SUSTAINABLE URBAN TRANSPORT PLANS (SUTPs)

Prof. dr.-ing. Gerd-Axel AHRENS
Chair for Transportation and Infrastructure Planning,
Faculty of Transportation and Traffic Sciences "Friedrich List

ABSTRACT. Unbalanced traffic growth with urban sprawl, environmental problems, accidents and congestion require better coordinated planning, design and management of the urban scheme and transport plan. An integrated approach is introduced and with its most important features characterized. The state of the art of transport master planning in Europe is briefly reflected upon. SUTPs are increasingly necessary as a precondition to obtain funding for urban transport measures by EU and national authorities.

REZUMAT. Creşterea necontrolată a traficului datorită extinderii urbane, problemele de mediu, accidentele şi congestionarea fac necesară îmbunătăţirea planificării coordonate, a proiectării şi a managementului schemei urbane şi planului de transport. Este prezentată o abordare integrată şi sunt caracterizate trăsăturile ei cele mai importante. Planificarea transportului în Europa cu ajutorul SUTP devine tot mai mult o comdiţie pentru obţinerea finanţărilor pentru măsurile de transport urban adoptate de UE şide autorităţile naţionale.

Keywords: sustainable integrated urban transport planning, traffic growth, modal split, planning process, consensus, acceptance of plans and measures.

Cuvinte cheie: planificare durabilă a transportului urban integrat, creşterea traficului, separare modală, consens, acceptanţa planurilor şi măsurilor.

1. WHAT ARE THE PROBLEMS?

So far the unbalanced traffic growth with automobiles was the major concern of urban transport planners. Fig. 1 shows, how in East German cities car ownership doubled after the political changes 1990 in about 10 years. By now the West German level is practically reached with decreasing growth rates.

However, the world perspective is alarming. Can we afford in terms of energy consumption and other resources a worldwide full motorisation? Just think about what it means when billions of Chinese and Indian people would reach only the world wide motorisation average of about 130 cars per 1000 inhabitants! Now they have only 10 – 15 cars per 1000.

Fig. 2 shows that through the increased motorisation the daily trip lengths by cars increased with the factor four! More cars, higher car use, longer trip lengths, all this creates pressure on and in our cities. The modal split development of East German cities is shown in fig. 3. Alarming is the decline of walking. The 10%-loss of public transport seems to recover somewhat and also cycling gains. This indicates necessary chances and hidden potentials for a more sustainable balanced urban transport system.

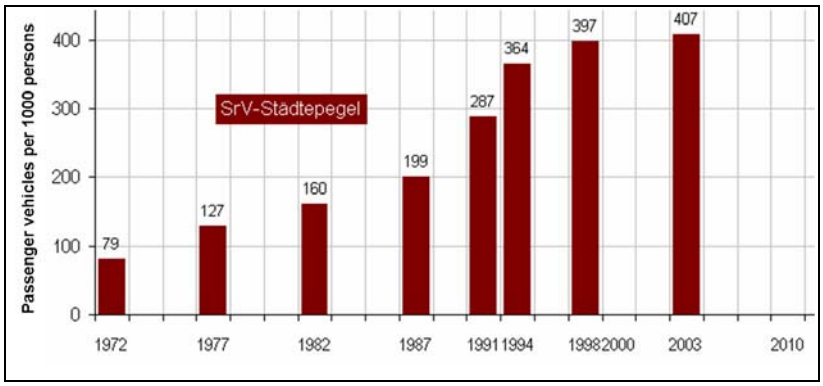

Fig. 1. Development of motorisation in East German cities [1].

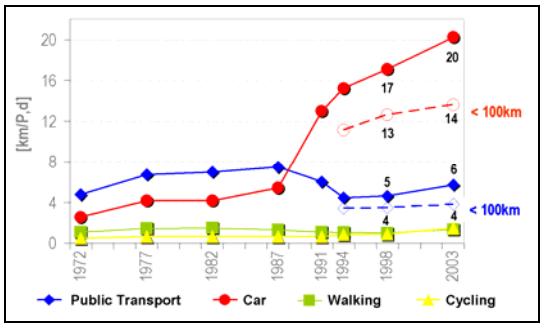

Fig. 2. Development of daily trip lengths by modes [1].

