



WORLD
RESOURCES
INSTITUTE

LOW-CARBON CITIES: WHY ? WHAT ? HOW ?

Example of the urban transport sector

*“Urban, Climate change and Finance” JICA side event
COP20, Lima - December 5th, 2015*

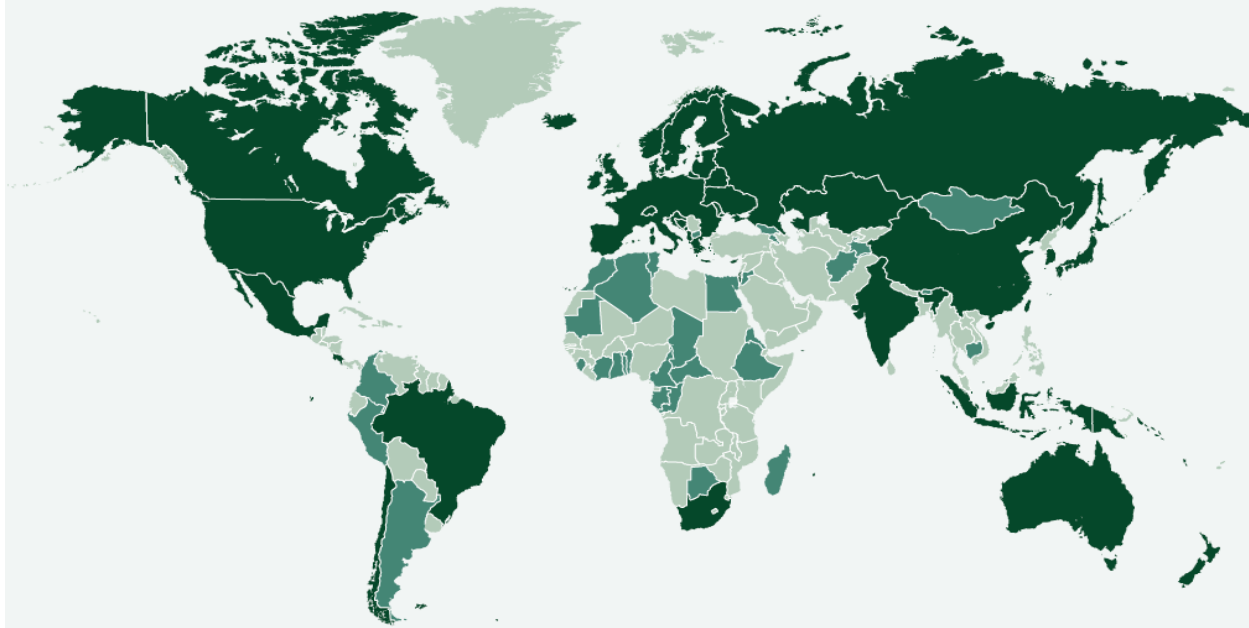
BENOIT LEFEVRE, PHD
DIRECTOR ENERGY & CLIMATE, WRI ROSS CENTER FOR SUSTAINABLE CITIES, WRI

**WHY
low-carbon cities ?**



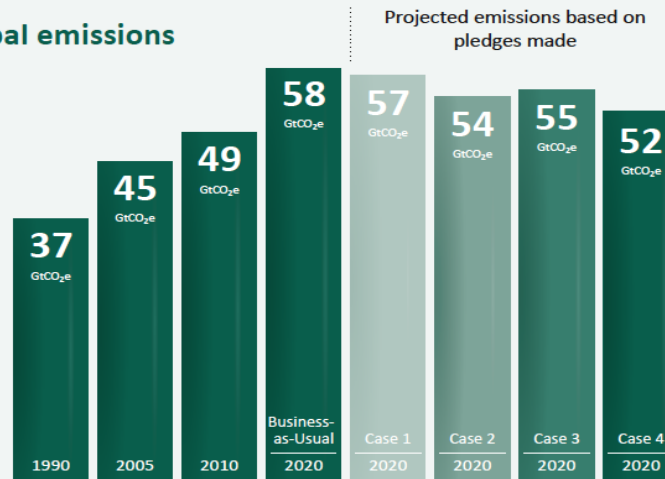
Global map showing the different categories of pledges

● Pledges formulated in terms of GHG emissions ● Submitted actions ● No pledge



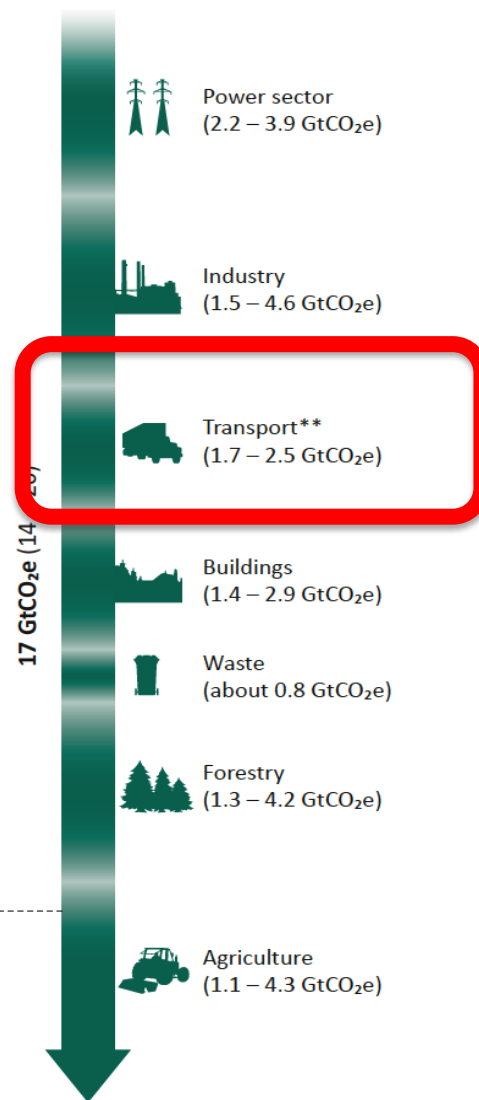
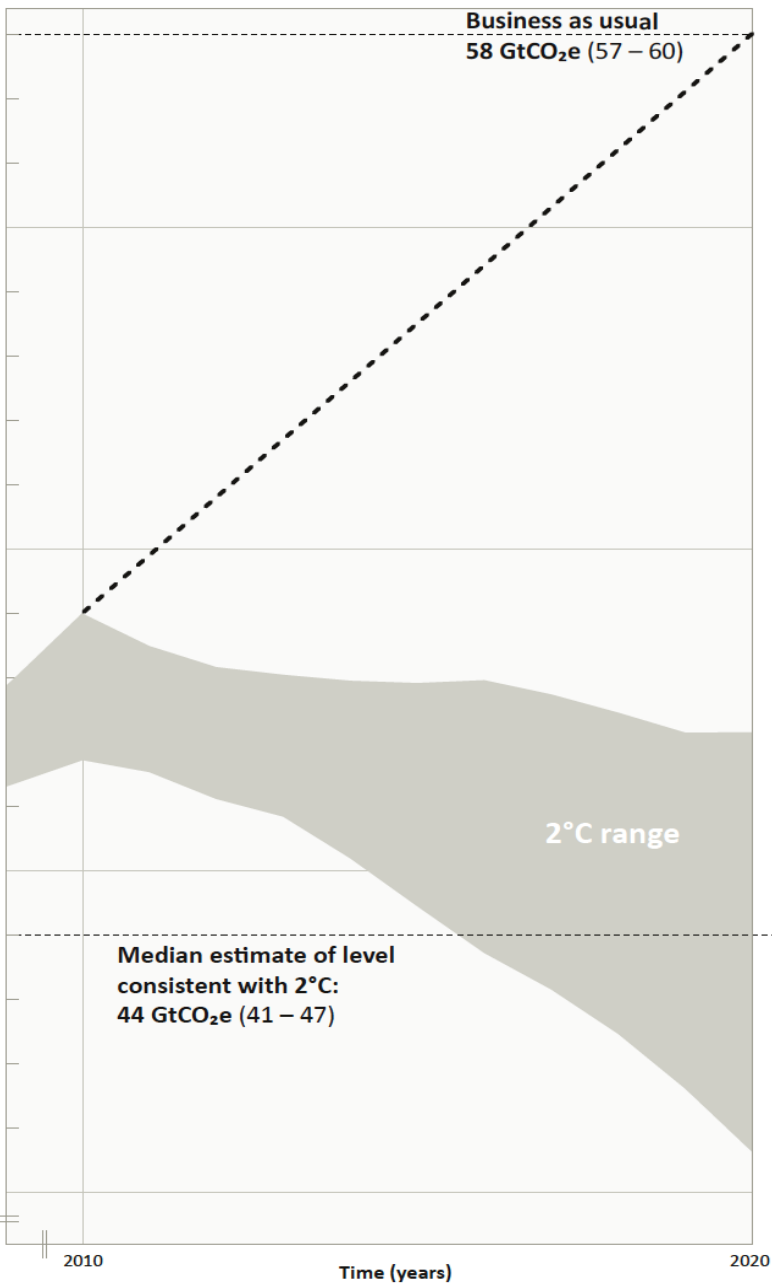
EMISSION PLEDGES AND EMISSION SCENARIOS

Estimated global emissions



How to bridge the gap: results from sectoral policy analysis*

HOW TO BRIDGE THE GAP – RESULTS FROM SECTORAL ANALYSIS



*based on results from Bridging the Emissions Gap Report 2011

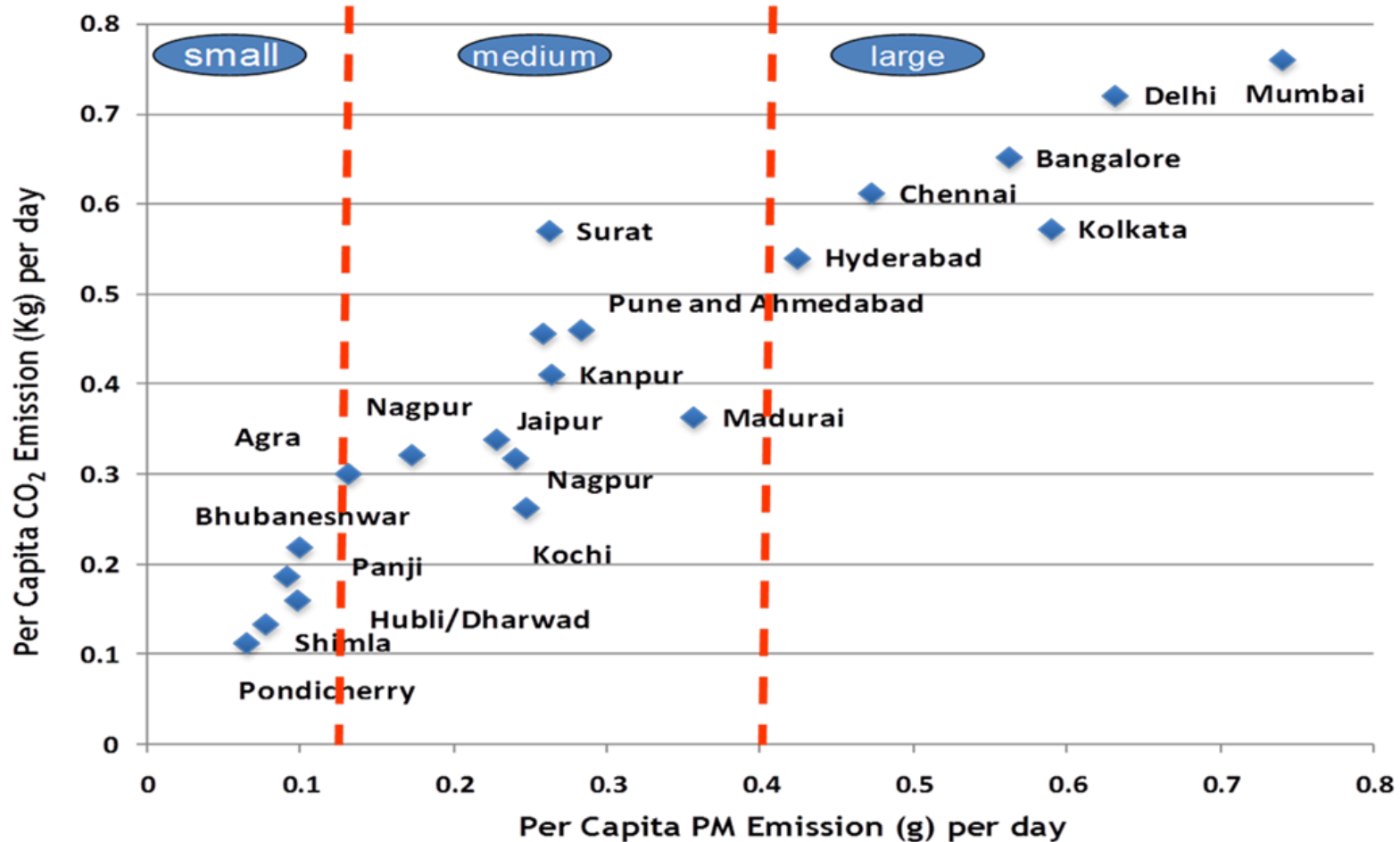
**including shipping and aviation

Transport has long-term impacts.



Transport links climate change and sustainable development goals.

