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Mongolia

Taming the Tyrannies of Distance and Isolation A Transport Strategy for Mongolia

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Transport Sector Unit
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Acronyms

ADB	Asian Development Bank
BC	Bus Company
CAA	Civil Aviation Authority
CAS	Country Assistance Strategy
CR	China Railways
DoRT	Department of Roads and Transport
DoT	Department of Transportation
ESCAP	Economic and Social Commission on Asia and the Pacific
GDP	Gross Domestic Product
GOM	Government of Mongolia
IDA	International Development Association
HDM	Highway Development Model
MIAT	Mongolian Airlines
MID	Ministry of Infrastructure Development
MTZ	Mongolian Railways
RR	Russian Railways
RTTD	Road, Transportation and Tourism Division
TACIS	Technical Assistance to the Commonwealth of Independent States
TEU	Transport Equivalent Unit
TOFC	Trailer-On-Flat-Car
TREDA	Tumen River Economic Development Area
UB	Ulaanbaatar
UK	United Kingdom
UNCTAD	United Nations Commission on Trade and Development
UNDP	United Nations Development Program
USSR	former Union of Soviet Socialist Republics
US	United States

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TRANSPORT STRATEGY: A SUMMARY

Objectives and constraints

Mongolia's transport sector is underdeveloped and is unable to fulfill its objectives of stimulating economic growth and national integration. The greatest obstacles to be overcome are physical distance from international markets and isolation among the regions of the country. The greatest constraint in overcoming these obstacles is financial. With a low population, low Gross National Product and vast area, combining available public finance with that likely to come from private sources, will not be enough to develop an adequate transport network in the foreseeable future. Innovative approaches will be needed to generate as much private funding as possible, leveraging public funding to maximize the amount of private investment.

To overcome the tyranny of distance from international markets, development of at least two trade corridors should be encouraged, so that the transport and logistics costs of exports and essential imports can be minimized. To overcome the internal isolation of vast regions of the national territory, a combination of low-cost, all-weather roads and basic regional airports will provide the infrastructure over which effective transport services can operate. Undertaking these tasks would consume most of the available investment budget for the transport sector. However, there are other investment needs with substantial popular support, so a strong and widely acceptable method of determining priorities would help ensure that the most worthwhile investments are made first.

With historically scarce financial resources, infrastructure maintenance has received a very low priority. This is now resulting in high infrastructure reconstruction costs that could have been avoided, since with just 1% of GDP allocated to its maintenance, the economic and technical life of most transport infrastructure can be greatly extended. To avoid further costly reconstruction, at least this amount should be allocated to infrastructure maintenance.

Competition provides the best framework for generating and allocating scarce resources both for transport infrastructure and services. However, with such sparse demands for particular facilities or services, the additional costs of providing competing services or allowing competing transport modes within a corridor can sometimes outweigh its advantages. Finding ways to maximize competition without incurring excessive additional costs presents a greater problem for Mongolia than most countries. A combination of competitive services within markets where demand is sufficient to sustain them, and concessioned services that compete for the market elsewhere, will be the most cost-effective way of implementing a policy of competition within the transport sector.

This policy will require a strong regulatory system so that its potential abuses can be controlled. But a regulatory system is very demanding of human resources. Mongolia's human resource base is too small, albeit well educated, to sustain a conventional regulatory system and so it must seek innovative ways to make further develop and make best use of what is available.

These considerations form the background to the Transport Strategy proposed here. The Strategy comprises a policy framework based on these principles, and an application of that framework to the principal sector issues.

Policy framework

- Competition should be the principal means of achieving low-cost, efficient transport. The sparse demand for transport makes the application of a competition based Strategy more difficult than in other countries and limits the situations in which direct competition can be used. More use than usual needs to be made of regulations to avoid the exercise of monopoly powers, but the lack of experienced regulators will mean that a multi-sector agency might need to be used for this purpose. Where the market is unlikely to provide even minimally acceptable services or where regulation of monopolies is expected to be ineffective, transport services should be concessioned on a “competition for the market” basis.
- So far as is possible, prices for transport services should be market-based. Infrastructure maintenance and expansion should be put on a sustainable financial basis, with users paying the full-cost of infrastructure maintenance and making a substantial contribution to the cost of expanded and new infrastructure.
- Regulations should be used to limit the excesses of competition. They should be implemented by a single agency, preferably one with similar responsibilities throughout the economy. Users should have redress to the agency to investigate alleged abuses and rectify them where found.
- Although many transport services can best be provided by private operators, the low intensity of demand for the use of transport infrastructure makes it unattractive to private investors, with a few notable exceptions. So most new infrastructure will continue to be financed from public sources, at least in the next five to ten years. However, the choice and management of infrastructure projects for public investment should follow similar principles to those that private investors would follow.
- The institutional structure has recently been revised, but needs further clarification and strengthening, so that it becomes more sector and less mode oriented. The role of the Department of Transport within MID should be to determine sector policies and priorities, as well as to ensure the adequate provision of transport infrastructure and services. Its Director would be a member of the Board of a proposed Transport Investment Fund. The existing transport Agencies would continue, but their role would be even more oriented to implementation of the policies of the Department than at present.

Sector issues

All sector issues could be addressed within this framework. The most pressing of these are:

International trade corridors

- More competition needs to be introduced into Mongolia's external trade routes. To further this aim, two export corridors could be promoted, one to Tianjin in China, and the other to Vostochny in Russia. While they will serve rather different markets, there will be sufficient overlap between them to stimulate competition. Both corridors would eventually be served by both rail and road transport, but in the short term they will both be rail served, with road transport to Tianjin becoming a possibility sooner than that to Vostochny.

- Negotiations should be initiated immediately with the Nakhodka Regional Development Agency to provide a duty-free secure zone for Mongolia in the port of Vostochny. While both rail and road transport are possible within the Mongolia section of the corridor to Vostochny, conditions within Russia as well as the long distance involved indicate that this corridor will remain predominantly rail served.
- A strategy for development of the road from Ulaanbaatar to the Chinese border should be established before any further commitment is made to build the road. After completion of the section from Nalaih to Maant, high priority in paving this road should be given to the section south of Sainshand. This section has the greatest potential traffic, and a paved road here could do much to stimulate economic development in the southern Gobi and petroleum trade with China. Until demand has increased sufficiently to sustain two transport modes throughout the corridor, a rail service competing with Mongolian Railways (MTZ) for non-bulk freight could be provided by a private operator, or at least the existing service should be concessioned to a private operator who would have strong incentives to provide a service that satisfied users reasonable needs.
- Completion of this section, together with reconstruction of the road from Ulaanbaatar to Suhbaatar, will facilitate road based transit traffic to compete with the railway. However, regulations allowing the operation of Chinese, Mongolian and Russian trucks in each others territory would be needed to maximize the potential of this competition.
- Part of the road development strategy should include promoting negotiations with China to allow the operation of each others trucks in the two countries territories, at least within a defined trade corridor.

Internal integration

- High priority should be given to completing a low-cost gravel road from Arvaiheer to Hovd and Ulaangom, along the southern route. This road would unite six aimag centers (Arvaiheer, Bayanhongor, Altay, Hovd, Olgii and Ulaangom) and other urban populations, and join them all to Ulaanbaatar. The total cost would be about U\$17 million, much less than indicated in the Roads Master Plan.
- All domestic air services should be provided on a concession basis ("competition for the market"), with payments for commercially viable routes being used to cross-subsidize those to aimag centers that are more than one day's bus travel from Ulaanbaatar and that cannot support a commercial service.
- The road from Ulaanbaatar to Choibalsan should be upgraded to all-weather status, but a lower priority should be given to upgrading the road east of Choibalsan.
- Funding should be made available on a shared basis with local communities, for the improvement of aimag and som roads.

Transit traffic between Russia and China

- A new all-weather gravel road should be developed in western Mongolia for transit traffic, but not as a high priority for public funds. Most of the road would be part of the Arvaiheer to Ulaangom road,

recommended above as part of the strategy to reduce internal isolation, so the additional cost to complete the road to the frontiers with Russia and China would be about US\$5 million.

- Mongolia should maintain participation in the Tumen River Economic Development Area project, but not commit funds for investment for at least five years, or until prospects for mineral and petroleum production are much further advanced.

Railway services

- The present joint-ownership arrangement between Russia and Mongolia should be revised to give Mongolia a controlling interest. Within MTZ, responsibility for infrastructure investment and maintenance should be separated from that for operations, allowing the latter to operate on a quasi-commercial basis. Joint-venture services with private operators should be permitted and encouraged, possibly using leased MTZ locomotives and wagons. Priority in establishing these services should be given to container trains to Tianjin via Zamyn Uud.

Urban transport

- The present arrangements for urban bus services in Ulaanbaatar are unsustainable. The routes should be privatized on a concession basis to route cooperatives that will replace, and in some cases be formed from, the present bus companies. Once the issue of funding of free-passes has been resolved, so that the agencies that issue them compensate the bus operators, urban bus services in Ulaanbaatar should be financially viable. So, with the possible exception of trolleybus infrastructure, no further public investment in urban bus transport is necessary. A detailed study of the trolleybus company should be made to assess both its financial and social feasibility. In the short-term, existing buses should be transferred to a leasing company, that might have to remain municipally-owned so long as some buses from a Japanese donation are in service. When these vehicles are phased out of service in about three to five years time, the leasing company could also be privatized.
- Roads within ger areas should be improved to permit better water, waste and public transport services. These improvements, to minimum all-weather standards and making maximum use local materials and volunteer labor, could be financed through a community-based revolving fund that could provide up to 500km of improved roads per year.
- A self-financing scheme to test vehicle emissions and technical standards should be implemented within the next five years. The cost of the compulsory system would be recovered from user fees. The scheme would eliminate most of the risk of vehicle induced degradation of air quality, and help reduce the alarmingly high road accident rate.

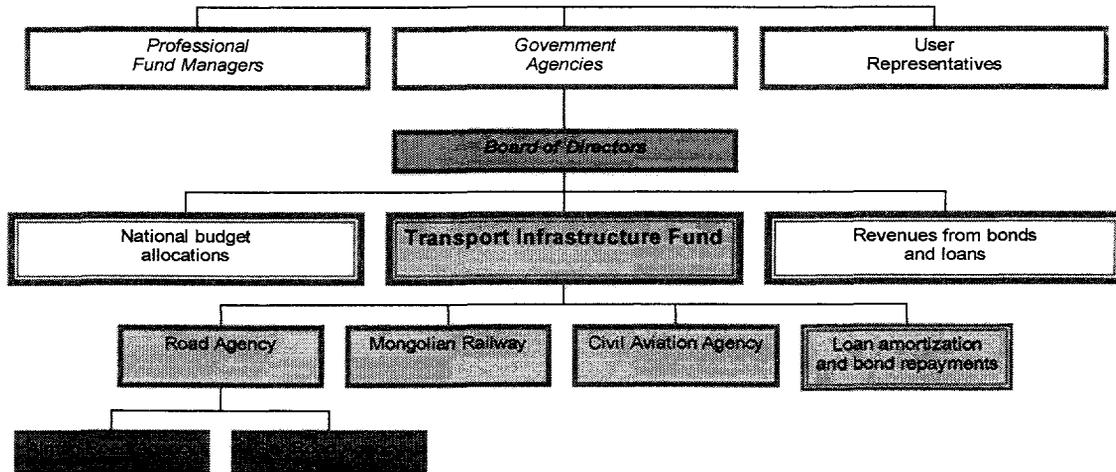
Sector Finance

- Investment in transport should be increased to the maximum affordable, estimated at about 2.5% of GDP per year, based on the experiences of other countries at similar stages of their economic development. Although this is more than double what has been invested in the sector since independence, it will be just enough to satisfy the minimum requirements. This amount cannot be raised only from public sources, so better use needs to be made of potential private funding. With few exceptions, conventional private BOT schemes will not be feasible for transport investments in Mongolia in the foreseeable future. The low levels of demand could not generate enough user charge revenue to service the debt or provide an adequate return on equity. Various schemes of mixed

private-public funding will need to be developed, so as to leverage as much private finance as possible. Among the first applications of this principle might be the road from Ulaanbaatar to the Chinese border.

- Given the complexities of raising and allocating finance in these difficult circumstances, consideration should be given to the creation of a Transport Investment Fund. This would have three main sources of revenue: allocations from the national budget; revenues from the various transport user charges, and; the Fund's own bond issues, using the future user charge revenues as security. All investment for transport infrastructure would be channeled through the Fund, although the allocation of funds within each mode would continue to be the responsibility of the respective modal agencies. To encourage institutional investors to take up the bonds, as well as to ensure that the Fund is used for the benefit of the sector and its users, it would best be managed by Board of Directors that includes experienced private fund managers and representatives of users, as well as the government agencies involved in the sector. Although the government would determine the overall objectives of the Fund, these would need to be more closely defined than are those of the present Road Fund. For all transport modes, but particularly for roads, investment in routine maintenance should be a first priority, followed by deferred maintenance, infrastructure improvement and new construction. Aimag and Ger roads would also be financed through the Fund, although allocations from the Fund could be supplemented by local community contributions.

Possible structure of a Transport Infrastructure Fund



Chapter 1

Distance and Isolation

Mongolia's economics and politics are subject to the powerful twin influences of distance and isolation: distance in relation to the rest of the world and the major markets for its products, isolation in reference to the distance of the majority of its people from the centers of economic, social and political activity. The principal role of the transport sector is to help Mongolia cope with these influences and overcome their negative impact on its prospects for growth.

An authoritative economic history of Australia¹ showed how its development had been influenced by its isolation from the economic and political centers of the world, what its author referred to as the "tyranny of distance". Its economy only prospered when it encountered products such as wool and gold, that had a high enough value per unit of weight to overcome the high transport costs to world markets, originally in Europe. Further economic progress was made in the second half of this century, with the creation of closer markets in Asia, and reductions in the cost of transporting bulk minerals to them through the use of unit trains for the land part of the trip, and bulk tankers for the sea voyage.

A comparable review of Mongolia's current history would show strong similarities. The main export products are cashmere, semi-processed copper and gold - all with a high value to weight ratio needed to tolerate the cost of transport to world markets. The production of cashmere is limited, as was Australia's production of wool, by the capacity of the land to support more grazing animals. Potential new mineral developments are likely to be frustrated unless the cost of transporting them in bulk to world markets can be reduced as it was for Australia. In common with Australia, East Asian countries offer a potential new outlet for bulk mineral products. Unlike Australia, Mongolia has the added problem of being landlocked and depending on its neighbors to help reduce its costs of isolation. Few countries in the world are more than 1,000km from a deep-sea port and without any navigable rivers. The distances to the main markets of Europe, the United States and East Asia are greater than for most of its competitors.

For economic growth to be sustainable Mongolia needs to develop new products with high value to weight ratios, and reduce transport costs for bringing these products to market. New markets in closer countries must also be developed. Creating conditions to overcome the tyranny of distance from markets and make export of these products feasible is first objective of the transport strategy proposed here.

With a population density lower than any country with more than one million people and comparable to those of the arctic north of Canada, Siberia and Alaska, Mongolia must also cope with the isolation of its people from each other. This isolation is aggravated by a lack of financial resources to develop physical infrastructure links between them. Although new technology is bringing voice and video communications within the reach of even the poorest and most isolated sectors of the country, getting products to market is still difficult and costly. Parts of western Mongolia are too isolated to fully participate in the market economy. Not only is the direct cost of transport high because of poor infrastructure, but the condition in which products reach their destinations after being transported over hundreds of kilometers of earth roads, jeopardizes their marketability and reduces the payoff to their producers. Overcoming these consequences of internal isolation is the second objective of the strategy.

¹ The Tyranny of Distance, Geoffrey Blainey, Second Edition, Sun Books, Melbourne, Australia, 1972

A policy framework

In the eight years since Mongolia regained its political and economic independence, many positive initiatives have been taken to address these and other problems of the transport sector. This has been done within a policy context of rapid transition to a market economy, but with little attention to the finance or planning of the sector. The capitalist model being applied to the economy holds that such planning is largely irrelevant in a market environment. This belief is reinforced by memories of the negative impacts of state planning under the previous economic model. Inter-urban freight road services have been privatized, urban bus services have been corporatized, MIAT (the national airline) is up for sale, and road maintenance has been decentralized and its execution may soon be partially privatized. Some institutional restructuring has taken place, although little has been established in the way of a regulatory framework for the newly competitive sector. Despite these actions, and the best efforts of the International Development Agency (IDA), the Asia Development Bank (ADB), the Japanese International Cooperation Agency (JICA), and bi-national donors, many problems remain. International trade is still hampered by high costs and lack of co-operation from neighboring countries. Many people cannot make full use of internal transport because of its high cost, and instead of improving, the quality of the road network has deteriorated to a precarious condition. This is therefore a good moment to assess whether the policies pursued over these eight years need to be modified if they are to help tame the tyrannies of distance and isolation.

Mongolia's institutional arrangements for transport have reinforced a modal structure, making it difficult to get a comprehensive sectoral perspective of the many issues it faces. The rejection of planning, as representing a throwback to the period of Soviet domination, and an enthusiastic acceptance of the precepts of a market economy, have contributed to an atomization of the sector. There is little coordination between agencies responsible for infrastructure or services by different transport modes, no measures to ensure minimum levels of service throughout the country, and none of the necessary coordination needed to facilitate multi-modal services. A partial reversal was started in 1995 with the ADB's preparation of a Roads Master Plan. Being limited to the roads sector, it reflected a modal approach and did not deal with issues that cut across modes. It was also designed to address relatively short-term issues, despite including a "medium-term" investment plan, and to emphasize new construction rather than maintenance.

