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Working Paper

THE TRILLION DOLLAR QUESTION: TRACKING PUBLIC AND PRIVATE INVESTMENT IN TRANSPORT

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EXECUTIVE SUMMARY

In a first step to quantify global public and private investment in transport across all modes, WRI estimated annual capital expenditures (excluding consumer spending) at between US$1.4 trillion and US$2.1 trillion annually (**Figure 1**). In aggregate, this investment consists of slightly more private investment than public. Public investment, at US$569 billion to US$905 billion per year, consists almost exclusively of domestic budget expenditures. In 2010, 2 percent of public investment was international, mostly provided through official development assistance (ODA). Less than half a percent comes from climate-focused funds and institutions. Private investment, including both domestic and cross-border flows, is estimated to be between US$814 billion and US$1.2 trillion per year. About three-quarters of private investment occurs in high-income countries (**Figure 1**). This working paper sets the stage for analysis on how to shift financial flows to meet transport needs sustainably and with lower greenhouse gas emissions. Although these data are preliminary, we conclude that shifting future transport investment patterns, especially in the rapidly urbanizing and motorizing countries where transport growth is fastest, will depend on leveraging public finance and the establishment of a secure investment climate for private investment. To successfully target future investment in sustainable, low-carbon transport, more research is needed on the relationships among financial instruments, financing sources, and transport modes.

CONTENTS

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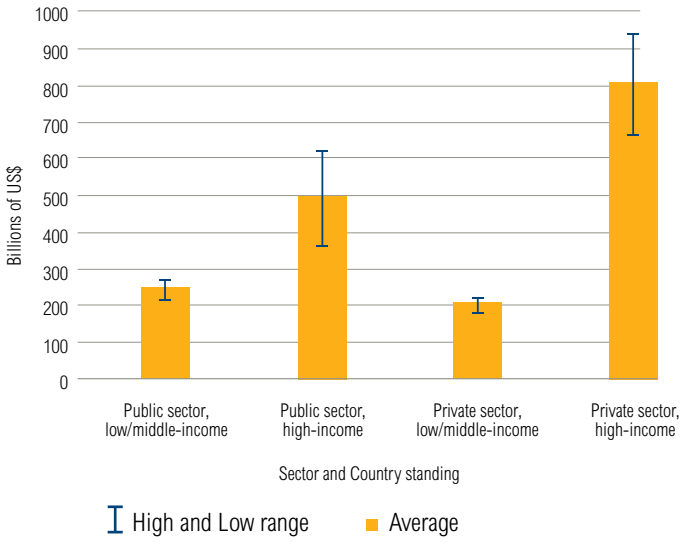
Figure 1 | **Estimated Annual Transport Investment**



Sources: Wagenvoort 2010; World Bank PPI Database 2013; Government Budget Publications; CBI 2013; OECD Stats 2013; IMF Government Finance Statistics 2013; ITF 2012; ITC 2013.

INTRODUCTION

Transportation systems provide personal mobility and facilitate local and international commerce, but they also contribute to adverse effects on the environment. Negative externalities from transport include productivity losses from congestion and poor infrastructure, health problems from air pollution and lack of physical activity, and traffic fatalities. The cost of these systems can add up to more than 10 percent of a country's economic output (Dalkmann and Sakamoto 2011). Transport accounted for 24 percent of energy-related CO_2 emissions worldwide in 2010 and transport is the fastest-growing emissions sector (IEA 2012). In a business-as-usual scenario greenhouse gas emissions from transport are projected to double by 2050, and other negative externalities from transport might worsen (Ang and Marchal 2013). Decisions made now about physical transport assets (systems, infrastructure, and vehicles) will have powerful implications for decades. Therefore, to reduce future carbon emissions and the burden on society, it is essential to understand transport investment sources and the mechanisms of financing them.

It is difficult to track the details of finance that support transport investment.[1] Attempts to quantify total global investment in transport show wide variation. For example, research from the Institute for Transport and Development Policy (ITDP) (Sakamoto et al. 2010) and EMBARQ (Mahendra et al. 2013) put the figure at about US$900 billion per year. More recent projections from the International Energy Agency (IEA) (Dulac 2013) suggest a figure of US$2.6 trillion. Such variation is due to the complexity and diversity of financial flows involved and the lack of publicly available data. It is a challenge to collect consolidated and consistent data. None of these estimates differentiates public and private flows on both a domestic and cross-border level. Yet, because the means of influencing public and private investment patterns are different, a clear picture of investment flows for each is important to developing a strategy to influence the nature and volume of global transport investment.