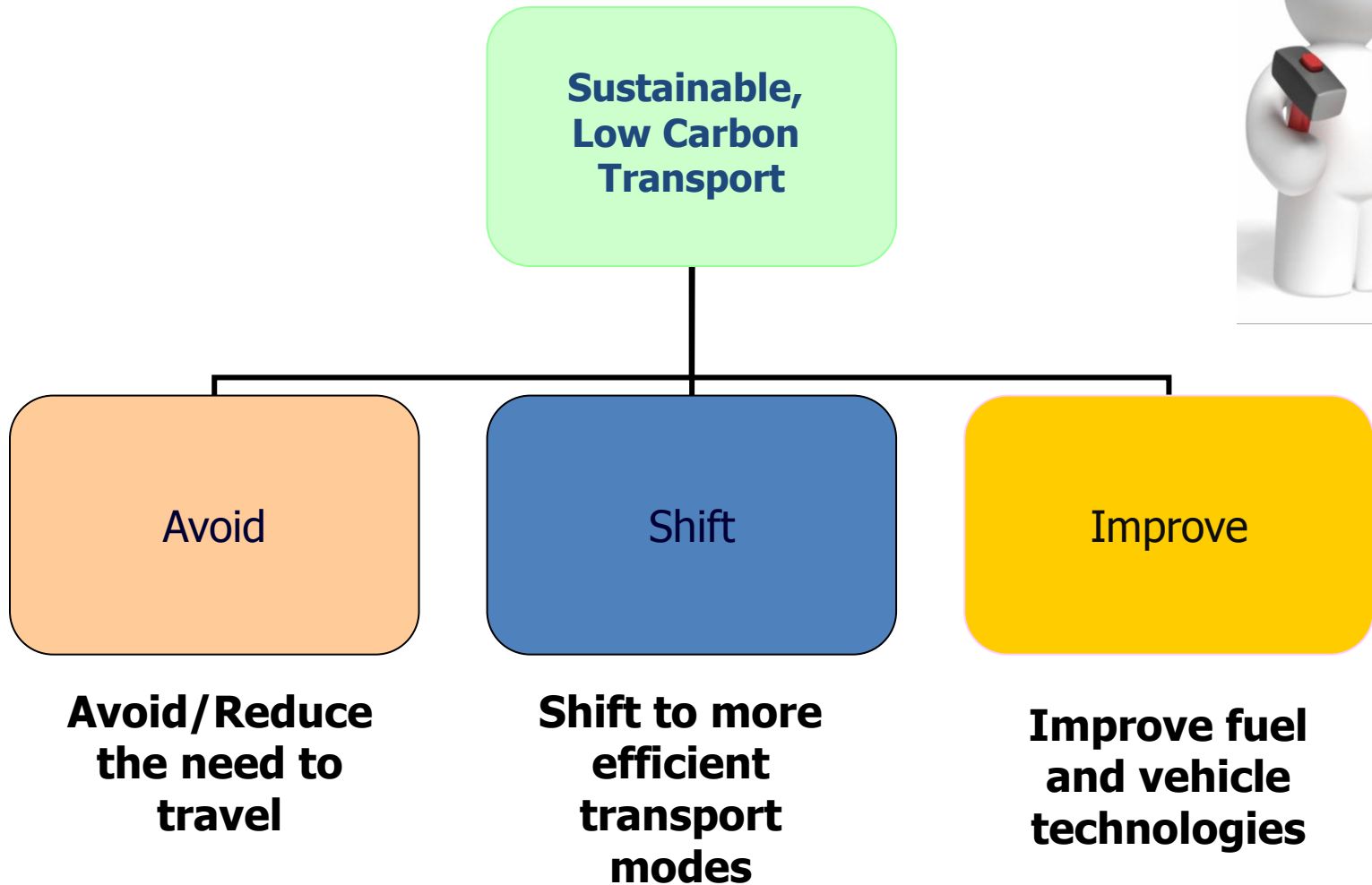
Per Capita CO₂ and Per Capita PM Emissions



WHAT low-carbon cities ?



HOW TO REDUCE GHG EMISSIONS FROM TRANSPORT?



Problem Definition:

Excessive emissions from transport activities

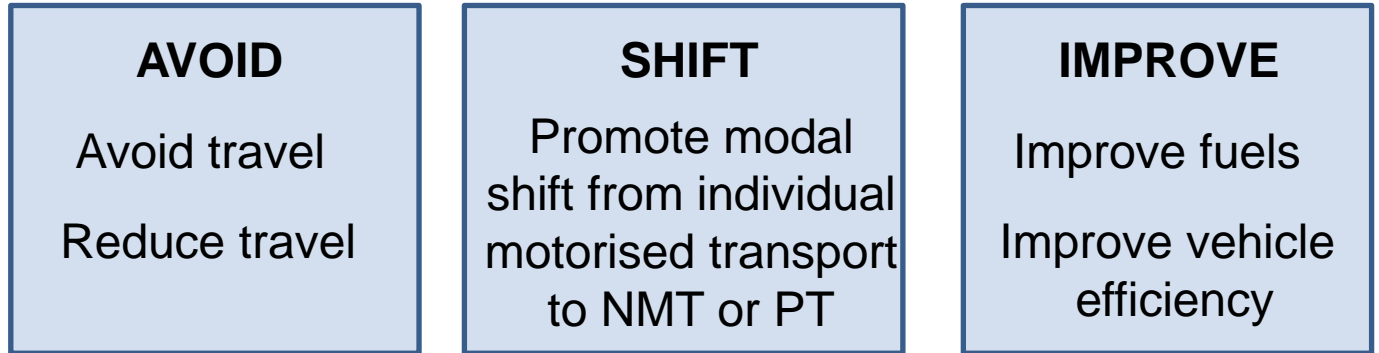
Core Objective:

Mitigation from transport (and co-benefits)

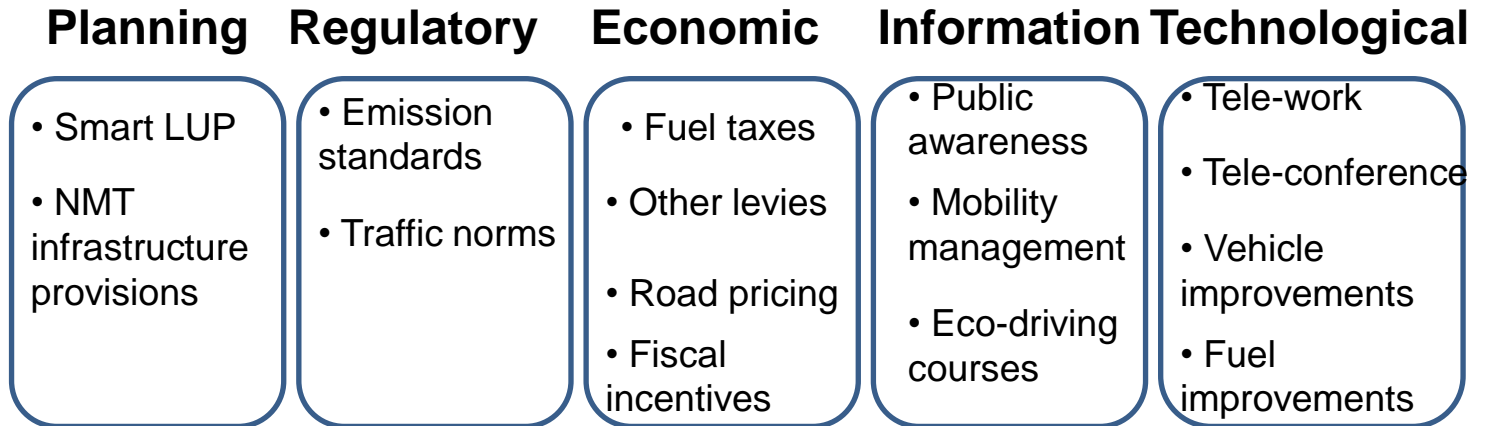
Methodological Framework:

$$\text{GHG} = \text{Activity} \times \text{modal Share} \times \text{energy Intensity} \times \text{carbon intensity of Fuel}$$

Systematic Mapping:

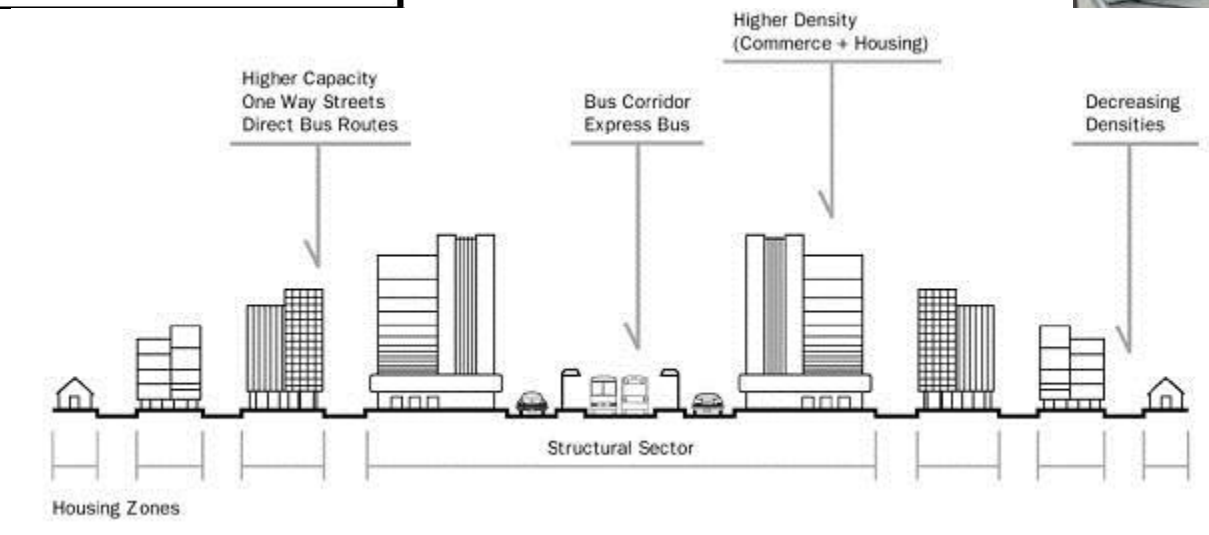
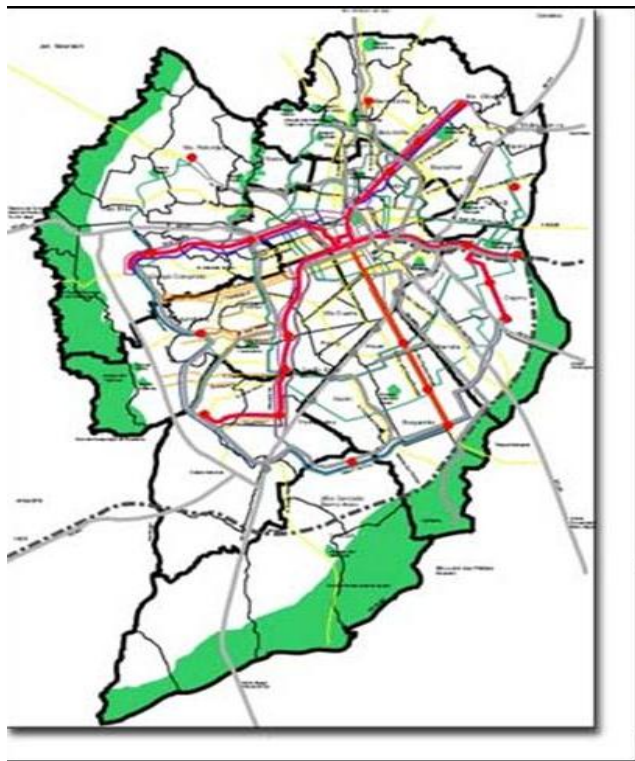


Policy Instruments:



Outcome:

Reduced carbon emissions from transport systems





**HOW
low-carbon cities ?**



WRI Ross center for sustainable cities


Finance-related activities:



- 1) Track financial flows + Investment needs :
big picture + detailed analysis (countries, private sources)
- 2) Increase, improve and popularize climate finance options
- 3) Support developing countries & cities,
Highlight public instruments to mobilize funding

How to Shift & Increase Investment to Low-Carbon Transport?

Global Financial Flows & the Role of Readiness for Climate Finance



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Working Paper

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

BENOIT LEFEVRE, DAVID LEIPZIGER, MATTHEW RAIFMAN

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\$369 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.

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Investment Estimates..... 3


Conclusions..... 6


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Disclaimers: Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues. Most working papers are eventually published in another form and their content may be revised.

Suggested Citation: Lefevre, B. et al. 2014. "The Trillion Dollar Question: Tracking public and private investment in transport." Working Paper. World Resources Institute, Washington, DC. Available online at: wri.org/publication/trillion-dollar-question-transport.





Transport Readiness for Climate Finance: A framework to access climate finance in the transport sector

Benoit Lefevre and David Leipziger
EMBARQ – The World Resources Institute (WRI)
Center for Sustainable Transport

Updated January 2014

Acknowledgements: The authors are grateful to Heather Allen (TRL), Stefan Bakker, Jonas Bleckmann, Friedel Sehleier (GIZ) and Comie Hutzenza (SLoCaT partnership) for their contributions to this report. This document has been commissioned, financed and edited by GIZ.

**How much is invested annually
in the transport sector?**

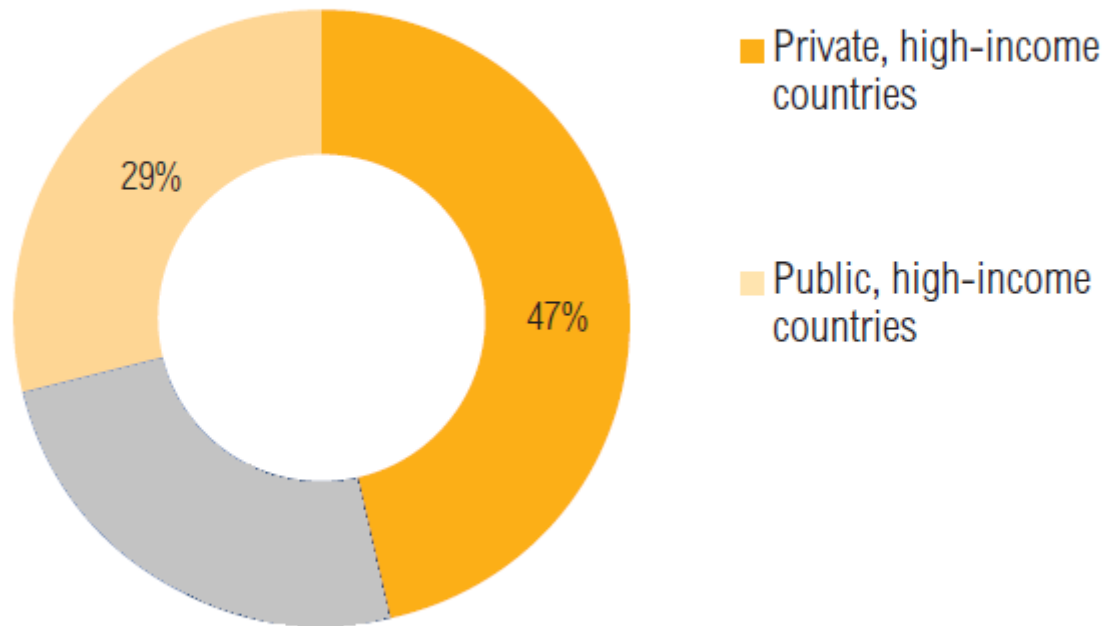
\$1.4 - \$2.1 trillion

**What portion comes from
private investors?**

**About 58%
or \$1 trillion**

Is public or private investment larger in developed countries?

