Strategic Perspectives on Intercity Transport Development in Asian Countries

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Abstract: Diverse patterns of intercity transport systems across countries reveals that maintaining balanced shares of different modes contributes to both environmental and efficiency objectives. This is because of the better division of the transport market among different modes according to their inherent advantages. The paper proposes a framework for setting vision and strategies to achieve the modal balance, and also forwards a hypothesis on future scenarios emphasizing importance of considering long term changes in travel behavior for formulating effective policies. Finally, focusing on the cases of developing Asian countries, the paper discusses the key issues and related policy options covering such topics as assessing the needs for different transport infrastructure, managing the intermodal competition, coordinating the transport and spatial developments, promoting the low-carbon transport, and exploring alternative financing schemes.

Key Words: intercity transport, Asian countries, travel behavior, modal share

1. INTRODUCTION

Economic growth and increasing trend of globalization of the economy are creating huge transport demand in developing countries. However, transport infrastructure and services are grossly inadequate to respond such demand trend. The problem is becoming a major concern, especially in rapidly growing Asian developing countries, where transport bottleneck stands out a key factor holding back the growth momentum and international competitiveness. The inadequate infrastructure and services in developing Asia is likely to have serious implications in the form of economic loss, environmental cost, and regional and social inequity.

Moreover, developing Asian countries have their own characteristics in terms of speed of growth, population density, and settlement patterns, capacity and resource availability among other, which calls for special approach in handling issues related to intercity transport.

The efforts for policy research in transport have been mainly focusing on urban transport issues, since the challenges posed by the rapid and large scale urbanization in developing Asian countries is more visible. In comparison, intercity transport, which plays important role in shaping spatial development patterns at the national and regional level, and thereby determine structure and efficiency of overall transport system, has not received due attention for policy research. As both spatial structure and system of transport network are just at an evolving phase in Asian developing countries, intercity transport policies may serve as powerful policy levers to achieve not only transport goals but also other socio-economic and environmental goals. For example, regional disparity is an increasing problem in Asian developing countries, which can be addressed through planned intercity transport. Besides, transport sector has significant contribution to greenhouse gas emission, and the increasing
trend of transport emission despite various efforts has become major global concerns. Unlike
in developed countries, where greenhouse gas reduction policies inevitably involves some
degree of trade-off with economic growth, developing countries have real opportunity to
shape their evolving transport system in an environmental friendly way without significant
economic trade-off. What is however needed to achieve such synergy between economic and
environmental goals is an innovative policy approach considering special situations of Asian
developing countries.

With this background, an international collaborative research studies, titled Intercity Transport
in Asian Countries (ITAC) is currently undertaken, and this paper is a preliminary outcome.
The study covers intercity transport system of ten countries from East and South Asia, and is
jointly conducted by a team of experts drawn from each country. The study has also been
endorsed by EASTS as one of its IRG activities. The content of the paper basically provide an
overview of the broad perspective that is adopted in this study, and preliminary analysis on
the key policy issues.

The structure of the paper is as follows. Section 2 discusses key characteristics of intercity
transport distinguishing it from urban transport. The discussion sets a stage to see how policy
approach may need to be different in case of intercity transport. In Section 3, international
trends in intercity transport are broadly examined to draw possible insights that are relevant to
Asian developing countries. This will be followed by a conceptual framework to appropriately
frame the intercity transport problems of Asian developing countries. Section 5 identifies key
policy issues and strategic measures relevant for developing Asian countries. Finally, broad
conclusions are drawn.

2. CHARACTERISTICS OF INTERCITY TRANSPORT

Traditionally, transport infrastructure and services are subject to heavy involvement of public
sector, be it direct investment for capital intensive infrastructure, service operation by public
monopolies or regulation on privately run services. There remained more or less similar
approach for all types of services and modes, for instance, urban and inter-city modes used to
be treated almost similar ways in terms of infrastructure investment and regulation. However,
the technological development and institutional changes in recent decades have significantly
changed the way transport infrastructure and services are managed. Accordingly, the
difference between urban transport and intercity transport has been more distinctive when it
comes to various policy issues and necessary response measures. In particular, in the face of
resource constraint and problem-laden transport sector in developing countries, urban
transport has received much policy attention as compared with intercity transport. In order to
set a context for examining importance and nature of policy measures for intercity transport,
Table 1 shows the difference between urban transport and intercity transport with respect to
various policy-relevant aspects.

