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TOWARDS MODERN TRAFFIC MANAGEMENT IN CENTRAL EUROPE IN CARE OF THE ENVIRONMENT

ABSTRACT

A plea to adopt the most modern transportation technique for reasonable coping with the dramatically increasing traffic needs in modern Europe and careful preservation of the environmental values.

KEY WORDS

environmentally sustainable traffic systems, Central Europe

1. INTRODUCTION

Trade and traffic are the preconditions for the establishment of permanent human settlements. Only farmers leaving settlements and fields after some years or decades can survive without high amounts of traffic and trade, such as communities of nomads and hunters. If one of the important preconditions of their existence is no more fulfilled, they move to another site where still enough deer, fodder for domesticated animals, fertility of soils, timber and firewood are available. If stable settlements are founded, routes for transportation must be available, on which the demanded resources can be transported at least in periods of crisis. The first cities developed therefore on riversides and coasts (Herzog 1998, Küster 1998). Crops and other resources could always be transported to the settlements across water, primarily to towns. The urban inhabitants had to travel, too, to explore possible resources and to establish foreign trade contacts; they also had to make transport secure. When the Romans started to colonise the centre of the European continent they constructed both stable settlements and roads. Politically and economically they were most successful using natural routes of traffic. Along the Western European coasts and along the Rhine the Imperium Romanum stayed stable for a very long period of time (Küster 1995).

For the continuation of the European colonisation the Baltic Sea and the great rivers in Eastern Europe were extremely important. Also roads running over land became more important over time; on these routes the areas of the Mediterranean, the North and Baltic Seas were connected with each other. These led over hills and mountains. Roads were constructed alongside rivers and coast as traffic increased. Roads over land became the most important axes of traffic not before the period, when motorised traffic developed. Towns were always the final points of important traffic routes. Therefore, a close connection between the future of urban settlements and the future of traffic was and has always been evident (Bertolini 1999).

2. THE FORMATION OF MODERN TRAFFIC

Modern civilisation demands the support of much greater masses of products than an antique or medieval town. More and more people travel to establish trade contacts and to realise the complicated conditions for the exchange of products. Also, holiday journeys have increased enormously since the second half of the 18th century (Wagner 1983, Grossklaus 1983, Vorsteher 1985). Since then traffic is becoming faster and faster. At present, many boundaries are removed to facilitate traffic. Some new boundaries inside Europe came into existence to further the connections between the independent countries and the free part of Europe, in which they hope to play an important role for the connection of traffic routes. It is hoped that cities like Budapest and Zagreb will play an important role in the European traffic system, which – especially in the case of Zagreb – does not have very much to do with the actual situation (Ivakovic, Legac & Mavrin 1999). Up to the present, in many parts of Europe prevail traffic routes originating from the 19th century. Traffic often runs on old army roads. Most railway tracks originate from the 19th century when they were built for the first time. They had to be constructed following other reasons than ordinary roads as narrow curves and inclinations had to be avoided (Gerleve 1939). They were planned for slow trains, which hinders the introduction of rapid trains on the

same tracks. In Germany one can still see the remnants of the "Länderbahnzeit" in the railway net, the period when railway tracks were constructed by the single states which together formed the German Empire later on. In this period more railway tracks were built inside the states than between them and also to the periphery of the states (Gradmann 1931, p. 190, Blum 1933). Some towns in the periphery of the former states, e.g. Tothenburg/Tauber and Isny, are not sufficiently connected to other regions by modern traffic. After the unification of the railway companies of the single states, after World War I, only some additional tracks were built or rebuilt.

Highways, tracks of modern traffic from the 20th century, were at first constructed inside the countries, too, which is also the case with the railway tracks. Highways have several lanes, on which fast and slow traffic is separated. This fact contributed to the big success of the highways. Today they are the backbone of both the slower goods traffic and the faster passenger car traffic.

