

Research Article

A Study on Non-Motorised (NMT) Activities for Urban Environment

Bibie Sara Salleh, Riza Atiq Abdullah O.K Rahmat and Amiruddin Ismail

Department of Civil and Structural Engineering, Faculty of Engineering and Built Environment,
Sustainable Urban Transport Research Centre (SUTRA), National University of Malaysia
(UKM), Malaysia

Abstract: This study aim to define strategies for influencing of shifting from motorised to non-motorised modes of transport in the framework of a sustainable urban transport. A growing number of Asian cities have high numbers of private car making up the majority of traffic. This has resulted in the negative impact of traffic congestion, road safety, air pollution and climate change. Many policy measures to reduce these problems have been implemented, such as widening the roads, limiting speed, upgrading the motorcycle lanes and upgrading public transport, but there are no measures and encouragement for the provision of non-motorised modes of transport (cycling and walking) in Malaysia. These modes of transport are seldom acknowledged by planners and policymakers. This study suggests areas for reforming the traditional views of highway provision and touches upon the framework for cycling and walking strategies.

Keywords: Cycling, non-motorised, public transport, walking

INTRODUCTION

A cycling and walking strategy should begin by stating its purpose. The purpose is to promote these non-motorised modes of transport as an environmentally sustainable feeder mode for public transport and as preferred modes for short distance trips. The choice of cycling and walking as feeder modes can increase the coverage of buses to inaccessible areas (Adjei, 2010). Unfortunately, service and facilities for cyclists and pedestrians in Malaysia are mostly inadequate. Public transport also does not provide a door-to-door service. This depends on the traffic demand, where public transport cannot access all parts of the city if there are low-demand areas. Commuters need to access the public transport station (e.g., bus stop, train station etc.) over some distance. According to Adjei (2010), commuters are, however, willing to make bicycle and walking trips when non-motorised infrastructures are provided on access routes to a bus stop. In Klang Valley, Malaysia, 61% of the population lives 400 m from the bus lane (possible walking distance) and 40% of 4,000 bus stops in the Klang Valley are not roofed and are without any signboard (Kuala Lumpur Structure Plan, 2020). In order to understand the implementation of non-motorised strategies in an urban environment and the integration of non-motorised modes of transport with public transport, this study presents a framework of the

concept of non-motorised planning with current information on ways to make communities better places for cycling and walking.

HOW TO IMPROVE NMT CONDITION

According to Litman (2004), one of the factors that influences travel changes is improving NMT travel. Five areas were identified to improve NMT modes of transport condition as shown in Fig. 1. These are: improved convenience and comfort for NMT users; improved transport options; building up attractive and liveable communities; improved basic mobility for non-drivers; and improved land-use efficiency.

Improved convenience and comfort to NMT users: Four areas are identified in this study that influences the convenience and comfort of NMT users. The Pedestrian Master Plan, in Litman *et al.* (2011), states that the physical infrastructure is one of the indicators that influence convenience and the infrastructure should be accessible to everyone, by accommodating the needs of people, regardless of age and ability. According to Department of Transport (2000), the other indicator is to improve safety and security in that area. There are many ways to increase safety, such as improving lighting, crossings and signal settings, traffic calming measures, signing and improving accident remedial schemes.

Corresponding Author: Bibie Sara Salleh, Department of Civil and Structural Engineering, Faculty of Engineering and Built Environment, Sustainable Urban Transport Research Centre (SUTRA), National University of Malaysia (UKM), Malaysia

