

## NON-MOTORIZED TRANSPORTATION – AN EDUCATIONAL CHALLENGE FOR URBAN COMMUNITIES

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### **Abstract**

The continuous growth of the urban traffic threatens cities with “thrombosis”, generating social, economic and ecological long term problems. The paper outlines the positive externalities induced by the non-motorized transportation (walking, bicycling or small-wheeled transport) at individual, social and environmental level. This kind of transportation meets the requests of the urban sustainable development, being used stand-alone or as a part of an intermodal chain. Local authorities, education institutes, corporate and non-governmental organizations should be involved in challenging perceptions and attitudes toward non-motorized trips. Beside the infrastructure construction, the early education is mandatory for creating a civic culture regarding the use of non-motorized transportation. The case study in Bucharest shows out the present state concerning the use of non-motorized transportation and the barriers in using it.

**Keywords:** urban mobility, non-motorized transportation, sustainable transport barriers

### **1. SUSTAINABLE URBAN MOBILITY**

In a classic view, transport planning stands on two principles. Firstly, transportation is mostly perceived as a derived demand and not a *per se* human activity. The final activity value (e.g., working, leisure, shopping) or the satisfaction obtained at destination is determinant for the transportation. Secondly, users usually seek to minimize the generalized cost of transport, using a combination of the transport monetary costs and times along transport process (walking, in-vehicle, transfer and waiting times).

Obviously, the traditional hypothesis concerning urban mobility growth, time saving through speed increase and modal choice freedom are myths that lead to the acuteness of urban transport problems and generate negative externalities for the social, economic and natural environment (Banister, 2008).

Cities represent one of the most sustainable human development patterns, as long as the historical evolution and economy principles based on public services and information are respected (Banister, 2008; Knoflachner, 2008). Marshall (2001) suggests another paradigm for sustainable urban planning and mobility, where connections between land-use and transportation are outlined (Table 1).

TABLE 1 - CONTRASTING APPROACHES TO URBAN MOBILITY

Conventional approaches – traffic and transport	Sustainable oriented approaches
Narrow specialization in transport planning and traffic engineering	Holistic approach, involving urban planning, transport and traffic engineering, economic, social and environmental sciences
Traffic oriented (and mainly car oriented)	Accessibility oriented
Concern for large-scale movements and long distances, often ignoring local trips (e.g. within zones)	Concern for local movements and small scale accessibility
Motorized transport oriented, ignoring walking and cycling	Concern for all modes of transport, changing hierarchy and putting pedestrians and cyclists at the top and car users at the bottom
Focus on streets as movement ways	Streets as public space, used not solely for movements but for other activities and purposes
Evaluation focused on business criteria	Evaluation based on mix of criteria (economic, social and environmental)
Evaluation oriented towards road user costs and benefits (e.g. time saving, speed improvement)	Evaluation acknowledges non-user costs and benefits (e.g. pedestrians, residents relieved of traffic, road users taking advantages of rail improvements)
Traffic capacity provision based on forecast demand	Demand management attempting to moderate demand for travel
Design based on traffic efficiency and facilitating traffic flows	Design based on traffic calming (e.g. speed humps, chicanes, curb extensions)
Segregation of pedestrians and vehicles (e.g. walkways, underpasses, barriers to prevent pedestrian crossing the road)	Integration of pedestrian and car space where appropriate (e.g. traffic calming, shared surfaces, woonerfs)

Adapted from Marshall, 2001

The multi-polar urban development, with clear hierarchies offering appropriate distance to facilities and high accessibility to daily activities is quite essential for urban management. Such urban patterns provide a medium trip length under the maximum affordable limit for non-motorized transport (walking, cycling or small-wheeled transport). The meaning is not to ban the car use that would be quite difficult to realize and would affect the liberty of choice and of free movement. Especially for Central and Eastern European societies, facing a high motorization rate during the last decades and promoting the personal car as a social status symbol, the enforcement measures concerning the free movement and the free

choice would stress an important part of voters. By efficiently combining the urban planning strategies, cities could be designed to a personal scale promoting a high degree of accessibility and a pleasant environment (Hatzopoulou and Miller, 2008).