The peaking demand is a major issue while planning for transport infrastructure. Urban
transport system faces daily peaking, which poses more difficult challenge than the seasonal
peaking of demand for intercity transport. That is perhaps the reason that the congestion
problem in intercity transport routes is not as severe as in urban routes during peak periods.
This is also somehow related with service reliability for which performance of intercity
transport services could be better than that of urban services. However, this may not be true if
the intercity transport is dominated by the air mode with severely confectioned hub airports as
currently is the case of major hub airports in the US and Europe.
Table 1: Different characteristics of urban and inter-city transport

<table>
<thead>
<tr>
<th>Issue/element</th>
<th>Urban Transport</th>
<th>Intercity-transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand peaking</td>
<td>Daily (narrow peak-hours)</td>
<td>Seasonal</td>
</tr>
<tr>
<td>Congestion</td>
<td>High</td>
<td>Moderate/low</td>
</tr>
<tr>
<td>Emission impact</td>
<td>Local, Global</td>
<td>Global (CO2)</td>
</tr>
<tr>
<td>Reliability</td>
<td>Lower</td>
<td>Moderate/higher</td>
</tr>
<tr>
<td>Multimodality</td>
<td>Coordination</td>
<td>Competition</td>
</tr>
<tr>
<td>Technology (speed)</td>
<td>Narrow range</td>
<td>Wide range (bus to air)</td>
</tr>
<tr>
<td>Benefit/Impact</td>
<td>Local/Local</td>
<td>National/Local</td>
</tr>
<tr>
<td>Spatial impact</td>
<td>Local</td>
<td>National/local</td>
</tr>
<tr>
<td>Operation</td>
<td>Public-Private</td>
<td>Mostly private (except rail)</td>
</tr>
<tr>
<td>Regulation</td>
<td>Mostly regulated</td>
<td>Can be deregulated</td>
</tr>
<tr>
<td>Operating subsidy</td>
<td>Possible (through other tax)</td>
<td>Not reasonable (except rail)</td>
</tr>
<tr>
<td>Do nothing alternative</td>
<td>Car (with congestion)</td>
<td>Air (higher service), car</td>
</tr>
<tr>
<td>Problem nature</td>
<td>Immediately visible</td>
<td>Not visible (long-term cost)</td>
</tr>
</tbody>
</table>

The urban transport service of different modes is usually coordinated with possibility of operating subsidies, while that of intercity transport service is largely on competition basis and includes wider modes of transport (bus to air). Intercity transport has its own features in its impact, positive or negative. For example, emission affects both locally and globally in urban transport service while it is global in intercity transport. Because of serious impact of urban transport emission on local environment, urban transport was dealt from environmental perspective long before the climate change concerns came into picture. That is why urban transport policies to address transport emission have well established framework and tradition, whereas such policies in intercity transport are just recent initiatives under limited applications. Likewise, the direct and indirect benefits of the urban transport service are limited to local compared to that of intercity transport which could be both local and global.

Intercity transport services are relatively more amenable for market regime, and the service is mainly provided by private sector (except in case of national railways) without subsidy with increasing trend of deregulation. Unless proper measures are in place, air or auto could dominate intercity travel due to their relatively higher service, while in urban service car users face serious road traffic congestion. Urban transport problems are thus more visible locally, and therefore can draw policy attention immediately. In contrast, intercity transport problems evolve over time and their impacts are more at the structural level driving a vicious dynamics. Unless the intercity transport problems are recognized and solved at an early stage it would be difficult to undo them once the underlying factors stabilizes at the later stage.
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3. INTERNATIONAL TRENDS IN INTERCITY PASSENGER TRANSPORT

3.1 Transport demand

As is usually expected, demand for passenger transport increased across the countries in the world over the time. This trend is mainly driven by economic growth and development, which generates new trips or increases trip distance for intercity travel. However, the patterns of travel demand vary widely across the countries in the world. Even among OECD countries, significant differences can be observed in overall travel demand, and choice of travel modes, and as result in the efficiency of transport system in terms of economic, social and environmental aspects. As shown in Figure 1, the distance travelled per capita per year is around 30,000 km in US, whereas the figure for France is around 15,000 km, Germany is around 13,000 km, and Japan is only around 10,000 km. The drastic differences in travel demand can partly be attributed to the size of country. Moreover, some other factors such as spatial development pattern or structure of transport system itself might be in play. What is obvious here is that US has somewhat excessive travel demand perhaps due to the combination extensive network of highway and under-priced usage of automobile. The key message here is that the travel growth over time is inevitable outcome of economic prosperity, yet the degree of travel demand can possibly be influenced by various transport policies. The developing countries therefore have to make choice for appropriate policies keeping such different pattern of travel demand in view.

Data source: Japan (MLIT); US (Department of Transport); UK (Department for Transport); France (Ministry of Transport)

Figure 1: Trends in passenger volume by modes

3. INTERNATIONAL TRENDS IN INTERCITY PASSENGER TRANSPORT

3.1 Transport demand
3.2 Infrastructure

The performance of transport system primarily depends on whether available stock of transport infrastructure is enough to meet the need of travel demand. Table 2 compares availability of road network in selected countries. In general, road infrastructure is less dense in Asian countries than in western countries particularly when measured as network length per population. The difference is more striking for higher grade roads, such as expressways, for which even the advance Asian country like Japan lags far behind its western peers. On the other hand, in the context of growing concerns for domination of road mode with range of negative externalities, there could be a legitimate question that if the large stock of road infrastructure in western countries is indeed an asset or cause of inefficiency in overall transport performance.

