



Calming traffic - a modern way of improving safety in cities

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ABSTRACT

The rapid urban development in recent years has been reflected not only by the change in structure and size of towns, but especially by the increase in population mobility, which is strongly reflected by the fact that urban centers are clogged with individual transport, therefore, experts are dealing with possibilities of alternative solutions. Traffic calming in cities is a process that reflects the pursuit for a new quality of life as well as applying modern transport solutions at European level. In practice, there are many different types of this process depending on the type of area, road and citizens' requirements. Streets, plazas and other public places of towns and cities are the points where a large part of social life is taking place. These venues do not serve only transport but are the places where commuters, children, elderly people and disabled persons meet. Especially bicycle transport for its significant reach, readiness to ride, easy operation and relatively high cruising speed has the appropriate conditions for further successful development in centre of a city. Article outlines some of the principles of traffic calm and their impact on road safety.

KEYWORDS: central urban areas, safety, calming street

1. Introduction

Significant externalities are: accidents caused by operation of transportation systems (loss of life, medical care for the disabled and so on.), congestions and the others (air pollution, emissions toxic for health, environment and buildings, climate change, emissions of greenhouse gas (CO₂), which have a lasting impact on the earth's climate, noise). The greatest proportion of negative externalities of transport is attributed to accidents. Entering the traffic operation, every participant risks injury or death. The amount of this risk is, of course, different and varies in space and time. Taking into account the speed of vehicles and state of infrastructure, traffic accidents are becoming a serious problem. Traffic congestions cause huge losses in terms of loss-making time and environmental impact and reduce the availability of the territory. This can be alleviated by increasing car occupancy and use alternative ways of transportation. Nowadays it is estimated that about 10% of the road network suffers from congestions [1]. We therefore required creating the environment of cities so that the life in them is "pleasant" [1].

In comparison with automobile transport, cycling and walking has many advantages. In particular, the negative externalities are not created; it prevents congestions and the like. It also has positive impact on health, acting as prevention against diseases that are caused by lack of exercise. Bicycle transport can be defined as an active way of transport, which is environment friendly, promotes a healthy lifestyle and has a positive effect on health.

2. Characteristic of calming street

The term „traffic calming“ is a set of measures and tools serving the increase of utility value of communication, improving the environment and safety of pedestrians and cyclists at the expense of car transport which has been favoured until now. The synonym for traffic calming could be the term „traffic humanization“. The main goal of this moderation is to blend the character of street space with the functions of the particular road section crossing the analysed area.

Traffic calming has four main principles [2, 3]:

- Spatial influence: changes introduced by traffic moderation in a certain part of a settlement affect the processes in the whole road network. It is therefore necessary to include the requirements for roads of the main road network and through sections that require a different set of measures in comparison to the frontage roads and roads for non-motor vehicles.
- The integration of functions in the transport space: is aimed at the common interaction of town-planning, traffic and environmental requirements and also of special entitlements of traffic moderation from the view of the function of the given area.
- Effectiveness of measures: it is necessary to verify the deployment measures in terms of effectiveness. Often simple and affordable measures aimed at traffic management bring about more positive effects than costly, isolated measures. Each solution has to be verified using appropriate evaluation methods “ex-ante” and “ex-post” deployment of moderation elements, or after implementation of other proposed measures.
- Public acceptance: the enforcement of traffic moderation measures requires high acceptance of aggrieved groups (citizens, visitors, institutions, enterprises, commerce, services etc.), also with regard to the age, e.g. requirements of children, elderly people, impaired persons but also pedestrians, cyclists, drivers and users of public transport, medical emergency vehicles, firefighting vehicles and maintenance vehicles. Effective work with public and timely incorporation of solutions is the top priority assumption for successful traffic moderation on through sections.

A suitable way of increasing the quality of life in living areas of urban entities, the primary function of which is residing and the intensity of traffic is very low, is the implementation of so-called residential zones. The main idea of a residential zone is the removal of traditional split of street space into driveway and pavement, or setting up a single-plane surface that can be fully exploited in the whole breadth for common life activities. However, the possibility of a drive through for motor vehicles at low speed is maintained. Experience shows that well-designed residential zones (attractive, multi-colour concrete surface, creation of closed spaces, enough green) can help improve living conditions of citizens and improve the public environment. Many European cities have solved the town centre in this way. Figure 1 depicts the layout of a city centre as residential zone in Grenoble, France. The whole centre is nicely designed in the architectonic view, cars move in a dedicated drive at speed of not more than 20 km/h and they are allowed to park in certain parts of the centre. Cyclists have their own refugee areas and pedestrians have a good view on the rest of traffic.