In the second half of the 20th century the national highway nets in Germany, the Netherlands, Belgium, France, Switzerland, Italy and Austria were well connected. But good four- lane roads into countries in the East of Central Europe are still lacking. However, they applied for membership in the European Union, so that it is extremely necessary to construct better roads in these countries. After the end of the Iron Curtain traffic with these countries increased a lot. Good roads to e.g. Warsaw, Prague, Vilnius, Riga and Tallinn are lacking, not to mention roads to Ukraine, Belarus and Russia, states which may never stay apart from the process of the EU area expansion.

3. ACTUAL PROBLEMS OF TRAFFIC INSIDE THE STATES

The increasing welfare and the availability of better roads led to an enormous increase of car traffic during the last decades. In the German state of Lower Saxony for instance, from 1970 to 1995 the number of cars grew from 2 million to 4.6 million. There was a special increase in the number of private cars (Seedorf 1998). During the same period it became more and more obvious that the world resources are limited and the environment is being increasingly destroyed by pollution (Meadows 1972, Mesarovic & Pestel 1974). During the 1973 oil crisis it became obvious that the scenarios developed by Meadows and others could become reality. More and more it became clear that cars and the unlimited mobility contributed remarkably to the shortage of resources, mainly through shortage of petrol and the waste of land for the construction of roads (Klenke 1995). It became necessary to think of alternatives to car traffic in spite of the fact that everybody knew that the individual traffic would continue to grow.

In the following years railway traffic was supported more than before. Since ca. 1970 new railway tracks were built in several European countries, and other tracks were reconstructed, so that they could be used by faster express trains than before. This was the case especially in France, where since 1981 the greatest cities were connected by the TGV (Klenke 1995), whereas the extremely poorly settled countryside has only very few connections of public traffic. In the Federal Republic of Germany the Intercity trains have been operating since 1971, and since 1979 once per hour and also with 2nd class compartments (Schulz 1979), which mainly used the still old tracks from the 19th century. Therefore, the travelling speeds remained considerably low, so that car and plane trips remained the faster alternatives. Since 1970 the most important railway lines inside countries have been improved for higher speed of trains. Curves became straighter, single lines were newly built. Faster engines and wagons were designed and purchased, which did not only need stronger machines but also more efficient brake and security systems.

More and more the fast railway passenger traffic became a good alternative to car and plane traffic, which is highly desirable from the ecological point of view. Railway traffic cares better for the environment than plane and car traffic, which is commonly acknowledged. But new problems arose by the fact that the speeds of trains running on the same tracks became more different. Local and regional trains, stopping at each station, goods trains running economically at an even, but not too high speed as relatively slow trains on the one hand and fast express trains on the other. The slower trains must be led to neighbouring tracks in the stations, where they have to stop to allow the faster train to pass by. The travelling speed of the slower trains decreases as a consequence of the several minutes of waiting in the stations. The heavy goods trains must be stopped more and more often, and a lot of energy is necessary to set them into operation again. This problem will be illustrated with examples from the timetables for winter 1974/75 and winter 1999/2000 (from the timetables of the Deutsche Bundesbahn or the Deutsche Bahn).

1974/75 between Hamburg and Hannover 18 trains per day were running which had a travelling speed of more than 100 kilometres per hour. Eight of them ran at an average speed of more than 120 kilometres per hour. The fastest trains reached their destination with a maximum speed of 160 kilometres per hour and an average speed of 127 kilometres per hour. Goods trains running at a speed of 80 to 100 kilometres per hour and without any stopping were not remarkably

slower than the fast traffic. The intervals between the fast trains were relatively long so that many goods trains from Hamburg could reach Hannover without stopping to allow the by-passing of a faster train. Between 6.10 and 7.40, 9.45 and 11.15, 11.40 and 13.45, 14.00 and 15.55, 17.40 and 22.00 as well as between 23.25 and 6.00 no train left Hamburg Central Station with the destination Hannover, which had an average speed of more than 100 kilometres per hour. There were "time slots" for the slower goods train traffic all day round.

