# TRANSPORTATION SYSTEM ALTERNATIVES

Rudolf Kampf[1], Milan Velechovský[2]

*Summary: This paper deals with predicting possible alternatives for transport operator in relation to the transport process. Furthermore, the paper describes the effects of motor vehicles in the city center and the average intensity of traffic.*

*Keywords: congestion, Park and Ride, cycling, public transport*

## INTRODUCTION

The ratio between the use of public transport and cars is constantly changing to the detriment of public transport. Moving away from public transport has resulted in inadequate funding for investment, which could be put back into its development. Insufficient funding or the means by which the state subsidizes public transportation or village transportation is also problematic. Quality of public transportation, it can not compete with individual passenger transport vehicles. Rising ticket fares for public transport users will cause more to favor individual transport and thus closes the circle. However, in some agglomerations, traffic on roads is already so thick that personal transportation vehicles is slower than it used to be with horse-drawn wagons, often even during off-peak times. And so even though the road network is already in many places so thick that some new roads simply can not be build. New roads attract new traffic flows and their capacity will soon also be depleted. Even better organization of traffic using modern information systems and telematics does not solve all problems, but can only partially modify problems. During peak traffic times there is no solution because the extra capacity does not exist. But even there, where they have no free space left on the road. There is always vacancies in vehicles that ride on the roads. The average vehicle occupancy is only about 1.3 people per car.

## 1. EFFECTS OF MOTOR VEHICLES IN THE CITY CENTER

Reducing the level of private car transport to an acceptable and sustainable level is becoming a necessity for modern states. The basic means of achieving this objective has been considered and the development of public transport with the need to promote the development of integrated systems to provide the widest range of alternatives but retaining high quality. In this integrated system plan is walking, cycling and sharing vehicles. The integrated system also includes adequate infrastructure, organization and background information which will help to optimize the use of complex transport systems.

[1] doc. Ing. Rudolf Kampf, Ph.D., University of Pardubice, Jan Perner Transport Faculty, Department of Transport Management, Marketing and Logistics, Studentská 95, 532 10 Pardubice, Tel.: +420 46 603 64 00, E-mail: kampf@upce.cz

[2] Ing. Milan Velechovský, University of Pardubice, Jan Perner Transport Faculty, Department of Transport Management, Marketing and Logistics, Studentská 95, 532 10 Pardubice, Tel.: +420 46 603 63 85, E-mail: milan.velechovsky@student.upce.cz

Tab. 1 - Effects of motor vehicles in the city center.

| EU Coutries | Effects of motor vehicles in the city center (%). | | |
|---|---|---|---|
| | **Intolerable** | **Annoying** | **Caused by automobile traffic** |
| **Belgiím** | 15,1 | 47,8 | 27,1 |
| **Denmark** | 11,7 | 15,3 | 21,3 |
| **Germany** | 18 | 35,9 | 39,9 |
| **Greece** | 43,6 | 29,5 | 25,5 |
| **Spain** | 29 | 33,8 | 32,2 |
| **France** | 17,5 | 20,5 | 25,4 |
| **Ireland** | 20,8 | 37,9 | 23,3 |
| **Italy** | 46,1 | 46 | 51,4 |
| **Luxembourg** | 24,3 | 39,9 | 29,6 |
| **Netherlands** | 17,9 | 30,8 | 19,7 |
| **Portugal** | 22,9 | 26,3 | 19,7 |
| **Great Britain** | 22,5 | 33,2 | 30,4 |

Source: (11)

## 2. TRANSPORTATION SYSTEM ALTERNATIVES

As a possible alternative system of transportation services that can be offered is the use of the Park and Bike, Bike and Ride Park & Ride, Call & Ride, Kiss & Ride, car-pooling and car-sharing, which are used in EU countries (1) These systems can greatly relieve the congestion city center.

### 2.1 Park and Bike

The system is when a passenger arrives at the car park on the outskirts of town by car and continues on a bicycle, which he brought in his car. This system represents an alternative to pure cycling, it is also possible to cover greater distances. The benefit is the passenger's complete independence from public transport systems (1).

Tab. 2 - Average annual savings for travel from home to work in the use of cycling.

| Average annual savings for travel from home to work when cycling. | | |
|---|---|---|
| Indicator | **Basis of Cost** | **Annual cost (EUR)** |
| Air pollution | additional Costs (unleaded petrol) | 25 000 |
| Noise | tax, noise (included in the price of fuel) | 10 000 |
| Infrastructure | parking fees | 3 100 000 |
| Power Consumption | average consumption | 400 000 |
| Congestion | Increased consumption in congestion | 485 000 |
| Resources | cost of production of another 150 cars | 160 000 |

Source: (11)

## 2.2 Bike and Ride

This system combines public transport and cycling. Usually, the passenger uses a bicycle for transportation from home to the nearest appropriate bus stop, where the wheel locks on the prepared rack and continues on public transport. The system is applicable only when it is a reasonable distance to be covered on a bicycle (up to about 10 km). In the case of a greater distance it is more appropriate to use the system of Park & Ride (1).

## 2.3 Park and Ride

A similar system to Bike and Ride, but the passengers uses a bicycle instead of a car. Parking for the Park and Ride system is set up on the outskirts of the stops of lines with a higher frequency of connections. With this system it is necessary to provide space for parking in front of a bus stop. The advantage is the better utilization of the two modes of transport (1).

## 2.4 Call and Ride

This service is usually operated by local governments and is designed for the collection and distribution of the elderly and immobile people. Telephone orders will come into a place and drive a minibus with their passengers to their chosen destination. The system is popular in Great Britain (1).