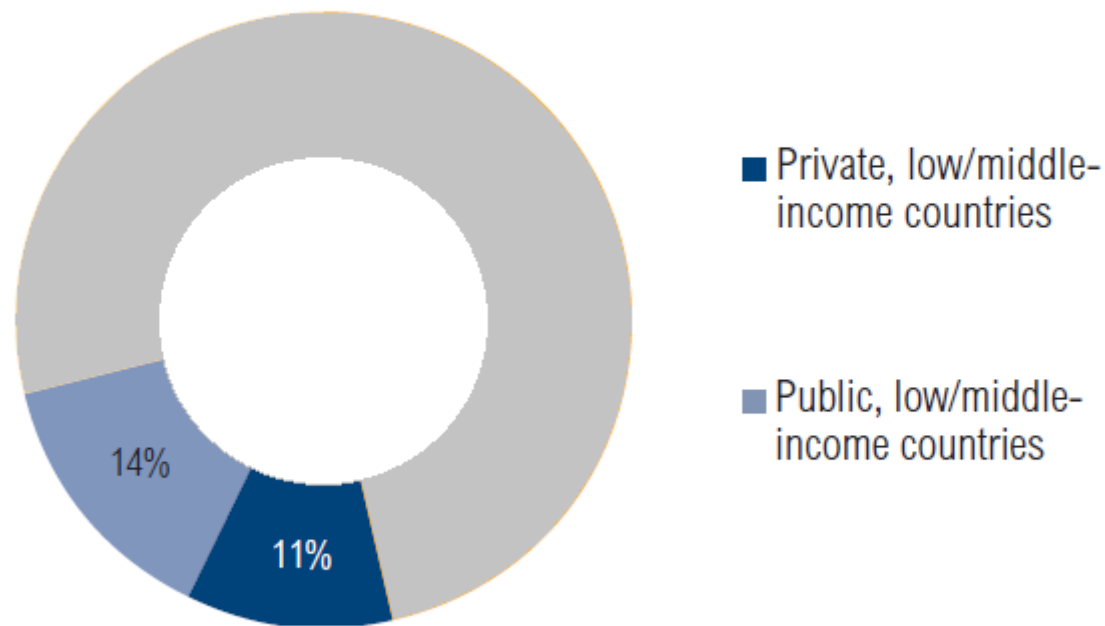
Proportion of Public and Private Investment in Transport, 2010 estimate (billions of US\$)



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

Is public or private investment larger in developing countries?

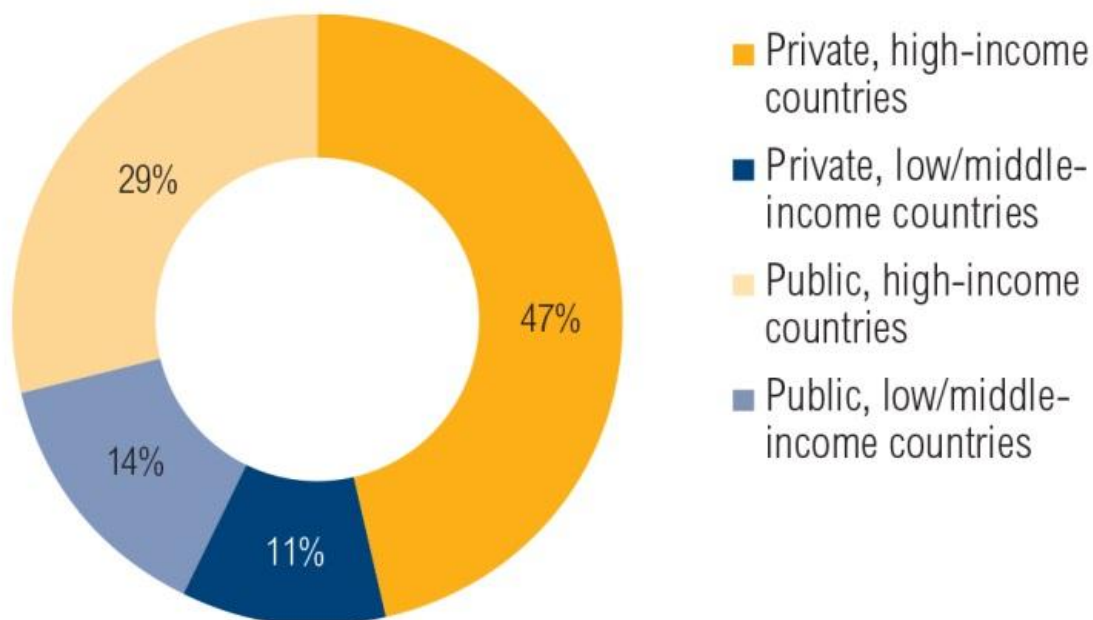
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The whole picture.

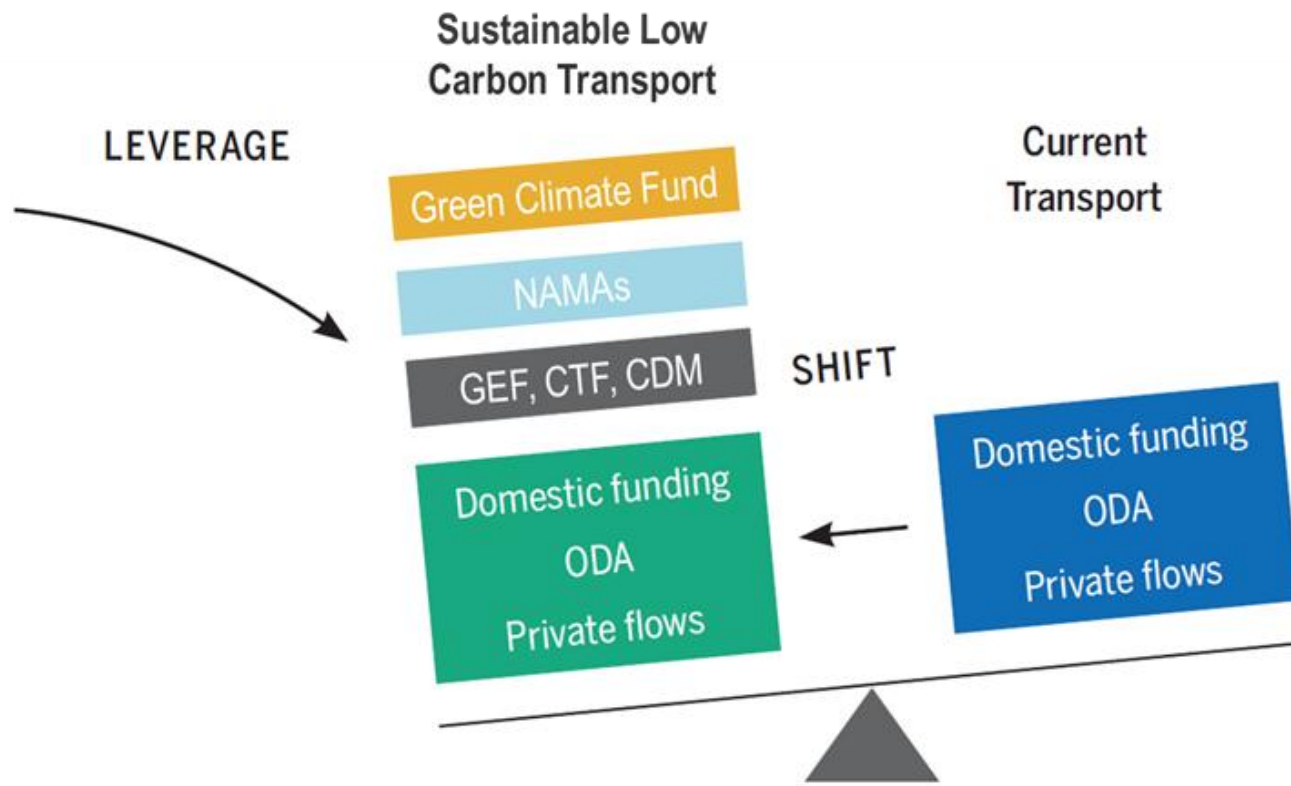
Figure 2 | **Proportion of Public and Private Investment in Transport, 2010 estimate (billions of US\$)**



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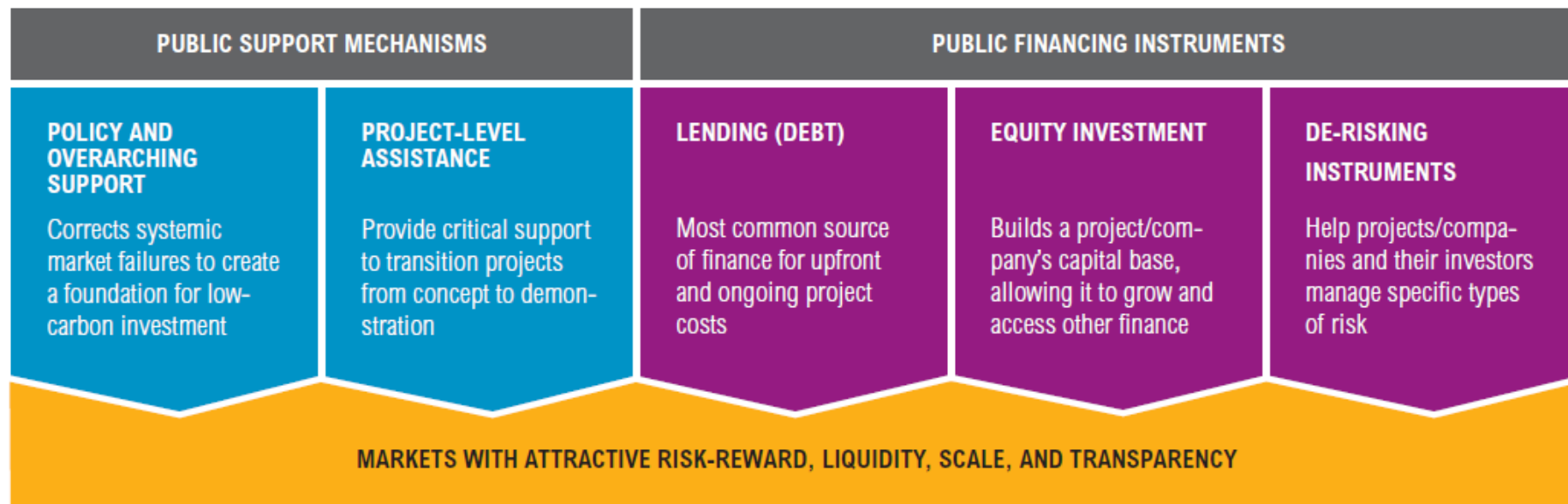
HOW can public sector intervene
to mobilize private finance and
grow markets ?

International public climate finance should offer *leverage*.



A MIX OF APPROACHES

Policy instruments and financial instruments work most effectively when used in coordination



Source: WRI

MERCI !

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www.wri.org

www.embarq.org

www.thecityfix.com



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Climate Finance

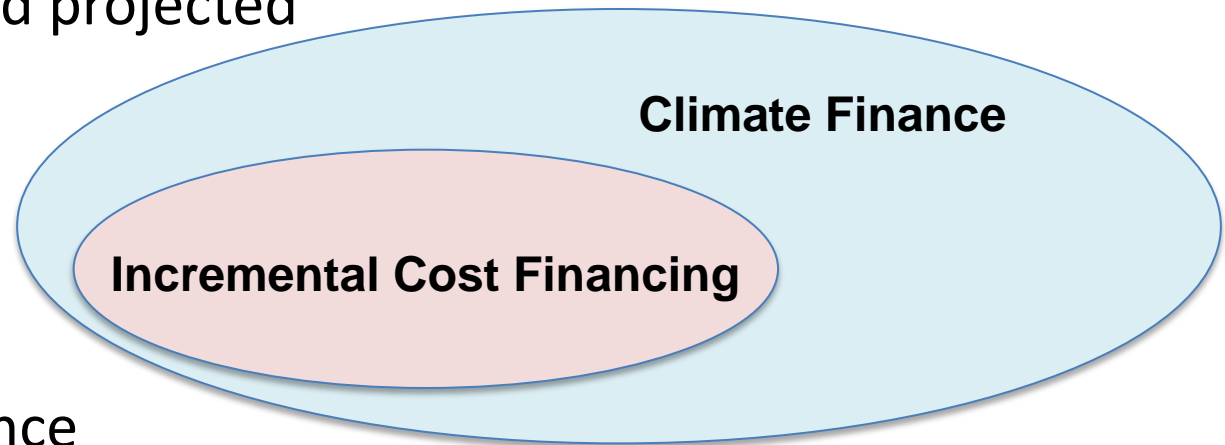
All financial flows whose expected effect is to reduce net greenhouse emissions or to enhance resilience to the impacts of climate variability and projected climate change.

Incremental Cost

The marginal difference between a cheaper, more environmentally harmful investment and a costlier, more sustainable or climate-resilient one.

