APPRAISING THE SOCIAL COSTS AND BENEFITS OF ROAD PROJECTS

Walter Hook, Executive Director,
Institute for Transportation and Development Policy

The social costs and benefits of road transport have traditionally been incorporated partially into economic appraisal, partially into social impact assessments and environmental impact assessments, and sometimes are dealt with in a section identifying the project's intended beneficiaries. This paper first evaluates current practice in terms of how these types of evaluation are conducted and relate to one another, identifies their shortcomings and strengths in terms of how they affect project outcomes in practice (if at all) and then suggests some possible areas of reform, generally building on work done elsewhere.

Economic Appraisal

-----External Costs and their Incorporation into Economic Analysis

There has been extensive discussion of whether it makes sense to broaden economic appraisal to include more external costs and benefits, and whether this will lead to projects better targeting the needs of the poor, or at least better maximizing of the 'social good.'

The work that has been done identifying, quantifying and incorporating social costs into transport sector economic analysis and decision-making in general is fairly extensive, particularly in the EU. It has focused much more on the quantifying and internalizing the external social costs associated with transportation, and much less attention has been paid to broadening the definition and quantification of social benefits.

One of the earliest and more influential was:

Per Kageson, 1993. "Getting the Prices Right: A European Scheme for Making Transport Pay its True Costs." (Brussels: European Federation for Transport and Environment)

Kageson first laid out the external costs of

a. accidents and related costs

b. environmental costs including air pollution, noise, vibrations,

c. severance

d. congestion

Some similar efforts in the US by Ketchaum and Komanov, and James McKenzie at the World Resources Institute were in a similar vein.

Later, the OECD published Internalizing the Social Costs of Transport, of which the

following was the most useful summary of the literature:

Quinet, Emile. 1994. "The Social Costs of Transport: Evaluation and Links with Internalization Policies," in Internalizing the Social Costs of Transport (Paris: OECD/ECMT), p. 58.

Mark Delucci at UC Irvine published several papers on "The Total Costs of Motor Vehicle Use." (madelucchi@ucdavis.edu). He probably has more recent data of interest.

Todd Litman of the Victoria Transportation Policy Institute, have both done a lot of work on identifying and quantifying the social costs of transport. The Litman paper is available on line at http://www.vtpi.org/tca.

These papers led to the development of the following EU White Paper:

Commission of the European Communities. 1998a. ***Fair Payment for Infrastructure Use****: A phased approach to a common transport infrastructure charging framework in the EU (White Paper; COM(98) 466 final).* Brussels: COM.

ITDP published in 1994 ***Counting on Cars, Counting out People***: A critique of the World Bank's Economic Assessment Procedures for the Transport Sector" which reviewed World Bank economic analysis. This study reviewed some of the shortcomings of the HDM III model, a few of which were partially addressed in the new version.

It identified the problem of excluding many of the same external costs identified in the Kageson study, and also pointed out that a more serious problem was that HDM basically **ignored non-motorized modes all together**. The HDM model was basically set up to measure road conditions' impact on vehicle operating costs, and was useful in prioritizing rural and intercity road investments, but was often more broadly applied for decisions it was ill-equipped to address. While some recommendations for how to incorporate non-motorized trips into HDM were made by follow up studies commissioned by the World Bank from PADECO, and the identification of 'severance' problems was also recommended in the World Bank's environmental sourcebook, the extent to which they have actually been used in practice in probably minimal. The ITDP study also pointed out that building a road with government subsidies in a corridor parallel to a rail line with no government subsidies could have adverse economic impacts on the parallel rail corridor, and the same could be said for urban ring roads paralleling or serving the same origins and destinations as rail-based public transit routes. This was clearly the case in the M3 Highway Project in Hungary funded by the EIB and the EBRD, and perhaps of the M0 ring road in Budapest funded by the World Bank.

It also built on the issue of insufficient compensation generally paid to the victims of involuntary resettlement, pointing out that even when the dispossessed get even better housing than they had previously, this housing is often far from their jobs and their community support networks, driving up their daily transport costs and affecting their income generating ability in other diverse ways. (Immers, R. & Bijl. H. 1993. "Slum

Relocation in Bangkok," (Washington D.C.: TRB Preprint#93CF105). The fact that these costs are never quantified in economic appraisal nor in social impact assessments is quite clear from a review of their Guangzhou Inner City Transportation Project, for example.

Later, work by ITDP for GTZ (***Improving Conditions for Non-Motorized Transport, Surabaya Indonesia:*** GTZ, Surabaya, 2002) in Surabaya proved that ignoring non-motorized modes from economic analysis is not just a minor oversight but a fatal flaw, particularly in urban areas. There are numerous examples where road improvements may increase vehicle speeds but in fact impose severe inconvenience on slower moving, lower income pedestrians and other non-motorized vehicle users.

The GTZ study of two locations in Surabaya indicated that the introduction of pedestrian barriers and the one way street system increased vehicular speeds but also increased the average detour factor faced by both motorized and non-motorized trips from roughly 2 to roughly 4. This is the distance that a person actually has to travel between any origin and destination given the nature of the road network, compared to the distance as the crow flies. This dramatic increase in the detour factor increased the travel time for all motorized and non-motorized modes. Our data indicated that because of these high detour factors poor families are traveling an average of 3 km extra per day. At the estimated average travel speed of 6 kilometers per hour, this is a loss of a half hour per day per person. At 1/3 of the average hourly wage ($0.35), or $0.12 per day, this is $30 per year: a big penalty to a low income family. This time is also often at the expense of education and income generating activities.

