



ELECTRIC VEHICLES CHANGEOVER SUSTAINABLE MOBILITY



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This publication is dated September 2021 and is one of 24 documents being produced as part of the Local Councils' Association's ResidentFirst vision 2024, under the pillar of Sustainable Mobility.

This document is one of the twenty-four technical documents the Local Councils' Association, with the assistance of several experts, is publishing under 'ResidentFirst', a multi-year project in partnership with Local Councils. ResidentFirst focuses on Sustainable Mobility, Open Spaces, Smart Cities and Green Environment, further identifying how these pillars may improve the quality of life of our residents in their respective localities.

This document results from strategic research focusing on transport technologies' social and environmental effects and how new technologies will affect social and urban development from a local context. It proposes strategies and instruments to ensure that new technologies will contribute to sustainable development and better mobility.

The ResidentFirst technical documents aim to serve as an informative tool to Local Councillors and Mayors alike. They communicate the Local Councils' position, proposals and ideas to the Government Ministries and Agencies, so as to improve collaboration and coordination. Proposed solutions take a simplified stepped approach to make the document more readable and adaptable to the various communication channels to the public. The Local Councils will invite their residents to be part of the process through further public consultation.

This document is complementary to the National Policy for EV Public Infrastructure; the National Transport Strategy 2050 - which sets out the long-term vision and policy framework; and the Transport Master Plan 2025, noting the commitments, targets and specific measures relating to EV infrastructure and electromobility in relation to EU policy. This document also supports the Green Paper issued by the Ministry for the Environment, Climate Change and Planning on the use of cleaner vehicles on our roads.

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Introduction

Our country must reduce its greenhouse gas emissions from transport faster to reach its climate goals and air pollution targets. One of several measures is the electrification of mobility of people and goods.

For this to happen, we need to install a carefully planned charging infrastructure across our towns and cities. Residents may need to change their mobility habits, and battery production needs to become more ecologically and socially sustainable. Local Councils may contribute to reaching climate goals as well as increasing social and economic sustainability. Other measures include increasing the availability of, and providing safer infrastructure for, more diverse multi-modality. These include walking, the use of micro-mobility, cycling and public transport (see the other documents produced by the LCA, including Walkability and Accessibility, Last Mile Transportation and Shared Transport), and a shift to private electric vehicles on the roads.

Many local and national authorities worldwide support and promote the conversion to EVs by providing financial and fiscal incentives, developing specific regulations, and complementing policy to reduce their emissions and reach air quality goals. As technology improves and costs slowly decrease, the transition to EVs will become increasingly feasible for residents and governments alike.

A well-planned infrastructure requires significant public financial investment in tandem with quality urban planning, the planning of incentive schemes and cost projections upon national targets, and a timing programme of how charging infrastructure will grow and when and where it is best installed. Planning also involves producing and distributing electricity, the environmental friendliness of the energy generation, and the electric grids' power capacity to achieve a dynamic charging infrastructure master plan that can adapt to growth and accommodate new technologies as they are developed.

The amount of stakeholders involved in this process makes it necessary to look at the whole picture while the individual parts are still studied sufficiently. The involvement of Transport Malta, Infrastructure Malta, the Planning Authority and Local Councils, coordinated by the Ministry for Energy, Enterprise, and Sustainable Development, is essential for this changeover's success.

Step 1

We need to identify the challenges that EV will solve and those that it will not.

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EVs will reduce carbon dioxide emissions from our towns and cities but do nothing for traffic congestion and the lack of public parking spaces. We, therefore, require a broader and more holistic policy so that the total number of vehicles may be reduced, centred around active transport policies, prioritizing walking and cycling.

The increase in EVs will also bring a general improvement in ambient air quality through the removal of pollutants generated from exhaust emissions. EVs still emit particulate matter (predominantly the coarser fraction: PM size ranging from 2.5 to 10µm) from non-exhaust emissions, produced from the wearing down of brakes, tyres and road surfaces, as well as the resuspension of road dust. Moreover, because of their increased weight due to the battery, EVs may contribute to more PM10 emissions. Despite these emissions, the benefits of EVs are particularly relevant for Malta. Distances are short and many urban areas suffer from toxic air and noise pollution, which severely affects the health of local residents and their quality of living.

Local data shows the direct relationship that air and noise pollution levels have with traffic congestion. The inner harbour area, which is also the most densely populated, recorded elevated levels of nitrogen dioxide, an air pollutant which can be directly associated with road traffic emissions. With respect

to noise, the results of the strategic noise mapping and the population exposure assessment carried out by the Environment and Resources Authority (ERA) indicate that the predominant source of noise exposure across Malta is from road traffic sources and this can also be linked to the steady increase in the number of daily registered vehicles on the roads. EVs will contribute to a cleaner and quieter environment for residents.

The challenges that are not solved by Electric Vehicles.

Traffic remains a challenge that EV will not change. The main solutions here lie in prioritising walkability within our urban areas and moving towards a modal shift, through shared transport and other more sustainable modes, particularly within the last mile of travel and of freight.

This challenge becomes more pertinent when considering issues of obesity in Malta, a serious health concern due to both dietary patterns and the lack of an active lifestyle – 2020 statistics released by NSO reveal an obesity rate in the Maltese population of 25.5%, which greatly exceeds the EU-average (14.9%); in turn, the more recent Eurostat statistics, albeit for 2014, show over 55% of Maltese women and over 65% of Maltese men being overweight and/or obese. A corresponding study by PwC carried out in 2017 indicated that over 25% of the Maltese adult population over 15 years was obese in 2015.