Table 2 Road network indicators for selected countries (2004 – 2006)

<table>
<thead>
<tr>
<th>Selected countries</th>
<th>Total road (gross addition)</th>
<th>Expressway (motorway)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000 km</td>
<td>km/100km²</td>
</tr>
<tr>
<td>Malaysia</td>
<td>99</td>
<td>69</td>
</tr>
<tr>
<td>Nepal</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Thailand</td>
<td>180</td>
<td>60</td>
</tr>
<tr>
<td>Japan</td>
<td>1197</td>
<td>234</td>
</tr>
<tr>
<td>Indonesia</td>
<td>392</td>
<td>119</td>
</tr>
<tr>
<td>India</td>
<td>3513</td>
<td>964</td>
</tr>
<tr>
<td>China</td>
<td>3457</td>
<td>37</td>
</tr>
<tr>
<td>Spain</td>
<td>666</td>
<td>133</td>
</tr>
<tr>
<td>Italy</td>
<td>488</td>
<td>166</td>
</tr>
<tr>
<td>UK</td>
<td>398</td>
<td>165</td>
</tr>
<tr>
<td>France</td>
<td>952</td>
<td>173</td>
</tr>
<tr>
<td>US</td>
<td>6544</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: IRF (2009), National Statistics for some developing Asian countries

With respect to rail, most Asian developing countries have conventional rail system, which they inherited from their colonial powers. In most of the cases, national rail system is neglected for necessary capital investment to expand the network or improve the level of service. The institutional inefficiency has become a norm for national railway in most developing countries. Only four Asian countries or region, namely Japan, Korea, Taiwan and China now have high-speed rail service. In other countries, the conventional rail has to serve the rapidly growing intercity passenger without significant improvement in services. The conventional rail system runs with much lower speed, usually in the range of 40 to 100 km/hour (World Speed Survey, 1997; 2007). With slow moving conventional trains, it is impossible to compete with air and automobile in the face of surging demand for higher speed travel especially from time-conscious population groups which is in increasing trend. The resurgence of railway traffic in some European countries in recent year and sustaining of high rail ridership in Japan can largely be attributed to high-speed rail. For example, in France 60% of rail passenger are carried by high speed rail, while the share of the high speed rail share is 40 % and 30% in Spain and Japan respectively.
3.3 Modal share

Since different transport modes exhibit inherent advantages in efficiently serving particular market niche of intercity passenger transport, achieving optimal balance of mode share is the most important goal of transport policies. The mounting concern for reducing transport emission has further raised the importance of balanced modal share as the emission load varies greatly among different transport modes. Normally, railway and bus, if operated with reasonable load factor, have minimum emission load per passenger kilometer, while automobile and air mode are more burdensome for environment. As shown in Figure 1, the share of railway in total passenger travel (passenger-km) is relatively much higher in Japan, which accounts for 29% of total (MLIT, 2008). Railway share in EU countries is around 8%, while US accounts for exceptionally lower share of railway for passenger transport. In US, passenger transport is dominated by private automobile and air.

![Modal share by distance in Japan, 2007](image1)

![Modal share by distance in UK, 2006](image2)

![Modal share by distance in US, 2001](image3)

**Data sources:**
- Japan: MLIT (2009), Modal Share by travel distance (kyoritaibetsu yusou kikan buntanritsu)
- UK: Department for Transport, National Travel Survey, Long Distance Journey 2006
- US: The 2001 National Household Travel Survey, preliminary long distance file

Figure 2 Mode share for inter-city transport by travel distance

However, while discussing mode share for intercity travel, it is important to examine the mode share by travel distance since the efficient market niche for each mode is primarily determined by travel distance. Figure 2 shows modal share of intercity transport by distance for Japan, UK and US. There are contrasting patterns for modal share by trip distance particularly between US and Japan. In Japan, the distribution of mode share in intercity passenger transport broadly follows a pattern that corresponds to theoretically prescribed competitive market niche for each mode. For up to 300 km of intercity travel, automobile and railway (including high-speed rail) compete fiercely in Japan. For 300 to 750 km segment, railway outperforms other modes, while beyond 750 km air mode demonstrates inherent advantage mainly because of lesser travel time. In contrast, the mode share distribution by trip

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distance in US is far off the theoretically suggested patterns. Automobile is used even for trips with 1600 km in length. Lower end of trip distance is fully dominated by automobile, while higher end is by air mode. In US, mode share of rail and bus for intercity passenger travel is almost negligible. The case of UK is little better but much suboptimal when compared with the mode share patterns in Japan.

