Mobility for development

Facts and Trends

World Business Council for
Sustainable Development

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Introduction

This 'Facts and Trends' briefing provides an overview of key issues and data related to the challenge of developing sustainable mobility solutions to enable economic and human development. It forms part of the Mobility for Development workstream which follows on from the WBCSD's four year Sustainable Mobility Project (SMP) and its final publication: *Mobility 2030: Meeting the challenge to sustainability.*

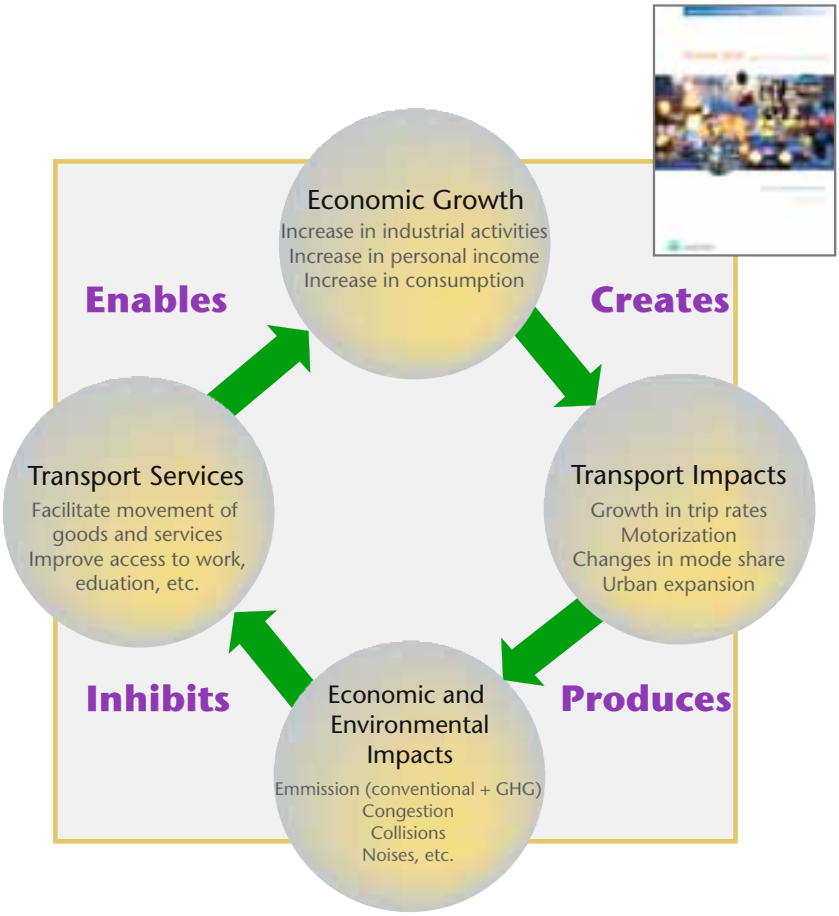
Mobility 2030 defined "sustainable mobility" as the ability to meet the needs of a society to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological value today or in the future. For mobility to be sustainable, it must improve accessibility while avoiding disruptions in societal, environmental and economic well-being that more than offset the socio-economic benefits of accessibility improvements, as illustrated in figure 1. Mobility 2030 focused much of its attention on the question of how to reduce and mitigate the negative impacts of increasing road transport associated with existing economic growth.

By contrast, the Mobility for Development project takes its starting point from the top left hand side of Figure 1; considering the importance of mobility as an enabler for economic development. The project seeks to understand mobility needs in the developing world in order to assist business in identifying opportunities to profitably narrow what the SMP referred to as the 'mobility opportunity divide' while avoiding the problems of unsustainable impacts.* More than the original SMP, it considers both physical mobility (the actual transportation of goods and people) and virtual mobility (the use of the internet and telecommunications technology, or ITC) to connect people to people and people to goods. Recognising that this is not an issue that can be addressed by the private sector alone, the project is also working to develop a strong business voice on mobility related issues for dialogue with governments and policy makers.

While this briefing illustrates the 'mobility opportunity divide' using a number of different indicators such as kilometers traveled, roads paved or cars owned, there is no compelling reason to expect that closing the divide requires all regions to converge to the same level, or mix of mobility modes. Rather, the focus should be on removing barriers to opportunity so that people are not held back from jobs, markets, education, services and social activities by the availability, cost, unreliability or safety risk of mobility.

Narrowing the mobility divide will require new strategies for enabling access to safer, cleaner, more efficient and more affordable motorized and non-motorized vehicles, public transit systems, transport infrastructure, as well as internet and telecommunications services. However just as important as efficiency improvements and mode switching may be innovations in communications, services, public planning and logistics which reduce the amount of travel needed to access other people, jobs, markets or resources.

Figure 1. The challenges of making mobility sustainable



Source: Molina and Molina 2002, p 214

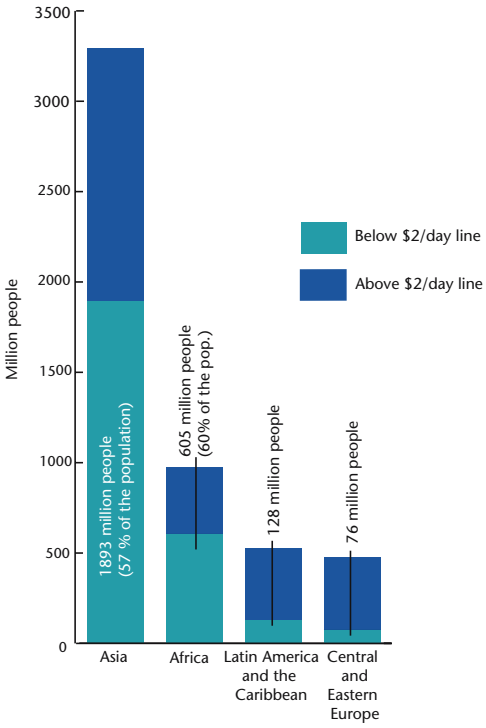
* The SMP defined the "mobility divide" (or "mobility opportunity divide") as the wide disparity in mobility opportunities that exist at present between those available to the average citizen in the poorest developing nations and regions and those experienced today by the average citizen in the developed world.

The "mobility divide"

Lack of access to transportation and information are both symptoms of poverty and key factors in keeping families, communities and nations poor.

Most of the world's people live in developing countries and almost half, with incomes below $2 per day, are effectively invisible to business and excluded from the global economy.

Figure 2. The Poverty Headcount



Source: World Bank Databases

What people say: [1]

Today, 2.7 billion people; just under half the World's population - live on less than $2 per day**.

The vast majority live in Asia and Africa. There are also significant levels of poverty in Latin America and the Caribbean and in Central and Eastern Europe.

"What is the incentive to produce more than the family needs if there are no access roads to get one's produce to a market?"

