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**Electric vehicles and new mobility  
concepts**

**(Véhicules électriques et nouvelles  
formes de mobilité)**

# SUMMARY

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The regular increase in the volumes of traffic that can be observed in most cities and urban agglomerations may be perceived as a sign of urban growth, but also as one of the causes of the degradation of environmental conditions and the quality of life. The increased traffic of private motor vehicles also has an impact on other means of transport, in particular as far as traffic conditions, safety and their respective use is concerned. Given the complexity of the problem of urban transport, we must adopt a global approach in our search for solutions: in this context, electric vehicles may offer solutions, but only if they are integrated into multimodal mobility schemes. Like any other vehicle, of course, electric vehicles are a tool at the service of a transport policy that has the aim of satisfying objectives related to mobility, accessibility, territorial planning, environment and quality of life.

The **main aims of this research** are as follows :

- to describe the problems perceived in an urban environment concerning the movement of persons and to identify the objectives that communities and users should aim at in particular as far as transport, environment and the environment in which we live are concerned;
- to present the characteristics of existing electric vehicles and the functions that may be performed by these vehicles in the organization of urban transport requirements;
- to examine whether the (or some of the) characteristics of electric vehicles may be useful to achieve the defined objectives; in this case, to propose new concepts of mobility in the urban environment integrating electric vehicles, while also specifying the nature of the accompanying measures to be implemented.

The ambition of this research is to differentiate itself from the many research projects and specialized studies carried out over a number of decades concerning electric vehicles. Instead of considering "solely" technological aspects or elaborating new transport systems as such, it would seem to be much more important to concentrate on an overall transport policy that could accommodate a new form of mobility based on electric vehicles. It is necessary to speak of **FUNCTIONS**, before detailing the **TOOLS** that could be used.

Electric vehicles have been developed over a number of years, in an attempt to ensure :

- maximum respect for the environment;
- minimum urban clutter;
- flexibility and comfort close to those offered by a private vehicle;
- a transport capacity adequate to satisfy the demand observed in space and time.

**However, the "mere" replacement of internal combustion vehicles by electric vehicles is not in itself a panacea** : although some environmental problems could be drastically reduced in an urban environment, other negative aspects related to transit (saturation, difficulty of access, occupation of public space, ...) would not change. It is therefore essential to define beforehand **new functions** characteristic of this type of vehicle and any other new form of mobility, allowing us to satisfy the transport – environment – urban planning objectives defined.

Among the vehicles used mainly to perform the function of transporting people (even if, of course, a reduced capacity for the transport of goods or luggage is always possible), a clear distinction should be made between private and public transport. Going beyond this private – public distinction, it is useful to clarify the difference that may exist between a private individual vehicle, which means almost all the automobiles currently in existence, and a shared individual vehicle. While the former generally belongs to its driver, who uses it whenever he or she wants to and leaves it parked for 95% of the time, the latter may be used in an individual manner, but by several users over a period of time. This is the concept of "car-sharing" or of a public (or shared !) individual vehicle, which allows us to optimize the use of vehicles and therefore to reduce the time during which vehicles are stationary, all to the benefit of the parking facilities required.

**A means of transport that is half way between individual transport in the strictest sense and public transport** may be imagined by including shared individual vehicles. A network of small parking units for this kind of vehicles, at the service of the population, would allow us to offer a public service complementary to public transport in areas of low population density or in city center areas (close to pedestrian precincts).

Also, **medium capacity public transport systems** constituting the "capillary" level of true public transport, that is to say accessible to the entire population (unlike shared individual vehicles which require a driving license) may be in part redesigned to move towards a greater flexibility of use (routes, timetables,...). Their role is therefore of vital importance and their complementarity with, on the one hand, high-capacity public transport and, on the other hand, shared individual transport, is necessary (performing the function of traffic reduction lines).

For these two means of transport, the use of electric vehicles (or "clean" vehicles in general) may be positive. But going beyond the aspect of mechanization, it is important above all to recall that the use of **specific vehicles**, satisfying a certain number of criteria in terms of accessibility, image, effective operation, etc., is in any case necessary.

Among the conclusions that may be drawn at the end of this research, it should be pointed out that the user must be able to count on **continuity in the transit chain** thanks to interchanges with the "heavy" networks that constitute the true structure of public transport networks or with stations of vehicles available for free service. These vehicles available for free service should benefit from special measures aimed at ensuring their competitive use in relation to automobiles, such as :

- complementarity with the various public transport and road networks (according to the basic principle applied with Mobility);
- possibility of use for urban and suburban travel;

- preferential access in certain areas closed to automobile traffic;
- favorable parking conditions in the urban environment, in particular as far as rates and duration of authorized parking are concerned;
- any preferential tax/tariff measures (purchase of the vehicle, participation in maintenance expenses, taxes, vehicle tax, ...).

The electric vehicle is therefore an interesting "tool" for improving the quality of life in the urban environment : its lack of noise and atmospheric pollution constitutes an undeniable asset in the reduction of environmental problems in the city, but it must also be integrated in a global context of mobility to achieve not only environmental objectives, but also objectives related to transport and territorial planning.

In the longer term, the availability of vehicles that can be used both for local and intercity travel should be envisioned. The principle proposed constitutes a development of two existing, but contrasting systems, that is to say Mobility (self-sharing vehicles) and City Car (free service vehicles), thus allowing us to offer an answer that is better adapted to the various mobility needs encountered in urban agglomerations. This new form of mobility should be accompanied, of course, by the introduction of traffic reduction shuttles to ensure the continuity of certain transit chains in the urban environment and urban agglomerations.

**The introduction of a truly integrated offering in the various transit chains grouping large and medium capacity public transport and free service vehicles with or without prior reservation therefore constitutes a very interesting alternative to the almost exclusive use of private vehicles.**