The services roadways which are not suitable for transformation into residential zones can be moderated through zones with flat-rate reduction of speed limit, usually through so-called “Tempo 30” zones that do not have high demands on the artistic design of the street space. The split into driveway and pavement may stay in place but construction measures are desirable to underline the relation to local functions (e.g. raised pedestrian crossings, parking bays with green etc.). The basic principle of Tempo 30 is simple. The speed of 50 km/h is allowed only at main local roads serving the long-haul transport relations. However, the communications

which serve the general transport services and access to sites will bear a speed limit of 30 km/h. This is the outcome of the application of the new transport policy which protects the ‘weak’ road users but it also requires moderating the negative impacts of traffic and increasing quality of living.



Fig. 1. Solution of Grenoble city centre as a residential zone [own study]

3. Development of cycling transport

In previous there is no universal tool for promoting cycling as coequal means of transport because each city has its specific geographical structure, history, policy and so forth.

These aspects are derived from both the total level of economy and rate of economic growth and the method and direction of life quality development. But we can say that the most common economic tool to promote cycling is subsidies which are among the most effective tools to promote cycling transport. In most developed European cities, bicycle transport is one of the most important topics and every political party that wants to succeed in municipal elections will give the priority to improve the organization of bicycle transport as such. In developed cities, with a quality network of cycling routes, the bicyclist share ranges from 5 to 35% [1].

As an example we can allege Sweden and Netherlander that supported good cycling facilities and an extensive network of cycling routes. Scandinavian countries are generally known for their approach to bicycle transport. Bicycles in Stockholm are equivalent kind of transport and are on equal footing with cars and public transport. Each kind of transport has its own lane (see Fig.2).

In the 1970s Dutch cities were in a similar situation to the one of present-day Slovak cities – increased demands of individual road transport were solved by higher-capacity roads. In the second half of the 1980s, however, the nation-wide change in opinions of traffic problem solutions occurred in the Netherlands.

The “new” approach may be expressed by the following equation: integrated approach, cooperation between traffic engineering and urban planning and equality of all transport modes. This leads to the creation of attractive urban centres, increase in safety, creating places for people. The result of this trend has been building of the first so-called “woonerf” (traffic tranquilized zones in residential areas) and “winkelerf” (traffic tranquilized zones in commercial areas) since 1977 [4].

In our latitudes, i.e. Czech and Slovak Republics, Poland, Hungary during the 20th century, the technical and transport quality of infrastructure (except for some regional differences), essentially moved in the same direction. Non-motorized transport has been only a marginal issue, far beyond the car and public transport. In practice it means that there are hardly any tranquilizing measures adopted for cyclists. In the common space with other traffic, cyclists are not taken into consideration, though according to the law they are (or should be) the coequal users of road transport, which causes that they are forced out to the so-called greens reserves and green spaces or they are forced to weave their way through build-up areas of tranquilized streets.



Fig. 2. The choice of vehicle in Stockholm [own study]

These and other similar measures, and, in essence the incomprehension of the role of daily bicycle transport, cause that the cyclist is in a position of the occasional user and is forced to use a safer and faster means of transport, which is the individual and public transport. All the former Eastern bloc countries, as well as countries with strong lobbying motor traffic policy, such as the United States, were condemned to this view of cycling transport. Austria and its metropolis Vienna have experienced similar development in the past, where facilities for cyclists already existed in the 1960s, but were massively cancelled at the time of the automobile boom. In the last 20th years Vienna has tended to equalize the bicycle transport as it is in the neighbouring western countries.

4. Conclusion

Closely related to the development of car transport is the change of nature and function of the street space. The transport function has become a dominant part of the street space. Pedestrians who were allowed to freely use the whole area street have been forced to use the pavement. The hygienic function of the street and dominance of the transport function is naturally reflected in the visual appearance. Instead of a space incorporating more functions, the street gradually becomes a single-use transport area. All these changes are projected in the life of citizens. The result is a significant change in the lifestyle where the street does not play the role of living area.

Streets, squares and other public places of cities and towns are the places where the common, every-day life activities take place. These are the places not only serving the road transport but are also places where commuters, playing children, elderly and impaired persons meet up with each other. The design of the street space should respect the interests of all these persons. It is therefore necessary to involve public in the process of searching for the optimal solution in addition to the teams of various experts in order to achieve that all interests in the area are optimally mellowed. It is also important to avoid past mistakes when the individual car transport was preferred to other road users.

Traffic calming in the cities is a process reflecting the efforts to achieve new quality of life as well as the implementation of modern transport policy at European level. In practice, traffic moderation may come in various forms according to the type of area and road, and to the requirements of relevant citizens. It is appreciated that after many years of hesitation, traffic moderation is developing in Slovakia too. The common task is the advertising and edification of public and the presentation of good practices. Nevertheless, the trend is definitely in the direction of joining the European efforts of humanisation of transport system.

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