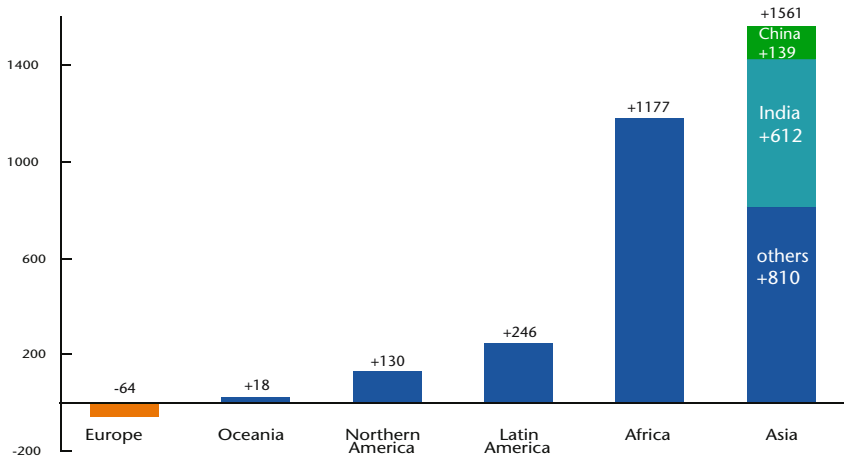
A poor farmer from Guatemala

Asia and Africa are the growth markets of tomorrow

By 2050 it is forecast that the world population will have risen to 9 billion. Most of these people will live in India, China, Africa and Latin America.

Unless this population can be brought into the global market, two thirds of the World's future population could be living in poverty. This level of inequity represents an enormous risk to global stability, as well as a lost opportunity for business to create new markets.

Figure 3. Forecast Population Change 2005-2050 (millions)



Source: UN World Population Prospects, 2006 revision

** Dollar figures denote purchasing power parity dollars throughout this briefing, unless otherwise stated.

Mobility is critical to development

Increasing mobility is associated with economic growth and development:

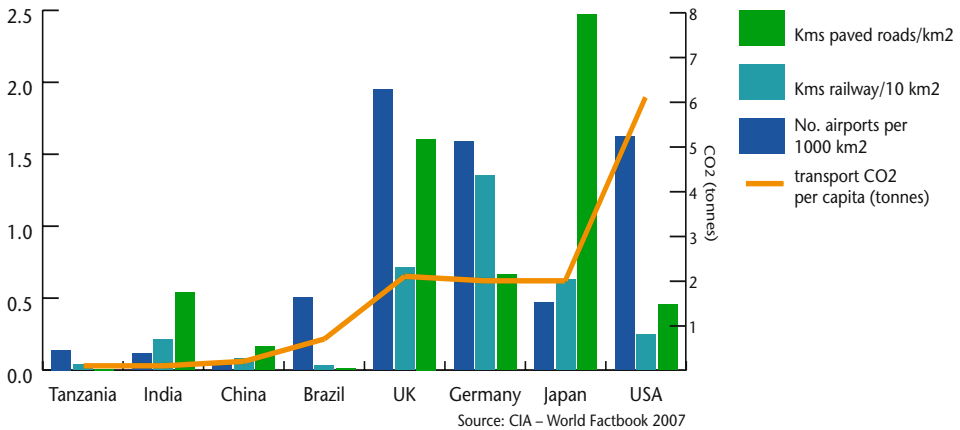
- It connects people to jobs, markets, essential services and political representation.
- It enables business to contribute to development, by serving new markets and unlocking new resources.
- It reduces the trade barrier effect of costly and unreliable transport, enabling poor regions and nations to become more competitive.

Transportation also has negative impacts such as pollution, collisions and congestion which can affect the whole economy but are often felt most by the poorest.

"A community without roads does not have a way out."
A poor man, Ecuador

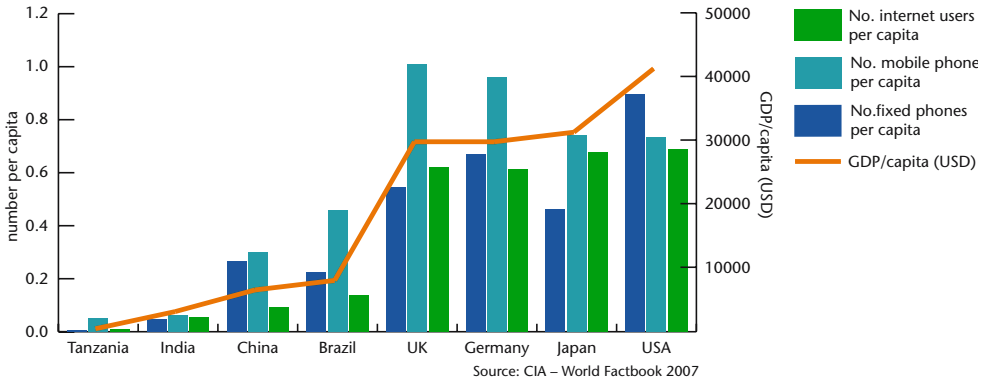
"If we get a road, we would get everything else: community center, employment, post office, water, telephone."
Young woman, Jamaica

Figure 4. Examples of the transportation divide



Source: CIA – World Factbook 2007

Figure 5. Examples of the ICT divide



Source: CIA – World Factbook 2007

The mobility opportunity divide

The benefits and harms of transportation are unequally distributed. In Western European countries, for example there is nearly one car for every two people while in the Central African Republic, Bangladesh and Tajikistan there is one car for every 2000+ people.

In 2000, the non-OECD countries accounted for 35% of all motorized vehicles, but 85% of all road casualties.[2]

There are also mobility opportunity divides within countries – in every region, city and town the poor make fewer trips, and spend a greater proportion of their time and income getting from A to B.

The ICT divide has been closing more quickly than physical forms of mobility. In Tanzania for example mobile phone ownership has increased from just over 2000 subscribers in 1995 to 3.8 million in 2006 (1 mobile phone per 10 people). This compares with 230,000 registered vehicles in 2006 (1 vehicle for every 170 people). The main reasons attributed to the rapid growth in mobile phones are: the introduction of pre-paid services, rapid network deployment and high levels of competition driving down costs.[3]

- North Americans travel an average of 40 miles per day mainly by car and plane and emit 6 tonnes of transport related CO2 a year.
- Brazilians travel an average of seven miles a day, by a combination of car and bus, and emit 0.7 tonnes of CO2 a year.
- Tanzanians travel around 3 miles a day, mainly on foot, by bus and bicycle and emit 0.1 tonnes of transport related CO2 per year.