Objectives, Scope, and Definitions

The purpose of this working paper is to quantify the capital investments in transport around the globe in order to focus the sustainable development conversation on the investment trends for carbon-intensive and low-carbon sustainable transport.[2] This analysis stops short of identifying funding by transport mode. Although having data for the instruments and sources of transport investment would be ideal, data were available only for public sources and private instruments. Transport investment in this paper refers only to capital asset expenditures (including networks, vehicles, and interchange facilities) across all transport modes, including air-, water-, and land-based modes in freight and passenger transport.[3] Figures exclude operating and maintenance costs. Public investment is defined in this analysis as outlays from local, regional, and national governments and government-funded financial institutions. Private investment does not include consumer spending—for example, acquisition of vehicles by households—but comprises both domestic and cross-border capital investment from private firms. In an effort to compare the different needs and volumes of investment in countries across the development spectrum, we distinguish high-income from low/middle-income countries using definitions from the World Bank.[4]

Methodology

This WRI Working Paper draws on diverse publicly available data to quantify global capital investment in transport. We aggregated data from more than 50 of the largest global economies (see **Appendix** for data sources and summary).[5] For public data, we combined infrastructure spending statistics from several institutions. As a starting

point, we used the Organisation for Economic Co-operation and Development's (OECD) Stats database, Transport Infrastructure and Maintenance Spending.[6] For non-OECD members and major gaps in OECD Stats data, we pulled from the International Monetary Fund's (IMF) Government Finance Statistics (GFS) on transport infrastructure.[7] Both OECD Stats and IMF GFS depend on country reporting for their data. For national expenditures not covered in these data, we turned to national budget publications.[8] Public data are from 2010, the most complete year across OECD and IMF databases.[9] For international public investment, we used OECD Creditor Reporting Service data and annual reports from climate and environmental funds. We relied on the transport sector definition applied by each publication and international research institution source (see next section, Limitations of Analysis).

Private investments include gross fixed capital investment and foreign direct investment (FDI) but exclude consumer spending. Data from the European Union is from the European Investment Bank (EIB) using Eurostat data. For developing countries, we used the World Bank Private Participation in Infrastructure (PPI) Project Database as well as Bloomberg data on bond investment.[10] For other large countries, namely the United States, Japan, and Australia, we used government statistics for private capital investment in transport.[11] FDI sources are the OECD's Foreign Direct Investment Statistics and the International Trade Center's (ITC) Investment Map. The annual investment total is a composite figure from the years 2009–12. The most recent data for each country or group of countries comes from 2009 (for the European Union and the United States), 2010 (Japan and Australia), 2012 (ODA recipients), and the most recent year available for other countries.

The use of composite years for estimating total annual investment renders our figures more representative than conclusive. To account for the variable quality of data and inconsistencies across sources, investment figures have been expressed in ranges determined by the weighted average of data quality for each source. Each data source was ranked according to four qualitative characteristics: verifiability, completeness, accuracy, and relevance. The average score for each source reflected the size of its potential margin of error and determined the subsequent range of variability applied to its data (see **Appendix, Table A1** for complete analysis).

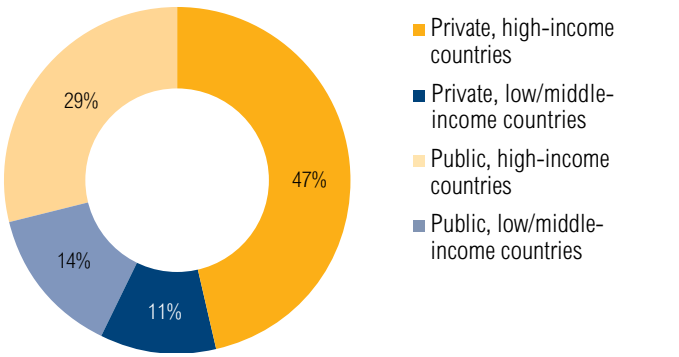
Limitations of Analysis

The conclusions of this preliminary analysis must be caveated because of the amalgamation of data sets, scope of research, and limitations of available data. Different data sources use differing definitions for "transport," and often include it alongside warehousing, storage, or communications. Other key differences—like the methodologies of data collection or generation, the treatment of public-private partnerships, or definitions of capital investment—may also skew results. Moreover, gaps in data for individual years and countries make this an imperfect summation of annual global investment. Private investment, in general, is difficult to define and quantify. There are blurred lines between capital and maintenance expenditures (like the capital costs of road maintenance) and the combination of gross capital formation with foreign direct investment is only an approximation to describe how private sector participation supports transport vehicles and infrastructure. In addition, much data on private investment is not tracked or not publicly available, limiting the completeness of private investment totals.

