

DECONSTRUCTING HARRY: LOW EMISSION ZONES AND THEIR MOST RECURRENT CRITICS

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After decades of developmentalism where cities have been built to provide 70% of public space for private car use ([ref](#)), citizens have seen their pavements narrow and their air polluted with gases and noise for years. As environmental parameters are increasingly taken into account and their relationship with people's quality of life is better understood, Europe has decided to promote policies aimed at improving these data and tackling several fronts at once with Low Emission Zones (LEZs).

With the approval of [Law 7/2021 on Climate Change and Energy Transition](#) together with [Royal Decree 1052/2022](#), the Low Emission Zones (LEZs) made their official appearance: municipalities with more than 50,000 inhabitants were obliged to delimit and manage the zones within the exercise of their functions.

LEZs are urban areas that act as bubbles where vehicle entry is conditional on the carbon emission levels associated with the type of vehicle. The ultimate goal is to improve the air quality of cities and the health of the population, but, in addition, clearing cities of cars is expected to achieve other benefits such as noise reduction, reducing Greenhouse Gas (GHG) emissions, taking advantage of public space for greater social interaction, enabling urban regeneration and incorporation of natural elements and adaptation to climate change, among many others.

These zones seem, therefore, to be an instrument capable of favouring a change in the city model, but be careful, because if they are not approached with caution, they can also produce undesirable adverse effects. The problem is, as is almost always the case, that if things are not done well, it will not be long before the bubbles burst. As we already know, any restrictive policy has to be well founded, its casuistry analysed and its characteristics well defined so that it does not have adverse effects to those intended.

The undesirable effects that can occur with the LEZ are: the rebound effect, where vehicles move from one street to the next; the barrier effect, where the area behaves like a ring separating social classes; the island effect, whereby the difficulty of access causes a loss of economic activity; the effect of "hostelerisation" of the streets; among other issues. **Combating these effects must be done from the design of the ZBE, dealing with the issues with strategic intelligence and thinking beforehand about the cascading effects** that may occur in order to anticipate and foresee an adequate public transport system, peripheral car parks, shuttle buses to the LEZs, accompanied by economic analyses to avoid any kind of island effect and impact on economic activity that would have repercussions on the current centrality of these areas.

To all this, we must add that, historically, restrictions on mobility have been met with **a reaction of citizen protest**. The same is happening with the LEZs, where we have seen how the social reaction has led the High Court of Justice of Catalonia (TSJC) to annul the LEZ for "lack of reports", for an "excess in the geographical scope of implementation" and for an "excessive restriction on the type of vehicles affected". Or the most recent ruling that obliges Barcelona City Council to return to the state prior to the pacification works in Consell de Cent street, works valued at more than €50m.

These collateral effects are issues to be assessed in order to establish an EBZ with guarantees and to send a clear message to the population backed by monitoring and evaluation indicators that support them. Some of the main issues that generate mistrust towards the EPZs are listed below, in contrast to the benefits that are sought, as a way to ensure the correct application of the regulation.

“LEZs are a disguised boost to the car industry”

One of the most vociferous opponents is the defence that the EPZs are aimed solely at boosting the car industry. The restrictions on cars depending on the environmental label they have, which induce a renewal of the vehicle fleet, have been widely criticised.

According to the latest data from the Spanish Association of Car and Truck Manufacturers (Anfac) (ref), the Spanish car fleet is made up of approximately 29.9 million vehicles. Of these, only one million have the 0 Emissions or ECO label from the DGT (Spanish Directorate-General for Traffic), which reflects a rather worrying picture: **more than 28 million vehicles without an environmental sticker or with a B or C label.**

The truth is that **it is still too early to see results that reflect that the LEZs have induced a higher rate of private vehicle renewal.** What we are beginning to see is a certain change in mobility patterns, **which has led to an increase in the use of motorbikes and, to a lesser extent, to an increase in the use of cars and public transport, the latter being mainly encouraged by women** (ref.). Furthermore, studies indicate that Taxis, VTC and car sharing should be promoted as the options that make Low Emission Zones more efficient (ref.).

In any case, the recommendation would be to establish initial limits with progressively increasing restrictions in order to be able to match the renewal of the vehicle fleet with the population's capacities.

