



Pedestrian's needs matters: Examining Manila's walking environment



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ABSTRACT

Developing cities report higher walk shares in comparison to their developed city counterpart. Also, they present a strikingly different set of challenges and opportunities in their pedestrian environments. The need to enhance our understanding of environmental attributes, which encourage pedestrians to participate (or not) in walking and walking-related activities, has prompted this pedestrian-scale face-to-face questionnaire survey on one developing city. This paper has three aims, namely: examine the pedestrian decision making process, apply the Analytic Hierarchy Process (AHP) to empirically define the hierarchy of pedestrian needs (criteria), and examine the relative priorities of environmental attributes (alternatives) that satisfy the pedestrian needs, with the end goal of realising a positive walking environment. A total of 70 respondents were collected via face-to-face questionnaire survey which was rolled out in the Quiapo District (Manila, Philippines). Results of this study demonstrated the feasibility of AHP in supporting an evidence-based approach to defining the pedestrian need hierarchy. Moreover, it established that the most important criteria is *protection* rather than *mobility*. Traditionally, the design of pedestrian facilities (e.g. sidewalks/pathways) was premised on the need to move. Moreover, based on the survey, the relative priority of the criteria in the order of most important to least important priority is: *protection, ease, equitable access, mobility, identity and enjoyment*. This comprises the pedestrian need-hierarchy, which served as the theoretical framework of this paper. This paper presents an alternative approach at quantifying qualitative criteria and attributes that served relevant to the pedestrian decision-making process. Moreover, this research sheds light on the importance of a user-centred needs-assessment approach to better understand pedestrian decision-making and behaviour.

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1. Introduction

1.1. Walking in developing cities

Walking is the most basic, active and most inclusive of all modes. Aside from delivering economic benefits such as vehicle or public transport cost savings, time savings and transport externality reduction (Litman, 2003), it also increases personal mobility options. In addition, it supports equitable access to opportunities, particularly to the most vulnerable transport users in our society such as women, children and the elderly (Borst et al., 2009). However, walking has continued to be undervalued in current transportation planning and policy development (Shoup, 2010; Litman, 2003, Newman and Kenworthy, 1999) especially in a number of Asian developing cities. Despite the fact that pedestrians account for approximately 40–60% of modal shares (Leather et al., 2011), pedestrians and the needs of pedestrians have continued to be the last priority of the public and private sectors,

particularly in developing contexts. This plain disregard towards nonmotorised transport users is also manifested in the inadequate provision of good quality pedestrian facilities, the limited funding allocation for pedestrian infrastructures, and transport planning and policies that fundamentally cater towards private car drivers (Newman and Kenworthy, 1999). However, with half of the world's annual 1.3 million road-related fatalities being predominantly pedestrians, cyclists, and motorcyclists, and a disproportionate numbers (approximately 90%) occurring in developing countries (World Health Organization (WHO), 2009), transport planning and policy at the international, national and even local levels have continued to be silent. However, it is imperative that we urgently address the need to protect the most vulnerable users of our transport system (Naci et al., 2009; Zegeer and Bushell, 2012; World Health Organization (WHO), 2013).

Given that developing cities present a different set of urban challenges compared to its Western neighbours, this paper aims to increase our understanding on the pedestrian decision making process within the Asian context. It seeks to identify and prioritise environmental attributes of the walking environment that are perceived to encourage pedestrians to participate or not participate in walking and walking-related activities, with the

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Table 1
Percent change in walking mode share in selected Asian Cities.

CITY	% (Initial year)	% (End year)	Motorised mode with greatest gain
Bangalore	44.00 (1984)	08.33 (2007)	Two-wheeler and car
Changzhou	38.24 (1986)	21.54 (2006)	Two-wheeler and car
Chennai	47.00 (2002)	22.00 (2008)	Two-wheeler
Delhi	39.00 (2002)	21.00 (2008)	Two-wheeler and car
Nanchang	44.99 (2001)	39.11 (2005)	Car
Shanghai	38.00 (1986)	10.40 (2004)	Two-wheeler and bus
Xi'an	22.94 (2002)	15.78 (2006)	Bus
Metro Manila*	21.86 (1999)	19.81 (2015)**	Motorised mode*

* Adapted from: [Leather et al., 2011](#); [Japan International Cooperation Agency, 1999](#).