4. FRAMING INTERCITY TRANSPORT PROBLEMS FOR ASIAN COUNTRIES

As discussed in the above sections, countries across the world show diverse patterns of intercity transport in terms of infrastructure, services, and modal structure. The difference between developing and developed countries is quite understandable since the evolution of transport patterns is primarily driven by economic growth and development. What is otherwise unanticipated is the drastic difference in the intensity of travel demand and distribution of modal share among industrialized countries with comparable stage of economic development, such as US and Japan. By examining the underlying reasons for such contrasting patterns, useful policy insights can be generated especially for developing countries, which may contribute significantly to steer the process of intercity transport development towards the more sustainable path. These section first sets up a framework in relation with setting key elements of strategic vision for intercity transport, and proposes some working hypothesis for strategic scenarios, and finally suggests effective policy approach.

4.1 Vision and strategies

Figure 3 illustrate the hierarchical elements of vision and strategies for intercity transport development in developing countries. Since the intercity transport system is not yet fully developed, developing countries are better placed to articulate visions and strategies in order to achieve most optimal intercity transport system. The vision should be first defined in terms of some key elements, such as level of services, structure of mode share, financial sustainability, and possible linkages and impacts on spatial structure. These elements, in facts, correspond to common indicators against which intercity transport system is often evaluated. As illustrated in the Figure 3, this step basically involves answering political questions about what policy makers (politicians) want their system to be like in future. Fortunately, there is broad consensus even in developing countries while answering this question. For example, there is no dispute over the proposal that the future intercity transport system should be environmentally sustainable, economically efficient, financially healthy, and socially equitable.

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**Figure 3: Strategic frame for policy making**

1. **Vision: what is to be achieved?**
   - Level of intercity transport services
   - Desirable form of regional structure
   - Modal split (low-emission modes)
   - Operational sustainability

2. **What kind of infrastructure and services are needed?**
   - General roads, Expressways, Conventional Railways, High-speed railways, Airports

3. **How to accomplish intended vision and plans?**
   - Funding, financing, institutions, pricing
Next, is to answer the question that what kind of infrastructure and services are needed to achieve the intended vision. This may involve prioritizing and sequencing different kind of modes, technology, and services considering the dynamic interaction of transport system with spatial, economic, social, and environmental dimensions. Particularly, important is to achieve balance between different modes so as to allow each mode to efficiently serve its respective market niche. This step involves largely responding to technical questions, if the vision is well defined.

Finally, specific policy strategies should work out to accomplish the provision of different infrastructure and services along with efficient and coordinated operation. This would involve range of policy measures in relation with infrastructure investment, financing, regulation, and institutional reforms. Obviously, this step involves both political and technical questions and subject to a great deal of institutional complexities and resource constraints.

The sequence here represents logical flow from vision setting to formulating policy measures. However, in most developing countries, which face severe resource constraints, the process often runs in reverse direction. Policy measures are first identified from the faceable set under the given resource or political constraints leading to provision of certain kinds of infrastructure and services, which are often not in consistent with the aspired vision. The key problem in most developing countries is therefore the inconsistency between the vision and adopted policy measures because of the prevailing constraints. What is, therefore, most important is to follow a logical flow and work out policy measures that can resolve the constraints, and offer opportunities for adopting wide range of policy measures which can support in achieving the vision.

As discussed above setting a vision and deciding for various policy measures for intercity transport system are political decisions, which essentially require political judgment. And most political judgment involves dealing with technical (factual) and political (stakeholders’ preference and values) issues (Miller, 2003), and the case here is not an exception. As the answer to the technical question is straightforward, this part of the problem should be solved first. Considering the factual information on technical questions, decision should be made, usually of political nature, on whether to go for resolving existing resource or institutional constraints to implement most desirable policy solution or choosing minimalist solution within the existing constraint.

4.2 Working hypothesis

Figure 4 propose a working hypothesis illustrating the core problem of intercity transport system in a dynamic setting. The underlying premise here is that the main source of inefficiency in intercity transport system is the disproportionate dominance of private automobile and air mode. Empirical cases have also demonstrated that balanced mode shares among different travel modes such as railways, buses, automobile, and air is an all inclusive indicator for efficiency and sustainability of intercity transport system. The fact that railway is a superior mode from economical, environmental as well as social view point in servicing high-density demand corridor is well established principle in transport planning. The desirable pattern of intercity transport system would, therefore, involve balanced development of all modes with proportionate level of mode share.

At the low income stage along with lower level of motorization, public transport modes, such as bus or train dominate intercity passenger market, as can be observed now in most developing Asian countries. However, as the economy grows and household income increases, the modal structure may undergo changes, mainly because of changes in traveler’s
preference for speedy and comfortable modes. We can observe the beginning of such trend in some rapidly developing Asian countries, which faces rapid rise in the ownership of car and motorcycles. The final mode share patterns may therefore take different shapes depending upon the related undercurrents. As discussed earlier, in US, the role of bus and train—supposedly more desirable modes from sustainability perspective— is very marginal serving only a small percentage of demand, whereas in Japan, railway is dominating market niche up to 700 km travel distance. Asian developing countries are, in fact, now at the cross roads and have to choose alternative paths ahead, and accordingly shape their intercity transport system. Obviously, every country would aspire to obtain the Japanese patterns, yet the path is not obvious. In fact, the visibly more sustainable pattern of Japanese intercity transport system is the result of range of policy measures adopted over a long and many decades. What can be broadly understood is that US perhaps adopted incremental policy responses just to respond emerging demand, whereas Japan may have adopted a more balanced multimodal approach.

