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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

Mobility sharing economy in Shanghai

Bora Ly^{1*}

Abstract: Urban development is key to sustainable development in the world because people have moved from rural areas to urban cities. Mobility and transport have the highest potential to reduce emissions of carbon in urban areas. Local and international companies have been affected by introducing Chinese apps and smart communication networks. A vast potential can be seen in turning urban mobility into long-term sustainability by incorporating pre-existing but under-utilized low-carbon carriers in cities like public transport into various shared business networks. Though, exponential market growth and creativity in the sharing economy have undermined existing knowledge sources, socio-economic relations, and physical and spatial urban infrastructures. This paper explores the connection between the ongoing development of urban systems and socio-ecological developments in mobility sharing, using observational data from three case studies focusing on automobile sharing in Shanghai. There is a robust evolutionary structure that incorporates an increasingly sustainable urban at macro-level and advanced industry systems into a smart and green transport framework at meso-level. These two layers of evolutionary expansion in urban environments and market systems, created by disruptive mobility-sharing innovations and brought on by urban changes towards an increase in sustainability, both shape one another and strengthen sustainable principles and practices in the swift-changing urban and business innovation industries in Shanghai.

Subjects: Chinese Studies; Cities & Infrastructure; Urban Studies; Urban Communications & Technology; Urban Economics; Urban Politics; ICT; Political Communication; Environmental Communication

Keywords: sharing economy; mobility; transport; automobile sharing; sustainability; Shanghai

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PUBLIC INTEREST STATEMENT

The transport and mobility industry has the most significant opportunity in metropolises to reduce carbon emissions. The arrival in China of application-based and smart sharing platforms has disrupted local and foreign industries. The incorporation of current but underutilized low-carbon vehicles into metropolitan environments has tremendous potential to turn public mobility to long-term viability. The findings argue that there is a dynamic evolutionary process that integrates the increasingly sustainable macro-level urban ecosystem and creative business mechanisms into the smart and green transport framework in Shanghai.

1. Introduction

Even in the urban landscape, as citizens increasingly migrate from rural regions to urban cities, they are the secret to sustainable development in the nation. The 11th target of the Sustainable Development Goals (SDGs) of the UN is to transform urban landscapes into stable, integrated, sustainable, and healthy communities (Assembly, 2015). As a significant emissions contributor, the mobility and transport sectors have generated around 25 percent of the global emissions, and they offer the highest potential for a solution too. The industry expands even faster than any other business, and by 2050, emissions are projected to increase (Habitat, 2016). The new sensitivity to excessive carbon emissions from various forms of transport can undoubtedly help ensure sustainability.

Air pollution has emerged as one of the most significant environmental issues in China and other developing nations. Since serious PM 2.5 pollution incidents in Beijing in 2013, air quality in China, especially in many cities, received unprecedented attention (Song et al., 2018; Zhu, 2018). Besides other contaminants, researchers and public opinion have gradually perceived that vehicle emissions have been identified as a significant contributor to air pollution in most cities in China (Gong et al., 2017; Wu et al., 2016), and has even exceeded other sources of contamination for some cities. Vehicle emissions from the consumption of large quantities of fossil fuel were identified as a significant contributor to air pollution in China (Huang et al., 2016) and a significant source of greenhouse gas emissions (Feng et al., 2013).

Despite its production status, China has entered the developed automotive world. The complicated problem of traffic and substantial pollution from vehicles cannot be quickly resolved. The progress towards a sustainable transport paradigm is critical to the international achievement of the SDGs. Shanghai has the largest population and territory but is also an internationally emerging city with enormous cultural, economic, and social consequences in and beyond China (Parilla et al., 2015). A Yan et al. (2019) study showed that the significant contaminants in Shanghai are PM_{2.5}, and O₃, while in the first half of the year, especially in winter, the highest air pollution occurred. To improve economic progress, improve climate, improved health, and better social services for the citizens of Shanghai, cleaner and smarter transport is necessary. Innovation has altered the operation of companies and the strategies of government in Shanghai since 2010, in the fields of transport sharing—cars, EVs, electric and non-electric bicycles. For example, over 50 percent of the population of Shanghai 24 million have registered a bicycle-sharing model account. The explosion operators in 2017 are predicted to increase by approximately two times, and sharing bicycles are expected to reach 61.70 million per year, and operations to RMB 8.86 billion, with figures set to hit 198 million, while the figures for the Chinese bicycle-sharing industry report are estimated at RMB 29.05 billion in 2021 (China Bicycle Sharing Industry Report, 2017).