Source: CIA – World Factbook 2007 & IEA – CO2 emissions from fuel combustion 1971-2004 (2006 edition)

The state of sustainable mobility in developing countries

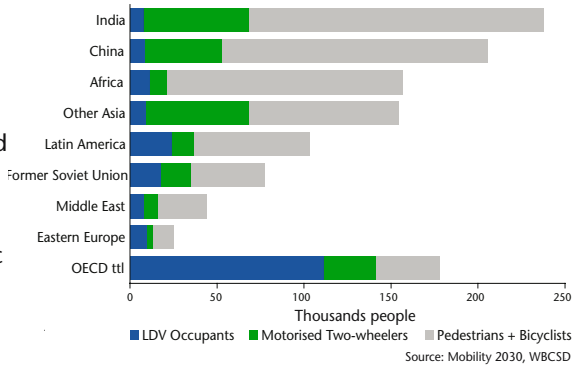
Access to mobility services is improving in the developing world, but vehicle ownership is growing too fast for infrastructure investment to keep up and not fast enough to close the mobility divide.

As a result citizens in developing countries suffer from poor or deteriorating conditions for nearly every indicator of sustainable mobility.

The last twenty years has seen massive growth in the number of cars, bikes, motorized two-wheelers and para-transit vehicles (such as minibuses) in many developing countries. Vehicle ownership is rising at a rate of 15 to 20 percent annually in much of the developing world, as more people live and work in cities. However the necessary transport infrastructure such as roads, pavements, bike lanes, public transport, traffic management, driver education and emissions controls are developing more slowly, generating congestion, pollution and high accident rates.

Despite this rapid growth, vehicle ownership rates are still relatively low, ranging from 15 percent in Mexico and Brazil to less than one percent in India and Nigeria. The majority of people still travel by foot, bike or public transport. The negative consequences of increased traffic disproportionately impact the urban poor through deteriorating public transportation and increasingly dangerous roads.

Figure 7. Road related deaths, 2000



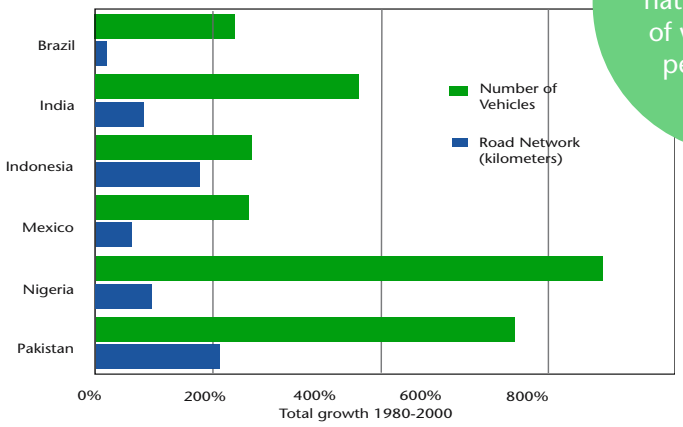
Source: Mobility 2030, WBCSD

85% of road related deaths occur in developing nations, over half of which involve pedestrians or cyclists. [4]

Accelerating mobility

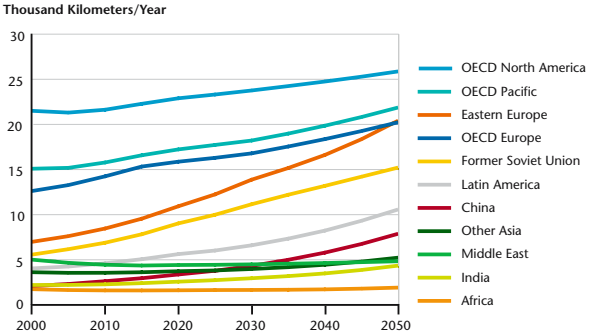
Projections by the WBCSD Mobility 2030 project show that some regions such as Eastern Europe and the Former Soviet Union are likely to reach OECD levels of personal transportation activity by 2050. Others such as China and Latin America will narrow the divide significantly. However in Africa, the middle east and the rest of Asia there is predicted to be little overall change in the rates of personal mobility. The fastest growing modes of transport will be light duty vehicles (i.e. automobiles and light trucks) with motorized two-wheelers also contributing a significant amount to vehicle totals in Asia the Former Soviet Union and Eastern Europe.

Figure 6. Recent growth in roads and vehicle ownership



Source: EarthTrends, 2006 from the International Road Federation, 2003

Figure 8. Projected growth in per capita transport activity



Source: Sustainable Mobility Project calculations

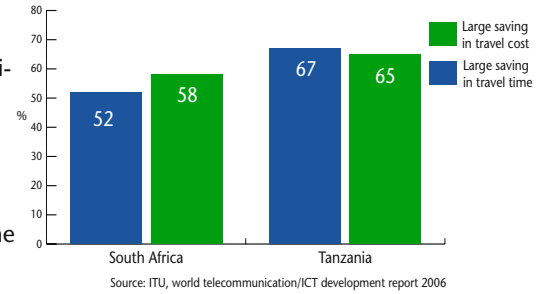
Alternatives to physical transportation

Recent developments in Information and Communications Technology (ICT) have greatly increased the opportunities for people to "connect" virtually without the need for a face to face visit or transaction. Mobile phone penetration rates are expanding much more rapidly than transportation, with 85% of the one new million subscribers every day coming from developing countries.[5]

Virtual mobility acts as a complement rather than as a substitute for physical mobility. While mobile phones may reduce the need for some trips to meet people, make enquiries or conduct transactions, they can increase opportunities for others, as people are able to stay connected to larger social and trading networks.

Developments in ICT can also increase the efficiency of trade. For example, access to market information can facilitate more targeted trade that attracts higher prices while improved ability to track and control freight movements makes longer or more complex supply chains more reliable and hence viable

Figure 9. Mobile phone users reporting travel savings



Source: ITU, world telecommunication/ICT development report 2006

Each month mobile phone subscriptions in India expand by 6 million people. [6]

Developing a Sustainable Mobility Scorecard for the developing world

Mobility cannot simply be measured by the availability, cost and quality of transportation but by its impacts on people in terms of what services and markets they can access, how much productive time and energy they waste in arduous journeys, and whether trip making is deterred because of vulnerability to traffic accidents and personal violence .The Sustainable Mobility Project defined twelve indicators of sustainable mobility which cover these impacts as well as enablers such as public and private investment (a full list of the indicators is included as an annex). The questions below are intended to assist in determining the current status and future trends of sustainable mobility at any location.

During the course of this project, we will develop a 'scorecard' against these indicators for both urban and rural areas at 4 case study locations in Tanzania, India, China and Brazil.

