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Section: Traffic Planning
Review
Accepted: Apr. 25, 2005
Approved: Dec. 20, 2005

TECHNOLOGY OF URBAN, INTERURBAN AND RURAL PASSENGER TRANSPORT

ABSTRACT

The work will consider the significance of various public transport modes, since different methods of travel that form the transport system are interconnected. The application of the level of service in one mode influences other transport modes and changes depending on the type of travel and is divided in three groups: urban, interurban and rural travel. In considering the significance of ***urban public transport*** *there are three levels of trip-end generation/attraction, with which six types of urban travel can be identified.* ***Interurban travel*** *is presented through two main transport modes, rail and bus. Apart from business trips, air travel is relatively insignificant, primarily because of the prices and small distances. In* ***rural*** *areas, characterized by low population density, there is the problem of travelling of the elderly people, as well as those without cars, as the difficulty of providing economic public transport services has increased because the number of carried passengers is small. This results in the reduction in mobility and the quality of life. Attempts have been made to improve the standard of provision of public transport services by introducing unconventional transport means.*

KEY WORDS

mobility, standard of living, public transport modes, travel time, private car

1. INTRODUCTION

Although the number of automobiles has risen during the last several decades, there will always be a large number of people who cannot afford a car and who will therefore be dependent on some form of public transport if their mobility needs are to be met. To stimulate the use of public transport means for those who have no other choice because they are either too old or too young to drive a car, cannot drive due to illness, or cannot afford to buy a car or simply because the car is being used by another member of the family, the local or national authorities have to provide access to work, shopping, education, health care and recreation.

Generally, movement is a means to an end, and not an end in itself. There is strong relation between land use planning through the construction of cities on the one hand, and transport planning on the other. Transport planning cannot be considered in isolation, but rather as part of a wider perspective of land use planning, since various travel modes are interrelated. The changing of level of service on one mode has an impact upon the others. Therefore, one of the frequently stated objectives of transport planning is to develop a plan which results in the best balance between all the available travel modes in order to satisfy the needs for mobility in all the social segments.

2. URBAN TRAVEL

In urban areas there are five main transport methods available:

- walking,
- bicycle,
- motorcycle,
- private car,
- some form of public transport.

Walking and cycling are used for short distance journeys, and motorcycle for a relatively small proportion of trips. The main competition in urban traffic is between the two travel modes, the private car and some form of available public transport.

In order to consider the significance of public transport, it is necessary to consider the transport modes that operate in the cities, through three levels of trip-end generation/attraction:

- high-density level (central area, terminals),
- mid-density level (densely populated area, industrial site),
- low-density level (poorly populated areas).

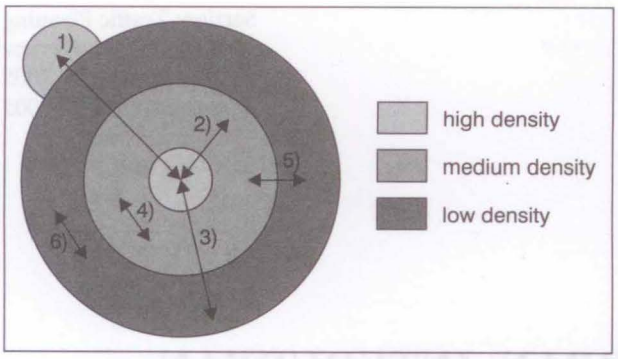

Figure 1 - Different types of urban journey

With the proposed levels, six types of urban journey can be identified:

1) *from high density level to high density level (high-high)* – This journey type has high concentration of travellers at both ends of the journey and the journey requirements can be met by a high-capacity transport mode with good access/egress facilities at both ends.
2) *from medium density level to high density level (medium-high)* – This journey type has less concentrated journey densities at the medium density level. The problem arises in picking up passengers who travel from the high density level to the medium density level.
3) *from low density level to high density level (low-high)* – This journey type is characterized by journey to work. Travelling towards the high density level requires a high-capacity, low space-demand mode, whereas travelling towards low density level requires good pick-up and distribution characteristics, and here the best solution is the private car. Opportunities for public transport fall into the following:
   - some form of public transport,
   - "park and ride" system linked with a fast, reliable and segregated form of public transport.
4) *from medium density level to medium density level (medium-medium)*
5) *from low density to medium density level (low-medium)*
6) *from low density level to low density level (low-low).*

For journey types 5 and 6 with the lower concentrations of journey origins and destinations, the private car is the most effective means. However, travellers who have no car have to be provided with public transport and this creates the issue of the level of service as well as economic justification. Effective and economic significance of public transport is possible only for the journey types 1), 2) and 3), and less efficient for journey types 4), 5) and 6), even though it has to be organized.

The study has shown that people who use private cars would be prepared to transfer to public transport when the travel by car would become difficult, expensive and unreliable. This is the situation that occurs in the peak period in urban journeys. Reduced travel by public transport means reduced revenue to the operators, which then reduces the service frequency or increase in the fares. The result is the loss of more passengers and increased travel by car, which means serious damaging consequences:

- *traffic congestion* which is reflected in increased noise and visual pollution, diversion of traffic onto alternative routes through residential areas, increased journey times and journey unreliability, as well as unacceptable driver stress and frustration;
- *energy consumption and air pollution*, cars consume fossil fuel of limited reserves and cause additional air pollution, which favours public transport;
- *safety* is at greater risk since the traditional morning and afternoon peak hours are extended resulting in longer and less reliable journeys, increasing also the risk of accidents particularly to vulnerable users of the road system such as motorcyclists, cyclists and pedestrians.

