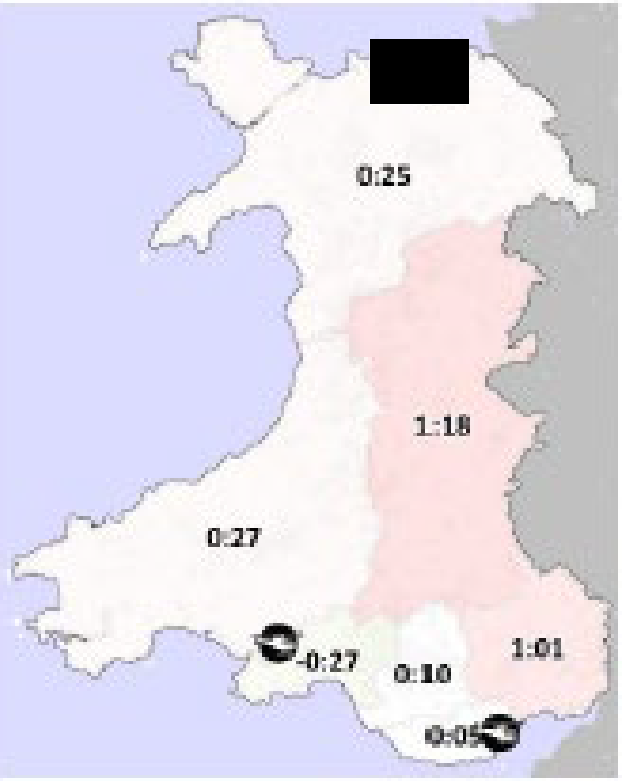
(+91 arrivals)

Scenario 7: daylight helicopters only

- H67 24/7 night HEMS
- Others restricted (i.e. as current service)

- Mid/ west Wales disadvantaged
- Lose 73 scene arrivals per year

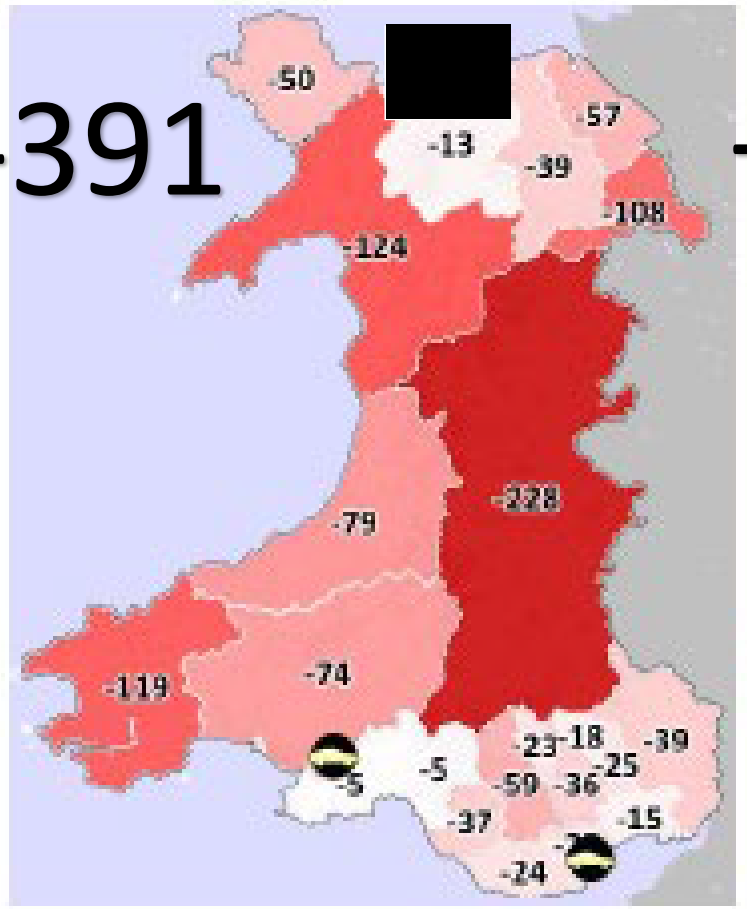




Scenario 8: No aircraft (with 2 shifts in Cardiff)

