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E-Mobility Solutions

Electric Scooter Sharing



**Wuppertal
Institut**

UN HABITAT
FOR A BETTER URBAN FUTURE



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Urban Electric Mobility Initiative (UEMI) was initiated by UN-Habitat and the SOLUTIONS project and launched at the UN Climate Summit in September 2014 in New York.

UEMI aims to help phasing out conventionally fueled vehicles and increase the share of electric vehicles (2-,3- and 4-wheelers) in the total volume of individual motorized transport in cities to at least 30% by 2030. The UEMI is an active partnership that aims to track international action in the area of electric mobility and initiates local actions. The UEMI delivers tools and guidelines, generates synergies between e-mobility programmes and supports local implementation actions in Africa, Asia, Europe and Latin America.

Future Research, Advanced Development and Implementation Activities for Road Transport (FUTURE-RADAR) project will support the European Technology Platform ERTRAC (the European Road Transport Research Advisory Council) and the European Green Vehicle Initiative PPP to create and implement the needed research and innovation strategies for a sustainable and competitive European road transport system. Linking all relevant stakeholders FUTURE-RADAR will provide the consensus-based plans and roadmaps addressing the key societal, environmental, economic and technological challenges in areas such as road transport safety, urban mobility, long distance freight transport, automated road transport, global competitiveness and all issues related to energy and environment.

FUTURE-RADAR will also facilitate exchange between cities in Europe, Asia and Latin America on urban electric mobility solutions. The FUTURE-RADAR activities include project monitoring, strategic research agendas, international assessments and recommendations for innovation deployment as well as twinning of international projects and comprehensive dissemination and awareness activities. Overall it can be stated that FUTURE-RADAR provides the best opportunity to maintain, strengthen and widen the activities to further develop the multi-stakeholder road transport research area, for the high-quality research of societal and industrial relevance in Europe.

UEMI

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In brief

Electric scooter sharing has been gaining increased attention recently. These electric “scooters” are primarily upgraded versions of what used to be originally children toys (or kick scooters). These are deemed to provide efficient “last-mile” solutions for urban commute trips. These e-scooters ideally provide a cheaper alternative to other modes such as taxis, motorcycles, or provide faster mobility options than walking, or provide a viable option for people who cannot ride bicycles. The advent of modern technology (i.e. GPS coupled with mobile apps), improvements in battery technologies, as well as the increasing appetite towards moving to shared economies, have contributed towards the proliferation of such innovative solutions to urban mobility.

In brief



Examples

These electric scooter systems are relatively new. The existing ones operating in the United States resemble the new generation of bike sharing schemes which integrate mobile app technologies for accessing the vehicle. Users register through an app, utilizes the app to find available scooters (which are equipped with GPS devices), as well as in unlocking the scooters (QR code-enabled). The scooters generally can travel up to 15 mph. The existing systems are “dockless,” which means that users can leave the units wherever they wish - this may result in unpleasant consequences such as obstruction - which adds to the convenience to the user. The existing systems in the U.S. (e.g. San Francisco and Washington) charge 1 dollar for unlocking the scooter, and 15 US cents for each minute of use.¹ The scooters are owned by the company, and they are responsible for the charging and maintenance of the scooters.²

Examples Measures



¹ <https://www.thestar.com.my/tech/tech-news/2018/06/22/electric-scooter-sharing-moves-into-the-fast-lane/>

² <https://www.forbes.com/sites/civiconation/2018/06/21/this-is-your-superpower-celebrating-and-supporting-students-who-beat-the-odds/#326bfa7a446d>

Results

Depending on the city of operation, such electric scooters may provide a viable alternative to private modes of vehicles that are used in performing short-distance trips. These scooters have substantially lower carbon emissions as compared to cars, generate less noise, and can contribute towards freeing-up road capacity. Moreover, such scooters may potentially contribute towards making public transport more attractive, by providing last-mile connection from the transit stops. On the other hand, these scooters can be obstructive (or potentially pose safety risks) to pedestrians, if proper regulation and management is not put in place.

Results

Technical & Financial Considerations

Existing estimates show that operating such systems can be feasible, and depending on the assumptions, can be highly profitable. These businesses have the electric scooters at the core of their business models, which are relatively cheap, and can cost only around 500 USD. Lime, a California-based company was recently reported to have raised 2 billion capital for expansion.¹

Conservative estimates, though, show that 10.5% gross profit margins (not yet including potential additional revenue streams such as advertising, but does not include full operating expenses) may make it difficult to make the business model sustainable.² Such conservative estimates assume that the scooters would have an average 300 trips for its lifetime (5 trips per day, 25 minutes for each trip), but more optimistic estimates utilize 1000 trips as an assumption.³

Cities might have to consider providing supportive infrastructure (e.g. perhaps separate lanes for such mobility devices, if they grow significantly in number) for such mobility devices. Dedicated docking stations might be needed, particularly amidst numerous anecdotal evidences of such devices posing as obstructions on the road (or being dumped on waterways and other places).

3 <http://fortune.com/2018/06/21/lime-electric-scooters-paris/> and <http://dashboards.trefis.com/no-login-required/AkTNXQ1T?fromforbesand-article=what-drives-value-at-electric-scooter-sharing-startups-like-bird>

4 <https://www.forbes.com/sites/civicnation/2018/06/21/this-is-your-superpower-celebrating-and-supporting-students-who-beat-the-odds/#326bfa7a446d>

5 <https://www.forbes.com/sites/civicnation/2018/06/21/this-is-your-superpower-celebrating-and-supporting-students-who-beat-the-odds/#326bfa7a446d>

Policy/legislation

The experience in San Francisco reveals an interesting development regarding the involvement of the public in the operations of such e-scooter systems, particularly in the charging and redistribution of the scooters (known as “bird hunting”). Private individuals can sign-up (but no background checks are required) as bird hunters whose tasks are to retrieve scooters, charge them, and return them to pre-agreed pick-up points. Redistribution has been a key issue for bike sharing schemes, but is seemingly solvable in the case of scooters. However, the government may want to institute regulations regarding the involvement of private individuals in the charging and redistribution, to ensure proper protocols and observance thereof for charging, and managing competition.¹

As mentioned, these scooters can be potential obstructions in the urban realm, as well as subjects of vandalism (either being thrown away, or deconstructed, as components can be sold elsewhere), which brings the issue of penalties into the discussion. These have been banned in New York recently due to the obstruction issue.

