

Characteristics, Impacts and Trends of Urban Transportation

Subjects: Transportation Science & Technology

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Economic growth, urban development and the prosperity of the automobile industry have driven a huge shift in global urban transportation from walking to public transportation and then to automobiles. Private mobility has become an important part of residents' daily trips. Cities, especially automobile-dependent cities, face a variety of negative impacts such as increased commuting distances, higher congestion costs, traffic accidents, traffic pollution including climate change, etc. Therefore, how to balance the relationship between people's growing demand for private motorization with the development of urbanization, modernization and motorization and the huge economic, social and environmental costs brought about by them, so as to realize the sustainable development of cities and transportation, is the main problem facing cities around the world. The entry focuses on trends in the sustainable development of urban transportation such as restrictions in private car ownership and use, electrification of urban transportation, intelligent transportation systems (including shared mobility, customized buses and Mobility as a Service/MaaS) and transit-oriented development (TOD). China, as the largest global automobile producer and consumer, represents and leads the growth and evolution of other emerging countries.

Keywords: urban transportation ; transportation demand management ; electrification of urban transportation ; intelligent transportation system ; transit-oriented development (TOD)

Cities not only drive economic and value creation and play a vital role in many key social issues but are also the main link between human and environmental systems. In 1800, the global urbanization rate was only 2%, and it reached 50.16% in 2007 for the first time. It is predicted to be as high as 68.36% in 2050 ^[1]. Every year, more than 20 million people worldwide move from rural to urban areas, equivalent to the entire population of Romania in 2020. Although cities account for only 3% of the world's land area, they generate about 80% of the world's gross domestic product (GDP). The role of the city, especially in the new economic era, is becoming more and more important. It is not only the center of production, consumption, finance and service but also the center of innovation. The sustainable development of cities is crucial to achieving global sustainability within the Earth's environmental capacity.

The function and development of cities are inseparable from urban transportation. As a carrier to realize the movement of people and goods, urban transportation has gradually changed from a supporting facility of urban development to an important means of regulating the urban development model. Cesare Marchetti ^[2] initially found that the average daily trip time of residents, called the travel time budget, is about 65–70 mins based on research in major cities around the world. This is the "Marchetti constant". Beyond that amount, passengers perceive time spent traveling to and from their destination (usually work) as wasted or less valuable. According to the "one-hour travel circle", Newman and Kenworthy ^[3] divided cities into the categories of "Walking City" (prehistoric to 1850s), "Transit City" (1850s–1950s) and "Automobile City" (1950s–present). Currently, most cities contain elements of all three urban forms, differentiated by different modal splits and urban densities. Even some urban centers still retain features of walking and transit urban fabrics, in the United States, the "Automobile City" is a typical model, for example: as of 2013, about 86% of Americans completed their commute by private car, and 76% of them drove alone ^[4].

References

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