

**English summary from the report: “Perspectives on implementation of free public transport - assessments and recommendations from a working group under the Danish Board of Technology “, November 2006.**

## Summary

### General Reflections

The Danish Board of Technology has appointed an interdisciplinary working group commissioned to

- prepare a survey of the possible societal consequences of introducing free public transportation (0-fare) in Denmark
- and on the basis of this survey, to draft assessments and recommendations in relation to the potential of free public transportation as a possible political instrument to counter the growing traffic problems, in a long societal perspective.

As a point of departure for the completion of this task, the working group has chosen to analyze the loss of revenue and the additional costs that the public (state, counties and municipalities) may incur following the introduction of free public transportation. This point has not been elucidated before. The costs caused by the loss of fare revenues are examined, and the development in the number of passengers and the reduction of car traffic is assessed.

The working group finds that one of the most important purposes of a cut in the price of public transportation is to reduce traffic crush and other nuisances of car traffic by enticing a great number of motorists to use busses and trains instead.

Car transport involves a number of advantages to society and the individual: It affords great mobility and freedom in the choice of residence and place of work. But the increasing motor traffic entails a number of nuisances, e.g. traffic crush and – especially in cities – health hazardous noise and air pollution, just as it causes a significant increase in traffic-related energy consumption and carbon dioxide emission. These are nuisances that involve significant economic burdens for society.

It is imperative that political decision-makers at all levels seek new solutions to the ever-increasing traffic problems. Simply allowing the traffic situation to develop without intervention is no longer tenable.

The work group stresses that public transportation is a precondition for the mobility of a large part of the population. Furthermore, means of transportation increasingly constitute a prerequisite for participation in recreational activities and accomplishment of everyday tasks such childcare, shopping and visits.

Public transportation has not been able to maintain its share of the total passenger conveyance. This is partly due to the striking fares increases which have rendered it relatively more expensive to commute by public transportation than by car.

The premise of the work group is that public transportation must constitute a genuine alternative to car transport in areas with a sizeable number of passengers, i.e. in larger cities with more than 100,000 inhabitants and in road sections with large traffic volume.

0-fare as a possible instrument of traffic policy is assessed in relation to five parameters:

- traffic crush
- environment
- health
- accidents
- access to mobility

By way of calculations, the working group has examined the consequences of introducing free public transportation in geographically different areas in Denmark (metropolis, provincial town, rural district):

- in the country as a whole
- in the metropolitan area (the area of The Greater Copenhagen Authority, HUR)
- in the municipalities of Copenhagen and Frederiksberg

- in the County of North Jutland
- in the municipality of Aalborg
- in Western Himmerland

## **The Assessments and Conclusions of the Work Group**

The work group concludes from its investigations that there are benefits to free public transportation as far as all five parameters are concerned: traffic crush, environment, health, accidents and access to mobility for everyone. Another conclusion that is common for all five parameters is that it will demand considerable resources to achieve these benefits and that these resources, under the present circumstances, will not be proportionate to the effect. In other words, the desired effects can be achieved considerably cheaper by using other instruments.

### **The general conclusions of the report are:**

- that a general implementation of free public transportation on a national basis will be inexpedient. The economic costs will be high and the effect small as far as crush, traffic environment and accidents are concerned.
- that free public transportation will have a much larger impact in the big cities than in the countryside.
- that the effect on environment and health is limited. Generally, noise strain and air pollution will not change perceptibly, and the expected improvement in the health of the lapsed motorists will be counterbalanced by the equivalent decline in the health of lapsed cyclists and pedestrians.
- that mobility will be generally enhanced – especially for citizens without car access. Free public transportation will also reduce car ownership (acquiring a second car), in that it will be possible to maintain mobility without having more than one car.
- that a combination of fares reduction and an improved range of transportation services (quality and frequency) will have greater impact than the introduction of general 0-fare alone.

### **The device of 0-fare as a “carrot” must be combined with a “stick”**

In the assessment of the work group, the introduction of free public transportation (0-fare) as an isolated initiative is not a recommendable instrument in traffic policy. The greatest effect – on public transportation as well as on the desired reduction in car traffic - is achieved by a combination of “the carrot” and “the stick” in which the “the stick” is constituted by initiatives in parking policy and roadpricing etc. This way, considerable shifts in the population’s choice of transportation may be contrived.

Furthermore, an isolated introduction of fares reductions, entailing a huge demand for increased capacity and/or entailing considerable economic losses, will hardly be politically viable.