INVESTMENT ESTIMATES

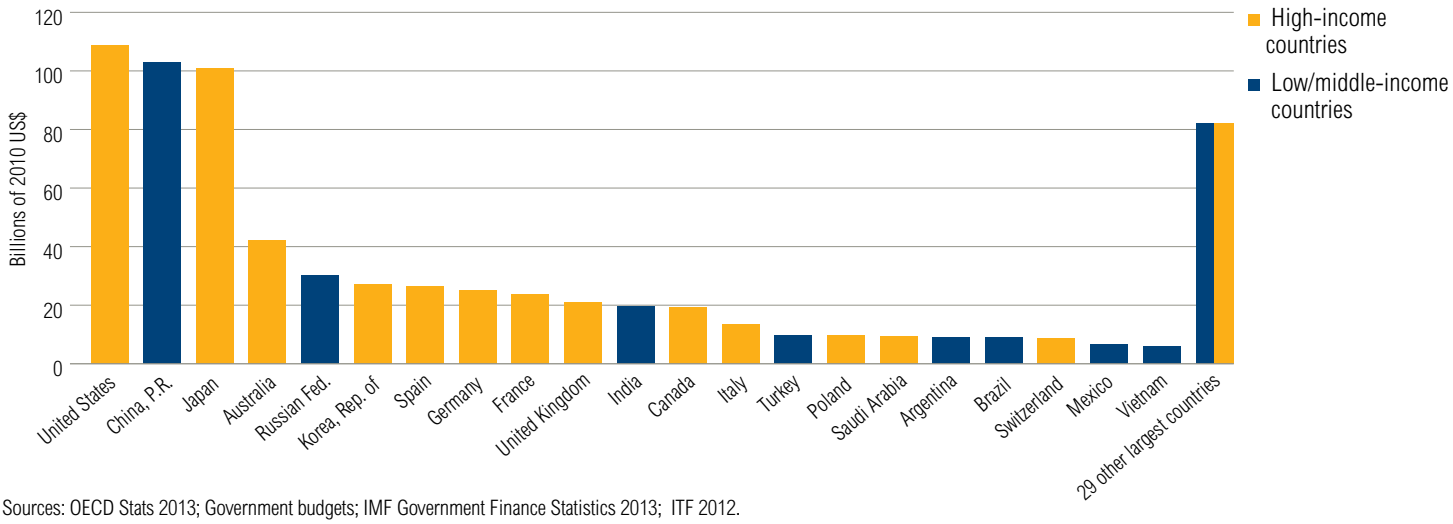
We estimate annual transport investment to be between US$1.4 trillion and US$2.1 trillion (**Figure 1**). Private sources account for slightly more than half of the global total, but the split varies widely across countries and modes. In India, for example, the public sector provides 85 percent of investment in the road sector, but only 20 percent in ports (Dobbs et al. 2013). Both government and private

Figure 2 | **Proportion of Public and Private Investment in Transport, 2010 estimate (billions of US$)**



Sources: Wagenvoort et al. 2010; World Bank PPI 2013; Government budget publications; CBI 2013; OECD Stats 2013; IMF Government Finance Statistics 2013; ITF 2012.

Figure 3 | **Annual Domestic Budgets for Transport Capital Investment, 2010 estimate**



Sources: OECD Stats 2013; Government budgets; IMF Government Finance Statistics 2013; ITF 2012.

contributions are larger in high-income countries. About three times as much investment takes place in wealthy countries compared with those defined by the World Bank as low- and middle-income. Private spending in high-income countries is the single largest source of transport investment. In low- and middle-income countries, the public contribution is larger than the private one (**Figure 2**).

