

ZERO CARBON, VISION ZERO

WRITTEN BY
PEDRO GOMES
PEDRO HOMEM DE GOUVEIA

The decarbonisation of urban mobility is a political priority all over Europe. With public incentives and market growth, the number of e-vehicles is expanding. But zero emissions are not enough — electromobility must also become safe. Are we fully aware of the challenges and opportunities brought by electric vehicles to road safety? And **how can we make Zero-Carbon support Vision-Zero**?

Climate change is an urgent and tangible reality that impacts our daily lives through more frequent and severe extreme weather events, such as heat waves, droughts, and flooding. These phenomena directly threaten human health, disrupt local food systems, and pose risks to our built environment.

To combat this global challenge effectively, it is crucial to prioritise the transformation of our transportation systems to be as environmentally friendly as possible. Currently, the transport sector is responsible for 14% of global greenhouse gas (GHG) emissions, with 75% of it attributable to road transport, either of goods or people.

Electric vehicles (EVs) represent a vital solution in the fight against climate change, particularly in the context of the EU's climate mitigation strategy. Unlike internal combustion engine (ICE) vehicles, EVs do not rely on fossil fuels, leading to zero tailpipe GHG or air pollutant emissions. Their simpler design and superior performance also translate into reduced maintenance requirements, making them a more sustainable and cost-effective option.

To maximize EV benefits, however, we need suitable charging infrastructure to ease driver range anxiety. The European Union's Alternative Fuel Infrastructure Regulation (AFIR) addresses this, deploying infrastructure to meet energy demands and promote EV adoption.

How e-mobility impacts road safety

First, e-mobility comes in many sizes and shapes: cars, vans, light electric vehicles (LEVs) like e-scooters, e-mopeds, e-cargo bikes, and others for last mile distribution, but also e-buses, e-trucks, electric waste collection vehicles and autonomous vehicles (big and small). These bring different benefits and opportunities but also challenges, that we must address to avoid any backlash resulting from transitioning to sustainable urban mobility. Then, we must consider several aspects when we look at e-mobility from the point of view of road safety.

Speed

The first concern is the speed. Like ICE cars, EVs can travel at high speeds too, and they can reach those speeds quicker, as they have instant torque and accelerate faster. EV drivers might sometimes not be fully aware of excess speed because an EV does not 'provide' them with the usual signals, like engine noise. Technology will play a key role in minimising this — with an electric powertrain, it is easier to implement Intelligent Speed Assistance (ISA). And if we go beyond cars, there are lots of inexperienced LEV users who do not fully grasp that it is a road vehicle, not a 'toy', and are often not aware of the speed and acceleration. Manufacturers and local authorities need to do a better job explaining this.





Noise

The second concern is the lack of noise. Engine sounds help people with visual disabilities detect the approach of cars, buses, and motorcycles. Silent EVs are a major benefit for our quality of life, and a desirable outcome for cities and regions. But they bring additional challenges for vulnerable road users, like the elderly, people with visual disabilities or hearing-impaired people.

Creative thinking is needed, as some EVs' current 'buzzing' noise is very intrusive. We need to think about noise from a psychological and neurological point of view, and not just from a purely physics point of view! Regardless of the approach, there is a need for better technology — EVs need to be intelligent enough to produce noises only when approaching pedestrians, to reduce their overall nuisance. Regulators should also consider establishing size-dependent noise emitted by EVs.

Size

The third concern is size. Like ICEs, EVs are getting bigger. The fast growth of electric plug-in SUVs is a matter of concern, as they are more dangerous for people walking and cycling. Size still matters — across the entire Belgian car fleet, an increase of 60 kW power or 135 kg weight increases pedestrian death risk by 10%, and for an increase of 575 kg, this risk rose by 50%.

Manufacturers argue that EVs need to be bigger due to EU's safety regulations and to support larger batteries that respond to drivers' 'range anxiety'. But do we really need such cars for our daily commute? Therefore, we must ensure that not only do we have fewer cars in our cities and regions, but also smaller, shared vehicles.

Infrastructure

The fourth concern is infrastructure. To keep up with the demand, we need EV chargers in public space. But these must not become an additional barrier for pedestrians. Pushing vulnerable users onto the road is extremely dangerous. On one hand, the charging infrastructure must be there, but on the other hand, cities need to be 'creative' and provide charging infrastructure that does not act as an added barrier. Future innovation will produce out-of-the-box solutions, but we also need answers for the present.

Diversity

The fifth concern is diversity. E-mobility is expanding way beyond cars, and now powers growing numbers of LEVs, automated vehicles... and whatever is coming next. This diversification is rapidly growing the number of “vulnerable road users on wheels”. LEVs are currently extremely popular as a clean last-mile travel solution in cities, sharing space with pedestrians and cyclists. This started during the COVID-19 pandemic and shows no sign of slowing down. How do cities fit all users in the same spaces? Failure to plan and act proactively might lead to drastic solutions. Intelligent street design and geofencing will help pedestrians and vulnerable road users. E-hubs provide an interesting solution, by creating designated areas for LEV parking, in combination with other transport modes.



Doing a Zero-Carbon Vision-Zero the right way

Achieving more sustainable urban mobility is a priority for local governments all over the world. As an essential tool to reach that goal, zero-emission mobility is advancing fast. However, simply reducing vehicle emissions is not enough; urban mobility must also prioritize safety. While e-mobility is here to stay and clearly represents an opportunity to improve the environment and our quality of life, its challenges, as much as its opportunities, are significant and require careful consideration.

As always, disruption and innovation bring new risks, and only by acknowledging, understanding, and dealing with them, one may leverage their potential in full.