“Electric vehicles also have an impact on the environment”

Another of the open fronts relates to the environmental impact of electric vehicles. It is worth remembering that **the objective is the reduction of the number of cars and not the 1:1 replacement of conventional cars by electric cars**, because, in fact, that is not the point.

In this respect it seems that what produces the greatest consensus is the view that only **a comprehensive change of mobility** with significantly fewer cars and a shift towards walking, cycling and public transport will allow for climate-friendly and environmentally balanced mobility. Combustion and battery-powered cars are forms of driving that have an impact on the environment and should be avoided if possible. In direct comparison, the battery-powered car is less harmful to the environment than the internal combustion engine.

In any case, **over its life cycle, a typical electric car in Europe produces fewer greenhouse gases (GHGs) and less air pollutants or noise, compared to its petrol or diesel equivalent.** Emissions are typically higher in the production phase, but over time are more than offset by lower emissions in the use phase (EEA). In the same vein, a study carried out by IHOBE, the Basque Government's Public Company for Environmental Management, indicates that: The vehicles with the lowest environmental impact are pure electric vehicles (BEVs), followed by plug-in hybrid vehicles (PHEVs) (ref.).

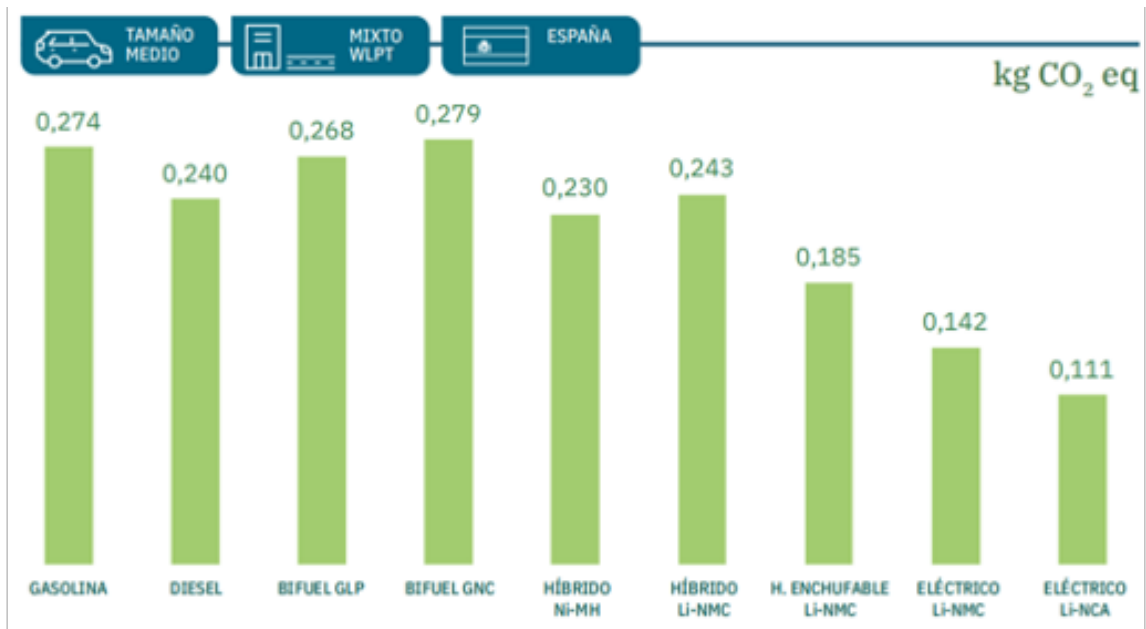
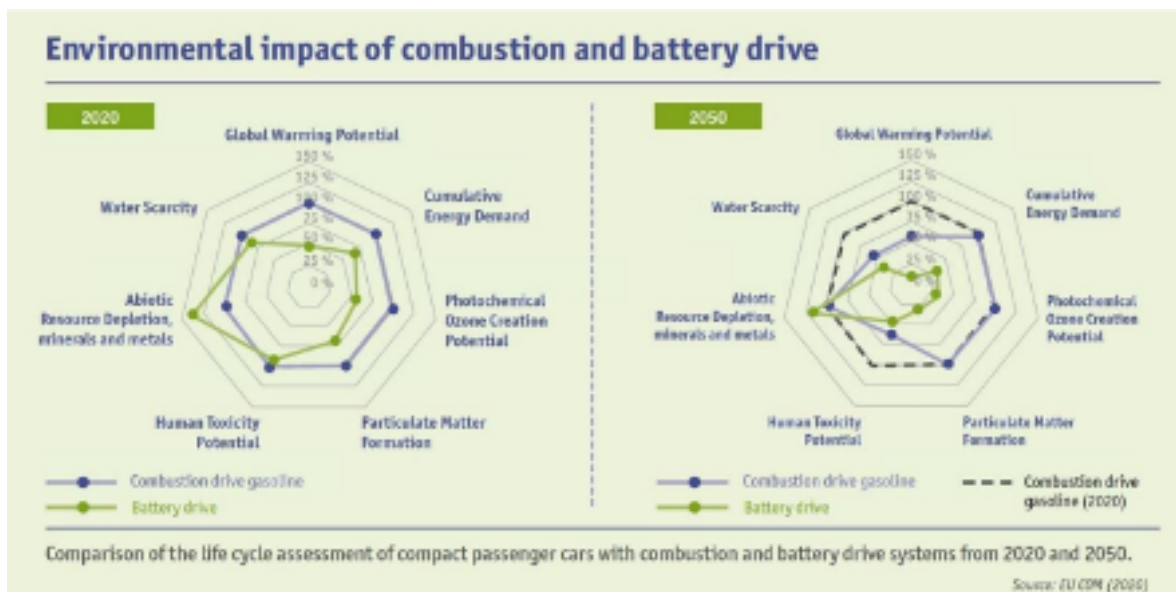


