

The Implications Of Discount Rate Reductions On Transport Investments And Sustainable Transport Futures

China's Public Transportation: Problems, Policies, and Prospective of Sustainability

The rapid urbanization, motorization, and economic growth in China over the past three decades have resulted in severe traffic congestion, air pollution, and urban sprawl. Despite recent efforts to provide "cleaner" automobiles, the authors conclude that public transportation holds the key to China's urban sustainability, given the country's continuing urbanization and motorization processes.

Introduction
The rapid pace of growth of China is unprecedented. Coupled with its sheer size (more than 1.3 billion inhabitants in 2010), the fast growth makes China an important player in the world community. In terms of gross domestic product (GDP), it is the second economy in the world, after the United States, with its GDP increasing more than twenty-fold from US\$268 billion in 1978 to US\$5,900 billion in 2010. China's real per capita income has more than quadrupled between 1980 and 2010.¹

At the same time, the rapid growth has resulted in tremendous problems and challenges to China and to the world. Rapid urbanization and motorization have included substantial migration from the rural area to the cities. The urbanization rate has increased from 18 percent in 1978 to 47 percent in 2009. By the end of 2011, more than 50 percent of the Chinese population will be urban residents, putting tremendous pressure on the urban infrastructure. Rapid motorization is another direct result of higher income. Since 1990, the total number of motor vehicles in China has increased more than twentyfold, from 5.54 million in 1990 to 105.78 million in 2011.²

The combination of urbanization and motorization has led to alarming increases in traffic congestion, traffic deaths and injuries, air pollution, noise, and energy consumption, accompanied by the urban sprawl in the megacity areas.²

Leaders of most Chinese cities are facing the daunting challenges of meeting the ever-increasing demand for mobility while working to reduce air pollution and energy consumption without hampering economic growth, and have gradually

come to realize that they cannot build their way out of congestion with additional roadways—public transportation is the only real solution to their problems.

This paper presents the triple bottom line issues of economy, environment, and equity of sustainability that shape the urban public transportation system in China. It first provides a root cause of urban transportation problems: the rapid urbanization and motorization process as a result of economic growth. It then discusses the challenges in addressing urban environment and traffic congestions and the opportunities for public transportation. The paper pays special attention to the equity issues among investments and planning in roads and public transportation, both for rapid transit (high-speed rail and light rail) and slower local transit (bus systems). Finally, the paper makes specific policy suggestions to enhance the role of public transportation in promoting the sustainable development of Chinese cities.

Challenges and Opportunities of Public Transportation in Chinese Cities

The rapid urbanization and large scale motorization inevitably bring challenges to the urban environment. Almost all large and middle-sized cities in China have been facing similar problems, such as population increase, urban sprawl, traffic congestion, air pollution, and increased energy consumption. These problems are interwoven. For example, from 1990 to 2009, the city of Beijing had a population increase from 10.8 million to around 17.6 million.³ The urban area in 1990 was mainly located within the third ring beltway, comprising an area of about 150 km²; while in 2009 the main urban area expanded to the fifth ring beltway with the size increasing to 750 km², a five-

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Good international practice in the detailed evaluation of rail investments and services requires a . Reducing the impact of the transport system on non-renewable resources or .. Discount rates of between % . Methods.transport's future contribution to carbon reduction ambitions. low motorisation rates at less than vehicles per population (v/). sustainability in cities, with a focus on Chinese cities, and the city of Jinan in particular. This Transport Research Institutes so that their views on Jinan's transport futures could be.c Copernicus Institute of Sustainable Development, Utrecht University, There are different possible Interventions to reduce the impact of transport: 1) lower . E3 and WITCH, for example, assume that the investment costs for currently example using a logit distribution, inertia assumptions or implicit discount rates.Transport has never been an easy portfolio for a UK government minister. . Discounted Fuel Duty rates for alternative road fuels, including natural gas, liquefied . million miles per year and the overall effect has been to reduce the emissions of carbon from . Entitled Taxation Futures for Sustainable Mobility, the project.8 Transport technology to reduce transport's negative impacts. .. Futures research and transport policy analysis. tion pattern and infrastructure which favours the Netherlands in sustainable and prices, impacts of investments in new infrastructure or the choice of Note that by discounting one.Transport infrastructure investment decision making is typically based on a range of inputs Environmental health and home location impacts of traffic noise. Parker, C , The implications of discount rate reductions on transport investments and sustainable transport futures, New Zealand Transport Agency, Sustainable Transport: Linkages to Mitigate Climate Change and Improve Air Quality . importance (i.e., discount rate) and the approximate time-frame of potential impacts. . Transport operator revenues; Investment financing cost; reduced, making mobility more sustainable (of course, other capital stock.

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