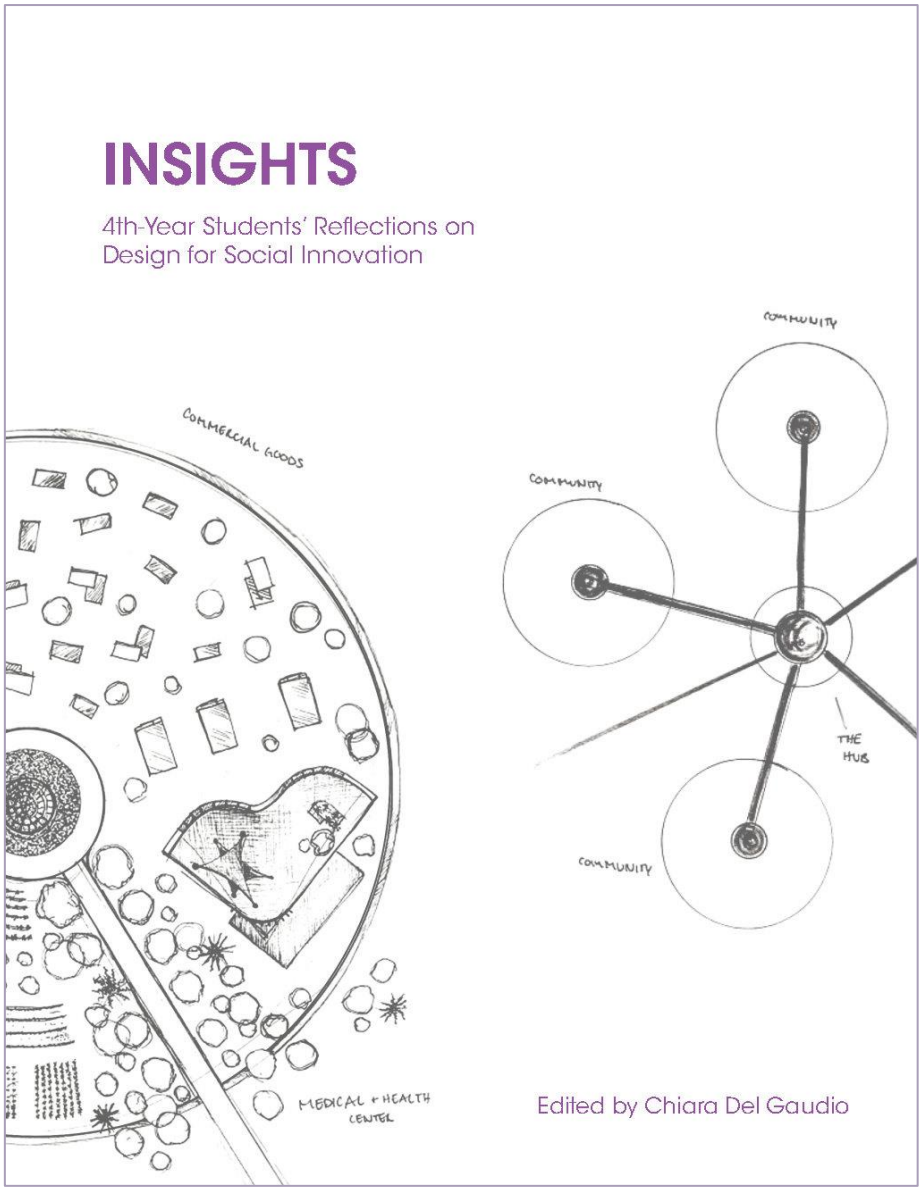
Section excerpted from:



ISBN 978-1-4884-0017-9 (ebook) DOI: 10.22215/srp/2021.delg

First edition: January 2021

Edited by Chiara Del Gaudio
Front cover image by Catherine Caetano-Macdonell, Callum Goncalves, Chimzuruoke Nebo, Gabriel Laudisa, and Heidi Evans
Paper Images retrieved by each paper's author Book Design by Maya Chopra

Published by Carleton University https://carleton.ca/

PRAKRITI PRATIJIT

The Impact of Transportation Engineering in the Context of Urban Planning for Social Innovation

URBAN PLANNING - TRANSPORTATION ENGINEERING - INTERCONNECTIVITY

Social innovation is a broad term open to many interpretations; however, for the purpose of this paper we will be using Phills *et al.* (2008) definition of *desirable social innovation*. It defines social innovation as "a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals." (Phills et al., 2008, para. 3). Tackling social innovation through the design of infrastructure in theory provides cities with long-term, sustainable solutions that appeal to the general public.

Poverty is a social problem that plagues almost every urban or rural area. One of the major causes of poverty is lack of proper infrastructure (Braveman & Gruskin, 2003). One aspect of infrastructure that can greatly aid in diminishing poverty is well-functioning public transit (Whitfield, 2017). Many people living in low-income neighbourhoods rely on public transit as their main mode of transportation to jobs, education, and basic amenities. Housing available near public transit routes tends to be inaccessible to low-income people due to the high cost of such housing (McKenzie, 2013). Inequality of access to public transit in low-income neighbourhoods prevents people in these neighbourhoods from accessing well-paying jobs, goods and markets, quality education, and other neighbourhoods (Whitfield, 2017).