### **Costs of 0-fare is not counterbalanced by benefits**

In the assessment of the work group, a general introduction of free public transportation will involve a public expenditure for increased capacity that is not counterbalanced by the achieved benefits in relation to environment, distribution policy or traffic. The loss of DKK 6 billions in missing fare revenues and the missing state income from motor taxes in excess of DKK 1 billion could be used more effectively in the form of an overall strengthening of public transportation – if a staking this offensive could find political support in Parliament and town councils.

### **0-fare may be counterproductive**

The work group finds it to be of crucial importance that 0-fare, if implemented, does not entail that economic limitations are imposed on the ability of public transportation to enhance the quality of public transportation services or that public transportation is rendered politically low-status. The work group fears that 0-fare, as an isolated instrument, will come to mean a reduced economic scope for providers of public transportation and hence a deterioration of quality. Likewise, the work group fears that users may view transportation for which they do not have to pay as “valueless”, and that 0-fare will thus contribute to a depreciation of public transportation.

### **Travelling time is at least as important as fare**

Travelling time, especially in relation to waits, changes and delays, have a great deal of influence on how users experience the total 'cost' of the ride. Thus, when trying to attract more passengers to mass transit, reducing travelling time, waits and delays are at least as important as doing away with fare. If the introduction of 0-fare means a reduction in the quality of the ride, this may lead to a diminishing of the number of passengers.

### **Free public transportation will mean more passengers**

The introduction of free public transportation is estimated to entail an increase of as much as 75 percent in the long term, i.e. more than five years ahead in time. This increase is due to several circumstances: Forthwith, free transportation will attract more travellers, and many will give up other means of transportation, especially pedestrians and cyclists. 20 percent of the new passengers are expected to be former motorists. New passengers will include especially people with low income who will now have greater opportunity to make avail of the public system of transportation.

In addition, an increased frequency in public transportation, in places where a greater number of passengers may justify it, will in itself entail a further influx of passengers – passenger groups such as commuters to whom travel duration and departure frequency are significant factors.

### **Localization of residences, places of work, shopping and leisure activities will change**

In the long term (10 to 20 years into the future) free transportation will affect the localization of destinations: residences, places of work, shopping and leisure activities. Due to the lowering of travel costs, some will move further away from their places of work etc. Another and perhaps stronger tendency is that increasingly citizens will choose to reside closer to railway stations and important bus stops. Also, some may choose to sell their car or refrain from buying one or refrain from acquiring a second car.

### **0-fare means less car traffic**

Transport by car is expected to drop by 3 – 4 percent, roughly the equivalent of the general increase in car traffic in a period of two years.

In the municipalities of Copenhagen and Frederiksberg 0-fare will entail a general reduction of traffic strain by 10 percent. This will really have an impact on the most strained road sections. In certain sections the reduction will be even greater.

### **- and less traffic crush**

Generally, the small drop in car traffic will only have a limited impact on the crush in streets of the big cities and on the major roads, but since even a reduction by a few percent may be significant, perceptible reductions in traffic crush will be felt locally. The impact will be greatest in the largest cities.

In the metropolitan area of Copenhagen, car traffic in general will drop by 5 percent, mostly on the main approaches to the city and in the busy local streets in rush hours. In saved time and diminished cartage expenses the reduction of crush will amount to at least DKK 1 billion for the remaining motorists and the busses – the expenses due to traffic crush in the greater Copenhagen area is at present computed to be about DKK 6 billion annually. Without intervention the societal loss due to crush is likely to double several times over within the coming 10 to 20 years.

### **Consequences for the environment, health and accidents**

On a national basis the introduction free public transportation will lead to fewer accidents, just as it will have a positive impact on the environment and health. In total, the transfer of private road-users to public transportation is estimated to result in 12 fewer road fatalities annually and almost 140 fewer casualties corresponding to a societal saving of about DKK 300 million.

As far as health is concerned, the transfer of road-users from car traffic to public transportation will result in an improved health standard (walking/cycling to railway station or bus stop), but this benefit is partly counterbalanced by an increased demand for busses and trains which will also have a negative impact on the environment and health. Likewise, the people, who used to ride a bicycle or walk, will also be affected negatively in a health perspective, because they will now get less exercise.

### **Significance to national economy**

The total loss of fare revenues for providers of public transportation is assessed to amount to DKK 7.3 billion in the country as a whole. From this amount must be deducted DKK 1.4 billion in that the work group presumes that DKK 0.7 billion will be saved in collection of fares and another DKK 0.7 billion in discounts and free transportation for e.g. schoolchildren and the elderly, paid for by the public authorities as it is.