Without the overall perspective that a sector study can provide, it is impossible to be sure that even the well-intentioned short-term measures are leading to a positive outcome. Prior to implementation of IDA's ongoing Transport Rehabilitation Project, a brief review of the issues facing the sector was made, and a number of immediate interventions were identified that would avoid a collapse of the transport system. These included technical assistance for policy advice that would lay the groundwork for a longer-term strategy. This Sector Strategy is largely based on that advice. It provides a consistent framework of five components, within which most policy issues can be addressed, and comprises measures that relate to:

- **Competition as the measure through which efficiency in the sector should be increased and the impacts of the twin tyrannies reduced.** The scarce provision of transport infrastructure and the low level of expenditure on its maintenance make it difficult to increase competition in these activities. Inter-urban freight and informal urban passenger transport are, as in other countries, in the vanguard of private provision, with both now being provided by private operators on a competitive basis. For freight, there is strong competition for the market from a myriad of small, independent operators, while for passengers the competition is for the market instead of within it, with a few operators competing for route franchises.

Innovative ideas are needed to ensure that these incipient moves towards competition lead to a broader reliance on markets to generate and allocate resources and provide adequate infrastructure and services. Attempts to introduce competition in domestic air transport have not produced any viable results, and competition for urban bus services in Ulaanbaatar is yet to be achieved.

- **Pricing of infrastructure and services.** Most transport infrastructure is still provided by the public sector, although the principle is well established that users should contribute to its funding. A balance is needed in setting the levels of charges for the use of infrastructure, between maximizing cost recovery and maximizing the economic benefit from its use. If charges are too high they will stifle demand, while if they are too low they will fail to set appropriate market signals or generate enough revenue to fund maintenance and development.

Charges for infrastructure use and transport services should follow market-principles, with two notable exceptions. The first is where communities, if charged the full cost would be unable to participate in the market economy and would remain economically and socially isolated. In these cases, provision of basic infrastructure at below cost is an obligation of government, as well as being in the national interest to distribute the benefits of restructuring the economy as widely as possible. Amplification and expansion of infrastructure above these basic levels should be charged at cost. For transport services that operate over the infrastructure, competition can be relied on to a large extent to bring about market-based pricing. The second exception is in those cases, still frequent in Mongolia, where markets are too thin to create conditions of true competition. Regulations should be used to constrain maximum tariffs for private services, with competition for markets rather than within them, as an additional control on public services.

- **Regulations.** While the need for regulations to promote the safety of transport operations is largely taken for granted, the need for continued regulation of tariffs and service quality is less accepted. Control of monopoly powers is needed where low levels of demand cannot support more than one operator, prevent collusion between operators to fix tariffs, or where set-up costs are too high for a new entrant to compete with an established operator. Some form of monitoring of market performance is needed, together with a forum for users to protest against alleged abuses and seek redress where they are proven.
- **Investment.** Prudent management of public funds for investment in transport is possibly the most important function of a state in Mongolia's situation, where the slightest miscalculation can upset the delicate path to sustained economic growth. However, there are many conflicting interests to be taken into account in setting investment priorities, and these cannot be resolved only by technical and financial analyses. Many subjective, political judgements need to be made as to the relative importance of different national priorities, and to what extent it is justified to pursue one at the cost of the others. These judgements should be made on the basis the best information and analyses possible, and this is not yet happening. The principal competing objectives are taming the effects of distance from international markets and reducing the impacts of internal isolation. Setting of priorities between these is still largely based on political considerations, and these need to be informed by better and more complete information than is presently available. Mongolia can afford even less than most

countries to make ill-advised transport investments, and needs to develop a sounder and more reliable system of evaluating alternatives and establishing investment priorities.

- **Institutional.** A strategy needs an appropriate institutional framework within which to function. The same framework is not necessarily for all strategies, and one that served well in a centrally planned economy is almost certainly inappropriate for one that is market-based. The old centralist framework is still being dismantled and new arrangements suitable for a market-based strategy are still being developed. Rigid planning led to many misallocations of resources, but undue reliance on imperfect markets to set priorities can bring about a similar result. Some level of planning and coordination of policies and actions is needed, but this should be tempered by a strong reliance on market signals to indicate priorities. In addition to establishing an appropriate planning framework, the emerging market-based system needs a minimum-level regulatory system to avoid its worst excesses. Expertise in regulating market systems is scarce in Mongolia, so what is available should be concentrated in one regulatory agency rather than being spread among different economic sectors. This lack of operational experience also acts a severe constraint on the type of regulatory system that can be operated.

Implementation of a transport strategy is more difficult than its design and specification. While most sector issues can be addressed within the strategy context, some order of priorities is needed in dealing with them. How the issues are addressed depends on the levels of demands that the sector must satisfy. When dealing with rail pricing for example, application of market pricing for an underutilized railway brings about different tariffs to applying them to a congested railway, although the principles and strategy are the same in both cases. The resource constraints on applying the strategies to particular issues also need to be taken into account. Each of these conditions and constraints in applying the strategy are dealt with in the following chapters of this Report. Application of the strategy to the priority issues is also covered, and in a final Chapter, the potential role of the IDA and donor agencies in implementing the strategy is outlined.

The Country Assistance Strategy (CAS) of the World Bank Group for Mongolia recognizes that development of infrastructure will contribute to Mongolia's global integration and improve the living conditions of the poor by improving access to services and increasing efficiency gains (CAS, April, 1998, page 13). The Transport Strategy proposed here translates these ideas into an integrated strategy for the sector, proposes specific policies to put that strategy into action and indicates the investment priorities needed to make it work. In all three aspects of the Strategy there is an emphasis on integrating the transport sector and not seeing it simply as the sum of road, rail and air transport modes. The policies put forward are aimed at making transport even more competitive and efficient than it is already becoming, while the investment proposals are aimed at getting the maximum benefit from what little funding is available. The role of the World Bank group is seen as concentrating on increasing accessibility to international and domestic markets, as well as improving the accessibility of the rural population to social services.

Chapter 2 Transport sector issues

Trade corridors

A recent study of the development prospects of countries in different geographical contexts² found that landlocked countries have greater problems in sustaining growth than those with easier access to ports and markets. It also found that countries that had experienced substantial periods of central planning of their economy were also likely to find sustained growth difficult to achieve. With the exception of some small European countries (such as Switzerland and Austria, that are highly integrated into their regional economies, and have relatively good access to deep-sea ports through the Rhine and Danube rivers respectively), the highest ranked landlocked country in terms of GDP per capita is Paraguay, ranked 47 out of 129 in the sample studied (but is accessible by ships of up to 5,000dwt through the River Paraguay, so is not as completely landlocked as Mongolia).

Table 2.1: Population density, terrain and port access for low-density countries

	Population Million	Area Km2 (1000)	Pop. density People/km2	GDP/capita	Terrain	Access
Mongolia	2.4	1,566	1.53	310	Gobi/Steppe/Arctic	Land-locked
Namibia	1.5	824	1.82	2,000	Desert	Good port
Mauritania	2.2	1,026	2.14	460	Desert	Port
Australia	17.8	7,713	2.31	7,713	Part desert	Island
Botswana	1.4	582	2.41	3,020	Desert	Land-locked
Canada	29.2	9,976	2.93	9,976	Part arctic	Good ports
Oman	1.3	268	4.85	4,820	Desert	Good port
Chad	6.3	1,284	4.91	180	Desert	Land-locked
C/African Republic	3.2	623	5.14	340	Desert	Land-locked
Kazakstan	16.8	2,717	6.18	2,717	Steppe	Land-locked
Bolivia	7.2	1,099	6.55	1,099	Alpine/Rainforest	Land-locked
Congo	2.6	342	7.60	680	Rainforest	Port
Niger	9.7	1,267	7.66	220	Desert	Land-locked
Russian Federation	148.3	17,075	8.69	2,240	Part arctic	Good ports
Paraguay	4.8	407	11.80	1,690	Semi-tropical	Land-locked, River access

Source: World Development Report, World Bank, 1996

It is difficult to exaggerate the importance of being landlocked for Mongolia, possibly the single most important hurdle in Mongolia's prospects for growth and the greatest challenge for the transport sector. Most other landlocked countries are not so far from a deep-water port as most of Mongolia and few of them have such difficult relationships with their neighbors who control their access to the sea. Unless this natural penalty can be overcome, there can be little hope for success from other policy measures to achieve sustainable growth.

² Geography and Economic Growth, John Luke Gallup and Jeffrey Sachs, Harvard Institute for International Development, April 20, 1998

The most useful corridors are those from Ulaanbaatar to the ports of Tianjin, China and Vostochny, Russia. While the corridor to Tianjin is much shorter, the access route through China is heavily congested. It is in Mongolia's interest to maintain two trade corridors, so as not to be dependent on a one neighboring country. A more pro-active strategy is needed to encourage both China and Russia to provide Mongolia with better port access.

Transit traffic

Mongolia has a potentially important role to play as a corridor for transit traffic, principally between China and Russia, but also between China and Europe via the Trans-Siberian railway. At present the volume of transit traffic is very low, less than 400,000 tons in 1996, and comprises mostly low-value bulk products. Some of these have viable lower cost alternative routes³, and should not be considered as a sustainable source of foreign currency earnings for Mongolia. There is a growing belief that China's increasing interest in regional economic integration, combined with eastern Russia's increasing economic independence from the west and its availability of energy resources needed by China, provide an excellent opportunity for Mongolia to fulfill a trading role between them.

To minimize the foreign exchange costs of their international trade, both Russia and China try to keep down the distance that freight between them has to be carried on other country's transport systems. For traffic between eastern China and Moscow and on to Europe, there are three possible routes. A passenger service makes use of the shortest route via Mongolia (8,016 km), but this is little used for westbound freight. Since this traffic is controlled by China Railways (CR), and the Mongolia route involves the longest distance outside China (7,169 km), most westbound freight instead uses the route via Kazakstan. While about 539 km longer, this involves only 4,162km outside China. For eastbound traffic the situation is reversed in Mongolia's favor, since the traffic is under the control of Russia Railways, and the route via Mongolia involves only 1,956km outside Russia compared with 6,353km for the route via China and Kazakstan. Although the Manchuria route has 1,950km outside Russia, this is 56km less than the Mongolia route, and this small difference is not enough to compensate for the 750km extra total distance. So the chances for MTZ to attract transit rail traffic are much greater for that going from Russia to China than in the reverse direction. This is reflected in the present volumes of freight, with a 3:1 advantage for traffic from Russia.

**Table 2.2: Rail distances between China and Moscow
(kms)**

	Via Manchuria	Via Mongolia	Via China and Kazakstan
Total distance (Beijing to Moscow))	8,766	8,016	8,555
In China	1,950	847	4,393
In Russia	6,816	6,060	2,202
In Kazakstan	-	-	1,960
In Mongolia	-	1,109	-

Source: Business Plan for Mongolian Railways

³ ITAR-TASS reported on August 12, 1998 that a new rail link between Makhhalino (Russia, Primore Region) and Hunchun (North East China) had opened, with an expected 500,000 tons of freight in 1999 and 3 million tons by 2002

Although there is a short (about 50km) direct border between Russia and China to the west of Mongolia, it lacks feasible road access on either side. This creates the possibility of a road transit route between Russia and China, linking the area of Novosibirsk in Russia to the autonomous region of Xinjiang in China. The potential demand for this route is highly speculative, although there is rapidly growing trade between Xinjiang and Russia. Most of this uses road and rail routes via Kazakhstan, but an increasingly amount is using informal road transport across the tracks of western Mongolia. Mongolian hopes to develop this route for transit traffic between Russia and China are speculative and not enough to justify the cost of upgrading the road to make it suitable for large trucks.

Internal integration

Lack of access between different parts of the national territory has become an increasingly important issue as Mongolia has opened its trade to the rest of the world rather than being so dependent on the countries of the former USSR. While communications within Mongolia remain difficult, there is a growing risk that products from this region will be traded directly with neighboring countries, rather than being transported to the capital for processing into higher value-added products. This could represent an important reduction in the national product, as well as being a loss of government revenue if the trade continues to be largely informal and possibly illegal.

While many social services are still provided by the central government, there is an obligation to ensure that these services, particularly those relating to health and education, are made available throughout the country. Lack of road access and the prohibitive cost of air transport are now making it more difficult for these obligations to be met. Many personal services, and even some related to education and health services can now be provided electronically, but trading in goods which is essential to most rural accessibility, still requires physical access. When people in remote regions feel that the central government is not responding to their needs, and they are being deprived of services available to the more accessible parts of the country, resentment will grow and could lead to political instability.

Apart from the trade and service perspectives, there is a social and political dimension to the lack of access between regions. Trade contacts quickly lead to closer personal contacts and these could in turn lead to a growing stronger identification with people of neighboring countries than with other Mongolians. In other countries that have suffered similar circumstances, the outcome has been growing pressure for regional autonomy and eventual disintegration of the nation. While this is not an immediate danger for Mongolia, any measures taken at this time to increase the integration of remote areas with the rest of the country could prevent it ever becoming so.

Regional transport

While the difficulties of access between the regions and Ulaanbaatar have to some extent been recognized if not adequately addressed, lack of access within the regions and aimags has received little attention. Few regions outside of the corridor between Ulaanbaatar and the border with Russia have any paved or even gravel-surfaced roads. They depend on earth tracks, with little or no improvements to natural drainage or river crossings. In the few instances where gravel roads are provided, lack of maintenance has resulted in their reversion to an almost natural state, and parallel earth tracks provide a better surface for motorized vehicles. The benefits of an improved road network between aimag capitals and Ulaanbaatar would be greatly enhanced if the road systems within the aimags were also improved to allow the efficient operation of the same vehicles as would use the improved inter-aimag network.

Urban transport

Ger areas

There are two issues of transport in urban areas that merit attention, one related to infrastructure and the other to services. While there is an adequate road system linking most residential areas to each other and to commercial and industrial areas, the road network inside the ger areas is inadequate for access of basic social services. Public transport services generally only operate to the outside of the areas, or at best use a spine road through the development when weather permits. Other services – water supply and waste disposal – are irregular, inefficient and costly, in large part because of inadequate road access.

Mongolia's few cities bear the imprint of socialist urban planning, that is, a reliance on rigid physical norms with little regard to user demand, technological alternatives, or realistic resource constraints. An outcome of these policies has been very uneven urban development. The combination of high standards for publicly financed formal housing and inadequate resources for the rest, stranded a large segment of the urban population in self-financed housing in plotted developments, where standards of facilities and services are very low. These traditional ger housing areas comprise individually fenced plots and clusters of traditional round tents (gers) and/or assorted low-cost structures ranging from wooden shacks to a scattering of two-story brick houses. These ger areas have received the bare minimum of infrastructure investment, and lack basic services, such as paved or stabilized all-weather access roads, community services, piped water supply, public transport and sanitation.

Under the on going Bank supported Urban Services Project, infrastructure improvements are being piloted in five priority ger areas. In addition to solid waste, drainage and flood protection, the project will provide 28 km of 1.2 m wide footpaths, 10.8 km of paved or gravel roads, three footbridges and one road bridge, together giving residents better access from their plots to public facilities. Although there is an expectation that similar works will subsequently be carried out in other ger areas, the project still leaves most ger residents without adequate roads or access to public transport.

Urban Bus Services

Public transport services in Ulaanbaatar are provided by three publicly owned-bus companies, two of which operate diesel buses (just under 150 each) and one company that operates 150 trolleybuses. There is also a private bus company operating about 50 conventional diesel buses, a growing number of individual bus operators, individually operated taxis and private cars that legally can charge for taking passengers. With the introduction of new buses provided under a Japanese grant and an IDA credit, the bus fleet should now be adequate to satisfy the present demands for public transport within the urban area.

Direct subsidy of the bus companies was withdrawn in July 1995, since when the companies have struggled financially. The net cash flow of the four main bus companies is precarious: only one has a cash surplus after allowing for depreciation, two can cover their operating costs but not depreciation out of revenue, while the fourth does not even cover its operating costs. Two companies should soon start paying interest on their share of the IDA credit that financed their new vehicles, but will be unable to do so. All the companies are likely to need more replacement buses within a few years, and since they will not be able to finance them on commercial terms, the present situation is not sustainable. This financial instability stems from problems with both revenues and costs, and goes back to the origins of public transport as a municipal undertaking.

On the revenue side, when bus services were provided by the municipality as a social service, there was little incentive for the bus conductors to insist on payment of fares. This has left a legacy of “a strong culture of non-payment of fares.” Only about 52 per cent of all passengers pay for their travel, about 18 per cent are entitled to free travel and “about one-third of passengers avoid paying.” This situation is compounded by weak protection of the fare system against fraud, ticket forgery and fraudulent conduct by conductors (such as the replication and reissue of tickets) and an apparent lack of corporate will to tackle the problem⁴.

In respect of costs, the situation is even further out of control. In addition to problems of excessive staffing, there is:

- a lack of adequate maintenance, both routine and preventive.
- operation of vehicles in unserviceable condition.
- widespread fraud by drivers in respect of their allocation of fuel, to the extent that “excessive allocations have come to be seen as a legitimate part of driver remuneration.”
- poor scheduling of operations (with driving duties of excessive length).

All these problems have been known for a long time, and were confirmed and remedies proposed by consultants almost two years ago. Since then, no action has been taken and the situation has deteriorated. The bus companies are now pressing for an increase in their basic fare. However, with expenditure on public transport now representing more than 20% of household income for ger residents⁵, the financial and social impact of the substantial increase that the operators need to overcome their negative cash flow would not be justified. It is difficult to see how the required changes in operating practices can be brought about without a radical shake-up in the organization and ownership of bus services and buses.

Traffic congestion

Increasing personal incomes are leading to the first problems of motorization, the import of low cost and heavily polluting used cars from Eastern Europe, especially from Germany, and incipient traffic congestion at peak periods. It seems that the rigorous climate is saving Mongolia from the scourge of mopeds, motor scooters and motor cycles that has bedeviled other countries in Asia. The environmental impact of old, badly maintained private cars on the sensitive environmental conditions of Ulaanbaatar is being controlled by a taxation policy that penalizes older vehicles. While this policy is slowing some of the benefits of higher personal incomes, its benefits will become more apparent as the vehicle fleet increases. However, the measure is a crude one, since it applies equally to highly polluting vehicles as well as to those that are well maintained and cause fewer problems (catalytic converters cannot be used in Mongolia since there is no lead-free gasoline).