Readiness

The capacities of countries and local governments to plan for, access, report on, and use climate finance as well as implement and monitor resulting projects.



Financial flows to transport: a *Trillion Dollar Question*

1. Global annual investment
2. Only capital assets (not operational or consumer spending)
3. All modes (i.e. land, air, & water)
4. Public and Private sources
5. Domestic and cross-border



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Methodology

PRIVATE

PUBLIC



**How much is invested annually
in the transport sector?**

\$1.4 - \$2.1 trillion

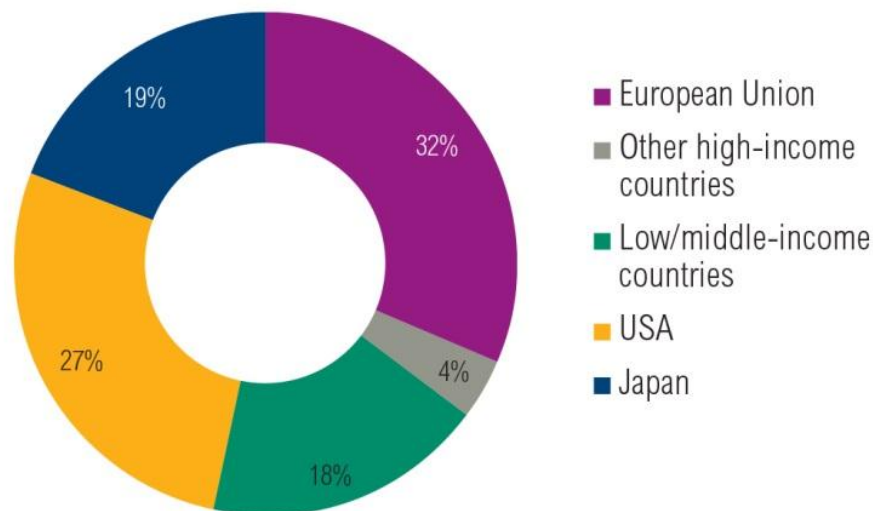
**What portion comes from
private investors?**

**About 58%
or \$1 trillion**

What countries receive the most private investment?

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

**TOTAL INVESTMENT (2010 US\$):
US\$814 BILLION - US\$1.2 TRILLION**

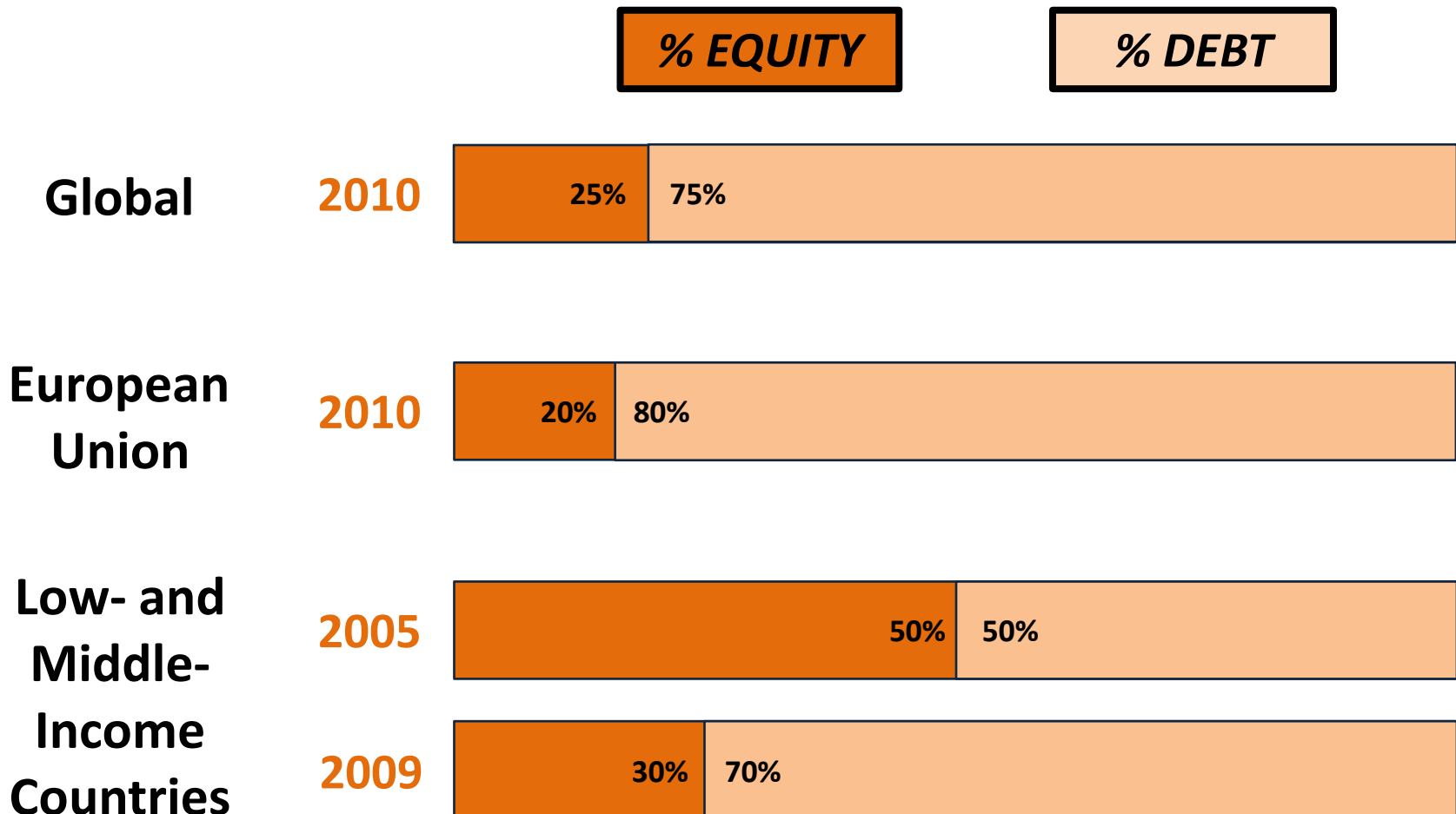


Sources: Wagenvoort et al. 2010; World Bank PPI 2013; Government budget publications; CBI 2013; ITC 2013.

What investment vehicles are most common?

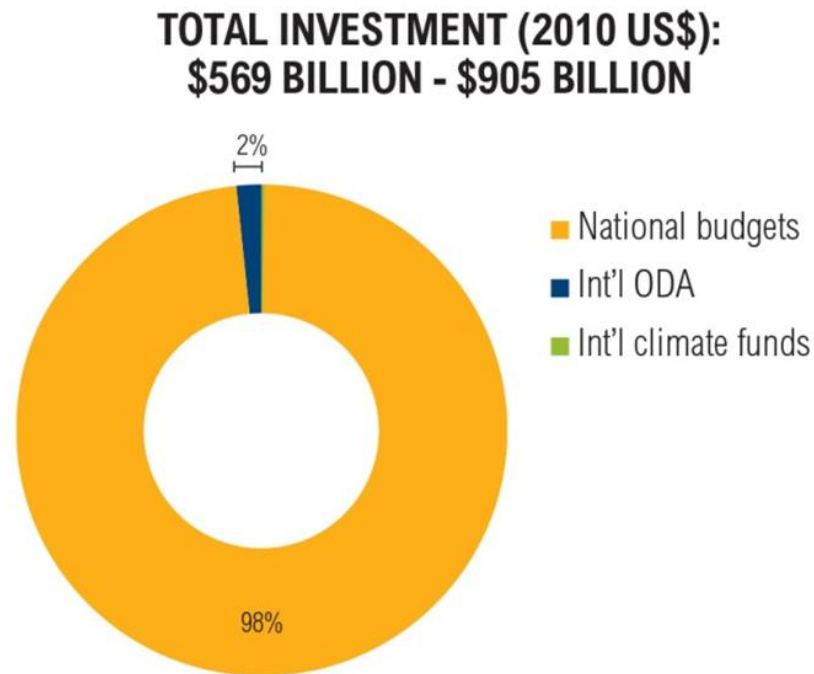
% EQUITY

% DEBT



What portion of public investment comes from domestic budget?

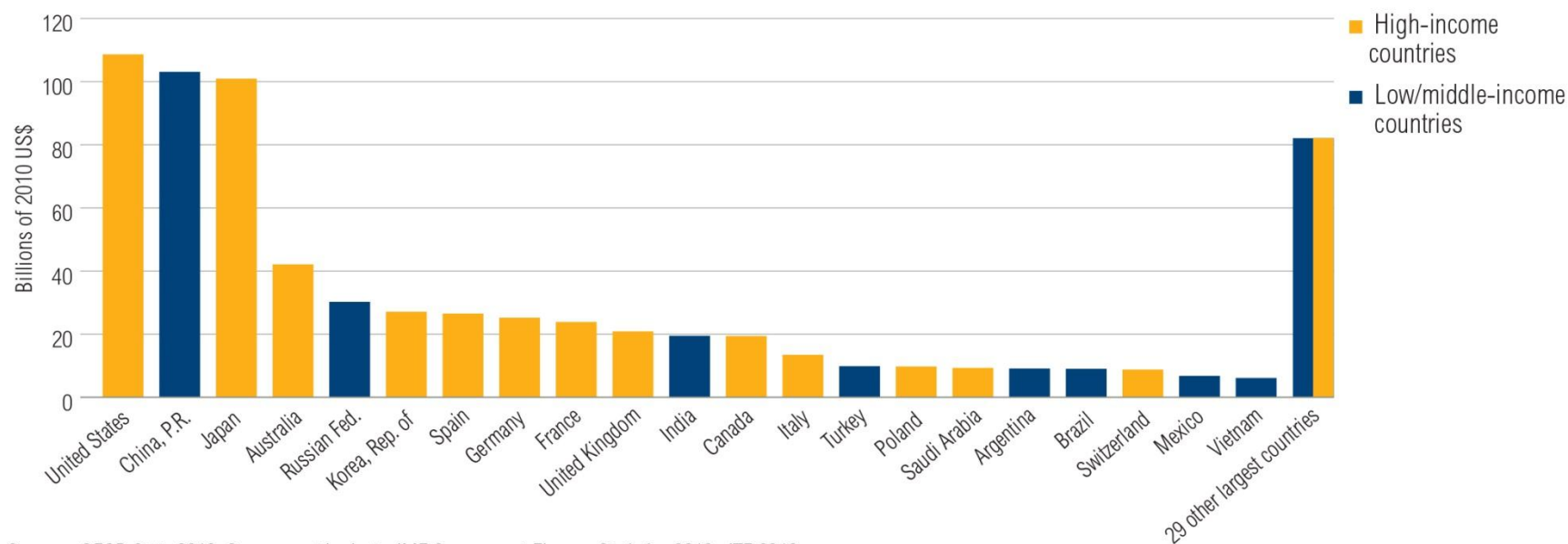
Figure 5 | **Composition of Public Investment in Transport in 2010**



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

How much do government budgets allocate to transport investment?

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



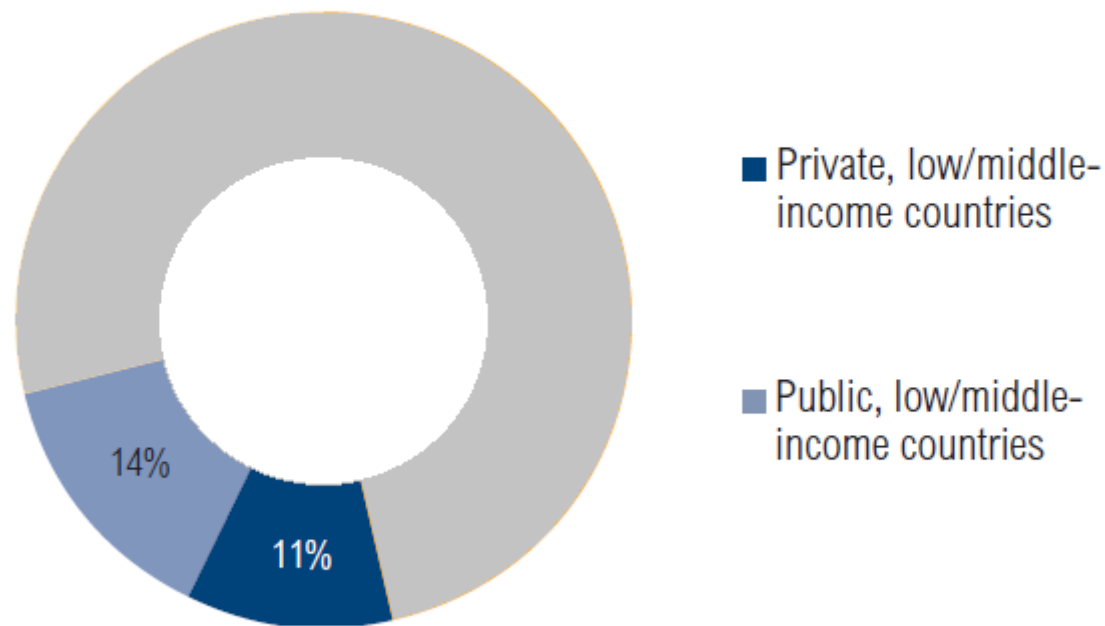
Sources: OECD Stats 2013; Government budgets; IMF Government Finance Statistics 2013; ITF 2012.

**What portion is invested in
developing countries?**

**About 24%,
or \$500 billion**

Is public or private investment larger in developing countries?

