


OECD work on

# Mobilising private investment in sustainable transport infrastructure

A high-speed train is stopped at a modern station platform. The scene is captured during sunset or sunrise, with the sun low on the horizon, creating a strong orange glow and long shadows. The train is white with dark accents. Several people are visible on the platform, some standing and others walking. The platform has a metal grating floor and a red tactile paving strip. The sky is a mix of blue and orange, with some clouds. The overall mood is serene and modern.

*“It is urgent that investment in transportation moves toward building right, not just building more. The private sector has a key role to play in this shift, which will help governments to meet the pressing economic, social and environmental challenges they will face over coming decades. Governments on their part must play a central role in mobilising private sector investment for sustainable transport infrastructure.”*

**Angel Gurría**, OECD Secretary-General



OECD work on

# Mobilising private investment in sustainable transport infrastructure

By 2050, global investment needs for land transport infrastructure will reach USD 3 trillion per year on average, under current policies. Today's investments in transport infrastructure present a unique opportunity to meet growing transport demand and development goals while avoiding “locking-in” emissions-intensive development pathways. Engaging the private sector will be an important element of efforts to fill the infrastructure investment gap, particularly given current strains on public finances.

The OECD is helping advanced, emerging and developing economies identify the key enabling policies and instruments needed to mobilise private investment in sustainable transport infrastructure. In addition to reducing greenhouse gas emissions, such investments can help improve local air quality, reduce traffic congestion and enhance mobility. The new OECD report on “Mobilising Private Investment in Sustainable Transport: The Case of Land-based Passenger Transport Infrastructure” provides a comprehensive toolkit of investment and climate policies, regulations and innovative financial tools to **scale-up private investment and shift toward greener modes of transport**. This report builds on a review of existing practices, and focuses on land-based transport infrastructure for passenger use, including passenger rail, metros, bus rapid transit systems, non-motorised transportation and electric vehicle charging infrastructure.

## KEY PRIORITIES:

- Strengthen domestic policy frameworks to support sustainable transport infrastructure investment, through:
  1. Setting strategic goals and aligning policies across and within different levels of government
  2. Reforming policies to enable investment and strengthen market incentives
  3. Establishing financial policies and instruments
  4. Harnessing resources and building capacity
  5. Promoting green business and consumer behaviour

# Scale-up and shift private investment toward sustainable transport infrastructure

Transport is the second-largest source of global greenhouse gas (GHG) emissions and contributes 23% of carbon dioxide (CO<sub>2</sub>) emissions from fossil-fuel combustion. It also is a significant source of fine particulate matter, nitrogen oxides (NO<sub>x</sub>) and ozone, which pose serious risks to public health.

Investments in more sustainable transport infrastructure solutions can deliver environmental, social and economic benefits beyond GHG reductions. These include improved local air quality and associated health benefits, and reduced traffic congestion. This is particularly critical in cities as more than half of transport occurred in urban areas in 2010. Rapid urbanisation trends give rise to significant environmental challenges due to automobile-based urban sprawl.

Transport infrastructure systems are also vulnerable to climate change impacts due to their long operational lifetime. Delivering both climate mitigation and adaptation at scale requires unprecedented efforts to transform our mobility patterns and transport infrastructure systems across countries.

The growth of global transport demand and the challenge of reducing GHG reductions in the transport sector will require:

- **scaling-up** investment in renovated or new transport infrastructure to meet development goals and increased travel needs, particularly in emerging economies; and
- **shifting** investment away from carbon-intensive road transport and toward sustainable transport modes, to avoid locking-in carbon-intensive and climate-vulnerable development pathways.

The public sector has traditionally played a key role in financing land-based passenger transport, which is considered a quasi-public good. Given the extent of investment needs, and growing constraints on public finances, it will be necessary to mobilise private investment at pace and at scale. Investment barriers, however, often limit the attractiveness of sustainable transport projects compared to fossil fuel-based alternatives. Market and government failures still prevent accounting for the full costs of carbon-intensive road transport externalities and the benefits of sustainable transport.





