EVInsight

Blue Light, Black Spot

EV Infrastructure and Emergency Services in Wales

A data-led intelligence report examining where electric vehicle charging infrastructure gaps, broadband connectivity failures, and operational geography intersect to create risk for Welsh blue light fleets.

5.8mi	**19.9mi**	**4.1%**	**5.5mi**
Ceredigion avg nearest rapid	SA43 nearest rapid charger	Carmarthenshire no 2Mbit/s	Powys avg nearest rapid
Highest in Wales	*Cardigan cluster*	*Worst in Wales*	*6,117 postcodes*

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Executive Summary

Wales is electrifying its blue light fleets. The pressure is coming from Welsh Government net zero commitments, the timeline is tightening, and across much of the country the charging infrastructure is not ready for what is being asked of it.

The question this report asks is a practical one. Can blue light fleets actually charge where they operate? The answer, across much of Wales, is no.

EVInsight has applied its postcode-level risk intelligence platform to the operational geography of Welsh emergency services. The data covers 1,792,247 UK postcodes and draws on Ofcom fixed broadband coverage, DVLA EV registration data, NHS and police station locations, and EV charging infrastructure from the EVInsight chargepoint dataset. The findings are clear and they are urgent.

In Ceredigion, the average distance to the nearest rapid charger across 3,082 postcodes is 9.4 miles. In the SA43 postcode area covering Cardigan and surrounding communities, the worst-case distance to the nearest Major A&E hospital is 25.3 miles. The nearest facility is Cardigan Minor Injuries Unit, which has no Major A&E capability. Gigabit broadband availability is zero. The Index of Multiple Deprivation places most of these postcodes in decile one, the most deprived nationally.

In Powys, the largest county in Wales by area, the average nearest rapid charger across 6,117 postcodes is 8.88 miles. In Carmarthenshire, 4.06 percent of premises cannot receive 2Mbit/s broadband, the worst figure in Wales and a direct threat to the connectivity that modern chargepoints require for payment processing and remote monitoring.

These are not abstract planning concerns. A Welsh Ambulance Service vehicle responding to a cardiac arrest in Cardigan in an electric vehicle would need to have charged at Carmarthen or Haverfordwest before the shift begins. There is no rapid charger within 20 miles. For a rural ambulance trust already managing the longest patient transport distances in Wales, adding charging logistics to an already stretched operation is not a marginal inconvenience. It is a structural risk.

Key Findings

5.8mi	Ceredigion has the greatest average distance to a rapid charger of any Welsh local authority, across 3,082 postcodes.
19.9mi	The SA43 postcode cluster around Cardigan sits more than 19 miles from the nearest rapid charger and has zero gigabit broadband availability.
25.3mi	The worst-case SA43 postcode is 25.3 miles from the nearest Major A&E, verified against NHS facility data. The typical distance across the SA43 cluster is 18.1 miles to Glangwili General, Carmarthen. The nearest facility is Cardigan Minor Injuries Unit, which cannot receive emergency trauma admissions.
4.06%	Carmarthenshire has the highest proportion of premises unable to receive 2Mbit/s broadband in Wales, creating a co-dependency failure for any chargepoint requiring connectivity to operate.
5.5mi	Powys averages 5.5 miles to the nearest rapid charger across 6,117 postcodes, covering the largest county in Wales by geographic area.
0.65	Powys averages fewer than one rapid charger within 5 miles across all postcodes.
7.2mi	Ceredigion has the greatest average distance to a hospital of any Welsh local authority, compounding the operational challenge for ambulance services in the county.
3.4mi	Ceredigion also has the greatest average distance to a fire station of any Welsh local authority. In SA43, the worst-case postcode is 9.8 miles from the nearest station at Crymych, a retained on-call station with longer crew mobilisation times than a wholetime station.

The Emergency Services Electrification Challenge

Blue light fleets represent one of the most demanding use cases for electric vehicles. Emergency service vehicles cannot be recalled mid-shift for charging, cannot tolerate range uncertainty on an active response, and cannot queue at a public rapid charger behind a member of the public.

Rapid response vehicles operate on unpredictable duty cycles. A rural ambulance in Powys may travel significant distances at speed to collect a patient and transport them to a district general hospital. A North Wales Police vehicle responding to an incident in Gwynedd may be deployed for hours. Speed drains a battery faster. Long deployments leave less time to recharge before the next call. These are not edge cases. They are the routine operational reality for Welsh emergency services in rural areas.