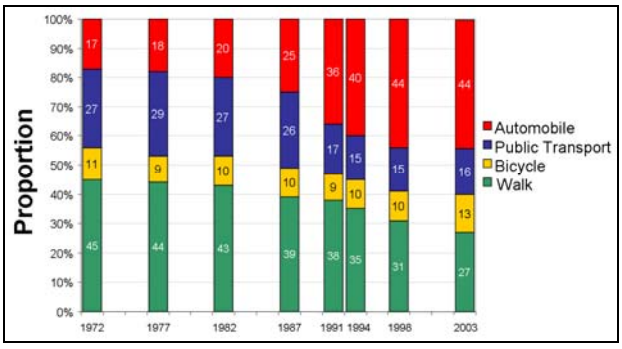

Fig. 3. Modal split development in East German cities [1].

However, when we compare modal split data of different cities (fig. 4.) we see variations. The problems in smaller and bigger towns apparently vary and need particular and specific treatment and plans in each town. The message for our politicians is easy: "The lower the modal split for automobile is in your towns, the easier it is to keep the traffic situation uncongested." Metropolitan areas, like Manhattan, London, Paris, have the highest modal split for public transport. So try to be metropolitan and you reach more sustainability at the same time.

The growing demand for car travel has many reasons as fig. 5 indicates. The growing standard of life with increasing motorisation meets improved transportation networks with an increasing radius for activities. Sub-urban sprawl as a major traffic generator is a result of the critical interrelation of cities and their surroundings. How can city and regional planning, integrated transport planning and policy, help to improve this situation?

2. TASKS FOR TRANSPORT PLANNING, DESIGN AND MANAGEMENT

Transport planners have to enable activities of people and products, they have to secure mobility. Everybody, whether he owns a car or not, should be able to participate in all relevant activities. So all kinds of transportation modes have to be considered, also to minimize the negative effects of the transport sector.

For this complex task a wide range of integrated measures is available and needs to be specifically developed. The relevant areas and tasks of transport professionals, the curriculum of urban transport planning reaches from exploration of trip causing factors, over development, design and operation of all transport modes, to avoiding and minimizing negative effects of transport.

In this context I want to point out that the major, the primary and causal task for transport professionals is not simply to fulfil the needs of growing traffic. In the first place with highest priority we have to enable activities of people and goods (fig.6). They are the reason for trips and they should be guaranteed with the lowest transport effort. So mobility is the ability for activities away from home or at different locations.

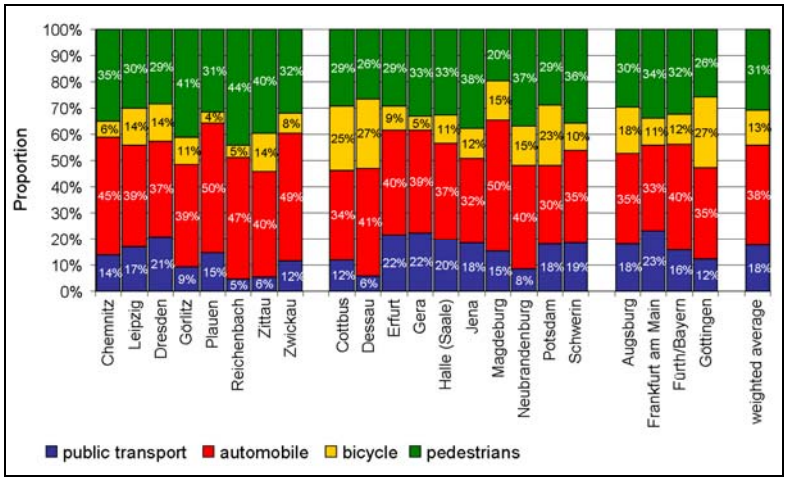

Fig. 4. Development of motorisation in East German cities [1].