The push for sustainable mobility and the reduction on the reliance of private vehicles will necessitate the identification of a hierarchy of travel modes, wherein walking and cycling prevails over other modes. This discussion is expanded upon in a number of other upcoming documents produced by the LCA – Walkability and Accessibility, Last Mile Transportation and Shared Transport.

Parking is another challenge that EV will not solve. In March 2021, NSO statistics indicated that there were 404,303 licensed motor vehicles in Malta, of which over three quarters were passenger cars (a motorisation of around 700 passenger cars for every 1,000 inhabitants). In turn, as of April 2021, there were 270,000 licensed motorists in Malta – an even higher rate of motorisation, implying

around 1.5 passenger cars for each licensed motorist. These statistics have a significant implication on urban space management, which include parking pressures, in turn becoming an essential consideration from both policy and decision-making points of view. A number of solutions may be envisaged, discussed in the LCA document Parking Projects, such as incentivising households owning one car by leaving the current cost of single car ownership and increasing the road license from the second car upwards.

The excessive importation of vehicles that are furthermore idle for most of the time, as well as minimum parking standards imposed by the PA that have increased building development requirements, have in turn both contributed to the reduction in available open spaces and walkable paths, as every little public available space has been exploited to create parking spaces, reducing our pavement widths and occupying large open spaces which would be better served as gardens and play spaces for children and adults alike. In spite of this, the lack of public parking spaces is still a problem felt by many individuals, especially in areas that have experienced redevelopment and are characterised by higher building densities. Solutions here, again discussed further in the LCA documents Parking Projects and Shared Transport, would be financial and fiscal incentives that reward residents who choose not to purchase

a car (in the form of measures such as free public transportation and the subsidisation of car-pooling and other shared schemes).

The shift to Electric Vehicles

EVs are generally more expensive to purchase than conventional fuel-based vehicles (although the cost of batteries is decreasing), as when deciding which vehicle to purchase consumers usually account for the upfront price more heavily than for future fuel savings. Nevertheless, and despite such capital outlay, the total cost of ownership might be reduced when considering the contribution of Government tax incentives for higher-purchase agreements.

Another obstacle to a rapid changeover is the expandability of electrical supply from the national energy grid, providing pressure on an already-challenged energy network which will continue to increase. The national electricity service provider will need to handle increased variation in supply and demand in the electricity grid as well as changing consumer needs, that add to increased volatility. The use of technology may help to achieve more efficient power

consumption in the grid, keeping the costs down for customers, companies and society alike.

The change-over to rechargeable vehicles can be accelerated by an increase of solar cells and other renewable electricity generation within private households. When households generate their own electricity, there should be financial incentives to store self-generated energy. Electric vehicles can make use of the renewable, self-generated electricity, through local battery storage, hot water heaters and other electricity appliances. Residents should be encouraged to become energy self-sufficient and actively contribute to achieving sustainability.

Additionally, according to Malta's Low Carbon Development Strategy, "given the assumed increase in energy demand over time, and in order for the energy grid to decarbonise by moving away from the use of gas over time, the proposed scenario considers the installation of an additional interconnector as an alternative source of supply". This additional interconnector may hence provide a solution for the future national electricity scenario.



Step 2

Soon, transportation will be increasingly multi-modal and more shared. We need to look at EV as part of the sustainable mobility puzzle.

photo source: Vince Jacob, Unsplash

Our means of transport will vary from day to day, as we can use technology and smart algorithms that will optimise our journey on that particular day to arrive quicker, cheaper and in an environmentally aware manner.

The rapid conversion to rechargeable vehicles is challenging. In a highly competitive and mature market, the automotive industry has invested heavily in today's internal combustion engine and car design to obtain the best possible value. Most drivers are used to the current refuelling system, and know how far they can drive on a full fuel tank, how long it takes to refuel and what they get for the cost of fuel. Electromobility means changes in both behaviour and costs. Batteries take up space in the vehicle, take considerably longer to recharge compared to combustion engines and require a higher capital outlay. Despite all the possible efforts, in the end, it is the customers who decide whether the value of EV is high enough to choose one instead of the combustion engine types that today dominate the market.

Transportation fleets, of both people and goods, can accelerate the roll out to rechargeable vehicles. The greatest advantage of such fleets is that routes are mostly predictable, the use falls within an established schedule and vehicles are parked at the company's depot when not in use. Thus, concerns

of battery range, charging points and charging duration are less of a determining factor here.

With today's accessible technology, fleets can become shared mobility tools to transfer people and goods efficiently and more cost effectively. These sharing concepts are key to reduce our reliance on private motor vehicles and as a result reduce the number of vehicles from our streets. The younger generation find it easier to accept such concepts but it is important that we make it attractive to older generations too. Mobility-as-a-Service (MaaS) becomes more mainstream if it provides cheaper, quicker journeys.

Paving the way for EV shared fleets, that consists of electrified micro-mobility (Scooters and Bicycles), shared self-driven vehicles shared chauffeured or automated driven vehicles, circular city loops, public transportation and last mile goods transportation requires a solid and comprehensive strategy from the fiscal and financial incentive side to a well planned charging infrastructure. Shared and designated charging hubs, last mile goods warehousing depots, and other measures are included in the

LCA's Shared Transport and Last Mile Transportation documents.