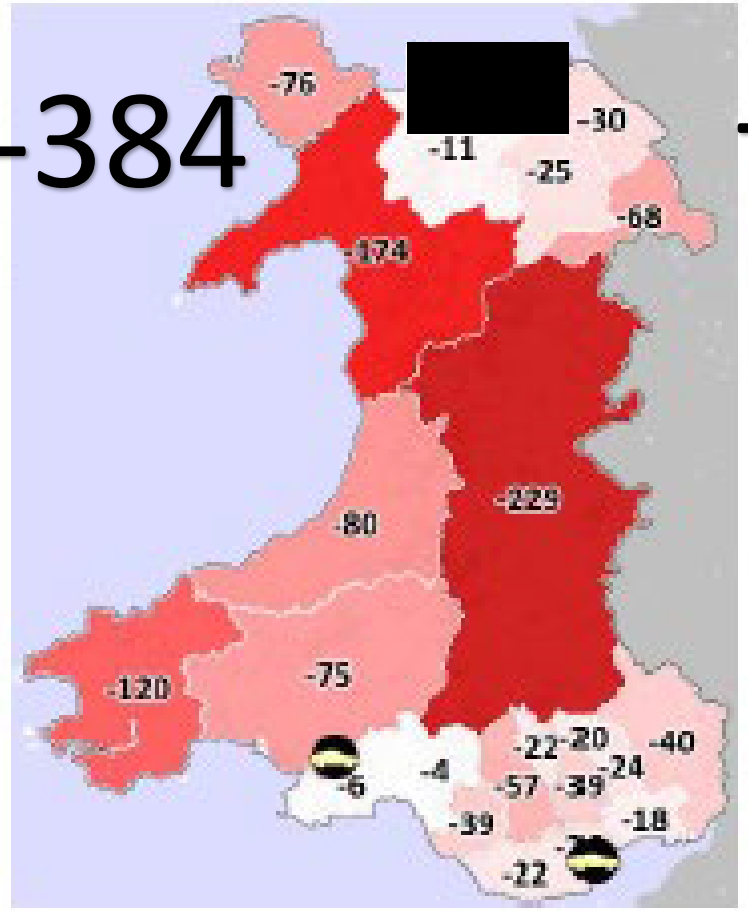
[redacted]

-391



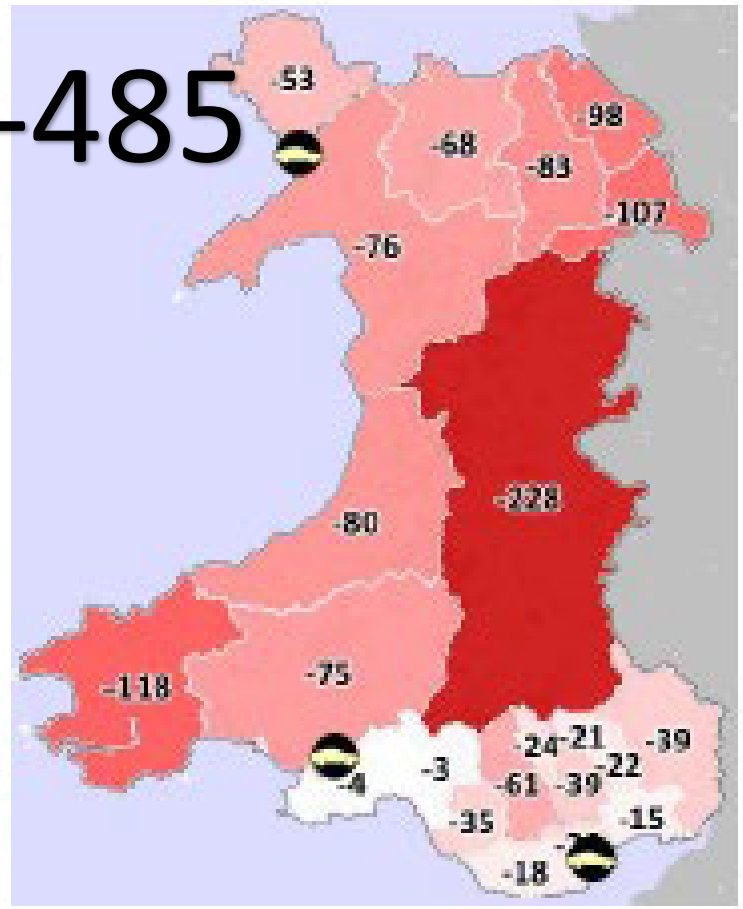
[redacted]