25 years later, in winter 1999/2000, after reconstruction of some parts of the track allowing maximum speed of 200 kilometres per hour and the introduction of the ICE traffic, between Hamburg and Hannover 47 trains were running on a normal working day, which had an average speed of more than 100 kilometres per hour. 28 of them ran at an average speed of more than 120 kilometres per hour, and the fastest trains were running at an average speed of 142 kilometres per hour. During daytime three express trains were running per hour in each direction. Only between 21.29 and 5.06 fast trains did not leave Hamburg Central Station. Because the travelling speeds of goods trains did not increase in the same way during the last 25 years, it is obvious that the conditions for goods traffic on the track from Hamburg to Hannover became more complicated. During the day, goods trains had more often to be stopped to allow the by-passing of faster trains. The times for transport become longer, and the costs for transportation increase, because it is necessary to let trains stop and start again; the crews on the trains have to be paid also for the time when the trains stop, and the signals become more complicated and expensive to guarantee the necessary minimum distances between slow and fast trains. It is very often stated that more goods should be transported by rail, but this is not possible. On the tracks, which are used, both by slow and fast traffic, capacities for additional traffic are not available.

4. CONSEQUENCES FOR THE FUTURE DEVELOPMENT OF NATIONAL TRAFFIC

To establish modern traffic concepts it is urgently necessary to think of different solutions: For rails per track should be constructed, so that one rail per direction can be used by the fast, the other by the slower trains; in Germany this is prepared at the moment e.g. between Augsburg and Munich and between Karlsruhe and Offenburg. On level terrain these lines were designed well already in the 19th century, so that high speeds are possible without constructions of new rails. Other and much more complicated preconditions for the introduction of fast traffic exist on tracks in valleys with many bends. In these cases, new tracks must be constructed for the fast rail traffic, whereas the slower local, regional and goods traffic can continue to use the old rails; local and goods trains have similar average speeds. If the fast traffic is excluded from the old tracks, all slower trains can run at a higher average speed, which favours the local, but first of all the goods traffic.

There are, in all, two reasons for the necessity of building new railway tracks: on the one hand, express trains should run at higher speeds, and on the other hand, the existing tracks should be more efficiently used by the goods traffic. This is the important precondition for forcing people and companies to transport more goods by rail at low costs.

5. ACTUAL PROBLEMS OF INTERNATIONAL TRAFFIC

In the last few years international railway tracks have been built first on those connections which did not exist before as e.g. through the Channel Tunnel between England and France and crossing the Øresund between Copenhagen and Malmö. The connections of other railway nets from the 19th century are totally unsatisfactory. Railway traffic on bordering lines has not been improved since then; some tracks between the Netherlands, Belgium, France, Germany and passing the Alps are being reconstructed at the moment. A strict schedule of express trains which is valid in many countries in Western Europe, such as in the Netherlands, Switzerland, Austria and Germany, is not well established between Germany and its neighbouring countries. The electric support and security systems are different in many countries. Engines and cars differ in sizes; some of them are too broad, so that they cannot run on tracks, where the distances between the rails are too small. For this reason, the German ICE is not suitable for running on French rails.

Fast trains run every hour between Munich and Salzburg as across the Swiss border in Bale, but it is very often necessary to change the trains either at the Swiss station in Bale or in Salzburg. Good high-speed train connections across the border can be found between Germany and Belgium. But the high-speed train "THALYS" runs only every second hour and in an hourly change with ordinary express trains, which are slower. The railway connections between Central and Eastern Europe are extremely bad. From Germany, only a few Eurocity trains per day run to Budapest, Prague, and Warsaw at relatively low speeds. Even worse are the connections with other countries where other rail gauges are used, such as to Russia,

Belarus, Ukraine and the Baltic States. Therefore, it is necessary to change the trains at the borders, or the cars must be carried to axes of different gauges, which is a rather time consuming procedure. For this reason, only very few trains run between Central and Eastern Europe (Slikhter 1999).