A number of European cities have current regulations in place to make shared mobility providers reduce carbon emissions across fleets. Car-sharing providers are also proactively complying with increasingly strict emissions regulations because they want to secure long-term access to city centres. Madrid has banned conventional vehicles from crossing the inner-city area and is now only accessible for electric cars and hybrids with an electric range of more than 40 km, known as the low-emission zone concept. This is one of the reasons why the city has become an EV-sharing hotspot. Cities like Hamburg provide free on-street parking or reduced parking fees for electric cars, for car-sharing providers. Paris is offering between 15-20% off parking permits for electric

car-sharing providers. Even Malta has launched a national car sharing scheme, which is discussed in the LCA's Shared Transport.

Charging of large EV fleets is one of the challenges cities and shared mobility providers have to cope with. In large cities, the public charging infrastructure is an integral part of the setup for charging the vehicles within the active commercial area. Additionally, partnerships between shared mobility providers and private companies that install and operate charging infrastructure are vital. WeShare, for example, formed an alliance with retailers like Lidl or Kaufland. Both chains are providing charging stations on their parking lots, which customers can use during business hours while the e-car-sharing provider will use the chargers at night.

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Step 3

Setting up a national sustainable mobility policy and a clearly communicated roadmap with all stakeholders is critical to the speed of this transition. Local adaptation by region, local councils and by neighbourhoods is crucial for success.

Attaining a fossil fuel-independent vehicle fleet in Malta is a government objective that generates necessary investments into vehicle electrification. A mass-market of electrified vehicles presents benefits, such as reduced greenhouse gas and air emissions, less oil dependence and less noise. Together with self-driving buses, electric scooters, mobility-as-a-Service and other revolutionary technologies related to the movement of people and goods all have great potential to improve mobility in our cities and communities. But it will not happen automatically. National authorities need to work with Local Councils who, together and in consultation with their communities, adapt these plans to improve their residents' overall quality of life.

The creation of a highly skilled team of stakeholders, joining efforts and sharing knowledge and expertise is necessary to build a high-level design strategy which would lead to the establishment of a charging network roadmap and installation guidelines. The team would also have the responsibility to set targets together with the necessary fiscal and financial incentives plan. It is important that the setting up of these targets take into consideration environmental objectives, which then lead to health benefits. These would lead to the formulation of policies and good practice guidance that eventually serve as a basis for permits and inspection. The

development of a national educational campaign strategy will also be within this team's remit. The following stakeholders should be represented in this team:

- Policy makers within the Ministry for Energy, Enterprise and Sustainable Development and the Ministry for the Environment, Climate Change and Planning
- Finance Ministry
- Other Authorities, including Transport Malta, Infrastructure Malta, and the Planning Authority
- Local Councils, resident groups and other related NGOs.
- Enemalta plc
- The Foundation for Transport

Other consultative stakeholders include: Charging station operators, Electric Vehicles car importers, Malta Public Transport, public utility companies, the business community through their representatives and shared mobility operators.

Local Councils should play an important part in drafting an inclusive and holistic National Policy as they have the potential to contribute significantly to more public involvement, acceptance and implementation. Running the project is costly and should be given weight too.

Through the involvement of Local

Councils, master planning may take place from a local perspective. This process would enable the much-needed transfer of local knowledge onto a GIS system – this includes projects such as Slow Streets, a combination of walkable and cyclable paths connecting the services of every individual town and city, available parking stock, gardens and other open spaces, lighting and urban street furniture. This information will be valuable to strategically place public chargers. Furthermore, Local Councils can play an active role in ground research to keep tabs on the existing travelling patterns of residents from, to and within their localities.

Step 4

The correct data, at the right time and in the right way, should guide our decisions. Clearly communicated national targets and timely data collection and analysis will keep us in line with ever-evolving technologies and market realities.

Photo by Clay Banks on Unsplash

The access to data from the various stakeholders will empower policymakers to plan, manage, and continuously optimise incentives to increase electric vehicle adoption at the lowest cost and in the shortest time. Incentives and other activities designed to promote and reach our national electromobility Key Performance Indicators (KPI) should be continuously monitored.

Research into electromobility that is focused on the evolving technologies such as battery technologies, energy conversion, energy management and charging infrastructure, user behaviour and new business models, should guide our decisions. The duration of terms of service agreements and government concessions should be short in order to enable the government to introduce new technologies and realities as the market evolves swiftly and effectively.

From publicly available international data, it is clear that there is no one-size-fits-all solution to the successful and sustainable shift to electromobility. In all probability, Malta will have to have its own learning curve and needs to rapidly react to the market signals. Some key indicators should guide our strategies with regard to the number of public chargers, the mix of charging technologies and the rollout timing programme. For example, having the

least road space per household with one of the highest number of registered cars per population in Europe should strongly suggest that we need to make use of the more rapid charging technologies to have the best public space management. The ratio of EVs to public chargers reveals differing charging infrastructure development across markets. Other data such as the number of private car park spaces, in residential, commercial and institutional developments, in relation to the volume of public on-street parking, are all important variables that should directly influence our charging stations installation targets.

Nevertheless, the analysis of up-to-date international data of the most successful rollouts may give us insight on the best practices that our country could adapt, or possibly adopt. The table hereunder identifies the strongest policies and practices in the cities of London, Oslo and Amsterdam according to different

categories related to EV targets. Other cities could use and follow this list of actions and regulations for the purpose of their own policy development, with necessary adjustments according to local market conditions, local EV demand and available government budgets.

The two types of charging – AC and DC – differ in terms of (a) cost, (b) impact on the grid and (c) placement for optimal locations. As a result, many European cities have different strategies for the distribution of charging points. Two examples are worth singling out briefly, Amsterdam and Paris, due to the different approaches towards EV charging adopted therein.