![Dynamics of mode share by travel distance](image)

**Figure 4: Hypothesis for strategic Scenario**

Such a broad conclusion, however, may not be much of help to draw policy relevant specific insights for developing countries. What is important is to investigate the existing structure of intercity transport and to analyze the underlying dynamics of mode choice behavior under different future scenario as shown in the figure. Two possible scenarios are (1) if existing policy of incremental adjustment (reactive approach) is continued, private car dominates short-distance while air dominates medium and long-distance inter-city transport (2) if proactive policy of promoting multi-modal transport is adopted, more desirable pattern of optimal modal split by travel distance can be achieved. Now, the challenge here is to identify powerful levers which can effectively drive the development of intercity transport system in developing Asian countries towards the desirable patterns.

### 4.3 Framework for travel behavior and policy implications

Transport is the derived demand, and the travel behavior in relation with trip characteristics or
mode choice is motivated to fulfill socio-economic and physiological needs of the traveler. It is important to understand the underlying process that results in certain pattern of travel behavior including mode choice decision. A potentially useful concept for this is the frame of reference of the theory of action proposed by Parson and Shils (2001), which “deals with action as a process of striving for the attainment of states of gratification or goals within a situation”. Here the need is determined through physiological or social processes, the situation of actions refers to structure both physical and institutional (including cultural), and the result of an action entails selection, and possibly choice. The given situation provides alternative possibilities and imposes limitations on the mode of gratifying the needs and achieving the goal of the actor. This is also a pioneering theory in sociology that governs relationships among the actor, goal, and situation (structure). Similar concepts that the individuals’ actions or behaviors which are driven to achieve intended goals are shaped up by the given situation or structure have been well recognized in other literature (Sange 1990, Ostrom 2005).

The common theoretical framework for analyzing the mode choice behavior while making travel decision is based on the random utility theory (Ben-Akiva and Lerman 1985). The framework postulates that mode choice decision depends on the attributes of alternatives and characteristics of the traveler. We can relate the attributes of alternatives to the given situation (structure) that include transport system along with associated institutional provision. Travelers’ characteristics reflect their physiological and social needs and preferences. The commonly utilized framework for the mode choice analysis in passenger transport is therefore much similar to the theory of action pioneered by Parson and Shils (2001).

Drawing on the basic concepts of above mentioned frameworks, Figure 5 further elaborate the mechanism showing what should be the role of policy makers in achieving desirable pattern of mode choice for intercity passenger transport. The left-side block in figure 5 shows mechanisms of travel behavior as conceptualized in the commonly discussed theoretical framework. The travel behavior is the result of travelers’ decision to maximize their utilities subject to alternatives, incentives, and constraints offered by the situation. The situation is composed of physical and non-physical objects, such as transport infrastructure, service facilities, spatial development patterns, and institutional provisions. In other words, it is the system of external structure which would involve both hard-structure and soft-structure. The bottom left box, on the other hand, represent users’ attributes which shape their physiological or socio-economic needs. The mode choice behavior is, therefore, a result of interaction between structural elements and users preferences. In other words, the travelers interact with the given institutional and physical structure, and make travel decision to maximize their utilities.

Now the question is what is the role of public policy to achieve desirable pattern of travel (such as in terms of travel demand or choice of travel mode)? The policy measures have to work within the interaction between structure and travelers’ needs or preference, and achieve
the intended objectives. The existing situation or given system structure imposes constraints or generate incentives for particular decision by the traveler. Under such a context, the policy measures are expected to bring about some changes in structural elements or travelers’ needs or preference, which ultimately leads to desired changes in travel behavior. The right-side block purpose how public policy process should interact with the framework of travel behavior. As is obvious the case, the travel behavior can be influenced by changing either system structure or travelers’ needs and preferences. However, in practice, travelers’ needs and preferences usually have physiological or socio-economic roots, and may not avail themselves to get readily influenced by public policies except in some special cases (such as policy measures for raising awareness on some social or environmental values). It is important here to make distinction between influencing travel behavior and influencing travelers’ needs and preferences. As discussed above, behavior is the result of interaction of structure and preferences (economic, social and psychological needs, such as speed and perception of comfort and safety). Despite limitation of policy measures to directly alter travelers’ needs and preferences, it is important for policy makers to understand the dynamics of change in needs and preferences. For example, as income increases, such needs and preferences may undergo drastic changes, such as travelers may have higher preference for speed, comfort and reliability over the fare level.