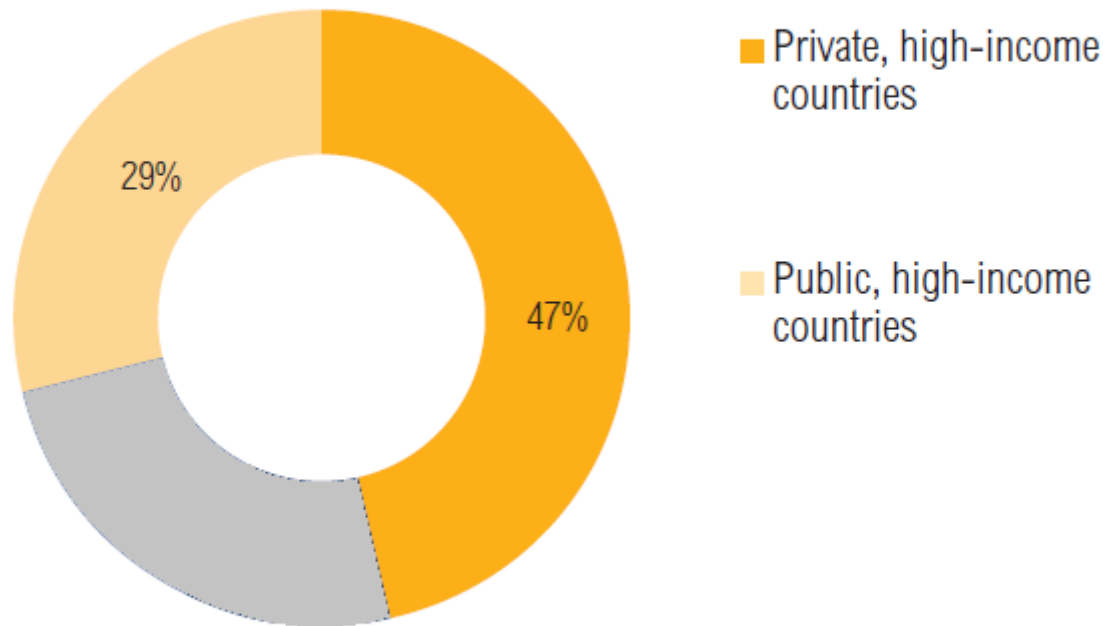
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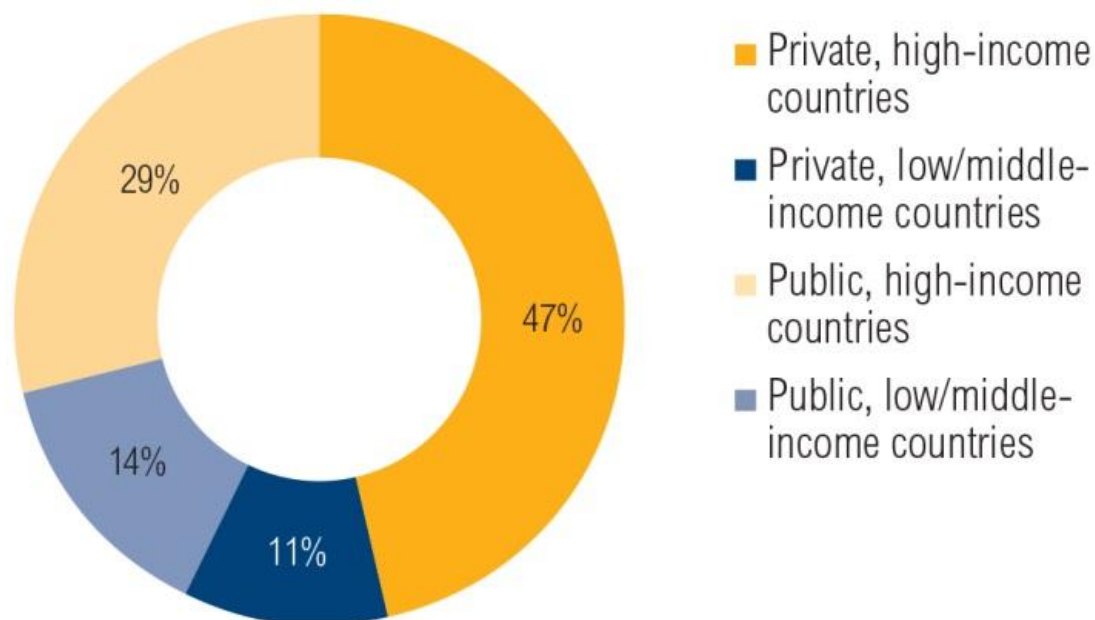
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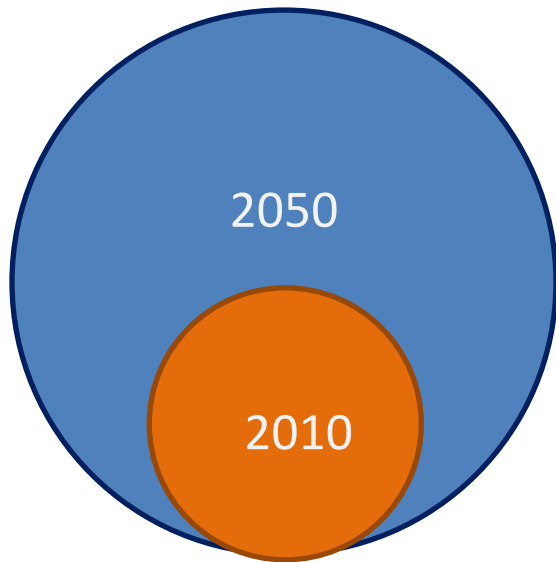
The whole picture.

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

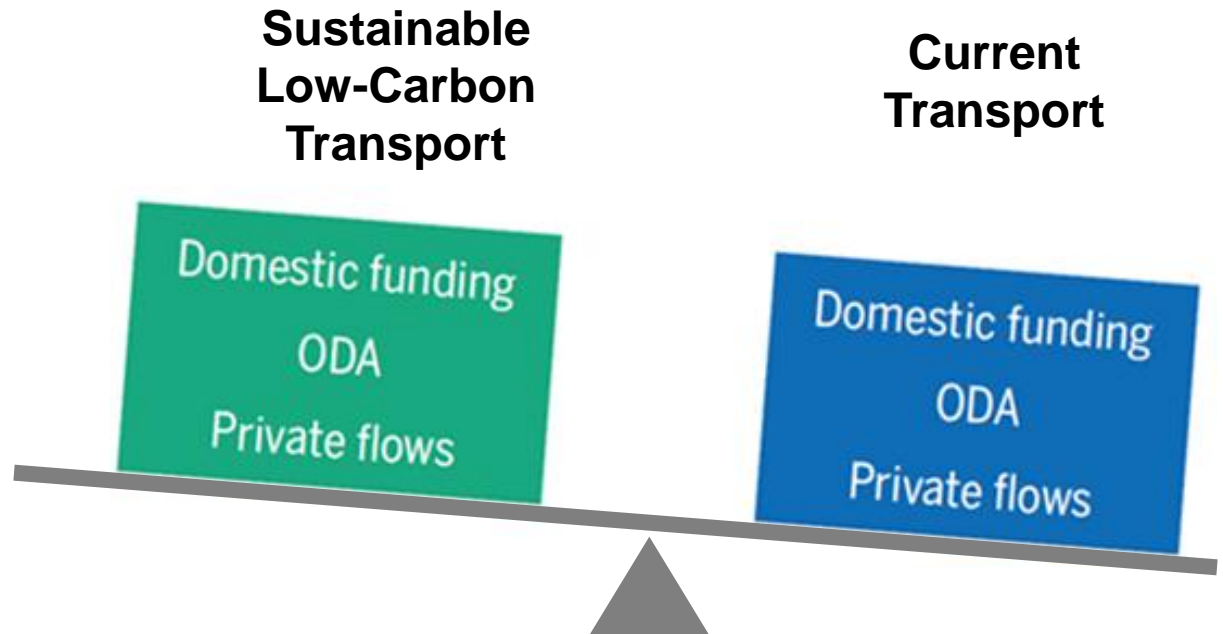


Sources: Wagenvoort et al. 2010; World Bank PPI 2013; Government budget publications; CBI 2013; OECD Stats 2013; IMF Government Finance Statistics 2013; ITF 2012.

Need to *Increase and Shift* to reverse current trends



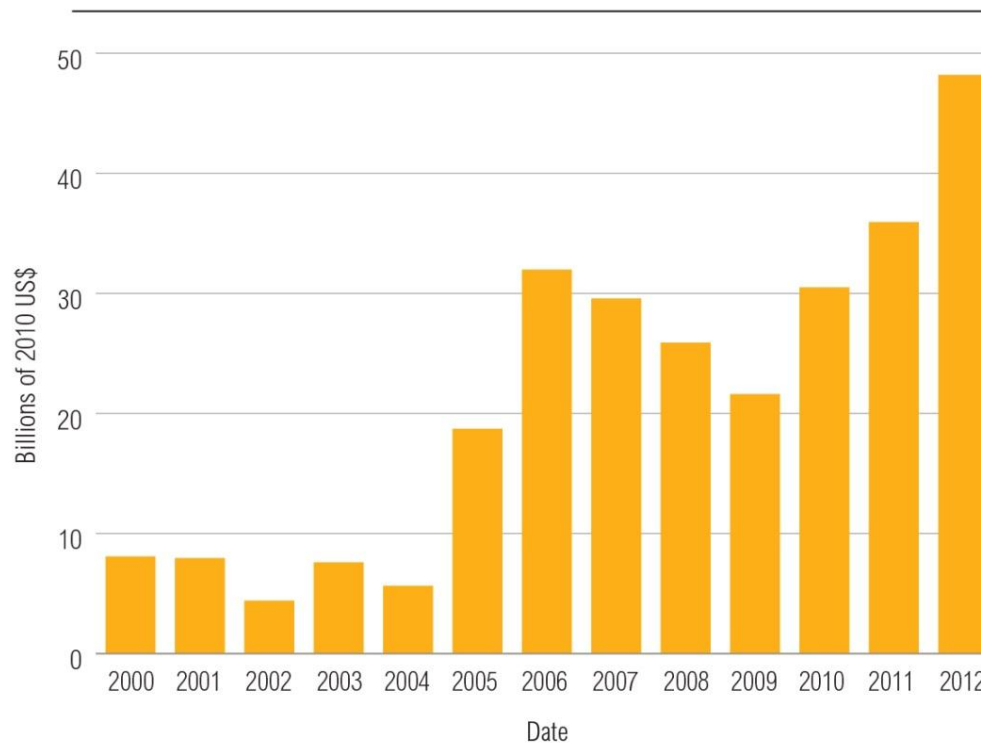
**Transport
Investment
Needs**



How to increase?

Grow private sector investment

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



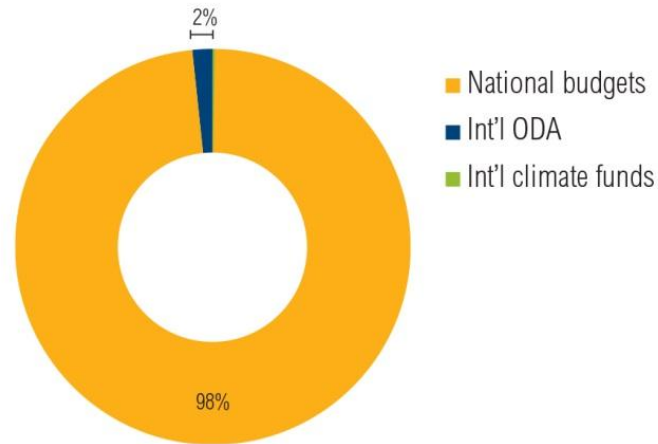
Source: World Bank PPI 2013.

How to shift given constrained public finances?

The Role of Readiness

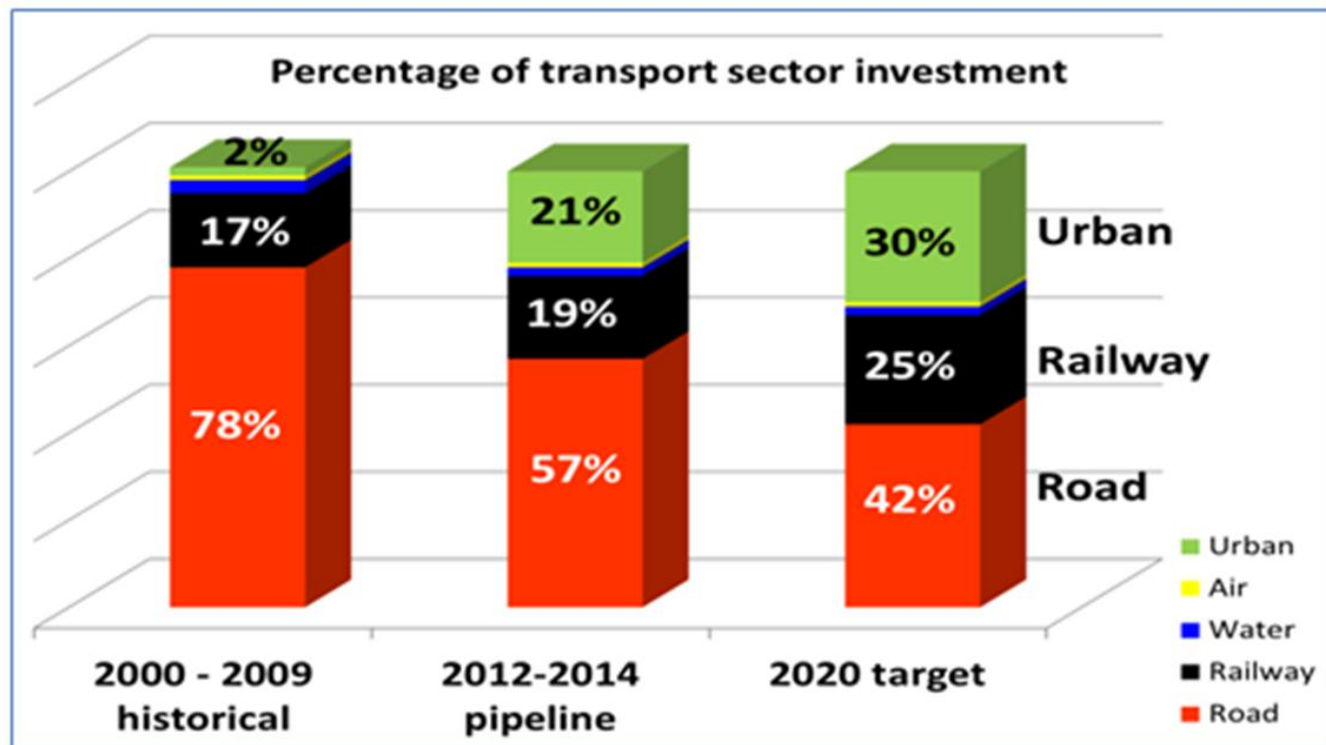
Figure 5 | **Composition of Public Investment in Transport in 2010**

