BUSINESS IMPACT BRIEF

Smart Mobility reshaping Urbanization: Challenges and steps to maintain a sustainable future

SMART PAPERS

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Introduction

Affronted with challenges to deliver satisfactory transport services, cities have been investing in Intelligent Transportation Systems (ITS), for many decades. Smart mobility is an industry that is seeing increasing deployment across the world. The demand for transport services faced by governments who have limited resources is noticeable, and Intelligent Transportation Systems (ITS). ITS uses Information and Communications Technology (ICT) to improve the efficiency of existing transport infrastructure and thus reducing side effects such as congestion, accidents and air pollution. In the past two decades, big technology vendors have pushed forward the idea of 'smart cities', and more hubs are interested in improving urban services using technology in the name of smart initiatives.

Energy efficiency and emission reduction is driving future investments in these technologies. Some of the cities that were studied include Amsterdam, Barcelona, London, Madrid, New York City, San Francisco, Seoul, Singapore, Tokyo and Vienna. These either have the infrastructure in place to test smart mobility or are in close proximity to large vehicle manufacturers which makes them the ideal training grounds. The transport sector accounts for one-fifth of total energy use worldwide, with the largest share in passenger vehicles. However, transportation is a difficult sector to cost-effectively reduce energy. Urban transport demand management, mostly enabled by ITS, is regarded as a major solution to mitigate climate change. **The conceptual model outlines the following steps:**

> ❯ **Designing a smart mobility solution to solve an identified problem:**

There are several challenges in today's world regarding the saving of energy, and people are unknowingly consuming more. For example, the problem is traffic on some routes with less parking spaces than the demand.

> ❯ **Deploying & operating the solution and then deployed among a few select residents of the population.**

If sufficient criteria are passed, the testing expands to the whole population. For example, ride sharing can be adopted after monitoring visitors and the cars return to pick up and drop off.

> ❯ **Users take advantage from the solution and change their regular behaviors.**

If the product is adequately solving the problem, they are required to share their feedback to the manufacturers who will have to act upon it. [1]

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1. World Bank Group, ESMAP. (2016, April) Achieving Energy Savings by Intelligent Transportation Systems Investments in the Context of Smart Cities.

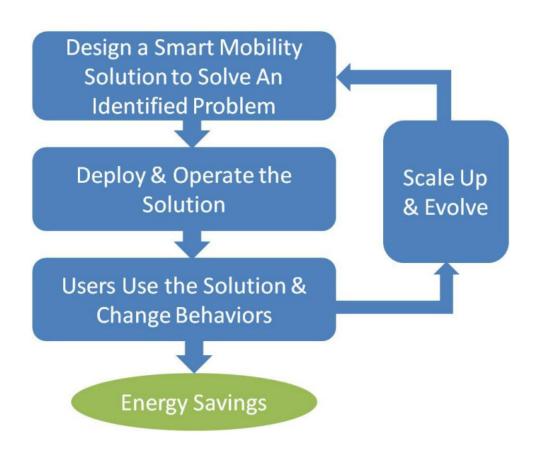| Introduction | Section 1 | Section 2 | Section 3 | Conclusion |

Figure 1. *Conceptual model for ITS investments in the smart cities context to achieve energy savings. World Bank Group, ESMAP. (2016, April) Achieving Energy Savings by Intelligent Transportation Systems Investments in the Context of Smart Cities. World Bank.*

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The global Smart Mobility Market is expected to reach USD 148.91 billion by 2028, reflecting the increasing demand for advanced transportation services and the rise of new smart city projects and the growing adoption of digital technology platforms to augment passenger experience. The emergence of Covid-19 has impacted this surge due to strict lockdown measures that imposed the use of carpooling, car sharing and on-demand ride solutions. [2] According to other estimations, the market is expected to grow at a CAGR of around 20.5 percent during the forecast period 2020-2027, reaching value of nearly USD 70.5 billion by 2027. Europe is dominating this segment due to the booming population that necessitates high energy consumption. Asia Pacific records the fastest market penetration through embracing advanced tools that include automation. [3]

Smart cities concept has reshaped the ITS industry and leading the pathway to the revolutionary multi-modal mobility, which aims to improve sustainability through technology integration. In this context, government initiatives and engineering efforts are critical to improve the efficiency of transport networks and invest in energy saving projects. Added to this, smart mobility management from private and public entities requires the adoption of intelligent and more dynamic strategies that can handle issues in real time, including administrative barriers in terms of inadequate or incompatible governance methods when it comes to such investments.

