SALES STRATEGY

The international introduction of the Transrapid as a new, particularly high quality transport system is based on a long-term sales strategy of the German system industry. The very different boundary conditions in the respective markets and countries must be taken into account in the acquisition.

The sales strategy is specifically oriented to the respective national conditions with respect to
- transport networks and markets and their future development
- political structures and decision-making processes
- planning law and
- financing conditions.

Due to the very different circumstances and political boundary conditions in various countries, a detailed and flexible adjustment of the individual steps is necessary.

Together with the parent companies, Siemens and ThyssenKrupp, TRI has its own branches or representatives in all countries, in order to advise customers individually. This enables the following goals or individual steps to be pursued:
- Introduction of the Transrapid high-speed maglev system as a future transport system for passengers and goods for short-distance, regional and long-haul transport.
- Specific introduction of the Transrapid within the scope of planning for future transport networks, each country requiring a specific approach and argumentation/justification
- Participation in planning and design work on the realization of the objectives
- Securing the supply share for the German systems industry in the respective projects and markets, taking into consideration any localization measures required,
- Providing systems advice to the client.

REGIONAL AND TEMPORAL MARKET SEGMENTATION

Attempts have been made over a number of years in many countries not only to promote the innovative transportation system, Transrapid, but also very concrete steps have been taken to introduce the Transrapid. Experience has shown that any real progress to be achieved with high-speed systems and within a reasonably acceptable time span is only possible in highly developed economies where the state is responsible for both the planning and coordination of transportation systems. A shift in responsibilities to the private sector causes the chances to sink dra-
Any change in the political scene is a key contributory factor due to the nature of the lengthy project development phase and the long-term planning involved.

The focus of Transrapid International’s activities is therefore on those countries where the Transrapid is either already in operation (such as China) or concrete planning in progress thanks to state funding. We have called this a regional segmentation. A further classification is the temporal market segmentation: The acquisition of short-haul projects in the short and medium term (e.g. airport connector) as opposed to long-haul projects may make it easier to penetrate the market for the following reasons:

- Less funding required
- Chance of carrying out the project within a 5 year period
- No competition with other high-speed systems or aeroplanes due to Transrapid’s specific system and project characteristics
- All long-haul projects are preceded by the inevitable wheel-rail/maglev debate
- No basic system/technology decision required

Transrapid International (TRI) is therefore concentrating its acquisition efforts on those countries in which the relevant political and economic boundary conditions exist and/or which have already proven to be receptive to new, high-quality transport systems in the past.

At the moment there are three countries in the world in which Transrapid projects are actively being planned, respectively have a Transrapid system in operation. These countries, denoted by us as “A-level” countries are:

- China
- Germany
- USA

There are other countries in which Transrapid International is developing projects together with local authorities and partners or possible investors. Currently these B-level countries are:

- Bahrain - Qatar
- United Kingdom
- United Arab Emirates
- Netherlands

There are further countries, which may be receptive to super-speed ground transportation in the future. Countries which have shown interest are for example (C-level):

- Canada
- Brazil
- Malaysia – Singapore
- Philippines
- Thailand
- Middle and Eastern Europe

Figure 1: Worldwide Transrapid Activities

3 SITUATION OF FUTURE TRANSPORT MARKETS

A glance at the current transport situation in many countries and the population growth figures shows that an environmentally friendly solution to the congested roads and air space is long overdue. It is estimated that by 2025 the world population will have reached the 8 billion mark. We are currently experiencing an annual population growth of approx. 80 million. If we consider the degree of environmental pollution and the numerous traffic jams, it quickly becomes clear that a further population growth of 2 billion must lead to gridlock in many parts of the world. Ever scarcer resources and increasing environmental pollution are the result of growing individual and air traffic. The drastic increase in the price of energy and scarcity problems inevitably point towards energy saving mass transportation systems being the transportation means of the future.

3.1 Development of the modal split

During the past 40 years, air traffic has established itself as practical, affordable and convenient for medium and long distance travel. Flying is also becoming increasingly popular with commuters, not only as the fastest but also as the most reliable and - especially since the boom experienced in the low-cost airline sector – often as the cheapest means of transport.

The downside to this development however is the degree of congestion this inevitably leads to at European airports, making it blatantly clear that an environmentally friendly alternative to flying must be found. As Figure 2 shows, during the past 30 years the number of passengers in Europe’s 20 largest air-
ports has increased by almost 500%. The most significant increase occurred during the 1990’s.