These detour factors, coupled with coupled with extremely unsafe road conditions also led to a modal shift that adversely impacted low income people. The poor are actually forced to take motorized vehicles even for short trips. Despite the fact that per capita incomes in Surabaya are 1/40 of in German cities, 60% of trips under 3km in Surabaya are made by motor vehicle, compared to under 20% in German cities. If it were possible for people to walk and bike safely, and residents of Surabaya were able to walk and bicycle as frequently as citizens of Germany, this would save each trip roughly Rp.700, for 3 trips, or Rp. 2100 per day (about $0.25). This is an annual dis-benefit to the majority of the population of roughly $65 per year, when the traffic engineers actually justified the changes in terms of a social *benefit*

This is not just true in urban road projects. Intercity roads in India, for example, are being upgraded to higher speeds and putting in pedestrian barricades to prevent them from crossing the road. This creates fairly severe severance problems for large numbers of people and does not appear to be improving the safety situation. These changes impose real costs on those short trips which are always ignored in economic analysis.

This illustrates the fact that ignoring non-motorized trips is not a trivial problem but in fact invalidates entirely the conclusions of an economic analysis.

Another major problem pointed out in these studies is that economic analysis does not include any analysis of 'induced demand.' In rural areas this is not really a major issue, but in urban areas many of the claimed 'benefits' of urban road projects such as improved air quality and reduced traffic congestion are often overstated because induced demand effects are ignored. This problem is recognized in the new World Bank Urban Transport Policy, and a practical manifestation of it is thoroughly critiqued in ITDP's "Critique of the World Bank's Guangzhou City Center Transportation Project" (available on line at www.itdp.org)

To overcome some of these problems, the effort to internalize external costs into project evaluation led to the development of 'least cost planning methodologies' which try to incorporate social costs into an alternatives analysis that is basically a modified version of cost benefit analysis. Patrick DeCorla Souza and others developed a modified cost benefit analysis which basically converts all these social costs into a $ per kilometer parameter, and then treats all of the costs of making a trip through different alternative mechanisms equally, including the travel time of making the trip. In this way all 'benefits' are includes as simply 'lower costs' for making the trip.

Some metropolitan planning organizations have tried to incorporate these least cost planning techniques into their infrastructure investment decision-making, such as the MPO of Albany, New York, but I have no details on the outcomes. Litman and Zegras at the International Institute for Energy Conservation tried to apply these principles to Santiago de Chile, and issued a report on this. (probably available on the vtpi web site) Whether it had any impact on decision-making in Santiago is not clear.

There are extensive critiques of this literature, (Coase could be used, the Reason Foundation has made some feeble efforts) and it still by and large remains outside the mainstream of accepted planning procedure outside a few very narrow applications, like new EU rules allowing higher trucking fees on roads traversing sensitive alpine ecological zones.

Whatever their validity, these studies all focused on the fact that traditional economic appraisal tends to ignore external costs and non-motorized modes, and tended to discount the existence of benefits that should be quantified but are currently being ignored.

-----External Benefits and their Incorporation into Economic Appraisal

This research effort, with a concentration on low volume roads serving low income populations, is more interested in possible 'economic benefits' that have been overlooked. It should be pointed out that this effort flies in the face of a general impression of many groups pressing for reform of existing decision-making processes that in fact far more external costs had been excluded in the past than external benefits. While most of this literature grew out of primarily urban concerns, it would be unfortunate to establish a decision-making precedent that was not technically and theoretically sound in all contexts.

Generally, economic appraisal only focuses on the following benefits:

a. reductions in vehicle operating costs, mainly fuel and maintenance,
b. reductions in the travel time (valued usually at some share of the average wage rate).

There is an extensive literature on how best to quantify travel time. Clearly, using actual incomes of the populations served or the 'willingness to pay' of the population served is going to introduce an enormous bias in project targeting in favor of projects targeting the wealthy. For this reason, most institutions use an average wage rate regardless of the population served. Others have argued that the time of a poor person is more valuable to a poor person who's days are filled just managing to make ends meet, and have developed mechanisms that would increase the weighed value of the time of the poor.

These efforts, when used, introduce an element of 'equity' into economic analysis that takes the economic evaluation process away from giving us purely 'economic' information, though it may help bring about a more 'equitable' decision. However, it must realized that at least to the extent higher incomes reflect higher marginal productivity of labor. As such, the mobility needs of higher income people are indeed of greater economic value (though not of greater social value) than the mobility needs of the marginally employed poor. If time savings were valued to reflect this, it is highly possible that government road investment decisions would be even more biased in favor of urban rich than currently.

As such, it would be simpler and theoretically cleaner to keep the question of 'economic impact' and 'impact on the poor' analytically separate, and improve targeting of the poor simply by increasing the importance of the 'social impact analysis' and targeting of 'intended beneficiaries' in the overall decision-making process.

As this research effort seems particularly keen to explore whether there are further economic benefits that are perhaps being missed by current economic evaluation, the inclusion of which might help to target road sector investments to the poor, something more can be said.

Since the Keynesian economists in vogue after World War II, Rosenstein-Rodan (Rosenstein-Rodan, P.N. 1943. "Problems of Industrialisation of Eastern and South Eastern Europe," The Economic Journal, June-September, p. 202) developed a theory that the private sector, left to its own devices, would tend to under-invest in roads because the benefits to society are difficult to capture by society at large. This was used then as a justification for government subsidies to the road sector.