The primary influence of public policy measures therefore comes through their effects on the system structure. Change in transport infrastructure or service provision or institutional changes can strongly influence travel behavior. For example, an income increase would make travelers to value travel time higher, and may result in modal shift from rail to air, which is not desirable from environmental view point. Policy makers can respond to this issue by providing an environmental friendly high-speed mode such as high-speed rail or imposing tax on air mode to internalize the external costs of air. Both of these measures may discourage modal shift to air though in varying degrees. However, some policy measures may have more lasting effects than others. This is because that the effectiveness of policy measures may depend up on the timing of implementation in the sense that appropriateness of policy measures may varies by development stages. For example, early development of railways system may promote high density corridor, and also contribute to efficient operation of service due to higher demand density. Likewise, when the transport network and spatial system achieve a stable shape like in most industrialized countries now, the effect of infrastructure investment may be limited to just marginal changes without any significant impacts, where as institutional reforms may still be effective in achieving intended objectives.

What is important for policy makers is therefore to fully understand the dynamics of travelers’ needs and preferences in relation with intercity transport, and then identify policy measures to change physical (infrastructure and service facilities) or institutional structure in order to influence travel behavior towards the desired end.

5. ISSUES AND STRATEGIC OPTIONS

The development of multimodal system by following above mentioned policy framework is not an easy task. Intercity transport policies often involve large scale capital investment or major institutional reform which might be a subject of legitimate interest for politicians. Nonetheless, for a rational political decision, it is important to firstly clarify associated technical or factual issues (Miller 2005). In the following paragraphs, the key issues that are now relevant for developing Asian countries are discussed along with strategic options to be considered to address such issues.
5.1 Assessing the need of intercity transport infrastructure and services

There is a broad agreement that the current stock of transport infrastructure in developing Asian countries is not adequate to support the pace of economic growth development. The worldwide wave of adopting neo-liberal economic model in 1990s drastically reduced public investment in transport infrastructure. The Asian crisis, particularly, causes drastic cuts in transport investment in developing Asia. The importance of investing in transport infrastructure has been acknowledged by policy makers, but the investment is not forthcoming to the desired extent. The discussion is mostly limited in identifying immediately perceived needs. What is important in this context is to examine how much infrastructure is needed and what kind of infrastructure or mode of services should receive priority from the long-term viewpoint considering country specific features (such as geography, population size-and distribution). Given the rapid rise in intercity transport demand along with diverse kind of demand due to accelerated growth, multimodal infrastructure and services need to be developed. Likewise, as the economy advances, value of time increases, which demands a significant improvement in the speed of transportation services. In fact, western industrialized countries improved different aspects of their transport system in a sequential way. However, in case of Asian developing countries, the growth process is so fast that different stages are overlapped to a great extent requiring simultaneous implementation of otherwise sequential policy measures. For example, Asian developing countries need to provide both access oriented low-speed and mobility oriented high-speed infrastructure simultaneously.

5.1.1 General roads and expressways network

First priority should be to complete national network of general highway, which acts as primary lifeline for national economy. In rapidly growing economies, it is also important to build expressway network as international experience shows that without some level of high-speed road network, process of industrialization cannot be properly supported. However, in terms of handling volume of passenger, road mode is less efficient than railway especially when road traffic is dominated by private automobile. It would therefore almost impossible for most Asian developing countries to develop extensive road system to handle all travel demand in future. Rather road development strategy should be geared towards providing basic accessibility across the national land. Road alone should not be relied on to provide necessary capacity especially in heavily travelled corridors. Equally important issue is to make sure that the road network system is hierarchically balanced to provide efficient movement of traffic. What is important however is to charge the road traffic properly reflecting real cost of road transport, which make it possible to expand road access and improve mobility without promoting excessive motorization.