*“Investments in more sustainable transport infrastructure solutions can deliver environmental, social and economic benefits beyond GHG reductions. These include improved local air quality and associated health benefits, and reduced traffic congestion.”*

### The Avoid-Shift-Improve (A-S-I) approach

- **Avoid** or **reduce** the need to travel, by improving transport system efficiency through integrated land-use planning and transport demand management, e.g. through compact, mixed-use urban development or traffic restrictions.
- **Shift to** (or **maintain**) sustainable transport modes to improve trip efficiency, e.g. through dedicated bus lanes.
- **Improve** fuel and vehicle efficiency and technologies, e.g. through vehicle fuel economy standards.

### The Infrastructure Investment Gap

- Cumulative investment needs in land transport infrastructure are projected to reach **USD 45 trillion by 2050** (or USD 3 trillion per year on average), under current policies.
- **“Avoid”** and **“Shift”** policies could achieve net savings on rail, high speed rail and bus rapid transit infrastructure, through savings in travel times and reduced investment and maintenance costs for roads and parking lots. Such savings could offset additional investment in low-carbon vehicles.
- **“Improve”** policies could represent an additional USD 30 trillion of savings in vehicle and fuel expenditures.

Source: IEA, 2012.

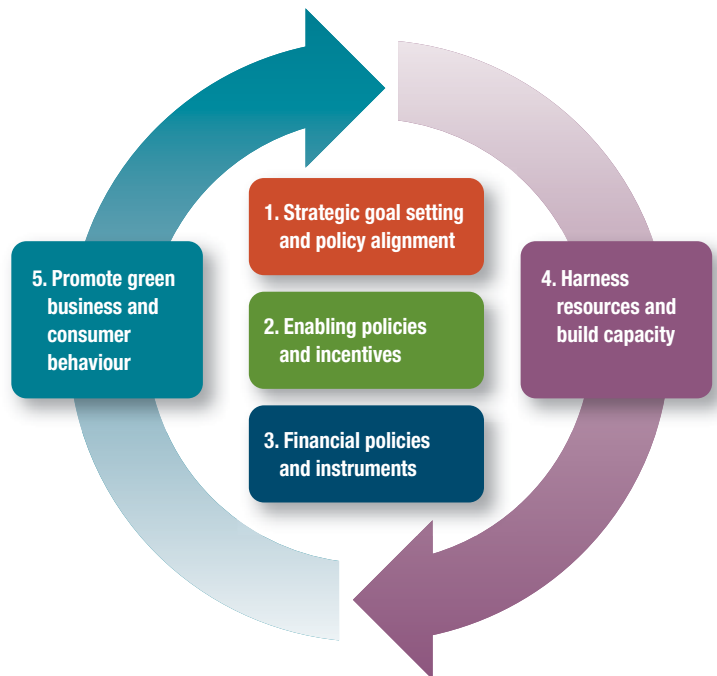
# Strengthen domestic policy frameworks

Governments have a central role to play in mobilising private investment in sustainable transport infrastructure, by establishing reform agendas that deliver “investment-grade policies”. An integrated framework with clear and stable climate and transport policies, sound investment policies, and targeted and innovative tools is essential to overcome barriers to private sector investments in sustainable transport.

The OECD “Green Investment Policy Framework” provides a non-prescriptive list of policies, tools and instruments available to policy makers to create domestic enabling conditions to shift and scale-up private investment toward sustainable transport infrastructure.

