

Sustainable Cities and Communities: Affordable and Sustainable Transport Systems

1. Introduction

1.1. Public transportation system plays a fundamental role in economic competitiveness, social cohesion and sustainable growth. Mobility is critical for urban poverty and economic development as it provides access to jobs, healthcare, education services and other public goods. The evolution of modern transportation can be seen as the outcome of a complex and changing set of social interactions and demographic patterns.

2. Urbanisation and Transportation Demand

2.1. The next decades will be characterised by higher share of urban population and as a city grows, its vehicle population will increase. Growing traffic congestion has a direct effect on air pollution, traffic accidents and CO₂ emissions. Traffic congestion will be unavoidable as the pace of infrastructure expansion will not be as rapid as growing vehicle population. Adding infrastructure capacity to relieve congestion will be costly and slow and it may further increase traffic congestion as the vehicle growth rate will outpace the capacity.

2.2. It is a vicious cycle of more cars leads to more roads leading to more cars and congestion. By 2050, the number of vehicles on the road is forecasted to double to 2 billion and the average time an urban dweller spends in traffic congestion will be 106 hours per year. Spaces for car parking are another challenge as the vehicle population grows. It is estimated that about 30 percent of the cars circling a city at any given time are doing so because the drivers are looking for parking. More congestion will also lead to inefficiencies of the public bus systems as buses are delayed in the traffic. This will impact those commuters who heavily rely on public buses to commute from home to work, school and etc.

3. Sharing Economy and Digital-Age Transportation Ecosystem

3.1. The concept of sharing economy has brought a new era of transportation and shaped the landscape of transportation. The rise of social networking, peer-to-peer networking and the spread of smartphones have brought commuters to engage in a collaborative model. Commuters can borrow a bike on one side of town and leave it on the other. Ride-sharing Apps such as Uber or Grab has allowed commuters to connect to private vehicle for ride from Point A to Point B.

3.2. The digital-age transportation has brought individuals to greater choice in getting around from route planning, finding way while in the car or on foot, paying transportation fares or tolls, car parking fees and etc. This new era of transportation is beyond mobile apps on a smartphone. It requires massive networking throughout the transportation systems between vehicles (V2V), between vehicles and surrounding infrastructure (V2I) and between transportation systems and commuters.



3.3. In this ecosystem, providing safe and reliable infrastructure with the capacity to handle transportation demand remains the core function of the government. As a result, governments around the globe have been pressured to review its existing transportation regulations to allow non-traditional transportation provider to enter into the market. Building such a dynamic and multi-modal transportation system requires a fundamental change from who will control the data and how the data is to be shared.

4. Insight

4.1. Despite the proliferation of the digital innovation across the transportation sector, the sector has been further segmented by these ride-sharing apps and transportation efficiency is not optimised. We have witnessed existing taxi operators having more idle taxis on the road and some cities even experienced a drop in train ridership. As a result, governments are cautioned of future public transportation expansion and have to consider downstream impact by this new sharing economy.

4.2. The challenge is how to harness all these innovations and make far more efficient transportation system. Who will own the data and how can the government optimise this future multi-modal transportation system for future planning? It will certainly require a system of systems connecting different transportation modes, services and technologies to optimise private-public collaboration.

5. Problem Statement

5.1. How can the Government or Industry build a future multi-modal transportation system that can optimise the collaboration among neighbours, communities, public transport operators, technology companies and ride-sharing apps companies?