Figure 1 – Comparison of the impact on climate change of the 9 technologies analysed for a medium-sized vehicle travelling 15,000 km per year, making a mixed WLTP journey (52% urban, 48% interurban), circulating in Spain (ES) (kg CO₂ eq.). Impact per km travelled.

Looking at other environmental effects, electric vehicles perform worse on mineral and metal consumption and the combustion engine on energy consumption, global warming and ozone precursors. It is assumed that by 2050, battery propulsion will have a significantly lower environmental impact than combustion propulsion in almost all areas (EEB).



“It only moves pollution from one area to another.”

This phrase refers to the so-called *Rebound Effect*. This can occur when the restriction of traffic in the low emission zone leads to the displacement of the same traffic to the surrounding environment and therefore does not have a positive impact beyond the low emission zone.

The rebound effect is more likely to occur in a small LEZ, where drivers change their usual routes to avoid the restrictions, increasing traffic intensity in other areas, which increases congestion, travel times and parking times in neighbouring areas, all of which are linked to higher pollutant emissions. This effect has also been attributed to Barcelona's "superblocks", however, **this does not seem to be the case in all cases and the results do not have sufficient evidence.**

The recommendation is that the rebound effect should be taken into account when delimiting the LEZ, and that, **even if it cannot be avoided, the pollution should be displaced to less populated areas, reducing the effect on the population in absolute terms.**

“LEZs benefit the rich and hurt the poor”

It is true that LEZs tend to be concentrated in the central areas of a city, which are generally places with a per capita income above the city average ([ref.](#)) It is also the case that poorer households tend to drive less modern vehicles, so that the general application of the standard, without incorporating these considerations, has grounds to be questioned. **This may result in the LEZs acting as a "social frontier", a kind of boundary between social classes** where only people with higher incomes have access because they have a new (and more expensive) car, or because they live within the LEZ and own a car park.

Indeed, **this effect can be particularly sensitive** and one should not lose sight of the economic and social border that can result from the LEZs. Barcelona, for example, will exempt people with the lowest incomes from the Low Emission Zone ([news](#)).

Another consequence of class inequality is that **the more vulnerable population is more sensitive to air pollution.** [ISGlobal](#) refers to a study published in 2021 that showed that, despite not necessarily having a higher exposure to pollution, in the most deprived areas of Barcelona, mortality attributable to PM2.5 tended to be higher (1.22 times) compared to the least deprived areas. This suggests that the most deprived subpopulations suffer most from exposure to these environmental health hazards.