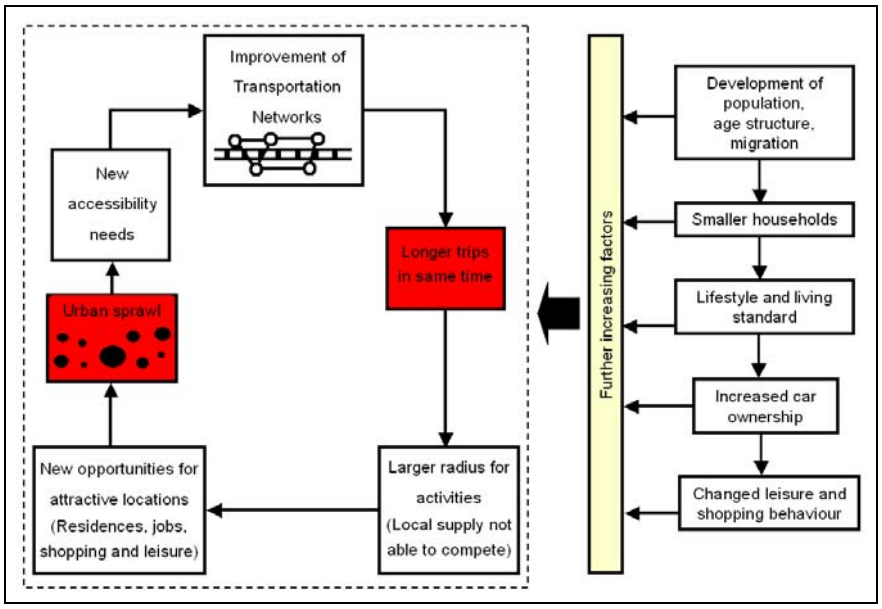

Fig. 5. Increasing factors of passenger travel.

When we look at the descriptors of daily mobility, we realize that it has not really grown as everybody thinks:

– the average value for daily trips of a person stays constant in the range of 3 – 3,5 trips per day already since decades;

– the required time for daily trips is also a rather constant parameter with 70 to 80 minutes per day;

– only the trip length per day increased from 20 km in 1991 to 29 km in 2003!

In order to do the same things like in 1990, today the East German city-population has to travel 50% longer distances. Is that improved or grown mobility?

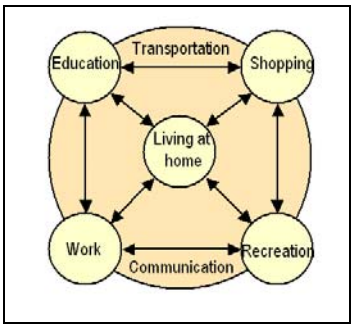

Fig. 6. Traffic causing activities.

The task of sustainable transport planning is to enable the participation of the population in individual activities and of goods in the supply chain. At the same time the use of resources and negative effects have to be minimized. The goal is to achieve highest mobility with the least amount of traffic and effort.

The future threat for transport planners and politicians is to achieve more personal and especially economical activities with not increasing traffic. In Europe energy policy succeeded already in having economical growth with less energy-consumption. This could also be achieved in the transport sector with a more sustainable transport system, dense cities and more awareness of the trip makes (fig. 7).

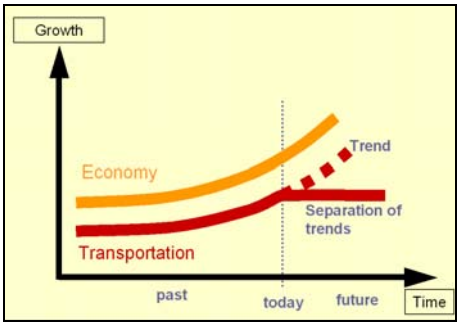

Fig.7. Economical growth with less traffic.