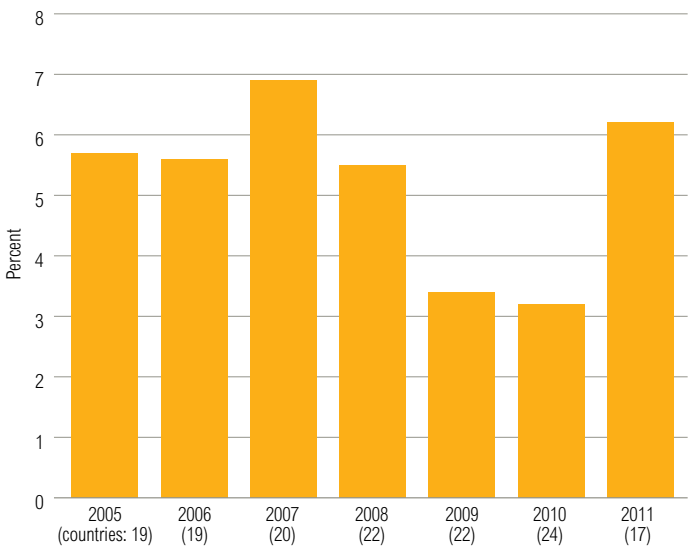
Public Sources

Our analysis indicates that global transport investment by governments ranges between US$569 billion and US$905 billion. Public investment encapsulates all levels of government. The vast majority (about 98 percent) is domestic. International public investment, including ODA and climate funds, accounts for between US$12 billion and US$20 billion. The United States, China, and Japan account for roughly half of domestic spending. Public investment in developing countries is nearly one-third of the total (between US$213 billion and US$279 billion) and concentrated in large upper-middle income countries, particularly Brazil, Russia, and India. Domestic transport investment in developing countries outside those three is roughly $80 billion—about 10 percent of the public total.

Domestic Investment

Government budgets for domestic capital investments in transport totaled between US$558 billion and US$886 billion in 2010, based on national budget statistics and the most complete data from the IMF, OECD, ITF, and government budgets (**Figure 3**). From 2005 to 2011, transport's average share in national budgets hovered between 3 percent and 7 percent (**Figure 4**). While data from 2010 is the most complete of recent years, investment estimates are likely to be conservative. On average, transport's share in government budgets in 2010 was at its lowest between 2005 and 2011 (**Figure 4**). The majority of public-

Figure 4 | **Transport's Average Share of National Government Budgets in 2010**



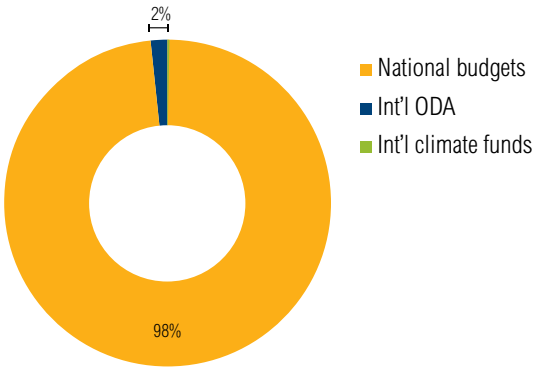
Source: IMF Government Finance Statistics 2013.

sector investment consists of government budget allocations. This investment forms the baseline funding for transportation agencies and departments that invest in basic infrastructure.

- **International Investment**

  International sources, primarily from bilateral and multilateral ODA, contribute roughly 2 percent of public investment in transport (less than 1 percent of the global total). See **Figure 5**. ODA investment in transport is distributed largely through concessional loans and reached about US$14 billion in 2010.[12] ODA flows in transport are generally directed toward roads and highways. In 2010, these two subsectors comprised 70 percent of transport investments at the World Bank and 78 percent at the Asian Development Bank (Mahendra et al. 2013).

Figure 5 | **Composition of Public Investment in Transport in 2010**



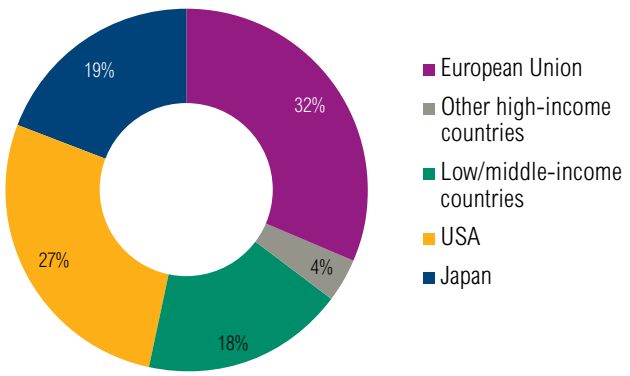
Sources: OECD Stats 2013; IMF Government Finance Statistics 2013; ITF 2012; Government budgets.

Roughly 10 percent of international public investment in transport is made through climate and environmental funds (like the Global Environment Facility and the Clean Technology Fund). This is approximately one-tenth of 1 percent of the global total. These contributions are from developed country governments to multilateral or bilateral funds earmarked exclusively for climate change adaptation and mitigation actions. Compared with the size of global investment, transport financing from climate funds is extremely limited and largely intended to leverage additional investment. Nine of the major climate and environmental funds channelled US$1.74 billion to the transport sector in 2012.[13] This constitutes an average allocation of 13 percent of climate and environmental fund expenditures (Lefevre and Leipziger 2013).

Private Sources

Our analysis estimates private investment in transport to be between US$814 billion and US$1.2 trillion. More than three-quarters is spent in high-income countries. The European Union accounts for roughly one-third; the United States and Japan, taken together, account for nearly half (**Figure 6**). In developed countries, private investment in transport is typically larger than public investment; for example, the average atio in the European Union is 60:40 (Wagenvoort et al. 2010).