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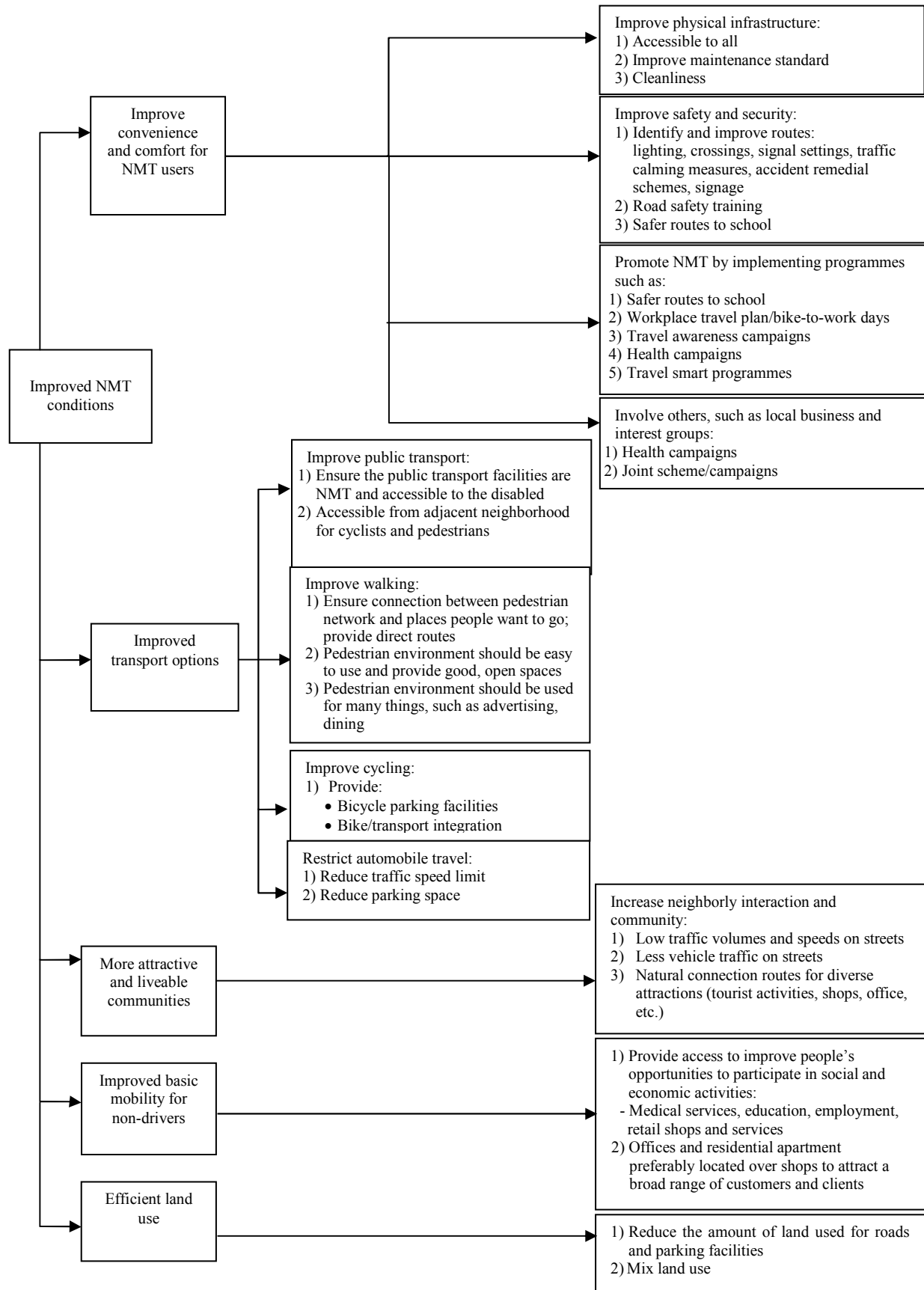


Fig. 1: Framework to improve NMT condition

The other indicator to improve convenience and comfort for NMT users is to promote special programmes related to NMT, such as safer routes to school programmes, workplace travel plans, cycle-to-work-day programmes, travel awareness campaigns, health campaigns and travel smart programmes. Putcher *et al.* (2010) conclude that safe routes to school are a programme that includes education, infrastructure and enforcement, in order to increase student safety by cycling and walking to school. A study in Marin County found that the number of students cycling to school increased by up to 114% after the implementation of this programme (Staunton, 2003). Cycling-to-work-day programmes encourage commuters to try cycling and include free breakfast and contests for encouragement. The implementation of this programme in Seattle successfully increased the number of first-time cyclists from 845 in 2004 to 2,478 in 2008.

Improve transport option: Litman (2011) mentioned that to improve urban transport means improving walking and cycling conditions and restricting automobile travel. He also stated that NMT modes are important transport choices, since cycling and walking trips support public transport.

Walking is a component of the transportation system. It provides connections among homes and public transit, car parks and destinations etc. According to Litman *et al.* (2011), one of the principles for pedestrian designs is that the pedestrian network and destinations should be well connected. They should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, public transit and recreational opportunities. The Pedestrian Master Plan, in Litman *et al.* (2011), states that the walking environment should be easy to use and provide good places. The walkways should be designed so that it is easy for people to find a direct route to a destination. The good design for walking environment includes open spaces such as plazas, courtyards and squares. Amenities such as planting, street furniture and special paving should promote a sense of place. The walking environment should also be used for many things where public activities are encouraged, such as dining and advertising.

Cycling conditions need to be improved in order to improve the transport option. Bike parking is one of the key aspects of integrating bicycled with public transport (Putcher *et al.*, 2010). Litman *et al.* (2011) address the fact that the bicycle parking facilities should provide security for bicycle users and must be fully protected from the weather and enclosed in a secure space, such as lockers, storage room or fenced area. The racks should be highly visible to discourage theft and vandalism. To avoid theft and vandalism, the racks and lockers must be well-anchored to the ground. Integrating cycling and transit by expanding the catchment area can increase the efficiency of the public

transport service (Litman *et al.*, 2011). Bicycle and transport integration is a successful implementation in attracting new users. Thirty percent of users of Vancouver's bike lockers at transit station had not previously used public transport to commute. Bike parking needs to be provided at transit stops and terminals. The accommodation for bicycles on transit vehicles is one of the approaches recommended by Litman *et al.* (2011).