3. INTEGRATED SUSTAINABLE TRANSPORT PLANNING: DEFINITION AND PROCESS

Integrated transport planning in Germany is defined as:

• „anticipated systematic preparation and conduction of decision processes with the intention, to influence trips in a certain planning area according to goals and objectives through land-use measures, construction of

facilities, police measures, operational management, price and information measures." (FGSV 1985)

- an interdisciplinary task orientated to the future;
- a continuous, iterative and transparent process;
- a process on different planning levels (federal, state, regional and local transport planning);
- an informal co-operative process, not regulated by laws;
- a process, mainly divided into 3 phases: problem analyses, development of measures, balancing and decision (fig. 8).

Important elements of this process are:

- goal-orientation instead of demand-orientation;
- differentiation of scientific preparation of decisions and political-decision making;
- co-operative and communicative approach;
- orientation on consensus and acceptance.

Important in the transport planning and management process is to integrate all sectors that are affected and involved with the transport system. Fig. 9 indicates the seven main areas of integration that turn the process into a complex organisational and communicational task.

Of course, integrated sustainable planning, design and management means to think parallel and everything at the same time. Not just planning for bicycles, public transport, cars, or handicapped people. Considering everything and the interrelations and then to come up with the right concepts and measures is a challenge and an art. However, we still have to develop the particular networks by modes. The task would be too complex otherwise. But in the end, the networks have to fit together and have to enable intermodal trip making as fig.10 illustrates.

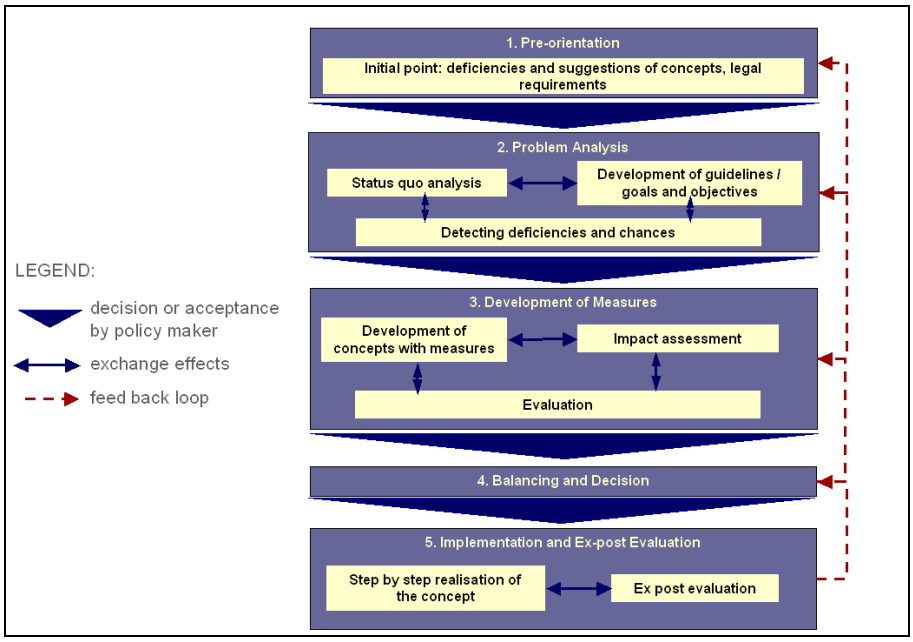

Fig. 8. Process of transport planning [2].

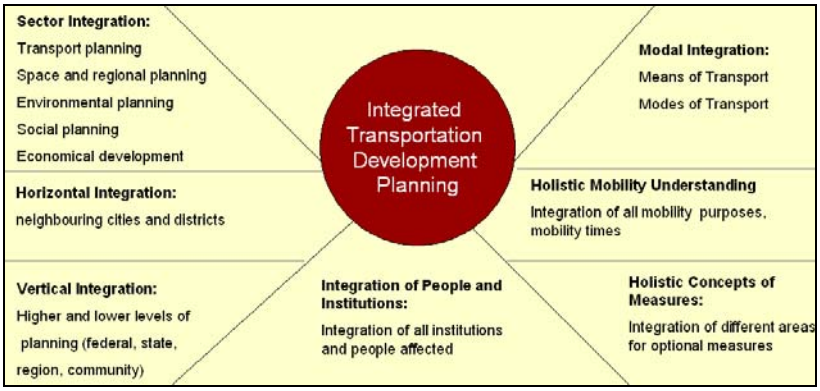

Fig. 9. Aspects of integration of a holistic process of transport planning [3].