Indicators	Personal mobility	Movement of goods
ACCESSIBILITY	Do households have access to motorized personal vehicles or reliable public transport? Do households have access to ICT services?	Can goods be delivered and received where and when they are needed?
FINANCIAL OUTLAY REQUIRED	Is personal travel affordable within household budgets? What proportion of the population can afford some form of ICT services	Are logistics costs economic to enable goods to be transported?
TRAVEL TIME	Is transportation taking too much time?	Is transportation and logistics holding up trade?
RELIABILITY	Are people confident they will reach their destination in the expected timeframe? Are the ICT services reliable?	Can businesses make effective plans and efficient choices with confidence in logistics and transportation?
SAFETY	Can individuals reasonably expect to travel without threat of death or serious injury?	Can goods be transported without damage or loss?
SECURITY	Can individuals feel safe to travel without fear of harassment, robbery, or assault.	Can goods be transported with confidence that they won't be stolen or deliberately damaged
GREENHOUSE GAS EMISSIONS (GHGs)	Are transport related greenhouse gas emissions on a sustainable path	
IMPACT ON THE ENVIRONMENT AND PUBLIC WELL-BEING	Are mobility-related "conventional" emissions, noise and impact on ecosystems at an acceptable level?	
RESOURCE USE	Is mobility-related energy, land and materials use sustainable in the context of overall supply and alternative demands for these resources?	
EQUITY IMPLICATIONS	How equitably are the positive and negative impacts of mobility distributed across different societal groupings (income, age, ethnicity, gender etc)?	
IMPACT ON PUBLIC REVENUES AND EXPENDITURES	What proportion of public spending (including revenue offsets) is allocated to infrastructure and mobility services? Is there sufficient to close the mobility divide within a reasonable planning period?	
PROSPECTIVE RATE OF RETURN TO PRIVATE BUSINESS	Is the prospective rate of return for mobility related goods and services sufficient to attract investment?	

Mobilizing markets

Lack of access, cost and unreliability of mobility services are barriers to trade and economic development.

Non OECD countries account for 82% of world population but only around 30 % of world trade and tourist revenues. Poor accessibility and high cost of freight transportation are key barriers to greater integration into global and regional markets.

Transport and trade

There is a two way link between the volume and quality of transport activity and the growth of an economy. Economic growth stimulates an increased demand for transport services, but mobility itself is also a key enabler of growth:

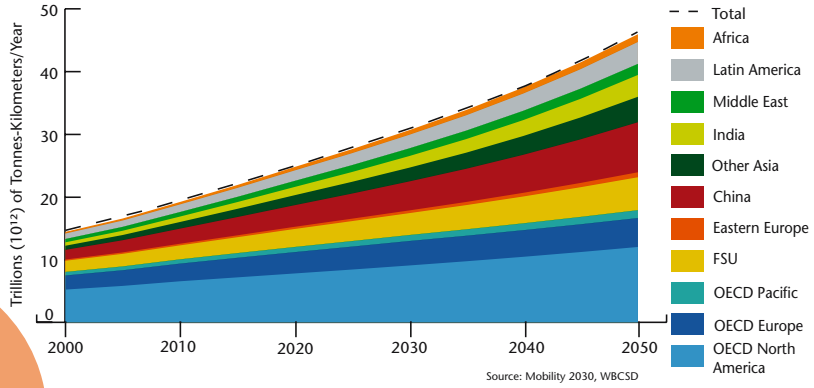
- Directly contributing to economic growth and employment through production of vehicles, fuel, infrastructure and transport services.
- 'Liberating' new resources by making otherwise remote commodities accessible.
- Increasing the productivity of labor and raw materials by enabling them to be combined more efficiently.
- Enabling economies to produce higher value products and services that can compete in the global market place
- Enabling people to plan more effectively, take more risks and seize more opportunities

By 2015 road and rail freight transport demand in the non-OECD countries is predicted to exceed OECD countries

Figure 10. Trade Activity in the World

Source: United Nations Commodity Trade Statistics Database, Yearbook 2005

Figure 11. Freight transport activity forecasts by region



Source: Mobility 2030, WBCSD

Growth in freight

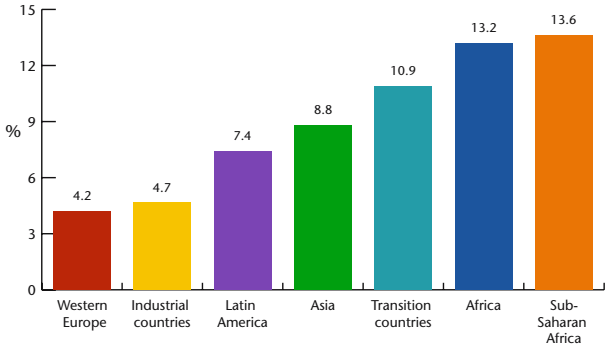
Most freight transportation in the developing world is by truck. Coastal and inland shipping also plays a significant role in some countries. In Bangladesh, for example, around 1.5 million boats carry around 25 percent of the country's freight. In the Mekong delta area of Vietnam, over two-thirds of freight is carried by inland waterways.[7] A few countries such as China, India and Russia have extensive but aging rail networks. It is forecast that freight transport activity will increase in all regions, with particularly high rates of growth in Asia, driven both by domestic distribution, production and exports. However, despite this growth, cost and reliability issues and critical bottlenecks will still be barriers to growth in many developing countries.

Freight costs

High freight costs decrease the competitiveness of exports from the Least Developed Countries, as well as increasing the costs of imports. They are a clear disincentive to trade. For, example trade-associated transport costs for landlocked countries are around 50 percent higher than in coastal countries and the volume of trade is 60 percent less.[8]

High costs are not simply related to distance, for example it costs $1,000 to ship a 20-foot container to the UK from Accra, Ghana, but $2,300 to transport the same container next door to Liberia.[9] Poor road networks, inadequate road condition, high operating cost of vehicles, unnecessary roadblocks, taxes & transit charges as well as bribes are key factors in driving up the cost of transportation.

Figure 12. Freight costs as a percentage of total import value



Source: UNECA, Economic report on Africa 2004, ECA

International shipping is increasingly concentrated into fewer ports with greater share of world traffic: the largest 10 containers ports handle 40% of world traffic.[12]

Reducing the time burdens of women could increase household cash incomes for smallholder coffee and banana growers by 10 per cent, labor productivity by 15 per cent and capital productivity by 44 per cent.[13]

Ports and Shipping

Water based transport is crucial both to international trade, and in some countries to domestic goods traffic. More than 80 percent of trade with origins or destinations in developing countries, in tonnage, is waterborne.