Because the expansion of airports is becoming increasingly difficult, it is necessary to use existing airport capacities more efficiently. Short haul travelers should change to other means of transport. The resulting vacant slots at the airports would then be available for the growing demand for long-haul connections.

This increase is not only apparent in air traffic. Figure 3 shows that during the past 30 years, passenger traffic has more than doubled, and the largest increase is due to individual automobile traffic.

During the past three decades, the number of passenger kilometers traveled by automobile has risen on average by 3% per year. During the same period, the number of passenger kilometers flown has risen more than sevenfold.

In contrast to this, the figures for conventional rail traffic have hardly grown during the past 30 years. The passenger transport sector has shown a slight rise, approx. 40%, over this very long period of time.

This shows the gradual reduction in the railway’s market share, compared to road and air traffic. Within the EU states, the railway’s market share of passenger transport fell from 10% in 1970 to 6% in 2003. The share of air traffic in this sector constantly grew from 1.5% to almost 8% (2003).

In view of the annually increasing passenger figures and airports which are verging on the limits of their capacity, it must be clearly recognized that only the most modern, fastest and attractive track bound systems will be capable of competing with the airplane and automobile. In Europe, this has already been recognized, where the use of high-speed trains has caused a real renaissance in the rail transport sector. As Figure 4 shows, in only ten years its share of passenger kilometers in Europe has risen from 5.6% to 20%. This growth was mainly achieved by consistent development of the high-speed network.

The aforementioned countries are important target markets, in which rail transport needs to be completely restructured and developed from scratch. Especially in the USA there are primarily no handicaps to be taken into account due to an underdeveloped wheel/rail infrastructure network, which is why high-speed maglev system applications have good prospects despite actual political and financial obstacles.

In Europe, recent decades have shown that modern railway systems such as the TGV or ICE can revitalize rail transport.

This development was proven by the successful introduction of high-speed trains in Europe during the 1980s and 1990s (TGV in France, TAV-ETR in Italy, ICE in Germany and AVE in Spain), without which the railway would have lost further market shares. By comparison, in this context reference is made to the rapid, innovative development in aircraft construction, e.g. large capacity jets, which were also a prerequisite for the major air traffic successes.
Transport experts and an increasing part of the broad public therefore agree: the mobility crisis can only be averted by developing and using attractive high-speed rail systems. However, it is doubtful whether conventional railway systems can be categorized worldwide as sufficiently attractive for long-haul transport. In order to win back a considerable share of the market and to divert large parts of individual traffic and air traffic on to the railway, new rail systems must be very fast, convenient and comfortable. The conventional wheel/rail system is limited here, as daily operational experience shows. In other parts of the world such as the USA, China, Asia in general, South America and Australia, the distances are much greater than in Western Europe. Therefore, it is necessary to increase the speed in order to compete with the airplane. For this reason, China has decided to incorporate modern wheel/rail systems and the high-speed maglev system in the overall transport concept.

In the USA, in practical terms the classic railway is no longer important. Public opinion considers it to have been left behind. De facto, in future the wheel/rail system will not be able to play a significant role in competition with the airplane, the only relevant long-haul transport provider in the USA, because of the great distances between the conurbations. The Transrapid high-speed maglev system is therefore an important contribution towards the U.S. requirements of future transport markets. In the U.S. public debate, Maglev is undoubtedly acknowledged as the future means of transportation.

4 INTERNATIONAL TRANSRAPID PROJECTS

The Transrapid technology offers a particularly fast, attractive, comfortable and environmentally friendly alternative to the known means of transport.

The Transrapid philosophy is to replace mechanical structures and subassemblies subject to wear with contact-free, low-wear, electronic or electromagnetically based components. After many years’ testing, the Transrapid is now ready for worldwide application and has already completed its market launch with the Shanghai airport connector.

As with each technological advance, Transrapid must fulfil certain economic criteria in order to be successful on the market. Even though engineers are enthusiastic about the potential of this new transport system the market is still dominated by automobiles and other means of transport, all of which compete with each other to secure their market share. However, experience gained from the first commercially operated application route in Shanghai clearly shows that considerable cost savings are not only necessary for future application projects but are also achievable.

The projects contained in the following overview are actively being pursued by TRI and its parent companies.

4.1 People’s Republic of China

The People’s Republic of China is planning a high-speed network with a total length of approx. 8,000 km, which is to be realized in the next few decades (Figure 5). Apart from the Shanghai project, in operation since the end of 2003, there are promising routes starting from Peking, Shanghai and Guangzhou.