The main benefits identified by Rosenstein-Rodan and later writers include:

a. the reduction of the costs of products in the market, including one could argue the cost of reproduction of the labor force and hence the competitiveness of that

labor. This might include a reduction in the cost of housing as lower land costs are achieved through the dispersal of economic activity.

b. expansion of markets for lower cost producers with greater returns to scale, again reducing the price of commodities in the market, (the traditional justification)
c. stable and reliable transport can allow firms to tie up less of their money on warehoused inputs or unsold outputs, freeing up capital and reducing the risk of market volatility both in terms of factor prices and in terms of demand for their final products (the advantages of 'flexible specialization' and 'just-in-time production')
d. the ability to reduce the amount of land required to warehouse the said inputs and outputs.
e. Greater access to schools and other networks, increasing indirectly the productivity of labor

Aside from the point that collecting such data is fairly cumbersome, it should be pointed out that these 'economic' benefits are likely to be much higher in industrial and urbanized areas than in rural areas. Their inclusion in economic evaluation is therefore theoretically valid but unlikely to increase the flow of funds to low volume roads serving low income people.

The World Bank study in Morocco (Morocco: Impact Evaluation Report, Socioeconomnic Invluence of Rural Roads, Fourth Highway Project, Loan # 2254-MOR, No. 15808-MOR, June 28 1996. Washington DC: World Bank Operations Evaluation Dept) noted that the cost of goods in local shops dropped in areas where roads were improved and not in areas where roads were not. Most of this 'benefit' will be the result of reduced travel costs, and hence has already been captured by standard analysis. The only additional benefit is the additional drop in the cost of goods which results from the fact that the production process used to produce the goods themselves has changed as a result of increased returns to scale, etc. The likelihood that these impacts are going to be very significant in a rural area is fairly marginal.

In terms of school access, while this can indeed be extremely important in the long run, the direct economic effects of this are likely to be so protracted in time as to make their measurement exceedingly difficult. It would be much easier to set a social target of generally literacy that to quantify its economic importance.

Furthermore, the quantification of these benefits makes people nervous that this will be used as a justification for subsidized public investment into roads. This is because cost benefit analysis has been used precisely in this way since its development.

This view was attacked first by Hirschman, A. 1958. The Strategy of Economic Development, (New Haven: Yale University), then by Coase (Coase, R. 1990. The Firm, the Market, and the Law (Chicago: University of Chicago Press), then by Rothengatter, W. (1992) "Externalities of Transport" (ECMT: Transport Economics, a State of the Art). The attacks took several forms.

Hirschman's argument is not that there are no economic benefits from roads, only that they are unpredictable and difficult to identify in the absence of a clear market signal. Coase's attack was based on the fact that unless the cost of transport trips were fully internalized into the cost of the trip, not only would travel decisions but also real estate investment location decisions would be distorted, creating inefficiencies in the built environment. Rothengatter's critique is mainly that these benefits, while real, are not 'external' and do not constitute a justification for government subsidy because there is always a clear beneficiary who would be willing to pay real money for them. Hence, there is no justification for government subsidies if user-fees are sufficiently well targeted.

For these reasons, transport experts with a focus primarily on urban transport and sustainability are greatly reluctant to expand the definition of social benefits that are included in the economic appraisal of road projects for fear that they would again be used to justify unsustainable urban highway projects.

The easiest way to use the economic appraisal to justify more loans to low volume rural roads in low income areas is to simply include such roads in a larger package of investments so that the aggregate ERR comes out sufficiently high. This game has been played for years against the interest of the poor, and there is nothing stopping it from being used in the interests of the poor. Another way would be to tighten the rigor with which the 'social impact assessment' and the identification of intended beneficiaries is conducted.

-----How Economic Appraisal Relates to Financial Appraisal and Cost Recovery Targets: the Need for a Uniform Appraisal Methodology Across Modes.

Simply focusing on the inherent biases of current economic analysis ultimately misses the somewhat more important point that the use of economic analysis is highly selective and biased in itself.

In 1996, ITDP did a follow up study, "***Wheels Out of Balance***" (available at www.itdp.org) focused less on the problems with economic analysis per se, and focused more on the problems with the way that economic analysis tends to be used highly selectively in the project appraisal process. Basically, cost benefit analysis is only used when a development institution or government is trying to justify an investment into something that is going to be heavily subsidized by the government. Otherwise, their primary evaluation criteria is likely to be a financial analysis.

In fact, as development banks, one might expect that the primary concern would be whether or not the loan will be repaid. However, because most development banks are sovereign lenders with preferential treatment in the event of a sovereign default, development banks are not really that concerned about financial risk. Therefore, when the World Bank wants to subsidize something, like a road, they use cost benefit analysis. They make no pay little attention to whether the construction of the road is going to help or hurt the government's ability to repay the loan, or will even be able to raise sufficient

revenues to maintain the road. This lack of attention to the impact of a road loan on the fiscal position of the borrower may have been responsible for unsustainable road sector loans made by the World Bank to Africa in the 1960s and 1970s, and burgeoning public sector debts in many countries. According to Creightney, for loans to the road sector in Africa,

> "the combined effect of these project-induced fiscal flows can be a reduction in government revenues of over $17 million per annum, despite the high economic rate of return." (Creightney, p. 28)

[Creightney, C. 1993. Transport and Economic Performance (Washington D.C.: World Bank Technical Paper No. 232].