At least half of all container shipping in the world involves China, this includes imports and exports as well as a large proportion of domestic transport. Dependence on waterborne transport affects development patterns: It can cost three times as much and take five times as long to move a container 500km inland in China as it does in the United States, therefore most of China's export-led growth is currently concentrated in coastal regions.[11]

Figure 14. World shipping: Territory size shows the proportion of all shipping containers being loaded and unloaded

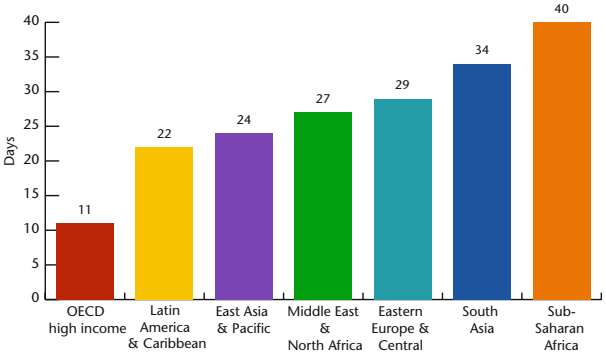
Source: Worldmapper

Delays and unreliability

The problems of inadequate physical infrastructure and inefficient institutional processes also causes delays and unreliability for goods transportation, both between rural areas and cities, and in accessing international markets. A large portion of transit cost and hold-ups are associated with inefficiencies in crossing borders. In Africa, for example, it is estimated that the cost of crossing a border can be equivalent to a 1000 miles of inland road transport.[10]

International competitiveness increasingly depends on the ability to participate efficiently and flexibly in global supply chains. Unreliability and delays make it impossible for producers to trade in time-sensitive goods.

Figure 13. Time to complete all the procedures for export



Source: Doing Business 2007, copublication of the World Bank and the International Finance Corporation

Mobility and micro-enterprise

Mobility improvements can enable broad based economic growth which helps to lift people poverty, but mobility improvements can also be targeted at improving growth prospects for the poor, for example by investing in the modes of transport used by the poor and improving road safety and pedestrian welfare.

Cities on the move

Transport infrastructure and services are trying to catch up with the world's fastest growing cities.

Mobility is critical to successful urbanization. Cities in the developing world are growing rapidly and are major engines of economic growth, both in their own right and as trading centers for a wider rural hinterland. But pollution, congestion and sprawl are damaging both the economy of cities and the quality of life for their residents. As a result developing world cities are at risk of descending towards unsustainable gridlock and environmental degradation.

More and bigger cities

For the first time in human history, more than half of the world's population lives in cities, and that proportion is still rising. The United Nations predicts that more than 80 percent of population growth in the next ten years will take place in cities in the developing world.

Urban populations are rising at an average of 2 percent each year, and at up to 6% a year in some developing country cities. The number of mega-cities with populations in excess of 10 million people has quadrupled in the past two decades and is forecast to double again in the next two decades with the majority being in the developing world. United nations predicts that by 2025, population will exceed 4 million in 135 cities of which 114 are in developing countries. Smaller cities are also important population centers, for example 60% the urbanised population living in Asia live in cities of under 1 million people.[14] Whilst incomes are growing in cities, they are characterized by large wealth divides.

In Mexico City, 20 percent of workers spend more than three hours traveling to and from work each day, and 10 percent spend more than five hours. [15]

The economic cost of congestion has reached 4.4% of GDP in Korea and 6% in Bangkok. [15]

In Bangkok, Manila, São Paulo, and Shanghai, downtown weekday traffic speeds average 15 kilometers per hour (9 miles per hour). [15]

Forecasts for the top fifteen mega-cities in 2015

	City	Country	Population (million)
1	Tokyo	Japan	35
2	Mumbai	India	22
3	Mexico City	Mexico	22
4	Sao Paulo	Brazil	21
5	New York	USA	20
6	Delhi	India	19
7	Shanghai	China	17
8	Calcutta	India	17
9	Dhaka	Bangladesh	17
10	Jakarta	Indonesia	17
11	Lagos	Nigeria	16
12	Karachi	Pakistan	15
13	Buenos Aires	Argentina	13
14	Cairo	Egypt	13
15	Los Angeles	USA	13

Source: UN World Urbanization Prospects: The 2005 revision

Gridlock

Ownership of motor vehicles is rising even faster than city populations, at up to 15 to 20 percent per year in some cities. Meanwhile the proportion of central urban space devoted to roads is rising much more slowly.

Pedestrian and other non-motorized transport are also poorly served by the roads infrastructure and increased use of private vehicles has resulted in falling demand for public transport and a decline in service levels. Congestion, poor public transport and sprawling cities make the journey to work excessively long and costly, particularly for the poorest.

Urban pollution and road safety

Slow moving traffic combined with poorly maintained and regulated vehicle stock, is a key contributor in making the megacities of developing countries the most polluted in the world. In the most heavily polluted cities, such as Bangkok, Kuala Lumpur, and Jakarta, economic losses from air pollution are estimated to reach 10 percent of GDP.[16] Whilst transport is a significant, and often the most easily measured and targeted contributor to air pollution, burning of solid fuels such as biomass and coal are also important sources of pollution in these cities.

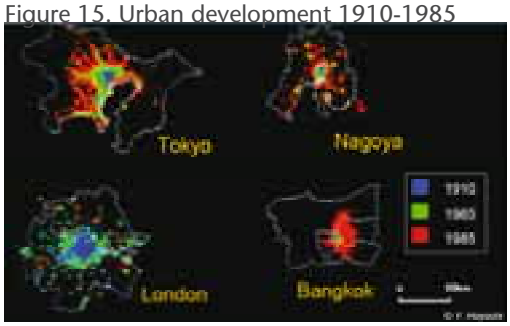
The poor are most at risk from pollution, safety, and security because they are most exposed, and less able to afford preventative action. The World Health Organization estimates that urban air pollution (from transport and non-transport sources) causes 800,000 premature deaths each year, while urban road accidents cost developing countries US$65 billion each year.

Rapid growth

Developing world cities have as many differences as similarities, but they share the challenge of rapid demographic, financial, political, cultural and technological change. They are growing rapidly and experiencing severe congestion, safety and pollution problems.

Most developing cities are concentrated around dense, highly populated city centers. Ports, industry, and commodity markets often remain in their historic locations, served by narrow roads requiring the use of more, and smaller, vehicles for freight flows, including handcarts, bicycles, and rickshaws.

Figure 15. Urban development 1910-1985



Source: Yoshitsugu Hayashi and Jon Roy eds. (1996) Transport, Land Use and the Environment, p 8, Kluwer Academic Publishers

Non-motorized transport

Non-motorized transport such as walking, bicycles and handcarts still account for a significant proportion of journeys in many developing countries, although their share is falling.

However transport infrastructure projects rarely improve the safety and security of pedestrians or cyclists.

60 percent of Indonesia's paved roads have no usable sidewalks and none have cycle paths[17]

Public transportation

As in developed countries, the increased dependence on automobiles is reducing the use and availability of public transport services . Recent developments to try to counteract this trend include the development of 'Bus Rapid Transit' systems pioneered in Bogota and Curitiba, based on exclusive right of way lanes, rapid boarding and free transfers in safe and comfortable stations.

