Universitatea Transilvania din Brașov
FACULTATEA DE INGINERIE MECANICĂ

Str. Politehnicii 1
500024 - Brașov
tel.: (+40) 268 474761 | fax: (+40) 268 474761
f-im@unitbv.ro | www.unitbv.ro/fim

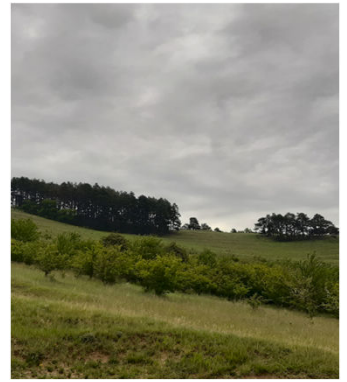
Romania

E-mobility solutions for rural areas

Assoc. Prof. PhD. Eng. Stelian Țârulescu

Universitatea Transilvania din Brașov
FACULTATEA DE INGINERIE MECANICĂ
Str. Politehnicii 1
500024 - Brașov
tel.: (+40) 268 474761 | fax: (+40) 268 474761
f-im@unitbv.ro | www.unitbv.ro/fim

Introduction



Residents of rural areas have mobility needs, in order to carry out their daily activities, but also to move to metropolitan areas for various reasons, whether related to work, education, socio-cultural, shopping, other services, etc. Thus, it must be possible to make regular trips using electric vehicles to achieve personal goals, as well as access to the necessary infrastructure.

Currently there are many problems related to rural mobility. The main problems are: limited access and connectivity, long distances that must be served by the transport service, the partial or total lack of public transport and non-polluting transport alternatives, the lack of funding sources for mobility projects.

So far, the mobility strategies have focused primarily on urban areas, as the probability of implementation was greater by involving local authorities to solve environmental problems. Rural areas also need new technologies to solve transportation problems. Local public transport systems operating in rural areas are forced to adopt innovative strategies to make mobility more efficient due to demographic changes. However, these technological developments must also take into account the environment, so ecological transport solutions are needed.

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Electric vehicles that can be used in rural transport, the infrastructure needed and technical solutions for e-mobility integrated system

Sustainable solutions for electric mobility in rural areas can be:
- electric car-sharing;
- electric bike-sharing;
- electric public transport;
- autonomous buses.

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Car sharing with electric vehicles

The most suitable sharing solution for rural areas would be the one with stations. While the free sharing system offers a greater degree of flexibility, it is not sustainably operable in low-density rural and peripheral areas. The stationary model has lower prices and is usually used for longer journeys - especially suitable in rural areas. Stations are usually established in frequently frequented central locations such as town halls, community centers or other areas of local interest.

Cultural acceptance of carsharing services in rural areas plays an important role in generating sufficient demand. For the users that driving and owning a car, a switch to carsharing may break current social norms and may be associated with a certain degree of dependence, uncertainty or insecurity. Lack of public awareness and familiarity also affects acceptance and use, as people often do not fully understand the function and benefits of carsharing.

The success of his system is relied on leadership by local authority figures using the service themselves and thus setting a positive example.

Example: Mobilize - rural communities adopting shared electric mobility solutions.

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Autonomous public transport

The use of autonomous vehicles (AVs) could make rural public transport cheaper to operate in the future. This is an attractive opportunity, especially for regions facing a shortage of personnel that can be used in the transport system. This e-mobility solution, with autonomous buses has several important operational requirements that may be more difficult to meet in rural areas:

- Digital connectivity, like underdeveloped telecommunications networks and the lack of a reliable support structure.
- Variable landscapes and infrastructure, that are specific to rural areas may contain more unexpected obstacles.
- Distance can be a problem, especially in villages or small towns.

The potential of autonomous buses is currently limited to very predictable rural environments and small city centers. In several countries of the European Union, a first legislative framework was created to allow the testing of autonomous cars on public roads. However, many jurisdictions do not yet allow regular operation without a driver or support staff on board.


THE **AGILITY** EFFECT

France's first rural self-driving shuttle bus dubbed Beti has started operating on a public road in the south-eastern Drôme department. The breakthrough offers a solution to transportation needs in rural areas.

CITY PERFORMANCE

More sustainable and less costly: public lighting gets a makeover

CITY PERFORMANCE

Aix en Provence places data at the heart of its city management

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Electric bike-sharing

The use of bicycles and especially electric bicycles in rural areas is an extremely ecological and beneficial mode of transport. Cycling is suitable for short journeys of up to 5-10 kilometers, such as routes between towns or from a small settlement to the neighboring town. The usual obstacles to using bicycles in rural areas are the lack of safe cycling routes, longer distances and landforms that require extra effort.