However, concerns over data privacy and security are real, entailing hazardous effects when it comes to improve intelligent solutions. As long as system evolve, high volumes of data can be exposed and distributed to unauthorized users threatening the integrity of systems, computers, networks, and programs. Nevertheless, research highlights the potential to increase mobility integration through the key drivers below:

2. Mobility Outlook. (2021, September). Global Smart Mobility market to reach $148.91 billion by 2018.

3. Acumen Research and Consulting. (n.d.). Smart Mobility market.

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01 **Flexibility** gives drivers and passengers to share means of transport, such as ride and vehicle sharing, aiming to reduce car dependency and eventually traffic congestion. Automated navigation systems can also improve mobility services though data real-time collection, powered by ITS systems.

02 **Sustainability:** As companies want to be more environment friendly and reduce carbon footprint, air pollution and noise, smart mobility enables 'greener' ways of transportation and vehicles with minimum power consumption

03 **Accessibility:** It involves safe streets and autonomous access for disabled people or reduced capacity to the transport infrastructure. Smart mobility can enable here increased citizen autonomy by detecting barriers or identifying optimizations in specific facilities.

04 **Maximum connectivity** is crucial to enhance journeys and make users interact with real-time information, i.e. hourly tables, forecasts on arrivals at public stations, road conditions, etc. Connectivity empowers people with increased decision making regarding the most suitable routes and means of transport, and therefore, making trips customized to user needs.

05 **Security and safety:** Reflecting the privacy concerns, security is one of the most important elements in smart cities concept. Safety entails all the necessary actions to improve the security of transport infrastructure and ensure the physical integrity of passengers and drivers.

06 **Urban logistics** focus on implementing more economical routes by leveraging digital capabilities to enhance the experience across chains.

07 **User experience:** Arguably the most important factor that determines smart mobility success, as it encompasses various stakeholders needs. Many users are looking to reach their destinations in a safe and smooth ride with minimal time, while others may seek for good quality seating and availability of media content to stream during the trip.

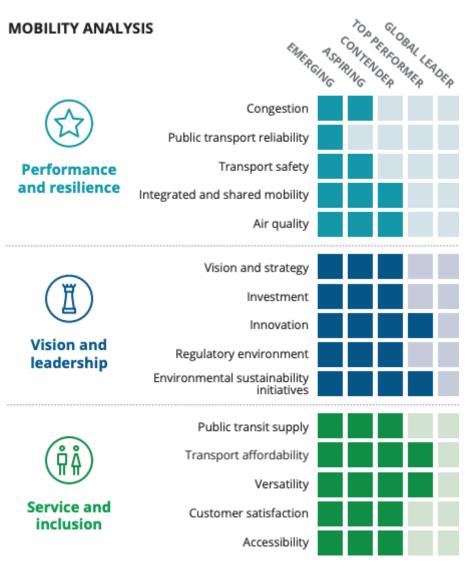| Introduction | Section 1 | Section 2 | Section 3 | Conclusion |

MOBILITY ANALYSIS

Figure 14. *New York City's Mobility Index. Deloitte MCS Limited. (2018). Deloitte City Mobility Index.*

Conclusion

Most global leaders have recently begun to realize that a city's survival depends on sustainability and advanced technology adoption. Therefore, they have redefined their strategies to accommodate new business models. With the exponential rise of Web 2.0 and e-commerce, consumers demand real-time information as the move. Therefore, connecting technology with mobility is the natural result of this transformation, allowing ground-braking integrations, improved road safety, convenience and efficiency. The pandemic has amplified the sensitivity to overcrowding on public transport, bringing smart urban design into the surface.

Connected and automated vehicles, as one of the most vital elements in smart mobility, have reshaped the industry's landscape, though their massive adoptions are still on the way due to limited stakeholder engagement and substantial funding. Opportunities in tech automotive are abundant and highly competitive, and navigating through the shift to the smart city concept will require careful urban planning and strong partnerships across various groups.

Public authorities and private entities should bridge their previous fierce competitiveness and build a new, co-opetitive framework of meaningful collaboration in areas that make the difference in value chains and passenger experience. To deliver smart city projects and achieve emission reduction targets, all member states and nations across the globe should work together and raise sustainability awareness.

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Data-driven metrics on commuter behavior, people flow, accident rate and ridership can provide an overview of modern urbanization, which constantly strives for a revolutionary approach to address recent disruption. Stresses on digitalization, enhancing security and the promotion of innovation are key driving forces behind long-term, viable business cases, and therefore market growth.

However, concerns regarding data privacy and security will remain a challenge that cannot be overseen in the new digital consumer era. Open data is real, making cyber threats a liable scenario in the near future. Companies are already alarmed about sharing information in a huge network, interconnected with multiple smart devices and systems. Finally, the absence of the relevant regulation is delaying massive digital adoption, while businesses are not fully prepared for infrastructure, resources and training purposes.

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