Privately run Para-transit services such as share-taxis, minibuses and pick-up trucks are also a major form of public transport in cities. They provide between 20-50% of public transport in Manila, Jakarta, Kuala Lumpar and Bangkok.[18] Authorities often view them as a problem because they are often old and polluting vehicles, dangerously driven, but planners and policy makers are now beginning to look on them as possible solutions given the right regulatory framework.

A highway without a bus lane can move 2,000 -4,000 passengers per hour. Exclusive bus lanes can move 20,000 passengers per hour at speed of up to 27 kilometers per hour.[19]

Rural routes

Improving rural mobility enables people to migrate from subsistence to commercial agriculture and to gain access to essential services such as health and education.

Poor people in rural areas spend a huge amount of their time walking to collect water and firewood or to reach essential services. Poor transport raises the costs of production and marketing of agricultural products, rendering them uncompetitive.

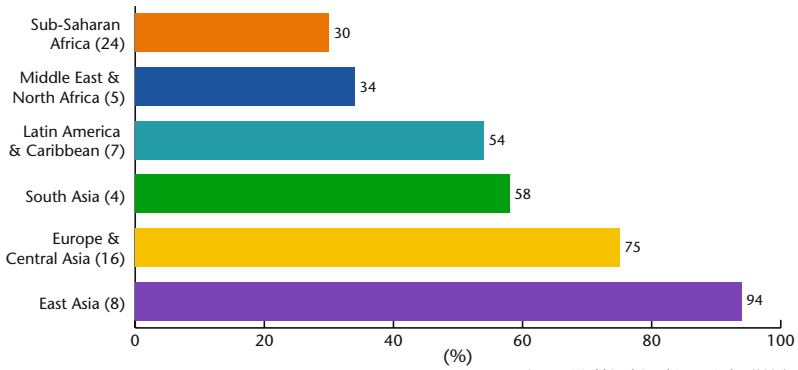
Where the road ends

Although the rural population is growing at a much slower rate than urban populations, roughly half of the world, and 70 percent of people in the poorest countries, live in rural areas[20] Rural communities that lack reliable access to services and markets are poorer than those with reliable access.

The World Bank estimates that around 900 million rural dwellers, mainly in the poorest developing countries, are without reliable transport access. Thirty-three percent of China's population and 75 percent of Ethiopia's population still do not have access to paved roads. Non-motorized transportation such as walking and animal traction is the major mode of transport in rural areas of developing countries

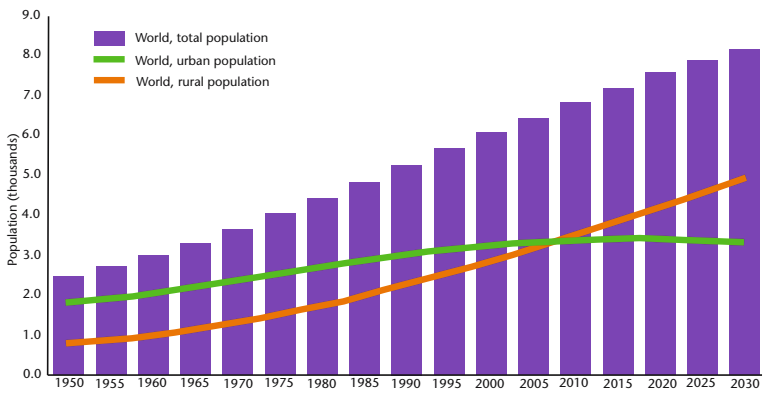
The first step in moving rural livelihoods from subsistence to commercial agriculture and beyond, is often the development of new road. Transport improvements assist agricultural modernization, and often pave the way for financial services, electricity lines and water pipes

Figure 17. Percentage of people within 30 minutes walk of an all weather road (no. of countries included)



Source: World Bank Rural Access Index (2006)

Figure 16. The urban and rural population of the world, 1950 -2030



Source: UN United Nations Population Division

Mobility impacts on livelihoods

Lack of transportation and long distances to services and resources mean that household members, particularly women and girls spend significant time traveling in order to meet basic needs. Where access to such services is improved they are able to invest more time in income earning occupations.

Poor roads greatly limit trade between villages and with cities, reducing the price that farmers are paid and reducing their incentive to improve productivity.

Women in a village on a main road in Cameroon spend more time producing food to sell, and earn almost twice the income of women living 1.5 hours from the road end.[21]

In Guinea, provision of rural roads led to a doubling of the area sown to crops and quadrupled market earnings.[22]

In Colombia an improvement of rural roads in areas previously inaccessible to vehicles reduced travel times and transport costs by 80 percent. Farmers responded by increasing production of goods for market between 50 – 200%.[23]

Mobility impacts on quality of life

Walking over 10 km each way to farms, schools and clinics is not unusual in rural areas, particularly in Sub-Saharan Africa but also in parts of Asia and Latin America. Poor people generally need to travel much further to reach basic services such as health and education, than richer people in the same country. As an example in rural Nigeria, children from the poorest quintile of the population need to travel more than five times farther than the children in the richest quintile to reach the nearest primary school.[24]

In addition to isolating communities from services, lack of roads is a barrier to political access, as officials and elected representatives tend to avoid villages that are only accessible through bad or dangerous roads.

Of course transportation improvements are not the only way to bring services closer. Mobile telephone based banking services can make it easier for people to access financial services, and receive money transfers from relatives. Water projects which provide potable water closer to home can reduce the time and effort spent per household per day on water collection by up to two hours. The introduction of improved wood-burning stoves can reduce firewood consumption by 30 per cent, with an equivalent reduction in the time and effort spent on collection.

Where the road begins

While road building can be an important facilitator of development in rural areas, it has differing impacts of different sections of the population and can bring problems with it. For example improved access often leads to men's migration, and increased workload for women, while opening up of rural markets to consumption goods affects rural artisans.[27]

Better transport increases the mobility of disease as well as of people. The spread of HIV in particular has been linked to new transport routes particularly through the high-risk behavior of transport sector workers such as road construction workers and truck drivers.

Road improvements in Morocco facilitated children's attendance in school, and resulted in a 220% increase in attendance by girls in the regions affected.[25]

Provision of improved water supplies saved women in Mozambique, Zaire, and Chad two hours per day travel time.[26]

Sustainable resourcing

Improving mobility will require energy and financial resources and will come with an environmental cost.

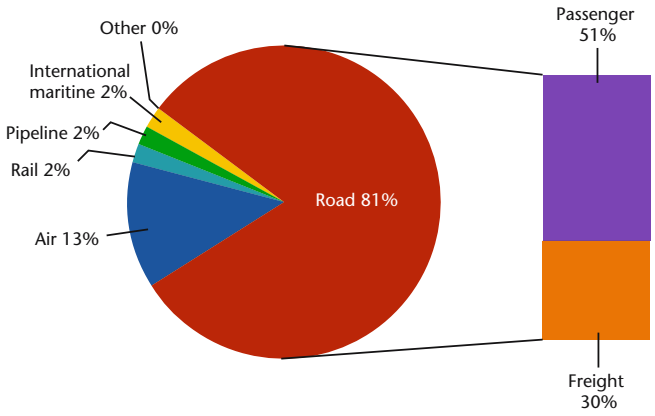
Different challenges will need to be faced in addressing the mobility opportunity divide in diverse regions and cities. But two challenges are common globally – Developing the innovative business models which attract investment and create sustainable economic returns from providing mobility to the poor and doing this while keeping global greenhouse gas emissions within acceptable limits.