4.2 Shanghai-Pudong International Airport and Future Projects

The contract for the worldwide first application of the Transrapid technology was signed on 23 January 2001. The new international airport of Pudong is located 30 km outside Shanghai’s centre and does not yet have a short-distance public transport service. Figure 6 shows an overview of the route and the most important project data.

Construction started immediately after the contract was signed and on 31 December 2002, the so-called VIP run took place in the presence of the former Chinese Premier, Zhu Rongji, and the German Chancellor. Commercial operation started after gaining of final approval in April 2004. Since the VIP run up until June 2006 7.2 million passengers have...
used the Transrapid. A total of 2.65 million km and 88,000 trips in all have been accomplished during this period.

<table>
<thead>
<tr>
<th>Longyang Road Station</th>
<th>Pudong International Airport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longyang Road to Int. Airport</td>
<td>Route length 30 km / 19 miles</td>
</tr>
<tr>
<td></td>
<td>Stations 2</td>
</tr>
<tr>
<td></td>
<td>Trip time 8 minutes</td>
</tr>
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<td></td>
<td>Commercial Operation 2004</td>
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Figure 6: Shanghai project

The route to the south to Hangzhou with a distance of around 163 km is a most probable extension of the world’s first maglev application project. (Figure 7)

Figure 7: Extension to Hangzhou

4.2 Germany

Munich’s airport is one of the most important air hubs in Germany, second only to Frankfurt, and one of the ten largest in Europe. The number of passengers using this facility is rising continuously and is expected to double within the next few years. This will naturally cause problems for the road and rail links between downtown Munich and the airport, which is 37 kilometres from the city centre. With a bus or taxi, it usually takes an hour for the journey and the suburban rail system still needs at least 40 minutes. The highway between the city and the airport is already overloaded. The results are obvious – congestion, delays, stress, noise, pollution – with the obvious restrictions on mobility in a city used to being on the move.

Figure 8: Project Munich

But help is on the way. In only a few years time, Munich’s airport and the city will be brought a lot closer together. It will only take ten minutes to travel from the central train station to the international airport. This will all be made possible by Transrapid, a sophisticated, futuristic maglev system that will take the pressure off passengers and environment alike.

4.3 United States of America

Maglev Deployment Program

The Maglev Deployment Program (MDP) was included in the Transportation Equity Act for the 21st century (TEA-21) of 1998. This made public funds available for the planning activities of several projects, which partially performed their Draft Environmental Impact Studies (DEIS) (Pittsburgh and Baltimore – Washington) after a down-select in 2001 was carried out by the US DOT.

All project activities in the United States are handled by Transrapid International USA, Inc., (TRI-USA), a subsidiary of TRI based in Washington DC.
The Transportation Bill – SAFETEA-LU – passed by Congress into law in the fall of 2005 includes and identifies Federal funding of $90 million to initiate/complete the Environmental Impact Statement planning activities (EIS) for two maglev projects. One project, the Las Vegas to Primm project, is “earmarked” by name as the “Western U.S. Project”, while a second maglev project “East of the Mississippi River” still has to be selected by the Secretary of Transportation. Although $90 million are identified in the Transportation Bill, a “correction” to the Bill is needed to classify these funds as “Contract Authority Funding”. It is now believed that this correction will be included as part of the Fiscal Year 2007 Transportation Appropriations Bill that is expected to be passed towards the end of this fiscal year, prior to the November elections. Once the funding becomes reinstated and $45 million become available for both Maglev Projects, the current Transportation Bill will only govern for the remaining three years – from October of 2006 through September of 2009.

The Federal Railroad Administration (FRA) has jurisdiction and will manage and distribute the Federal funds under strict guidelines to the State Departments of Transportation (DOT). The State DOT may in turn delegate the project oversight and release funding against an agreed upon Scope of Work and Project Schedule to a “Public – Private Partnership (PPP)”, which places contracts for the “Environmental Impact Statement (EIS)” (Planfeststellungsverfahren) planning activities with pre-qualified infrastructure planning/engineering firms. The EIS process concludes with the “Record of Decision (ROD)”, before actual construction engineering work and system component manufacturing can begin.

In addition to the above mentioned projects, the US awareness of maglev is significant also in other parts of the country. The benefit Transrapid provides as a high-speed mass transit solution in metropolitan centers on the East and West Coast is understood and supported by many high ranking political leaders. The emphasis developing now in utilizing Transrapid as an Airport Connector between the LAX Airport and other local below-capacity operating airports near Los Angeles is of great importance. Another aspect that is gaining more attention is the environmental benefit of Maglev, coupled with its energy efficiency, especially now, when in America the impact of high gasoline prices is showing indisputable effects on commuters.