-384



Caernarfon

-485



Minimal difference overall between optimum North Wales sites, but approx. 98 less for Caernarfon

Summary of Scenarios 5 - 9:

- 5 = Second North Central Helicopter (+91) (12 months)
- 6 = No Winter Helicopter for 6 months (-27)
- 7 =Daylight flying only (ex Cardiff) (-76)

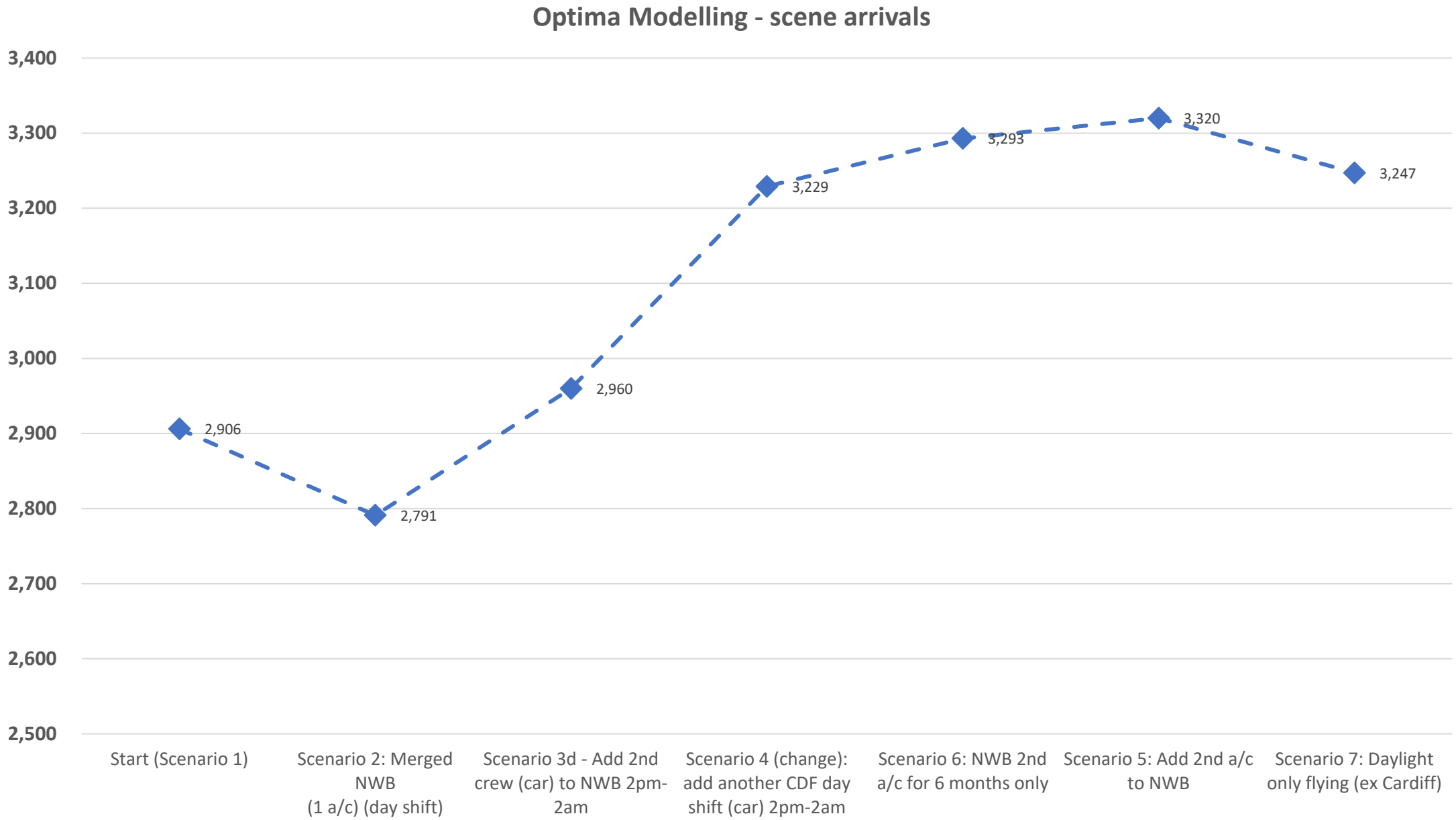
- 8 & 9 reveal the importance of the aircraft, with a loss of 1132-1300 scene arrivals per year

