

SOCIAL EFFECTS OF FAST TRANSPORTATION SYSTEMS

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Abstract: The transportation systems are changing social relationship in a dramatic way. The main effects which hasn't be to understood very well to do is the segretation of human activities on the one side and the concentration on the other side. Studies in Vienna have showns at fundamental human behaviour patterns are responsible for this segregation effects together with a prevailing ideology in economy. The report will describe the existing effect demonstrate them on real practical situation and give informations how to handle this phenomenon. New technologies have to take into account the findings of this system effects of the prevailing technology to prevent mistakes for the future.

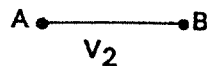
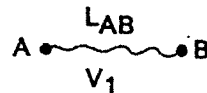
1. INTRODUCTION

The main goal of classical traffic planning and traffic economy was the increase of the speed of the traffic systems. For that purpose mankind has developed mechanic traffic systems like the railway, the car or the air plane. All investments in faster traffic systems are proofed by the argument that we can save time if we increase the speed of the traffic system. 85 % of the efficiency of investments for any kind of higher speed traffic systems are proofed by time saving effects. If we calculate all the time save during the last 50 years in our countries, we must have a tremendous surplus of time in the system.

This rational argument seems the beam contradiction with our experiences, so we have to ask were the mistake has been done.

2. TRADITIONAL CALCULATION:

Traditionally we calculate the time difference (by increase of speed) as the result of a traffic system with higher speed by following calculations:



Δt = L_AB * (V_2 - V_1) / (V_1 * V_2) (1)

The efficiency is calculated by formula (2).

Efficiency E = F_AB * Δt * m (2)

F_AB is the number of trips between a) and b)

Δt is the time difference from formula 1 and

m is the money term for time savings.

This efficiency amounts for about 80 to 90 % of the total efficiency of high speed traffic systems. These results of scientific analysis of mobility we know since many years but we cannot find any time saving in

speeds. This effect has been studied worldwide and locally. The time for mobility is nearly constant. Since the time for mobility is always constant, the sum of time savings is always 0 (formula 3). If we have therefore time savings in the part of this system, we must have two effects:

$$\Sigma \Delta t = 0 \quad (3)$$

Loss of efficiency in other parts of the traffic system.

1. We have a wrong definition of the system.

If we look to the traffic system itself, what is calculated on the bases of formula 1 and 2 are always situated either in the railway section or in the road section. They don't take care on a whole mobility in the traffic system, and

2. the system borders have to be changed, if the speed of the system is changing.

Since the time saving is not possible also not in the part of the system (the fast car drivers have absolute the same time amount as the slow pedestrians) each increase of speed means an increase in distance. This has been found worldwide in all studies.

3. EFFECTS

This effect of the fast traffic system is not very well understood, because it is in contradiction to our personal experiences. In each single case we can prove that high speeds of movements save time. So we believe, that we observe the system effect, but we don't do it. The system effect is different from our personal experiences, as well as the high speed is outside of our human abilities.

What we can observe are the effects of high speed and they are two:

1. segregation of settlements (individual segregation) and

2. concentration of labor, industry and trade.

For hundred thousand of years the human society has been developed on the basis of pedestrians. Since few decades but destroy this kind of society and we are losing the complexity of urbanisation. We are losing the human scale and we are becoming more and more dependent on megastructures, which control our life more and more.

4. REASONS FOR THIS EFFECTS

But not only the high speeds, attract mankind, it is also the tremendous amount of comfort which is connected close into the car as well as the tremendous amount of privileges for the car driver together with the saving of body energy for movements. A car driver use only a small part of energy of his body to move from A) to B) compared to pedestrians and so on. And this effect is substitution.

Effects: Since we are not able to understand the effects of high speeds in the traffic system which can be individually used, we have developed a infrastructure of roads and railways which is destroying in high motorized countries the sustainable development of cities and settlements. The increase of speed is followed by concentration of working places, industry and culture and segregation of settlements and societies ? The price we are paying for this system is the deterioration of our culture, air pollution, dependency of man on mega structure and the tremendous amount of energy. The increase of energy use for a faster system is increasing with the speed of the second power of speed and it is increasing in the third power with all the effects.

5. CONCLUSION

Our uncontrolled increase of the speed has a lot of negative effects on settlements,

culture, economy and environment. Since the man is not able to save time by increasing speeds in the system it is necessary to control the speed of the system on the basis of general goals for the future development, the development of the society and economy. Speed of the traffic system has no value in itself, it is not so important as it has been mentioned in the past. Speed is also expression of the stupidity of the system. A very clever system which is sustainable, can operate on a very low speed level. The tremendous amount of energy in the traffic system is an indicator. This kind of economy can be of advantage or a certain amount of time, but in the long time around it has negative effects for itself and also for the whole globe. Today, the high motorized countries are using this kind of mobility against all the other countries to exploit their resources. In a short term range just for the own profit, because they don't pay the right price for the traffic system. Instead of decreasing the speed the society can also introduce higher prices for faster transportation. Today we have a market economy without market economy principles in the traffic system. If we would have market economy principles in the traffic system, we will have to reduce the speed of the traffic system very soon.

Straßen- und Eisenbahnbau (IVT) der ETH-Zürich Nr. 81, Zürich.

Europa der Fußgänger (1986). Hrsg. vom Verkehrsclub Österreich VCO und Socialdata, Institut für Verkehrs- und Infrastrukturforschung GmbH, München. Wissenschaft & Verkehr Nr. 2/1992.

Richtlinie für die Anlage von Straßen RAS, Teil: Wirtschaftlichkeitsuntersuchungen RAS-W (FGSV 115). Forschungsgesellschaft für Straßen- und Verkehrswesen, Arbeitsgruppe "Verkehrsplanung". Köln (1986).

6. REFERENCES

Knoflacher, H. (1993). Zur Harmonie von Stadt und Mobilität. Bibliothek der Kulturgeschichte, Sonderband 16; Böhlau Verlag Wien-Köln-Weimar, 1993.

Schmidl, H. (1990). Mobilitätskennziffern des werktäglichen Personenverkehrs im räumlichen und benutzergruppenspezifischen Vergleich. Dissertation an der Fakultät für Bauingenieurwesen der Technischen Universität Wien, 1990.

HCM - Highway Capacity Manual (1985). Transportation Research Board, Special Report 209; National Research Council, Washington, D.C., 1985.

Meier, E. (1989). Neuverkehr infolge Ausbau und Veränderung des Verkehrssystems. Schriftenreihe des Instituts für Verkehrsplanung, Transporttechnik,

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