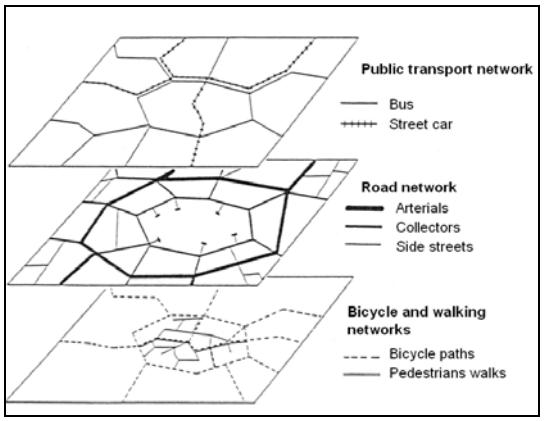

Fig. 10. Congruent transport networks [4].

Accordingly, the urban transport sector is organized in most cities (fig.11). German municipal experience of the last decade is to concentrate, if possible, all transport related urban activities in one agency. Avoid the split of responsibilities, like e.g. transport planning and road construction, traffic signs/signalization and planning. Separated responsibilities lead to many unnecessary frictions in all areas of planning, building, maintaining, operating managing, and in the information systems.

4. MOBILITY MASTER PLANNING OR SUSTAINABLE URBAN TRANSPORT PLANS IN EUROPE

In *Germany* federal funding for transport investments require so called „general transport plans“ of the cities. However, often just the land use plan is accepted as a substitute by the state authorities. In addition it is often not checked, whether the used data is from recent times and whether the plans were adjusted to new developments during the last years. Nevertheless, the legal base for financing municipal transport investment is in the process of change. In the context of city development “master concepts” are required to obtain funds from the programs “Aufbau Ost” and “Aufbau-West”.

In other European countries we observe a renaissance of master planning. Cities who want to participate in the CIVITAS-Program, the EU initiative for sustainable urban mobility, need to explain their measures on the basis of a politically decided “Sustainable Urban Transport Plans” (SUTP). These cities produce remarkable results with their new integrated transport master plans.

In *France* a law from 1996 against air pollution, climatic change and for sustainable energy use (LAURE) forces cities with a population of more than 100.000 to prepare a (mobility) master plan, the Plan de Déplacements Urbains (PDU). Since 2000 this got additional impulse through the law of “Urban Solidarity and Renewal” (SRU). The areas city development, transport and residences were tightened very closely. Cities with a mobility master plan are allowed to collect public transport fees from companies (Versement Transport).

The also legally required Plani Urbani de Traffico in *Italy* are more detailed than the strategic French plans. Based on air quality management, interventions in company’s mobility management and also car-restricted zones in inner cities are intended. Cities with more than 150.000 inhabitants have to employ a mobility manger. The development of municipal mobility plans is partly financed by the national government, the provinces and the cities.

