E-mobility at the +1 level in public transport

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Megatrends & Challenges

Today, cities are the centre of human life. Due to increasing urbanization worldwide, 4.6 billion people currently live in urban areas, which corresponds to 57% of the world's population. People associate prosperity with living in a city. This prosperity can only be achieved if cities also have sufficient mobility options. In many cases, cities and the mobility needs of city dwellers are growing faster than the transport infrastructure can keep pace. In addition, urban development to date, which is based on the occupation of land for various uses, causes many problems. In particular, the high degree of sealing of cities by buildings and transport routes on the ground leads to massive problems in the context of climate change-induced weather changes. Cities with a high degree of sealing heat up more in summer, which leads to a variety of problems. During heavy rainfall events, water can drain away less easily and cause more damage, to name just two examples.

If every city dweller wants to motorize their individual mobility with a car in the future, there simply won't be enough space. Especially since per capita space requirements for housing are constantly increasing. It is therefore clear that cities need a more sustainable urban design to continue to be liveable environments. The current challenges must be given special consideration in urban and transport planning. This includes climate change resilient urban development, which considers the unsealing of surfaces, for example. In addition, green and blue infrastructures are increasingly being used to create a city that is adapted to the consequences of climate change.

An important factor in this context is the expansion and promotion of public mobility, especially on exclusive corridors. Cars will (must) continue to exist, but in addition to non-motorized individual mobility (walking and cycling), only public transport can meet people's mobility needs in the long term and still enable sustainable urban development.

Solution & Implementation

A simple formula for sustainable urban mobility is the combination of public mobility plus electric drive and the use of an exclusive corridor such as the +1 level (above the ground). This formula results in the use of the cable car as an urban means of public transport. Just like the underground, the cable car operates exclusively on its own route and as the crow flies. The system and the technology are established and tried and tested. The application can generate a variety of economic advantages, such as low staffing requirements (e.g. through at least partially autonomous operation). The short construction time also enables rapid realization and satisfaction of demand. The transport benefits of a cable car require only a fraction of the space that other means of transport, especially individual ones, would need. As part of a multimodal public transport system, the cable car can open a new level and generate additional benefits. This also counteracts the increasing overheating of cities, as the degree of sealing can be reduced. In addition, a cable car is an attractive means of transport, which is already convincing. As part of the toolbox of planners around the world, the cable car has become indispensable.

Nevertheless, all too often the question arises as to how to get the cable car out of the toolbox and into practical realization. Often, the cable car is not yet seen as an equivalent alternative to conventional means of transport and is therefore still used comparatively rarely. Although there are pioneering countries, most countries do not yet use cable cars for public transport. There is therefore a need for much greater awareness of the possibilities and applications of this mode of transport, as well as greater visibility, e.g. at international conferences. In addition, experience and experts are needed who can pass on the existing knowledge to the right contacts. This networking in turn requires spaces for professional exchange, such as Cable Car World. To this end, the expertise and the right tools must be made available to all planners and decision-makers and the cable car must be able to be modelled using these tools.

An important tool here is the Life Cycle Assessment (LCA). The LCA measures the environmental impact of a product (e.g. means of public transport) at every stage of its life – from production to waste. The analysis consists of four phases:

1. defining the goal and scope
2. analyzing the inventory
3. assessment of the impact
4. results and interpretation

The individual steps are interdependent. In the first phase of the LCA, it is determined what is to be analyzed, how it is to be analyzed and how in-depth the analysis is to be. A functional unit is also created as a reference value, which is used to define the product of a system when the LCA is created. When comparing several e.g. public transport systems for the provision of benefits, the systems must have the same functional unit to be comparable. Different technologies can be used to provide the benefit. The second phase is used to collect data for an LCA. Data is collected and modelled into input and output flows. The collected data is then assigned in the third phase and the effects are analyzed and compared. The interpretation phase of an LCA can take place in parallel with the other phases, even if the assessment has not yet been finalized.

If the LCA is used to select a suitable mode of transport for an existing transport problem that needs to be solved, this has the following advantages. It enables a non-discriminatory analysis of the available options due to the clearly defined objectives at the outset. The LCA also ensures that different systems are compared without a favorite being predetermined. The holistic and integrated approach means that all environmentally relevant factors are considered, and the individuality of the project is taken into account. The system that can best achieve the objective under the given test criteria is found. With the data-based approach, valid decisions can be made, and planners and decision-makers can be convinced.

Conclusion

The urban megatrends open a wide range of possible applications for cable cars in urban areas in the coming decades. The +1 level can be seen as a potential area for e-mobility by rope. Broad communication and sharing of existing knowledge are necessary for further utilization of the system for this application. Tools such as the LCA can be used to create comparability and accessibility to the cable car system. In future, the cable car must not only be established as part of the toolbox of urban and transport planners, but its practical use must also be promoted by raising awareness. Cable cars can then be widely used as an integral part of multimodal public transport.