However, the sharing economy has brought disruptive technologies to the fore, changing the urban landscape and, in urban areas, obviously harmonizing with the UN SDGs. It takes the shape that vehicles, EVs, and bicycles can be shared. Introducing new but used low-carbon cars in urban cities such as public transport and using numerous application-based business mobility-sharing services has an immense potential to turn the urban transport system into one with long-term viability. Therefore, this paper aims to explore the connection between the ongoing development of urban systems and the social-ecological developments in the mobility sharing economy, using observatory data from three in the potential sharing of rides, EVs, and bicycles in China.

It can be asserted from this research that the increasingly sustainable macro-urban landscape and the innovative business structures have a robust evolutionary connection for a smart and green transport framework on a meso-level. These two forms of evolutionary change in urban landscapes and structure, created by disruptive technology in the mobility-sharing sector and guided by economic development, form one another and reinforce sustainable practices and values in the rapidly-widening urban market and corporate innovation in Shanghai. The theory of transforming sustainable development from the field of global environmental change and the

theory on business ecosystem innovation (Gawer & Cusumano, 2014) will further examine the following in global management studies: how the evolution in urban areas are connected to and implicated for business innovation.

2. Theory of transformation towards sustainability

Global environmental change claims that accumulative scientific methods used by the majority of climate policies to resolve the challenges of climate change and the man's systemic efforts are unsuccessful (Lonsdale et al., 2015). To evaluate financial, monetary, cultural, and relational outlets for vulnerabilities in the environment and grit, Geels et al. (2016) suggested a revolutionary approach which does not necessarily include hypotheses regarding the socio-technical or technological change.

Transformation theory towards sustainability emphasizes that transformational measures and methods have positive social, environmental, and economic value. It also underlines the significance of deliberate or structural methods of change, which lead to significant socio-economic systems in sustainable development. The philosophy involves adaptation, mitigation, and collaboration, particularly in urban cities where mitigation and adaptation are combined to develop interdependence and mitigate compromises. In the analysis of urban cities in rapidly developing foreign megacities such as Shanghai, implementing this principle can be beneficial, as described in large population densities, rapidly growing economic systems, increased social inequality, international relations, and environmental effects. The philosophy of transition into development addresses critical challenges and situations in complex cases.

Through extending this principle to sustainable urban environments, three variables can be defined as essential elements to ensuring that multinational megacities are converted into sustainability. First, physical constraints relate to knowing the location, landscape, facilities, and environmental capability for the growth and survival of a region. A technical capability study must clarify what areas are open for incentives and to sustainable change in communities. It involves understanding and methodologies for the prevailing traffic system's bottlenecks, unsuccessful ventures, and increasing needs. Last, it is vital to investigate the critical, catalytic, persevering, and vulnerable social structures in terms of changes made to society. Such partnerships change the roles and connections between the actors, between participants and different systems, and the broader economic and political context (Gawer & Cusumano, 2014).

3. Theory of business ecosystem innovation

For sustainability to be achieved, the business ecosystem must also be quickly innovated. A business environment includes various players, including policy, industrial and corporate interests, rivals, customers, and everyone else, who cooperate and co-exist in the same financial landscape. The ecosystem is essential for the induction of emerging technologies and corporate innovation, because, in the early stages of the uprising, all players will accelerate their marketing methods. The business environment embraces not only the resource base and network as critical features but also interoperability and industrial input (Gawer & Cusumano, 2014).