** Projected modal share value for pedestrians.

expectation that this can potentially contribute towards realising a positive walking experience. To do this, the paper initially develops and proposes a pedestrian need-hierarchy as a potential framework to better understand the pedestrian decision making process. By examining a particular district in Manila (Philippines), the paper validates the pedestrian need-hierarchy by undertaking a street-level face-to-face questionnaire survey. Results are then analysed with the application of the Analytic Hierarchy Process (AHP) to ([Saaty, 1980](#)) empirically define the hierarchy of pedestrian needs (criteria) and examine the relative priorities of environmental attributes (alternatives). The premise is that a pedestrian-centred needs-assessment of the walking environment would elicit a more authentic representation of the attributes that contribute to the walkability of the pedestrian environment. This representation can only be developed based on an individual's actual experience of the said environment. This hierarchy is useful in prioritising pedestrian facility interventions as well as inform pedestrian planning and policy.

The paper is organised as follows: the next section provides a critical discussion on the existing literature on walking, pedestrian decision making and the built environment culminating in the discussion of the pedestrian need hierarchy, which is the paper's theoretical framework. Subsequently, the methodology section describes the empirical design of this study, which is then followed by the results and discussion of this study. The final section reiterates the paper's key findings in the summary and conclusion to assist in better understanding pedestrian needs as an approach to realise better pedestrian environments.

1.2. Manila as the study context

Manila, the capital of the Philippines, is the empirical case context for this study. It is one of the 16 cities and municipalities that comprise Metropolitan Manila. Similar to megacities in Asia,



Fig. 1. Metro Manila's pedestrians and sidewalks.

the lack of effective planning coupled with rapid urbanization and high population growth is said to have exacerbated various transport and transport-related problems within Manila's urban centre. Problems such as lack of safety, traffic congestion and environmental pollution are some of the challenges that Manila's commuters have to contend with on a daily basis (see [Fig. 1](#)). In addition, the lack of upkeep of Manila's pedestrian facilities has resulted in the continued degeneration of the walking environment. According to an Asian Development Bank report ([Leather et al., 2011](#)), Manila's poor pedestrian infrastructure has forced people to patronise other transport modes, such as paratransits (e.g. jeepneys) or motorised cars, even for trips that could have been otherwise easily accomplished by a 15 min walk (approximately 1.2 km). This has naturally resulted in a continuous decline of overall non-motorised transport share, a phenomenon which is manifested not only in Manila but also across cities of the developing world (see [Table 1](#)).

Compared to its developed city counterparts, developing metropolises such as Manila continue to accommodate a higher walk share proportion, particularly in their urban centres. This is in part due to the limited access to the motorised car and the presence of formal and informal public transport options. According to Japan International Cooperation Agency's 2010 High Standard Highway Study, the current road transport network of Metro Manila carries approximately 89% of motorised public transport, a relatively high modal share in comparison to other countries. This is generally complemented by non-motorised transport modes (e.g. walking). However, walking individuals are considered as captive pedestrians instead of choice users. This means that these individuals walk because "they have to" and not because "they want to". According to the 1999 MMUTIS study, approximately 10.8 million pedestrians in Metro Manila will be walking per day by 2015, which means a 250% increase from 1996 figures of 4.3 million. However, while this is a large increase in absolute numbers, the overall proportion of pedestrians will actually drop by 2% ([Japan International Cooperation Agency, 1999](#)). Therefore, the aim is to find approaches that would help sustain the current proportion of walk share if the desired outcome is to promote a more sustainable and inclusive city. Therefore, it then becomes crucial then that an improved understanding of the pedestrian decision making process be gained so as to strategically identify approaches that support an enhanced pedestrian environment.

2. Pedestrian need: a theoretical framework

2.1. A critical review on pedestrian needs

A pedestrian when deciding on a walking route tends to choose a route based on a number of influencing factors. One such factor is their socio-demographic characteristics. This may include their

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