5.1.2 Conventional and high-speed railways

As mentioned earlier, in most Asian developing countries railway sector has been neglected for long resulting in a gradual degradation of infrastructure and services. Given the higher population density- or by extension density of transport demand- in Asian countries, railway has a good potential for sustainable operation providing efficient and reliable service. The intercity transport market in most western industrialized countries is not as much favorable for railways mainly due to higher level of motorization and lower density travel corridors. For some lower demand density corridor, contrary to the commonly held notion, railways have inferior performance not only economically but also environmentally. Yet, railway has been promoted especially in EU countries on the ground of other benefits, such as for spatial cohesion. In this respect, when higher population density in Asian countries/regions is properly factored in intercity transport development, railway has potential to be a competitive mode, and therefore should receive high priority.
The railway mode has recently drawn significant attention as the most effective means to expand much needed transport capacity with minimum environmental load. There is a broad consensus on the need of capital investment and institutional reform in order to improve the service of conventional railway. However, the issue is not yet settled in regard with the kind of railway technology to be selected for given situations in a country. This is particularly important in countries where the conventional railway needs substantial capacity expansion requiring a large capital investment, such as in Vietnam’s North-south corridor. Because, rapidly growing countries may need high-speed rail sooner or later to compete with air or auto mode on some high density travel corridor. The common argument is then to have a leap-fogging to start with advanced technology. But given the large capital cost of high-speed rail, the timing of investment is very important. At the lower level of income, the capital cost of a high-speed rail project may account for very high ratio of GDP, which may pose difficulty in mobilizing funding and also create a big risk macro-economically. For example, the total project cost of Japan’s first route of high-speed rail route (500 km between Tokyo and Osaka), for which construction started in 1959 and service opened in 1964 accounted for 380 billion yen, which comes about 1.5% of average GDP over 1959-1964. In comparison, the construction cost (excluding rolling stocks and taxes) for the currently discussed high-speed rail project in Vietnam is about 38 billion US dollar, which is about 42% of Vietnam’s GDP in 2008. Such an exceptionally high scale of project investment needs to be carefully assessed for potential risks to the national economy. Likewise, at the time of opening of Tokyo-Osaka route in Japan, the fare for single trip was 3000 yen, which was just 1% of GDP per capita in 1964. One percent of GDP per capita in Vietnam in 2008 is just US$ 10.4. Running high-speed rail service with this fare level is clearly not sustainable. Also for financially rational fare level, the high-speed rail service may not be attractive for people with moderate level of income. A related concept here is money value of time, which indicates how much value travelers attached to travel time reduction and if they are willing to pay higher fare for high-speed rail services. When income is lower, traveler may prefer slower and low-fare modes such as buses. Therefore, the appropriateness of high-speed rail for any inter-city travel corridor needs to be carefully judged considering long-term dynamics.

One of the obvious options here is to wait until the economy or income is large enough to afford the capital and operating costs of high-speed rail. Even if the investment is possible for the primary route, it may take years before completing the nation-wide high-speed rail network. Until then it is important to improve conventional rail services, which includes investment for improving existing alignment or investment for new routes. Such improvement for conventional rail should be carried out keeping the future development of high-speed rail in views, and adequate consideration should be made to ensure interoperability between conventional and high-speed railways. There are various models for interoperability such as free-gauge train or third rail, but if planned earlier more uniform standards can be worked out, such as the uniform gauges for conventional rail and high-speed rails. Other important issue to be considered is the possible impact on the rail freight by speeding up of passenger services on the conventional lines. As the rail freight has important role especially in a large country such as India, the possibility of expanding passenger capacity of existing conventional rail line is quite limited. Under such circumstances, construction of new high-speed rail may be justified on capacity ground, since there would not be much cost differences between new conventional line and high-speed rail. In terms of a coordinated operation and interoperability between the conventional and high-speed rails, the developed countries’ experience may offer valuable lessons for developing Asia.

5.2 Managing modal competition and coordination

How to achieve an efficient modal coordination without distorting competitive market is
another key issue. One of the transport dilemmas most industrialized countries are facing now is underutilized railways and congested highways. There is much discussion on the need of model shift from road to rail, but it is not an easy proposition as the system has already been locked-in. There is inefficiency in both road and rail sectors because of inappropriate modal splits. One of the possible reasons for this is the obsession of modal competition between road and rail on the part of policy makers in the postwar decades. The issue here is how to achieve modal coordination and integration from the early stage so that similar dilemma can be avoided.

The dynamics of modal competition in facts run to favor auto and air modes in the long-run. The price index of auto cost in real term is continuously declining while the both capital cost (mainly includes construction) and operation cost (labor cost) are increasing in the real term. The spread of low-cost carriers are changing market completion for intercity transport drastically. The flexibility in air transport in terms of optimizing both capital and operational cost along with yield management to achieve higher load factor is likely to make competition between air and high-speed rail very fierce. High-speed railways should therefore continuously improve service level to be competitive against auto and air modes.

Given the higher demand density in major intercity travel corridors, the competitive market can be maintained without the risk of wasteful provision of services (multiple services each with lower load factor) in Asian countries. However, it is important to gear policy measures towards achieving optimal modal coordination in terms of securing level playing fields, which allows each mode to serve its competitive market niche. Such coordinating strategy may involve prioritizing and sequencing infrastructure development for different modes and taking the externalities, both positive and negative, into account.

5.3 Integrating intercity transport policies with spatial development plans

Investment for intercity transport infrastructure and service has important implication for spatial development, and there by on regional disparity. Recent theoretical advances on agglomeration economies have brought the role of intercity transport into new lights (World Bank 2009). One of the issues in most developing countries in Asia is over-concentration of population and economic activities into the advanced regions or metropolitan areas. The megacities regions seem to have exhausted agglomeration economies with increasing congestions and pollution. However, the centrifugal pressure for dispersion cannot be generated unless these economic hubs are well connected with secondary cities. By examining the role of intercity transport to shape the pattern of concentration and regional connectivity useful policy insights can be drawn.