4. The sharing economy in the transport industry

The unprecedented development of smart sharing and collaboration networks brought attention to the consequential policy and the excitement created by academics who have explored sharing economics encouraged with the socio-economic effect of online networking processes and activities. The most troubling economy in the world is China's urban transport industry. Innovations have emerged in the automotive sharing economy since 2010, including EVs and bicycles, and substantially changed business practices, government policymaking, regulations, and daily life in China. However, speedy business development and digital economy innovation have challenged all traditional information channels, socio-economic ties, and urban physical and spatial networks. As an example, rapidly linked communities made possible by technological developments and a car-sharing network need to strike a balance on roads that exacerbate the congestion and pollution

they have encountered. Also, the effects of the drastically changing transport behavior, generated by the sharing economy and instigated by big data technology and private investment input that enhances connectivity through using smartphone apps. Finally, it remains an excellent task to navigate the tension between the opportunity of private investment equity companies and government policy mediation. It is essential to understand the evolving process holistically and its environmental, cultural, and social consequences for society to encourage the sustainability of developments in the transport sector sharing and to address the unsatisfactory outcomes simultaneously.

5. Research methods

This paper employed a qualitative approach to investigate the issue. An examination of the sharing economy will be conducted to appropriately grasp the relation between innovation in urban landscapes and market developments. This work analyzes secondary data based on the current and emerging mobility sharing economy in Shanghai, China. First, given Chinese efforts to eliminate carbon emissions, the transition to sustainable transport in Shanghai is contextualized. Next, three case studies on mobility sharing firms in Shanghai will be analyzed, including Didi Chuxing (a private company for ride-sharing), EVCARD (a publicly supported electric car rental service), and Mobike (startup bike sharing). Therefore, previous works and three case studies are analyzed to explain and distinguish the correlations and differences between trends in growth related to sustainability goals. One can be argued that there is a robust relation between developments towards more sustainable urban cities. Improvements to the corporate ecosystem in a smarter and greener transport system are being made at the meso level.

6. Macro-sustainability transformation in Shanghai

The above analysis shows how Shanghai adjusted and moved for sustainable development. Reducing carbon emissions has become China's domestic target to address its many significant trends with its rapid economic growth, including industrial reform, minimizing overcapacity, environmental damage, and improved social well-being of its citizens (Liu et al., 2013).

In climate policy, China has undoubtedly made great strides. Notwithstanding the dynamic transit policy hurdles, China continues to establish a decarbonization program, emphasizing its pledge to reduce carbon emissions by 2030, set national carbon intensity goals in the 12th and 13th five-year plans, build national and sub-national emission control schemes for greenhouse gas and launch step one (Min & Montero, 2018). Since 2011, there has been a disparity between coal consumption and primary energy consumption. In 2014, China reached the highest level of coal consumption, indicating a shift in the energy sources of reduced carbon. It is also relevant to note that since 2005, energy consumption growth has been separated from economic growth.

In response to regional emissions reductions, urban cities are increasingly embracing long-term, environmentally efficient, low-carbon trajectories (Bai et al., 2014). The overview of the interviews and the central strategy policies reveals that Shanghai is a leader in its sustainable development. China pursues its carbon reduction and positive developments in the low carbon sector.

7. National physical constraints

Despite the gains made in sustainability, the role of the government in such practices should also be considered. The authoritarian governmental structure in China requires careful preparation of master plans to define sustainability targets accurately (Wu, 2015). With Shanghai's Master Plan from 1999 to 2020, Shanghai's environmental preservation, renewable energy development, and the creation of green spaces have become its development objectives. However, about land management and population control, environmental degradation, and energy growth, the priorities of the most recent master plan released two years ago, have been to improve the efficiency.

The main principle of the 2035 Shanghai Master plan is to concentrate on ecological limits to reinforce government controls to ensure that they do not circumvent these physical constraints

that do not impact the existing ecological system. Most contentious, Shanghai's plan sets a population cap of 25 million in 2035. It indicates the government's tenacity to preserve the climate despite challenging physical restrictions. This perception has been reaffirmed by the discussions with officials in Shanghai (Liu et al., 2013).

8. Green and innovative development

Shanghai aims to combine its long-term aspirations for economic growth with the increasing social sustainability and environmental goals besides understanding and working within its physical constraints. Besides being a top international, innovative, and financial hub, Shanghai is hoping to sustainably develop in the next few decades, including the enhancement of its environment and its people's welfare. This goal stresses that the preservation of a healthy urban environment is an essential part of Shanghai's international competitiveness. The immediate developmental path of Shanghai is described through five essential elements: integrative, innovative, open, green, and shared. The focus of the interviews is always on how the urban landscape can continue to evolve and drive forward business innovations that promote sustainability and ensure the sustainable path for this sustainability (Liu et al., 2013).