*Source: Adapted from Corfee-Morlot et al., 2012.*

## The OECD Green Investment Policy Framework

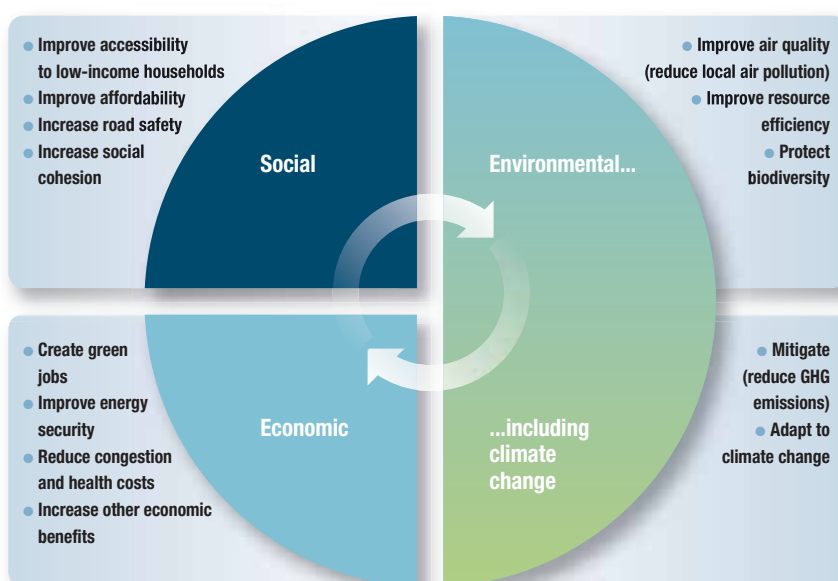


# 1 Strategic goal setting and policy alignment

Creating a stable stream of investment opportunities in sustainable transport infrastructure requires:

- **Adopting long-term targets and clear policy goals**, and integrating sustainable transport goals within national strategies, infrastructure plans and disaster risk management.
- **Adopting a “co-benefits” approach**. GHG reductions may have less prominence than other co-benefits. Other policy goals, such as reduced traffic congestion and local air pollution, often drive policy support for metros and bus rapid transit systems, and can help achieve climate change goals.
- **Mainstreaming the use of multi-criteria cost-benefit analyses** to assess the full environmental, social and economic costs and benefits of sustainable transport infrastructure projects.
- **Integrating land-use and transport planning** is a key enabling activity to help reverse the trend toward automobile-based urban sprawl. Integrated planning can encourage the creation of “compact cities” with dense, mixed-use development patterns in urban areas well connected to public transport. Coordinating multiple stakeholders is a key challenge.

## Co-Benefits of Sustainable Transport Infrastructure



Source: Authors, adapted from GIZ (2012).



## Metrobus bus rapid transit system

In Mexico City, the bus rapid transit system “Metrobus” was launched to improve air quality and reduce congestion. The transit system generated strong co-benefits, which played a key role in fostering political support. Co-benefits included:

- **50% reduction in passenger exposure** to carbon monoxide, benzene, and particulate matter compared to older buses;
- **110,000 tonnes** of GHG emissions savings per year;
- **40% trip time reduction** for users; and
- **84% reduction in accidents** between 2005 and 2010.

Source: Ang and Marchal, 2013; Francke et al., 2012.





*“The ability of individuals and society at large to switch transport modes in response to a carbon price signal is limited in the absence of high-quality public transit systems.”*

# 2

## Enabling policies and incentives

Policymakers should **promote sound investment principles** such as transparency and non-discrimination, and open and competitive access to sustainable transport infrastructure markets.

According to the World Bank, the cost of corruption is estimated to reach approximately 13-35% of contract value in road transport projects in developing countries.