Case Studies

Amsterdam

Amsterdam has already developed a dense public charging infrastructure network, focused on slow to fast residential chargers. Amsterdam first provided a basic charging infrastructure network in 2009 to spur electric vehicle uptake and is now relying on an approach that is triggered by EV drivers' requests for charging stations – that is, a 'Demand-driven approach'.

Paris

Paris has adopted a city-led planning-oriented business model for the development of its public AC regular charging network. The city is responsible for finding the right location for the charging station and then outsourcing the implementation of the charging point to an operator. To incentivise EV uptake in the entire city, Paris has opted to select charging station locations based on providing an even coverage across the city, as opposed to relying on driver demand – this may be termed as a 'Planning-oriented approach'.



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Category	Comprehensive Policy Element	Example
Electric Vehicle target	Targets for electric vehicles in 2025, 2030	Amsterdam
	Planned zero-emission area covering city by 2030	Amsterdam
Electric Vehicle charging infrastructure goal	Strong targets for taxis, private-hire vehicles and government fleets	London
	Charging infrastructure demand modelling aligned to electric vehicle target	Amsterdam
Electric Vehicle charging infrastructure action plan	Neighbourhood charging gap analysis based on housing and transport needs	Oslo
	Coordination among transportation, energy, local districts and other city departments	London
	Consultation with private stakeholders including utilities, charge point operators, major fleet operators	London
Public charger promotion	Identification of priority public charging locations	Oslo
	Provide public right-of-way for private charging investments	Stockholm
	Data reporting requirements for stations receiving public support	Amsterdam
Private Workplace charger promotion	Dedicated chargers for taxi and fleet vehicles	Amsterdam
	Cost-sharing for charging infrastructure of housing cooperatives and public housing	Oslo
	Subsidies for home charging for taxi drivers	Oslo
Curbside and lamppost charging	Outreach and education to help promote national government home charging subsidies	Stockholm
	Dynamic demand assessment for curbside chargers	Amsterdam
EV-ready building codes	Add charging to lampposts in residential areas	London
	100%EV ready requirements for new parking facilities	Oslo
EV charging interoperability requirements	EV-ready requirements for retrofits and major modifications	Amsterdam
	Clear, streamlined permitting and guidelines for charging	London
	Requirements for interoperability and open payment standards (OCPP) at all public chargers	Amsterdam

Source: Efficient planning and implementation of public chargers: Lessons learned from European cities - International Council on Clean Transportation

Step 5

The speed of transition to emission-free vehicles is closely linked to the attractiveness of financial incentives and other benefits. Electric charging at home, when possible, is the most viable option for all stakeholders. However, it needs to be managed and supported through national policy.



Private charging is the most convenient and preferred method of charging amongst most electric vehicle drivers with access to privately owned car parking spaces. Public charging, therefore, should primarily provide a solution for those without a car park space. The successful adoption of domestic charging will ease pressure and demand on public charging.

Cars are usually parked for the longest duration at home and the workplace. Most charging can happen overnight when off-peak electricity prices are lower. Across the most advanced EV markets worldwide, the most common place for charging is in residential and commercial buildings and is predicted to remain so in the future. Consequently, many governments are focused on facilitating and maximising the availability of charging at homes, workplaces and destination car parks.

Private charging stations are therefore the most important elements for enabling EV adoption. Cities with a mature EV market are seeking to gain control and more insight through their schemes and electric chargers operators to improve efficiency in energy use. As mentioned in Step 1, private charging can also decrease the load on the main distributing power-grid by incentivising households to invest in technology to store self-generated power. The private charging definition includes single residential, multi-residential, fleet and workplace charging stations, as

illustrated in the pyramidal figure below.



Source: Argonne National Laboratory, 2012

Gaining an understanding of the potential numbers of private charging and the eventual level of success in the uptake of charging schemes is critical to planning the overall public charging distribution network. In most cases, upgrading buildings' electrical infrastructure will be necessary to satisfy EV charging demand, especially in multi-residential buildings. Furthermore, large-scale EV charging requires careful planning of a building's electrical distribution system as well as local electric-grid infrastructure. To make the most of private charging potential and make it more accessible and affordable, urban planners, architects, developers and electrical suppliers must

integrate charging infrastructure into standard building design plans. Charger penetration at work will predominantly reflect employer choice and/or regulatory requirements.

Policies and regulations will play a crucial role in this process, promoting and facilitating private charging EV installation through clear guidelines, financial and fiscal incentives.

Local Councils believe private charging should be an integral part of a national policy in order to ensure the success of its implementation. The Local Councils also see a unique opportunity to improve the management of private parking as a holistic national policy on parking provision. An advantageous private parking scheme would be an incentive to residents and building owners to make better use of their private parking facilities, thus relieving the pressure on the limited on-street parking facilities to the advantage of drivers who do not own a private parking space as well as to the business community who would have more spaces dedicated to shoppers. In this respect, there should be schemes that promote the use of a garage if one has access to it. There is currently no way of enforcing the use of a licenced car space as a designated space for cars. Most drivers still choose to make use of the free on-street parking facilities to the detriment of others who have no access to a car park space.

Building and land owners, supermarkets and shopping centres, schools and other

public buildings should be encouraged to turn their spaces into mobility hubs and generate further revenue by utilising their car parks into a 24-hour operation. Such encouragement could be accompanied by financial incentives, as discussed next.

