



High Quality Walking Infrastructure

Annex A of the Handbook 'Navigating Transport NAMAs'

TRANSfer Project – Towards climate-friendly transport technologies and measures

The concept

Besides cycling, walking is the most efficient and sustainable means of transport and, although often underestimated, is highly important in urban transport systems. Walking is the only mode of transport that is totally cost-free for the individual. Thus, walking is the main mode for low-income households, especially in developing countries. With increasing income, the share of walking typically declines. Often, in public opinion walking is associated with an inferior position in society and consequently wealthy citizens use their private car even for short distances. Furthermore, cities often lack formal pedestrian infrastructure. In developing and developed countries, walking receives often too little consideration in transport planning and investment. However, walking is an essential element of the transport system for short distance travel and for intermodal transport chains.

Elements of a high quality walking infrastructure:

- Develop a high quality walking network;
- Provide urban public space.

For more details on the elements' characteristics see Box 1.

Table 1: GHG mitigation matrix of high quality walking infrastructure

	Avoid	Shift	Improve
Direct effects		<ul style="list-style-type: none"> ☑ Attracts motorists to walk short distances ☑ Encourages motorists to combine walking and public transport (PT) for longer distances 	
Indirect effects	<ul style="list-style-type: none"> ☑ Attractive walking facilities create public space that can reduce the travel activity of residents 		<ul style="list-style-type: none"> ☑ Can improve the efficiency of the PT system by increasing the occupancy rate
Rebound effect	<ul style="list-style-type: none"> ☒ Attractive urban public spaces can induce tourism travel 		
Complementary measures <i>(to achieve full mitigation potential)</i>	<ul style="list-style-type: none"> ☑ Dense and transit-oriented urban development (see Factsheet 'Dense and Transit-oriented Urban Development') 	<ul style="list-style-type: none"> ☑ Parking management and enforcement (protect side-walks from illegal parking) (see Factsheet 'Sustainable Parking Management') ☑ Speed restrictions (see Factsheet 'Economic and Regulatory Instruments for Road Traffic') ☑ 'Public Transport First' strategy (see Factsheet "'Public Transport First' Strategy") 	

On behalf of

Box 1: Possible elements of high quality walking infrastructure

Develop a high quality walking network

A high quality walking network is characterised by several factors (Hook, 2005; Wright, 2005):

Convenience:

- Continuity of sidewalks;
- Segregation from vehicles on routes with dense traffic and higher speeds;
- Proper position of pedestrian crossings, short waiting times and adequate crossing times;
- Direct routes (independence from vehicle roads).

Security and safety:

- Adequate lightning;
- Sufficient police surveillance;
- Comfortable surfaces without potholes;
- No underpasses.

Comfort:

- Pedestrian guidance system;
- No obstructions on the sidewalks (e.g. telephone boxes, put-up-hinges, vehicle parking);
- Adequate width of the pavement;
- No overpasses;
- Rain or sun shelters and resting areas;
- Clean pavements (no garbage, mud or smell).

Local governments can bring together different departments to plan and implement a high quality walking network.

How it works and intended effects:

- Increase the attractiveness of walking;
 - ➔ Shift short distance trips from motorised modes to walking;
- Improves access to public transport;
 - ➔ Induces a shift from private motorised modes to public transport for longer distances;

To be considered for implementation:

- Some improvements can be implemented rapidly and at low/moderate costs (e.g. clean pavements, road space reallocation);
- Physical constructions are more costly and time-consuming but still possible to be implemented quickly.

Responsible actor: Local transport planning departments

Provide urban public space

Urban public spaces such as pedestrian streets, sidewalks, parks or plazas are locations of public life and can provide an attractive framework for pedestrians. Vivid public spaces, in which vehicles are banned, can break the psychological dominance of motorised streets. Furthermore, lively streets enhance personal security for pedestrians. Public space can be used for markets and events or can provide a playing area for children. Pedestrian zones along shopping streets offer an attractive alternative to greenfield shopping centres.

For instance, the city of Curitiba created “Citizenship Streets”, which are fully pedestrianised and close to public transport stations. In these streets, public services (e.g. libraries, health care) and shops are located to provide a convenient destination for area residents (Wright, 2005).

Municipal authorities can create new urban public spaces in newly developed areas or reallocate existing road space to the benefit of pedestrians and urban life.

How it works and intended effects:

- Can provide recreational areas in short distances;
 - ➔ Can reduce the transport activity;
- Increases the attractiveness and security of walking;
 - ➔ Induces a shift from motorised modes.

To be considered for implementation.

- Streets can be banned for cars;
- Constructional changes such as sidewalk expansion take more time and might require a considerable public debate and some investments.

Responsible actor: Local land use planning departments

GHG mitigation effect and co-benefits

As walking produces no emissions, the provision of high quality walking infrastructure holds a certain GHG reduction potential. However, this is in most cases mainly attainable for short distance trips. Therefore additional measures (e.g. public transport improvements) are also important. Wright and Fulton (2005) analyse the potential GHG mitigation effect of investments in the pedestrian infrastructure. In their scenario analysis, an imaginary city of approximately 7 million inhabitants invested USD 60 million to improve 300 km of pedestrian infrastructure. The authors assume that this can increase the mode share of walking from 20 to 25 % at the expense of private car, taxi and mini-bus travel. Over a time span of 20 years, CO₂ emission mitigation of approximately 7 % is projected at cost of USD 17 per ton of CO₂. As mentioned earlier (see Factsheets “Public Transport First Strategy” and ‘High Quality Cycle Infrastructure’), the highest GHG mitigation is identified for a combination of public transport, cycling and walking improvements, since synergistic effects can be realised and the loss of mode share between these environmentally-friendly modes is minimised.