## 2. NON-MOTORIZED TRANSPORTATION – BETWEEN INSTITUTIONAL INTEGRATION, PUBLIC ACCEPTANCE AND CIVIC EDUCATION

The economic, social and environmental stress of the inhabitants from large urban areas urged policy-makers and NGOs to encourage the development of new urban patterns and to promote the non-motorized transportation resulting in a better land-use strategy, cutting off vehicle emissions, improving air quality and public health, increasing the social welfare and the quality of life. A common point of the sustainable policies in the field is the holistic approach involving beside the traditional institutional dimension new actors responsible for environment protection, health and educational system, acting as formal, informal or governance institutions (Rietveld and Stough, 2005). These mean new and increased duties for policy-makers in coordinating actors involved in setting up, financing, implementing and monitoring the solutions (Stead, 2008). The European Commission has a strong commitment in integration of different actors for encouraging and implementing sustainable urban mobility.

Banister (2005) outlines the common institutional barriers in adopting and implementing a sustainable transport policy:

- Resource barriers – local, regional, and governmental authorities are reluctant to provide money for investments that do not match their policy priorities;
- Institutional – the inner structure of institution involved in transport provision and the differences in culture between departments (e.g. bureaucratic, market oriented, sustainable vision), the lack of coordination and the dissipation of legal power may reduce the capacity to implement;
- Social and cultural – social acceptability is often influenced by the type of implementing measures (*push* or *pull* actions), the pull (encouragement) measures being more popular than push (discouragement) measures;
- Legal – many transport policies need adjustment of laws and regulations outside the transport domain, therefore more efforts have to be done in implementing them;
- Side effects – sometimes is quite difficult to anticipate both positive and negative side effects (e.g. road pricing, traffic calm), but former records on their utility gathered from other areas could help in choosing the most suitable policy;

- Physical – the topography of the area may limit the implementation of the policies (e.g. slope terrain, narrow space).

Public acceptability should be consistent with political acceptability. Shaping a critical-mass of non-motorized transportation supporters could trigger support actions from the legal authorities. Also, local community initiatives are incentive for the new EU member states.

*Green paper. Towards a new culture for urban mobility* issued by Commission of the European Communities (European Commission, 2007), states that "...to improve the attractiveness and safety of walking and cycling, local and regional authorities should ensure that these modes are fully integrated into the development and monitoring of urban mobility policies. More attention should be paid to the development of adequate infrastructure. There are innovative ways of ensuring the full involvement of families, children and youngsters in policy development. Initiatives in cities, companies and schools can promote cycling and walking, for example through traffic games, road safety assessments or educational packages. Stakeholders have proposed that bigger towns and cities could consider appointing a policy officer specifically for walking and cycling".

A lot of social events such as European Mobility Week, Reclaim the Streets, World Squares and Home Zones are able to promote the benefits of the non-motorized transportation at individual, social, economic and environmental level, to increase public acceptability and awareness and to encourage the modal shift to non-motorized transportation. Table 2 shows the modal split in some European cities.

TABLE 2 - MODE SPLIT IN SELECTED EUROPEAN CITIES

City	Foot and Cycle	Public transport	Car	Inhabitants
Amsterdam (NL)	47 %	16 %	34 %	718,000
Groningen (NL)	58 %	6 %	36 %	170,000
Delft (NL)	49 %	7 %	40 %	93,000
Copenhagen (DK)	47 %	20 %	33 %	562,000
Arhus (DK)	32 %	15 %	51 %	280,000
Odense (DK)	34 %	8 %	57 %	1,983,000
Barcelona (Spain)	32 %	39 %	29 %	1,643,000
L'Hospitalet (Spain)	35 %	36 %	28 %	273,000
Matar (Spain)	48 %	8 %	43 %	102,000
Vitoria (Spain)	66 %	16 %	17 %	215,000
Brussels (BE)	10 %	26 %	54 %	952,000
Gent (BE)	17 %	17 %	56 %	226,000
Bruges (BE)	27 %	11 %	53 %	116,000

Source: ADONIS, 1998

The public awareness and acceptability of the sustainable urban transportation and in particular of the non-motorized transportation are often biased from the adjustment of the social rules and cultural

background. Solely the development of the dedicated infrastructures is not sufficient. Therefore, the legal regulations should be enforced in a much persuaded manner. The mutual reliability and deference, the strong communication and the active involvement are prerequisites for the effectiveness of the transport sustainable policy. Legitimacy gain has to stand on a cooperative and sharing strategy which assumes sustainable movement endorsement at individual, group or local level, outlining the need to change attitudes and behavior. Brög et al. (2004) and Banister (2005) revealed the importance of proactive measures, which not only supply information to potential users, but also help them to choose the most adequate trip method.