Once again, as highlighted in step 4, priority should be given in real time. Data collection on private charging would subsequently inform government and other stakeholders about the largest gaps in charging infrastructure and provide targeted and effective solutions and policies to bridge these gaps.

Financial incentives for private residential charging

Barriers to installing and efficiently using private charging stations may vary, and include financial, information- and coordination-related, and policy challenges.

In order to encourage the use of private charging, the government could provide tax credits for residential consumers and for businesses for alternative fuelling infrastructure, including electricity charging stations. In addition to providing incentives to consumers and businesses for private charging station installation, Local Councils, via specific central government schemes, could also directly

fund public charging infrastructure installations.

Financial incentives for residential charging are key drivers to increasing the adoption of EVs amongst drivers with access to a garage space, as the installing charging point is costly. The Local Councils' Association believes however that such incentives and subsidies should not be discriminatory against anyone who does not have access to private garage spaces and who, by choice or as a matter of affordability, does not own a car.

The charging rate should be calculated on a sustainable model which would ensure a commercial return on investment. Subsidies on the rate should be in the form of one time fixed credit upon the purchase of a new electric vehicle, which value would lower the total cost of ownership when compared to combustion engine vehicles based on the average cost of electric vehicle and the average efficiency. This credit may be utilised as a percentage subsidy on the charging rate when using public chargers and public commercial chargers or as a refund for the installation of private charging infrastructure for licensed garage car park spaces being either privately owned, collectively owned or through condominiums or other third parties.

Residents who opt to give up their vehicle driving license for a number of years should receive the same subsidy credit that may be used against public transportation costs, shared transport

and sharing schemes of micromobility which does not require a driving licence (such as a scooter, bicycle, etc). In turn, owners of licensed car parks should benefit from interest-free and/or subsidised interest loans through Malta's development bank to be able to invest in electric charging infrastructure. Rate subsidies may be also utilised when using these public facilities.

At the end of the day, any electric charging business model must be viable. Society should not be subsidising the private ownership of vehicles, which remains an unsustainable form of mobility, and related costs. The Government should ensure such financial viability of new investments in electric vehicles, over combustion vehicles, using the total cost of ownership comparison based on the average cost of vehicles with an average efficiency rate. In line with the principle of social subsidiarity, an adequate form of transport may be found, based on the approach of 'polluter pays'.

The Local Councils' Association will be issuing a similar document on parking, one of the 24 technical documents under the 'ResidentFirst' project. The document will be proposing creative solutions to car parking mostly through car parking management, better parking planning through data, proposals for sustainable parking business models through community-funded projects and others. Local Councils are uniquely placed to promote and manage the implementation of private electric charging for a faster changeover.

Step 6

With the transition to electric vehicles come new concerns and challenges for stakeholders in transportation and infrastructure, as well as urban planning. These questions can be addressed by the redrafting of local master plans.



Photo by Tchoutcho Dantine de Thier on Unsplash

An urban city is made up of pedestrian paths, slow, recreational and green spaces and parks, schools, health centres, urban cores, community service hubs and residential areas. The provision of vehicular traffic paths, parking, public transportation networks and the integration of sharing transportation hubs needs to be designed around these urban elements and the way residents and visitors alike navigate through these elements. The location and volume of public charging units should be the result of this exercise and should seek to address the gaps resulting from the private provision of charging infrastructure.

Planning of the locations and the spatial setup of EV charging infrastructure should also consider distances from one station to another in order to provide adequate infrastructure promoting the widest EV adoption. The efficiency of the charging technology should also be considered according to location. Whilst slow public chargers can be adequate in exclusively residential areas, faster chargers are required for city centres and commercial hubs. Every individual Local Council must undertake appropriate studies with regard to the locations it chooses for EV charging points and subsequently choose highly visible and strategic locations for the placement of new charging infrastructure. The Association also believes that fast chargers, usually appropriate for long distance driving, could make sense in

the most dense urban areas where space management is essential.

The choice of charging stations should favour models that can accommodate the different plug types in order to reduce the amount of charging stations on public areas and increase the investment viability. Charging technology with the ability to be integrated within existing urban structures and street furniture, such as utility poles, should be given preference. The Local Councils are seeking ways to reduce clutter from our sidewalks to improve walkability.

After having established a high-level national policy, containing policies and targets which provide direction to all stakeholders, Local Councils, supported by urban planners and other technical

engineers, could proceed to create a master plan for their locality. This includes mapping future locations of charging stations in line with the national policy and with the prospect of achieving national targets. Local Councils should be incentivised to take on this active role and be remunerated according to set KPIs.

All the ground research accumulated to contribute towards a local masterplan, together with the masterplan itself, should be then passed on for approval to the relevant authority who will be able to view the resultant plans holistically. The charging network master plan should include information related to the existing stock of parking provision, walkable pavements, potential cycling lanes, and intermodal hubs and public stations. The overall master plans should reflect the intention of enhancing walkability within the locality and decreasing private vehicular access in towns and city urban cores in favour of residents' safety, increased open spaces and the inclusion of more green areas in our urban fabric.

Unessential driving should be discouraged and environmental responsibility should be at the basis of such strategies. Moreover, the plan needs to achieve the minimum imposed number of public charging stations as established by the national policy, identify appropriate locations in consultation with the local community and the

affected neighbourhood whilst ensuring walkability and access for all in all cases, provide for future planned installations ensuring equal geographical dispersion and maximising the occupancy rate of such infrastructure. The priority should be set in coordination with Infrastructure Malta and their planned road works programme and other utility operators to ensure the least possible nuisance to the residents and business community alike.