TOTAL INVESTMENT (2010 US\$):
\$569 BILLION - \$905 BILLION



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

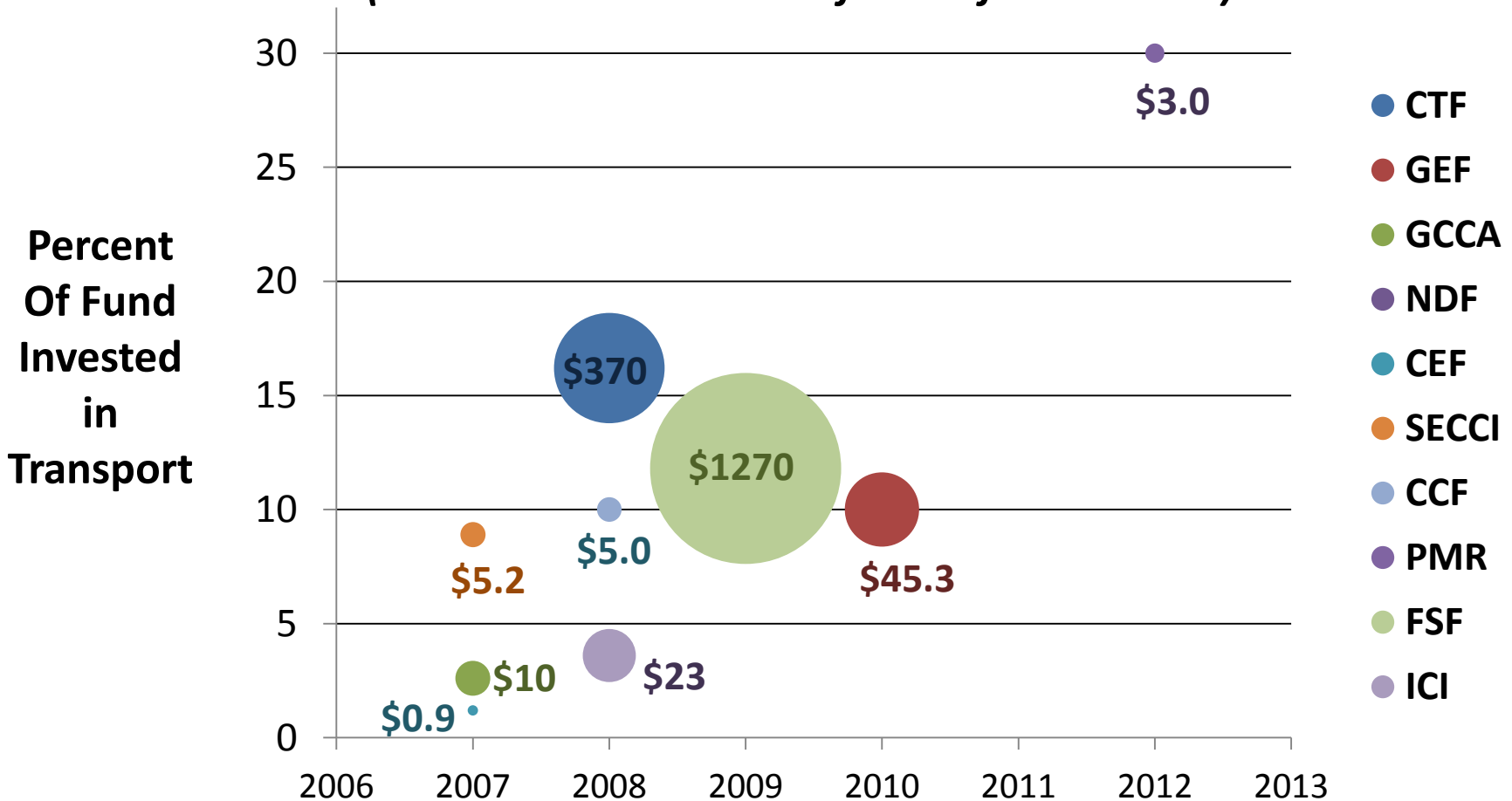
Good news: Development banks are allocating more to low-carbon transport



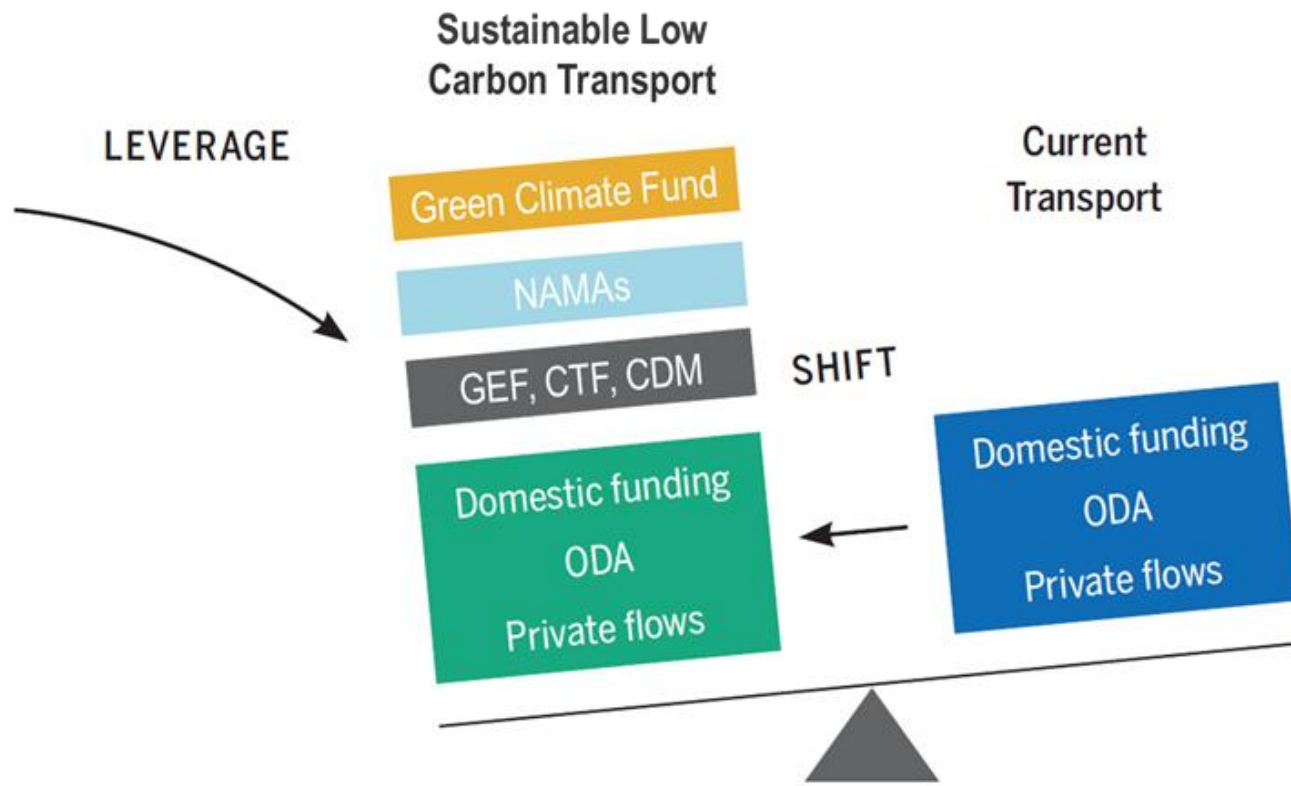
Source: ADB

Good news: Climate funds are allocating more to transport.

(Bubble Size is Millions of USD of Investment)



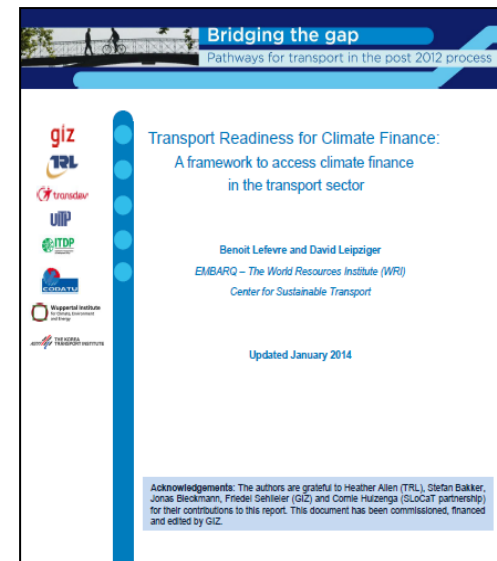
International public climate finance should offer *leverage*.



Transport Readiness

How can developing countries increase their capacity to access and deliver on financing for low-carbon transport?

- Identify essential focus areas for countries eager to attract climate investment
- First step to demonstrating how climate finance can figure into broader sustainable development



WHAT IS “READINESS”?

Status Quo

Climate Financiers

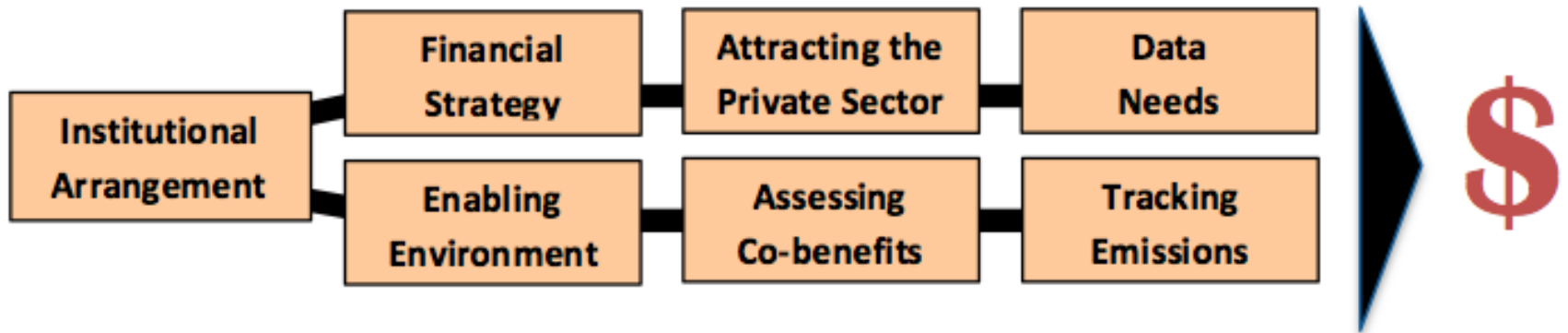
Recipient Country/City

“Readiness”