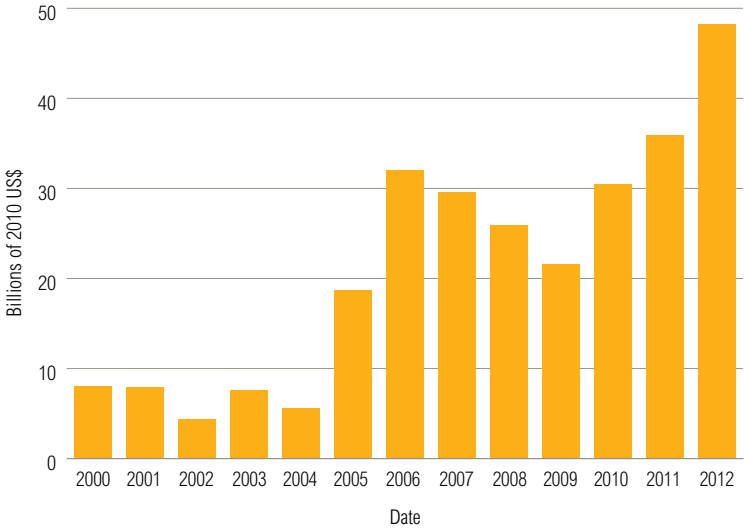
Figure 6 | **Estimated Private Investment in Transport by Site of Investment**



Sources: Wagenvoort et al. 2010; World Bank PPI 2013; Government budget publications; CBI 2013; ITC 2013.

Private investment in transport is also significant in the developing world. In low- and middle-income countries, annual private investment in transport reaches between US$134 billion and US$228 billion.[14] This amount includes investments from public-private partnerships, where investment costs are shared.[15] It represents a sizeable increase over the past decade: private participation in transport sector projects in developing countries increased 400 percent from 2000 to 2012 (World Bank PPI 2013). See **Figure 7**.

Figure 7 | **Private Participation in Transport from 2000 to 2012 in Low/Middle-Income Countries**



Source: World Bank PPI 2013.

Private investment in high-income countries over the same period has been much more stable (Wagenvoort et al. 2010). The growth in private investment in developing countries is driven primarily by China and secondarily by other large economies like Brazil and India. As with the public sector, international private investment in transport disproportionately supports roads. In 2011, roads were the largest transport subsector supported by private project finance worldwide at 23 percent.[16] The next largest subsector was urban rail at 13 percent (Ang and Marchal 2013). According to the World Bank PPI database, road projects accounted for 50 percent of those receiving private investment of any kind in low- and middle-income countries from 1990 to 2012.

Private Instruments

Various financing instruments are used for transport investment, including both debt and equity. The financial structure depends on the type of project, nature of public support, market characteristics, and other factors. On average, transport projects are financed with debt-equity ratios greater than 3:1 (Sharma 2013). The role of debt in transport finance is generally lower in the developing world but has increased in the last decade. Between 2005 and 2009, the most common debt-equity ratio for transport projects in low- and middle-income countries with private participation shifted from 50:50 to 70:30 (Izaguirre and Kulkarni 2011).

Debt

Debt investment comprises the majority of private sector finance for transport. The most common form of debt investment in transport is commercial bank loans (Ang and Marchal 2013). In Europe, for example, loans finance about 98 percent of transport infrastructure investment, leaving 2 percent to the bond market (Wagenvoort et al. 2013). Conversely, bonds are an attractive debt instrument for private institutional investors. They are the dominant asset class in portfolios from pension funds and insurance companies that invest in transport infrastructure (Kaminker et al. 2012). In developing countries, the role of bonds in transport finance is normally limited by the difficulty of attaining quality bond ratings, especially at the municipal level (Lefevre and Leipziger 2013). The lion's share of transport bond investment in the developing world is concentrated in China, where bonds for the rail sector (including metro) totaled US$263 billion in 2010.[17]

Equity

The role of private equity is ancillary to debt for transport investment projects. The uncertainties of the global financial crisis of 2008–2010 and the ensuing regulations on banks' balance sheets have recently limited the availability of long-term bank debt (Ang and Marchal 2013). With debt financing more difficult to come by, private equity investment in transport has increased in recent years. The number of infrastructure equity funds has grown from a handful in the early 2000s to more than 60 in 2013 (Sharma 2013). In 2010, transport was the third largest climate change investment asset class receiving private equity and venture capital investment (DB Climate Change Advisors 2011).