Population density- or by extension density of transport demand- is the key determinant in shaping the structure of transport system and operation of transport market. Despite the theoretical superiority of public transport modes, such as buses, conventional rail and high-speed rails, the transport market in most western industrialized countries is not much favorable for these modes. The main underlying reason is lower demand density which results in lower load factor with negative effects on commercial viability. For some travel corridors with very low demand, contrary to the commonly held notion, buses and railways perform worse than automobile for greenhouse gas emissions. In that respect, the higher population density in Asian countries/regions should be properly factored in while formulating strategies for future transport systems.

On the other hand, spatial development and high-speed railways may have stronger linkage especially in the case of developing countries. The spatial development patterns in developing countries are just evolving and yet take a firm shape. High-speed rail development may attract
economic activities around the stations as they improve the accessibility (market reach) significantly, and contribute to development of high-density corridors. This increases the ridership of high-speed rail leading to higher service level, and hence triggers a virtuous cycle. An important point to consider here is to make a choice between maximizing land-development impacts by locating a high-speed rail station at a green field site, and maximizing accessibility by locating the station at the existing railway station. There are successes and failures for both kinds of choices. In case of Taiwan and China the bias is however towards locating the high speed rail stations at the green field sites to maximize value-capture, and also for allowing flexibility for straight-line alignment to achieve maximum speeds. This approach may erode the competitiveness of high-speed rail in the long run when travelers will be very sensitive to the access and egress times, which are much higher in the new sites than in the existing station sites. In fact, the smaller access and egress time for high-speed rail with station at the city center is the primary factor giving competitive edge to high-speed rail against the air mode.

5.4 Intercity transport and climate change

Transport sector contributes about one-fourth of the greenhouse gas emissions, and increasing trend of transport emissions in both developing and developed countries is a major policy concern internationally. Urban transport policies have long tradition of dealing with emission, which also has local environmental impacts- an immediate concern for policy makers. On the other hand, transport is also important for the economic growth. Unfortunately, the current debate on climate change is derived largely by a perceived trade-off between economic efficiency and low-carbon policy measures. However, in Asian developing countries there is a real opportunity to get over such trade-off and create a win-win situation. In Asian developing countries public transport is still dominant, and as the transport system is just evolving it can be directed from this early stage towards low carbon paths. Being later comers, Asian developing countries can leap-frog in adopting advanced technology and innovative managements to develop low-carbon intercity transport system.

5.5 Sustainable funding and financing for intercity transport

What is the sustainable financing model for intercity transport in developing Asian countries/regions? For the given scale of investment needs and available funding resources, the constraint of financing gap is obvious. One of the key misgivings not yet resolved in developing countries/regions is over-expectation from private sector investment in transport. Private sector is certainly an important player, but not necessarily to the extent of meeting the financing gap. In particular, for private sector investment, transport infrastructures are not as attractive as other infrastructures such as energy and telecom. However, in the face of growing pressure on government budgets, Asian developing countries formulate rather optimistic plans to mobilize private sector investments.

In this context, it is important to make a distinction between the basic concept of “funding” and “financing” as discussed by TRB (2009). What particularly needs to be clarify is that the private sector is not going to “fund” the investment in the sense of taking ultimate burden; rather it will simply “finance” and/or “invest” expecting to recover the investment in the future with profits. Hence, the ultimate burden of funding the investment lies either on the users or the government. Indeed, private sector investment can add value by injecting management innovation and efficiency, and thereby can lessen the ultimate funding burden, but the funding burden will remain there. On the other hand, there are also cases that private sector involvement increased the ultimate burden (for users or government) mainly because that the cost of capital for private sector is higher than that for public sector (Estache et al 2008).
If the historical experience from now developed countries/regions is of any guidance, the responsibility of filling major share of gap lies on the public sector devising some alternative financing schemes that is reliable and stable. Some countries/regions utilized a part of economic stimulate package (in response to recent economic downturn) for transport investment and have achieved positive impacts through better transport. Ironically, it appears that to realize much efficient investment in transport infrastructure, countries/regions need to wait for major economic downturns. The financing aspect should be discussed not only for infrastructure investment but also for service operation. The key point here is to secure commercially viable infrastructure maintenance and service operation. Then financing initial investment may not pose that much problem as it can justified on the ground of long-term strategic public assets with wider socio-economic benefits.

6. CONCLUSION

Sustaining rapid economic growth in developing Asian countries requires major improvements in intercity transport systems in terms of capacity expansion, and upgrading of speeds and other service attributes. The diverse patterns of intercity transport systems across countries in the world may indeed offer useful lessons for developing countries. Examining the pattern in selected developed countries revealed that maintaining balanced shares of different modes contributes to both environmental and efficiency objectives. This is because of better division of transport market between different modes according to their inherent advantages. However, it is not an easy task to achieve this. The paper proposed a framework for setting vision and strategies, and also forwards a hypothesis on future scenarios emphasizing importance of considering long-term change in travel behavior for formulating effective policies. Finally, the paper identifies key issues and strategic options for developing Asian countries. It is expected that the contents of the paper will contribute to clarify some critical issues currently under debate in relation with the development of intercity transport system in Asian developing countries.

REFERENCES


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