### 3. BENEFITS OF THE NON-MOTORIZED TRANSPORTATION

The intensive use of non-motorized transportation in spite of the motorized one generates benefits such as:

- Individual and social benefits – improving health and personal physical state, stimulating social communication and cohesion, reducing trip costs and accidents;
- Economic benefits – less parking space, reducing infrastructure maintaining costs, urban congestion mitigation, reducing trip time (in some cases);
- Environment benefits – alleviation of air and noise pollution, reducing vibrations.

Despite its advantages, the non-motorized transportation is often underestimated in public perception, being associated with poverty or childhood age. The non-motorized transportation sustains the social harmonization and inclusion, alleviates discrepancies and inequities (between driver/passenger, expensive/cheap car owner, and passenger/pedestrian), and facilitates mobility of social disadvantaged individuals and personal interaction of peoples in a stronger way than motorized transportation. Cavil et al. (2008) sum up the results of different studies related to health effects of walking and cycling, including them in economic analysis of transport infrastructures development policies.

### 4. NON-MOTORIZED TRANSPORTATION IN BUCHAREST. ADMINISTRATIVE FORMALISM AND EDUCATIONAL BACKGROUND

Bucharest city recently joined the metropolitan areas club implementing non-motorized dedicated infrastructure (Popa et al., 2006). The specific network is developed along the main boulevards in the center of the city and in some residential areas (Figure 1).

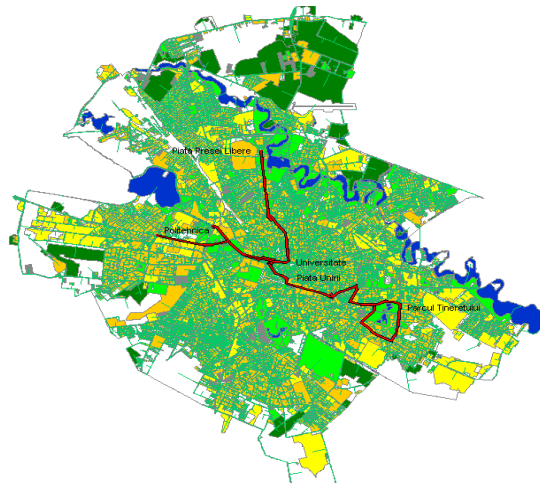


FIGURE 1 - BUCHAREST BICYCLE NETWORK

In '80s, the first bicycle lane (3.6 km length) was created along the Kiseleff Avenue in N-E zone of the city, but due to its poor utilization it was turned into parking lots. Nowadays, the municipality funds projects for extending the bicycle network up to 70 km along 12 of the greatest boulevards in the city. In accordance with the corporate social responsibility, some of the biggest corporate firms in Romania support municipality actions towards sustainable urban transportation and are involved in the construction of new bicycle lanes especially in the green areas. Additional services have been developed (bike rental, parking, vulcanization, information etc.) and dedicated traffic signs and lights are working now. Thus, many of the resource, institutional and legal barriers are surpassed. The main physical barrier to extend the bicycle network resides in the narrowing of the pedestrian area. Due to its historical evolution, the street and pedestrian infrastructure does not provide adequate space for additional non-motorized transport lanes, so that mostly pedestrians compete with cyclists or small-wheeled transport users for motion space (Popa and Chonkova, 2008).

Fighting the peak-hours car traffic congestion, the non-motorized transportation can reduce the travel time on different origin-destinations (OD) in Bucharest, as shown in Figure 2.