CONCLUSIONS

Annual capital investment in transport is US$1.4 trillion to US$2.1 trillion, with slightly more than half derived from private sources (**Figure 1**). Investment—both public and private—is concentrated in a few countries, led by the United States and Japan. Private investment

in low- and middle-income countries is limited but growing, especially in rapidly urbanizing and motorizing countries.[18] The private sector has shown willingness to invest substantially in high-income countries, suggesting that risk aversion plays a large role in limiting private investment elsewhere. Providing a transparent, secure, and stable investment climate will help to mitigate risk for private finance for transport.[19]

Public investment, on the other hand, has been relatively stable for the past decade or so. International public investment is too small to dramatically affect the global public contribution, but could be instrumental in pushing domestic investment in a more sustainable direction. Funding for transport from climate and environmental sources will increase in the near future—transport is a current priority for the Global Environment Facility, and likely a target sector for the Global Climate Fund and multilateral development banks—but these resources are comparatively scarce.[20] Public funding, both domestic and international, should be used strategically to leverage private resources and prioritize sustainable, low-carbon transport modes beyond a focus on roads and highways. Moreover, while the drivers of a country's public investment in transport are closely related to its economy, natural resources, and geography, political decisions can also be influential.

Next Steps and Future Work

The call to increase private participation in transport reflects a general need to bridge a funding gap to support a shift toward low-carbon transport. The broad-based estimates in this analysis comprise a starting point from which to inform more specific investment strategies. More information is needed on investment patterns in individual countries, regions, and modes. Our analysis of transport finance from the perspective of investment sources and instruments should be expanded and compared with results on the ground.[21] It would be valuable to track how different transport subsectors or modes are supported in different geographies and over time. A special focus is needed on the barriers to investment in sustainable, low-carbon transport, particularly from the private sector. Further research and analysis are needed to understand cost-efficient policies and instruments to attract and leverage private investment.

APPENDIX

Table A1 | Data Quality Evaluation and Methodology

DATA SOURCE	DATA CHARACTERISTIC					CONCLUSION	
	INDEPENDENT	COMPLETE	ACCURATE	RELEVANT	AVERAGE	QUALITY	VARIABILITY RANGE
PUBLIC INVESTMENT							
OECD Stats 2013	2	3	4	3	3	LOW	100%
IMF GFS 2013	2	5	4	5	4	HIGH	10%
ITF 2012	1	5	3	5	3.5	MED	50%
Climate Fund Annual reports	3	5	2	5	3.75	MED	50%
Government Budgets	3	5	4	5	4.25	HIGH	10%
PRIVATE INVESTMENT							
Wagenvoort et al. 2012	1	5	4	3	3.25	LOW	100%
WB PPI 2013	2	3	4	5	3.5	MED	50%
CBI 2012	1	4	4	5	3.5	MED	50%
ITC 2013	3	2	4	3	3	LOW	100%
OECD Stats 2013	2	3	4	3	3	LOW	100%
Gov't Budgets	3	5	4	5	4.25	HIGH	10%

DATA CHARACTERISTICS	
Independent	Derived from a verifiable source; subject to review or data polishing by authority other than reporting body
Complete	Contains no data gaps
Accurate	Data matches exactly and exclusively the desired variable(s)
Relevant	Data is consistently up-to-date

SCALE	
1	Not at all
2	Barely
3	Somewhat
4	Mostly
5	Definitely

DATA QUALITY VARIABILITY ADJUSTMENT			
QUALITY	RANGE (R)	LOWER BOUND	UPPERBOUND
Low	100%	x-(R/2)	x+(R/2)
Med	50%		
High	10%		

Table A2 | Total Transport Investment Estimate by Country or Group of Countries (billions of US$)

COUNTRY	PUBLIC	PRIVATE	TOTAL
U.S.A.	108.63	268.00	376.63
Japan	100.94	190.00	290.94
Australia	42.11	13.00	124.43
Korea	27.11	0.96	
Canada	19.41	16.92	
S. Arabia	9.31	2.87	
Switzerland	8.77	5.41	
Singapore	2.72	-	
Iceland	0.13	-	
N. Zealand	0.97	-	
Croatia	0.9	0.51	
Oman	-	0.10	
Qatar	-	0.48	
OTHER HIGH-INCOME	111.43	40.25	148.88