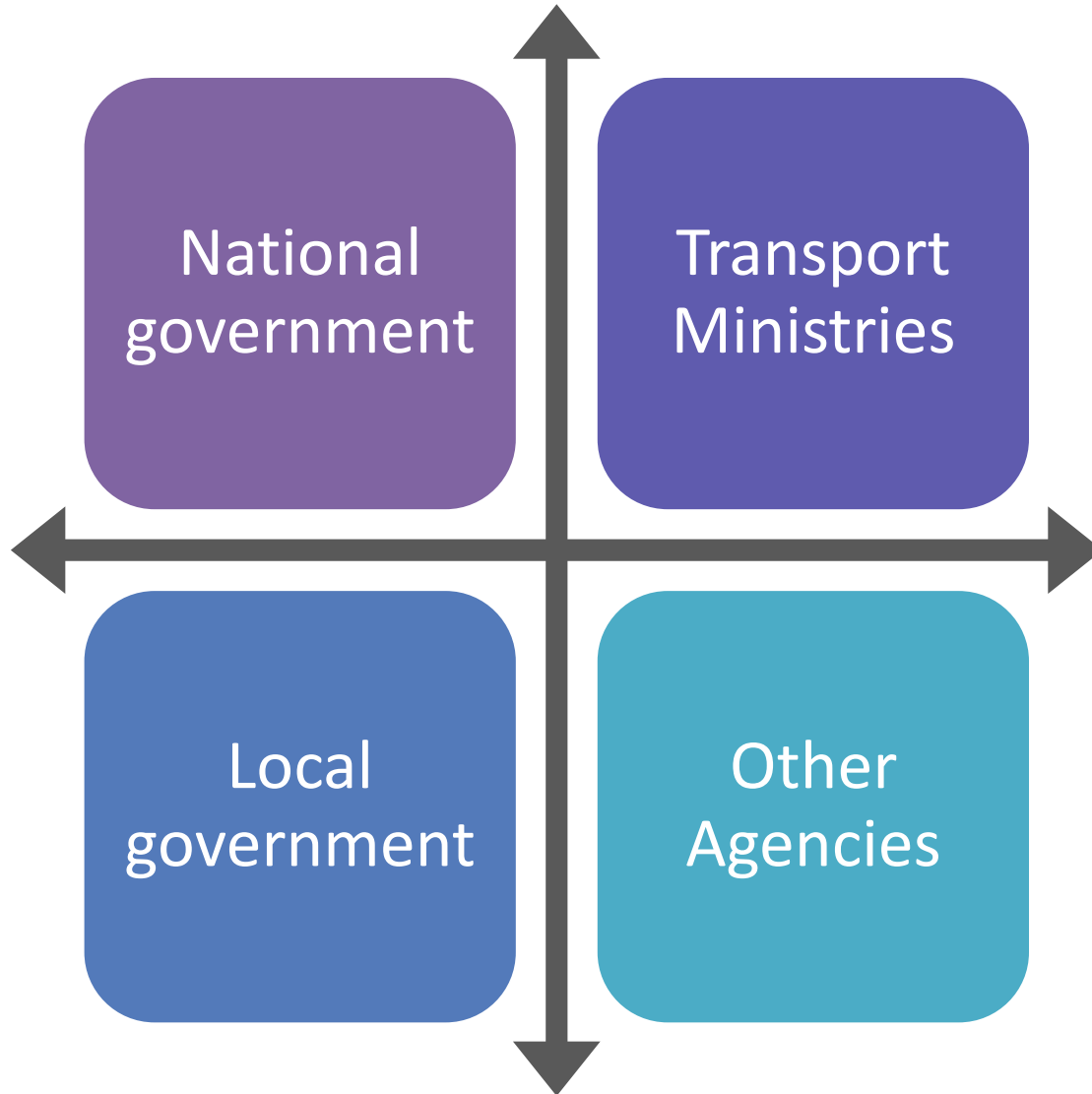
Climate Financiers

Recipient Country/City

Transport Readiness



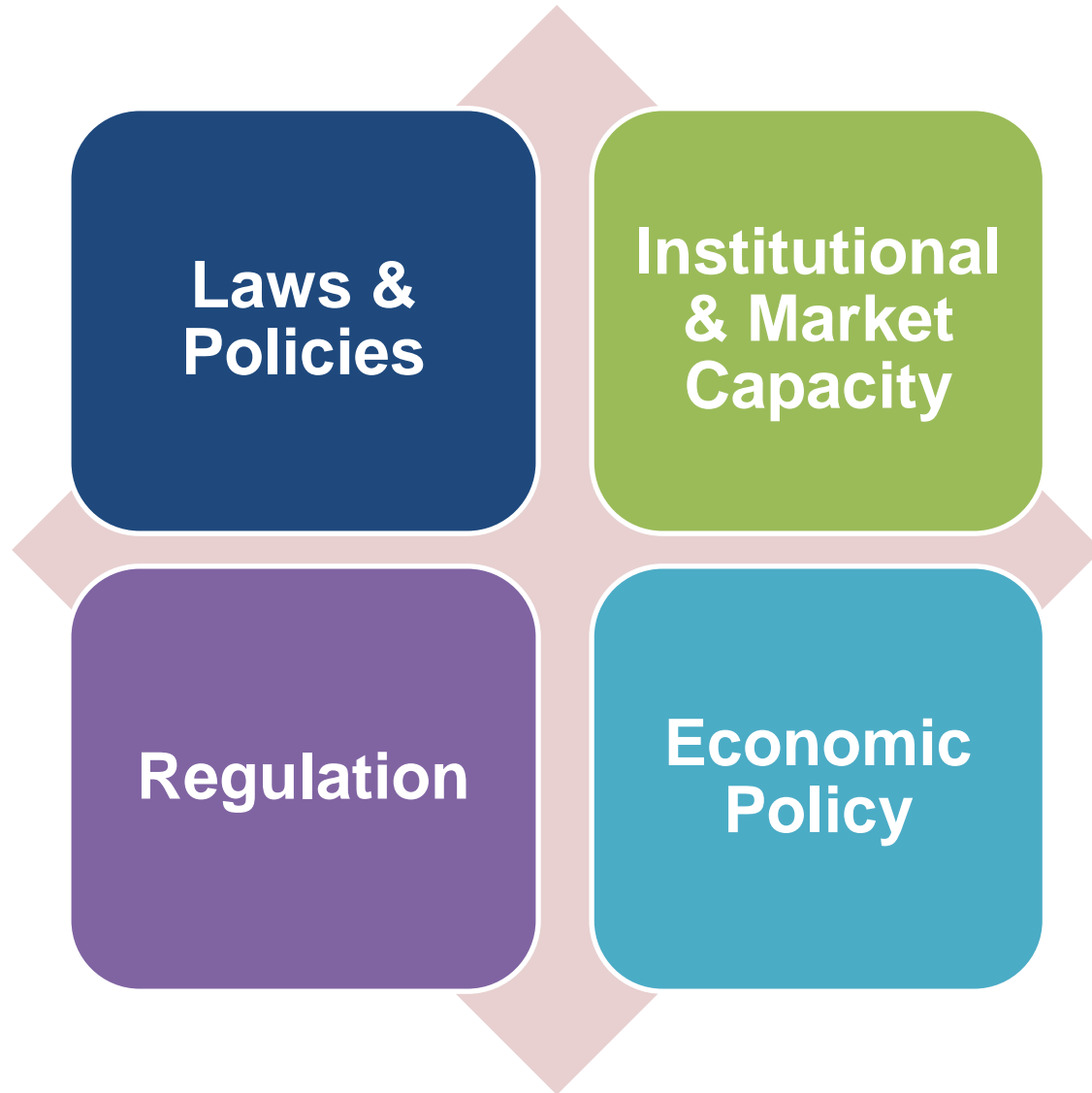
1. Institutional Arrangement



Example: JnNURM in India



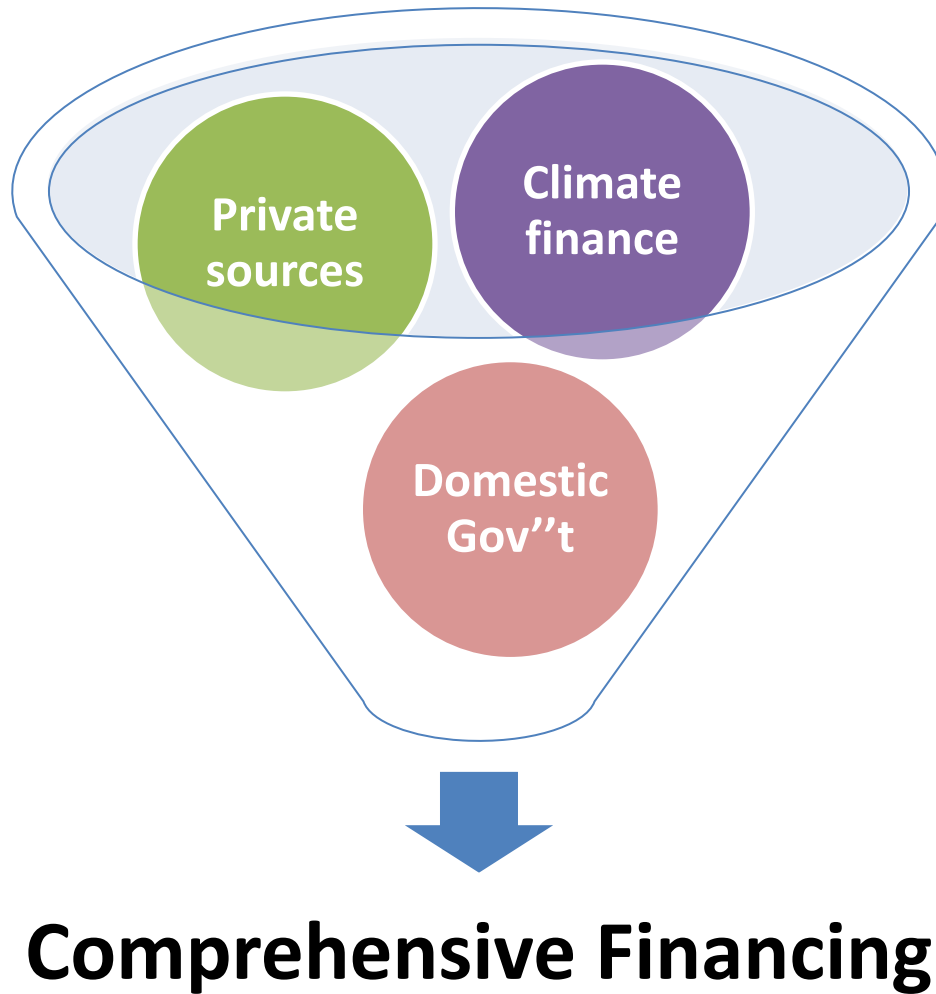
2. Enabling Environment



Example: PAC in Brazil



3. Financial Strategy



Example: PROTRAM in Mexico



4. Attract the Private Sector

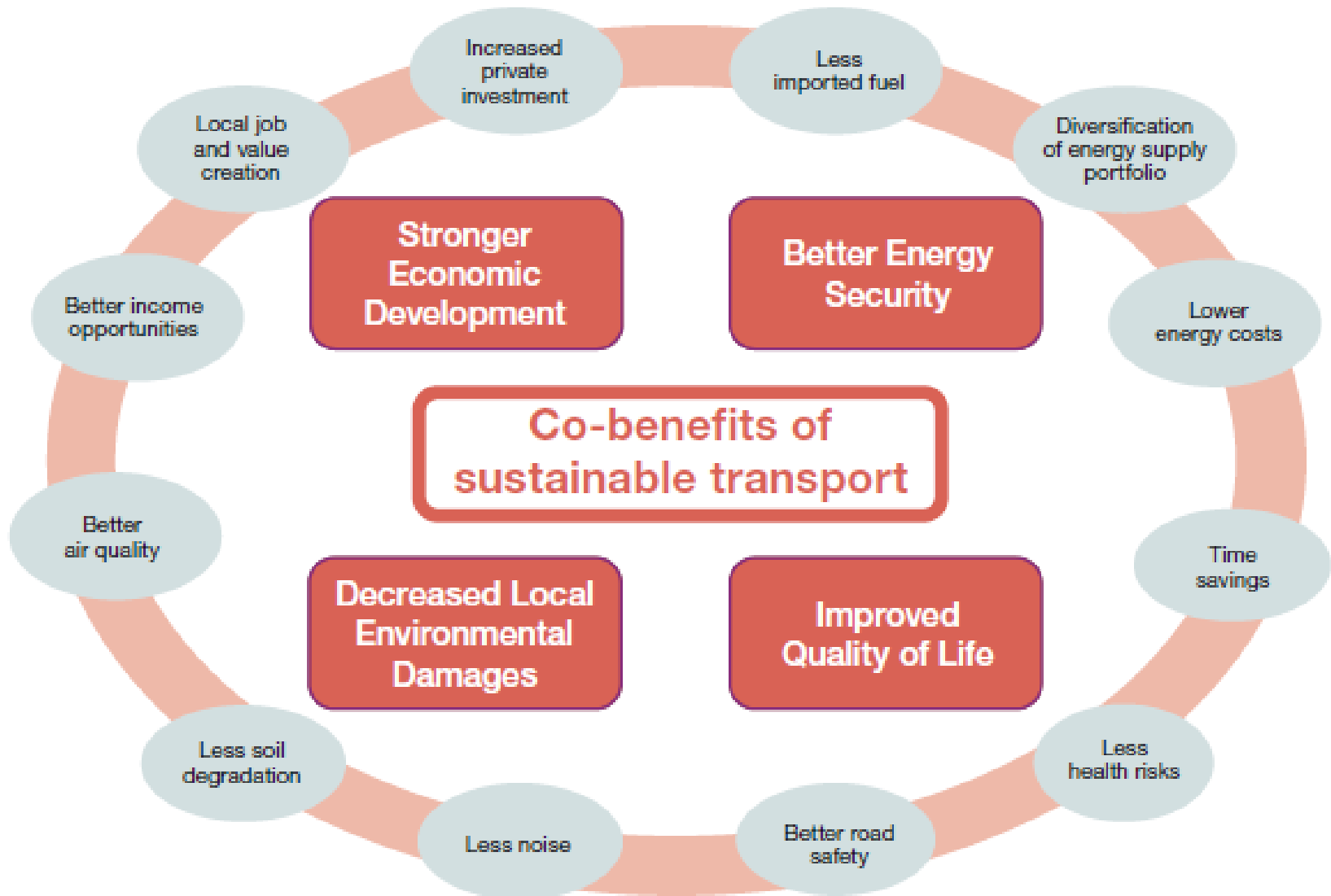


Example: Linha 4 in Sao Paulo



Via  Quatro

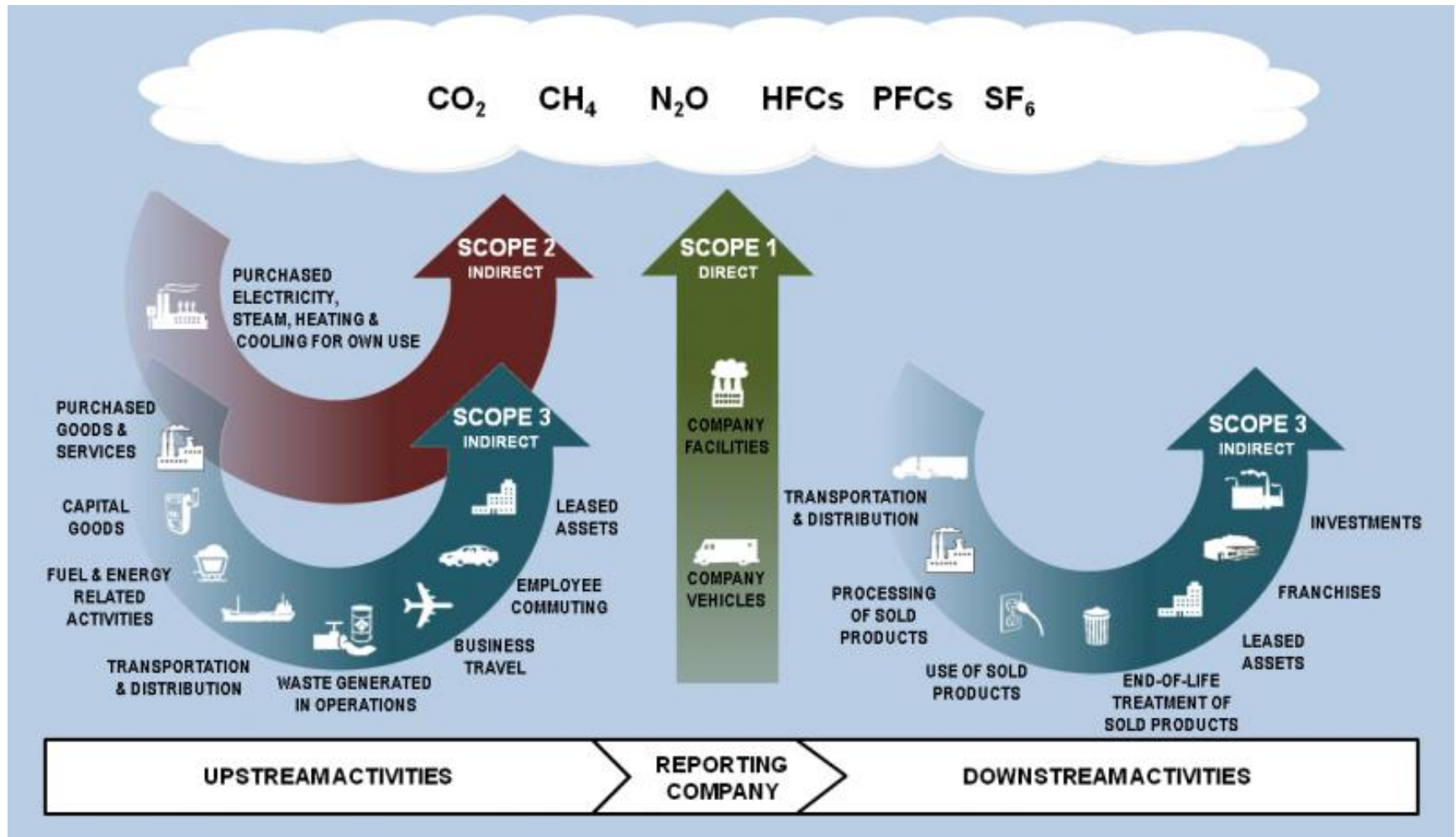
5: Assess Co-Benefits



Example: Metrobús in Mexico city



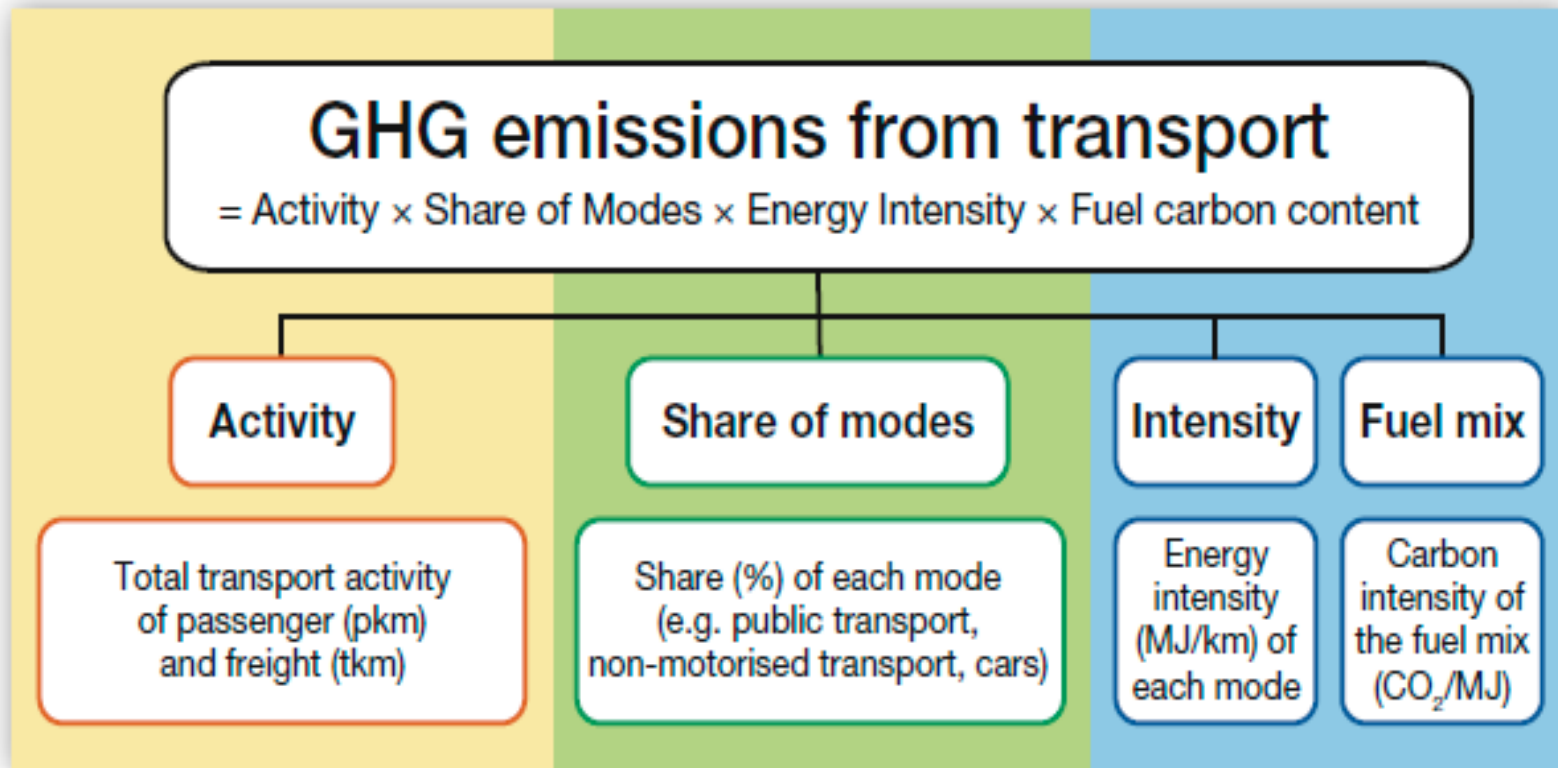
6. Track Emissions



Example: TransMilenio in Bogotá



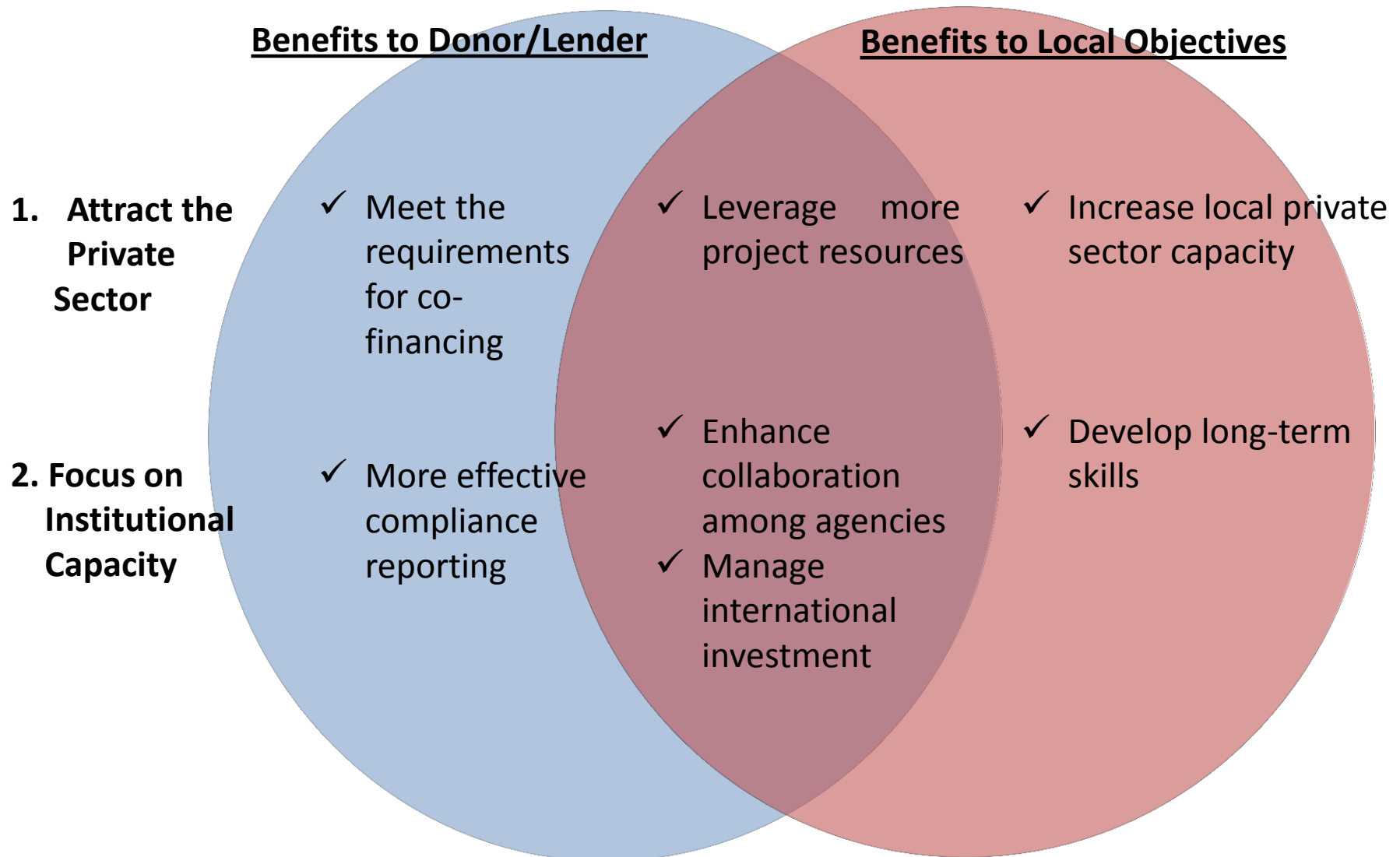
7. Data Requirements



Examples: IDB Observatorio Mesoamericano



Readiness has broad benefits.



Readiness has broad benefits.