During 2009 - 2010, surveys conducted by different NGOs in Bucharest revealed the following results ([www.velorutia.ro](http://www.velorutia.ro)):

- 66.2% of the population choose to use personal cars for daily transport, 32.2% use urban transport, 1.1% are walking and 0.5% prefer the bicycle;
- The parents of the young generation do not have bicycle. Even that they do, they do not use it for daily activities;

- Parents do not encourage children to use bicycle. They usually buy it for small children and less for teenagers. 72.5% of the male parents can ride a bicycle and only 48.5% of the women parents can;
- 75% of the children know to ride a bike, but as they grow up they do not use it anymore;
- Teachers are not good examples for young generation in using non-motorized transportation. The average trip time to primary and secondary school is around 15 min, that could be an incentive for using bike to travel to school;
- The main reasons that parents do not encourage children in using bicycle are: traffic safety, personal security, urban pollution, lack of parking and depository space, the price of good quality bicycles and of the additional equipment.

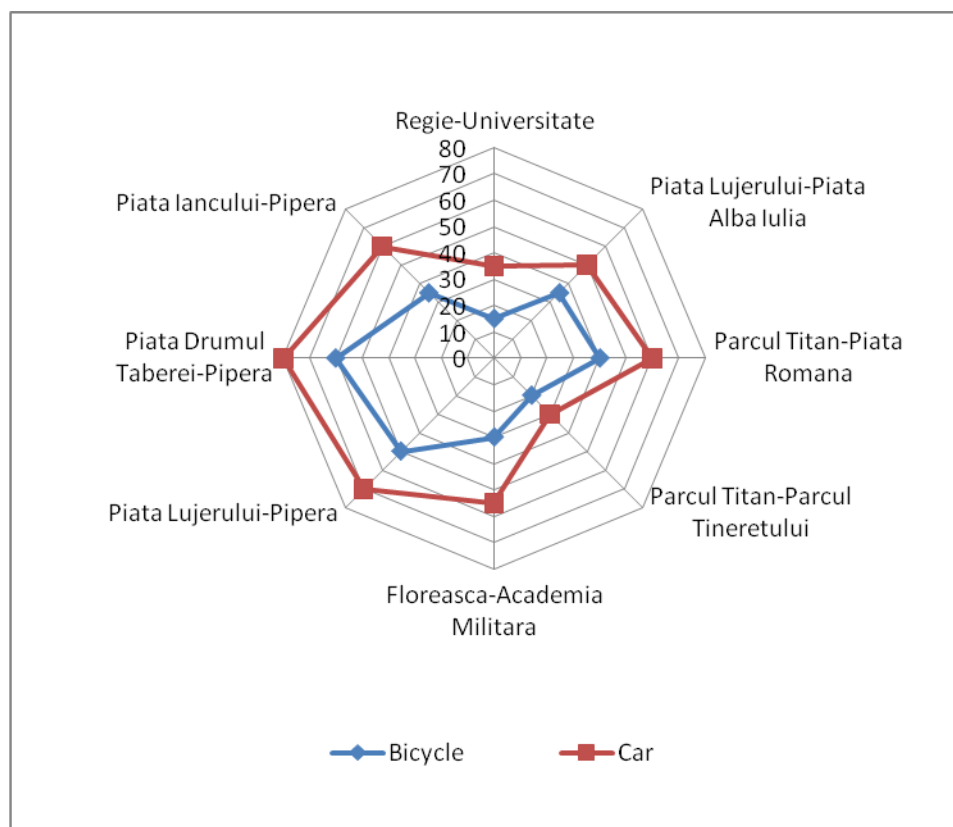


FIGURE 2 - TRAVEL TIME [MIN] BETWEEN OD PAIRS IN BUCHAREST

In 2009, Transport, Traffic and Logistics Department from University Politehnica of Bucharest conducted a survey concerning the availability of young generation to use the non-motorized transportation. The study was realized among 780 scholars enrolled at secondary and high-school level, in the 6<sup>th</sup> district of Bucharest city. The relative frequencies of non-motorized transportation use for school trips and the distribution according to the year of study are depicted in Figure 3.