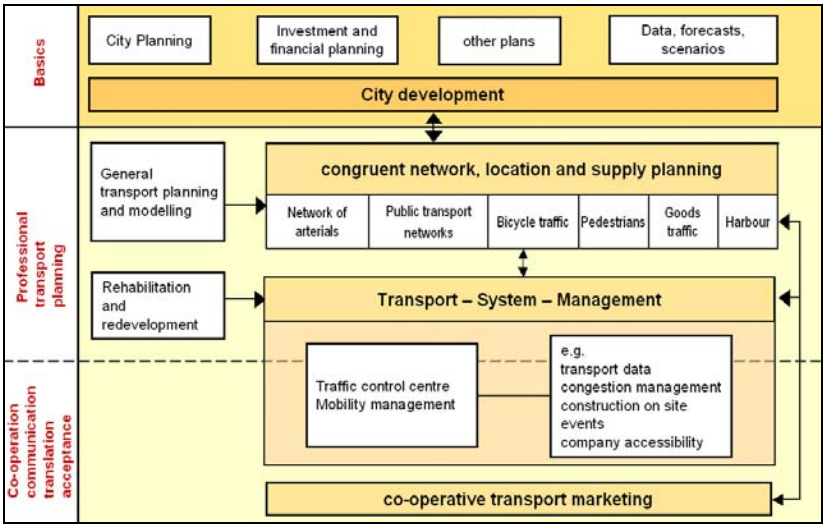

Fig. 11. Working areas in urban transport.

In *Great Britain* since 2000 the Local Transport Plans (LTP), which are volunteer informal tools, became compulsory in England and Wales. The first phase of LTP1 is already finished and we can observe the second phase from 2006 to 2012.

Focus of the elaboration of LTPs is the monitoring after the planning process through annual reports and the evaluation of the goal achievements through parameters like trip frequency, trip times, trip lengths, development of auto and bicycle use, punctuality of public transport, congestion times and immission concentrations.

Also in England the state finances a municipal - mobility manager. The national "Transport Innovation Fund" offers from 2008 to 2012 13 billion EURO for the municipal transport sector.

In the *Netherlands* provinces have to prepare transport plans according to the Transport law (Planwet verkeer en ver voer) under consideration of certain requirements (Nota Mobiliteit). Important is the integration of land-use and transport planning as well as mobility management.

Since a few years the EU-commission and the European Parliament promote an EU-wide frame for integrated urban policies, especially for urban mobility. About 80 % of the EU-population lives in cities. The presently discussed Green Paper "Towards a new culture for urban mobility" has to be seen in the context of preparing a concrete European action plan. The EU-project European Research Forum for Urban Mobility – EURFORUM (www.eurforum.net) development a research agenda on urban mobility. We have to expect that the issue of urban mobility planning becomes more drive through the program CIVITAS, where many best practises were developed already.

5. SOME KEY ASPECTS FOR SUTPS

The methods of developing SUTPs differ. They depend on local actors and problems. Some prefer qualitative rather than quantitative modelling approaches. According to the specific local needs and partners the methods have to be developed 'specifically'.

However, the implementation of major projects requires formal procedures. They are often debated as controversies and they are decided as court-cases, where reliable quantitative basics for the decisions are needed. Also with the dynamical changes through e.g. globalisation, demographic changes, economical developments, recent data as well as comprehensive modelling is helpful and required for evaluation and funding.

In German universities we teach to update models and plans every five years for projections of 15 years. The standard 4-step transport models are still a valuable tool for the development and evaluation of measures (fig.12). Unfortunately only few cities keep methods, data and plans up to date.

Fig.13 shows that traffic behaviour and modal split vary according to age groups, occupation and car ownership. Accordingly, with the dramatic demographic changes in our cities we have to project future traffic very carefully. Population loss and a new social mixture will influence the amount of public and private traffic in and around the cities. Results for a number of shrinking German cities are show in fig.14. Depending on the more or less sustainable scenario "dense" or "disperse" (trend with continuing suburbanisation), car traffic might decrease with the degree of population losses in towns. However, when we look at the more realistic scenario "disperse", we can conclude that only cities with a population loss of more than 15 % might also experience less automobile traffic in the year 2020. Looking at public transportation we see much higher passenger losses than population losses. This is due to the loss of young people with often more than 50 %.

Fortunately, there are numerous cities with an offensive public transportation policy who manage to increase fare collection and number of passengers even though the demographic potential of customers shrinks. The area of Dresden is such an example (fig.15).

Transport plans and measures are everywhere in the world a controversial issue. However, we learned our lesson in democratic societies: traditional authoritarian planning procedures of administrations lead to resistance and non-acceptance of the public and of political decision makers. As a result, very often only the "zero"-alternative is left over as the final choice. Today we should try everything to co-operate with all potential partners and to achieve consensus (fig. 16).