The safety of the pedestrians should also be a primary consideration. As these mobility devices are seen (at least in the foreseeable future) to be a mode that can mix directly with pedestrian traffic, setting appropriate operating speed limits, and the mandatory use of speed limiters should be considered. Insurance liability is also a key consideration - who is liable if accidents happen?

In all mobility schemes that utilizes mobile applications, issues regarding privacy would also need to be considered. Permits may be used as a vessel for mandating specific privacy protection stipulations as a requirement for operations.

6 <https://www.theatlantic.com/technology/archive/2018/05/charging-electric-scooters-is-a-cut-throat-business/560747/>

Policy/legislation

Institutions

Government institutions which are primarily responsible for urban transportation would be the primary stakeholders in such a measure. As such schemes are primarily being implemented by private operators, entities that regulate commerce, and competition need to be involved closely. Ensuring public safety is of primary concern (both for the users, and the people sharing the space with them), and thus, the police, and traffic enforcement entities would need to closely be involved. A strong collaboration with the locators within primary urban areas (businesses, schools, among others) would have to be instituted for maximizing the benefits of the scheme. Close collaboration with the public transport agency/operators is also ideal for ensuring that the scooters contribute towards making public transport more attractive and convenient. As mentioned, there is an emerging trend of private individuals' involvement in the scheme, including the charging process. Involving the entities responsible for electricity distribution in the discussions regarding charging protocols is ensuring the appropriateness of charging such devices at home, and preventing undesirable incidences related to such.

Transferability

While the concept is still new, a few cities in the United States (e.g. San Francisco, Washington D.C.), as well as in Europe (e.g. Berlin, Bremen, Frankfurt, Zurich), are currently serving as test grounds for such schemes. Theoretically, these shared electric scooters can provide viable alternatives to conventional vehicles for performing short trips, or enabling faster, more convenient transfers to public transport. The operating model has been used by bike sharing schemes all over the globe, and the vehicle itself enables features that are not available in such bike sharing schemes - e.g. redistribution by private individuals. While it is said that these can be cheaper alternatives, a comparison in Paris shows that using such (for 20 minutes) is slightly more expensive than using an electric moped, and significantly more expensive than using a bike sharing scheme (i.e. half a Euro vs 3 Euros for the e-scooter). Other considerations for transferability include operations-related factors (paved stones, speed bumps), as well as the general culture (and preparedness) for shared mobility schemes.

Institutions

Transferability

Context

The City and County of San Francisco is the commercial, financial, and cultural centre of Northern California, and is home to more than 800 thousand people with a population density of 7,282 persons per square kilometer. It ranks third overall in the United States in terms of the % share of public transport use for work-related commute trips. It features the “Muni” (railway) as its primary transport system.

While the transit system in San Francisco appears to be comprehensive, the inclusion of topographical characteristics reveals that there are large areas that do not have adequate access to non-private transport modes (i.e. more than 20 minutes walk to the nearest bus or train stop). About half of the CO₂ emissions in San Francisco is from transportation, and switching from car to mobility on demand modes is estimated to save 1 pound of CO₂ per mile driven.¹

In action

San Francisco, in June 2018, halted scooter sharing operations as it undergoes policy development relating to insurance, parking, and other relevant regulatory aspects for such services. The City has required that motorized scooter companies acquire a permit before operating in the city. The City authorities also confiscated more than 100 units in April 2018 due to complaints that the scooters were obstructing pedestrian sidewalks.²

The San Francisco Municipal Transportation Agency (SFMTA) has recently announced its Powered Scooter Share Permit and Pilot Program which allows operators that have been granted with permits to implement scooter share programs in the City (and county) of San Francisco. In conjunction with the permitting system, it also established a 1 year pilot program in order to collect data, and evaluate future increases in scooters. The program involves 5 companies which, in total, can operate up to 2,500 shared motorized scooters in San Francisco. The applications are to be evaluated by the SFMTA Director of Transport, and will either be granted, granted with modifications, or denied.³

8 http://smartcities.media.mit.edu/pdf/Mobility_on_Demand_SanFranciscoCaseStudy.pdf

9 <http://fortune.com/2018/06/06/lime-scooter-sharing-bird-unicorn-250-million-google-ventures-funding/>

10 <https://www.sfmta.com/projects/powered->

Case Study: San Francisco

In action

The companies are required to provide data and information regarding the following (selected):⁴

- Pricing structure
- Scooter availability and service area
- Redistribution and deployment
- Hours of operation
- Number of scooters and specifications
- Plan for safe riding and storage of scooters
- Ensuring that riders have valid driver's licenses
- Scooter recharging plan
- Use of independent contractors
- Mitigation of negative impacts related to charging
- Documentation of additional
- Maintenance, cleaning and zero waste plan
- Identification of scooters with maintenance needs
- Approach to maintenance
- Hiring and Labor Plan
- Community Outreach Plan
- Privacy Policy

Results

The pilot testing has just commenced this June 2018, and will run for a year. For more information about the project, please visit this [link](#).

Results



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More Information

Implementing
Partners

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