Another indicator to improve the transport option is to restrict automobile travel. VTPI (2008), wide roads, high traffic speeds and large parking facilities discourage people to use NMT.

More attractive and liveable communities: As stated by Weissman and Corbett (1992) and VTPI (2008), Community Liveability refers to the environmental and social quality of an area, as perceived by residents, visitors and employees. Litman (2011) mentioned that community liveability impacts the improvement of NMT conditions. The liveability of communities is related partially to how convenient it is to cycle and walk in the neighborhood (Burden *et al.*, 1999). They addressed the aspects that can be modified, such as the availability of destinations for walking and cycling and the directness and continuity of routes to the destinations people want to access. Streets are where people interact with their community. Attractive and liveable communities will increase neighborly interaction and community. Concern for their local environment can be achieved by the lower vehicle volumes and lower speeds on street (Appleyard, 1981). Pedestrianised streets should form a natural connection route for diverse attractions (shops, offices, tourist activities, etc.).

Improve basic mobility for non-drivers: Another way to improve NMT conditions is to improve basic mobility for non-drivers. Walking and cycling provide basic mobility and many people rely on walking to access activities, such as medical services, education, employment, retail shops and services (Litman, 2011). The situation will improve people's opportunities to participate in social and economic activities. He also stated that offices and residential apartments should, preferably, be located over shops to attract a broad range of customers and clients.

Efficient land use: Land-use considerations, such as reducing the amount of land used for roads and parking facilities, is one of the factors for improving NMT conditions. Bryant (2005) stated that mixing land use by providing housing near employment centres helps to encourage a jobs or housing balance that reduces automobile travel and encourages NMT travel for commuting. It also encourages commercial land use, such as restaurants and shops nearby, so that these places stimulate pedestrian activities.

Mixing land use and clustering buildings was addressed by Cervero (1986). He suggested a denser clustering of office buildings, with mixed use within and among office buildings, to reduce motorized trips at lunchtime and to create a pedestrian-friendly environment.

HOW TO INTEGRATE NMT WITH PUBLIC TRANSPORT

The integration of NMT with public transport offers many of the benefits of door-to-door transport. Research found that 90% of public transport commuters