Benefits to Donor/Lender

Benefits to Local Objectives

**3. Develop
Financial
Strategy**

- ✓ Distribute investment risk

- ✓ Maximize investment impact

- ✓ Reduce debt obligation

**4. Plan Early
& Upstream**

- ✓ Increased data availability
- ✓ More finance opportunities
- ✓ Clear project roles/responsibilities

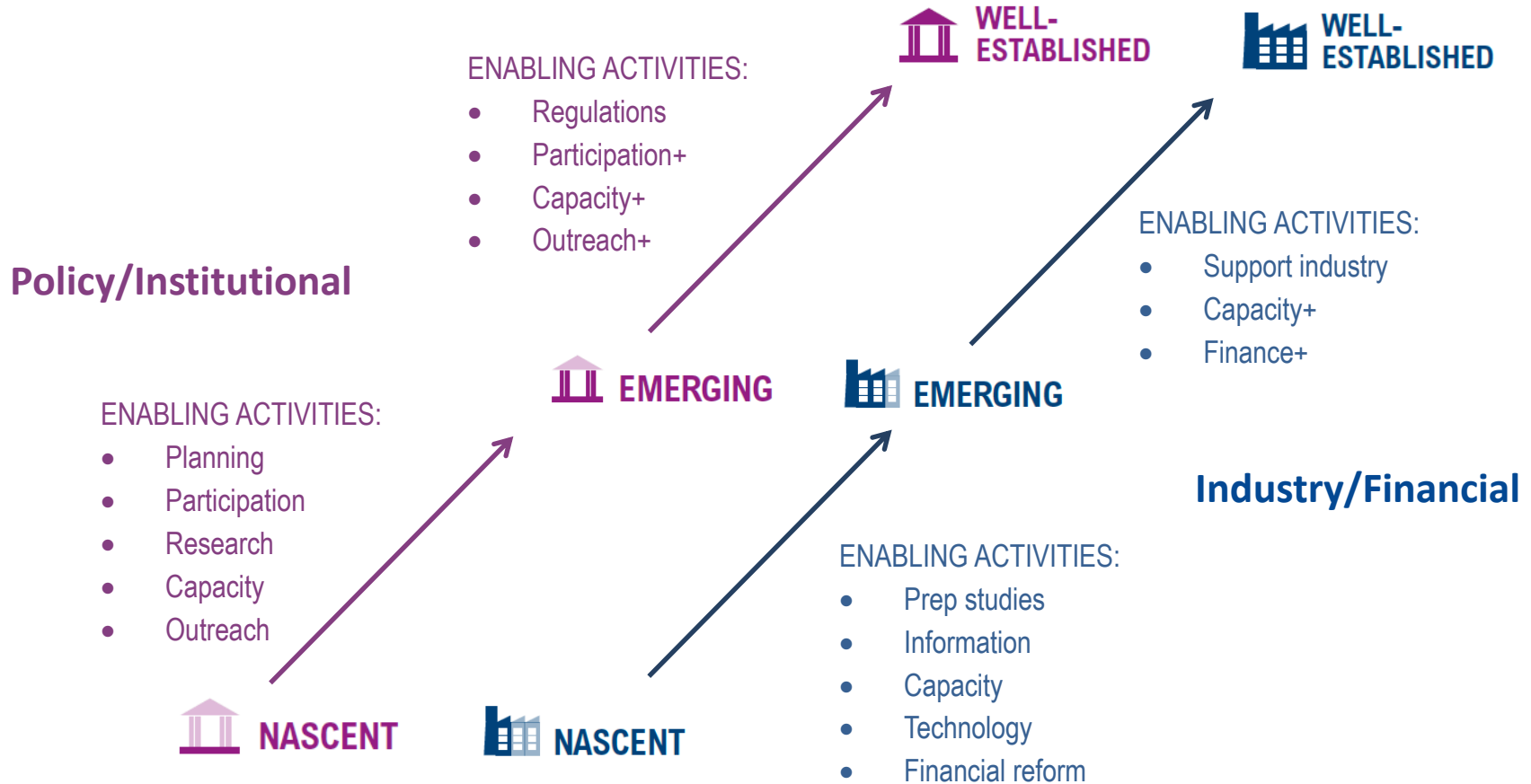
**5. Gather
Good Data**

- ✓ Create defensible carbon offset credits

- ✓ Strengthen MRV framework to verify results

- ✓ Use data for ongoing projects
- ✓ Track co-benefits

READINESS ACTIVITIES AND ABSORPTIVE CAPACITY



Source: WRI

Other forms of Readiness

What is readiness and for whom?

Green Climate Fund (GCF) Readiness:

- *Proper conditions to access GCF funds*

Top-down vs. Bottom-up Readiness:

- *'Ready' from the perspective of the donor or the recipient?*