The recommendation to ensure that the risk of an LEZ affecting lower incomes does not materialise is that the measures to be implemented incorporate actions to improve sustainable modes (walking, cycling and public transport) and discourage car use (all types of cars: with and without environmental badges). Exceptionality in the application of restrictions for the lowest incomes can also be considered, as in Barcelona ([ref.](#)).

“No scientific evidence of air quality improvement”

In terms of public health, and in relation to the quality of the air that citizens breathe, it is worth noting that in the most densely urbanised areas, 80% of pollution comes from road transport ([ref.](#)).

If we look at the effectiveness of LEZs in reducing air pollution and the direct effect on health, studies carried out in other countries confirm the relationship between areas with traffic restrictions and pollution, indicating that "LEZs are indeed effective in reducing pollution" ([ref.](#)). In a study carried out in Barcelona, it was estimated that during 2018, pollution caused the death of 351 people in the city. ([ref.](#)) an improvement in air quality and noise to improve the health of citizens, and reduce premature mortality (estimated at 38,500 premature deaths each year in the State, [EEA](#)), limiting the use of private vehicles is a sensitive issue.

Low and ultra-low emission zones in London (UK) have led to a **reduction in the concentration of air pollutants such as particulate matter (PM10) and NO2**, according to [a 2022 scientific study](#). This research also looked at the direct link between these low and ultra-low emission zones and

health problems in the UK capital and found **an improvement in health problems** such as chronic obstructive pulmonary disease ([COPD](#)), anxiety and sick leave, as well as a benefit of £963 million for the general population.

The health effects of LEZs have also been studied in Germany. There, they have reduced air pollution levels in urban areas, resulting in health benefits such as **fewer air pollution-related diagnoses in hospitals within the LEZs**, [a 2021 study](#) concludes.

In any case, the relationship between **the influence of LEZs on pollution and the effect on health must continue to be analysed**. The difficulty of these studies lies in the fact that it depends on numerous factors such as: the very scope of the LEZ in question, the need for time periods to ascertain the reduction of diseases, meteorology and/or urban layout, among other issues, can complicate measurements and comparisons), it is known that the effects of air quality have a direct impact on mortality.

In addition to the direct relationship with mortality, costs related to hospitalisations have also been studied, showing that **meeting international health recommendations on air quality, physical activity, access to green spaces and temperature would save 9.3 billion euros in the city of Barcelona** ([ref.](#)).

“LEZs lead medium-sized cities to become mere pedestrian spaces for terraces”



While it is true that many examples of pedestrianisation have led to the emergence of avenues full of terraces, the reality is that there is now around 70% of public space for vehicles (roads and car parks) and 30% for people (and other uses). The reality is that around 70% of public space is now given over to vehicles (roads and car parks) and 30% to people (and other uses). The emergence of the LEZs will make it possible to rethink the distribution of the use of public space and implement urban regeneration measures aimed at having richer uses such as living, playing, social relations, it is the space of coexistence par excellence, commerce, cultural and artistic events, leisure, and/or sport.

The possibility of reconceptualising the streets is an opportunity that should not be missed, nor

should it be carried out in a way that does not take into account this mix of uses of public space so that they have an impact on the improvement of the city in all its dimensions.

It is recommended that thought be given to the possibilities of transforming the city model. The creation of pedestrian routes, cycle highways, urban green corridors, healthy school environments, spaces for social interaction, centres for active ageing, among others, should be considered.

“LEZs will produce a Gentrification Effect”

Another concern is that because the LEZs will allow for the urban transformation and improvement of these areas through public investment, these environments will be more in demand and a gentrification effect will occur. Gentrification occurs when a process of urban renewal and redevelopment is accompanied by an influx of middle or upper class people, often displacing poorer inhabitants outside the intervention areas ([ref.](#)).

To address these consequences, **redistributive economic policies** can be envisaged where the resources generated by gentrification can be used to boost the regeneration of other, less centrally located sites. Speculative pressure from uncontrolled development could also be reduced through social programmes.

“Vehicle restriction policies have been in place for years without the need for so many cameras, sensors, ordinances and restrictions.”

Policies to limit the use of private vehicles are not new and it is true that there are international success stories such as Pontevedra. Between 1999 and 2015, the city reduced 53% of traffic in the city as a whole and 77% in the inner ring road. No environmental labels on cars, no number plate cameras, no need to scrap some cars for newer ones.