When I personally gathered my first experiences with conducting a three years planning process for an integrated transport master plan in the city of Bremen in North Germany, I learned very fast that planning without involving the region and the surrounding districts would not have reached the goals. So we included the 'Landkreise' into the analysis and into developing the concept. As a result, not much later we could celebrate the successful operation of the areas Verkehrsverbund Bremen-Niedersachsen. For public participation we installed a "Traffic Parliament".

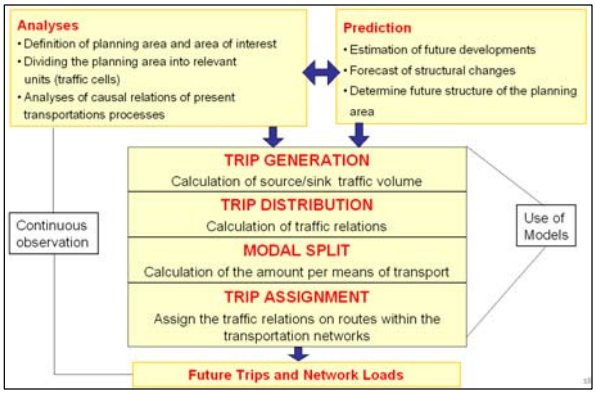

Fig. 12. Application of models in transport planning.

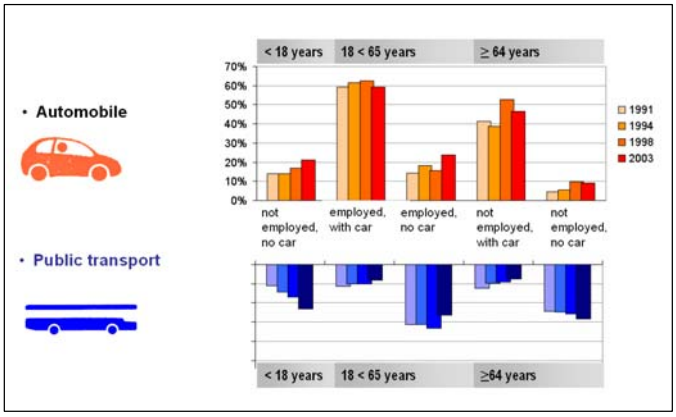

Fig. 13. Modal split according to age and availability of cars [1].

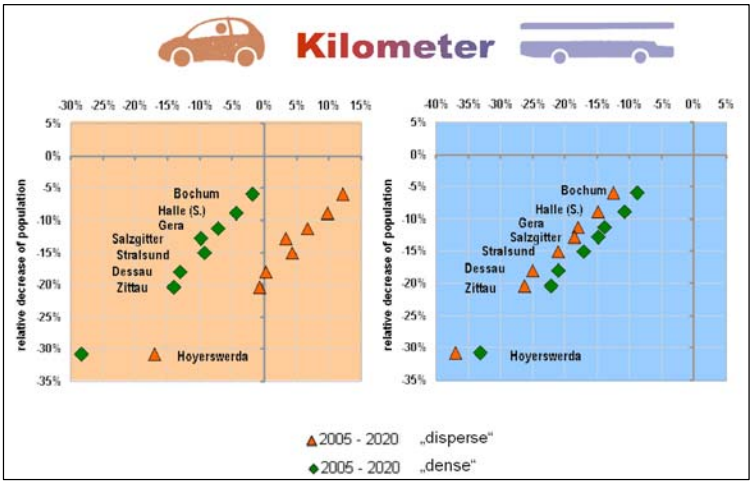

Fig. 14. Relative changes of person kilometre per day in selected shrinking German cities [5].