Fire engines present a distinct set of challenges. A retained on-call crew responding from home adds mobilisation time before the vehicle even leaves the station. Once deployed, a fire engine at a structure fire or road traffic collision may be on scene for several hours running ancillary equipment from the vehicle. Battery drain under these conditions is substantial and unpredictable. Mid and West Wales Fire and Rescue Service operates the largest fire service area in England and Wales at over 4,500 square miles, with the majority of its 58 stations crewed by retained on-call firefighters. The nearest rapid charger to many of those stations does not exist within a practical range.

Current battery electric vehicles suit predictable depot-based operations well. Pool cars, community response vehicles, and non-emergency transport are natural starting points for fleet electrification. Primary rapid response vehicles present a harder problem, and the infrastructure to support them in rural Wales does not yet exist.

Across the UK, over 1,000 zero emissions emergency vehicles are now in operation. That represents around 3.3 percent of the total blue light fleet. Fire services are leading the transition. In Wales, the pressure to publish fleet decarbonisation plans is real and growing. Welsh Government net zero commitments and public sector sustainability targets are pushing every ambulance trust, police force, and fire service toward a timeline that the current charging infrastructure in mid and west Wales cannot support.

UK Power Networks has recognised this challenge directly. Its Blue Light project is building a digital tool to help emergency services understand where electrical capacity exists across their estate. The local grid in Wales was not designed with the charging demands of blue light fleets in mind. Power availability is the primary constraint in many rural areas, and a new DNO connection at a remote station site is a complex and costly process.

The Infrastructure Gap: Wales by Local Authority

The table below draws on EVInsight postcode data for all Welsh local authority areas, covering charging infrastructure proximity, broadband connectivity, hospital distance, and deprivation. Figures represent arithmetic means across all postcodes within each local authority with valid data.

LA	Avg Nearest Rapid	Rapids within 5mi	Gigabit %	No 2Mbit/s %	Avg Hospital	Avg Fire Stn	Avg Police	IMD
Ceredigion	**5.8mi**	**1.11**	49.8%	**3.27%**	7.2mi	**3.4mi**	**5.0mi**	5.8
Powys	**5.5mi**	0.65	54.2%	**3.65%**	5.0mi	**2.9mi**	**6.4mi**	6.5
Gwynedd	4.2mi	0.78	60.0%	1.39%	4.4mi	2.5mi	4.9mi	6.1
Carmarthenshire	**4.0mi**	1.17	54.2%	**4.06%**	4.3mi	**2.7mi**	**5.6mi**	5.3
Pembrokeshire	3.6mi	1.75	57.9%	1.93%	6.3mi	2.7mi	5.1mi	5.9
Conwy	3.4mi	0.78	77.9%	1.45%	2.9mi	1.7mi	4.0mi	6.0
Rhondda Cynon Taf	3.3mi	0.82	74.2%	0.06%	2.0mi	1.4mi	2.0mi	4.6
Isle of Anglesey	3.0mi	1.27	56.3%	1.29%	4.4mi	2.3mi	**12.0mi**	5.9
Bridgend	2.9mi	1.78	84.7%	0.26%	1.8mi	1.2mi	2.3mi	5.5
Monmouthshire	2.6mi	1.64	66.2%	1.32%	3.3mi	2.1mi	1.8mi	7.2
Neath Port Talbot	2.6mi	1.35	77.8%	0.08%	2.1mi	1.5mi	2.9mi	4.2
Caerphilly	2.4mi	1.62	83.3%	0.16%	2.8mi	1.5mi	1.3mi	4.9
Denbighshire	2.4mi	2.54	77.1%	1.16%	2.5mi	1.5mi	2.0mi	5.6
Torfaen	2.4mi	2.51	78.0%	0.23%	1.8mi	0.9mi	1.3mi	4.8
Blaenau Gwent	2.0mi	1.26	66.9%	0.11%	1.3mi	1.0mi	1.0mi	3.3
Flintshire	1.9mi	2.09	88.2%	0.40%	2.3mi	1.8mi	3.6mi	6.7
Merthyr Tydfil	1.9mi	1.76	73.1%	0.08%	1.9mi	1.2mi	1.1mi	3.8
Wrexham	1.9mi	3.57	72.6%	0.36%	2.0mi	2.5mi	2.1mi	6.1
Swansea	1.6mi	3.60	85.3%	0.37%	1.6mi	1.5mi	1.5mi	5.9
Cardiff	0.9mi	10.27	92.5%	0.05%	1.1mi	1.3mi	1.1mi	5.8
Newport	0.8mi	10.23	91.4%	0.01%	1.3mi	1.3mi	0.9mi	4.7

Table 1: Welsh local authorities ranked by average distance to nearest rapid charger. Red values indicate worst performers. Fire station distances from Welsh Government 2023-24 dataset.