The truth is that the Royal Decree that regulates the LEZs indicates that LEZs can be designed without applying restrictions according to the polluting potential of vehicles (as long as it can be demonstrated that the objectives of improving air quality and mitigating climate change are met). **It is therefore up to the local councils to decide the scope, depth and complementary regulations they want to endow the LEZs with.**

Although not mandatory, **it is important to have strategies, tools and studies that reinforce the implementation of a LEZ** in order to be able to analyse its impact in terms of emissions, improvement of public space and socio-economic impacts, and thus have greater flexibility when regulating mobility conditions. It is also particularly important to be able to have a legal basis in case there is evidence to justify the decisions taken.

“The LEZs will have a negative impact on the shops and businesses affected”

Another of the controversies surrounding the LEZ is the belief that due to traffic restrictions and greater difficulty in accessing city centres by private vehicle, tourists and citizens will stop visiting

these places.

In this sense, the results of the study carried out by [Clean Cities](#) on the impact of the LEZs on retail trade in European cities indicate that, in the cities analysed, the effects of the LEZ are positive in terms of retail activity and that, in addition, the number of empty premises decreases, which implies greater activity and attractiveness of the streets within the LEZs.

Among the conclusions of the studies carried out in Madrid, Stockholm, Oslo, London, Berlin, Brussels, Bern, etc. It is observed that BEZs lead to a change in mobility patterns which translates into **an increase in the number of pedestrians on the streets, between 14% and 43% more, leading to increases in retail sales of up to 30%.**

Another striking finding is that transforming car parking spaces into space for bicycles can have a positive impact on local businesses: for each square metre of parking space, customers who cycle spend 7,500 euros, compared to an average of 6,625 euros spent by customers who cycle, compared to 6,625 euros spent by car.

This contrasts with the common belief that customers who shop in their private cars outnumber those who shop by public transport, on foot or by bicycle.

Spending by cycling and walking customers can account for as much as half of total retail income, and two thirds of shopping trips.

The decline in the number of customers shopping by car is more than offset by those who walk, cycle or use public transport, as they are more numerous and visit shopping streets and shops more frequently.

Despite the fact that people who drive to shops spend more on average, people **who walk or cycle** visit more frequently and represent a higher proportion of total customers, which means **a higher total contribution to shops' revenues.**