Adequate **pricing mechanisms** also are needed to address market and government failures. Pricing externalities such as GHG emissions, local air pollution and traffic congestion can help account for the full costs of fossil-fuel based road transport and shift incentives away from carbon-intensive road transport. These pricing mechanisms include:

- **Carbon prices** (carbon taxes and cap-and-trade systems)
- **Fuel and vehicle taxes**
- **Reform of fossil-fuel subsidies**
- **Congestion charges and other road user charges**
- **Parking levies**

The effectiveness of carbon prices in reducing road transport demand is hampered by the relatively low price-elasticity of transport demand. In part, this reflects the limited ability of individuals and society at large to switch transport modes in response to a carbon price signal in the absence of high-quality public transit systems. Pricing instruments are also politically challenging to implement. For these and other reasons, **carbon pricing schemes need be complemented by supply-side regulations and policies**, such as:

- **Zoning policies and land-use planning** (e.g. dedicated bus lanes)
- **Standards:**
  - **Performance-based standards** (e.g. fuel economy standards)
  - **Technology-based standards** (e.g. to support electric vehicle charging infrastructure)
  - **Building codes or design standards** (e.g. to increase climate resilience)
- **Public procurement programmes** (e.g. to support electric vehicle charging infrastructure)

### Congestion charges

- Can help reduce congestion, local air pollution and GHG emissions, by accounting for the travel-time costs of private vehicle use.
- Are typically imposed for entry into business districts, and sometimes calculated based on the congestion level or time of the day.
- Can be differentiated by vehicle types, while exempting electric vehicles.
- Are politically challenging and complex to implement. Cities with congestion charges include Stockholm, London and Singapore.



# 3

## Transitional financial policies and instruments

### Principles for effective and competitive public-private partnerships (PPPs)

- **Estimation of projects' affordability** and sufficient "value for money" (VfM) compared to traditional public procurement.
- **Competitive bidding processes** in tenders.
- **Full disclosure** of conditions in tenders and **clear rules** on project cancelation and compensation.
- **Clear responsibility and risk-sharing agreements.**
- **Pricing regulations** to secure revenue flows and incentivise new entrants.
- **Independence** of PPP operators.
- **Creation of PPP units** to plan, implement, manage and evaluate PPP projects.

Source: OECD, 2012d.

### Land value capture to finance Hudson Yards metro, New York

New York City (NYC) is financing Hudson Yards subway line extension and station through the issuance of bonds by a special purpose vehicle (SPV), the "Hudson Yards Infrastructure Corporation," with debt service guaranteed by innovative sources of revenues, including:

- **Tax Equivalency Payments (TEPs)**, provided by NYC in anticipation of future tax revenues from land value increases;
- **Payments in Lieu of Taxes (PILOTs)**, which offer land tax exemptions to project developers in a specific area; and
- **Transferable Development Rights** from the transfer of public property land and building rights.

Source: PriceWaterhouseCoopers, 2013.

Passenger rail and metros are often constrained by higher upfront capital costs, lower returns and longer development and payback periods, compared to toll highways. In addition, direct user fares are often set too low to cover operational costs, due to social affordability concerns.

Several financial tools and risk-sharing mechanisms are available to improve the relative risk-return profile of sustainable transport infrastructure projects:

- **Public-private partnerships (PPPs)** are procurement methods that allow for private sector participation and risk sharing. To be effective, they must offer sufficient "value for money" compared to traditional public procurement. The right institutional capacities and processes must also be in place. Experience to date suggests that PPPs are particularly suited for BRTs, highly-used and specific rail links, and shared-use vehicle and bicycle systems.
- **Land value capture tools** capture revenues from the indirect and proximity benefits generated by transport infrastructure (e.g. increased real estate value) to help fund transport projects. Examples of land value capture tools include tax increment financing (TIF) districts, development charges, development rights and joint development. To date, these tools have been applied mainly to roads, metros and rail.
- **Loans, grants and loan guarantees** are traditional financial tools frequently used to leverage private investment in large-scale rail or metro projects that otherwise would be fully owned and operated by public stakeholders. Infrastructure banks or funds can play a transitional role to disburse loans and guarantees.
- **Green bonds** have the potential to attract institutional investors such as pension funds and insurance companies by tapping into the debt capital markets, which are currently underexploited for green infrastructure investment. Bonds remain the dominant asset class in portfolio allocations of pension funds (50%) and insurance companies (61%) across OECD countries. Rail infrastructure projects in Europe account for most of the limited green bond issuances to date (68% out of USD 174 billion).
- **Short-run subsidies** can be used to provide transitional support to sustainable transport options and technologies. They notably can be used to foster innovation, ramp-up production, offset upfront capital costs, and compensate for network infrastructure bias toward fossil-fuel-based road transport. Examples include support to charging infrastructure for electric vehicles (EVs) and plug-in hybrid vehicles (PHEVs).



