



Conflict and consensus in stakeholder attitudes toward sustainable transport projects in China: An empirical investigation

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ABSTRACT

Conflicts inevitably occur in major transport projects as various stakeholders express diverse, often conflicting needs and concerns, and failing to address and manage these conflicts often leads to project failures. Understanding stakeholders' perceptions and the discrepancies among them is crucial to an effective dialogue among the parties seeking to build consensus. This study investigates the potential influences of stakeholder characteristics as well as project environments on conflicts and consensuses in stakeholders' overall preferences about sustainable transport projects. Data on the perspectives of three stakeholder-group types (system providers, project designers, and system users) with regard to 14 sustainability criteria are drawn from a survey of eight major transport projects across China. Two-way analysis of variance is then carried out to investigate whether or not the differences in the mean scores among stakeholder-group types and cities were statistically significant. The results show that discrepancies of opinion about transport-project sustainability criteria prevail among stakeholder-group types in every region we studied, due to these types' different needs and concerns. Our findings also suggest that special attention should be given to cases in which multiple stakeholder groups assign the same priorities to certain criteria, as those criteria are likely to represent the most serious issues affecting all stakeholders in a given project environment. With regard to the potential influences of project environments, we found that, in general, the discrepancies in stakeholders' prior concerns about sustainability criteria exhibited no obvious geographic pattern. However, exceptions did occur when a specific criterion was of major concern in a given project environment. Taken together, our findings emphasize the necessity of addressing and managing specific local issues, and the divergent concerns of stakeholders, when planning sustainable-transport projects.

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1. Introduction and background

Transport plays an important role in promoting the sustainability of communities, since its infrastructure directly influences many non-transport factors such as economic growth, environmental protection and social development. A comprehensive evaluation of sustainability performance renders the planning of sustainable-transport projects a complex task, requiring coordination among diverse stakeholders. Addressing and managing the interests and concerns of these different stakeholders at the planning stage is increasingly recognized as crucial to a successful

sustainable transport project (Mok, Shen, & Yang, 2015; Yang, Shen, Ho, Drew, & Xue, 2011). While forestalling certain problems, however, the involvement of a variety of stakeholders often results in new ones, arising from these groups' diverse and conflicting concerns (Balali, Zahraie, & Roozbahani, 2012; Li, Ng, & Skitmore, 2013; Olander, 2007). Thus, to reduce the potential for conflicts among stakeholders attempting to arrive at a collective preference, the perceptions of each stakeholder group and the discrepancies between these perceptions need to be thoroughly investigated.

Transport infrastructure serves as an engine of urban development and prosperity, in terms of both accessibility and mobility. However, amid growing awareness of the need for sustainable development of transport infrastructure, in addition to economic development, governments planning major transport initiatives now face concerns raised by the general public, including the social

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inequity and exploitation of the environment that can result from urbanization (Wilson & Rezgui, 2013; Yao, Shen, Tan, & Hao, 2011). Failing to address stakeholders' expectations regarding these and similar issues may result in project failures (Xiong, Yuan, Li, & Skibniewski, 2015; Yang, Shen, Drew, & Ho, 2009), especially given the increasing tendency for the general public and various interest groups to seek to influence the implementation of public infrastructure projects (Atkin & Skitmore, 2008; Olander & Landin, 2008). A recent example is the Hong Kong Express Rail Link controversy of 2009 (Li, Ng, & Skitmore, 2012a, 2012b). Groups in Hong Kong including residents and local politicians protested the proposed Hong Kong section of the railway on the grounds that, in addition to increasing the levels of air- and noise pollution in the affected districts, its construction would cause around 500 residents to be displaced. Moreover, the opposition groups contended that the government had not facilitated any effective public participation in the process: the affected residents were simply informed of the finalized decision about the project, without at any point having been invited to voice their concerns about it. Although this project was finally approved – construction commenced in 2010 – the unprecedented protest is considered one of the reasons that the line's expected completion date has been pushed back by two years, to 2017 (Lin, 2014).