9. Socio-economic ties and fairer change rapidly, and cleaner development

Shanghai aims at working towards these targets, with different groups holding varied and sometimes opposing goals, a variety of complicated issues arise. The main socio-economic links within Shanghai concern mainly cooperation and tension within and across three parties—corporations, governmental organizations, and individuals. Such three classes of actors respond to each other through formal and informal laws, regulations, traditions, and local cultures.

Their complex interaction has shaped the diverse economic and political environments in Shanghai and China. In other ways, partnerships, conflicts, and rent have been pursued by the governmental-corporation ties at various levels. The improvement of social welfare and the reverse like the precariat were also driven by corporate and individual interactions (Ngai & Chan, 2012). A multitude of embedded relationships and subcategories also exist for each stakeholder. An interviewee, for example, stressed that the ties between Shanghai and China could convolute or impede the development in the city due to the various and often contradictory agendas (Zheng, 2006).

Besides, people with different behaviors and principles to sustainability would also shape one another's points of view and contribute to increased opportunities or difficulties in changing towards sustainability. The Shanghai authorities are also anxious that socio-economic relations are becoming more complicated, and try to resolve it by improving the sharing and development of the environment. It is uncertain, however, whether or not the socio-economic relationship is progressing sustainably.

10. Industrial transition

The automotive sharing industry has built an elaborate, creative network growth. Shanghai built its digital environments strategically so economic growth would increase without sacrificing sustainability targets in line with the international and national trends towards smart and digital urban landscapes. Shanghai has achieved in establishing robust ICT infrastructure and encouraging people to use smartphones (ShGov, 2015). China has the world's most extensive network base, with Chinese smartphones using over 1.3 billion and 90 percent surfing the network via mobile phones (Economist, 2016). Even with the declining material economy, the digital economy continues to thrive in China. China not only has the most extensive international e-commerce segment, but it also has the fastest growing online business (Zhang, 2015).

The rapid growth of the digital economy has contributed to an economical pool of resources that allowed automotive sharing platforms to evolve. These included automobile sharing apps such as Uber China and Didi Chuxing. Investments in these startups create enormous interest among risk

capitalists, mainly because of the expanding online market, especially the share economy growth. Over several phases of investment, DiDi and Uber raised more than USD 1 billion in equity to enable people to consider their transportation services on conventional buses and trains with efficiency. Such benefits and promotions changed social attitudes, which contributed to a restructuring in 2016 in a short period. Within four years, the disruptive technologies of the app-based ride-sharing service have changed the automotive industry. Before 2012, city citizens were reluctant to use smartphones to schedule their daily trips. In 2016, over 80% of urban residents were using transportation options based on applications. Several firms in the transport sector, therefore, have included smart, sharing apps in their offerings and have established software to prepare with Uber and Didi (Cramer & Krueger, 2016).

11. Feedback on market

In the industry, big data and the internet of things have increased efficiency, which also contributes to technological revolutions in the automotive industry (Cramer & Krueger, 2016). The transport sector considers itself mainly as industrial businesses, instead of transportation companies. It is because the application sharing service provides a competitive advantage. Didi, for example, claims that 70 TB of data must be processed every day, covering approximately 20 million transport services. A Didi Research Institute was also founded in 2016, driven by top international machine learning specialists and big data. Also considered their primary asset is the electric vehicle rental system. Although EVCARD and Mobike also possess physical properties, for example, EVs and bikes, the technology behind the service are essential. The surface of integrated mobility sharing systems has transformed the transport industry, putting complementary sectors such as electric vehicles, fuel-powered vehicles, motorbikes, and bicycles together into a standard network of automotive-sharing firms. Technological innovations in this sector have removed limits and challenges for different vital modes of transport, promoting the flow of production characteristics from one sector to the next. It includes information, capital, and people. For example, Mobike's co-founder was a senior employee of Ford Motors, a leading international car company. His initial foray into Mobike was because of the complexity in working with governments and targeting consumers of his difficulty in initiating a car-sharing service. This needed funding, which is far beyond a startup. He tried to put the same concept into a more sustainable business, such as bike-sharing. The players in the automotive industry are less antagonistic, and the scale of consumers is less complicated. However, some aspects of the car industry were designed and implemented for bicycles and used the same idea of car sharing as an essential role for intelligent sharing in cities. Before joining Mobike, the other top manager of Mobike was previously Uber China's Shanghai Regional Manager. It was possible to connect the automotive industry, to share ideas and technological expertise with the transport sharing industry, and to turn it into an ecosystem for companies. There are different overlaps for the financial investors, too, as a risk capitalist can invest in Didi and Mobike and so on. Another reason is that Tencent, one of the giant's digital and technical leaders, is an owner of both firms. Its sophisticated technology services include GPS and using big data, online payment mechanisms, Social Media and application structures, and not physical assets of the firms are an essential feature of Tencent, Mobike, and Didi.

