Technology Fact Sheet

Non-motorized Transport[i] /http://climatetechwiki.org/technology/nmt
http://www.vtpi.org/tdm/tdm25.htm/

General description

Non-motorized Transportation (also known as active transportation and human powered transportation) includes walking and bicycling, and variants such as small-wheeled transport (cycle rickshaws, skates, skateboards, push scooters and hand carts) and wheelchair travel. These modes provide both recreation and transportation (VTPI, 2010; gTKP, 2010), and are especially important for short trips up to 7 km, which take up the largest share of trips in urban areas (Witting et al., 2006). NMT can be stimulated by a policy package consisting of investments in facilities, awareness campaigns, smart urban planning, improved public transport and disincentives for the use of motorized private vehicles.

Specific ways to improve non motorized transportation are, inter alia (VPTI, 2010; Litman, 2009): Improve sidewalks, crosswalks, paths, bicycle lanes and networks; public bicycle systems (automated bicycle rental systems designed to provide efficient mobility for short, utilitarian urban trips); develop pedestrian oriented land use and building design; increase road and path connectivity, with special non motorized shortcuts; traffic calming, streetscape improvements, traffic speed reductions, vehicle restrictions and road space reallocation; safety education, law enforcement and encouragement programs; bicycle parking; bicycle integration in transit systems (e.g. racks in metro or on bus); address security concerns of pedestrians and cyclists; congestion pricing; vehicle parking policies; fuel taxes.

Implementation

In many developing countries, NMT takes a larger share of trips than in developed countries. However the reverse is often true for the trends: modal shares of walking and cycling decreases in developing countries, and slowly rises in the developed world. Modal splits are highly country and city-specific, with NMT shares between 10% and 66% for different Western-European cities, and cycling in urban areas varying between 1% (USA) and 27% (The Netherlands) of total trips (VTPI, 2010).

NMT is mostly used for short-distance trips, with cycling particularly relevant up to 7.5 km, and walking up to 2.5 km. As up to 70% of cars trips cover less than 5 km, NMT has a large potential to replace car travel (IPCC, 2007). Several studies have shown that 5-10% of car trips can be replaced by NMT provided good policies are in place (Mackett 2000).

One of the key parameters is urban density. Most cities in developing countries are high-density and therefore very suitable for NMT-oriented policies.

However, the extent to which NMT is used has little to do with the welfare of the country and mostly depend on the country's further development direction (Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007). If the country is committed to promote walking and cycling, designing and developing urban areas accordingly, higher rates in the use of NMT can be achieved.

Given the density of population in Chisinau (54 persons / ha) and size of similar projects successfully implemented in European cities (for example, Amsterdam with density of population of 58 persons / ha and a certain share of non-motorized transport), such project has the implementation potential in the city with TNM area of cca.5 km long.

Implementation barriers

Increasing the modal share of NMT is possible in any country; however the successfulness depends on many country-specific factors, including climate, geography, culture, political commitment, public awareness, policy effort and consistency, long-term vision and the attractiveness of the alternatives.

The main barriers towards implementing a successful NMT policy are (based on ICE (2000):

- Private-vehicle-oriented transport and spatial planning, which is business-as-usual in most countries, particularly developing.;

- Public perception and status: walking, cycling and public transport is perceived as the transportation mode for the poor. The richer part of the population often has a disproportionate decision power, which makes NMT-focused policy risky.
- Safety: pedestrians and particularly cyclist are vulnerable, and therefore need separate road space, or at least be respected and taken note of by vehicle users. Lack of social safety, especially for females can also be a barrier. NMT users have a higher risk of being involved in accidents than car users, particularly in developing countries (IPCC, 2007);
- Lack of convenient public transport, which is required to make NMT a good option for multi-modal trip (i.e. the combination of cycling and rapid bus or rail systems);
- Chicken-and-egg problem: people don't start cycling if there are few cycle lanes, and planners don't build these when there is no interest in cycling;
- Lack of overall long-term, integrated vision and planning;
- High costs for bicycles, including taxes, in particular in developing countries.

GHG emissions reduction (megatons CO_2 equivalent) – 4.2 thousand tons CO_2 in 2030.

Impact on development priorities:

a) social

- congestion reduction;
- health benefits due to exercise. For example, cycling for 30 minutes a day reduces the chance of cardiovascular diseases and diabetes by 50% (Witting et al., 2006);
- social equality and poverty reduction: cheap, fast and reliable transport opportunities, and public space development directed towards all segments of society (ICE, 2000);
- safety: increase in bicycle use is often accompanied by a reduction in cycling accidents and an increase in safety in public areas (Vanderbulcke et al., 2009; Witting et al., 2006);
- noise reduction.

b) Economic

- NMT, particularly cycling, is easy, flexible, cheap and fast
- More attractive cities for tourists and residents, particularly if car-free zones are included
- Reduced travel times due to improved traffic flow
- Energy security due to lower vehicle energy use
- Decreased demand for road space.

c) Environmental

- Air quality improvement
- GHG emission reduction
- By decreasing demand for road space and reducing the average travelling distance, cycling contributes to urban planning.

d) other

Investments

The cost of bicycle paths, including construction, maintenance and awareness campaigns, has been estimated at being $ 200,000 per km (Wittink & Godefrooij, 2009). Implementing a 5 km bicycle lane project in the center of Chisinau would require an investment of $1 million.

Operation and maintenance costs

Such costs were estimated at 20% of the annual investment cost or $5 thousand /year.

GHG reduction cost

The costs for increasing bicycle modal share by 1-10% have been estimated at 14 $/t$CO_2$, and a policy package covering bus rapid transit system, cycle lanes and pedestrian upgrades at 30 $/t$CO_2$ (IPCC, 2007).

Technology lifetime– 40 years.

Other

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[i] This fact sheet has been extracted from TNA Report - Technology Needs Assessment for climate change mitigation - Republic of Moldova. You can access the complete report from the TNA project website **http://tech-action.org/**