Heggie's work [Heggie, I. 1995. Management and Finance of Roads: An Agenda for Reform (Washington, D.C.: World Bank)] is an excellent review of the status of road cost recovery in Africa, and made a number of excellent suggestions as to how this problem might be overcome in terms of national government actions, but stopped short of proposing any real reforms in World Bank or other donor agency financing decisions.

This problem was not resolved (to the extent that it was resolved) by any fundamental shift in the manner in which project appraisal is performed, nor the requirement to do a de-facto financial analysis for the impact of the project on government finances. Rather it seems to have been resolved mainly by the decision to only fund road maintenance and rehabilitation and not new construction in heavily indebted countries.

As a result, the fundamental problem that current appraisal methodologies don't even ask the question of the impact of a road project on the governments finances.

This is particularly problematic because of the way loans to the rail and public transit sector are made. While loans to these sectors also generally perform an economic analysis, it will also almost certainly include some analysis of the impact of the project on the finances of the rail company or the transit company, and also include close scrutiny of the level of subsidy to the system. More than this, the loan agreements generally contain side agreements that require the borrower to reduce the level of government subsidy to the sector. These requirements have certainly had adverse affects on low income people, even if the reforms in the long run are justified.

This would not be so objectionable if it were not for the fact that virtually no road sector loans include any similar requirement that road-sector subsidies be phased out or reduced. As a result, a $500 million inner ring road in downtown Guangzhou upon which no public transit vehicles or bicycles operate can be justified through economic appraisal, while the loan agreement included no measures to increase cost recovery ratios in the road sector, or any analysis of the impact of the road on the government's finances.

As a result of using different evaluation criteria for different modes, the World Bank is effectively looking the other way to road projects which subsidize higher income people

for hundreds of millions of dollars while cracking down on subsidies to low and moderate income public transit users in order to reduce government budget deficits.

In response to ongoing criticism along these lines from the NGO community, Gannon and Liu (1997) from the World Bank now state that when using loan conditionality in the transport sector to affect transport sector subsidies,

> "borrowers should be encouraged to address the following questions:… b)who are the real, ultimate beneficiaries, and who ultimately pays the cost?"

To date, however, there has been no specific requirement that the World Bank or other development banks themselves require an analysis that a. assesses the project's impact on the finances of the borrowing government, and b. assesses the impact of the project on government subsidies, or c. assesses the equity of these subsidies.

Social Impact Assessment and Targeting of Low Income or other Beneficiaries

As most transport reform advocates are extremely reluctant to broaden the inclusion of social benefits in the road sector to make it easier to justify the financing of roads in low income areas for fear of the precedent it would establish, most would support improving the degree to which road projects are targeted to low income beneficiaries. In our view, this would best be done not by changing the economic appraisal but by changing the importance of the evaluation determining how well the project is targeted to the needs of the poor, and by changing the social impact assessment.

Most transport projects financed by an international development institution require some sort of 'social impact assessment.' Some also require that the project be 'targeted' to low income beneficiaries. In project appraisal documents, sometimes these assessments are covered under 'social appraisal' and sometimes under sections titled 'intended project beneficiaries.'

In the project appraisal process, the World Bank and most other development institutions require a social impact assessment, and generally also include a paragraph or two identifying the intended beneficiaries. The World Bank's overall mandate of alleviating poverty has traditionally been interpreted extremely broadly, accepting that all sorts of projects that do not benefit the poor directly do so indirectly so long as they contribute to economic growth. Hence the reliance on a non-income specific economic rate of return evaluation as nominally the determining factor in loan eligibility. In recent years the Board has been requiring more and more evidence of direct project benefits to the poor. This has not been done to date by changing the ERR methodologies but by separate analyses as mentioned above.

Some US Government-funded international programs require that the beneficiaries be 'below median income', such as the Housing Guarantee Loan Program, which was also used for urban infrastructure. (Once asked to do this assessment in Indonesia, I

determined that virtually all government infrastructure programs except one (KIP or slum upgrading) had to be disallowed on that basis. Needless to say, this determination was not the sought for outcome.)

Some governments require a social impact assessment of transport projects, but relatively few. Some include it as part of environmental impact assessment. The US Government requires state and municipal governments that are recipients of Federal funding to file a Title VI report which is a social impact assessment based on race rather than class (Section VI filings). As with environmental impact assessment, the methodologies for performing these social evaluations are rarely spelled out, the conclusions are rarely challenged, and there is little incentive mechanism for encouraging a more honest appraisal.

A review of the social impact assessment in a random sample of World Bank road sector loans indicates that this social impact assessment is primarily focused on avoiding highly negative social impacts, primarily those resulting from insufficiently compensated involuntary relocation. These impacts are now fairly carefully studied as a rule, but they rarely include the transport cost ramifications of relocation.

Occasionally, a World Bank or other development bank project will include in the project appraisal a more careful analysis of the poverty reduction benefits of some marginal sub-component of a loan, the bulk of which supports highway construction. Post-implementation evaluations are extremely rare, and when they are performed also focus on these relatively marginal poverty-specific sub-components rather than on the overall poverty impacts of the project as a whole.