Railway restructuring

Although MTZ is reasonably efficient from an operations perspective, with asset utilization above average for small railways, its unit revenues are too low for it to be financially viable and its unit costs are much higher than they need be. The president of a company that specializes in bringing small ex-state

⁴ Final Report, Combined Urban Transport and Motor Carriers Project, ICE Consult for the Ministry of Infrastructure Development, March 1997.

⁵ Survey carried out in preparation for the Ulaanbaatar Services Improvement Project, Report 16379-MOG

railways back to profitability recently commented that "no railway ever went out of business because its costs were too high; when they have failed, it has been because of inadequate revenues"⁶. So long as MTZ remains a state-owned enterprise, with its tariffs and funding subject to government approval, it will not be able to adopt the market-oriented policies that are needed for its survival in the coming competitive environment. Few of the recommendations of a recent consultants report on managerial restructuring⁷ that would make MTZ more commercially oriented, have been implemented. Unless these changes, or others with a similar objective, are made soon, MTZ will become yet another railway casualty of road-based competition. A more dramatic restructuring than that proposed is now needed to avoid this outcome

Table 2.3: Railway Performance Indicators

Country	Route km	Pass km	Freight ton-km	TU/ Employee	Employee/ Route km	TU/ Loco	TU/ Wagon	Op. Ratio
Belarus	5,543	12,505	25,510	503	12.5	32.9	643	67
Bolivia	3,698	287	697	187	3.5	16.7	340	85
Uruguay	2,993	0	208	63	3.1	3.5	95	325
Latvia	2,413	1,373	9,757	523	7.8	29.2	805	85
Mongolia	1,920	625	2,998	274	3.5	44.1	1,591	87
Malaysia	1,798	1,270	1,416	408	3.7	20.9	336	110
Peru	1,609	216	n.a.	81	1.6	3.8	195	n.a.
Uganda	1,250	35	208	63	3.1	4.0	140	121
Cameroon	1,006	317	812	301	3.7	18.5	597	109

Source: World Bank Railways Database

Sector finance

The most intransigent sector issue is that of finding enough funding to address investment needs. Resolution of all other issues is largely dependent on finding a solution to this one. With so many competing demands for public sector finance, the transport sector has not until now been able to progress far in fulfilling its objectives. Not only is necessary to develop new sources of investment funding and increase the efficiency of those already available, it is even more necessary to make better use of those funds that do become available. Until now, there has been no overall strategy for investment in transport and investment decisions are not made with the advice of the best technical advice available. Investment plans previously made for transport modes have been based on inconsistent assumptions, have used incompatible assessment methods and have failed to take account of the impact of policies (investment, charging and regulations) for one mode on those of the others. The sector policies and estimates of need and availability of investment funds made for the preparation of this Strategy are the first to consider the transport sector as a whole.

⁶ Henry Posner III. Presentation to Latin American Railways Roundtable, Vienna, 1995

⁷ Mongolian Railways; Restructuring Plan, Transurb/Hickling for the Ministry of Infrastructure Development, April, 1997

Chapter 3

Investment needs and priorities

Mongolia does not suffer from capacity bottlenecks in its transport infrastructure and there are a few transport services where demand is even close to capacity. Even where some evidence of congestion is beginning to appear, such as on the streets of Ulaanbaatar at peak periods, better demand management and utilization of existing capacity can avoid any serious capacity problems for a long time. Transport investment needs are therefore related to improving accessibility and reducing costs, rather than increasing capacity. Overcoming a long period of under-investment with severe financial constraints will take a long time, even with only the moderate rates of economic growth expected for the next few years. So a long-term perspective needs to be taken and quick solutions should not be expected.

The investment needs are easiest to categorize by mode, whereas the ordering of priorities needs to be based on a sector perspective. The first need in all modes is to ensure finance to maintain the integrity of the infrastructure network, given that most maintenance expenditure has an economic justification an order of magnitude higher than most investments in new or expanded capacity. Only when essential maintenance needs have been attended to should investment in upgrading, expanding and adding to capacity be contemplated. Mongolia has failed to pay attention to maintenance in the past, particularly of its highways. It allocated an even smaller percentage of its GDP to this activity than the inadequate amounts of many other countries at a similar state of economic and political development. In the years immediately following the opening of their economies, Cambodia and Vietnam both allocated about three times the percentage of GDP to road maintenance as did Mongolia.

Table 3.1: Infrastructure maintenance expenditures

Country	Percentage of GDP allocated to road maintenance
Ghana	1.1
South Africa	1.0
Cambodia	1.0
China	1.0
Chile	0.5
Vietnam	0.7
Ukraine	0.5
Kazakhstan	0.5
Hungary	0.3
Mongolia	0.2

Source: World Bank estimates. Data applies to various periods in the early to mid-1990s

Roads

Maintenance

With so many unformed and partly formed earth roads, it is difficult to determine the exact size of the road network. Most recent analyses of road investment needs have been based on a network of state and local roads comprising a total of 5,319km out of a total network of paved, gravel and formed earth roads of about 12,374km. The total includes about 7,055km of formed earth roads but excludes 26,900 km of

unformed earth tracks, for which regular maintenance is difficult to quantify and amounts to little more than ensuring that bridges or river crossings remain passable.

Table 3.2: Basic present road network (kms)

	Paved	Gravel	Formed Earth	Sub-Total	Other formed earth roads	Total
State roads	1,245	1,344	1,391	3,980	0	3,980
Other roads	343	480	516	1,339	7,055	8,394
Total	1,588	1,824	1,907	5,319	7,055	12,374

Source: Bank estimates based on DOR data

The UK's Transport Research Laboratory, working within the IDA Transport Rehabilitation Project, has recently improved on the earlier work on desirable levels of maintenance expenditure on the 5,319km of improved roads. The work has now reached the point at which usable and reliably indicative results are available. The tentative conclusion is that routine annual maintenance expenditure for paved, gravel and formed (improved) earth roads should be of the following order:

Table 3.3: Estimated necessary and justifiable expenditure on road maintenance (US\$m per year)

	Paved	Gravel	Formed Earth	Total
State roads	6.8	2.1	1.0	9.9
Other roads	1.8	0.6	0.2	2.6
Total	8.6	2.7	1.2	12.5

Source: Bank estimates

There is an addition a backlog of deferred maintenance on paved roads of about US\$12.3 million, of which US\$9.3 million would be on State roads.⁸

New road construction and improvement to existing roads

Recent road investment policy has been guided by the Asian Development Bank's sponsored Road Master Plan. An innovative points scoring system was used as part of a multi-criteria approach to prioritizing road sections for funding by external agencies. The system was a bold attempt, in the absence of any reliable data, to create a credible and defensible Plan. However, it did not address routine maintenance, did not adopt an incremental approach to investment, and it overlooked low cost solutions that were not expected to be of interest to the ADB to finance.

The Plan ranked 47 road sections and identified 23 of them comprising 3,898km and involving projects costing about US\$322 million to form a set of screened projects to be considered for ADB financing. The suggested candidates to emerge from the next round of studies are paving of the road from Maant to Choir (125km, originally ranked fifth), rehabilitating the gravel road from Erdenet to Bulgan (68km,

⁸ 91 km of cement concrete paved roads have been excluded, since these do not require the same level of periodic or routine maintenance).

originally ranked sixth) and rehabilitation of the existing paved road from Ulaanbaatar to Atar (82km, originally ranked 17th). It is also proposed to review the already completed feasibility study of paving the road from Nalaikh to Maant (70km, originally ranked second,). The road originally ranked first (paving the 184 km road from Darhan to Erdenet) is already being constructed.

Table 3.4: On-going improvements to Master Plan roads

Road	Length (km)	Original Priority	Project type	Funding source	Cost (U\$m)
Darhan-Erdenet	184	1	Paving	Kuwait Fund	21.0
Nalaikh – Baganur	36	2	Paving	Japan & DOR	10.3
UB North – Bayangol	130	7	Rehab. Paving	ADB	27.0
Bayangol – Darhan	70	9	Rehab. Paving	ADB	Inc above
Darhan – Suhbaatar	92	29	Rehab. Paving	ADB	Inc above
Suhbaatar – Altanbulag	24	11	Rehab. Paving	ADB	Inc above
Harhorin – Tosontsengel	119	14	Improved gravel	IDA	5.7
Total	655				64.0

Sources: Updated Road Master Plan, ADB and World Bank

Strategic road investments

Any final assessment of the priorities for road investment should be based on a reassessment of the network considered in the development of the Master Plan. The reassessment should include routine maintenance, adopt an incremental investment criteria for each link, take account of low cost solutions, involve shorter road sections than the average 155km length used originally, and make use of a points system that remedies the worst deficiencies of the previous pioneering attempt. Based on approximate evaluations of typical road sections, the most probable order of priorities for investment would be routine maintenance, deferred maintenance, improvement, and new construction.

Routine and periodic maintenance

- Routine and periodic road maintenance should have the highest priority. Most economic evaluations give it a much higher ranking than any investment in improvement or expansion of the network, since it will ensure continued access to communities and production centers that already have it. If it is not undertaken, the future costs of reconstruction will be much higher.

Deferred maintenance

- The next highest ranking should be for deferred maintenance, mostly of paved roads, since these also tend to have high economic rates of return and give access to places and localities that have come to depend on good transport. This category would include the paved roads from Ulaanbaatar to the Russian border and to Arvaikheer. If adequate routine and periodic maintenance is undertaken, deferred maintenance will be a declining part of the investment program.

Improvement

- Improvement of roads giving access to the far-west region should have the highest priority, since they will potentially bring new areas more fully into the market economy, and be essential to furthering national integration. The on-going IDA Transport Rehabilitation Project is upgrading the road to the central western districts at an average cost of about U\$10,000 per km, by dealing only with those sections that are at times impassable to medium-size vehicles. The average cost for the whole

southern route to Hovd would be considerably less, probably about US\$8,000 per km, since it passes through easier terrain and has fewer critical points that need improvement per km of route. These unit costs, based on spot improvements, are much less than the US\$29,000 needed for overall up-grading.

- In addition to the improvement of the basic road network, many unformed earth tracks can justifiably be upgraded to formed earth standards. The benefits would include all-weather access to aimag capitals and the more efficient operation of medium-size trucks through fewer accidents, lower maintenance costs and higher utilization. If about 9,000km of these tracks (an average of about 500km per aimag) were upgraded at an average cost of about US\$2,000/km, the total cost would be about US\$18 million. The cost could be made even lower by using local labor and materials as an "in-kind" user contribution.
- The final priority for improvement would be completing the East West road to the east as far as Choibalsan, also needed for national integration.

New construction

- A new paved road to the border with China, at a high enough standard to allow the operation of 5 or 6-axle semi-trailer trucks, also merits a high priority. This should be confirmed by a more complete economic and financial assessment than has been made so far. Improvement of the track in the first section is already committed, and the section south of Sainshand should have a high priority, as it will provide road access to China from the potential mineral and oil producing areas of southern Mongolia. (A strategy for planning and constructing this road is described in Chapter 5).

Railways

A recently completed Business Plan for MTZ⁹ shows a proposed investment of more than US\$272 million for the period 1996 through 2005. However, none of the proposed investments has been subject to economic or financial assessment to determine their impact on the national economy or the railways' finances. The proposed financing plan for these investments shows that only 14% of the funding would come from MTZ's own resources, the remainder to come from international loans and grants. Not only is the amount of investment unrealistic, but so is the financing plan. It is highly improbable that more than a few of the proposals for investment in traction (US\$77 million) and rolling stock (US\$51million) would be financially justified. However, much of the infrastructure investment (US\$73 million) is for track maintenance and equipment for reducing maintenance costs and some of it at least likely to be justifiable.

MTZ should undertake a realistic financial assessment of all its proposed investments, and for those that are commercially justifiable, it should seek private financing where possible. For traction and rolling stock, this might require the establishment of a separate company to purchase the equipment and lease it to MTZ or other train operators. Infrastructure investment should, so far as is possible, be financed from MTZ's internal resources, but will probably require continued government support until MTZ has adopted

⁹ Transport Rehabilitation Project: Business Plan for Mongolian Railways, Transurb Consult and Hickling, for Ministry of Infrastructure Development, June, 1997

a commercial objective and appropriate management structure, as recommended in a recent consultant's report.¹⁰

Maintenance and upgrading

Routine maintenance of railway infrastructure has been undertaken more conscientiously than that of roads. Continued expenditure on its maintenance and improvement should be at a level that minimizes the sum of operating and maintenance costs. Where traffic levels are at a high enough level, track maintenance can justifiably include some upgrading, to reduce operating costs, to reduce future maintenance requirements or to increase the safety of operations, particularly of passenger trains. The tracks of MTZ were laid largely to minimizing initial costs, so the ballast, sleepers and rails are not appropriate for the high axle-loads that optimize the operation of bulk trains for the transport of coal, the source of more than 50% of MTZ's traffic.

Ulaanbaatar to Bagakhangai: MTZ is already progressing on a program to upgrade this 106km of line with more ballast and sleepers and heavier rails. A further 136km need to be improved at an estimated cost of U\$8.7 million.

Ulaanbaatar to Baganuur: Under the IDA's ongoing Coal Project, facilities are being installed at the Baganuur mine to allow the operation of unit trains. The maximum benefit of these would be realized by increasing the maximum axle-load from 22.5 to 30 tons. This could be achieved by upgrading the track, with increased and improved ballast (gravel instead of rock, and laid to a depth of 35cm), rail renewal (using the 65kg rails from the Bayan Tumen railway where they are not needed), and concrete sleepers. The estimated cost is U\$21 million.

Sleeper renewal: The track was originally laid, and has until recently been maintained, with untreated softwood sleepers. The shortage of suitable timber, now in part a consequence of environmental considerations, together with objectives of reducing later regular replacements, will result in a need to manufacture or purchase concrete sleepers. If they are purchased the cost would be of the order of U\$64.4m over the next seven years, but would be considerably less if the domestic manufacturing facility could produce sleepers to a high enough specification.

Table 3.5: Proposed railway investments ¹¹

	1999-2004
Ulaanbaatar to Zamyn Uud	8.7
Ulaanbaatar to Baganuur	21.0
Sleeper renewal	64.4
Total	94.1

Source: Bank estimates

¹⁰ Transport Rehabilitation Project: Restructuring Plan for Mongolian Railways, , Transurb Consult and Hickling, for Ministry of Infrastructure Development, March, 1998

¹¹ It is assumed that after 2004 the railway would be operated privately or under concessions, so no further public investment would be needed

New construction

Many of the potential mining projects in Mongolia would be more feasible with rail than with road transport. However, mine developers are reluctant to commit themselves to the high cost of railway construction at the beginning of projects that so far have no proven markets. Investment and operation of the transport facilities for each mining project should be considered as part of the project and not as an independent transport consideration. All investment in transport infrastructure for these projects should come from the mine developers. Even where cooperation is needed between developers of projects that would make joint use of common transport infrastructure, the governments role should be no more than facilitation. If exceptions to these arrangements are made, the costs of any public investments (including loan amortization) should be fully recoverable from the developers through user charges and tariffs.

Urban Transport

New road construction will be needed as the city expands and car ownership increases, but the first priority should be to maintain the quality of the existing main road network and improve the access roads to ger areas. Network expansion should be funded from municipal revenues, possibly development taxes on the betterment value of newly developed land, while maintenance and improvement of the existing network should be funded from road user charges. (A study presently under way with JICA funding is looking at the urban development of Ulaanbaatar and, inter alia, at its road transport investment needs).

Public investment in new buses should not be necessary, as the finances of the existing bus companies are capable of being improved so that loans for new buses can be funded from operating revenues. New bus services using smaller vehicles to serve lower demand areas should also be self-financing. However, the trolleybus company will not generate enough revenue for the extension or overhaul of its power supply system. The present system cannot support more than 90 buses in operation at the same time, and this is a severe constraint on expansion of the system. Without the ability to operate more buses the company cannot generate enough revenue to fund all its maintenance needs. If trolleybus operations are to continue, some form of short-term municipal financial support will be needed. A detailed feasibility study is needed to determine whether the necessary investment would be justified.

Table 3.6: Estimated necessary and justifiable expenditure on road maintenance (US\$m per year)

	Paved	Gravel	Formed Earth	Total
State roads	6.8	2.1	1.0	9.9
Other roads	1.8	0.6	0.2	2.6
Total	8.6	2.7	1.2	12.5

Source: Bank estimates

Air transport

It was only in 1993 that the Civil Aviation Authority was established as a separate entity to MIAT. It operates 25 airports and airfields, the National Center for Flight Operations and Ulaanbaatar airport terminal. Five airports have paved runways, Ulaanbaatar, Choibalsan, Moron, Bayanhongor and Hovd. Ulaanbaatar handled about 92,000 international and a similar number of domestic passengers in 1997. Choibalsan and Moron dealt with about 50,000 domestic passengers each, with the remaining 150,000 domestic passengers spread among the other airfields. Provision of simple paved runways of adequate

length to allow the operation of new generation aircraft to cities more than about 800km from Ulaanbaatar (some jet aircraft such are now designed to operate from unpaved runways) and provision of basic passenger facilities could be justified. Investment by the public sector in new or replacement aircraft is not justified or necessary, although a cross-subsidy for services to remote aimag centers could be contemplated in the interests of national integration.

Summary of investment proposals

The minimum investments needed to achieve the sector objectives, while at the same time maintaining and improving the quality of transport infrastructure, will require almost US\$600 million over the next fifteen years, equivalent to about 3.5% of GDP. The distribution of these needs between the transport sub-sectors is 68.7% for inter-urban roads, 16.5% for railways, 8.8% for airports and 6.5% for urban transport.