📍 **Land value capture in Hong Kong:** The construction, maintenance of operations of Hong Kong metro were financed by the city operator, Mass Transit Railway Corporation (MTRC), by establishing joint ventures with private real estate developers and retail outlets located near subway stations, in addition to selling development rights.

## Constraints on long-term investment

The global economic and financial crisis has constrained the financing of large-scale infrastructure, such as metros and passenger rail, by reducing availability of long-tenor bank debt for project finance.

While they have important over-arching objectives, new regulatory initiatives such as Basel III and Solvency II also may have two unintended consequences for the financing of transport infrastructure projects:

1. Higher costs of capital for debt financing and refinancing, and a reduction in the availability of long-tenor bank debt, likely will reduce the growth and spread of public-private partnerships (PPPs) and constrain the financing of large-scale projects such as new rail and subway networks.
2. Regulatory constraints and balance sheet pressure on commercial banks create the need for alternative sources of

financing, such as institutional investors. Pension funds, insurance companies and mutual funds held over **USD 75 trillion in assets** in 2011 in OECD countries. **Less than 1%** of OECD pension fund assets, however, are allocated to direct infrastructure investments, and the “green” investment component remains even more limited.

To meet investment needs in sustainable transport and other green infrastructure, more work needs to be done to better understand and overcome barriers to institutional investment, including:

- market and government failures;
- regulatory and policy uncertainty;
- a lack of suitable financing vehicles; and
- investor inexperience with direct project investment and with new technologies and asset classes.

*Source: Kaminker and Stewart, 2012.*

# 4

## Harness resources and build capacity

Administrative hurdles and capacity gaps can hamper private investment in transport infrastructure projects.

- **Effective transport planning** is required to address those obstacles and ensure proper project implementation, foster innovation, and harness resources in support of sustainable transport goals. Inadequate administrative capacity creates hurdles for private investors and operators.
- **Investor capacity gaps** are particularly challenging (e.g. due to data gaps or lack of expertise in conducting public-private partnerships or investing in mass transit systems).
- **Climate risk assessment** is also needed to mainstream climate resilience in transport planning. Governments can support climate risk and vulnerability assessments by developing climate risk-screening and risk assessment tools, and climate projections and guidelines.

# 5

## Promote green business and consumer behaviour

Information, education, public awareness campaigns and business outreach programmes can help reduce information barriers. They also can promote changes in corporate and consumer behaviour in a manner that encourages the use of alternative transport modes and helps to shift investments toward sustainable transport infrastructure. Individuals and private actors need reliable information on which to base their travel and investment decisions, respectively.

### No one-size-fits-all solution

Although the elements of good practice are likely to be similar for all countries, country contexts do matter. Policy mixes and designs need to be tailored to specific domestic country contexts and adapted to the policy and regulatory framework, both at the national and sub-

national levels. Governments also need to package and integrate each tool into a coherent mix of policies and instruments. The OECD is working with national governments to tailor this policy toolkit and adapt it to specific country contexts.