COUNTRY	PUBLIC	PRIVATE	TOTAL
China, P.R.	103.10	180.84	405.81
Russia	30.23		
India	19.49		
Turkey	9.85		
Argentina	9.11		
Brazil	9.02		
Mexico	6.78		
Vietnam	6.11		
Malaysia	4.18		
Indonesia	3.86		
S. Africa	3.81		
Philippines	3.43		
Kazakhstan	2.57		
Peru	2.57		
Azerbaijan	2.39		
Colombia	2.17		
Chile	1.29		
Thailand	1.2		
Bangladesh	0.96		
Kenya	0.70		
Georgia	0.44		
Serbia	0.35		
Albania	0.33		
Jordan	0.32		
Nigeria	0.29		
Pakistan	0.26		
Macedonia	0.06		
Liechtenstein	0.04		
Moldova	0.03		
Ukraine	0.03		
LOW-/MIDDLE INCOME TOTAL	225.00	180.84	405.81

COUNTRY	PUBLIC	PRIVATE	TOTAL
Spain	26.52	309.75	475.63
Germany	25.20		
France	23.86		
U.K.	20.88		
Italy	13.46		
Poland	9.76		
Netherlands	4.82		
Romania	4.55		
Norway	4.39		
Sweden	4.33		
Belgium	3.91		
Austria	3.32		
Czech Rep.	3.20		
Greece	3.03		
Portugal	2.85		
Ireland	2.53		
Denmark	1.95		
Finland	1.71		
Hungary	1.54		
Slovak Rep.	0.91		
Lithuania	0.74		
Latvia	0.64		
Bulgaria	0.55		
Slovenia	0.49		
Luxembourg	0.46		
Estonia	0.28		
EU TOTAL	165.88	309.75	475.63
ODA	14.00	-	14.00
CLIMATE FUNDS	1.74	-	1.74
GLOBAL TOTAL	711.85	988.84	1697.9

Table A3 | **Government and Climate Fund Reports Used as Reference for Public and Private Investment in Transport**

PUBLIC SECTOR	
CLIMATE FUND ANNUAL REPORTS (9)	
Climate Change Fund	http://www.ntcc.nl/pdf/adb-annual-report-2012.pdf
Clean Energy Future	http://www.adb.org/documents/clean-energy-financing-partnership-facility-annual-report-2012
Clean Technology Facility	Climate Investment Funds (CIF), 2012, "Creating the Climate for Change: 2012 Annual Report."
Global Climate Change Alliance	Global Climate Change Alliance (GCCA), 2012, "Paving the Way for Climate Compatible Development: Experiences from the Global Climate Change Alliance."
Global Environment Facility	GEF, 2013. "Investing in Sustainable Transport & Urban Systems." Available at http://www.thegef.org/gef/node/1541.
International Climate Initiative	http://www.international-climate-initiative.com/en/
Japan's Fast-Start Fund	http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7924.pdf
Nordic Development Fund	http://www.ndf.fi/files/documents/NDF-ar-2012-low.pdf
Partnership for Market Readiness	PMR, 2013, "Summary of the PMR." Available at https://www.thepmr.org/system/files/documents/Summary%20of%20the%20PMR%20%28October%2014%29.pdf.
Sustainable Energy and Climate Change Initiative	http://www.iadb.org/en/publications/publication-detail,7101.html?id=67835
GOVERNMENT BUDGET SOURCES	
Australia	http://www.bitre.gov.au/publications/2011/stats_004.aspx
Argentina	http://www.mecon.gov.ar/onp/html/presupresumen/resum10.pdf
Bangladesh	http://www.scribd.com/doc/21084110/Bangladesh-Budget-2010-Briefings
Brazil	http://www.planejamento.gov.br/secretarias/upload/Arquivos/sof/orcamento_13/OFAT_2013.pdf
Chile	http://www.dipres.gob.cl/572/articles-74331_doc_pdf.pdf
China	National Bureau of Statistics of China (http://www.stats.gov.cn/english/statisticaldata/)
Colombia	http://www.minhacienda.gov.co/portal/page/portal/MinHacienda1/MinistryFinance/elministerio/prensa/Presentaciones/2009/PRESENTACION%20PROYECTO%20DE%20PRESUPUESTO%202010_0.pdf
India	http://indiabudget.nic.in/ub2010-11/eb/stat04.pdf
Indonesia	http://www.scribd.com/doc/34795923/Indonesia-Budget-Statistics-English-Edition-2005-2010