Sustainable development aims to improve quality of life in three areas: society, economy, and environment. The intricacy and multiplicity of the relationships between transportation infrastructure and non-transport factors make it difficult to isolate transportation when designing an urban transport system. In other words, development of sustainable transport requires consideration of indirect as well as direct impacts (Jones, Tefe, & Appiah-Opoku, 2013; Mihyeon Jeon & Amekudzi, 2005). Direct impacts, such as savings in fossil-fuel consumption and commuting time attributable to the new system, are usually derived from scientific analysis and expert opinion. Indirect impacts, in contrast, are more likely to arise from indigenous knowledge, and can only be ascertained via a thorough investigation of local stakeholders' opinions (Jones, Tefe, & Appiah-Opoku, 2015). Indigenous knowledge, although informal and often ignored in scientific research, is arguably a crucial factor for stakeholder-management strategies, especially in developing countries (Briggs, 2005; Jones et al. 2013). The application of indigenous knowledge in urban-transport planning processes aimed at sustainable development in developing nations has been well documented (Appiah-Opoku, 2007; Briggs, 2005; Brömmelstroet & Bertolini, 2010; Rist & Dahdouh-Guebas, 2006). Jones et al. (2013) concluded that, to gain the indigenous knowledge essential to transport-project success, the key stakeholders are system users, who perceive and can interpret their own interests and concerns with respect to local conditions and the project's impact on their lives. Scientific knowledge, in contrast, was defined in the same study as formal knowledge captured through data-driven and theoretical analysis for professional evaluation, as exercised by transport professionals like system providers (policymakers, administrators, planners and designers). Taken as a whole, prior research indicates that the voices of transport-system providers, designers and users all need to be investigated and incorporated into the planning process if a project is to successfully make use of both indigenous and scientific knowledge. In a standard transportation-planning process, indigenous and scientific knowledge are documented in project feasibility/appraisal studies using quantitative and/or qualitative performance metrics.

Along with information garnered from feasibility studies, multi-criteria decision analysis (MCDA) is widely used for making decisions about transport projects (Šaparauskas & Turskis, 2006; Jato-Espino, Castillo-Lopez, Rodriguez-Hernandez, & Canteras-Jordana, 2014). However, a decision achieved by the MCDA method does

not necessarily guarantee a mutually acceptable solution that reflects the diverse stakeholders' preferences about the multiple criteria (Balali, Mottaghi, Shoghli, & Golabchi, 2014). Conflicts among stakeholder groups are inevitable, as each has its own concerns vis-à-vis the objectives of the project, so conflict resolution – conceived of as the application of multiple perspectives to the making of a single mutually acceptable decision – is a central issue in transport planning (Cai, Lasdon, & Michelsen, 2004). However, an optimal compromise can only be achieved if the stakeholders' perceptions and the discrepancies among these perceptions are thoroughly examined (Yuan, Skibniewski, Li, & Zheng, 2009). Through an examination of infrastructure projects in Hong Kong, Li et al. (2012a, 2012b) found significant disparities among the prior concerns of four different stakeholder groups: with the system providers (government) seeing the projects' economic return on investment (ROI) as the priority, while the general public emphasized sustainable land use; pressure groups focused on the adoption of green technology in the design; and project-affected groups were most concerned about their levels of compensation and the adequacy of relocation plans. These authors' results suggest that policy decision-makers should seek to resolve major conflicts between the private and public sectors to maximize the chances of successful infrastructure-project implementation. Wei, Liu, Skibniewski, and Balali (2015) likewise found that three stakeholder groups had divergent prior concerns about the sustainability-performance criteria of transport projects in Tianjin Binhai New Area, China. Yet, the case studies in the aforementioned research have focused on only one type of project environment – cities – so their conclusions regarding disparities among stakeholder groups may not be generalizable to other project environments. Recent studies have argued that variances in project environments at both intra-national and inter-national levels may influence the perspectives of trans-regional and transnational stakeholders on major infrastructure projects (Minkov & Hofstede, 2012; Mok et al. 2015). Thus, if one is to avoid adopting a universal stakeholder-management approach across intra-national or national borders that neglects the potential effects of varying project environments, it will be necessary to investigate the discrepancies in stakeholders' needs and prior concerns across different project environments.

China is facing a serious transportation challenge due to the rapid growth of its urban populations, and increasing numbers of public-transport projects there have encountered public disputes over their social and environmental costs, all of which have caused serious implementation delays and financial overruns. The Shanghai-Hangzhou Maglev Line project, for instance, was suspended by the Shanghai government after hundreds of residents demonstrated against its construction close to their homes, citing potential health hazards, noise, and loss of property value (French, 2008). Similarly, an \$8.9 billion petrochemical facility expansion project in Ningbo was officially suspended after thousands of demonstrators voiced their concerns about industrial pollution the facilities might cause (Spegele, 2012). The aforementioned examples indicate the burning issues facing not only the Chinese government but other governments in the developing world, amid a growing tendency for public stakeholders to critically assess the implementation of public infrastructure projects from the viewpoint of social and environmental conservation (Atkin & Skitmore, 2008; Olander & Landin, 2008).

Failure to address stakeholders' different concerns or to manage the associated conflicts has been identified as a major barrier to successful infrastructure planning in developing nations, especially those such as China where levels of public participation are relatively low (Shan & Yai, 2011; Xie, Yang, Hu, & PCChan, 2014; Yang et al. 2011). Moreover, the extremely diverse project

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