3. INTERURBAN TRAVEL

According to UK interurban travel is defined as journeys over 40 km in length. Research carried out in Great Britain in 1973, 1980 and 2000 resulted in relatively small proportion of person journeys of 3% which were longer than 40 km, 1% on shopping journeys, 8% for work journeys, and 28% for holiday travel. Table 1 shows the number of long-distance person journeys by purpose and travel mode. One may also notice that there is a predominance of rail and car travel for work journeys.

Table 1 - Travel according to transport modes and trip purpose

Mode	Trip purpose			
	To and from work	In course of work	Non-business	Total
Rail	36	12	14	20
Bus/Coach	2	2	8	7
Car	51	84	75	68
Air (domestic only)	–	2	–	–
Internal transport	11	–	–	3
Other modes	1	1	2	2

Source of data: O'Flaherty, C. A.: Transport Planning and Traffic Engineering, p. 185.

Table 1 shows that car travel allows for 68%, rail 20%, and bus 7% of travel. Except for work journeys, air travel is relatively unimportant, primarily because

of the cost and small distances between major urban centres.

Research carried out in Croatia in 2000 have shown that interurban travel is predominated by rail and bus travel. Both transport means have terminals in the cities and are readily accessible to most travellers.

Rail, which is segregated from other traffic is immune from the delays outside the system, whereas *buses* are liable to be caught up in the increasingly occurring traffic delays. Bus travel is mainly cheaper, take longer and their journey times cannot be guaranteed. The same reasons make the car travel more and more unreliable as well as more stressful for the driver. In order to render public transport more attractive to the travellers in interurban travel, it is necessary to improve the level of service and to reduce the cost.

4. RURAL TRAVEL

In rural areas the travel of elderly people, as well as those without a car is becoming a serious problem, especially when greater distances are involved and greater scattering of facilities such as medical facilities, shops, banks and schools.

Rural areas are characterized by low density of population, closures of railway lines, reduced coverage of the area by bus line networks, as well as the frequency of transport service provision. Consequently, many families have to buy two cars which results in financial difficulties on the one hand, and on the other, reduces the transport problem. However, for those people who cannot afford to buy a car or drive a car at particular times, the problem has increased since no public transport service has been provided, resulting in reduced mobility and lower quality of life.

There have been attempts in some rural areas to improve the standard by introducing public transport services that use unconventional transport means. Many alternative ideas have been developed where public transport failed to satisfy the local needs.

Unconventional transport services feature the following characteristics:

- voluntary effort by local residents in organizing and operating county transport services;
- use of small vehicles where demand is small or roads too narrow,
- organizing of lines and scheduling according to pre-booked demand,
- transport of passengers by vehicles making regular journeys for other purposes (press)
- linking remote areas to the main public transport network with feeder services.

Unconventional transport services include:

- shared hire cars operating on scheduled lines linked to the existing services with pre-booking arrangements. Routes were not fixed and the passengers were picked up and returned to their homes;
- volunteer drivers carrying passengers in their own cars and accepting payment for the pre-booked journeys;
- county buses driven by unpaid local volunteers operating on a flexible route system picking up pre-booked passengers;
- car sharing service where passengers book journeys through a local organizer who keeps a list of when drivers participating in the scheme are available;
- postbuses where the carriage of passengers and the collection and delivery of mail are combined using a minibus instead of the conventional mail van.

Such services yield a limited contribution to improving the transport services in out of city areas, although the precise impact and most effective type of service varies from area to area. It is obvious that engaging local volunteers would reduce the unemployment problems of the respective area.

5. CONCLUSION

The tendency of increasing the usage of public transport, especially in urban environment where the problem of passenger transport is reaching an undesired level, has resulted in significant transport movements and environmental benefits. The underground and overground passenger transport technologies are favoured, that can yield significant contribution to solving the problem of urban transport, which is at the same time only a part of the package of measures including traffic management.

In interurban travel it is necessary to increase the speed, efficiency, image, provision of information and safety of travelling.

In rural areas, where drawbacks have been found in the provision of passenger transport services, research will continue in order to increase the level of service, especially by using the computer supply according to time and direction of travel. Also, local volunteers may be stimulated by reducing the tax bases when purchasing fuel or a new vehicle.

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SAŽETAK

TEHNOLOGIJA GRADSKOG, MEĐUGRADSKOG I RURALNOG PRIJEVOZA PUTNIKA

U radu će se razmotriti značaj raznih načina javnog prijevoza, jer različiti načini putovanja koji čine sustav transporta, međusobno su povezani. Primjena nivoa usluge u jednom načinu, ima utjecaja na ostale načine prijevoza i mijenja se ovisno o vrsti putovanja, te se svrstava u tri grupe: gradska putovanja, međugradska putovanja i ruralna putovanja. U sagledavanju značaja ***gradskog javnog prometa*** *izražena su tri nivoa generiranja/privlačenja odredišta putovanja s kojom se mogu identificirati šest tipova gradskog putovanja.* ***Međugradsko putovanje*** *prezentirano je kroz dva glavna prometna sredstva željeznicu i autobus. Osim za poslovna putovanja, putovanje zrakom relativno je nevažno, prvenstveno zbog cijene i malenih udaljenosti. U* ***ruralnim*** *područjima, čija je karakteristika niska gustoća naseljenosti, nastaje problem putovanja starijih ljudi, kao i onih bez automobila, jer je postalo još teže osiguranje ekonomskih usluga javnog transporta jer je broj prevezenih putnika mali. Posljedica je smanjenje pokretljivosti i kvalitete života. Postoje pokušaji poboljšanja standarda osiguravanjem usluga javnog prijevoza uvođenjem nekonvencionalnih prijevoznih sredstava.*

KLJUČNE RIJEČI

mobilnost, životni standard, oblici javnog prijevoza, vrijeme putovanja, osobni auto

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