Table 3.7: Summary of transport investment priorities, 1999-2014 (US\$m)

Priority	Project	Mode	Activity	Investment	Cumulative Total
1	Routine maintenance				
1a		Roads	Annual maintenance	180.0	
1b		Railway	Sleeper renewal	64.4	244.4
		Sub-total		244.4	244.4
2	Deferred maintenance				
2a	Erdenet to Bulan	Roads	Gravel reconstruction	2.7	247.1
2b	UB to Russian border	Roads	Pavement reconstruction	23.3	270.4
2c	UB to Avaikheer	Roads	Pavement reconstruction	28.9	299.3
2d	Other roads	Roads	Pavement reconstruction	10.1	309.4
2e	Trolleybus infrastructure	Urban	Electricity supply	2.0	311.4
2f	Urban roads	Urban	Pavement reconstruction	7.0	318.4
		Sub-total		74.0	318.4
3	Improvement				
3a	Ulaanbaatar to Zamyn Uud	Railway	Railway upgrade	21.0	339.4
3b	Ulaanbaatar to Baganuur	Railway	Railway upgrade	8.7	348.1
3c	Maant to Choir	Road	Upgrade to paved	20.6	368.7
3d	Edensur to Baganuur	Road	Improved gravel	6.0	374.7
		Sub-total		56.3	374.7
4	New construction				
4a	Avaikheet to Hovd, Ulaangom	Roads	Simple gravel	17.0	391.7
4b	Choir to Sainshand	Roads	Paved road	36.9	428.6
4c	Sainshand to Zamyn Uud	Roads	Paved road	35.5	464.1
4d	East West Road (East)	Roads	Paved road	30.0	494.1
4e	Darhan to Suhbaatar	Roads	Paved road	11.8	505.9
4f	Upgrade regional airports	Aviation	Airport upgrade	50.0	555.9
4g	East West Road (East)	Roads	Simple gravel	5.0	560.9
4h	Other gravel roads	Roads	Simple gravel	9.6	570.5
4i	Urban roads	Urban	Paved roads	25.0	595.5
		Sub-total		220.8	595.5
		Total			595.5

Note: Annual road maintenance is assumed to be maintained at US\$ 12 million/year

Source: Bank estimates

Chapter 4

Resources for Transport Development

The previous Chapter concluded with an estimate of the financial need of the transport sector. While by far the most pressing, this is only one of three constraints on development:

- **Financial.** The public funds that can be allocated to the transport sector are insufficient to satisfy all the needs. There are no specific or guaranteed funds dedicated to the transport sector, all are allocated by the democratic process. Even for the recently created State Road Fund, the enabling Law only mentions the sources of revenue in general terms (for example, “taxes on gasoline and diesel fuels”) but not their amounts or how the amounts should be determined or by what body or the mechanism for allocating the funds. Local road funds were also created under the responsibility of the Governors of aimags, and their sources of revenue are even more loosely defined than those of the State Road Fund. The present revenues allocated to these Funds are much less than needed to satisfy their investment obligations (the “construction, repair, maintenance, protection and development of roads, strengthening the building capacity of such roads and exercising the professional control over them”). Funds for railway investment are allocated in the national budget by the Great Hural, while aviation infrastructure is financed by part of the revenues from charges for over-flights.
- **Physical.** Parts of the country lack the physical resources for road and runway construction and they need to be transported large distances at high cost. Until now Mongolia has lacked its own resources of asphalt for road surfacing. Although this might change as new petroleum resources are exploited, in the short-term, concrete surfacing at higher initial cost is often the remedy. While rural areas in Western and Central Mongolia have abundant timber and stones for maintenance of bridges and gravel roads, lack of these materials in the South is to some extent compensated by the higher load-bearing quality of the soil and fewer rivers, so fewer physical resources are needed. The railway can no longer depend on locally produced timber sleepers (ties) and now requires imported tensioned steel for reinforced concrete sleepers.
- **Human.** While Mongolia’s education level is very high, there is a shortage of experience in transport related specialties, particularly planners, accountants and engineers. There are few contractors capable of carrying out large-scale works, and even the smaller ones lack equipment for basic maintenance. There will soon be a large number of private mining companies with equipment that could be used for maintenance of gravel roads. Given that they will be the principal users of these roads, it should be possible to devise procedures by which they can contribute their equipment to help maintain the roads of which they make use. Professional managerial experience is lacking in transport operating companies, but since it is quickly being developed in the emerging private sector, there should soon be a spillover into the transport sector.

Financial resources

There are at least four principal sources of finance for investment in transport infrastructure- user charges, allocations from the national budget, private investments, and loans and grants from international and bilateral agencies. Estimates of all of them are unreliable and subject to influences largely unrelated to the transport sector and even to Mongolia.

User charges and public sources

User charges provide some finance for roads and aviation investment, but not for railways where tariff revenue is mostly aimed to cover operating costs including depreciation but not investment. Revenues from road user charges are totally inadequate to fund the necessary level of road investment, whereas revenues from over-flight charges would be more than enough to fund aviation investment if it were considered as a genuine user charge. Instead it is treated as an important contributor to general state revenue, and the aviation sector is left with only a part of this revenue plus that from airport passenger charges (which like railway revenue, is mostly aimed at covering airport operating costs), insufficient for even priority projects such as a new air navigation system to increase safety.

The three ways of estimating how much public finance might be allocated to the transport sector all rely on assumptions about the growth of GDP, and are therefore subject to the uncertainties associated with its trying forecasts. In addition, each method is subject to its own assumptions about how total GDP might be allocated between public and private sectors, between investment and consumption, and between different sectors of the economy. Despite these differences and uncertainties, all three methods give broadly similar results (Table 4.2). The simplest and most frequently used measure, described in more detail below, is that of considering transport investment as a percentage of GDP. The second method is to consider transport investment as a percentage of public investment, this being expressed as a percentage of public revenue, and this in turn as a percentage of GDP. The third method considers transport as part of public investment, and public investment itself as part of total investment (instead of part of public revenue as in the second method).

Estimates of GDP growth

Estimates by the IDA of GDP growth, made before the seriousness of the Asian financial crisis was fully appreciated, indicated a short-term growth rate of 4% per year, while Mongolian sources indicated expectations of rather higher long-term rates. It is assumed here that the financial crisis will be resolved without lasting impact on the Mongolian economy, which is projected to grow at 4.5% per year for the five years starting in 1999, and at 5.5% per year for the following ten years. The greatest impact of the crisis on Mongolia is likely to be through the prices for mineral and petroleum exports. The current prices for these commodities are presently at historic low levels and show little prospect of recovering in the near future. (Note: The GDP estimates are made only for the purposes of estimating the possible sources of transport investment, and should not be considered as formal IDA projections of the Mongolian economy).

Percentage of GDP allocated to transport investment

Few countries have been able to sustain high percentages of GDP allocated to transport. During their eras of high economic growth, some larger developing countries have been able to sustain levels of up to 4% for periods of five years or more, but even a rate of 3% has been exceptional. For Mongolia, a rate of 2.5% of GDP would be an optimistic objective. If reached, it would provide about US\$19 millions of investment in 1999, US\$22 millions in 2004 and US\$35 millions by 2014, and average about US\$28 millions and total of US\$422 millions over the fifteen year period. Any higher rate of investment would require a higher overall savings rate and would probably be unsustainable. The present rate of investment of less than 1% of GDP would not provide enough infrastructure to sustain the assumed growth rate.

Table 4.1: International comparisons of public investment in transport

Country	Period	Transport investment as % of GDP
Japan	1964-73	3.5
Korea	1988-92	2.6
Taiwan, China	1988-92	2.3
Brazil	1979-81	2.4
India	1980-89	2.4
FSSU	1980-89	2.8
China	1992-94	2.5
Mongolia	1992-94	0.8

Sources: *China's Railway Strategy*, World Bank, Report 10592-CHA, February 1993

Forward with One Spirit, A Transport Strategy for China, World Bank, Report 15959-CHA, April, 1998

Korea Transport Sector: World Bank, Report 13847-KO, April, 1995

Mongolia: Institutional Strengthening of the Road Sector, NDLea International for ADB, March, 1997

The other two methods give similar results, so based on comparisons with other countries at a similar stage of their development, Mongolia might expect to invest an average up to US\$30 million per year for the next fifteen years or so. This is more than double the rate currently being achieved but still only about 80% of that needed to satisfy even the minimum needs indicated in the previous Chapter. To satisfy those needs would require investment of 3.5% of GDP over the period. If the economy were to grow at an average of only 3% per year instead of the assumed 4%, the proposed rate of transport investment would yield only US\$26 million per year, and it would require 3.8% of GDP to achieve the minimum needs.

Table 4.2: Alternative projections of public investment funds for transport (US\$m)

Method	1999	2004	2014	Average	Total
1. As 1% of GDP (present rate)	8.0	9.7	14.4	11.6	174.4
2. As 2.5 % of GDP (proposed rate)	19.3	22.5	34.8	28.1	421.9
3. As 30 % of public expenditure	16.2	20.2	34.5	27.3	409.5
4. As % of total investment (25% GDP)	17.0	21.1	36.2	28.7	430.3

Source: Bank estimates

International and bilateral sources

Since Mongolia still has a low per capita GDP, it is still eligible for IDA and other concessionary loans from multilateral agencies, and given its recent record of macro-economic reform and stability, it is an attractive destination for bilateral donations, grants and loans. While these sources of funds are available on attractive conditions, the government is circumspect in taking on obligations that will increase its indebtedness, with the present level of outstanding and disbursed debt already at close to 75% of GDP, although the *debt service:export* ratio has recently improved to 5.7%¹².

¹² Table 2, Country Assistance Strategy of the World Bank for Mongolia, World Bank, April 1998

The IDA is contemplating a transport sector credit to Mongolia for the year 2001 of the order of US\$20 million. The Asia Development Bank (ADB) has recently signed a memorandum of understanding for a Second Road Development Project that would provide US\$25 million towards the cost of paving the road from Nalaikh to Choir, and is presently funding the renovation of the Ulaanbaatar - Darkhan - Altanburg road. The other major foreign participant in the transport sector is the Japanese government and it is hoped to continue funding the road sector with loans of the order of US\$50 million. The Kuwait Development Fund is financing a road project (Darkhan to Erdenet) with a donation of about US\$15 million. So over the next five years, up to US\$110 million, an average of about US\$22 million per year, or about 70% of the minimum investment needs, might come from international sources. The serious funding problems will come in the following five-year period; concessionary loans and donor funding will be more difficult to find, and since the grace period for the present high level of borrowing expires, loan amortization will start to have a significant impact.

A severe constraint on the growth of donor and loan funding is the need for counterpart funding, usually 20% of the total cost. The principal source of this at present is the Road Fund, as is expected for the new ADB loan. Counterpart funding is now taking such a large proportion of the Fund's resource that routine and periodic maintenance is all but abandoned. If this Fund is to remain the main source of counterpart funding, as well as to provide for adequate maintenance, direct investment and service of transport sector debts, then its revenues must be more than doubled. Even with this increase, it will only be possible to provide counterpart funding at an average rate of about US\$5 million per year, implying a maximum donor and loan funding of US\$25 million per year.

Table 4.3: Road Sector Revenues and Expenditures, 2000 -2007 (US\$m)

Expenditure	Project	Year							
		2000	2001	2002	2003	2004	2005	2006	2007
Source									
ADB	UB - Altanberg	2.94							
Kuwait	Darkan - Erdenet	3.72							
Local	Roads and bridges	3.50	10.50	11.00	11.00	11.00	11.00	11.00	11.00
Local	Routine maintenance		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Japan	UB roads	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WB	Avaiheer - Hovd	0.60	1.00	1.00	1.40	1.00			
ADB	Nalaikh - Choir	0.50	1.00	2.50					
Korea	Choir - Sainshand				2.50	2.50	2.50		
Japan	Sainshand - Zamyn Uud						2.50	2.50	2.50
Sub total		11.26	13.50	15.50	15.90	15.50	17.00	14.50	14.50
Debt service		0.70	0.70	1.20	1.80	2.00	2.40	2.80	3.00
Total		11.96	14.20	16.70	17.70	17.50	19.40	17.30	17.50
Revenue	Source								
	Fuel tax	6.00	6.24	6.49	6.75	7.02	7.30	7.59	7.90
	Vehicle licence	1.00	1.10	1.21	1.33	1.46	1.61	1.77	1.95
Sub total		7.00	7.34	7.70	8.08	8.48	8.91	9.36	9.84
	Extra fuel tax	3.00	3.12	3.24	3.37	3.51	3.65	3.80	3.95
	Extra vehicle licence	1.10	1.21	1.33	1.46	1.61	1.77	1.95	2.14
Total		11.10	11.67	12.28	12.92	13.60	14.33	15.11	15.94
Deficit		0.86	2.53	4.42	4.78	3.90	5.07	2.19	1.56

Source: Bank Estimates

Private investment

More innovative use needs to be made of private funding to bridge the infrastructure financing gap between what is needed to sustain economic and social growth, and what is likely to be available from public and donor/loan finance. Mongolia has been less successful in attracting private finance than other developing countries, not only because the low density of demand makes few projects potentially profitable using conventional private financing methods, but also because; (a) the institutional framework is still being developed; (b) there is a lack of confidence in the legal system to protect investors interests, and; (c) a lack of cooperation between investors in various projects that would make use of the same transport infrastructure. In addition, the government has been reluctant to enter into joint ventures with private investors that might make some projects feasible, preferring to make a clear distinction between public and privately financed projects.

Opportunities for private investment in the railway are inhibited by the present joint-ownership of the assets with the Russian railway. Conflicts of interest between the joint owners are not only unsustainable in the long-term; they also militate against any agreement to allow private operators to take part in MTZ's operations. If this obstacle could be overcome, coal train operations could be concessioned as could container trains, and railway traction and rolling stock assets could be assigned to a leasing company for use by MTZ and private train operators. Either type of agreement could bring an injection of private capital in an investment-starved railway. If the ownership issue could be resolved, the chances for making such arrangements are quite good, given the potential profitability of many parts of MTZ's operation.

Summary of impact of financial resources

While some large rapidly industrializing countries have managed investment rates close to the 3.5% needed to implement the investment program identified at the close of the previous Chapter, this rate is unsustainable for a vast, lightly populated, low-income, land-locked country. It is almost four times greater than the percentage invested in the early 1990s. Further prioritization will be necessary to bring the total planned investment down to a sustainable level of about 2.5% of GDP. This can only be done on the basis of a more complete analysis than possible here, preferably using a multi-criteria assessment method similar to that used in the first stage of the Roads Master Plan.

Physical resources

Mongolia has an abundance of most of the materials needed for the construction of transport infrastructure, although they are not always available close to where they are needed. The main exceptions are timber required for wooden railway sleepers, tensile steel needed for concrete railway sleepers, and bitumen needed for road paving.

Roads

Paved roads need crushed stone for construction of their base and bitumen or concrete for their surface. Although appropriate mineral for crushing is widely available in the center and north of the country, it is sparse in the south and transport costs are prohibitive. Fortunately, the bearing strength of the soil in the south is such that less depth of base is required. Even for a major program of road paving in the south, availability of suitable material would be a serious problem. For an estimated program to pave 400km of road paving over ten years in the dry south of the country, construction of an average depth of 10cm

would require about 4,000m³ of crushed stone per year. If all the proposed 2,100km of priority road for paving were to have a bitumen surface, with an average depth of 7cm, the total requirement would be for almost 50,000m³ at a cost of about US\$18 million. If spread over the ten-year investment period, the annual cost would add about 1% to the total merchandise imports. Although technology for building concrete road surfaces is not well-advanced in Mongolia, it is possible that foreign contractors who might build most of the paved network would import the technology. There would be no shortage of materials if the paved roads were built with concrete pavements, and while this would also simplify the problem of maintenance, it would also increase the initial cost by up to 50%.

Local roads need mostly timber for bridge construction and maintenance, and this is available in adequate quantities in most of those parts of the country where the bridges are needed, although the timber is too soft for use on more intensively used bridges.

Railways

Wooden railway sleepers are unlikely to be used any more on a large scale in Mongolia. Replacement of most existing wooden sleepers will almost certainly involve the import of reinforced concrete sleepers, or at least the steel for their local manufacture. The estimated need for new sleepers is about 550,000 over the period up to 2004 and a further 500,000 in the following ten years. At a cost of about US\$100 per sleeper (including associated components such as fittings and anchors), of which about one third is for reinforcing steel, this would require about US\$18 million in foreign exchange in each period.

Maintenance of rail track also requires large volumes of ballast, which should be renewed about every seven years. With a network length of about 1,600km and an average ballast requirement of about 1m³ per linear meter of track, there is an annual need for about 250,000m³ ballast, about 1,000m³ per working day. At least 500km of track are in the south of the country where suitable material is scarce and will compete with road construction for what little is available.

Human resources

In most aspects of transport planning, management and operation, Mongolia has well-trained human resources, but not in sufficient numbers and not with sufficient experience of a market-based system. The main deficiencies are in knowing how to manage commercially based transport operations, including road construction companies (many formed by ex-employees of the Roads Department), all branches of the railway, urban and inter-urban bus companies and trucking operations. All these activities require skills very different to those needed until now. Much of the necessary experience will come with practice, but the process can be accelerated with appropriate training by foreign advisors, and possibly visits overseas to see how transport operations are managed in circumstances similar to those of Mongolia. International freight terminals appear to be an exception, and to be efficiently and profitably managed.

The first step in getting any necessary training is the recognition that it is needed. Although there is some initial reluctance among transport operators, the IDA's experience with urban bus companies is that they welcome training, once its relevance to them is demonstrated. Most future IDA and ADB projects will include resources for training, but these need to be better coordinated than at present. Currently, each new project includes a training program specific to its requirements, but these would be better planned as part of an overall sector training strategy. The two banks need to work together with the MID to determine the overall training needs of the sector and agree on their respective roles in financing them.