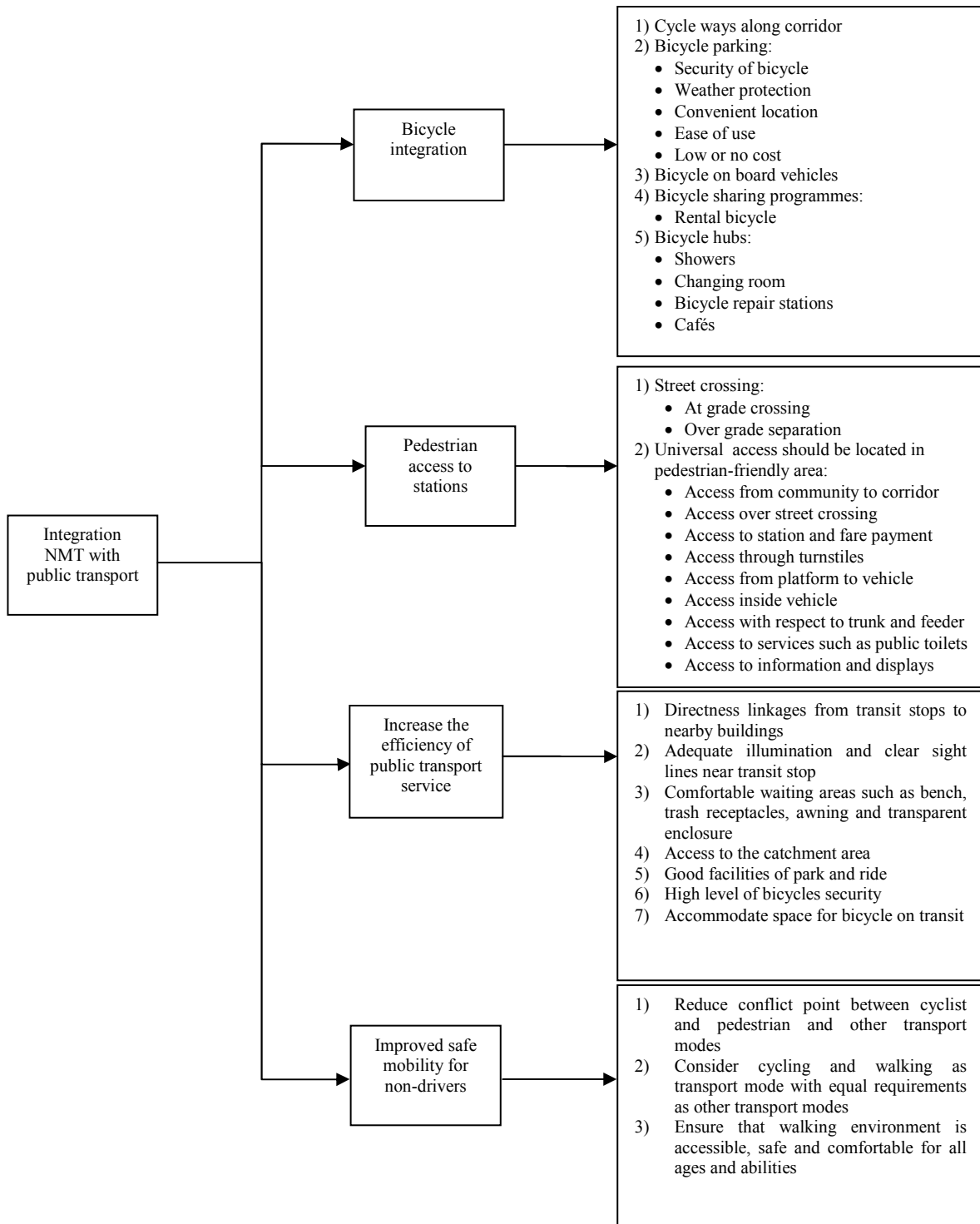


Fig. 2: Framework of integrating NMT with public transport

need to walk a short distance and many cyclists use public transport to finish their trips. According to Martens (2007), access to bus stops is the weakest part of a bus transport system. Research in the Netherlands shows that, with a good access provision to bus stops, the travel time ratio between public transport and the private car in the Netherlands reduced from 1.4 to 1.25 (Martens, 2007).

At the 5th Regional Environmentally Sustainable Transport Forum in Asia, here are two important elements that influence the integration of NMT with public transport; the access of pedestrian to the station; and bicycle integration (Fig. 2). He noted that for bicycle integration, the authority needs to provide cycle ways along corridors, as well as good facilities for bicycle parking, including security of the bicycles, protection from the weather, convenient location, ease of use and low-or no-cost bike parking. As strategies for the successful integration of bicycles with public transport, Wright also suggested allowing bicycles on vehicles, bicycle-sharing programmes, such as rental bikes and the provision of bicycle hubs, with showers, changing room, bicycle repair stations and cafés. As stated in Komanoff and Roelofs (1993), people would choose to walk and cycle more frequently if they had suitable facilities. An Australian survey found that 17% of adults claimed they would sometimes commute by bicycle if changing facilities and secure storage were provided.

According to Adjei (2010), walking is a mode of transport that is seen to have a big portion of total trips made per day, because commuters need to walk to their mode of transport, even over a short distance. The important of pedestrian access to stations has been seen as an important element to achieving the successful integration of NMT with public transport. Wright (2010) mentioned that the provision of at-grade crossings is generally preferred by pedestrians over grade-separation. He also mentioned universal access to encourage pedestrians to choose public transport. Universal access referred to the access from the community to corridor access over street crossings, access to stations and fare payment, access through turnstiles, access from platforms to vehicles, access inside vehicles, access with respect to trunk and feeder, access to services such as public toilets and access to information and displays. Litman *et al.* (2011) stated that pedestrian streets should have good access to public transport and parking, which should be located in a pedestrian-friendly area.

There are few designs that deal with transit accommodation in urban areas. The recommendation of providing direct links from transport to nearby buildings, adequate illumination and clear sight lines near transit stops and comfortable waiting areas (e.g., benches, rubbish bins, awnings) was suggested to encourage public transport use (Canadian Institute of

Transportation Engineers, 2003). According to Victoria Transport Policy Institute (2011), the integration of cycling and public transport provides a high level of mobility. The efficiency of public transit service can be increased by expanding the public transport service to the catchment area, providing Good Park and ride facilities, increasing the level of bicycle security and accommodating bicycles on transit vehicles. Papaioannou *et al.* (2011) conclude that one of the pedestrian needs is safe mobility. The strategy to achieve safe mobility among pedestrians is to reduce the conflict points between pedestrians and other transport modes, to consider walking as a transport mode with equal requirements as other transport modes and to ensure that the walking environment is accessible, safe and comfortable for all ages and abilities.

CONCLUSION

This study points to the concept of the implementation of cycling and walking in the urban environment and how to integrate NMT with public transport. From previous research, several factors that are significant to the planning and implementation of cycling and walking have been identified, to develop this framework. Therefore, the authors gathered all the factors that may influence the successful implementation of NMT in an urban area. The next phase of this study is to define carefully and assign weights to the variables that influence cycling and walking.

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