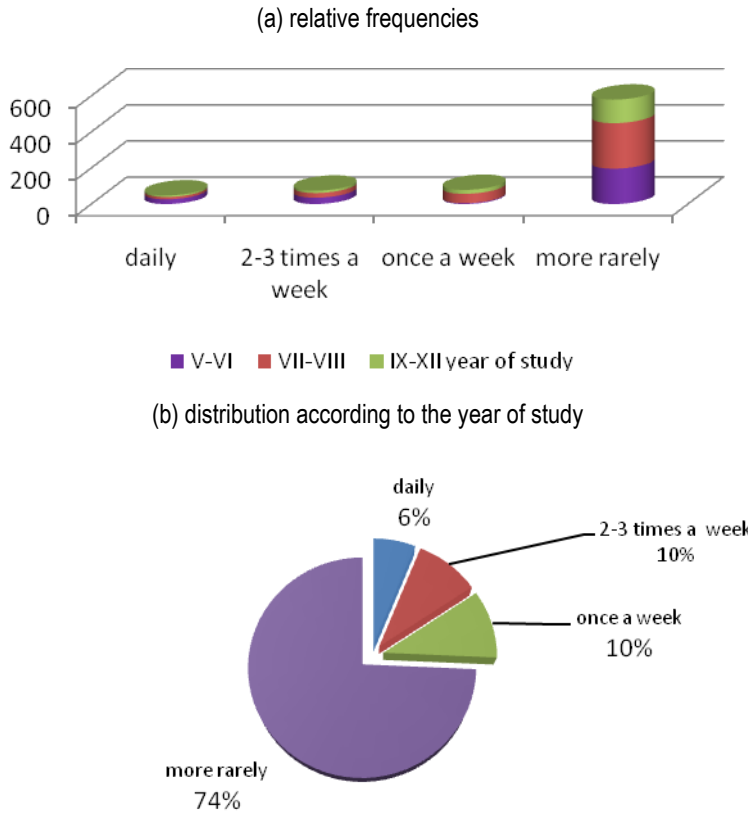


FIGURE 3 - SCHOLARS USE OF NON-MOTORIZED TRIPS TO SCHOOL

As the surveys brought out, the social-cultural barriers remain the most persistent.

Neither the traffic participants (pedestrians, car drivers), nor employees of public services are still prepared to fully observe the bicycle lanes delimitation and destination (Figure 4).

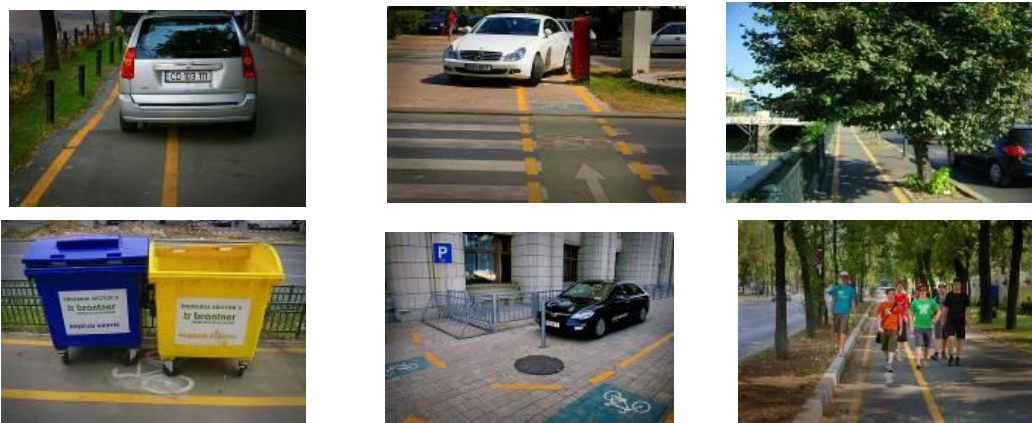


FIGURE 4 - OBSTRUCTION OF BICYCLE LANES IN BUCHAREST

Due to the new trends in sustainable urban development (incentive for public authorities and corporate also), to the different European funding schemes and grants and to the lobby supported by NGOs one



can conclude that the political acceptability of non-motorized transportation in Bucharest is quite raised and an ongoing policy in the field is shaped up. More efforts should be made for public acceptability and individual awareness, both for using the non-motorized transportation and for tolerating other people's option in using it.

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