A survey of the capacity of the construction industry undertaken for the Roads Master Plan¹³ indicated that there was excess human capacity, since total activity was lower than it had been in the late 1980s. DOR reported that utilization of human and equipment capacity in road construction sector was at about 60%. The proposed level of infrastructure expenditure is several times higher than that achieved in recent years, so even this amount of spare capacity would not be enough. It is probable that overseas construction companies, mostly Chinese, would readily fill any gap in national capacity. In time, if a credible and sustainable higher workload was available, the capacity of the national construction sector could easily be increased.

Developing an investment strategy and framework

The Mongolian transport sector, like those in many developing countries, has not yet developed a strategy for assessing investment priorities. Many projects are not even subjected to standard economic, financial and environmental assessments, an essential prerequisite for a prioritization process. Given Mongolia's vast investment needs and lack of resources, it can ill afford the luxury of time that has been available to other countries to establish a prioritization procedure. Making the best choices of investments is even more important in Mongolia's unfavorable circumstances than for other countries that do not face so many needs and constraints on satisfying them. A concerted effort by the Mongolian government, assisted by the major multilateral lenders and perhaps private investors, could provide the framework and tools for an adequate investment decision-making strategy. This should include a standard investment appraisal framework and a project prioritization process, perhaps based on a multi-criteria approach developed from that used in the first stage of the Roads Master Plan, but applied to all transport sector investments.

¹³ Mongolia: Institutional Strengthening of the Roads Sector, Volume III, N.D. Lea International for the Asia Development Bank, March, 1997

Chapter 5

Application of the Strategy to specific policy issues

The main elements of the Strategy are to: (i) increase competition as a means to increasing efficiency; (ii) use pricing of infrastructure and services to allocate demand efficiently, and give better signals as to where investment is needed; (iii) reduce regulations, but make those that remain a more effective part of competition policy; (iv) secure an increase in public funding for transport, getting the maximum economic and social benefit from what is available, and leverage more funds from the private sector, and; (v) revise the institutional framework to one more appropriate to a market oriented transport sector. The impact of these Strategy elements can best be seen by their application to the specific transport sector issues identified in Chapter 2.

International trade corridors

Russia is the origin of half of Mongolia's imports and the destination of one third of its exports. For the remainder, Mongolia depends almost exclusively on the rail served corridor through China. Application of the principle of competition to the development of trade corridors suggests that Mongolia should develop at least two corridors, one through each neighboring country and at least one by each transport mode. This will have at least two worthwhile advantages. First, competition between the ports and transport operators in different countries should result in better services for Mongolian traders, and second; Mongolia is less likely to suffer from an interruption to transport services within one of the neighboring countries, such as occurred in the summer of 1998 with Russian railways.

At present, only a small proportion of the freight using the corridor through Russia goes to third countries, mostly in Europe. In contrast, the route through China is used mostly for trade with countries other than China. Although China is Mongolia's second largest trading partner after Russia, the volume of physical trade is still small for such a large neighbor with a large population and heavy industry relatively close to the frontier. The problems of rail capacity in China suggest that it would be unwise for Mongolia to continue depending so heavily on rail access to Tianjin as its principal trade route. It is strongly recommended that the rail route to Vostochny be developed as an alternative rail-based export route. While the distance is much greater than to Tianjin, there are many factors that combine to make this an attractive proposition for Mongolia. These include: the short sea distance to regional markets in North East Asia; the lack of congestion on the Russian railway; the desire of Russian Railways (RR) and the private operator of the container service on the Trans-Siberian Railway (SeaLand) to increase its traffic, and; the dynamism of the port authority in Vostochny, and its willingness to develop a Mongolian free-trade zone in or close to the port.. Both commercial and diplomatic channels with the relevant central, regional and municipal governments in Russia could be used to

In an attempt to overcome the lack of rail capacity in China, the main freight forwarder looking after Mongolian interests in China (the Inner Mongolian agency of Sinotrans) has purchased a small fleet of trucks to transport urgent containers more quickly between the port and the border. This initiative will take advantage of a change in transport policy in China, where priority is being given to construction of a major inter-provincial road network that will increasingly be used for the transport of long-distance and high-value industrial products. The existing small Sinotrans container terminal at Baotou in Inner Mongolia will soon be joined by a larger one with a capacity to handle more than 100,000 teu per year. As most of the containerized freight at Baotou is for export, while that from Mongolia is for import, there will be large synergy gains by combining the two container flows to minimize empty backhauls for both. Mongolia should arrange with the Baotou terminal operators to take advantage of this opportunity to create an alternative route for its trade through Tianjin. Recent initiatives to improve diplomatic and

commercial relationships between the two countries could provide a suitable framework for furthering changes in transport arrangements that will benefit them both.

Improving the road from Ulaanbaatar to China

Applying the strategy of increasing competition in the China corridor does not necessarily mean that the road from Ulaanbaatar to the border should be built immediately. Given the potential importance of this project to future of Mongolia's economic development, a strategy for development of the road should be made. The strategy, which might take up to six months to prepare, would address:

- the probable impact of increased competition from road transport on the volume of international trade.
- the urgency of constructing the road. The ADB assessment of two sections of the road shows only a marginally acceptable economic benefit, but some of the potential benefits are omitted from that evaluation since it only takes account of current road traffic. No assessment has been made of the third section. If the road is considered as a single project, more benefits would be attributed to it, possibly increasing the priority for its construction.
- the order in which the sections should be constructed. While many of the benefits will not be realized until the road is open for the whole distance, it is possible that most benefits to international trade would come from first building the section from Sainshand to Zamyn Uud).
- how it should be funded. It would be a great risk to start construction without having a firm idea on how the whole road will be financed. It will require a blend of public and private funding, since neither alone can provide enough.
- how it will be operated, in part dependent on how it will be funded. A toll road would have very different economic and financial impacts to a road with free access, some of them positive, others negative.
- what its environmental and social impacts would be, and how the adverse effects could be minimized.
- what its impact on railway finances would be, since it will inevitably attract some of MTZ's most profitable international traffic.
- resolution of outstanding border transport issues with China. Until Mongolian and Chinese trucks are able to operate in each others' territory, the benefits of the road will be severely constrained.

Road and rail competition

If it is not to be a toll road, competition between the road and the existing railway would be inequitable, since road users would be exempted from paying for their basic infrastructure, while railway tariffs are set to cover its full infrastructure costs. Creating competition for a monopolistic railway is a desirable objective, but if the competition is "unfair", the result could be worse than the problem it is designed to

resolve. In many countries, construction of an untolled highway parallel to an existing railway that must cover its full costs has signaled the beginning of the end of the railway as a financially self-sufficient concern. International freight (excluding transit traffic) accounts for about 40% of MTZ's revenues, and about 25% of that is susceptible to road competition, so MTZ stands to lose about 10% of its gross revenue if the road is built. However, existing international rail tariffs are much lower than would be feasible for road transport even without an infrastructure charge, so the road competition would have to come through better quality of service and faster transit times. So the impact of the road on inter-modal competition is an issue that needs to be understood.

If the real objective of building the road is to achieve a better quality of service to users through providing competition to MTZ, there is a much less costly and more efficient way of bringing about a similar result. A private concession could be awarded for the operation of a train service of container wagons or TOFC (trailers-on-flat-cars), either on an exclusive basis or providing competition to the existing conventional MTZ wagon-load service. The present number of containers is still very low, about 10,000 per year, and could be accommodated on two weekly trains of 30 wagons (one MTZ and the other private). There is in addition about 100,000 tons of wagon-load and less-than-wagon load freight carried by MTZ and susceptible to competition, equivalent to about another two trains per week. So there is already just about enough traffic to support two competing train operations in the corridor, but even if the concession were for an exclusive service, replacing that of MTZ, at least competition for the concession would be an incentive for greater attention to user's needs than the present MTZ monopoly.

This competition "for the service" rather than "for the market" would require MTZ to use international competitive bidding to award a management contract to an experienced container transport operator for its existing service. This practice has been widely and successfully applied in transport operations throughout the world. Implementation of either of these options would be desirable anyway and be feasible within MTZ's present ownership structure. The proposal could be implemented in several ways. One viable option would be for the concessionaire to lease the locomotives and wagons from MTZ, and to pay an average cost for the use of the infrastructure (estimated at about US \$ 0.10 per teu-km). Without the need to amortize investments, the concession could be quite short (seven or ten years), by which time if the traffic grows as expected, completion of the road might be justified.

International integration

The Mongolian government has been striving to negotiate with its neighbors to gain better access to ports through trade corridors, utilizing the Global Framework for Transit Transport Cooperation between Land-locked and Transit Developing Countries, endorsed by the General Council of the United Nations in 1995. At a recent Consultative meeting of Land-locked and Transit Countries held in Ulaanbaatar, an Action Policy Plan was adopted with nine key elements. Implementation of this plan and observance of the principles behind it would go far in addressing Mongolia's problems of accessibility to the rest of the world. However, it will not produce results quickly and other measures are needed to achieve more immediate benefits.

The signing of this agreement by Mongolia, China and Russia marks a significant first step in Mongolia's long journey to realize its aim of better regional integration, but it needs continued and determined pressure to achieve specific results. The best chances of integration with China will come through the possible use of the new Inland Container Terminal at Bautou. Use of this terminal would not require any new actions other than for China to allow containers to travel less than 200 km in bond by rail from Zhamyn Uud to the terminal. China does not yet have any international agreements that allow the interchange of road vehicles with neighboring countries. Given that negotiations for this type of

interchange take a long time even when both countries are strongly in favor, Mongolia should start now seeking such an agreement with China. The best forum through which to initiate such negotiations in the UNCTAD, which has already contributed through its support of the Commission on land-locked countries.

Containerization

Only a small proportion of Mongolia's international trade is containerized. In 1997, fewer than 5,000 containers entered and left Mongolia (about 10,000 container movements), a very small number for a population of over 2 million. There are many reasons why the full potential has not been reached, not least being the long transit time from a deep-sea port, and the lack of return loads. There are adequate container handling facilities in Ulaanbaatar and at the border where containers must be transferred from Chinese to Mongolian rail wagons. However, China Railways does not give priority in allocating its scarce wagon resources to Mongolian requirements and Chinese customs and port agencies are also held responsible for excessive delays. Clearance of freight in Tianjin port can take a week even when all the documentation is in order and provided on time. In addition, wagons usually take more than another week to travel to Erenhot, and another two days to reach Ulaanbaatar, resulting in an average speed of about 8 km/hr for the whole trip. In addition to wagon shortages, China Railways suffers from a lack of track capacity even for its own traffic, and has little incentive to give priority on its overloaded network to Mongolian freight. However, forthcoming coming changes in the organization of Tianjin port, including the establishment of competing container terminal operators, should improve the service offered to Mongolian traders.

Although the UNDP agreement on transport for products to and from land-locked countries includes a policy of nondiscriminatory tariffs, China Railways charges about twice as much per km for containers to Mongolia than its own very high tariff for domestic container movements. The result is that the charge to move a container from Tianjin to Ulaanbaatar, a distance of about 1,700km, is about the same as from Vladivostock, a distance of more than 3,500km. The overland cost to Ulaanbaatar from Tianjin at about US\$1,750 per TEU can be almost as much as that for shipping to Tianjin from its overseas origin (about US\$450 from Japan, up to US\$1,200 from Europe, and US\$1,500 from the US West Coast). If a competitive corridor through Vostochny can be set up, the new container terminal operators in Tianjin might respond with better services and a more competitive tariff arrangement with China Railways

The first step on a long journey

We, the representatives of the Government of China, Mongolia and the Russian Federation, as well as of UNDP and UNCTAD, who participated in the North-South East Asia sub-regional consultative meeting of landlocked and transit countries, wish to reiterate that lack of territorial access to the sea, aggravated by remoteness and isolation from world markets, prohibitive transit costs and risks, impose serious constraints on the overall socio-economic development efforts of landlocked developing countries

Transit Transport Policy Issues

In order to achieve the fundamental transit transport policy objectives, which the countries in the sub-region have pursued and are determined to continue to support, we recommend to undertake every effort to implement an action policy plan, the main elements of which are as follows:

- 1. Strengthening and improving the current bilateral transit agreements by broadening their scope and content and adapting these agreements to changing transit needs and situations as appropriate;*
- 2. Promoting a comprehensive sub-regional legal agreement that is designed to harmonize transit regulations, procedures and documentation and to establish institutional support and monitoring mechanisms.*
- 3. Promotion of the adherence to international transit conventions and agreements related to transit trade and transport, which will serve as an instrument to further enhance the commitment of the countries in the sub-region to strengthen international cooperation in these important areas.*
- 4. Further development and improvement of institutional mechanisms at the national, bilateral and sub-regional level to monitor the implementation of agreed transit arrangements and agreements.*
- 5. Promoting the development of alternative routes in order to provide Mongolia flexibility in the movement of its transit cargo to different available ocean points taking into account the costs and benefits of such investments both for Mongolia and the transit countries involved in such schemes;*
- 6. According public sector transit transport organizations greater autonomy and scope to operate on commercial criteria, taking into consideration the specific features of the development of national economies;*
- 7. Encouragement of production and trade patterns, which promote sub-regional trade expansion, that will benefit the countries in the sub-region. Through such exploitation of regional trade potentials, Mongolia will reduce its heavy dependence on external markets and consequently lessen the heavy burden of transit transport costs;*
- 8. Promoting the use of modern technology in transit operations that will reduce environmental damage to the sub-region;*
- 9. The UNCTAD, UNDP and other relevant regional organizations are requested, in the development of the Euro-Asian transit transport infrastructure to undertake a study on the shortest land route from Europe to the sea of Japan.*

Ulaanbaatar Memorandum of Understanding, May, 1997

Transit traffic between Russia and China

Mongolia's role as a trade intermediary between its large neighbors is growing and has the potential to become a major contributor to the national economy. Mongolia is also increasing its role as a transit route for direct trade between Russia and China. This is mostly for bulk mineral movements, but also for individual Russian traders who buy products in northern China and sell them directly from the train as it passes through Russia. In western Mongolia, some Russian traders now travel through Mongolia by road to China's Xinjiang Autonomous Region for similar trading purposes.

While these opportunistic traders do not yet contribute much to Mongolia's economy, they do show that Mongolia could have an important intermediary role to play at a more formal level. The present traders thrive on informal transport services, but better transport infrastructure and services will encourage legitimate trade to develop more quickly. Both China and Russia have realized the potential of direct trade between them, and have recently opened new transport links that would avoid the need to transit through Mongolia. These links might however involve higher total costs than the transit route and as each neighbor becomes more market oriented, Mongolia stands to gain through the potential lower cost of its route. However, making large investments to capture this traffic would involve risks that should be avoided given the scarcity of investment funds.

The Tumen River Economic Development Area

The Tumen River Economic Development Area (TREDA) project is coordinated and supported by the United Nations Development Program on behalf of the five countries that are signatories to the October 1991 Agreement (South Korea, North Korea, China, Russia and Mongolia)¹⁴. The project is aimed at improving the concentration of industry, the level of employment and the standard of living of people living in the TREDA, and to create business activity beyond the borders of the defined zone. The zone is the area within conceptual boundary lines drawn from Chongjin in North Korea, through Yanji in China to Nakhodka in Russia. It stretches about 300km along the seaboard and extends about 100km inland. The current population of the area is about 3 million and it is expected to increase to about 10 million by 2020.

The area does not come within 500km of the Mongolian border. Its principal significance to Mongolia is as an export destination for potential mineral and oil production in Eastern Mongolia where there are believed to be abundant deposits of coal and rich deposits of polymetals (mostly zinc, molybdenum, and cadmium), uranium, gold and tungsten, and exploitable reserves of oil have been proven. A recent study undertaken for the Infrastructure Group of the TREDA Program¹⁵ estimated the construction cost of an improved road from Choibalsan to Vostochny at about US\$580 million, an average cost of about US\$1.5 million per km. A similar study of rail access estimated the cost of completing a rail link in the same corridor as about US\$1 billion¹⁶. Such investment in either mode could only be contemplated once the mineral deposits had been confirmed and market analyses demonstrated the feasibility of their extraction, including the costs of the rail links. Such conditions are unlikely to be met within the next ten years.

¹⁴ Tumen River Area Development Programme Agreement, October, 1991

¹⁵ Study of the Highway Connection between Mongolia and ports in the Tumen Area, Viatek Ltd. For UNDP, March, 1994

¹⁶ Pre-feasibility Study into Alternative Routes for a Railway linking Mongolia and the Tumen River Development Area, SwedeRail Ab, for the Tumen River Area Development Program, December, 1997

Although the interests of Mongolia are marginal to the those of the TREDAs, and the likely impact of any developments are a long way in the future, the GOM should continue to participate in TREDAs meetings and to contribute to its studies and deliberations. Nevertheless, it should also be cautious of the assumptions made. Many of those made so far in its studies and deliberations are unrealistic. They tend to exaggerate the benefits of potential investments and fail to take account of recent infrastructure developments in Russia and China that would significantly reduce the benefits of the projects under consideration. However, some TREDAs projects that require no investment by Mongolia might be beneficial to its international trade. It has recently (September, 1998) been announced that talks have started on possible Japanese funding for a US\$200 port development at Zarubino (Russia). While primarily aimed at Russian, North Korean and Chinese exports, if built, the facilities would provide another trade corridor for Mongolia.

Internal integration

The argument was made in Chapter 2 for using transport infrastructure to help preserve the integration of the national territory, of reducing the tyranny of isolation and bringing more people into the market economy. Reducing the cost and time of transport, the essential measures for achieving these objectives can better be achieved by improving infrastructure than interfering in the market provision of services. With poor roads, transport costs in Mongolia can contribute up to 30% of the market cost of animal products and up to 40% of that of minerals for export. With improved gravel roads, these costs can be reduced by up to 15%. This would be through the ability to use larger trucks, with lower maintenance costs, fewer breakdowns and less frequent accidents attributable to infrastructure deficiencies, and shorter travel times that result in higher truck utilization. Gravel rather than unimproved earth roads also bring a higher value to the products transported and make new products commercially viable. For example, cashmere can lose up to 10% of its market value in transit on earth roads, through contamination by dust and other airborne particles, and meat and goat milk production could be made viable. The benefits of small-scale investments, combined with expenditure on maintenance to sustain the infrastructure, can in most cases be easily demonstrated to outweigh the costs.