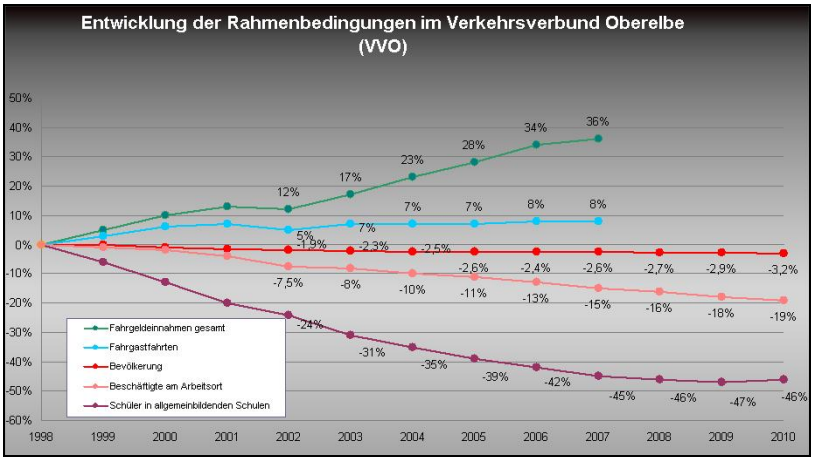

Fig. 15. Stability of passengers in public transport despite decreasing population [6].

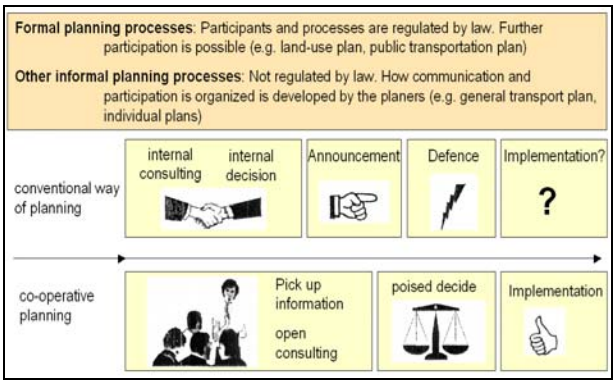

Fig. 16. Co-operative planning [7].

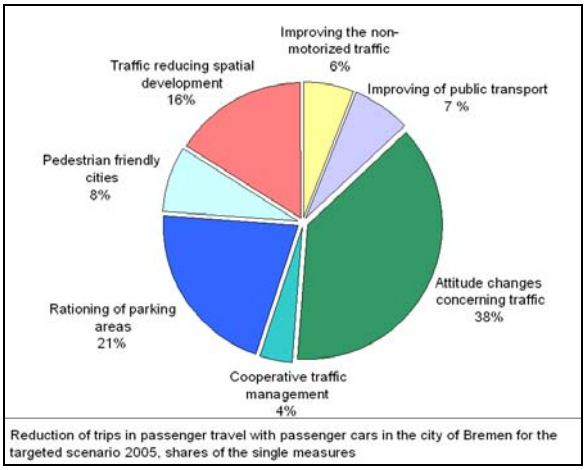

Fig. 17. Effects of traffic reducing measures in Bremen [8].

In the planning process of the 'Integrative Transport Planning Bremen' we calculated with the computer model VENUS two scenarios and evaluated and a wide range of different measures. They were developed and put together in a catalogue of more than 500 pages. Interesting was the result of the consultants, that the reduction of automobile traffic in the so called 'target-scenario' was mainly achieved with measures that aimed to change attitudes and behaviour (fig. 17).

6. CONCLUSION

More than ever before integrated sustainable urban transport plans (SUTPs) are needed. Transport and travel behaviour influencing parameters are changing so dramatically that the risks for wrong decisions or limited sector decisions are too high.

Furthermore, the integration of our intermodal transport system as an element of environment, city and economical development needs accepted concepts. No society can afford constant conflicts on isolated developed transport projects and measures. The implementation of critical projects might succeed, when they are developed out of comprehensive master plans, in which different interests can be balanced with package solutions.

The integration of all aspects is also the key to more sustainability. Transport is no longer an isolated area that should be maximised according to demand. There are many ways to reach with less more. This has to be developed by each city with its SUTP. I expect that in the future no urban transport measure will be funded with European or national money without requiring a SUTP as a decision basis.

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