Providing safe cycling infrastructure is essential to make active mobility more attractive in rural areas. Policies include reallocating road space, improving infrastructure, restricting car access or reducing speed limits on routes to cities to facilitate cycling. Also, rural integration of cycling mobility with other modes of transport is important to enable intermodal travel between rural areas and cities.

In rural areas the use of e-bikes can significantly lower the physical effort required to cross longer distances and hilly areas. E-cargo-bikes or e-trikes, open tricycles or tricycles and e-scooters are solutions that can be adapted to the needs of rural areas.

Example: International bike share firm Bolt starts operating in Dun Laoghaire-Rathdown

Lime - Sharing

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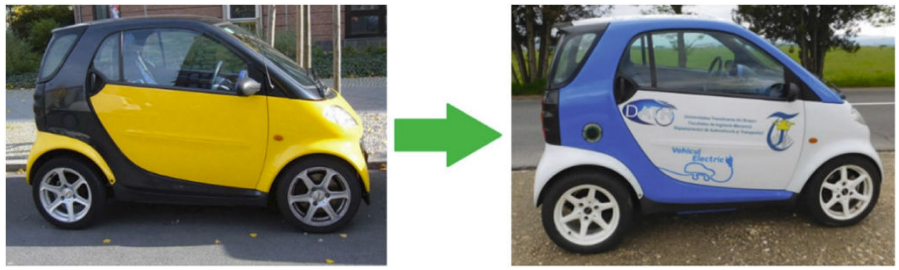
E-Conversion of conventional vehicles

To reduce the investment costs for EVs, a solution is to convert of existing vehicle to an electric vehicle Targeted pay-off times are around 3 years for the customers, making it a profitable investment.

One of the solutions that could also be implemented in rural areas is the conversion of old vehicles with engines that use fossil fuels into electric vehicles. In this subchapter we will present an example of an electric vehicle transformed from a classic vehicle. It is about E-SMART obtained by converting a Smart For Two City Coupe vehicle manufactured in 1999 and fueled by gasoline, with an electric propulsion system. The old gasoline engine of 33 kW power was replaced with an electric three-phase asynchronous motor of 22 kW power, model N50D2.



Example: From 1999 Smart For Two City Coupe to 2016 E-Smart electric vehicle

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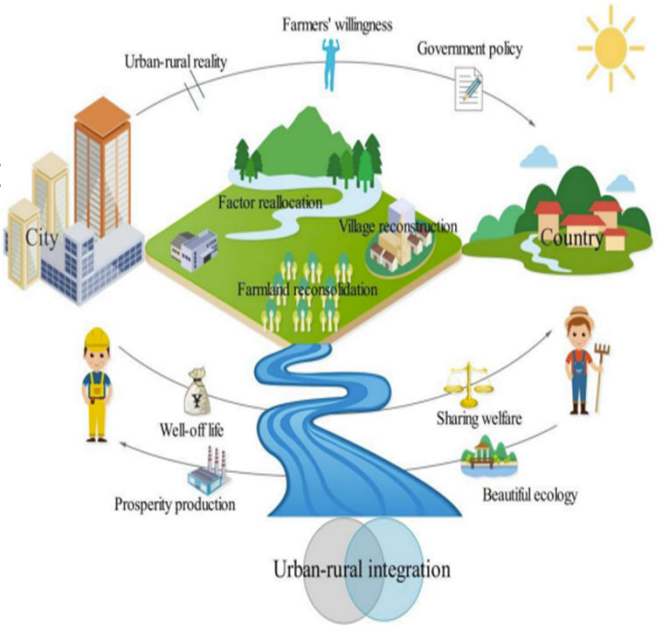
Infrastructure for electric vehicles in rural areas

Integrated electric mobility systems at rural level

Coordination between rail routes, public road transport routes and intermodal hubs, flexible last-mile travel services (home, education, other personal destinations) and other e-bike transport options are essential to improve accessibility in rural areas. Often, local last-mile services are extremely important for those who cannot use or afford a personal vehicle, while providing a sustainable alternative for those who wish to replace road travel with non-motorized travel.

MaaS can help synchronize local network services and ensure that local services are deployed exactly where they are needed to complement existing public transport routes. In rural areas, private transport is still one of the main modes of travel. Flexible last-mile services may be viable in some rural areas, but the private car will remain an important alternative in less populated and hard-to-reach areas. In this case, a balanced mobility package is needed, which combines the private car with more sustainable modes of transport and promotes intermodal models. Also, parking facilities are important issues to solve for future rural mobility centers.