Such perturbing innovations then changed the transport sector. They created a value network part of a new and evolving environment of transport sharing that is no longer focusing on a single mode of mobility. It is the smart sharing mechanism that acts as a value network employing digital technologies. These networks then call on more transport companies and related car and service companies, such as car rental companies and manufacturers of electric vehicles, either to incorporate transport-sharing sector features into their pre-existing business practice or to reform their business models to incorporate these features. These networks will help us to improve the system. It leads to further compelling disruptive technologies, which triggers robust industrial feedback to further enhance the unification of physical and social pools into the transport sector.

12. Co-existence

However, this review is minimal. Although the institutional reasons and outcomes of sustainable development in China, particularly in Shanghai, are holistically defined, we still lack information about how companies and stakeholders respond and engage in structural change. On the other side, a meso level study shows that the rapid, competitive growth of the transport sharing market, and the creation of the mobility industry from car sectors into a natural environment, reflects a move towards more efficient and greener integrated transport and consumerism in mobility. To deal with these shortcomings, the study will suggest there should be a method of co-evolution, which connects and evolves both urban landscapes and market technologies, in which the two systems are merged to explain findings on the three businesses further.

13. Strict car ownership controls and a lack of public transport

Transportation demand is a crucial indicator of the rapid and changing socio-economic development, with 24 million growing in Shanghai. Every year, there are on the road new additions to 200,000 brand new private vehicles. The time and distance traversed to people living in Shanghai are the highest in China, with a mean travel time of 51 minutes and 18.8 kilometers (ChinaNews, 2015). Shanghai is China's first town to apply car ownership regulations to address this issue. It was also the most prosperous area to do this. Shanghai has implemented the need for new car owners to participate in a Shanghai Car License bidding exercise to travel and use highly encapsulated streets in Shanghai. This strategy has shown its efficacy in controlling the number of cars and the increase in vehicles in Shanghai. It also generates considerable revenue from public transport for the government (Chen & Zhao, 2013). Williams and Arkarapraserkul (2017) have further asserted that car ownership is often regarded as a symbol of wealth in urban cities like Shanghai, instead of seen as a convenience. This perspective is further strengthened by the new Auction Regulation, as the cost to a car becomes a luxury that the rich can afford.

The growing demand is still being neglected by public transportation in Shanghai. Although public buses and trains are proliferating, they are still not adequate to meet people's requirements. In terms of population growth, the 50,000 taxis operated by Shanghai saw a marginal increase from 2003 to 2013 (Cramer & Krueger, 2016).

14. Key analysis

14.1. Reshaping the socio-economic relationship and physical boundaries of transformative technological innovations

Shanghai has participated in numerous projects, which can be seen in different cities in China, to respond to the demand needs and its increasing population. With implementing the ride-sharing service in 2012, the mode of transport was cheaper, more efficient, and more comfortable. Riding firms provide substantial discounts for enticing riders and drivers to join to create the new market. Didi and Uber China have spent nearly USD 4.5 billion on subsidies to drivers and passengers since their merger.

Such disruptive technologies re-established the car-sharing network capital pool to arise later because of how behavioral changes have taken place in customers while also challenging past socio-economic relations. For example, over 17 million drivers are employed by Didi. Some 2.4 million of the Chinese financial restructuring is underemployed or unemployed. However, many were working in other sectors before the downturn of the financial market. While this new automobile sharing industry has generated significant jobs, this shared ride company's increase in labor flexibility also raises several concerns over an increasingly precarious environment (Standing, 2016).