Extended hours and merged central North Wales base

Headlines impact

- Maintaining or increasing clinical staffing
- 4 x H-145 aircraft
- Hours of darkness NVIS

- Up to **583** additional incidents attended (**577** patients)
- Average response time improved 1h 05 minutes to 54 minutes
- Average reflex 28 to 25 mins
- **88%** of total demand met


Optima Modelling - scene arrivals
3,400
3,300
3,200
3,100
3,000
2,900
2,800
2,700
2,600
2,500
2,906
2,791
2,960
3,229
3,293
3,320
3,247
Start (Scenario 1)
Scenario 2: Merged NWB (1 a/c) (day shift)
Scenario 3d - Add 2nd crew (car) to NWB 2pm-2am
Scenario 4 (change): add another CDF day shift (car) 2pm-2am
Scenario 6: NWB 2nd a/c for 6 months only
Scenario 5: Add 2nd a/c to NWB
Scenario 7: Daylight only flying (ex Cardiff)

Conclusions

- Maintain or increase clinical staffing
- Extended hours, single base
  - North Central
- 14:00 -02:00 optimum for any additional shift
- Hours of darkness HEMS important
- Seasonal NW aircraft acceptable

The table **below** shows the results of scenarios 1 - 9 as covered in this and the previous report:

Scenario	Dispatches	Scene Arrivals	Crew Utilisation	Response Duration (avg)	Veh. Reflex Duration (avg)
Adjusted Baseline	3,620	2,743	39%	1:05:35	27:36
Scenario 1: first, add one daily 07:00 - 19:00 crew (can use car or helicopter) to Cardiff Heliport:					
1) Add shift to Cardiff	3,787	2,906	34%	58:09	25:44
Scenario 2: then merge the two crews of Welshpool and Caernarfon into one crew at:					
2A) Caernarfon	3,681	2,802	41%	1:04:00	27:36
2B) Welshpool	3,674	2,794	40%	1:03:36	27:47
2C) [redacted]	3,677	2,797	40%	1:02:34	27:07
2D) [redacted]	3,671	2,791	40%	1:02:20	27:21
Scenario 3 (car): then add a second 14h - 02h crew shift (car-only) to the merged base of scenario 2:					
3A car) Caernarfon	3,781	2,903	34%	1:00:07	26:35
3B car) Welshpool	3,737	2,857	34%	1:01:33	27:06
3C car) [redacted]	3,834	2,954	34%	58:39	25:25
3D car) [redacted]	3,840	2,960	34%	58:41	25:27
Scenario 3 (air): or allow the second 14h - 02h crew to also respond with a second helicopter:					
3A air) Caernarfon	3,964	3,083	36%	57:17	26:11
3B air) Welshpool	3,972	3,090	36%	57:27	26:27
3C air) [redacted]	3,954	3,073	36%	57:14	25:38
3D air) [redacted]	3,955	3,074	36%	56:40	25:50
Scenario 4 ("change"): continuing on scenario 3C/3D (car), change start time of Cardiff day shift to 14h:					
4A) [redacted] car + change Cardiff	4,027	3,147	37%	58:53	26:24
4B) [redacted] car + change Cardiff	4,034	3,153	37%	58:33	26:30