The aeroplane is still the fastest transfer, not only on long, but also on relatively short distances, as fast roads and sufficient railway nets are lacking. This is the case on the connections between Berlin and Warsaw and between Frankfurt and Prague; and this is in contrast to the fact that the short distance air traffic causes an extremely high demand of resources (Schliephake & Tietze 1999). Air traffic to all directions is increasing rapidly at present, so that it will certainly be necessary to expand existing airports, such as in Frankfurt; Frankfurt airport is extremely important for the traffic between Germany and abroad.

6. CONSEQUENCES FOR THE FUTURE DEVELOPMENT OF INTERNATIONAL TRAFFIC

It is very important to develop alternatives to the uneconomically short distance air traffic; the capacities of airports should be used predominantly for the fast international air traffic, to which there is no alternative at the moment.

From an ecological point of view one can argue against the reconstruction of travel routes over land. But an alternative to this does not exist as was outlined above. The degree of inner colonisation and the amount of mobility inside Europe are increasing a lot, first as a consequence of the demolition of the Iron Curtain and other boundaries. But the problems are commonly known that resources are limited, and the environment is burdened. Therefore, it is necessary to think about a better division of functions between different traffic vehicles.

Not only because of the improvement of traffic connections but first and foremost in favour of the ecological conditions we need a powerful and efficient net of tracks for vehicles of mass public transport. These vehicles can be fast railway trains such as the German ICE or the French TGV. But these trains cannot link countries with several different gauges (Slikhter 1999). A train operating in Central Europe could run to Sankt Peterburg, Riga and Moscow only after a completely new construction of rails. And vice versa, a train constructed for the broader gauges in Eastern Europe cannot operate to Bucharest, Budapest, Prague, Warsaw, Berlin and Paris. In this case, new rails are demanded for linking the traffic nets between different countries. It is not only important to construct single tracks, but a whole net of lines. By doing so, deficiencies in planning from the 19th century can be avoided and corrected.

In comparison to this, the advantages of a maglev train such as Transrapid become evident; this train has been developed in Germany during the last few years. Using this train for a parallel line to an existing railway track new perspectives of traffic are not visible. Therefore, one should construct another track for this fast train as a reference line which gives the opportunity of development of new perspectives of traffic between different countries. One should think about a line between Berlin, Warsaw, the Baltic countries and Russia. A track like this can be a very important contribution to the European integration, which is linked with inner colonisation and mobility. A maglev train can then also demonstrate its importance for hilly landscapes. Tracks crossing mountainous areas can be easier to build for Transrapid than for any other conventional train. Transrapid can operate via greater inclinations and narrower bends. It is important to consider this as it will be important to construct new tracks for rapid traffic also between Poland and Hungary or Romania; it will certainly be very complicated to construct those lines in the mountainous areas of the Carpathian Mountains.

7. CONCLUDING REMARKS

In conclusion, an alternative is found to the resources demanding car traffic. The existing railway tracks could be used for the goods transport and for the local traffic. These kinds of traffic could be intensified without hindering the express traffic. Existing airports could be used first by intercontinental traffic.

The public must participate and argue in a clearer way than up to now when new traffic projects are discussed. At the moment, there are most arguments against such traffic projects that demand areas. But most arguments should be against projects which lead to an increase of the demand of other resources such as petrol. Therefore, the public should not favour air transport by releasing it from paying taxes for petrol. It should belong to common sense that new tracks must be constructed for mass transport vehicles to avoid breakdown of traffic. From the ecological point of view it must be clear that arguing against new tracks for rapid trains and Transrapid will always favour the increase of other kinds of traffic such as road and air traffic.

From the ecological point of view priority should be given to the construction of fast railway tracks; it should be argued first and foremost against other forms of traffic. And there are great advantages of constructing tracks for maglev trains. They demand less petrol or other resources in spite of operating at very high speeds; they are very good alternative to air

and road traffic, and by building these tracks it will be possible to favour also the slower goods transport on traditional rails.

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