The World Bank's 1997 "**Poverty and Transport**" by Colin Gannon and Zhi Liu (p. 45 – 47) lays out suggestions as to how poverty impacts could and should be integrated into the project development cycle. Were these proposals followed it would indeed help to target transport projects to lower income beneficiaries. Ultimately, however, the World Bank seems to hold that it is up to the borrowing country to decide whether a project targets poverty alleviation or not. This would appear yet again as a case of selective conditionality. Since the World Bank's entire purpose is poverty alleviation, it is rather surprising that poverty alleviation and some direct assessment of it is not central to the loan eligibility criteria rather than as something of an afterthought or a piece of window-dressing.

Since the aim of poverty alleviation should be central to lending criteria for all projects and not just an assessment of poverty-oriented subcomponents and the mitigation of severe adverse social impacts, certainly loan evaluation criteria should require a much more thorough assessment of the impact of the project on the poor, perhaps in the social impact assessment.

To date, studies which have assessed these poverty impacts have not followed a commonly accepted methodology. A good review of those done to date is included in the technical annexes of:

Gannon, C., K. Gwilliam, Z. Liu, and C. M. Calvo***, Transport Infrastructure and Services*** (Chapter in the Poverty Handbook, the World Bank, 2001, Technical Note 1, the Sustainable Livelihoods Framework) available at www.worldbank.org.

Increasingly, poverty theory is moving in the direction of defining poverty in terms of the capacity of the poor to improve their own lives and deal with crisis. (UNDP. 1995. Human Development Report (UNDP: New York) Most analysts (see Moser, Caroline…) are moving towards an 'assets' based approach to assessing this capability. In other words, the poor are much more likely to have the capacity to improve their lives and survive crises if they have accumulated 'assets' such as

a. Land and home ownership and its accessibility
b. human capital (ie. education and skills)
c. natural capital (if relevant)
d. physical capital (vehicle ownership, roads that one has access to, public transit vehicles, busways, etc)
e. social capital (networks)
f. financial capital (pensions, savings, etc)

A first pass at relating this to transport can be seen in:

Gannon, C., K. Gwilliam, Z. Liu, and C. M. Calvo, Transport Infrastructure and Services (Chapter in the Poverty Handbook, the World Bank, 2001, Technical Note 1, the Sustainable Livelihoods Framework)

The work of Howe and others has already developed extensive methodologies in this area, and I assume that they can lay out these methodologies at greater length.

In practice, however, rather than peforming an extensive evaluation of the poverty impact of a transport project, most development institutions have used a kind of short-hand which relies essentially either on the 'geographic' targeting of beneficiaries or the 'modal' targeting of beneficiaries.

-----Geographic Targeting of Beneficiaries

To the extent that a project or sub-project has identified poverty alleviation as a 'goal', the most typical approach is **geographic**. In other words, a project is targeted to poor people because it is located in a location that has been defined as 'poor' by some agreed upon criteria. These criteria vary from the simplistic (per capita income for an entire nation or region) to the complex (per capita income, percentage of poor per 1000 population, infant mortality rates, literacy rates, etc), but all of them are used to define an entire discrete geographic region.

The World Bank has made several loans to Chinese provinces which target rural poverty. The method of targeting was to first locate a poor county by the criteria suggested above,

then identify roads which are proximate to the most people, and then use cost effectiveness criteria to prioritize those roads that can be improved for the most modest cost. This is a reasonably positive example.

Many development agencies have for years prioritized rural transport projects over urban projects on the grounds that a disproportionate number of poor live in rural areas. The Asian Development Bank's recent country strategy for China justifies ambitious road construction in land-locked provinces as a way of minimizing poverty and growing regional economic disparities. The European Union has similarly justified ambitious road construction schemes in less developed parts of Europe through both Cohesion Funds and PHARE funds, on the grounds that such investments will reduce regional economic disparities. Eligibility criteria are per capita income at the provincial level. Road projects in Eastern Germany and Eastern Hungary are being funded by the institutions of the European Union in the hope of reducing unemployment in these areas. The Hungarian national government agreed to fund the M3 highway to the Ukraine despite very weak economic impacts because the region was 'underdeveloped.' The US, similarly, has a special trust fund for highway construction in areas of rural poverty. The result of this approach is quite visible in West Virginia, a state crisscrossed with beautiful and reasonably empty interstate highways but still mired in the economic problems left by the reduction of US coal use.

Thus, the validity of geographic criteria will depend to a large extent on the specificity of the area defined, with national-level and even provincial level eligibility criteria being highly dubious, urban-rural distinctions being a bit dubious. The more localized (sub-district level) the level of analysis, the more likely that a geographic approach to project targeting will have some valid impact on the poor.

The geographic approach to social impact analysis of transport projects, while simple to implement, suffers from two fallacies.

a. Just because the average income in a particular area is low, this doesn't mean that everyone in the area is low income. Further, just because a project is in a poor area, in doesn't necessarily mean that the project will benefit the poor people in the area.

Take the example of a rural road project in Bangladesh. A recent World Bank assessment of just such a project concluded the following:

> "The rural road network now in existence is excessive and therefore much of it, maybe one half, would not merit improvement. [many of the current] road schemes are a waste of resources at best, and in many cases may be producing significant dis-benefits for the rural economy." (World Bank,1991)

As Howe points out:

> "Under the conditions prevailing in Bangladesh, improving rural transport without complementary changes in credit, the provision of agricultural inputs and marketing arrangements, would provide benefits only to the large farmers and the traders." (Howe, 1994a)

Not having access to motorized means of transport, small farmers are likely to make only minimal use of new roads. The production costs of small farmers will thus remain unchanged, while the production costs of larger commercial farmers, which now have access to motorized transport, will see their production costs reduced, giving them an additional competitive advantage over small subsistence farmers in local produce markets.