In Chapter 5, the cost of improving the southern route of the road to Western Mongolia was estimated at just over US\$42 million, although only US\$17 million of that would be for upgrading the earth tracks in the central and far west, the remaining US\$25 million being for reconstructing the neglected paved road as far as Arviakheer. Completion of the project in the whole corridor to Hovd and Ulaangom should have a high priority. The first part because further neglect of the paved road will result in an eventual even more expensive reconstruction, while upgrading the second part is needed to bring the more distant communities within reasonable road travel time and cost of Ulaanbaatar. In addition, this road links six aimag capitals with a total projected population of more than 200,000 by 2010¹⁷, further increasing national integration. Upgrading the eastern part of the highway as far as Choibalsan while important, does not have the same priority. The first part of the heaviest transited section from Ulaanbaatar to Baganuur is already being paved, but the second section of about 50km is now in urgent need of upgrading to paved condition. The unimproved earth road to Choibalsan through Ondorhan is more transitable than those in the west, passable throughout the year and therefore less in need of upgrading. Integration of the more densely populated region in the center west is already being improved through the on-going IDA Transport Rehabilitation Credit. That of much of the northern region will be improved with rehabilitation of the gravel road from Erdenet to Bulgan.

¹⁷ Second Roads Development Project, Interim Report, May, 1998. Table 9.5.1

Present road passenger tariffs, both for regulated formalized bus services and informal, unregulated transport, are higher than affordable for many potential passengers. A single roundtrip fare to Ulaanbaatar for distances over about 1,000km represents more than 20% of the monthly income of many herder families. High transport costs for some animal products also represent up to 20% of the market value, significantly reducing the income of the producers. The best way to reduce transport costs is to improve infrastructure, thereby allowing the operation of larger vehicles and reducing vehicle operating costs. A truck-trailer combination using a Zil 130 truck, operated over an adequately maintained basic gravel-surface road has cost per ton-km less than 50% of that of the same truck operated over a badly maintained earth road.

Aimag and som roads

Many aimag roads could be improved at relatively low cost to bring the benefits of all-weather travel to presently isolated communities. Roads that allow the transit of vehicles larger than jeeps, particularly closed trucks, would allow animal and agricultural products to maintain more of their value during transport to processing or exporting centers. This would make it possible for a higher proportion of the final product value to find its way back to the producer. The improvements would be at places where drainage or river crossings are a problem. It would not be necessary or justifiable to upgrade whole sections of road to formed earth standards. Responsibility for the proposed spot improvements is that of the aimag or som administrations, but they lack the financial resources and technical skills to implement them.

It is proposed that aimag and ger roads in the urban areas roads be administered separately from other roads, but that they should mostly be financed from the Transport Fund. For both types of roads, additional funding would come from local communities. Allocations from the Fund could be used by any aimag or som administration that complied with the project requirements, including the submission of an acceptable project execution, financing and maintenance plan. The Fund would finance up to 80% of the cost of an approved project, with the sponsoring som, aimag or municipality providing the remainder in the form of labor and/or local materials. The project cost would include technical assistance from the Department of Roads for design and supervision. An amount equivalent to at least 10% of each project cost would be allocated to set up a local fund at the Department of Roads, the interest from which would finance maintenance of the works to be constructed. A simple version of such a scheme was established under the World Bank's Poverty Alleviation for Vulnerable Groups Project, and the administrative systems it established could be used by this new scheme.

Air transport services

Despite these investments, some remote aimag capitals will remain largely inaccessible from Ulaanbaatar. They presently benefit from MIAT air passenger services, but with the withdrawal of the subsidy for their operation, fares have increased to such a level that few potential passengers can afford to travel. With MIATs aircraft for domestic services rapidly approaching the end of their economic lives, a decision must soon be taken on whether and how to replace them. The situation is complicated by the intended privatization of MIAT, and the unwillingness of potential purchasers to take on an obligation to continue operating these services.

The low level of demand for many domestic air services would make their commercial operation unsustainable. Rather than oblige MIAT to operate them, it would be better to apply the principle of "competition for the market" and for the routes to be franchised with minimum service requirements, and the possibility of negative bids. These routes would be cross-subsidized from the revenues of the positive

bids for the profitable routes. Existing aviation law is vague on what regulations a foreign-based operator must comply with¹⁸, and even whether a Mongolian operator other than MIAT can operate (although at least two of them do offer services). Bidders would be free to propose any aircraft type and service pattern, so long as they satisfied the frequency specifications and provided acceptable guarantees for operational safety and maintenance standards. Maximum tariffs would be set on a social basis, perhaps equivalent to a proportion of the bus fare, such that an average family in each aimag capital could afford one return air trip to Ulaanbaatar every three months. If all domestic routes of more than 400km were to be concessioned, all Mongolians would be within ten hours road or air travel of Ulaanbaatar at affordable tariffs and with minimum subsidy, a significant reduction in isolation at a minimum cost to the state.

Urban transport

The main issues in urban transport are; (a) road access to low-income urban communities; (b) provision of acceptable public transport services, and; (c) preventing traffic congestion, more easily addressed now rather than when it imposes high costs on urban movement.

(a) Local Road Development

Improving of local roads within ger areas has not been a priority for municipalities. Although the cost would be low and the benefits very high, the issue is seen as a local one. The main benefits would be better penetration of bus services, improved conditions for pedestrians, more regular water supply by tankers and better waste disposal.

In some cities with similar circumstances (Santa Cruz de la Sierra in Bolivia, and many small cities in Mexico, for example) a small revolving fund has been established to finance minor road improvements. Local community groups have access to the fund to contribute towards the cost of a simple low-cost road paving systems. The method of paving is adapted to local circumstances and materials available, and uses supervised but unskilled local labor. The cost is rarely more than about US\$2,000/km. Simple standard designs are often provided free by the municipality, and construction supervision charged by them at cost. Manual labor is provided as an equity contribution by the local community, which often also bids the proportion of materials cost it would be willing to finance from its own resources. Loans from the fund are charged at low-interest and repaid over three to five years by members of the community. As the funds are repaid, they are available for re-lending to other communities. Such a scheme is recommended for Ulaanbaatar, Darhan and Erdenet. The seed money for the fund would come from the proposed Transport Infrastructure Fund.

With an average cost of US\$2,000/km, an average of 10 plots/ha, a repayment period of 5 years and interest at 10% per year, the cost per plot would be less than US\$3/month, only about 4% of the monthly income for an average ger household. Collection of payments would be the responsibility of the community group that took out the loan, so the administration cost to the municipality would be minimized. Experience with similar schemes has shown a very low rate of default, either by individual contributors (subject to strong community pressure) or by the community groups to the municipality. Each community group would continue to receive interest on 10% of the amortized loan amount to finance maintenance of the roads, often the weakest point of such schemes. Since it is the local community that will suffer most if the roads are not maintained, there is a high probability that the work

¹⁸ Legal ramifications of Foreign Aviation Operations in Mongolia, Michael C. Walker et al, University of Florida, Internet:http://userpage.fu-berlin.de/corff/im/Landeskunde/Air_and_Law.html

will be done so long as the finance is available. A fund of US\$5million would finance the paving of about 2,500km of road every five years, and give the possibility of changing the characteristics of the neighborhoods served by the new roads.

(b) Public transport

Attempts to reform urban bus operations in Ulaanbaatar by creating separate companies out of the former single municipal operation have only been partially successful. They have succeeded in eliminating the direct municipal subsidy to cover operating costs, but not in eliminating or even significantly reducing excessive costs or revenue losses through non-payment of fares by a substantial minority of passengers. Urban bus operations will not be financially sustainable until bus operators are compensated for the costs of transporting large numbers of passengers with genuine free-passes issued by various national and municipal government agencies, and they have stronger legal powers to deal with holders of fraudulent passes and passengers who simply refuse to pay. Increasing tariffs is not a viable solution as the elasticity of demand (or for payment of fares) is higher than one, so that the point of decreasing total revenues from a fare increase has been reached. Creating competition between operators holds out the best chance of creating a viable and self-sustainable public transport service that also meets the needs of the urban population. Making bus operating staff directly responsible for the finances of the services they operate, by introducing an effective level of competition between them is the first action that needs to be taken. This is not possible with the present institutional structure, so the services need to be organized in a different way.

The system that has achieved most success in circumstances similar to those of Ulaanbaatar is for each route to be operated under a route license. These would be issued to cooperatives or companies that operate either a single route or a small number of complementary routes. The initial routes would be specified by the municipality as the regulating agency, but potential operators would be free to offer additional or alternative routes. Negative bids or different service conditions would be allowed where bidders did not think that a route would be profitable under the specified conditions. However, any positive bid that met these conditions would be accepted in preference to a negative bid. It would be expected that any cost to the municipality of accepting negative bids would be funded from the revenues from the positive bids for other routes.

The licenses, with a life of about five years, would specify the minimum frequency and quality of service to be offered. Any entity that satisfied minimum conditions of financial security, operational experience and guarantee of providing enough vehicles to satisfy the license conditions would be allowed to bid. Fares would be determined by the municipality, and the bid criterion would be the price paid for the route license. Alternatively the fare proposed by the bidder would be the bid criterion, and the price of a route license would be determined in advance by the municipality.

The existing vehicles would be assigned to a leasing company that would offer them to bidders for the route licenses. However, bidders could use other sources for vehicles, and might propose using different size buses, or even a combination of different size vehicles within their fleet. In other countries that have introduced similar systems, commercial credit has been available for purchasing mini- or midi-buses, but this might not be possible in Mongolia until the banking system is further developed and the financial stability of the potential borrowers is more certain. In the short-term at least, leasing buses from the holding company might be the only way the bidders could ensure enough buses to satisfy the license conditions.

The existing maintenance depots would also be operated on a commercial basis, with the bidders for route licenses being free to bid for these concessions as well, or to make contracts with those who do bid for them to maintain their vehicles. An alternative scheme would be for the maintenance depots to be part of the same holding company created to lease the buses. The bus leases would then include maintenance by the holding company. The transition from the present to the new system could be managed in sequence of bus companies, so as not to put at risk the whole system at one time. Bus Company Number 2 would possibly be the first candidate since BC No.1 has a fleet of buses provided by a Japanese donation that apparently limits their operation to public services. It might take time to confirm with the donor that passing the vehicles to a public holding company for lease to private operators complied with this condition. The first set of routes could be in operation within six months of a decision being made to implement the new system.

(c) Traffic congestion and road safety

Until recently there has not been a problem of traffic congestion or traffic generated air pollution, but through the rapidly motorization of the urban population these are becoming issues that need to be addressed.

In the long-term, traffic congestion should be addressed through applying market-pricing principles to vehicle use. Controlling car ownership in urban areas is easier but less equitable and less efficient. Sophisticated policies of charging for road use are not needed in Mongolia and with a few well-publicized exceptions, have yet to be used anywhere else. Parking charges, combined with vehicle taxes related to vehicle use (for example, use of a car only at weekends would require a lower annual tax than for daily use) would be more appropriate. These policies take time to evolve, and in the short-term traffic management measures should be sufficient to avoid incipient traffic congestion. These do not require economic or financial measures, but rather simple engineering such as traffic signaling, lane marking and enforcement of basic traffic regulations.

Air quality problems have been largely attributed to imported cars that failed to satisfy European emissions standards, and have led to the introduction of a simple tax based on the age of import of cars. While relatively crude, this is likely to achieve its purpose of preventing the import of the least environmentally friendly cars. In the longer term, a self-financing scheme to test the emissions of all cars each year would be administratively feasible and more effective, if less market oriented than the present system, unless vehicles were to be taxed according to the rate of emission indicated by the tests

Mongolia has one of the worlds highest road accident rates, when measured as the number of fatalities per million vehicle kms. This high rate is attributed to a combination of poor roads, low levels of driver training and a low level of vehicle maintenance. The proposed investments, particularly in road maintenance, will go far in addressing the first of these, but the second will require a sustained education program in road safety. The third cause would be largely addressed by the proposed system of regular safety inspections of vehicle, which would be combined with the emissions tests.

Railway restructuring

Once the privatization of MIAT is completed and urban public transport has been transferred to owners cooperatives, MYZ will be the only significant transport operation remaining in the public sector. Without a restructuring of its relationship with the state as well of its own internal organization, MTZ will be unprepared to face new challenges in some of its most profitable markets:

- energy producers will look more to building new power stations close to the coal mines that supply them.
- natural gas will become a viable alternative to coal as an energy source.
- the road to the Russian border is being rehabilitated, making road transport a viable alternative to rail.
- construction of paved roads south of Ulaanbaatar will create strong competition in this corridor for non-bulk products in this corridor.

If it loses traffic in these markets, and fails to contain its costs, MTZ will quickly become dependent on government finance to cover its operating costs as well as its investments. This would not only place yet another strain on public revenues, it would detract from the railways' progress to commercial independence and contribute to inequitable competition with road transport just as the benefits of such competition would become apparent.

The present joint-ownership arrangement with Russian railways is a barrier to restructuring the role of the railway with respect to the state, but progress on this issue should not be used as an excuse to delay restructuring of MTZ itself. The first action should be to separate non-railway activities from MTZ's core operation functions, and put social services to railway staff and their families onto a more market-oriented basis. This has already been agreed in principle but not so far implemented¹⁹ and should be a precursor to the complete separation of the non-core functions from MTZ's responsibility. Another urgent action is to implement a new accounting system, to indicate more clearly the financial performance of different parts of the operational railway. This is due to be implemented under the ongoing IDA Transport Sector Credit, but progress has been slow. When functioning, this will allow a system of internal charging to develop, with various departments of the railway charging each other for the services they provide. However, the recipients will have the freedom to go outside MTZ if that will result in lower prices. Where such competition exists, the result is usually a reduction in cost by the internal supplier, or failing that, a service obtained from outside at a lower cost than is possible internally. This process of "out-sourcing" of activities has been used successfully in many railways and other providers of public services.

A more controversial and more difficult internal restructuring would be to separate responsibility for investment, maintenance and supply of railway infrastructure from that for the operation of train services. This can be done as a simple accounting measure (a minimum requirement under current European Union regulations for its members' railways) but is more usefully achieved as a functional separation as well (as most of the European railways are actually doing). For MTZ, with a relatively simple infrastructure and operating system, this should not be difficult. Among the many advantages would be an ability to determine what infrastructure and maintenance can be justified.

More significantly, once it has been achieved, it only a small step to allowing private trains to be operated. These could be by joint-ventures with MTZ or completely independent operators. Container trains to China and Russia could be operated privately, and coal trains could be operated by the mines, electricity generating companies or contracted to third parties. To avoid the need for private operators to purchase equipment for their operations, locomotives and wagons could be leased from MTZ, or from a holding company created to manage all its traction and rolling stock (and this itself could be privately

¹⁹ Mongolian Railways; Restructuring Plan, Transurb/Hickling for the Ministry of Infrastructure Development, April, 1997

managed). Operation of gauge transfer facilities at Zamyn Uud, and of intermodal transfers between road to rail transport (such as those needed for oil transfer at Zuunbayan), could also be privatized.

If these largely internal measures not requiring any legislative or regulatory change are not implemented within a short time, say two years, then an alternative and more fundamental change will be needed. This should be the concessioning of the operation of the railway as a whole to a private operator. This might require a prior action to separate the existing assets of the railway into a separate holding company, and for the revenues from the concession (either an initial payment for use of the assets of the holding company or an annual charge for their use, or both) to accrue to MTZ. This should avoid any conflict with the existing joint-venture agreement with Russian railways.

Road Maintenance

Mongolia applies a market approach to funding road maintenance, under which most financing come from road user charges. However, the way in which it is being applied will make the strategy unsustainable within a very short time. The Road Fund as presently constituted does not work. Its revenues are less than half what is needed to satisfy its expenditure obligations. The Fund is mostly being used for new construction and deferred maintenance - funding for routine and periodic maintenance is almost non-existent. So present road users are financing the problems created by previous governments through lack of maintenance, and facilities for the benefit of future road users. With routine and periodic maintenance expenditure running at about one tenth of what is needed to stop the condition of the road network deteriorating, future road users will have to finance the additional costs of reconstruction brought about by this short-sighted policy.

Counterpart funding for deferred maintenance and new construction should come from general government revenue and not from current road users. Once roads have been constructed or reconstructed, their routine and periodic maintenance should be financed by the Fund. If this interpretation of the market approach to road financing is followed, after the first round of borrowing for reconstruction, no more should be needed, and all multilateral and bilateral borrowing or donor funding for roads can be used for new construction. Until the existing road network is fully rehabilitated and the funding of road maintenance put on a secure basis, no funds should be allocated to new construction.

Road transport vehicles

Improvements to road infrastructure as well as increasing incomes for urban households are likely to create opportunities for changes in the type of vehicles used for road transport. Russian manufactured Zil 130 have for many years been the core of the road freight transport fleet. They still make up almost 55% of the vehicle fleet and transport an even greater share of interurban ton-km. They have a simple and robust design, and although their expected life is rather short under the adverse Mongolian operating conditions, many of them are kept operating for twelve years or more. They are widely used in rural Russia and FSU states, so the easy availability of spare parts, combined with the low initial cost, maintains their competitive edge compared with more advanced but more expensive and less reliable trucks from other sources.

So far, there has been very little penetration of the market by non-FSU trucks. While this is in part due to an excess of supply following the dramatic drop in demand for road transport in the early 1990s, it is also in part attributable to the suitability trucks such as the Zil 130 to Mongolian conditions, and the lack of any serious competitor from Korea, Japan, China or western countries. However, the situation could soon change as the Zil 130 will soon go out of production and its replacement does not appear to have the

same appeal to Mongolian truckers, either in terms of robustness or price. With increased competition between transport operators, improved road infrastructure encouraging the use of more advanced designs and the financial crisis in East Asian countries making the price of their trucks more compatible with those from FSU countries, the predominance of the Zil 130 is being challenged. It is the more basic and rugged vehicles from China and Korea that are most likely to provide the first challenge to the Zils.