Social Interactions on Three Streets - Neighboring and Visiting

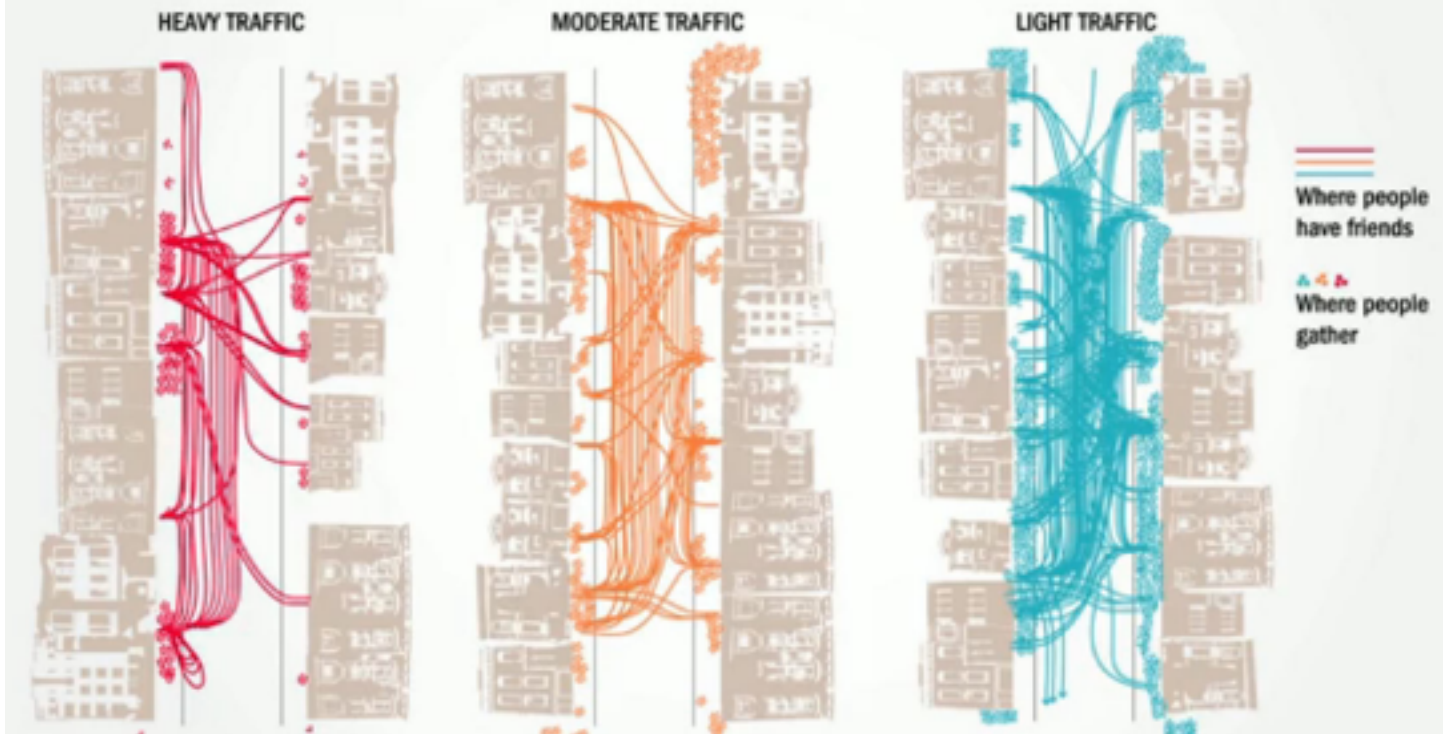


Figure 2. The impact of traffic flow on neighbourhood livability ([ref.](#))

RECAPPING

The LEZs are not the definitive instrument, but if they are approached intelligently, they can trigger a change in the city model that benefits all citizens

Anticipating the negative effects of the implementation of an EPZ should be done from its conception, dealing with the issues with strategic intelligence and considering in advance the cascading effects that may occur, in order to turn this policy into an ally of the city's transformation process.

LEZs are an urban planning instrument that reinforces society's decarbonisation policies.

In order to ensure that decarbonisation "leaves no one behind", it would be ideal to establish initial limits with progressively increasing restrictions so that the renewal of the vehicle fleet, the improvement of public transport and the pedestrian and cycling infrastructure can be harmonised.

The LEZs are committed to minimising the use of private vehicles in our cities

Remember that the objective is the reduction of the number of cars and not the 1:1 replacement of conventional cars by electric cars, because, in fact, that is not what it is all about.

The LEZs are configured as the vanguard of the new city model based on sustainability and the recovery of public space for citizens

Although they are not a panacea, they can become a policy that can serve as an opening spearhead when it comes to rethinking the regeneration of public space in the interests of a better quality of life in cities.

The LEZs propose a reconversion of the way we move in the city.

The approach of a LEZ must consider the city as a whole and foresee the consequences it may have on the neighbourhoods outside the delimitation in order to provide the necessary means and infrastructures to favour sustainable mobility in the movement of citizens.

LEZs are the main instrument for combating urban air pollution

Numerous studies confirm the link between traffic restriction zones and pollution, stating that "LEZs are indeed effective in reducing pollution by reducing the concentration of particulate matter that affects the health of the population.

LEZs have the potential to favour a redesign of streets.

The possibility of reconceptualising streets is an opportunity that should not be missed, nor should it be carried out in a way that does not take into account this mix of uses of public space in order to have an impact on the improvement of the city in all its dimensions.

The LEZs have the potential to introduce a new way of making policy based on information.

Cities are investing a lot of resources in order to implement a LEZ that really provides a clear response to the challenges it seeks to alleviate. On this path, progress is being made in the digitisation of the city, with greater use of information to analyse and understand urban diversity through models and tools that facilitate decision-making.

LEZs are able to boost retail trade and increase social interaction

The results of the study carried out by Clean Cities on the impact of LEZs on retail trade in European cities indicate that, in the cities analysed, the effects of LEZs are positive in terms of

retail activity and that, in addition, the number of empty premises decreases, which implies greater activity and attractiveness of the streets within the LEZs. In addition, streets with less vehicle presence stimulate the presence of citizens and increase social interaction.