*“Although the elements of good practice are likely to be similar for all countries, country contexts do matter. Policy mixes and designs need to be tailored to specific domestic country contexts.”*



## Relevant OECD References

- Ang, G. and V. Marchal** (2013), “Mobilising Private Investment in Sustainable Transport: The Case of Land-Based Passenger Transport Infrastructure”, *OECD Environment Working Papers*, No. 56, OECD Publishing.
- Beltramello, A.** (2012), “Market Developments for Green Cars”, *OECD Green Growth Papers*, No. 2012-03, OECD Publishing.
- Corfee-Morlot, J. et al.** (2012), “Towards a Green Investment Policy Framework: The Case of Low-Carbon, Climate-Resilient Infrastructure”, *OECD Environment Directorate Working Papers*, No. 48, OECD Publishing.
- Francke, E. et al.** (2012), “The Mobilisation of Private Investment for Low-carbon, Climate-Resilient Infrastructure: The Case of Metrobus Bus Rapid Transit System in Mexico City”, case study prepared by CTS EMBARQ Mexico for the OECD.
- International Energy Agency (IEA)** (2013a), “Global Land Transport Infrastructure Requirements, Estimating Road and Railway Infrastructure Capacity and Costs to 2050”, *Insights Paper*, OECD Publishing.
- IEA** (2013b), *A Tale of Renewed Cities: A Policy Guide on How to Transform Cities by Improving Energy Efficiency in Urban Transport Systems*, OECD Publishing.
- IEA** (2012), *Energy Technology Perspectives 2012: Pathways to a Clean Energy System*, OECD Publishing.
- Kaminker, C and F. Stewart** (2012). “The Role of Institutional Investors in Financing Clean Energy”, *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 23, OECD Publishing.
- Kennedy, C. and J. Corfee-Morlot** (2012), “Mobilising Investment in Low-Carbon, Climate Resilient Infrastructure”, *OECD Environment Working Papers*, No. 46, OECD Publishing.
- Merk, O. et al.** (2012), “Financing Green Urban Infrastructure”, *OECD Regional Development Working Papers*, No. 2012/10, OECD Publishing.
- OECD** (2012a), *Environmental Outlook to 2050: The Consequences of Inaction*, OECD Publishing, Paris.
- OECD** (2012b), *Strategic Transport Infrastructure Needs to 2030*, OECD Publishing.
- OECD** (2012c), *Compact City Policies: A Comparative Assessment*, *OECD Green Growth Studies*, OECD Publishing.
- OECD** (2012d), “Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships”, *OECD Recommendation*, No. C(2012)86.
- OECD/International Transport Forum (ITF)** (2012), *Transport Outlook 2012: Seamless Transport for Green Growth*, OECD Publishing.
- OECD/ITF** (2010a), *Stimulating Low-Carbon Vehicle Technologies*, *ITF Round Tables*, No. 148, OECD Publishing.
- OECD/ITF** (2010b), *Implementing Congestion Charges*, OECD Publishing.
- OECD/ITF** (2008), *Transport Infrastructure Investment. Options for Efficiency*, OECD Publishing.
- OECD, IEA, OPEC and the World Bank** (2011), “Joint report by IEA, OPEC, OECD and World Bank on fossil-fuel and other energy subsidies: An update of the G20 Pittsburgh and Toronto Commitment.”. Prepared for the G20 Meeting of Finance Ministers and Central Bank Governors (Paris, 14-15 October 2011) and the G20 Summit (Cannes, 3-4 November 2011).
- Other references:**
- GIZ** (2012), “Navigating Transport NAMAs: Practical handbook for the design and implementation of Nationally Appropriate Mitigation Action (NAMAs) in the transport sector”.
- PriceWaterhouseCoopers** (2013), “Quels mécanismes de financement pour les gares urbaines?”, study conducted for La Fabrique de La Cité, Paris.

CONTACTS:

**Geraldine Ang** ([geraldine.ang@oecd.org](mailto:geraldine.ang@oecd.org)) and  
**Virginie Marchal** ([virginie.marchal@oecd.org](mailto:virginie.marchal@oecd.org))



For more information:  
[www.oecd.org/env/cc/financing](http://www.oecd.org/env/cc/financing)