The construction of the road itself may also drive up the costs of certain locally-supplied resources used by the poor. For example, the construction of rural roads in Bangladesh consumed an enormous amount of local firewood for the firing of bricks, which drove up the price of firewood for cooking. (Howe, 1994a) Construction of roads in West Bengal also drove up local food prices because the soil taken to construct the roadbed led to the salinization of extensive tracts of agricultural land. (Int. w/ Thapar, AITD, 1997)

Furthermore, road projects require the appropriation of land for the right of way. In countries without developed legal systems to protect the poor, the risk that people suffering from land expropriation is considerable. The loss of property right and the land right could prove devastating to a poor family.

b. Building roads in a poor region may not even benefit the rich in the area.

An increasing body of evidence indicates that roads have little impact on poverty or regional economic disparities. According to a study by the former chief transport economist at the World Bank, "As far as regional development is concerned, we have seen little strong evidence to suggest that the motorway investment is a powerful influence on inter-regional location of activity." (Gwilliam and Judge, 1978) Research on the European Union concluded that:

> "new long-distance infrastructure may also have negative economic impacts. The assumption that roads are always beneficial to regional development is wrong." (Hey, et. al. 1996, p. I)

Basically, it is not clear whether better transportation access necessarily helps a low income area by increasing the market for goods produced in that area, or whether it ultimately undermines the economic viability of that area by opening the area's local producers up to competition from larger scale producers elsewhere. These impacts are so complex and so difficult to predict as to make invalid any blanket assumption that road construction or improvement will necessarily help the overall economic situation in a poor region.

For this reason, organizations primarily concerned about poverty alleviation rather than about transport per se have increasingly focused not on the targeting of roads projects but on the access of the poor to low cost appropriate vehicles. Giving poor families sustainable access to low cost vehicles directly ensures the increase of the productivity of the low income family's labor, helping them compete with other larger scale producers, whereas the benefits even of well targeted road projects are likely to be captured primarily by those wealthy enough to own motorized vehicles, which virtually assures they are not low income.

-----Mode-Based Targeting of Beneficiaries

Gannon and Liu (World Bank, 1997) suggest that for project appraisal, the

> "The benefits from all poverty focused investments should be estimated across all alternatives. This requires a careful investigation of how the poor use and could use transport facilities."

In some cases, the World Bank claims it has tried to improve the targeting of its urban sector road loans to low-income people by specifying in the loan conditions that only roads where public transit vehicles operate are eligible for road construction or road maintenance loans. Some urban road projects have focused on widening or improving roads and pathways in low income squatter areas. The World Bank Urban Transport project in Bogota (World Bank, 1996f) includes $10.8 million for access roads in low income areas. In order to ensure that the beneficiaries were predominantly below median income, the World Bank included in the cost benefit analysis only those benefits accruing to public transit riders, and selected corridors where private motor vehicle use was minimal. This helped to ensure that at least the sub-project targeted the poor.

But shouldn't this criteria be applied to all transport projects? This would avoid some of the most outrageous offenses against equity, such as the enormously expensive elevated inner ring road in Guangzhou that the World Bank financed. Somehow, the World Bank saw fit to finance a $500 million elevated highway funded entirely by the government (ie. subsidized virtually 100%) which currently contains no bus routes and on which non-motorized traffic is banned. While arguably traffic on surface streets was marginally reduced, hence increasing bus operating speeds on existing streets, but at enormous cost per low income beneficiary. A careful analysis of the beneficiaries was done only for a small sub-component of the loan focused on traffic management, which included the more progressive measures including busways and bike lanes. This analysis indicated that private vehicles represented 53% of the beneficiaries. The users of private vehicles in Guangzhou are almost certainly in the top income quintile. Bus passengers represented only 24% of the beneficiaries. As none of the busway and bike lanes were actually implemented in any case, even this marginal benefit to bus passengers was not in fact realized.

Given the difficulties of monitoring the activities of governments and lending institutions (virtually nobody besides ITDP has made any issue of the Guangzhou Inner Ring Road

despite it being almost an example of 'worst practice'), the criteria for poverty targeting needs to be very simple and verifiable. For this reason, we would be more in favor of a mode-based assessment.

A mode-based approach to targeting beneficiaries in general should be a reasonably simple method of targeting projects to intended low-income beneficiaries and would be easier to monitor. How many kilometers of sidewalks, bike lanes, and busways does the loan finance?

Since the vast majority of trips made by the poor are made by public transit, paratransit, walking, and sometimes cycling, and make no trips by airplane or private motor vehicle, certainly urban projects where the primary beneficiaries are passengers of these modes should simply not be eligible from any funds that are intended to reduce poverty.