The low level of demand and need to maintain a reasonable frequency of service favors the continued use of small trucks. Even where demand is high enough to justify a larger vehicle, the most cost-effective solution is to use a Zil 130 with a trailer. This can transport a payload of 11 tons on almost all the State roads for most of the year. Construction of a paved road south of Ulaanbaatar to the Chinese border at Zamyn Uud would provide the first opportunity for articulated trucks or truck-trailers to gain a significant market share. This would be enhanced as road and track conditions improve in the rest of the country.

With a large number of foreign manufactures vying to gain a share of the small market, there is a risk that Mongolia will end up with a myriad of truck types, each requiring its own specialized maintenance engineers and stocks of spare parts. This is a luxury that the country can ill-afford at its present state of development, but formal restrictions on the import of some truck types in favor of others can also impose unacceptable limits on competition. There is not very much that the Government can, or should, do to determine the shape of the truck fleet. Unlike the market for urban cars, there is no economic or environmental justification to restrict import of second-hand trucks vehicles, or influence choice through age-related taxes. When there is an over-supply of vehicles as at present, there is a temptation for the government to intervene and provide incentives for the early retirement of older vehicles, and perhaps to encourage the replacement of trucks on a less than one-for-one basis. As with other market interventions, these measures rarely have the desired effect and often end up providing a subsidy or protection to existing operators. One way of reducing the costs of excessive truck types is for trucking companies to coordinate among themselves to limit the numbers of truck types that they import, since they are in the best position to compare the benefits of greater cooperation with greater competition. However, it is sometimes impossible for any one of them to limit their own competitive advantage for their collective advantage, and when this occurs, some government encouragement to stimulate a more cooperative attitude can be advantageous.

Vehicle Construction and Use regulations should be developed and would contribute to increased road safety. Gross vehicle weight and axle load limits will become more relevant as the paved road network is extended. The road damage effects of different axle configurations should be reflected in the charges for annual vehicle licenses. Given that Russian design standards have been used for most of the road network, it would be sensible to use the same conservative vehicle weight and axle load limits as Russia. There has been some pressure for different weight and axle load limits for different classes of road, but these are impractical to implement and are not recommended.

In many other countries with similar road conditions to Mongolia, small truck body manufacturers have designed multi-use bodies for standard truck chassis. In Zimbabwe, a mixed-use truck body has been designed for a chassis that usually has a body for 3 tons of freight. With an appropriate liberal regulatory regime for inter-urban passenger transport, a similar design based on a Zil 130 chassis could be developed for Mongolia, and would provide a low-cost improvement over the unadapted Zil 130s now often used for passenger transport.

The present urban bus fleet is appropriate for services operated by municipal or corporate bus companies, but not necessarily for those provided by private companies or cooperatives. For these, smaller buses suitable for one-person operation are usually more appropriate, particularly if they operate on routes with

a lower density of demand such as those going into ger areas. In the first few years of private operation it will be convenient for the existing bus fleet to be leased to private operators, but in a few years additional and replacement buses will be needed. This is when the choice of vehicle type is likely to be more varied and the standard large, single deck buses presently used will no longer be predominant. As with trucks, government or municipal intervention in the choice of vehicles will be counterproductive. Based on the experience of other countries that have followed the proposed policy, many operators will use buses with between fifteen and thirty seats, mostly manufactured in Korea or Japan. Recent currency devaluations in those countries now make these mid-size buses a feasible option for public transport in Mongolia.

Competition

The previous sections of this Chapter have given some ideas of how greater competition in the transport sector could be stimulated and resulting in more user-oriented services being provided. Given the sparseness of demand for most transport services, competition for licenses to operate services on an exclusive basis for a limited period of time is probably the best way of introducing some competition. This would minimize the risk of services not being provided at all as operators are forced out of business by competition that the market cannot sustain. This policy could be applied to some railway services and should be applied to domestic air services and urban bus services in Ulaanbaatar.

For rail transport, concessioning of the non-bulk services (containers and general freight) to China would be the simplest way to increase competition, in this case competition for the market and not within in it. Allowing other railway companies to operate in competition with MTZs services would introduce a greater degree of competition (within instead of for the market) but will be more difficult to achieve and will have results on MTZs finances that are difficult to predict.

The proposed solution to introducing competition to domestic air services is based on similar reasoning, that there is a need to provide a service but the demand on most routes is insufficient to support more than a single operator. So competition for route licenses as described above would be a suitable way of introducing some competition, as well as resolving the financing of replacement aircraft.

For urban public transport in Ulaanbaatar, the same principle of allowing competition for exclusive route licenses would result in more efficient operations and possibly remove the need for fare increases as well.

Institutional structure

Transport, together with Energy, Fuel, Mining, Urban Development, Housing and Public Services, Communications and Tourism, is a responsibility of the Ministry of Infrastructure Development (MID). A similar institutional structure has recently been implemented, which clearly separates responsibility for strategy formulation and implementation.

Transport policy is managed by a Road, Transportation and Tourism Division (RTTD) of the Integrated Policy and Strategic Planning Department, while implementation of the policy is the responsibility of various transport agencies, including those for Roads, Road Transport, Railways and Civil Aviation. Having most transport responsibilities within one mega-ministry works well to maximize the effectiveness of the scarce professional resources, but reduces the impact that they can have on policy issues since the MID has such a wide range of responsibility. There is an imbalance between the RTTD and some of the sector agencies, and between the sector agencies themselves. By far the greatest part of the transport budget is allocated to roads, so the Roads Agency is powerful and well staffed. It has more planning resources to implement transport policies than the RTTD has to formulate them, so is largely

able to determine its own investment priorities. The other transport agencies, having smaller budgets and staffs, so are limited to their assigned role of implementation. Two significant results of this distribution of power are that non-road issues tend to be subordinated to the interests of the road lobby, and multi-modal transport tends to be neglected. Designation of Roads specifically in the title of the RTTD emphasizes the dominance of road interests.

Without changing the institutional structure of the transport part of MID, a better indication of the multi-modal function of RTTD would come from its being renamed the Transportation and Tourism Division. It would then be better able to deal with the transport sector as a whole. A strengthening of the renamed Division might be achieved by a transfer of some of the highly competent professional staff of the Roads Agency, combined with continued sending of senior staff on overseas courses, funded through multi-lateral and bilateral loans and credits. Among the major issues that the revitalized Division would address would be how to provide adequate access to remote rural areas, with a choice between road and domestic air services, how to improve international transport services, and how to deal with competition between road and rail in the North-South corridor.

Sector Finance

The organization of transport finance is very political, and as such lacks the predictability it needs for an efficient prioritization of projects and for them to be completed on time. Transport investment projects typically take several years to complete and involve a mixture of local and multilateral finance. Funding of the local contribution is now creating problems, with resources having to be diverted from other applications. Without a transport sector investment plan, even one that is flexible and subject to change, planning of financing needs is next to impossible.

Funding of transport investments through a Transport Infrastructure Fund would be one way of prioritizing investments and ensuring that they were all subject to economic, financial and environmental assessments. The Fund would derive its revenues from the fuel surcharge and specific modal user charges including vehicle licenses and airport passenger charges, and could also receive funding from MOF from the national budget. It could be authorized to seek credits, loans, and donations from multi- and bi-lateral sources, and to issue bonds (using its user charge revenues as security), all of these activities with MOF approval. It would fund infrastructure investments in all transport modes –roads, railways and airports.

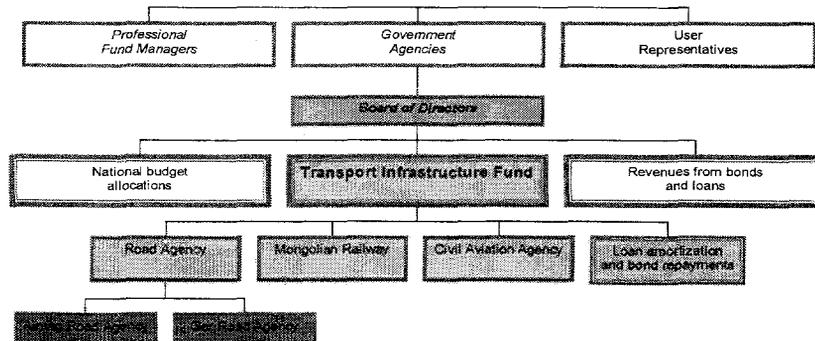
The Fund would allocate its revenues to projects included in a rolling Transport Plan, prepared and annually updated by MID and approved by the Great Hural. One of the main advantages of this arrangement would be that funds would be allocated between modes independently of their own ability to raise revenue. However the sectors' finances are arranged, the greatest problem will continue to be the allocation of insufficient resources between competing worthwhile projects. The more that decisions on such allocations are made within a sector and not a modal context, the more likely are the results to reflect the country's best interests.

Management of the Fund would best be delegated to an independent Board that operates with a mandate to maintain the value of the assets under its charge. Membership of the Board should include MOF and MID (acting as representative of the shareholders), supported by representatives of transport operators and their clients (representing users). In this way, political intervention in the way the Board allocates its Funds would be subject to checks and balances by different interests. Management of the Fund should follow commercial practices as far as possible, with the Board's directors being held responsible for its performance in satisfying its mandate. This method of managing government funds would be new to

Mongolia, but it has been successfully used in many developing countries and is now supported by the Asia Development Bank²⁰ as well as the World Bank.

²⁰ Chapter 4, Second Roads Development Project, Interim Report, Asia Development Bank, May 1998

Structure of Proposed Transport Infrastructure Fund



Several measures could be taken to boost the Fund's revenues in the short term, including: (a) setting vehicle license fees to the level originally approved by the Great Hural (later reduced to half); (b) setting the license fee for the Zil 130 truck to a rate based on its actual capacity (6 tons) and not the lower level (based on 5 tons) allowed as a concession; (c) increasing fuel taxes to their 1995 levels in real terms, and charging them on all transport fuels including those used in railways and domestic aviation; (d) increasing the diesel tax to a rate equivalent to the gasoline tax. Adopting all these measures could generate enough revenue to finance all routine and periodic maintenance in the transport sector and make some contribution to deferred maintenance. It would not be enough to finance any new construction or provide counterpart funds for multi-lateral loans for new construction. Funding for this would need to come from increased private sector investment, preferably from the issue of revenue bonds by the Fund.

Chapter 6

The Role of the IDA, other lending and donor agencies and private investors

There is a high level coincidence in the aims of the international aid agencies and bilateral and other donors in that they all focus on poverty alleviation in one way or another. There is however less coincidence in the projects and policies that they support in furtherance of that aim. Mongolia would benefit from enhanced coordination between these agencies, so that their support is more focussed and their efforts are mutually supportive.

In furtherance of the poverty alleviation, the Country Assistance Strategy of the World Bank Group for Mongolia is based on a four-pronged approach: (a) supporting macroeconomic stabilization; (b) facilitating private sector development; (c) investing in infrastructure; and (d) promoting greater equity in development. While the role of the Group in the transport sector is most closely related to the third of these, it is also relevant to the others. Macroeconomic stabilization is helped by a transport sector in which costs and tariffs are controlled or reduced. Private sector growth will not occur without better access to markets to international markets. Greater income equity depends on improved access to national markets and services. The transport sector would receive about 25% of new Group lending proposed for the next three years.

The role of the Group for the sector can be seen from various perspectives. The IDA, as a development institution working in coordination with other aid agencies and donors, orients its main effort to policy dialogue and reform, institutional development and training. From this perspective, its main role is to provide advice, technical assistance and training, so that Mongolia can best orient itself to take advantage of opportunities for development. From a financial perspective, its role is to provide funding for investment, but as it can only provide a fraction of the funds required, they need to be focused on projects that contribute most to alleviating poverty. These funds also have an important role in leveraging investments, to encourage private investors to provide more than they would otherwise. In recent years, aid and donor funds have been increasingly devoted to projects with a direct impact on poverty alleviation.

The IDA and the Asia Development Bank are providing complementary technical assistance to the Department of Roads. The IDA has provided financial and technical assistance, under its on-going Transport Rehabilitation Project, for road maintenance and administration, urban bus transport in Ulaanbaatar and Mongolian Railways. The ADB has funded technical assistance for roads' administration, strongly supported until the recent financial crisis at least, by Japanese donations, as well as for civil aviation, particularly for the upgrading of the airport at Ulaanbaatar and for air traffic control systems. Through its Urban Services Project, the IDA is making a small contribution to improving local roads in the ger areas of Ulaanbaatar, while its Poverty Alleviation for Vulnerable Groups Project has provided some funding for rural roads. In respect to investment in paved roads, the Asian Development Bank is already taking a leading role, JICA has also made a significant contribution to improving the efficiency of railway operations by financing the freight transfer facility at the Chinese border and a fiber optic communications system. The TACIS project of the European Union is also contributing to constructing a transfer facility for liquid freight (crude and/or refined petroleum and possibly mazout) at Zamyn Uud.

There is some questioning within the government as to whether distributing IDA Credits, ADB finance and donor funds over a large number of individual projects has produced as much impact as would have come from focusing the same amount of external funding on fewer projects. This view is supported by IDA, which proposes allocating its future funds to a small number of carefully selected projects so as to

produce the greatest impact on poverty alleviation. When the multilateral and bilateral assistance that is being provided to the transport sector is compared with the needs identified in this Strategy, the largest gaps are in respect of investment for national integration and in rural areas, and for technical assistance to put financing of the transport sector as a whole on a sustainable basis. Filling these gaps with a few coordinated projects would provide a suitable focus for future international aid and donations. Since they fit well with the development objectives and priorities of the IDA, it is proposed that the next transport sector Credit be similarly oriented.

The lack of a national transport development strategy and investment plan has made donor coordination difficult and hobbled efforts by private investors to participate in the sector. Once these tools exist, the annual Donors' Conference would be an appropriate venue for ensuring that forthcoming external assistance to the sector was oriented in tune with the strategy and compatible with the priorities of the investment plan. If this could be achieved, Mongolia would be able to reap the maximum benefit from the decreasing amounts of external aid likely to be available.

National integration

The most important investments to further this objective would be the upgrading of the East West road to the west of Ulaanbaatar, so that the even the most distant population centers (Hovd and Ulaangom) are brought within a maximum of two days' road travel of Ulaanbaatar. The minimum investment needed to achieve this is of the order of US\$17 million. This would be sufficient to upgrade the earth roads beyond Arvaikheer to simple all-weather, gravel standards, and this would be achieved by simple bridge improvements and upgrading the surface of short but critical road sections where there are drainage problems. It is proposed that this project be funded from the next IDA Transport Sector Credit. Donor funds could supplement the Credit to achieve a higher standard of gravel road, and to finance the road east of Ulaanbaatar towards Choibalsan.

Rural roads

The suggested strategy for developing aimag and som roads is the creation of revolving funds. This idea is already foreseen in the recent Roads Act, although its implementation has not so far been worked out in detail. During the course of preparation of the next IDA project, details would be worked out with the relevant government agencies of how the proposed fund would function. The World Bank has gained wide experience in the funding of rural roads through such schemes and can adapt that experience to the specific needs of Mongolia. The on-going IDA supported Poverty Alleviation for Vulnerable Groups Project, which has a component that addresses feeder roads, has already established guidelines for project selection and a framework for implementation. This would provide a sound basis on which to develop the rural roads component of the proposed project. It is suggested that IDA allocate about US\$5 million of the next Credit, possibly supplemented by donor funds, to the improvement of aimag roads.

Administration and finance

This strategy makes a proposal for minor restructuring the transport activities of the Ministry of Infrastructure Development. The recent changes in this respect go far in achieving what is needed, and perhaps now is too soon to implement any further changes or fine-tuning. However, during the disbursement of the next credit (about the year 2003) there would be ample experience of the new system to learn what might be done next. In addition, the credit could fund interchanges of experiences between Mongolian institutional and transport specialists with those of other countries in similar circumstances

(Kazakstan, Kyrgystan, Turkmenistan, Bolivia) as well as with those from other low density countries that have successfully implemented institutional changes in their transport administrations.

The recent changes in finance of the sector are incomplete, in that they do not show what funding will be needed or where it might come from. This is particularly true in respect of maintaining the highway network, where inadequate funding will result in much higher and probably inaccessible future needs. Therefore, the technical assistance would also help establish a sustainable financing mechanism for the whole transport sector.

Another area where the proposed IDA Credit and European donor funding could provide technical assistance is in railway reform. This would be aimed at helping MTZ accomplish the separation of responsibilities for infrastructure and operations, and facilitating the operation of private trains, including the possible concessioning of some of its own operations.

Urban bus services

If the urban bus services in Ulaanbaatar have not been privatized by the time the structure of the Credit is planned, it could also include technical assistance for transforming the present corporate structure of bus companies to one of route cooperatives, with a leasing company as the vehicle owner. This model would be adaptable to other cities, such as Darhan and Erdenet that could justify small-scale bus networks.

Proposed Transport Sector Development Credit

Investments:

National integration:	Road from Arvaikheer to Hovd and Ulaangom	US\$14.0m
Rural roads:	Aimag and Som road investments	US\$ 5.0m

Technical Assistance

Transport administration	US\$ 0.3m
Sustainable transport finance	US\$ 0.2m
Further railway restructuring	US\$ 0.3m
Urban transport privatization	US\$ 0.2m
<u>Total</u>	<u>US\$20.0m</u>

Potential transport projects, compatible with the Strategy, that are suitable for donor finance

Mongolia will benefit from greater coordination between lending and donor agencies in the transport sector. While each of the sponsored projects implemented until now has been beneficial in its own context, since they have not had any overall direction or policy orientation, they have pursued different and not always compatible objectives. The Transport Strategy provides a common framework within which future transport lending and donations can be better planned and better oriented to satisfying Mongolia's needs, as well as the more direct objectives of the sponsors and donors.