4C) Caernarfon car +change Cardiff	3,985	3,104	37%	59:45	27:20
Scenario 4 ("car"): continuing on scenario 3C/3D (car), add a 14h - 02 crew shift (car-only) to Cardiff:					
4A) [redacted] car + Cardiff car [#]	4,099	3,217	32%	54:13	25:04
4B) [redacted] car + Cardiff car [#]	4,110	3,229	32%	54:35	25:16
4C) Caernarfon car + Cardiff car	4,057	3,175	31%	55:53	26:03
Scenario 5: similar to scenario 4B ("car"), but the 14:00 shift at [redacted] is car/helicopter, instead of car-only.					
5) [redacted] air + Cardiff car	4,203	3,320	33%	53:16	25:29
Scenario 6: a hybrid of 4B ("car") and 5. The [redacted] 14:00 shift is car-only, except from April until September:					
6) [redacted] air (6mo) + Cardiff car	4,174	3,293	32%	54:07	25:22
Scenario 7: helicopters can fly during daylight only. These are variations of scenarios 4B, 5 and 6 above.					
7-4Bv1) Not applied to H67	4,079	3,198	31%	55:07	25:13
7-4Bv2) Applied to all shifts	3,937	3,056	30%	52:06	23:15
7-5v1) Not applied to H67	4,136	3,254	32%	53:34	25:04
7-5v2) Applied to all shifts	3,987	3,107	30%	51:21	23:17
7-6v1) Not applied to H67	4,127	3,247	31%	53:57	25:00
7-6v2) Applied to all shifts	3,985	3,105	30%	51:32	23:18
Scenario 8: poor weather (with 2 shifts in Cardiff, at 14:00 and 19:00 hours).					
8A) [redacted]	2,810	1,941	22%	59:32	20:43
8B) [redacted]	2,818	1,947	22%	58:21	20:45
8C) Caernarfon	2,680	1,811	20%	58:57	20:51
Scenario 9: poor weather (with 3 shifts in Cardiff, at 07:00, 14:00 and 19:00 hours).					
9A) [redacted]	2,985	2,113	20%	54:35	20:13
9B) [redacted]	2,987	2,115	20%	53:38	20:18
9C) Caernarfon	2,844	1,972	18%	53:30	20:16

WAA Trustee decisions and next steps

Trustees agreed that the model to move to single central NW base with extended hours was their preferred option.

This would be delivered via a fleet of 4 x H-145 helicopters, with fourth aircraft supplying maintenance back up and seasonal operation in North Wales during summer demand peak. All air missions to be NVIS capable during daylight shifts in addition to late shifts.

Whilst modelling showed clear benefit from central located base using patient need data, an options appraisal will be presented to Trustees at the end of July ensuring all factors are included to determine base location, including equity of HEMS service to patients across Wales.

Elusen Ambiwlans Awyr CYMRU | WALES Air Ambulance Charity

Anonymous feedback

GIG CYMRU NHS WALES
Gwasanaeth Casglu a Throsglwyddo Meddygol Brys
Emergency Medical Retrieval & Transfer Service