This mode-based approach would be the simplest form of targeting the projects to low income beneficiaries. Some World Bank critics have resisted this approach, claiming that the majority of public transit users are not poor people. Nonetheless, a much higher percentage of public transit users than road users per say are likely to be low income. Similarly, it is certainly true that not all bicycle operators and pedestrians are poor. However, to the extent that the poor travel at all, they will travel by these modes. For a more detailed survey of the travel modes used by the poor, see Hook, 1997. (UNDP study)

Even this mode-based approach has its problems. For example, many projects like the World Bank's new Mumbai Urban Transport Project, which include 'pedestrian' infrastructure, are in fact primarily financing pedestrian overpasses and underpasses, as well as physical barriers used to prevent at-grade crossing. This type of infrastructure in fact is only benefiting motorists, as the pedestrians are in fact greatly inconvenienced. Unless non-motorized trips are also included in the economic assessment in a serious manner, such problems are likely to be perpetuated. The same can easily be observed for bike lanes and bus lanes, which if ill-designed can be used to restrict bicycles and buses to narrow frequently obstructed lanes, increasing rather than decreasing the cost of travel by these modes, and mainly freeing up space for motorists

Environmental Impact Assessment and Safety

The other major social cost that is generally looked at separately is environmental costs. The treatment of environmental impacts through environmental impact assessment is now so established that the need to incorporate environmental costs into economic appraisal is doubtful, except perhaps in situations where economic criteria are so heavily weighted as a criteria for project selection that other criteria are simply discounted.

More often than not the problem is not so much that an EIA is not performed but that it is largely ignored or is methodologically unsound. One simple requirement for loan approval should be, for example, that the project does not drive an area into violation or further into violation of an ambient air or noise standard. Most governments

now have such standards, at least for some emissions, but surprisingly few governments require any sort of assessment of whether or not planned transportation projects or programs are in conformity with these standards. The 'Conformity' requirements in the US introduced after the Clean Air Act should be a useful model that to my knowledge is rarely applied in a developing country context. Certainly the World Bank and other IFIs could impose their own conformity requirements on their loans.

Taking the Guangzhou Inner Ring Road as an example. The EIA clearly shows that the road will drive areas adjacent to the road into violation of China's own ambient air standards. (the road passes within several meters of numerous apartments and hospitals). The loan was then justified on the dubious grounds that aggregate air improvements elsewhere make the loan justifiable.

Under US and most European law, the fact that a project in one location makes conditions better overall does not constitute a justification for driving a particular area into violation of an acceptable air standard. These standards are defined generally as maximum acceptable public health risks, and anything above them is simply defined socially unacceptable. In our view, this is the proper method of incorporating environmental costs into the loan approval process, rather than quantifying or monetizing these impacts (which will be highly imprecise and open to challenge) and including them in the economic appraisal.

Environmental impact assessment is increasingly coming under criticism in Europe for coming too late in the project cycle, at a time when all the most important project decisions have already been made. It has also come under attack for being too project specific, missing the cumulative environmental effects of a group of related transport projects that might be evaluated separately.

There have been two responses to this criticism. One, led by Sweden, has been to embed environmental goals (usually a target such as the reduction of overall Nox emissions) of into the earliest stages of the program development phase, forcing a fundamental rethink of overall project appraisal. The Swedes have taken a similar approach in the sector, with excellent results.

Another active area of discussion has been the emergence of requirements and methodologies for performing Strategic Environmental Impact Assessment, which tries to overcome the fundamental problem with traditional environmental impact assessment that it was too narrowly focused on site-specific impacts and frequently ignored traffic system impacts.

If this becomes mandatory anywhere it will be at the EU-level and tied to EU funding, but until now it has not been due to lack of agreement over a common methodology.

Safety impacts are particularly severe in the transport sector, and have received nowhere near the attention they warrant, given the impact that road accidents have on human life and the income earning potential of entire families. As with environmental impacts, quantification of the 'value' of this human life is probably less appropriate than a multi-

criteria analysis which also includes an appraisal of the safety impacts of a major project. Roadway design, intersection design, road speeds, and numerous other factors that can be considered in road project design have critical safety ramifications, and developing a standard safety impact analysis for transport projects should be a high priority. The World Bank's Global Road Safety Program (GRSP) has been rather a disappointment in terms of affecting overall project development.

Conclusion

ITDP in cooperation with the World Bank, the EBRD, the governments of the Baltic Sea Region, and the Helsinki Commission, developed a proposed set of changes in project evaluation methodologies for use by development institutions and governments that we felt would better incorporate the concerns of social costs and benefits. The focus was more on environmental costs than poverty targeting. Nonetheless, as this list of criteria has been approved by at least one international body, it might constitute something upon which to build. It is included as an annex.

ANNEX I
RECOMMENDATIONS OF HELCOM REGARDING 17.1

Changes in Project Appraisal: General

1. **Environmental, health, and safety goals should be directly included in the transportation planning and infrastructure investment decision-making process, following HELCOM Rec. 17.1 which states that "Environmental protection should be made an integral part of all activities in the transport sector."**

2. **Because of the specific environmental concerns related to the protection of the Baltic Sea, all major transportation plans and investments at the regional, national, and municipal level should be subjected to a Strategic Environmental Assessment (SEA) by governments. When making loans in the sector, international financial institutions (IFIs) should encourage the completion of an SEA and take account of the results in their decision-making. This SEA must include, but is not limited to, assessing short, medium, and long-term impacts on the Baltic Sea. Plans and investments should be modified if necessary to ensure**

their conformity with HELCOM emissions reduction and other environmental goals (in particular, noise), as well as safety and health regulations.

