

## Editorial introduction: Special issue on "Low carbon city in Asian Cities"

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## Editorial introduction

### *Special issue on "Low carbon city in Asian Cities"*

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Climate change is already beginning to transform life on Earth. Around the globe, rains and droughts are intensifying, glaciers are melting and sea levels are rising. If we don't act now, one-fourth of Earth's species could be headed for extinction by 2050. A path we must take is the Low Carbon City because Greenhouse gases (GHGs), a principal cause of global warming, are emitted in large quantities in cities where population growth and human activities are concentrated. The Kyoto Protocol Target Achievement Plan requires urban governance to promote low-carbon societies. In the case of Japan, about 50% total CO<sub>2</sub> emissions are attributed to socio-economic activities in the cities—residential sector, business sector and transportation sector. These activities in cities can be characterized as diverse and complex. It interacts with urban forms and functions. The dispersed urban forms of most North American cities, which were built recently, encourages automobile dependency and are linked with high levels of mobility, resulting in increase in CO<sub>2</sub> emissions. On the other hand, the dense urban cores of many European, Asian cities enable residents to make between one third and two thirds of all trips by walking and cycling. Nevertheless, it has been seen that the response to the rapid concentration of population in Asian cities is the housing development in suburban areas. This outward expansion of cities has given rise to an urban structure producing a large environmental burden, particularly in terms of traffic problems. Meanwhile, the evolution of transportation has generally led to changes in urban form. The more radical the changes in transport technology have been, the more the alterations on the urban form. One may argue that compact city is a solution to the problem of urban sprawl. However, due to the huge population in Asia, the population densities in large Asian cities such as Taipei, Jakarta and Beijing are already too high even with great expansion to go for more compact. Therefore, within Asia, one of the keys to averting a climate change crisis lies in low carbon transport. China, India and Asia's other emerging economies could promote fuel efficient vehicles, public transport, and sustainable urban planning. Or they could become locked into inefficient vehicles, energy intensive infrastructure, and suburban sprawl. The path they choose will have long-term impacts not just on Asia but on the entire world.

In view of the close interrelationship among urban form, transportation and CO<sub>2</sub> emissions and constrains toward compact city in Asia, the main focus of this special issue was placed on transportation sector, seeking

innovative solutions. Gao and her colleagues' contribution in this special issue proposed a concept of Behavior Zone as a unit for spatial planning and showed that the estimation of CO<sub>2</sub> emission based on Behavior Zones has several advantages as compared to estimation methods based on individual commuting behaviors in Beijing. Another contribution from Pai and Huang studied the travel behavior change of the residents under the influence of Transit Jointed Development (TJD) in Taipei. It concluded that TJD has significant positive effect on the Mass Rapid Transit (MRT) application and helps a lot for driving reduction. Another case study from Shrestha, et al. included in this issue was directed at studying urban accessibility and evaluating different scenarios with regard to the potential towards low carbon transport development in Kathmandu Metropolitan City. This issue also includes a paper dealing with solar power generation in Chinese cities. Zhang et al studied the potential and variance in solar irradiance and PV power generation among Chinese cities and addressed the issue of suitability to develop distributed PV power system in the targeted cities.

The studies collected in the special issue serve as good references for pursuing low carbon development in Asian cities although these works need further refinements in many aspects. In particular, guest editors take the view that authors should also discuss CO<sub>2</sub> emissions from the transport sector in relation to topographic features and meteorological conditions, which are missing in this issue. All submitted manuscripts were peer-reviewed. The guest editors would like to thank the reviewers for their hard work, time and valuable comments and suggestions that make this special issue possible.