Regarding physical restriction, the firm development policy in China still needs to be formalized, and China's rising population growth rates and environmental concerns still need to be regulated institutionally. Thus, even with the rapid increase in ride-sharing, the government has failed in

regulating or banning more vehicles along China's streets. The government was trying to tackle the problem by having soft regulations that provided room for growth while still keeping those rules. In their startup seasons, these riding businesses did not meet the same green targets in the town, but only much later in their growth.

The first phase of mobility sharing has therefore added more tension to the physical limitations of a community by encouraging more vehicles along Chinese highways, attempting to address the socio-economic relations that already occur with contradictory consequences and has little impact on the sustainable development of urban cities.

14.2. Sustainable state plan for electric vehicles

Although ride-sharing systems create new challenges, other travel methods offer a better alternative. Generous discounts by primary ride-sharing services opened up new possibilities in Shanghai for a more competitive travel sharing market. The government noted this incident and launched efforts to introduce electric vehicles before they were underdeveloped in 2013.

Three linked and relevant points of emphasis have been placed at the heart of the EVs industry for China's environmental sustainability, energy security, and economic growth (Howell et al., 2014). As far as research and development are concerned, China has wanted its electric vehicle industry to grow since the 1980s. The design of low-carbon policies was thus a national priority, related to the growth of the electric vehicle sector, which has been sponsored and integrated into several large-scale initiatives by growing demand on the energy supply and public transportation system. Policies have then sought to subsidize consumers highly and pressure local authorities to purchase electric vehicles. Nevertheless, these economies are still falling behind other industries in terms of their enthusiasm for electric vehicles (Cramer & Krueger, 2016).

Shanghai's government-owned company unveiled EVCARD, an electric vehicle sharing network, under heavy pressure to increase sales of locally produced electric vehicles, to establish a Chinese Autolib. EVCARD has prepared its consumers for the application-based smart sharing platform, by providing substantial national support such as complimentary automotive licenses or heavily or even free electric vehicles, charging and parking stations for these vehicles and to further develop this idea for sharing electric vehicles. BAIC and GreenGo have also improved further consumer behavior (Cramer & Krueger, 2016).

Electric vehicle sharing has more advantages compared with the first round of trying to bring the targets into line with the physical limitations of towns. It supports greener modes of transport and more collaborative forms of transportation and their use. However, its socio-economic consequences are less than those of ride-sharing. Since its consumers drive electric vehicle sharing, social interactions are reduced between drivers and passengers. Only a small circle of urban commuters remains the influence of EVCARD.

14.3. Enhance the shared mobility system and align with government sustainable development goals

Other countries and regions have also embraced this approach, and their strategies are focused on sustainability. On the global level, the UK and the EU have tried to encourage an informal economy to provide more jobs and growth, especially amid an economic recession (Martin, 2016). The mobility sharing industry was rapidly pursued in 2015, and this concept of sharing could be assimilated in national development policies by 2016. The main reason for the policy change was also the slowdown in China's financial markets and the adoption of low-carbon emissions. China performed a tough transition from production to a service economy after 2010.

Besides economic prospects, China's shared economy was a means of achieving its greener environment goals and reducing carbon emissions. The sharing economy can minimize resource consumptions, minimize environmental damage, and promote a circular economy by enhancing

the management and use of existing assets (Zhang & Zhang, 2016). Uber China and Didi have sought, both to formalize the social economy, to match their priorities with China's policy of reducing emissions of pollution to provide brand new technologies that enable ecological and competitive consumerism.

Application-based platforms were also meant to leverage the possibilities of opening up in China, such as the smartphone introduction of bicycle-sharing services. The government responded swiftly and positively during this period. In Shanghai, for example, Mobike has established strategic cooperation with the government of Yangpu locality, to promote the last miles in a green transport mode, which corresponds to the last distance people travel to their homes from trains or bus stations. It then continues to affiliate police stations and a variety of other municipal authorities. The government of Shanghai then formalized the goal of encouraging 80 percent of its populace to ride bikes or on foot (Zhang & Zhang, 2016).

However, these businesses must still be constructive. Strict regulations that require different skills for drivers participating in different riding sharing programs have, for example, been implemented. It indicates they must be permanent residents in China. It influenced over 90% of DiDi passengers, many of whom were low-skilled or international employees who needed a job to live. Therefore, while these sharing networks support the government's priorities, specific considerations in introducing ride-sharing across the country were addressed (Williams & Arkaraprasertkul, 2017).