4.4 United Kingdom

UK Ultraspeed is a proposal for a new national ground transport system, designed to link the major cities of Britain at speeds up to 500 km/h. It drastically reduces journey times between all major cities from Glasgow to London, operating as frequently as every 10 minutes. The main idea behind the project is to get the northern parts of Britain closer to the south and the metropolitan area of London and thus help to rebalance the economic structure of the UK.

4.5 The Netherlands

The Consortium Transrapid Nederland (consisting of Siemens, ABN Amro, Royal BAM group, Ballast Nedam and Fluor) has developed RandstadRapid a fast, safe and future-oriented system to fulfil the mobility needs of the Randstad (most densely populated agglomeration in the Netherlands). This concept consists of a metro-like system, connecting the major Randstad cities. Large terminals on the outskirts of urban areas will provide an intersection for local and regional public transport and even motorway. RandstadRapid will be integrated into the existing public transport network and will function as the "highway" within the mobility chain. The Transrapid technology is a perfect combination of the factors safety, comfort and high acceleration. The total length of RandstadRapid will be around 220 km with up to 14 stations (including 5 stations allowing for easy access by car) and operation at a 6 minute headway. The first phase of the project could be Schiphol to Almere (or Lelystad). It is anticipated
that a PPP structure will be achievable for RandstadRapid.

**4.6 Gulf States**

Transrapid International together with its parent companies Siemens and ThyssenKrupp is promoting super speed passenger and freight connections in the Gulf States.

**4.6.1 Bahrain – Qatar**

A trunk line with regular service once or twice an hour connects the capitals with safe and reliable service. This trunk line forms an entirely new, futuristic, super-speed ground transportation opportunity for passengers, cars, and freight with punctual delivery. This proposal focuses on a connection between the State of Qatar and the Kingdom of Bahrain. There are already plans for a bridge between these two countries.

A high-speed connection of less than half an hour between Manama and Doha delivers significant advantages for both states. Mobility and economic growth will be stimulated. People will be able to move quickly and conveniently - for the benefit of both business and pleasure. Improved interaction between the peoples will draw them closer together, bringing benefits for international, economic, and political relationships as well as travel reliability. A modern, attractive transportation system for a dynamic, growing region.

**4.6.2 United Arab Emirates**

The United Arab Emirates is a multi-faceted region with population and commercial centres spread across great distances. Until now, travel and transport on land has occurred exclusively on the road network, but this has become congested and unreliable. To correct this situation, high-level government representatives have repeatedly called for the establishment of a modern and unified rail system to handle both passenger and freight traffic. Although studies to investigate the situation have been contracted to date, a unified solution has yet to be proposed.

Transrapid International, together with its parent companies Siemens and ThyssenKrupp, and the construction company Max Boegl, have developed a concept for a mixed traffic system using Transrapid maglev technology to provide this unified solution. It foresees a high-speed passenger system between Abu Dhabi city, the international airport, and Dubai while maintaining the option for a heavy freight network between the main hubs extending to Khor Fakkan.

To generate revenue as early as possible, the German Transrapid system industry proposes a multi-phase plan to implement the mixed traffic network. The initial project in this plan is an airport connector in Abu Dhabi with an integrated freight demonstration facility. With this approach, the initial revenues from the airport connector can flow after only four years and in parallel, the containerized, heavy freight system can be demonstrated at a facility within the initial route.

The unique combination of high-speed passenger and heavy freight in a single transport network can only be accomplished with the world’s most modern ground transportation system, Transrapid. Transrapid’s high-performance characteristics of automatic, non-contact operation, low operating and maintenance costs, and modern, attractive appearance will support UAE’s development as the most dynamic, economic region in the world.

**4.7 Summary and Preview**

Due to the excellent position of the European rail industry active market efforts should be further increased in future. The coordination with regard to
time and selection of the marketing strategies must be carefully matched with the special distinctive features of the individual markets. Normally, local experts will be involved, who are familiar with the political and economic situation as well as the way of doing business in the respective area. The international marketing of Transrapid is based on the following focal points:

- International market observation and analyses for the purpose of better adjustment of the Transrapid technology to the requirements of the individual markets and detection of developing market trends at an early stage.
- Initiation of the product adjustment process in order to incorporate specific national requirements and specifications of the project country,
- Positioning the Transrapid technology in the markets as a high quality, reliable, high-speed system (with governments, operators and the public) as well as
- Developing and securing market shares (local content), evaluating possible application projects at an international level, drawing up feasibility studies taking into consideration whether projects are fundable and their financing conditions.

5 REFERENCES