3. **Governments and IFIs should require that major transportation infrastructure plans and investments should be subjected to an alternatives analysis where the costs and benefits, or cost effectiveness, of two or three alternatives for reaching the same access, safety, health, and environmental protection goal are compared. These alternatives must include investments into alternative modes, and traffic demand management measures. "Least Cost Planning" should be explored as a possible method.**

4. **Governments and IFIs should adopt the 'precautionary principle', avoiding plans and projects which constitute serious potential risks to the environment, public health, and safety, or adopting necessary mitigation measures, even if such actions cannot be justified on the basis of cost-benefit analysis alone.**

5. **IFIs should develop sustainable transportation policies that govern their transport sector lending. IFIs should furthermore strive to co-ordinate their policies and actions in the transport sector amongst each other.**

6. **Countries, with the assistance of IFIs, should develop the capacity necessary to perform high quality, state-of-the-art SEAs.**

7. **All international institutions should avoid funding multiple roads, airports, and ports where a single facility could serve the same need, by basing the investment decision as much as possible on objective economic and ecological criteria, and by encouraging regional co-operation.**

8. **IFI loans should be given in compliance with IFI policies and, where appropriate, the *access communautaire*. The latter applies particularly to lending outside the European Union (EU) where no alternative enforcement mechanism exists.**

Changes in Economic and Financial Appraisal

9. **IFI use of loan conditionality should be balanced between modes, and should never encourage a relative increase in government subsidies for less environmentally sustainable modes. IFIs and governments should harmonise their methodologies for performing economic and financial appraisal to ensure that the methodologies are consistent and comparable between modes.**

10. **National governments and IFIs should not fund any transportation infrastructure project with an ERR of less than the cost of capital unless a clear short or long term environmental benefit or poverty reduction benefit can be quantified. Further, the project should be demonstrated as an effective method of reaching this environmental or poverty alleviation goal. The criteria for such**

decision should be included in the SEA and developed and agreed upon in consultation with governments, experts and NGOs.

11. **Cost-benefit analysis used by governments and IFIs should take into consideration not only the infrastructure changes, but also the costs and benefits of any policy changes that are an integral part of the project.**

12. **When cost-benefit analysis is used, it should include the quantification of full social costs, consistent with Helcom 17.1 Recommendation #2, which requires the "internalisation of external costs (environment, accidents, etc.) into the costs of transport.**

13. **National governments should limit the earmarking of road user fees to levels necessary to ensure sufficient funds for ongoing maintenance and necessary rehabilitation. Earmarking of funds beyond such levels will compromise a goal-oriented investment decision-making process.**

14. **For Build-Operate-Transfer (BOT) highway projects, the ministry of finance or controller, supported by any IFIs involved in financing the project, should fully quantify the financial risk to which the government is exposed by signing the concession agreement, including the implicit moral hazard created by the 'too big to fail' problem. A BOT project should not go forward unless it can be demonstrated that the financial cost of the project, including the quantified financial risk to the state, is lower than any alternative method of financing the project. Moreover, a government's overall borrowing capacity given self-imposed or IMF-imposed constraints should be considered.**

Changes in Current Environmental Assessment Practice

15. **The categorisation of transport infrastructure projects for environmental appraisal by IFIs should require appropriate environmental impact assessment for any project that increases the capacity of the existing infrastructure and/or requires taking additional right of way.**

16. **National governments should make no exemption of EIA requirements for infrastructure deemed to be of critical or strategic importance.**

17. **IFI boards should not approve loans until all the design specifications likely to have significant health and environmental impacts have been identified, and this design has been subjected to the appropriate level of EIA. In cases where significant environmental damage risk comes to light after the loan has already received board approval, once the final engineering specifications are known, further tranches of IFI funds should not be released until a supplementary, or if necessary a new EIA is performed and appropriate mitigation measures accepted.**

18. **Responsibility for review of transport sector EIAs at both the IFIs and governments must be in the hands of competent professionals independent of the**

project promoter, with access to all relevant project information and sufficient capacity and resources to perform a competent evaluation of the methodological validity of the EIA. The agency responsible for oversight of EIA should establish accepted norms for determining the validity of transport sector EIAs.

19. **In order to ensure the continued effectiveness and adequacy of EIAs, governments should set up independent monitoring procedures that check whether assessments were carried out in accordance with existing legal requirements.**

Financing More Sustainable Transport Projects

20. **As the environmental consequences of unsustainable urban transportation systems are international in scope, as demonstrated by the current threat to the Baltic Sea, national governments, and regional and international institutions like the EU and the IFIs have a responsibility to ensure that environmentally sustainable urban transportation modes are adequately funded. IFIs should develop mechanisms to lend directly to municipalities without government guarantees.**

21. **IFI Transport sector loans should be used to leverage traffic demand management and traffic calming measures, and investment into more sustainable modes. Such measures are particularly important for ring roads in major metropolitan areas, and for toll roads where extensive traffic is likely to be diverted to local streets.**

Public Participation in Policy Making and Planning

22. **Following the recommendations of the Arhus Convention and the UNECE, all national, provincial, regional, municipal and local transport and land use plans should be subject to a public hearing for review and comment at a time when significant alternative modal approaches can still be discussed. IFI involvement in a major transportation project should be used to leverage governments into ensuring that transportation plans and projects are developed in a process of early and full public participation.**

23. **IFI decision-making criteria, internal policies, loan appraisal reports, and project specific information should be a matter of public record at least 120 days for public sector loans and 30 days for private sector loans before the board meeting where the loan is approved to ensure a full and adequate public review process.**

24. **Concession contracts signed with private agencies for Build-Operate-Transfer Highway projects should be made available to the public by the government.**