Growing energy demand

If sustainable mobility is to be achieved globally it must be made possible for developing countries to substantially improve their living standards while addressing the worldwide challenges of climate change.

Transportation is already responsible for 50% of world petroleum consumption and 14% of global green house gas emissions.[28] Road and air transportation are the two main drivers of demand.

Figure 18. Energy consumption for the transport sector, 2001



Source: Panorama 2005, IFP

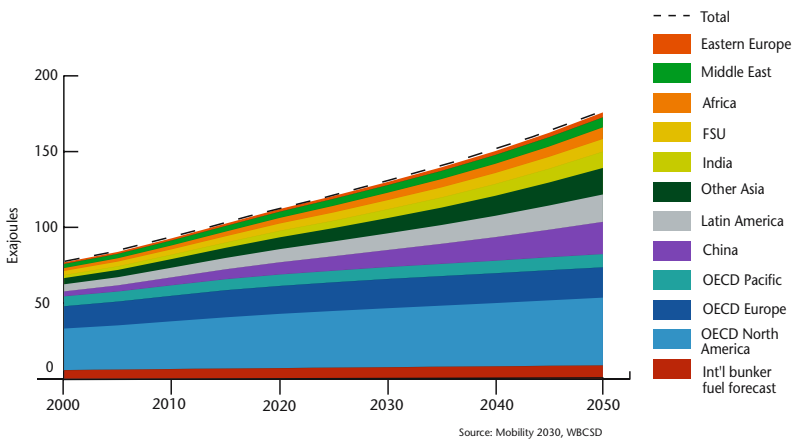
Reconciling mobility growth and environmental sustainability

As Mobility 2030's analysis of cleaner fuels indicates, the best case scenario for cleaner fuels would be to stabilize GHG emissions, at current rates by 2050. But any further reductions would have to be achieved through other methods such as changes in the mode and distance that people have to travel.

Fuel based approaches have other resource implications, for example some biofuels require land which could otherwise be used for food production.

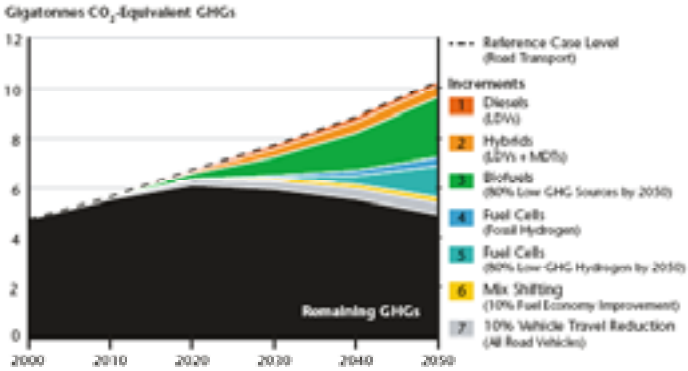
Based on current trends, WBCSD's mobility 2030 project forecast that energy demand from transportation would double between 2000 and 2030 and continue rising. Transport related green house gas emissions would rise more slowly, as fuels and technologies to lower green house gas emissions become more widely used. Conventional emissions will fall as cleaner technologies are adopted, but with a time lag that would mean that air pollution in developing countries is predicted to improve 10-20 years behind OECD regions.

Figure 19. Forecast energy consumption by the transport sector



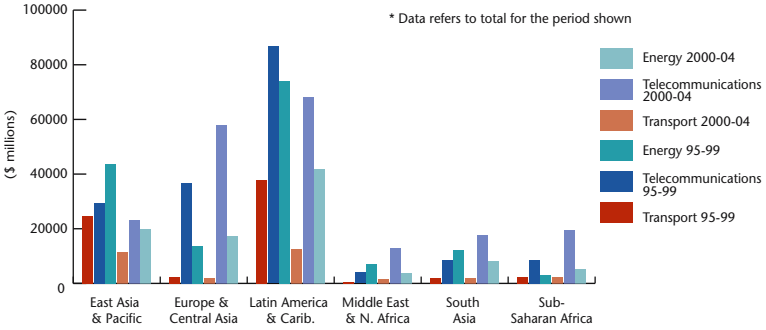
Source: Mobility 2030, WBCSD

Figure 20. Forecast Greenhouse Gas Emissions



Source: Mobility 2030

Figure 21. Investment in infrastructure projects with private investment



Source: World Bank,World Development Indicators 2006

These calculations are based on forecasts for rising levels of passenger and freight transportation in developing countries, but not at the rate necessary to close the mobility opportunity divide between the poorest countries and the developed world.[29]

Investment

The development of roads and other transport infrastructure is critical to development. But they are not a panacea. Development funding has targeted transport lending since the late 1940s, peaking in the 1950s and 60s. During this time developing countries have borrowed over US$62billion for transport projects from the World Bank alone, with the majority of this being spent on road building. However the results have often been disappointing. Maintenance costs have been high and not recouped in user charges, resulting in an effective transfer from poorer non-motorists to wealthier drivers.

Despite high costs, assets have not been maintained and over a two decade period (1964-84), US$45 billion worth of road infrastructure assets were lost in eighty-five developing countries owing to inadequate maintenance.

Firms that produce the inputs used for mobility systems (vehicles, fuels, infrastructure etc..) and transport services themselves (trucking, air transport, shipping, rail transport and ICT) have an essential stake in the financial sustainability of mobility. For the mobility opportunity divide to be closed these companies need to be attracted to invest in and provide services to the poorest countries and communities currently underserved by transportation.

The level of private sector involvement differs between different mobility sectors. For example 80 percent of urban bus services are now privately owned and operated, though infrastructure such as expressways and railroad tracks are more often publicly financed.

The World Bank's Private Participation in Infrastructure (PPI) Project database tracks infrastructure projects in developing countries that involve private participation in funding and risk taking. During the fifteen year period 1990 to 2004 it showed early growth but subsequent decline of private investments in transport. This investment is highly concentrate in a few countries, with only six accounting for nearly 80 percent of the total investment shown: China (18 percent), Brazil (16 percent), Malaysia (11 percent), Mexico (11 percent), Argentina (11 percent) and Chile (10 percent). In most of the other one hundred-fifty or so developing and transition countries, new private finance for transport infrastructure has varied from little to none. In all cases both energy and telecommunications attract higher levels of private investment than transport infrastructure, but the disparities are greater in those developing regions such as Sub-Saharan Africa and South Asia which are attracting the least investment overall.