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Intermodal nodes - mobility hubs

Rural mobility hubs can effectively restructure transport networks by integrating private transport modes and connecting services with public road and rail transport lines. A mobility hub is a location for changing transport modes, designed to improve intermodality by locating different stations and services next to each other or within a short walking distance. The built infrastructure will include parking and access ways for cars and bicycles, pick-up and drop-off areas for sharing services, taxis and carpooling, stations and micro mobility, charging infrastructure, bicycle maintenance services, closed waiting areas, cafes, vending machines power supply, easy box, Wi-Fi connection, facilities and office spaces, etc. depending on population density and local demand.

Example: Why mobility hubs are crucial to making transport more sustainable

Mobility hubs are crucial to making transport more sustainable according to Richard Dilks Credit: CoMo UK

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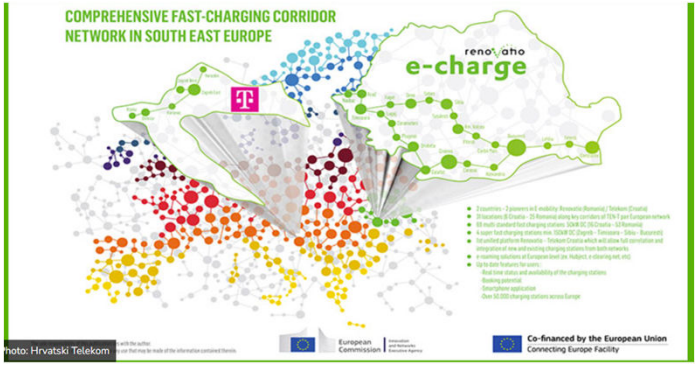
Use of an infrastructure dedicated to electric mobility

Charging locations can be private, located at the vehicle or bicycle owner's premises, semi-public or public. Sufficient public charging points are needed for user satisfaction, even in the early stages of electric mobility, for a sustainable transport network. Each of the following charging locations is associated with a typical charging pattern in terms of time and capacity:

- Residential loading: vehicles used for individual mobility purposes are usually parked near residential buildings, either on private or public land.
- Loading at the workplace: the vehicle is parked at the workplace during working hours during the day.
- Areas with charging facilities: the vehicle is parked while the user performs various activities (shopping, access to public institutions, errands).

Example: The leading provider of telecommunications services in Croatia, Hrvatski Telekom, has installed first two fast electric vehicle (EV) charging stations. This is the beginning of the project that aims to create e-chargers network and help development of green e-mobility corridors in Central and South East Europe (SEE).

BALKAN GREEN ENERGY NEWS



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Rural e-mobility good practice examples - Romania

There are good solutions out there which can inspire what could be done at local level in rural communities. The websites of SMARTA, Euromontana, LAST-MILE , MAMBA, HiReach, RuMobil projects describe around 200 case studies of rural mobility services.

For Romania, there are few examples of electromobility implemented in rural areas. The first steps have been taken, but much more involvement is needed to create sustainable rural electric mobility networks at the national level.

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Infrastructure for electric vehicles in Ciugud

Category. *4. Energy efficiency and environmentally friendly attitudes towards mobility*

Location

- Country: Romania
- Region or district: Alba
- Population: 3048 inhabitants
- Area (km²): 43,91 km²
- Population density: 60,65 inhabitants km²

Issue addressed. *The project wants to solve environmental problems related to road transport and encourage the use of electric vehicles.*

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School transport with electric minibuses in Galati

Category. *5. Dedicated mobility*

Location

- Country: Romania
- Region or district: Galati County
- Population: 604.556 inhabitants
- Area (km²): 4.466,3 km²
- Population density: 135,36 inhabitants km²

Issue addressed. *The project aims to solve two problems. The first is related to the mobility of students from rural areas. It is known that in the rural areas of many counties of Romania, children do not have easy access to primary and secondary education, especially in the case of isolated localities. Thus, it is necessary to make transport dedicated to students accessible for these regions. The second problem is related to the environment and the pollution produced by old public transport vehicles equipped with diesel engines. This service will use electric minibuses, being environmentally friendly.*

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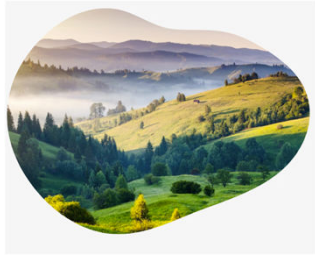

Thank you for your attention!

Assoc.Prof. Stelian Tarulescu

s.tarulescu@unitbv.ro