It would be of advantage to Mongolia if, as part of the design of such they projects, their relevance to supporting the transport strategy were emphasized, particularly how they will help reduce the tyrannies of distance and isolation. In addition, before agreement is reached on any specific project, it should be assessed for: (a) its impact on competition; (b) how users will contribute to its funding and implementation; (c) where any counterpart funds should come from and what other projects should be postponed to provide such funding; (d) what regulations are needed for its successful implementation and how such regulations will be promulgated and operated.

The following list indicates some transport projects that could be of interest to lenders and donors, but it is not exhaustive and many donors will have their own ideas of the projects they would like to support. Many aid and donor supported projects in other sectors of the economy have components that relate to transport. It should be part of the responsibility of the proposed Transport Department of MID to keep itself informed of such projects and ensure that they are also compatible with the strategy.

Strategic planning

- Development of a project evaluation framework.
- Development of a project prioritization process.

Reducing the tyranny of distance from international markets

- Funding further studies of the UB to China road, and subsequent investment in the road itself.
- Funding multi-modal interchanges in export corridors.
- Stimulating greater cooperation with neighboring countries, such as through developing more free-trade zones and negotiating treaties to allow the movement of trucks between countries.
- Stimulating development of the Eurasian Landbridge route through Mongolia.

Reducing the tyranny of internal isolation

- Routine maintenance of national roads (through the restructured National Road Fund).
- Development of the road from UB to Choibalsan and other high priority low-cost roads.
- Design and implementation of a Vehicle Inspection System
- Technical and financial support for the Aimag and Som Road Investment Fund.
- Technical assistance for the operation of ambulances in remote areas.
- Technical and financial support for the Ger Road Fund.
- Technical assistance for developing route cooperatives for urban public transport.
- Technical assistance for assessment of the environmental and social benefits of trolleybuses, and if appropriate, investment in renewal and expansion of the Ulaanbaatar system.

Potential projects for private foreign investment and/or operation

Despite the low levels of demand and utilization of infrastructure, there are several transport projects or transport related projects that could be of interest to private investors and operators. Some of these are associated with projects in other sectors of the economy, particularly mining. For the potential of any privately financed projects to be realized, Mongolia needs to offer attractive financial and regulatory conditions. Defining what these conditions might be is beyond the scope of this strategy, but advice is readily available from the IDA, ADB and other international agencies.

Given Mongolia's lack of direct access to a deep-water port, any privately funded and operated transport service for international trade will require the service provider to make transport arrangements with a neighboring country. This gives a clear advantage to transport operators from those countries to contribute to Mongolia's development by offering such services.

As with potential donor supported projects, it should be the responsibility of the proposed Transport Department of MID to ensure that private transport projects are compatible with the objectives and priorities of the transport strategy.

Among the projects that have the potential to attract private finance and operations management are:

Reducing the tyranny of distance from international markets

- Operation of container trains between Ulaanbaatar and Zamyn Uud or Tianjin.
- BOT development of the Ulaanbaatar road as a joint-venture toll road.
- Development of a new railway from Tavan Tolgoi to Sainshand and Tsinhuandao.
- Development of a new railway from Umnugov coalfield to China.
- Development and operation of a Mongolian free zone in the port of Vostochny.
- Operation of ground services and passenger facilities at Ulaanbaatar and other airports.
- Operation of air navigation services.
- Operating rail/road interchange facilities at international borders.

Reducing the tyranny of internal isolation

- Operation of a bus leasing company in Ulaanbaatar.
- Operating domestic air services under route concessions.
- Undertaking rail infrastructure maintenance.
- Undertaking railway traction and rolling stock maintenance.
- Operating coal transport by rail under a concession agreement.
- Maintenance of state roads under a concession from the National Road Fund.

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Annex A Transport demand

Transport intensity

The demand for freight transport can best be measured in units of ton-km since this captures the need for infrastructure and services better than the simpler measure of tons transported (although this is important when terminal capacities are being considered). The simplest index to project the demand for freight transport is the number of ton-km generated for each US\$ million of GNP, the transport intensity of the economy. Since different industries have different transport intensities, use of this index requires knowledge of the indices for each sector of the economy, and how the relative importance of sector will change over time.

Following the privatization of road freight transport in 1995, statistics on the volume of road freight have become difficult to find. They are also less complete, since private operators have no obligation to report their output. As the privatization coincided with a severe downturn in the economy, it is tempting to attribute the fall in indices of transport to that rather than to a failure in the statistical system. A more reliable indication of the extent of the fall in transport output is in the consumption of gasoline and diesel fuel. While there are many uses for these fuels other than for transport, gasoline in particular is predominantly used in this sector. Between 1990 and 1995 the consumption of diesel and gasoline fell by averages of 26% and 12% per year respectively. Statistics of rail transport are as complete as those of road transport are deficient. Total freight traffic (coal, other domestic freight, and export and import freight) reached its lowest level in 1994, with a total of 2,150 million ton-km. Since that time, international freight has increased by about 20%.

Table A.1: Comparison of Freight Transport Intensities

Country	Freight Transport Intensity (ton-km/\$GDP, 1994)
Kazakstan	4.00
Former Soviet Union	3.59
China	3.57
Mongolia	3.30
Ukraine	1.60
Poland	0.86
Former Czechoslovakia	0.82
Bulgaria	0.72
Hungary	0.58
Former Yugoslavia	0.48

Sources: Forward with One Spirit, a Transport Strategy for China (World Bank, April, 1998) and Kazakstan Transport Sector Review, World Bank (March, 1996)

Mongolia's transport intensity at about 3.3 ton km per US\$ of output is high in comparison with other transition economies, but comparable with that of Kazakstan, another formerly socialist economy and land-locked country. The high intensity is partly attributable to a dependence on coal for energy and the practice of transporting coal to power stations, rather than transmitting electricity from power stations located closer to the coal mines. The index of transport intensity is likely to fall as the energy sector becomes more efficient, with coal being washed before being transported, some new power stations being located near coal mines, and with natural gas and hydroelectric power as potential new energy sources.

Table A.2: Projected growth and freight transport intensity by economic sector and activity

Economic activity	Projected annual growth %		Transport intensity ton-km m / GDP US\$m	
	1999-2004	2005-2014	1999-2004	2005-2014
Agriculture	4.0	5.0	0.46	0.75
Other mining	3.0	6.5	0.48	0.50
Coal mining	4.0	2.0	1.55	1.20
Services	5.0	7.0	0.03	0.03
Manufacturing	4.0	5.0	0.30	0.40
Transit	7.0	10.0	0.26	0.30
Average/Total			3.08	3.18

Source: Bank estimates

Passenger demand can best be projected by an index of passenger-km to GDP, since the propensity of people to travel is more dependent on their income than anything else. Within the ranges of GDP expected for Mongolia over the next ten years, passenger transport intensity is expected to have an elasticity of about 0.6. That is not to say that other variables, such as population distribution and propensities for people to move their residence and therefore live apart from their extended families, do not influence the demand for travel. However, given a base level of demand that already takes these variables into account, changes are most likely to be generated by increases in income. Passenger intensity of travel reached a minimum of 4.25 passenger-km per US\$ of GDP in 1995, falling from over 5.2 at the end of the 1980s. With the projected increase in GDP, and with improvements in travel conditions, it is expected to recover to about 5.4 passenger-km per US\$ by 2004 and to increase by 1% per year thereafter.

Table A.3: Projected transport demand

	1999 ton-km/pass-km m	2004 ton-km/pass-km m	2014 ton-km/pass-km m
Freight			
Agriculture	399.3	485.8	791.4
Other mining	418.4	509.1	955.6
Coal mining	1,307.7	1,512.5	1,843.8
Services	56.2	68.4	134.6
Manufacturing	253.5	293.9	478.7
Transit	245.0	343.6	891.3
Total	2,677.3	3,213.4	5,095.4
Inter-urban passengers	1,871.2	2,388.2	4,276.9

Source: Bank estimates

Urban passenger transport

Since the level of fare evasion and number of passengers who legally do not pay fares are both unknown, it is difficult to estimate the total present number of urban bus passengers, let alone make projections for the future. Based on the estimates recently made by consultants financed under the on-going IDA Transport Rehabilitation Project, of about 50% non-fare paying passengers, the present total urban bus passenger trips per year is about 120 million. This total is likely to decrease as private modes of transport become more viable, but to increase as the population increases and if the quality of services improves, particularly into the ger areas. A conservative estimate is that the total number of passenger trips will remain about the same as now.

However, while the number of bus passenger trips might not change very much, those by private motorized transport will increase rapidly. Traffic congestion is not yet a serious problem in Ulaanbaatar or other urban centers, but its first signs are beginning to be seen. For short periods, traffic in the center of Ulaanbaatar is already blocked, more through lack of attention to traffic management than to a lack of capacity. However, car ownership in Ulaanbaatar, already at about 32 per 1,000 people²¹, is approaching levels that in other countries has led to the introduction of traffic management and demand restraint measures. If the rate of growth of the last three years were to continue for another five years, the resulting car ownership of more than 100 per 1,000 population would require new road construction as well as management and restraint of car use. Darhan and Erdenet will not face these problems, as their car ownership rates are unlikely to exceed the present rate of Ulaanbaatar for at least the next five years.

Mode shares of transport

Freight

Until now, road and rail serve very different freight markets, but they are likely to come into increasing competition as the paved road network is expanded in the North-South corridor where rail freight is concentrated. In this corridor competition is likely to be limited to the 30% of freight represented by non-bulk products, and likely to be dominated by the transport of containers between Zamyn Uud and Ulaanbaatar, and of transit freight between Zamyn Uud and the Russian border at Suhbaatar.

Providing a road between the Chinese border and Ulaanbaatar would contribute to reducing the distance impediment to the growth of trade with China, to the reduction of transport costs for Mongolian overseas trade through Tianjin and the increasing role of Mongolia as a trade intermediary between China and Russia. Nevertheless, the advantages of road transport in this corridor would be small if the rail service were to be operated more effectively.

Table A.4: Possible long-term (2014) freight mode shares (ton-km)

Market sector	Mode	
	Road	Rail
Domestic		
Coal	30%	70%
Agricultural products	100%	0%
Other Minerals (domestic)	20%	80%
Other domestic freight	70%	30%
Petroleum	50%	50%
Sub-total		
International		
Containers	40%	60%
Minerals (International)	10%	90%
Transit – China/Russia	50%	50%
Petroleum	20%	80%
Other international	80%	20%
Sub-total		
TOTAL		

Note: The mode shares assume that the road from UB to China is completed and that the policy proposals in this Strategy are implemented

Source: Bank estimates

²¹ Mongolian Statistical Yearbook, 1997

Goods traded between China and Mongolia can cross the border at up to six points, but only that at Zamyn Uud is open throughout the year. There is at present no arrangement with China that would allow the operation of Chinese or Mongolian trucks in the other country's territory. For this to come about, several international treaties and bi-national agreements would have to be negotiated and ratified. Even then, two impediments to trade on the Chinese side must be overcome. These are the lack of adequate road access from Erenhot to Tianjin and informal barriers to inter-provincial truck movements that are likely to impinge even more on the movement of foreign trucks.

Interurban passengers

The mode shares of passenger transport remained remarkably stable until about 1994, when the road share appeared to decline precipitously. While it is possible that the economic crisis of 1995 had a larger effect on road passenger transport than on other modes, the apparent decline is much more likely to be a result of under-reporting. When passenger services were privatized, incentives for reporting were reduced and informal inter-urban transport became more prevalent. The projections made here assume that about 25% of inter-urban road passenger trips are unrecorded.

As the road network improves and passenger transport services respond with improved quality, it is expected that the real road share, including informal transport, will regain and surpass its previous share, reaching about 45% of total non-urban transport by 2014. An indication of the impact of improved service quality on mode share can be seen from the increase of 20% in rail passenger-km from 1996 to 1997, while recorded road passenger-km reduced by about the same percentage. Air passenger demand reached a minimum in 1993 of less than half the peak level of the late 1980s as fare subsidies were withdrawn and services curtailed. Since then, with stabilization of fares and improved regularity of services, demand has increased by over 30% and is now back to its 1991 level. Despite continued increases in demand for air transport, in the long-term the mode share is likely to continue to fall in the face of increased competition from revitalized road passenger services.

Table A.5: Passenger mode shares (pass-km)

Mode	1997	2004	2014
Rail	53%	45%	35%
Road	23%	30%	45%
Air	24%	25%	20%
Total	100%	100%	100%

Sources: Mongolia Statistical Yearbook (1997) and Bank estimates

Specific projects that will influence the demand for transport

Coal

There are some new mines in operation, and many more planned or are under consideration. Most of them involve coal for electricity generation, but some also have reserves of coal suitable for steel making. Those in the first group have four possibilities for transporting their output: road transport of coal all the way to the electricity generating plant, usually feasible if the distance is less than about 200km; road transport of coal to the nearest rail line and then by rail to the generating plant; construction of a rail link from the mine to the area of electricity demand, or: building a mine-site electricity generating plant and transmitting the electricity instead of transporting the coal. Choices are determined by the costs of transfer between the modes, the potential cost savings on rail part of the trip and the cost of constructing

the rail line. Coking coal for steel production is usually produced in larger quantities, so the choices involving rail transport are more feasible than for steam coal. However, this advantage is outweighed by the long distances to the steel mills or deep-water ports for export to third countries.

A potential new mine at Tavan Tolgoi in South Gobi has all these possibilities. It has about one billion tons of recoverable coal, of which about 0.7 billion tons is high quality coking coal with export potential. The remainder is steam coal. Any development of this mine will have to overcome its isolation from markets for both categories of coal, and electricity generation at the site would have the additional obstacle of a lack of water.

The road from the mine site to Ulaanbaatar would have to be upgraded to be suitable for the large trucks needed to make road transport for using the steam coal to supply power stations in Ulaanbaatar. The cost of constructing 415km of new railway to connect with the main line at Sainshand, so that the steam coal could be transported by rail to Ulaanbaatar and the coking coal to export markets, would also be prohibitive in the short term (at least U\$100million), unless a large market for the coking coal was confirmed. Construction of a basic earth road across the Gobi to Sainshand, good enough for use by large trucks, would involve less investment but incur much higher truck operating costs. A likely recommendation from an on-going study of the feasibility of the mine, aimed at attracting private investment, is to construct a mine-site electricity generating plant and a transmission line to Ulaanbaatar, and a rail link to Sainshand for the coking coal.

Another coalfield being considered for development is in Umnugov aimag in the western part of South Gobi. The site is only 40km from the Chinese border and about another 140km from a Chinese steel mill that is a potential user of the high quality anthracite coal (125 million tons proven). However, the Ulaan Ovoo mine near the Russian border about 120 km west of Suhbaatar and part of the Erdenet complex, is still not in production two years after its scheduled opening. The most likely solution to the transport problems of the first of these is to construct an exclusive direct rail line between the mine and power station (about 180km and perhaps U\$50 million). The transport problems of production of the Ulaan Ovoo mine above that needed by Erdenet copper mine, could be resolved at least cost by trucking the coal over an existing earth road for about 23km to the nearest rail station, and then raiing it to Ulaanbaatar for domestic consumption, or for export to Russia.

Petroleum

Mongolia is presently dependent on Russia for almost all its 200,000 tons or so per year of petroleum. Is vulnerability to interruption was demonstrated when, as a result of industrial unrest in Russia, supplies by rail were blocked for several weeks in mid-1998, and reserves within Mongolia fell to just a few days. Attempts to diversify supply have not been successful given the high costs of importing by rail from China or by road from Russia to Western Mongolia.

There are two petroleum deposits within Mongolia that, if fully exploited, could alleviate this dependence and generate export potential. Development of either would have a significant impact on demand for transport. Output from a relatively modest oil deposit in Zuunbayan (East Gobi) is now being transported by a combination of road and rail transport. The principal market for additional output is China, but some is being used in Ulaanbaatar to supplement or replace mazout (a heavy distillate used to augment the calorific value of low quality coal) for electricity generation. If a rail link is built to transport coal from Tavan Tolgi, then this oil could be an additional product to transport, but on its own the projected output is too low and the oil field too close to the existing rail line to justify construction of a rail spur. Year round production would require special heating facilities at the inter-modal transfer facility at Sainshand, and the feasibility of this investment is being investigated with funding from TACIS.

Production on a larger scale is now under way in Eastern Mongolia, with output from wells in the Tamsag basin being exported to China by road, and a pipeline now under construction. The direct impact of this oilfield on the rest of Mongolia's transport system would be small, but it is possible that Mongolia would barter the crude oil in exchange for refined petroleum that would be imported by rail through Zamyn Uud. This would create a new rail freight flow from China to Mongolia, improve the finances of the rail line south from Ulaanbaatar, and possibly justify investment in its improvement.

Other minerals

Most current mineral exploration is concentrated on gold, for which the transport needs are minimal other than for site development. Another important prospect is iron ore. One deposit at Darkhan has probable reserves of more than 160 million tons with a mineral content of about 50%, and another at Bayangol has probable reserves of more than 110 million tons with a lower mineral content averaging about 35%. Copper is another mineral with export potential, with the Tavan Tolgoi site being one of the best prospects. The combined export of coal and copper could reduce the land transport cost to a deep-water port, such as Tsinhuandao in China, to about US\$15 to US\$20 per ton, making the mining of both of them feasible. Many other mineral deposits are being explored but none of them are close enough to production for their impact on the demand for transport to be considered.

Gas pipelines

If the proposed project to transport natural gas from Russia to China through Mongolia comes to fruition, it could fundamentally change the pattern of freight transport in Mongolia. Instead of Ulaanbaatar and other urban centers being dependent on coal for nearly all fixed source energy requirements, natural gas could become the preferred energy source in terms of cost and air quality impact. Since coal accounts for about half of all present freight ton-km, the impact could be dramatic. There will be a short-term demand for materials to construct the pipeline and the local distribution systems, but in the longer term, demand for freight transport will fall significantly. The negative impact on MTZ's operations and finances would be dramatic.