Besides reduced GHG emissions, measures to increase the share of pedestrians can lead to several co-benefits:

- Reduction of local air pollution;
- Reduction of noise;
- More efficient use of road space;

- Increase in quality of life within the city due to attractive urban public space;
- Health benefits due to physical exercise of walking;
- Improvements in travel conditions (especially the poor that are dependent on walking infrastructure can benefit from improvements);
- High quality sidewalks can lead to more equitable transport conditions, since the negative impacts of motorisation on the poor, the elderly and the children are reduced.

Towards implementation

The instrument targets all residents of the city. Conditions are significantly improved for those who already walk frequently and thus maintain a high share of walking. Moreover, motorists are attracted to leave their car at home and walk short distance trips.

Key stakeholders

- Local transport planning departments:
Responsible for the design and implementation of walking infrastructure; can implement specific design requirements/guidelines for walking facilities and promote walking-inclusive transport policy;
- Local land use planning departments:
Responsible for planning codes and the design of city structures; can dedicate more land to urban public space.

Table 2: Potential barriers to implementation and countermeasures

Barriers	Options to overcome
Walking is often “forgotten” in transport planning and municipal investments	<ul style="list-style-type: none"> ■ Anchor high quality walking infrastructure in the transport and land use planning codes. ■ Implement joint working groups that include representatives from different transport related departments.
Conflicts with other decision-makers (e.g. loss of parking due to road space reallocations)	<ul style="list-style-type: none"> ■ Consider that in many cities people who walk are the majority. ■ Strong political commitment and leadership. ■ Strong support from the mayor’s office or NGOs.
Opposition of the public to pedestrianised streets	<ul style="list-style-type: none"> ■ Pedestrianise streets gradually. ■ Involve the public in the planning process. ■ Cooperate with citizens’ groups.
High levels of robbery, assault and other crime befalling pedestrians	<ul style="list-style-type: none"> ■ Increase police surveillance. ■ Install sufficient lighting along sidewalks and avoid underpasses. ■ Make streets more vivid. ■ Security cameras or emergency call boxes can contribute to a more secure environment (Wright, 2005).
Inferior position of pedestrians in society	<ul style="list-style-type: none"> ■ Strengthen the rights of pedestrians. ■ Carry out public campaigns that promote walking. ■ Show strong political leadership to improve the walking conditions.
Vulnerability of pedestrians (high rate of accidents between motorised modes and pedestrians)	<ul style="list-style-type: none"> ■ Strict enforcement of traffic laws. ■ Avoid visual obstructions at street corners. ■ Install bollards to protect side-walks from illegal parking. ■ Speed reductions.

■ **Success factors**

- Dense city structures with mixed land use create short travel distances;
- The walking network has to be convenient, clean, safe and comfortable;
- Parking policy needs to be enforced strictly;
- Ensure security in public places;
- Safe crossing and shorter waiting times especially around offices and schools (Santos *et al.*, 2010);
- Sufficient sizing of sidewalks (avoid pedestrian overcrowding due to narrow pavements);
- Strict enforcement of traffic laws (*e.g.* avoid obstructed pavements due to illegal car parking);
- Consider the needs of impaired pedestrians such as elderly, children or handicapped (lower kerbstones, avoid overpasses or underpasses, provide barrier-free routes);
- Promote walking and communicate its benefits through public awareness campaigns and marketing (*e.g.* car-free days, street events).

**Practical example:
Pedestrian master plan in Portland**

The city of Portland (Oregon) is one of the most noted walkable cities in the US. For several years, the city has put an emphasis on developing pedestrian-friendly spaces. Under the city's System Transportation Plan, a Pedestrian Master Plan was created and adopted in 1998. It guides the city's pedestrian policies and projects for 20 years. The master plan resumed the concept of pedestrian districts introduced in Portland in 1977. Pedestrian districts are compact walkable areas with high density, mixed land use and excellent public transport services. Furthermore, the master plan defines several actions to increase the share of pedestrians in the city including:

- Implement sidewalks as part of all transport improvements;
- Reduce pedestrian waiting times at crossings;
- Make direct routes for walking;

- Require direct pedestrian connections between new developments and public transport stations;
- Reduce the incidence of automobile-pedestrian conflict.

The master plan was accompanied by the Pedestrian Design Guidelines that defines design features for sidewalks, crosswalks, street corners and so on. Every project that is built in Portland has to follow these guidelines. In addition, close cooperation between the city administration and the public was achieved through a Pedestrian Advisory Committee consisting of citizen volunteers (Portland Office of Transportation, 1998a and 1998b).

Many cities have followed the idea of pedestrian design guidelines, such as the city of Delhi, which published its pedestrian design guideline in 2009.



Further reading

- **Hook, W. (2005)** *'Non-motorised transport'* Training Course, Sustainable Urban Transport Project (SUTP), GIZ, Eschborn.
- **Portland Office of Transportation (1998a)** *'Portland Pedestrian Master Plan'* <http://www.portlandonline.com/shared/cfm/image.cfm?id=90244> accessed 13 October 2011.
- **Portland Office of Transportation (1998b)** *'Portland Pedestrian Design Guide'* <http://www.portlandonline.com/shared/cfm/image.cfm?id=84048> accessed 13 October 2011.
- **Santos, G., Behrendt, H. and Teytelboym, A. (2010)** *'Part II: Policy instruments for sustainable road transport'* Research in Transport Economics, vol. 28, pp. 46–91.
- **Wright, L. (2005)** *'Car-free Development'* SUTP Sourcebook Module 3e, GTZ Eschborn.
- **Wright, L. and Fulton, L. (2005)** *'Climate Change Mitigation and Transport in Developing Nations'* Transport Reviews, vol. 25, no. 6, pp. 691–717.

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