To reduce future charging infrastructure costs, the responsible Authority should further push for planning regulations which require that all new indoor and outdoor parking areas, public and private buildings are able to accommodate charging stations. The connection to the grid is one of the challenges in this transition and one of the largest costs for drivers. For instance, new regulations could instruct that new and renovated residential buildings would have to be equipped with the appropriate electrical foundation to facilitate the installation of charging points.

Specifically, the Association believes there should be a strong argument to enable the transformation of fuel stations strategically placed in Malta and Gozo as mobility hubs equipped with rapid charging stations. Existing fuel stations have been granted geographically exclusive permits and concessions that guarantee the convenient provision of fuel service to the national transportation network in strategic locations. Through

an effort to reduce unnecessary vehicular traffic flowing through the centres of our localities, some fuel stations have been permitted to develop large areas within the Outside Development Zone. Government needs to ensure the viability of these strategically located hubs and oblige the respective operators to provide high quality rapid charging service so as to avoid unnecessary traffic in our urban centres or the need for developing further undeveloped land in the peripheral areas of our towns and cities. The Local Councils' Association will be launching a national project on mobility hubs which could also include the re-purposing of fuel stations as the shift to rechargeable vehicles takes on steam.

Another central role of Local Councils is the management of designated public charging spaces as part of public parking management, explored further in step 7. This may include the coordination with LESA to ensure effective enforcement and maximum occupancy of these charging stations.

The charging infrastructure master plan should have the flexibility to continue

to evolve. Monitoring the frequency of use of charging stations, both private and public, will be important for future improvements. If charging stations are being overused by too many vehicles, this would require providing more charging stations in nearby locations or upgrading to faster charging technology. Similarly, if a charging station is barely used, after all efforts to encourage its use have been employed, the system may provide the opportunity to relocate such a station. Feedback from residents is vital as they may provide insight to everyday issues and Local Councils would be able to work towards solutions, with the support of the rest of the stakeholders. Consistent research and evaluation of charging technologies and battery development needs to be ongoing and will play a vital role in the expansion of the system without unnecessary increase of on-street charging units. Smart systems which indicate performance of charging stations would comprise an important part of this management. This will be explored in detail in the future LCA publication entitled Smart Cities as part of the twenty-four documents within the 'ResidentFirst' project.

Step 7

Thousands of public chargers will replace free-for-all public parking spaces by the end of this transition. The loss of public car spaces needs to be managed within a well-planned national parking strategy and better parking management in our towns and cities.

Photo by Raban Haaijk on Unsplash

The impossible promise of providing free-for-all parking spaces no matter the number of vehicles, the location and the time of day is a significant concern to our local councillors and mayors. Vehicle registrations have been steadily increasing. As a result, we now top the highest European statistics for the highest number of vehicles per licensed driver, cars per KM of roads and the highest density of households per km of public roads. The challenge becomes more pressing when residents rightly demand more public open spaces, better pedestrian infrastructure and safer road infrastructure for bicycles and micro-mobility vehicles.

The loss of thousands of on-street car parking spaces for electric car charging spots will only exacerbate the problem. One of the main concerns in providing public EV charging is the proper planning of both on-street and off-street parking, which is already a major issue in many dense localities in Malta and Gozo (amply discussed in another LCA document entitled Parking Projects as part of the twenty-four documents forming part of the 'ResidentFirst' project).

On-street parking heavily impacts walkability in every locality, causing a poorer walking experience for pedestrians. Walkability, especially within our towns and cities which are compact and dense (having a radius that corresponds to the so-called 'last mile'),

is the main priority within a sustainable mobility plan, as it is the most convenient mode of travel. This subject is explored in more detail in other upcoming documents produced by the LCA, namely Walkability and Accessibility, Last Mile Transportation and Shared Transport.

The location of public EV charge points should be studied and planned, whether on- or off-street, in order to ensure ease of use and to minimise the impact on pedestrian movement and overall walking experience, as well as visual local character. This is particularly important in Urban Conservation Areas and in areas already characterised by parking and pavement pressures. The positioning of EVs is an opportunity to re-evaluate parking policies (also discussed in the

LCA document entitled Parking Projects) and use these policies to incentivise a switch to EVs, therefore encouraging a cohesive sustainable mobility strategy.

Large public parking lots are limited in number. Introducing reserved EV parking bays therein could also encourage the move to EVs, as well as new planning policies for car parks to have a minimum number of spaces equipped with charging pillars. Such measures may effectively influence driver choices and are relatively low cost, but require proper, in-depth localised studies and management. As part of the national parking management policy, community parking projects including EV charging infrastructure could potentially be subsidised by the central government and managed by local government as part of reaching the necessary charging facilities required for a rapid change-over. Public and private ventures could be formed to introduce public charging in private parking lots, efficiently benefiting from the presence of shared space. Utilising existing infrastructure, both public and private, is a key element of sustainable mobility, as with the potential of utilising existing resources such as fuel stations, as discussed in Step 6. Additionally, planning policies should require developers to allocate a minimum fixed percentage of parking spaces equipped with charging pillars especially in large developments, in line with current Enemalta requirements for the inclusion of such charging points within both surface and underground car parks.