2010	Nigeria	http://www.omicsonline.com/open-access/2151-6219/2151-6219-1-004.pdf
2010	Peru	http://www.mtc.gob.pe/portal/ae2010_revision_14_06_2011_v2-rev.pdf
2010	Saudi Arabia	http://www.mof.gov.sa/English/DownloadsCenter/Budget/Statement%20by%20the%20Ministry%20of%20Finance%202012%20Final.pdf
2010	South Africa	http://www.ffc.co.za/docs/submissions/government_submissions/2010/Adjusted%20Estimates%20of%20National%20Expenditure%202010.pdf
2010	Vietnam	http://www.ausaid.gov.au/Publications/Documents/vietnam-development-cooperation-report.doc
2010	United States	http://www.bea.gov/industry/gdpbyind_data.htm.
2010		http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/government_transportation_financial_statistics/index.html
PRIVATE SECTOR		
GOVERNMENT PUBLICATIONS (5)		
2010	Australia	http://www.bitre.gov.au/publications/2011/stats_004.aspx
2010	Canada	http://www.statcan.gc.ca/pub/61-205-x/61-205-x2013000-eng.pdf
2010	Japan Capital Assets	Statistics Japan (www.stat.go.jp)
	Japan FDI	http://stats.oecd.org/Index.aspx?DatasetCode=FDI_FLOW_INDUSTRY#
2012	United States Capital Assets	http://www.bea.gov/iTable/iTable.cfm?ReqID=2&step=1#reqid=2&step=10&isuri=1&202=1&203=22&204=6&205=1&207=43&208=52&209=301&200=2&201=1
	United States FDI	http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=3&isuri=1&903=35

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ENDNOTES

1. Challenges to data access are diverse. Barriers exist to data collection and reporting as well as availability.
2. Sustainable low-carbon transport, as defined by Dalkmann and Huizenga (2010), "reduces short and long term negative impacts on the local and global environments, has economically viable infrastructure and operation, and provides safe and secure access for both persons and goods."
3. This includes road and highway networks, mass transit systems, railways, canals, ports, airports, and vehicles and support systems.
4. World Bank definitions for country income levels are available at: http://data.worldbank.org/about/country-classifications.
5. The top 50 global economies exclude Algeria, Venezuela, and Iran, for which transport spending figures are unavailable.
6. OECD figures for government spending estimates are based on national government reporting; 65 percent include state and local levels. A few countries in the database reported some private-sector expenditures.
7. IMF GFS transport expenditure data is available by subscription through the IMF website.
8. National budget publications, while not always reliable approximations of actual transport expenditures, were the best available sources for the United States, Australia, India, Saudi Arabia, Argentina, Brazil, Vietnam, Indonesia, South Africa, Peru, and Bangladesh. See Appendix Table A3 for publications list.
9. In a small number of cases, proxy years from 2008–12 were used. It should also be noted that transport's share of national budgets was at a six-year low in 2010 and rebounded in 2011.
10. The PPI database includes only large projects covered in media and public sources; small-scale projects without media coverage are easily overlooked.
11. The U.S. Bureau of Economic Analysis, Australian Bureau of Infrastructure, Transport and Regional Economics, and Statistics Japan.
12. Derived from Creditor Reporting System from the OECD Stats database.
13. The funds evaluated can be found in the Appendix. These are identified as the most relevant funds for transport in Binsted et al. (2013).
14. According to the World Bank PPI database, counting only annual investment in physical assets and not payments to governments through a PPP or similar arrangement.
15. Private contributions to transport investment are included for public-private partnerships in which a private firm owned, managed, or covered at least 25 percent of the contract cost. The World Bank PPI database covers investments made or to be made by project companies to physical assets and not to governments. When companies are owned by both public and private parties, the investment figure represents the total investment of these companies.
16. Project finance is a technique often used in infrastructure projects whereby the financial assets of a project are used to repay investors.
17. Derived from Bloomberg data as presented in CBI (2013).
18. This analysis only covers capital investment, which is generally higher in developing countries, which have more extensive infrastructure needs; higher spending on operations and maintenance would be likely in more developed countries, where a larger portion of infrastructure needs have been built and need repair.
19. These issues are further explored in recent WRI publications, Lefevre and Leipziger (2013) and Polycarp et al. (2013).
20. The last funding cycle of the GEF totaled US$3.3 billion and the GCF aims to raise $100 billion by 2020. A US$175 billion pledge to sustainable transport was made in a joint statement by multilateral development banks in June 2012. Accessible at: http://www.adb.org/sites/default/files/news/statement-commitment-sustainable-transport.pdf.
21. A useful starting place could be the work of Newman and Kenworthy (1999), "Sustainability and Cities: Overcoming Automobile Dependence," on the mobility status of urban areas across countries and regions.

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ABOUT WRI

WRI is a global research organization that works closely with leaders to turn big ideas into action to sustain a healthy environment—the foundation of economic opportunity and human well-being.

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EMBARQ catalyzes and helps implement environmentally, socially and financially sustainable urban mobility and urban planning solutions to improve people's quality of life in cities. Founded in 2002 as a program of the World Resources Institute (WRI), EMBARQ operates through a global network of centers in Brazil, China, India, Mexico, Turkey and the Andean region.

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