

Yorkshire Ambulance Service NHS Trust - Delivering a zero-emission fleet

Overview of the Project

Yorkshire Ambulance Service (YAS) are striving to reduce the emissions of their fleet by working towards a zero emission fleet. With the increase in the amount of emergency calls by 4% on an annual basis, we struggle to reduce our carbon footprint from our fleet through mileage reduction. All fleet are Euro V at best at present as there are no vehicles commercially available that fit the requirements for our front line ambulances (200 mile minimum range) and patient transport (150 mile range) so we have struggled to blanket change our fleet to low emission vehicles. We must therefore strive to reduce our fleet emissions through other means, altering the types of fuel that our fleet use, retrofit and innovate. We have a carbon management plan and sustainability plan, striving to achieve a zero emission fleet.

With a grant funding from the Office of Low Emission Vehicles, YAS have procured two hydrogen electric hybrids, Renault Kangoo ZEs H2, for the fleet. They have been converted from running on electric to become hybrid hydrogen fuel cells electric vehicles. The assessment period is three years.

Working with ULEMCo, Yorkshire Ambulance Service has joined several other national fleets who are working to see if diesel vehicles can be converted to run with hydrogen. Through an OLEV funded bid, we are working on a hydrogen retrofit to a patient transport vehicle located in South Yorkshire. The vehicle conversion is being carried out in January 2018 and will run on the front line once converted.

The solar fleet project identified a potential to install solar panels on the roof of Double Crewed Ambulances (DCAs) to eliminate idling issues. At present, ambulance staff sit in their vehicles with the engine running between jobs for up to 65% of their shift, to charge up the secondary battery or they return to an ambulance station in order to plug into the electricity shoreline system. With funding from the Clean Vehicle Technology Fund, YAS installed solar panels on 109 ambulances ensuring it is not necessary to keep engines running to maintain a charge in the ancillary batteries, supporting the aim of numerous local hospitals to have zero-idling outside their A&E departments, reducing diesel emissions into the buildings.

The vision for the solar panel was to reduce NOx levels as well as CO2 emissions from ambulances waiting for a call. Each solar panel collects energy from the light

surrounding it, from sunlight to strip lighting inside garages and this feeds the batteries with power.

As the batteries are charged, energy is supplied to the ancillary part of the vehicle. The lithium batteries are lighter and more efficient and are a new technology to the ambulance service nationwide. YAS is the first ambulance trust to trial these as part of our operational fleet.

Although we are at the beginning of the electric revolution, we have a plan to roll out electric charging points at all our ambulance stations, offices and car parks across our estate (all 110 locations).

Economic, Health and Carbon Impact of the project

These vehicles are more expensive at present so require alternative business cases to look at the lifespan of the vehicle and how it fits into the fleet. The health benefits are immediate for air quality externally but also for staff inside the vehicle as a reduced emission vehicle also means a lower emissions. The areas that ambulance service vehicles operate in usually have sensitive patients and people who are sensitive to air quality.

By introducing zero carbon vehicles into the fleet, it means that we are eliminating carbon emissions but also reducing harmful emissions from the exhaust pipe.

We have a duty of care responsibility as an ambulance service to reduce our emissions from our vehicles. We will have 5 clean air zones that will be operational in our region in the next few years that we need to eliminate our emissions and play a part in improving air quality.

By eliminating our carbon emissions from our vehicles and having a more integrated renewable installation programme we can ensure that our vehicles are charged through green resources and do not emit any harmful gases at any point of the electricity or hydrogen generation. We can also reach our carbon reduction goals in line with the Carbon Act. We are aiming to slash our fleet carbon emissions from our fleet in half by 2030.

The Kangoo vans will save 4 tonnes each of CO₂ per year and the PTS vehicle approximately 2.5 tonnes of CO₂ per year. If this can be replicated across the fleet we can dramatically reduce our tailpipe emissions.

Partners, supporters involved in the project

We work closely with vehicle retrofitters ULEMCo and Revolve technologies to design front line ambulances and patient transport vehicles. We are working with Arcola Symbio to run vehicles to support our support services to become zero emission.

We are working with local councils to support their clean air zones and get infrastructure in.

Future plans for the project

We conducted an assessment of our fleet and the how we will have to respond to a changing vehicle type, fuel infrastructure and a vehicle refueling process. Our assessment of the future fuels has lead to collaborative with a wide range of other fleet and infrastructure organisations to implement electric an hydrogen refueling stations across the region. We are developing a hydrogen-electric ambulance. We have considered the impact of the Clean Air Zone that will be implemented in the centre of Leeds. This will have a large impact on the requirements of our fleet across the region. Details are in the 'YAS Fleet for the Future' document.

We are looking to introduce more hybrid and zero emission vehicles into the fleet. We are designing hydrogen electric vehicles to join our fleet and will be looking to prototype them in the next year. This will include front line ambulances which will have a dramatic effect on the air quality at ambulance stations, hospitals, doctor's surgeries. The advancing technologies are enabling our fleets to become greener and cleaner although we still have the challenges of range and refueling infrastructure to deal with. By working with local councils we can identify our needs in line with regional requirements.

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