The layout of car parks should maximise the ease of use of charge points, placing them so they may serve as many vehicles as possible. In general, EVs can use charge points within 5 metres as most charging cables are roughly around 4 – 8 metres long. User experience and

access to the charging point would be improved if the following guidelines are implemented:

- Setting a length of stay limit for an EV bay. It is necessary to penalise 'overstaying' and blocking access for others. This may, for instance, involve higher fees after a set period, enforced via the charge point operator. The responsible use of energy should be encouraged, possibly through a stepped rate of consumption per driver, thus curbing potential abuse.
- Clear signage and painted bays help EV drivers find charge points and understand any restrictions. They need to be planned in a way that prevents them from being blocked by conventional (fossil fuel-based) vehicles.
- Heavy fines should be in place for conventional vehicles parked in EV parking bays or blocking dedicated EV spaces.

In order for these guidelines to be effective, it is important that the rules and restrictions be widely publicised and heavily enforced. On-street public charging requires innovative solutions to ensure that vehicles may be charged while parked in different streets and simultaneously do not impede walkability. A popular solution, often seen in other cities, would be integrating charging points into other street furniture elements, such as street lighting posts. These systems may be faster and cheaper to deploy than conventional column chargers although the local street lighting system would need to be altered to allow 24-hour supply at the lighting device. New technologies further allow for smart control management of street lighting through wireless data sensors.

Photo by Emmet from Pexels

Step 8

In the ideal scenario, tens of thousands of heavy fuel vehicles will be ditched in favour of new, emission-free vehicles every year. How and where would we handle, process and recycle this waste, and what would become of the hundreds of thousands of batteries once the first battery model vehicles need replacement?

As the EV market grows, questions arise as to what could be done with batteries after their life cycle is finished, and the use of second-hand batteries. Used batteries may present an opportunity as a valuable secondary source of materials.

Recent European regulations ensure that EV suppliers are responsible for reusing their products. Every battery pack is first tested to determine its state of health, then fully discharged and reconfigured to meet the energy demands of their new application.

Batteries with minimal degradation and damage could likely be reconditioned and reused directly as a replacement for the same model vehicle, which is done by both Nissan and Tesla. Nissan is also now reusing old batteries from its EV cars in robotic delivery vehicles within its factories. Other manufacturers, such as Volkswagen and Renault, recycle the batteries to recover different elements, such as nickel, lithium, and manganese.

According to recent research, batteries will need half the lithium they currently need in ten years' time. It is therefore critical to integrate a policy clarifying battery reuse as part of the general EV national policy, to ensure a sustainable future for the next ten years. Such policy should furthermore encourage investments of battery recycling activities.

The new EU regulatory framework for batteries is designed to modernise the EU's regulatory framework for batteries in order to secure the sustainability and competitiveness of battery value chains. It would introduce mandatory requirements on sustainability (such as carbon footprint rules, minimum recycled content, performance and durability criteria), safety and labelling for the marketing and putting into service of batteries, and requirements for end-of-life management.

Photo by Jeshua Deher on Unsplash



Concluding Thoughts

Cities are increasingly adopting strong EV policies, including targets for zero-emissions and fully electric fleets. The biggest challenge is building an efficient and reliable infrastructure that could possibly supply for an all-electric future. Local factors dictate different charging needs, influenced by the unique characteristics of each locality. Notably, home charging strongly influences how much public charging is needed at both the locality and national level. Localities with more residents in multi-unit dwellings need more public charging to make up for the lack of private home charging and spatial constraints. In the early stages of the transition to EV, an important part of planning for charging would be to provide enough space for both dedicated parking, as well as the location of the charging points. Important factors to be considered include population density, renting patterns, public transit access, and parking patterns.

In order to ensure the success of a national EV infrastructure strategy, it is vital that Local Councils participate as they have the most comprehensive knowledge regarding the challenges and opportunities within their localities. Local Councils are a valuable source of information for stakeholders that could:

- Track and measure charging infrastructure through the collection of valuable data
- Develop partnerships with stakeholders
- Create outreach and education campaigns
- Encourage the implementation of new charging regulations.

As evidenced by emerging best practices within other European cities, discussed throughout the 8 steps, a number of policies and actions could be adopted to encourage greater charging deployment.

Resource Section

Document References

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European Publications, Projects and Tools

Publications

The Power of Civic Ecosystems (URBACT)

MOBI-MIX Report: The MaaS Scene

The Innovative Mobility Landscape: The Case of Mobility as a Service (The International Transport Forum)

E-mobility: From strategy to legislation (CIVITAS)

Policy Advice Notes: Smart mobility management measures (CIVITAS)

Policy Advice Notes: Integration of parking and access management (CIVITAS)

Policy Note: The use of social media to involve citizens in urban mobility

projects and city planning (CIVITAS)

E-mobility: Make it happen through SUMPS! (CIVITAS)

Publication: Linking intermodal services better (CIVITAS)

Engaging the citizens of today to build the sustainable cities of tomorrow (CIVITAS)

Develop a smart choice of mobility services Factsheet (CIVITAS)

Shared mobility models (European Commission)

Planning for a more Resilient and Robust Urban Mobility (European Platform on Sustainable Urban Mobility Plans)

Projects

City district/urban corridor cases as pilots for sustainable urban mobility

Citizen and stakeholder involvement in the mobility planning process and new mobility services

Adaptive parking management based on energy efficiency and occupancy

Promote the installation of electric vehicle charging in multifamily housing

Shared Elba Mobility Agency
Dedicated to planning, managing and coordinating the different ride-sharing services, mobility information services for users, and other types of mobility planning support available on the island.

Tools

Mobility Marvels Podcast (CIVITAS)

Inspiring stories on smart, inclusive and sustainable mobility featuring forward-thinking cities, people and projects. In its first season, Mobility Marvels will take you on a journey to 16 cities that have made better living and moving a reality on the ground.