"We have learned from experience that physical completion of projects will not in itself generate the expected benefits if institutions are weak and the policy framework is inadequate."
The World Bank [30]

Other resource impacts

Rising levels of mobility also entails demand for other resources, such as rubber, aluminum and other metals for vehicles and land, cement, steel and bitumen for road and rail building, as well as labor and investment funding.

Changing land use as transport infrastructure is built and urban areas expand has impacts both on biodiversity and on any communities living nearby or relocated. The poor are much more likely to be involuntarily resettled as a result of new road projects, because they tend to live on state-owned or lower cost private land.

Annex: Sustainable Mobility Indicators from Mobility 2030

Indicators	Personal	Goods
ACCESSIBILITY	The percentage of households having access to motorized personal vehicles plus the percentage of households located within a certain distance of public transport of a given minimum quality	Some combination of response time (time to pick up shipment after requesting service, or time to deliver shipment after arrival) and the distance that a shipper or customer must travel to drop off or receive the shipment
FINANCIAL OUTLAY REQUIRED OF USERS	Share of individual (or family) budget devoted to personal travel	Total logistics costs per unit (weight or value) moved per unit of distance: alternatively, share of a good's price that represents all logistics costs associated with its production and final delivery
TRAVEL TIME	Average time required from origin to destination, including all switches of vehicle/mode and all "waiting" time	Average origin to destination time required for shipment
RELIABILITY	Variability in door-to-door travel time for a "typical" mobility system user	Variability in origin-to-destination time for "typical" shipments of different types.
SAFETY	The probability that an individual will be killed or injured in an accident while using a mobility system, and the total number of deaths and serious injuries (expressed as DALY – disability-adjusted life years) per year by category (air transport, automobile, truck, bus, moped, bicycle, pedestrian etc.)	The probability that a given shipment will be damaged or destroyed and the total value of goods damaged or destroyed in a crash.
SECURITY	For individuals, the probability that one will be harassed, robbed, or physically assaulted during a journey. For society, in addition to this, the total number of incidents (perhaps weighted by severity)	For individuals, the probability that a shipment will be stolen or damaged through pilferage. For society, in addition to this, the total value of goods lost to theft and/or pilferage
GREENHOUSE GAS EMISSIONS (GHGs)	GHG emissions per time period measured in carbon-equivalent units.	
IMPACT ON THE ENVIRONMENT AND ON PUBLIC WELL-BEING	• Transport-related "conventional" emissions – Emissions of NOx, CO, particulates, unburned hydrocarbons and lead per time period. • Impact on eco-systems – Transportation-related impacts on eco-systems (e.g. habitats, water) in addition to land-use. • Transport-related noise – The number of individuals (or percent of population) exposed to various transport-related noise levels over various time periods.	
RESOURCE USE	• Transport-related energy use and energy security – For energy use, total transport-related use of particular fuels. For energy security, the percentage of a region's energy supply coming from outside the region or from "insecure" sources. • Transport-related land use – The amount (or share) of land devoted to transportation activities. • Transport-related material use – Total volume of material use by transport sector; transport sector's share of total use; actual recycling rates.	
EQUITY IMPLICATIONS	We believe it is desirable that information be developed reflecting the distribution of sustainable mobility "values" across different population groupings. Examples include access to means of mobility, the cost of obtaining personal and goods mobility, and exposure to the effects of "conventional" emissions and noise, and threats to safety and security.	
IMPACT ON PUBLIC REVENUES AND EXPENDITURES	The level and change in level of public capital and operating expenditures for providing transportation services and transportation infrastructure. This includes "launching aid," public infrastructure capital, operating subsidies, revenues collected by government from transport operations and user fees, and reduction in other government outlays due to the quantity and quality of transport services.	
PROSPECTIVE RATE OF RETURN TO PRIVATE BUSINESS	The prospective return on investment available to an efficient private business from offering particular mobility-related goods and services – includes costs (capital and operating), private revenues, governmentprovided revenues ("launching aid," operating subsidies, grants of pubic funds to finance capital, etc.), and costs imposed by government regulatory policies.	

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Development Focus Area

Through its Development Focus Area, the WBCSD is seeking to:

- Raise awareness of the business contribution to development, helping business and non-business stakeholders understand what is possible by providing case studies, guides and tools that advance our understanding of development challenges and opportunities;
- Advocate for change by working collaboratively with multiple stakeholders to create a more enabling business environment and seek synergies between official development assistance (ODA) and foreign direct investment (FDI);
- Act by working with our members, Regional Network partners and other stakeholders to broker new business ventures that are both good business and good for development. A key element in this work is a partnership agreement with the Netherlands Development Agency SNV to broker inclusive business in the Andean and Central American regions of Latin America.

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Promoting Small and Medium Enterprises for Sustainable Development
Published by the WBCSD in collaboration with SNV Netherlands Development Organization, the Issue Brief explains how governments can help alleviate poverty by focusing on small and medium enterprises (SMEs) and how larger corporations can help themselves by including SMEs in their value chains. 2007.

Business for Development: Business solutions in support of the Millennium Development Goals
Illustrates how the private sector is taking an active role in the achievement of the Millennium Development Goals. Singling out framework conditions as the most important factor affecting business investment, the publication strongly advocates focusing investment on a strong regulatory and legal framework, building the capabilities of local enterprises, and improvingcore infrastructure. 2005.

A Business Guide to Development Actors
Introduces the business community to potential partners in the development community. The third in the sustainable livelihoods trilogy, it is a first port of call for managers who are interested in working with a development organization, but unsure how to begin. 2004.

Finding Capital for Sustainable Livelihoods Businesses
Access to financial resources is a primary obstacle to companies starting sustainable livelihoods businesses. This guide, the second in the sustainable livelihoods trilogy, explores sources of finance for pro-poor projects and provides strategies to access such capital. A blueprint for action, it presents innovative strategies, opportunities and practical implementation examples. 2004.

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The World Business Council for Sustainable Development (WBCSD) brings together some 200 international companies in a shared commitment to sustainable development through economic growth, ecological balance and social progress. Our members are drawn from more than 30 countries and 20 major industrial sectors. We also benefit from a global network of about 60 national and regional business councils and partner organizations.

Our mission is to provide business leadership as a catalyst for change toward sustainable development, and to support the business license to operate, innovate and grow in a world increasingly shaped by sustainable development issues.

Our objectives include:

Business Leadership – to be a leading business advocate on sustainable development; Policy Development – to help develop policies that create framework conditions for the business contribution to sustainable development;

The Business Case – to develop and promote the business case for sustainable development;

Best Practice – to demonstrate the business contribution to sustainable development and share best practices among members;

Global Outreach – to contribute to a sustainable future for developing nations and nations in transition.

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