Thus, sharing mobility has produced a material and positive impact on all three sustainability objectives for each period. It made the physical environment more and more sustainable by encouraging collaborative consumerism via distributing bicycles, sharing electric vehicles, carpooling, and the broader use of public transport. It has also forced the application of greener and sharing of concepts through policies and public demonstrations in the knowledge system. Also, the government's collaboration with the automotive sharing industries has facilitated a push towards more sustainable development that can be managed effectively in urban cities.

15. Conclusion

The modern and growing car-sharing environment in Shanghai paves the way for a change in the physical landscape, socio-economic relations, and the network of information that allows urban cities an ever more prosperous location. However, the path to progress is not linear. Preferably it displays an increasingly sustainable upward spiral path with numerous oscillations. The rise of a balanced low-carbon development target has contributed to a shared innovation process between close relationships and connections with innovations from corporate ecosystems.

First, it has led to industrial change and the creation of a new business ecosystem by using the same physical information and communication technology infrastructure, financial capitalists, and social resources in urban, technological, and other companies. Besides, the disruptive technologies of the platforms for automotive sharing demonstrate a broad range of urban physical constraints, which contradict the objective of reducing carbon emissions and improving sustainable development. The impact has also been mixed on the socio-economic relations of cities. Without significant reforms and help from the other key players and the community, even under the evolving features of the business environment, the initial phase of challenging innovations would not have been maintained.

Second, the prevalent and accelerated growth and the growing recognition of physical limitations limiting urban development of the low-carbon emissions agenda and information network in urban cities, have obliged the government to work on the creation and use of refreshing capital sources to help meet its targets for sustainable development. Extensive public funding (e.g., EVCARD) and additional support from businesses that promote market diversity led to developing a value network around a smart sharing system focused on the application which took place in the era of disruptive technological innovation. The state has also tried to respond effectively and favorably to this new corporate environment, clearly preferring other petrol-fueled modes of transport.

Third, support from the government and feedback related to the industrial, automotive industry has had positive effects, such as an increase in entrepreneurs, startups, and more considerable efforts to provide their resources for green and shared inventions. Given this support on all fronts, the urban macroeconomic government and the meso corporate ecosystem have paved the way for the sustainable development objectives of urban cities.

The emergence of the co-evolution process thus reveals a complex system that goes beyond a linear path and involves many feedback loops to sustainable development. Sustainable structures of information, physical limitations, and socio-economic linkages have interconnected roles that contribute to the corporate ecosystem's sustainable development.

16. Limitations and future research

Because such work is limited to one urban scenario only, the Shanghai and only one market, the transport sharing business, which continues to expand and develop, the analysis needs to be evaluated further through other case studies. However, it is a critical study that investigates the central aspect of culture and the climate and the extent to which development's ecological effects were encouraged or declined in the first development of the sector in a difficult period.

First, the position of financial capital is both important and challenging. As the automobile sharing industries represent technology businesses, their financial dynamics mainly rely on risk investors who can have significant shareholdings in these entrepreneurs by numerous investment rounds that can use the original brain child's development targets and decision-making processes. Further research must also be carried out to discover how beginners meet the short-term profit-seeking objectives and personalities of risk capitalist companies, which can not necessarily have immediate benefits from the long-term strategies for sustainable transformation.

Second, regulation in a transport-sharing economy is ambiguous, mainly when one considers the dynamic, unregulated relationships between the operators of different platforms and the government. Often, the confrontation with the crucial decision: either to regulate government action of these companies or to employ a more flexible or indirect approach to management, monitor their services and products to ensure they meet industry standards for quality, working conditions, and environmental impacts.

Third, these mobility sharing firms' growing power and authority should be investigated. Since the industry depends on a winner-taking strategy where one company eventually wins its rivals, this monopoly issue is yet another matter that must be unraveled and solved.

Finally, the awareness of the developmental and co-evolutionary synergies between the enterprise environment and the principal social and ecological boundaries of urban areas would improve success rates as urban areas move to sustainability. There is a question on how to incorporate such synergies in the vast and varied societies of a single region or country to promote sustainability?

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