The Cardigan Cluster: A Case Study

The SA43 postcode area covers Cardigan and surrounding communities in north Ceredigion, and presents a combination of infrastructure deficits not found anywhere else in Wales.

Verified NHS data shows SA43 is caught between two Major A&E departments with neither within easy reach. The worst-case postcode is 25.3 miles from Withybush General, Haverfordwest. The typical distance is 18.1 miles to Glangwili General, Carmarthen. The nearest facility is Cardigan Minor Injuries Unit, which has no Major A&E capability. Gigabit availability is zero and most postcodes sit in IMD decile one or two.

A Welsh Ambulance Service vehicle operating from Cardigan must charge at Carmarthen or Haverfordwest before or after a shift. A fire engine returning low on charge to Cardigan or Crymych has no local recovery option. IMD decile one communities are least likely to have home charging access or high-speed broadband, and most dependent on emergency services. The areas hardest to serve have the least infrastructure to support those who serve them.

Postcode	Nearest Major A&E	A&E dist	Nearest Rapid mi	Nearest Fire Station	Gigabit %	IMD Decile
SA43 1PU	Withybush, Haverfordwest	**25.3mi**	**19.9mi**	Crymych 9.8mi	0%	1
SA43 1QA	Withybush, Haverfordwest	**25.0mi**	**19.9mi**	Crymych 9.4mi	0%	1
SA43 1PZ	Withybush, Haverfordwest	**24.9mi**	**19.9mi**	Crymych 9.3mi	0%	1
SA43 1PX	Withybush, Haverfordwest	**24.8mi**	**19.8mi**	Crymych 9.3mi	0%	1
SA43 1PS	Withybush, Haverfordwest	**24.7mi**	**19.8mi**	Crymych 9.2mi	0%	1
SA43 2QT	Glangwili, Carmarthen	**18.1mi**	**20.2mi**	Cardigan 4.8mi	0%	2
SA43 2QU	Glangwili, Carmarthen	**18.0mi**	**20.1mi**	Cardigan 4.8mi	0%	2
SA43 2QW	Glangwili, Carmarthen	**18.3mi**	**20.4mi**	Cardigan 5.0mi	0%	1
SA43 1JX	Glangwili, Carmarthen	**20.0mi**	**20.1mi**	Crymych 7.1mi	0%	5
SA43 1PA	Glangwili, Carmarthen	**19.8mi**	**19.9mi**	Crymych 7.8mi	0%	1

Table 2: SA43 postcode cluster. A&E; distances verified against NHS facility data. Nearest facility in all cases is Cardigan Minor Injuries Unit, which has no Major A&E; capability.

The Mid-Wales Corridor

Ceredigion, Powys, and Carmarthenshire form a contiguous geographic corridor across mid and west Wales. Across this corridor, EV charging infrastructure, broadband connectivity, and hospital access are simultaneously at their weakest in Wales. This is not coincidence. It reflects decades of underinvestment in rural infrastructure that now creates compounding risk as fleet electrification accelerates.

The emergency service force areas most exposed to this corridor are Dyfed-Powys Police and Welsh Ambulance Service NHS Trust. Dyfed-Powys Police covers Ceredigion, Powys, Carmarthenshire, and Pembrokeshire, the four local authorities with the highest average distances to rapid chargers in Wales. Any EV fleet transition plan that does not account for charging infrastructure across this geography is operationally incomplete.

Welsh Ambulance Service rural response in Ceredigion and Powys already involves the longest patient transport distances in Wales, averaging 11.59 miles to the nearest hospital in Ceredigion and 7.98 miles in Powys. Adding charging logistics to these routes creates operational risk that must be modelled and mitigated before fleet electrification proceeds beyond non-emergency vehicles.

North Wales Police faces a different version of the same problem. Gwynedd averages 6.71 miles to the nearest rapid charger with fewer than one rapid charger within 5 miles on average. Conwy averages 5.51 miles. Mountain rescue support operations extend operational ranges well beyond the coastal urban centres of Bangor and Llandudno. Isle of Anglesey averages 4.89 miles and has only 1.27 rapids within 5 miles, despite being a geographically bounded area with a single main road corridor.

Mid and West Wales Fire and Rescue Service covers the same geography as Dyfed-Powys Police and faces the same infrastructure deficit. Ceredigion averages 3.4 miles to the nearest fire station across all postcodes, the highest of any Welsh local authority. In the most isolated parts of SA43, postcodes are nearly 10 miles from the nearest station at Crymych. Crymych is a retained on-call station. When those postcodes call 999, the crew must first travel to the station before any response vehicle moves. An electric fire engine returning to a rural retained station with depleted charge has no local recovery option. The infrastructure gap is not theoretical. It is geographic and it is measurable.