ITF Transport Outlook 2021 (International Transport Forum)

Provides scenarios for the development of transport demand up to 2050. It also models transport decarbonisation scenarios and their impacts on climate change.

Sustainable Transport across Europe Factsheet (EU Mobility Atlas)

Further Case Studies

City Liveability by Redesign

Launch real-life transition experiments in urban streets by means of small, tangible interventions, in combination with alternative mobility concepts.

Smart Mobility Hub Platform

A new efficient and reliable DSS tool to foster data exploitation so as to enable future urban mobility systems to be more collaborative, user-centred.

Mapping Urban Transportation Innovation Ecosystems

Creating a strategic infrastructure for urban policy management in the field of urban mobility.

UMOS: Urban mobility operating system

Developing a service platform that lifts the barriers between different mobility solutions and ecosystems.

Parking in the context of mobility hubs (Cologne)

Funding Opportunities

European City Facility (EUCF)

3rd call October - November 2021 - 4th call May - June 2022

The evaluation of the EUCF applications is conducted after the close of each call for applications by a dedicated evaluation team and it is based on five criteria: investment size, energy savings, governance structure, stakeholder engagement and alignment with EUCF objectives. Applicants undertake a 5-step journey within the scope of the EUCF, from the pre-application phase towards the implementation of their investment concepts.

ELENA

ELENA is a joint initiative by the EIB and the European Commission under the Horizon 2020 programme. ELENA provides grants, mainly to cities and regions, for technical assistance focused on the implementation of energy efficiency, distributed renewable energy and urban transport projects and programmes. The European Commission has allocated a further €35 million towards the initiative with €5 million dedicated to support projects across its sustainable transport portfolio.

Horizon Europe: Cluster 5: Climate, Energy and Mobility

Cluster 5 'Climate, Energy and Mobility' is the

second largest in size with a budget of €15.35 billion. The goals of Cluster 5 Climate, Energy and Mobility are:

- Accelerating the twin green and digital transition and associated transformation of the economy to achieve climate neutrality in Europe by 2050. This requires that the transition to greenhouse gas neutrality of the energy and mobility sectors be achieved by 2050.
- Making Europe the first digitally-led circular, climate-neutral and sustainable economy by transforming its mobility, energy, building and production systems.

This twin transition requires instilling profound changes in social practices and skills requirements; as a result, this involves engaging society in the co-design, co-development, and co-implementation of innovations (including through social innovation). In this way, development of new products, methods, and services for and with societal needs would involve citizens, public authorities, business and industry, social partners and academia – the so-called 'Quadruple Helix' – in their design, development, and implementation.

Cluster 5 will deliver on six specific expected impacts, each of which has been transformed into a specific Destination, as listed hereunder. This Destination-based work programme (WP) structure follows a thematic centre-of-gravity approach, but activities in a

given Destination can of course have a cross-cutting character and will often contribute to multiple expected impacts.

Climate – Destinations 1 & 2

1. Climate sciences and responses for the transformation towards climate neutrality
2. Cross-sectoral solutions for the climate transition

Energy – Destinations 3 & 4

3. Sustainable, secure and competitive energy supply
4. Efficient, sustainable and inclusive energy use

Mobility – Destinations 5 & 6

5. Clean and competitive solutions for all transport modes
6. Safe Resilient Transport and Smart Mobility services for passengers and goods

Further information is available from Mr George Bugeja and Ms Tamara Schembri

(the Cluster 5 National Contact Points) or from the European Commission website.

Smart Cities Marketplace - Is your city ready to redevelop certain areas?

Call for project concepts

The Smart Cities Marketplace matchmaking support service is continuously looking for projects in need of finance to be

matched with the requirements of members within its Investor Network. After completing and submitting their intake form, the matchmaking team will verify your submission, get back to you with any questions for clarification and, once resolved, submit your project concept to those investors whose investment strategy is matching your type of project. Once an investor is interested to learn more about your project, they will put you in touch for a 1:1 conversation with the investor. Typically, these conversations will be held during one of the face-to-face matchmaking events that are scheduled regularly.

Events

ITS World Congress (Hamburg)

11-15 October 2021

The ITS Congress is the biggest event focused on smart mobility and the digitalisation of transport. The Congresses offer stakeholders and patrons the ultimate platform to meet with industry influencers, discuss ideas and initiatives, make new contacts and promote their businesses by taking part in a range of activities.

Climathon Week

25-31 October 2021

Climathon is an ideathon-based global movement that builds the foundations for tangible projects, impact-driven start-ups and long-lasting conversations with decision-makers around city plans and policies. It happens over anything from hours to days, where hundreds of cities across 6 continents and many time zones come together with diverse groups of citizens ranging from policymakers to entrepreneurs, youth to business leaders, hackers to academics, students to professionals.

Urban Mobility Summit Berlin

October 2021

A City Summit is a unique event tailored to the needs of the host city and designed to activate the local mobility community, putting innovators and policymakers on stage together.

Civitas Forum 2021

20-21 October 2021

The 18th edition of the CIVITAS Initiative's flagship event will gather the keenest sustainable mobility minds to debate and analyse the most urgent topics in the field. Over the course of its two days, it will continue the tradition of offering interactive workshops, intriguing sessions, and interesting side visits, whilst introducing exciting new programme elements. This will provide the ideal opportunity to hear from the cities, people and projects driving innovation in smart, inclusive and sustainable mobility, as well as to exchange and connect with city representatives, policymakers, practitioners, planners, NGOs, and academics.

ResidentFirst 



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Local Councils' Association Malta