The drop in car traffic entails a reduction in the payment of motor taxes – and hence a reduction of state revenues – of DKK 1.2 billion.

The necessary extra capacity is provided, in the case of long-distance trains and S-trains by adding extra carriages to the existing trains. As far as the Metro trains are concerned, there is supposed to be ample capacity in the existing trains. The procurement of extra capacity in public transportation is estimated to cost DKK 3.6 billion annually.

The total public costs of introducing free public transportation on a national basis can thus be calculated to DKK 10.7 billion net. This includes the reduced expenses in traffic-related areas of expenditure. Thus, the cost of enhancing the capacity constitutes a significant share of the total costs of implementing free public transportation.

## **The Recommendations of the Work Group**

### **Use free public transportation as a selective instrument of traffic policy**

Providers of public transportation and municipalities should consider introducing free or significantly cheaper transportation in selected geographical areas and for selected sections of the population (e.g. young people and students).

Besides, 0-fare could be applied when launching new routes, re-launching public transportation as such or in connection to campaigns targeted on specific sections of the population or companies. 0-fare could be a way to allow the target groups in question to build experience with public transportation which may further the use of public transportation, in a long view as well. The costs would be limited and could be considered as expenses for marketing.

### **Price reduction on commuter passes**

One way to entice motorists to use busses and trains instead could be to reduce the prices of periodic or monthly commuter passes which are used especially by passengers who commute between residence and place of work and students. The group recommends that the price of this kind of fare is significantly reduced.

### **Use the Travelcard to differentiate the fare**

The coming electronic Travelcard offers providers of public transportation new possibilities to differentiate the price of the fare according to e.g. customer groups, travel patterns and travel times. The providers of public transportation and the municipalities should scrutinize these possibilities and consider this kind of initiative in the context of the effects of car traffic, especially as far as traffic crush is concerned.

### **Strengthening the competitive power of public transportation**

An efficient system of public transportation characterized by high regularity and frequency is a precondition for viewing public transportation as a genuine alternative to the car. The work group recommends political decision-makers to endeavour to improve the quality, punctuality and frequency of public transportation. Service reductions can be expected to induce a massive drain of passengers from trains and busses to cars.

### **A call for increased urban densification**

In order to ensure the best possible conditions for public transportation, municipal city planning should focus on the establishment of urban structures that allow for an efficient system of public transportation. This could be done, for example, by way of linear conurbations such as the 'Køge Bay Finger' or by creating New Towns. Municipal authorities should seek to avoid strong urban dispersal.

### **Examine the possibilities for differentiating the mileage relief**

In connection with the above the work group recommends Parliament to examine the possibilities for differentiating the mileage relief. The mileage relief contributes to an enhanced mobility and a more flexible labour market, but in the metropolitan area it also serves to further increase traffic crush.

### **It is necessary to implement a complete package-deal in traffic policy**

The aim must be to increase the market share of public transportation vis-à-vis car traffic, and the only way to achieve this end appears to be a combination with other instruments, i.e. through comprehensive plans of action that include various versions of roadpricing and a consistent parking policy. The expansion of public transportation must be combined with restrictions for car traffic.

**Roadpricing is an absolute necessity**

The introduction of roadpricing in one form or another should be included as a crucial element in a 'package-deal' for traffic policy. Increased negotiability, easier access to parking, improved urban environment, a better infrastructure and attractive public transportation will help render roadpricing acceptable to motorists.

The introduction of roadpricing and parking charges constitutes an opportunity to procure (partial) financing for the development of infrastructure to the benefit of car traffic as well as public transportation and financing for a fares reduction in public transportation.

**The Copenhagen Package – a tangible draft for a package-deal**

A recommended tangible package-deal for the municipalities of Frederiksberg and Copenhagen includes instruments such as a significant fares reduction in Copenhagen and Frederiksberg, a "Copenhagen Travelcard" valid for one year" priced at for example DKK 1200, an expansion of the Metro train system, better busses, light rails and improvements of frequency and capacity.

The proceeds are to be used for improvements of infrastructure for public transportation as well as for car traffic.

**A task for the Commission on Infrastructure**

The recommended package-deal should be thoroughly analysed in its consequences for traffic and economy. The work group requests others to undertake this task – the new commission on infrastructure for example, or the municipalities of Copenhagen and Frederiksberg.