Urban planning is a multidisciplinary field which affects almost every aspect of our lives, from housing to infrastructure to public policy. Due to its multidisciplinary nature, there are a number of branches of urban planning, all of which deal with the public good and improving the quality of life of citizens while taking into consideration health, aesthetics, equity, and efficiency (Canadian Institute of Planners, 2019). There are five main urbanization problems that urban planning is designed to address - poverty, housing availability and cost, transportation congestion, environmental decay, and fiscal squeeze. These problems are interdependent, and the multidisciplinary nature of urban planning is crucial to solving these problems (Whitfield, 2017). Transportation engineering is a branch of civil engineering which handles infrastructure. There are two major categories of transportation engineering in the context of urban planning that are of interest when it comes to social innovation - public transit and multimodal transit (Whitfield, 2017). These two categories play a major role in the interconnectivity of a city, which can help reduce poverty and environmental decay in both metropolitan and rural areas.

One proposed solution to this problem is implementing a high-performance bus (HPB) system, otherwise known as bus rapid transport (BRT). BRT consists of high frequency busses running along transitways and major transit nodes. BRT aims to have the same efficiency as metro transit at a fraction of the cost. A study performed in Barcelona showed that a well-designed BRT system can meet the demand of bus-based transit and a portion of metro-based transit while simultaneously saving bus agencies money (Estrada et al., 2011). Other viable options include light rail transit (LRT) in combination with BRT, as is seen in Ottawa currently, or a subway system in combination with regular bus systems as seen in New York.

Another proposed solution is the implementation of multimodal transit – otherwise known as complete streets. Complete streets are those streets which accommodate all types of transit (pedestrians, cyclists,

motor vehicles, transport vehicles, etc.) (Nes & Bovy, 2004). Multimodal transit and complete streets inherently allow for accessibility and interconnectivity by opening up major streets and arterial roads to all types of transportation, however it has a more significant impact on sustainability. This is due to the fact that the implementation of complete streets helps clear up traffic congestion and idling time of automotive vehicles, which helps reduce a city's carbon emissions (Whitfield, 2017).

Complete streets are considered a social innovation due to the novelty of the concept. A typical complete street consists of the following: wider sidewalks, curb cuts and ramps, crosswalks with islands for pedestrians, bike lanes and paths, bus lanes and shelters, central left-turn lanes, lower traffic speeds, and landscaping (Litman, 2015). Typical streets in metropolitan areas consist of roads that are either used for motor vehicles (main streets, arterial streets, highways, etc.) and streets that are for bike or pedestrian use only (neighbourhood sidewalks, pedestrian walkways, etc.). Due to the fact that complete streets allow for the integration of multiple modes of transit in one street, complete streets encourage the use of non-motor vehicle transportation. This, in turn, improves public health as modes of transportation such as walking and cycling are designed to be safer on complete streets relative to regular automobile-based designs for streets, which reduces emissions emitted from congested trafficways (McCann, 2011). Multimodal transit manages to tackle two social problems at once by increasing interconnectivity and accessibility to amenities while reducing emissions and harmful environmental impacts of automobile dependency (Whitfield, 2017).

Referring back to the definition of *desirable social innovation* as defined by Phills et al. (2008), social innovation must be efficient, effective, sustainable, and beneficial to the general public. Using transportation engineering in an urban planning context in order to improve interconnectivity and sustainability of a city is a very promising form of social innovation. Through transportation, there is the potential of reducing emissions, increasing public health, and increasing accessibility to education, health care, and jobs to low-income areas. These solutions are not only effective, but they are long term solutions which will continue to improve as a city grows and develops. Transportation engineering in an urban planning context helps lay down an easy-to-follow framework in order for social innovation to flourish as a city grows.

"Using transportation engineering in an urban planning context in order to improve interconnectivity and sustainability of a city is a very promising form of social innovation."

References included at the end of the document
DOI: http://dx.doi.org/10.22215/srp/2021.delg.19

References

Braveman, P., & Gruskin, S. (2003). Poverty, equity, human rights and health. *Bulletin of the World Health Organization, 81*(7), 540.

Canadian Institute of Planners. (2019). *About Planning*. Retrieved 28 October, 2019, from http://cip-icu.ca/Careers-in-Planning/About-Planning

Estrada, M., Roca-Riu, M., Badia, H., Robusté, F., & Daganzo, C. F. (2011). Design and Implementation of Efficient Transit Networks: Procedure, Case Study and Validity Test. *Procedia Social And Behavioral Sciences, 17*, 113-135. doi: 10.1016/j.sbspro.2011.04.510

Litman, T. (2015). *Evaluating Complete Streets*. Victoria Transport Policy Institute. https://www.vtpi.org/compstr.pdf

McCann, B. (2011). Perspectives From the Field: Complete Streets and Sustainability. *Environmental Practice, 13(*1), 63-64. doi:10.1017/S1466046610000591

McKenzie, B. (2013). Neighborhood Access to Transit by Race, Ethnicity, and Poverty in Portland, OR. *City & Community, 12*(2), 134-155. doi: 10.1111/cico.12022

Nes, R., & Bovy, P.H. L. (2004). Multimodal traveling and its impact on urban transit network design. *Journal of Advanced Transportation, 38*(3), 225-241. doi: 10.1002/atr.5670380302

Phills, J., Deiglmeier, K., & Miller, D. T. (2008). Rediscovering Social Innovation. *Stanford Social Innovation Review,* 38. Retrieved from https://ssir.org/articles/entry/rediscovering_social_innovation

Whitfield, K. (2017). *CIVE4303B: Introduction to Urban Planning*, *Week 1* [Lecture 1b Notes, PowerPoint Slides]. Retrieved from: https://culearn.carleton.ca/moodle/course/view.php?id=102785

Whitfield, K. (2017). *CIVE4303B: Urbanization in Canada, Week 2* [Lecture 2b Notes, PowerPoint Slides]. Retrieved from: https://culearn.carleton.ca/moodle/course/view.php?id=102785