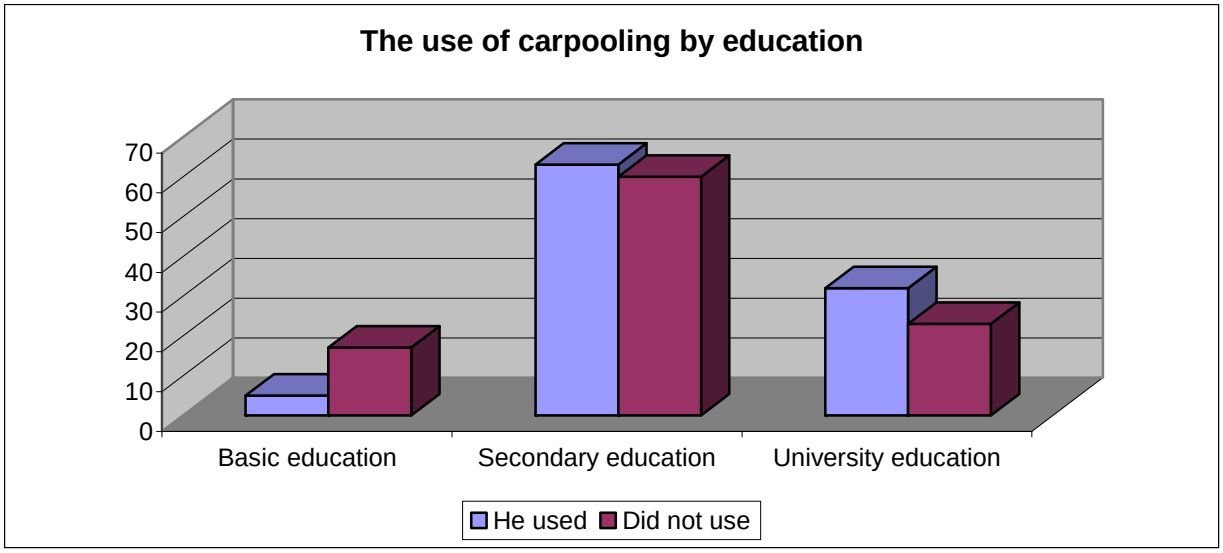
## 2.5 Kiss and Ride

The system uses a car as a means of transport for the whole family. One adult family member drops the other family members off wherever you want. It is advantageous that the whole family uses only one car (1).

The system has its limitations, however, concerning the position of the transport requirements of individual family members, which could lead to inefficient trips.

## 2.6 Car-pooling

Car-pooling can be translated into Czech as well as shared transport or car-sharing. Car-pooling is a system where at least two people ride together in one vehicle, which is usually one of their cars. Each participant in car-Pooling can independently use their own vehicle. When car-pooling, passengers take turns driving on different days (1). The driver and passengers share the ride as planned, including the time of its beginning. For a fully occupied vehicle, there is an option reserved for the use of prior systems, thereby reducing transit time. Commercial traffic can not be carried out using car-pooling.




Source: adjustments of the authors

Fig. 1 - The use of carpooling by education

They would lose their advantage of using their own designated lanes for car-pooling, thus accelerating traffic. Above the large investment costs, as in the construction of these lanes is not in doubt. However it is no longer reserved for the consideration of the current lane more occupied vehicles, especially in places with a higher incidence of traffic congestion. United Priority at traffic light controlled intersections with lane Car-pooling would provide a further incentive for the participants in this system.

Tab. 3 - Transportation Survey

| Country EU | Transportation Survey: How to reduce the intensity of traffic? | | |
|---|---|---|---|
| | **Restrict access to the center** | **Restrict parking in the center** | **Create more pedestrian zones in the center** |
| Belgium | 69,1 | 45,7 | 82,6 |
| Denmark | 84,2 | 68,8 | 61,2 |
| Germany | 75 | 67,6 | 73,3 |
| Greece | 72,1 | 74,3 | 83 |
| Spain | 77,3 | 64,5 | 87,1 |
| France | 67,5 | 42 | 82 |
| Ireland | 79,8 | 83,7 | 84,8 |
| Italy | 81,8 | 40,8 | 76,3 |
| Luxembourg | 75,2 | 77,8 | 76,5 |
| Netherlands | 77 | 55,1 | 87,7 |
| Portugal | 79,3 | 75,9 | 83,2 |
| United Kingdom | 79,4 | 69,2 | 80,7 |

Source: adjustments of the authors

### 2.7 Car-sharing

The idea of this system, car-pooling and car-sharing is very similar, and to ensure greater utilization of private passenger vehicles. Car-sharing: some people (friends, neighbors) share a car together to the same target location, either in their workplace or within a reasonable proximity to a common point on their way or to the Park and Ride facility (1).

### 2.8 Bike - Sharing (bicycle wheels)

Although users of the bike-sharing system usually pay for the rental bikes, there are projects or complete systems based on different principles than the AI fee-based bike-sharing and are different from the classical method of lending in the commercial rental of bikes. Most programs require membership in the association, these systems are then shielded by a public body, in this case the system operates on a principle similar to car-sharing (1).

## 3. CONCLUSION

It is obvious that the idea of car-pooling is very simple and almost everyone has this type of transport, albeit at an informal level, some experience, mostly in the form of neighborly assistance. An important issue is the question of social evaluation of shared services. It's about to become something socially desirable.

But there is a view that the above mentioned alternatives of transportation services are disadvantageous to society. They form competition to public transport. Public transport is a society - supported by the State, why not just consider alternatives as beneficial and useful systems. Alternative transport services used by people who would use their own cars as well as a transport vehicle. It is certainly better for society if two people ride in a car than if they drove two cars separately. In addition, this alternative is used primarily by people whose needs greatly satisfy transportation. For these reasons, we can say that alternative transport services are in competition with public transport, but they also complement the public transport system.

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