The broadband picture compounds all of this. EVInsight has analysed Ofcom residential fixed broadband coverage data across 1.6 million UK postcodes. Modern chargepoints require reliable connectivity for payment processing, remote fault monitoring, and smart charging management. A chargepoint without 4G or adequate fixed broadband is operationally compromised from the moment it is installed. In Ceredigion and Carmarthenshire, where several percent of premises cannot receive 2Mbit/s, connectivity is a co-dependency that must be resolved alongside the charging infrastructure itself.

What Needs to Happen

The evidence in this report points to a specific set of actions. They are not complicated. What they require is coordination between bodies that do not yet have a shared forum for this conversation.

Welsh Government and Transport for Wales should commission a dedicated blue light fleet charging infrastructure needs assessment for the Dyfed-Powys and Gwynedd operational areas. The analysis in this report provides a postcode-level baseline. What is needed now is a station-by-station assessment of grid capacity, DNO connection requirements, and the realistic cost of bringing rapid charging to the locations where emergency services actually operate.

Wales does not have access to the Local Electric Vehicle Infrastructure fund, which is an England-only programme. EV charging in Wales is funded through the Regional Transport Grant, administered by Corporate Joint Committees. That grant covers road safety, active travel, public transport, and highways within a single allocation. EV charging must compete for priority within that broader envelope and is not ring-fenced. In 2026 to 2027, the entire South East Wales region received just £50,000 for ULEV activity, allocated to an evaluation study rather than deployed infrastructure. The ten worst-served local authorities for emergency service charging access are concentrated in mid and west Wales. Any policy response must reflect this funding reality. A recommendation that assumes English-style ring-fenced infrastructure investment will not translate to the Welsh context.

Emergency service fleet managers should map all operational station locations against charging infrastructure data before committing to EV vehicle procurement in rural force areas. Electrification should proceed by role: non-emergency pool vehicles first, community response vehicles second, rapid response vehicles only once infrastructure within operational range is confirmed. The range calculations used for procurement planning must reflect worst-case duty cycles, not average ones. A rural ambulance or police vehicle should be modelled on a long, high-speed deployment, not a city commute.

Chargepoint operators should treat the mid-Wales corridor as an underserved market with growing demand signals. EV density in Carmarthenshire and Powys is rising. Public-private partnership models with emergency services offer a route to guaranteed utilisation in locations where general public footfall is low. A chargepoint with a committed blue light fleet user is a viable asset in a rural location where a purely commercial deployment is not. Connectivity must be assessed before any site survey in these areas. A chargepoint that cannot process payments or report faults remotely is a liability.

Methodology and Data Sources

This report uses EVInsight's postcode risk intelligence platform, which aggregates open data from government and regulatory sources into a unified dataset covering 1,792,247 UK postcodes across 40 variables.

Source	Data Provided	Licence
Ofcom Connected Nations	Fixed broadband coverage by postcode, residential	OGL v3
DVLA / DfT VEH0132	BEV registrations by local authority	OGL v3
ONS ONSPD Feb 2025	Postcode spine, centroids, LA codes	OGL v3
EVInsight chargepoint dataset	EV chargepoint locations and specifications	Proprietary
NHS ODS / open data	Hospital locations, verified by postcode centroid	OGL v3
Welsh Government / ONS	Index of Multiple Deprivation	OGL v3
Welsh Government	Fire station locations 2023-24, British National Grid coordinates	OGL v3
OSM / manual verification	Police station locations, Wales, verified against force websites	OGL v3

Distance calculations use the Haversine formula applied to postcode centroid coordinates from ONSPD. Police station locations are sourced from OpenStreetMap and manually verified against individual force websites and street-level imagery. The data.police.uk API does not provide station coordinates for the majority of Welsh forces. Hospital distances are calculated against a curated dataset of 22 NHS Wales facilities, with coordinates resolved from verified postcode centroids. Major A&E facilities are distinguished from Minor Injuries Units throughout. Broadband metrics are sourced from Ofcom July 2025 residential coverage files. All local authority figures are arithmetic means across constituent postcodes with valid data. The broadband analysis covers 1,602,391 residential postcodes across Great Britain.

About EVInsight

EVInsight is a data intelligence platform focused on electric vehicle infrastructure risk and opportunity across the UK. The platform scores 1,792,247 active postcodes across 40 variables using data sourced exclusively from government and statutory bodies. All source data is licensed under the Open Government Licence v3 or equivalent.

EVInsight has published open intelligence reports for Wales, Scotland, and England. Bespoke analysis for local authorities, chargepoint operators, fleet managers, and policy teams is available on request.

This report is produced and published from Wrexham, Wales.

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