WORLD BANK GROUP

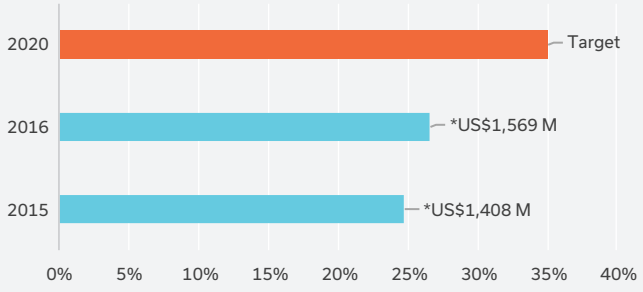
SHIFTING GEARS: TOWARD RESILIENT AND LOW-CARBON TRANSPORT

HOW THE WORLD BANK INTEGRATES CLIMATE IN ITS TRANSPORT LENDING AND POLICY WORK

Efficient transport systems move goods and services, connect people to economic opportunities, and enable access to essential services like healthcare and education. Countries invest in total between US$1.4-2.1 trillion per year in transport infrastructure to meet the demand for mobility and connectivity. Greenhouse gas (GHG) emissions from transport currently represent 23% of energy-related emissions, which, under a "business as usual" scenario, will rise to 33% by 2050. At the same time, existing transport infrastructure is put at risk by an increasingly changing climate, jeopardizing developing countries' efforts to provide decent access to transport for their populations. The World Bank is therefore committed to helping governments both reduce their transport-related GHG emissions and build climate resilience into their transport systems.

At the Annual Meetings in 2015, World Bank President Jim Kim pledged to increase the World Bank's climate finance from 21% of its funding in 2015 to 28% by 2020. In the transport sector specifically, we are committed to increasing the share of our lending informed by climate concerns to 35% by 2020. Firstly, this means higher transport investments in resilience and adaptation, to decrease the vulnerability of transport services and infrastructure to greater climate variability. Secondly, we aim to increase investment in mitigation, which includes improving the accessibility and efficiency provided by transport services without increasing GHG emissions. The commitment is ambitious but we are on track.

World Bank Transport and ICT - Climate-related Financing



*Values Calculated based on 3-year moving average.
Includes IBRD and IDA

WHAT WE ARE DOING DIFFERENTLY

Before the Paris COP, our approach to climate, reflected in 28% of our lending in FY15, focused on investing in low-carbon transport. Post-Paris, we have developed a four-pronged strategy that puts climate at the center of how we work.

ELEMENT 1. NDCs

We see the commitments countries have made via their Nationally Determined Contributions (NDC) as part of the Paris Agreement as the primary platform for developing low-carbon, resilient transport investment strategies. We are partnering with the German government and the World Resources Institute on a new NDC Partnership. Under this initiative, we aim to help governments implement their commitments, and set the stage for more ambitious NDCs by 2020, through upstream analytical and advocacy work. Work in the last year has focused on getting building blocks in place that can help countries refine and implement effective NDCs, including developing a global and sectoral database of NDCs, as well as a set of tools on GHG accounting. We are already discussing a NDC-based approach with some key countries, and we expect that the NDCs will increasingly become a central element of our strategic discussions and plans.

ELEMENT 2. MITIGATION

While the transport sector is a significant contributor to climate change, there is a convergence between the global imperative to reduce carbon emissions in the sector and the developmental imperatives for productive and safe cities and efficient logistics systems. Low-carbon freight systems, which incorporate rail and inland waterways and include a fuel-efficient and competitive trucking sector, also serve economic efficiency and reduce logistics costs. A low-carbon urban transport system comes with significant co-benefits: a city with effective public transport; walking and cycling infrastructure—a compact spatial structure that makes such low-carbon modes competitive; and measures to ensure that private automobiles (the biggest source of transport-related GHG emissions) are appropriately priced and regulated in line with the costs they impose. Such low-carbon cities are also more livable and competitive, tend to successfully address congestion, pollution, and accidents, and ensure accessibility to economic, social, and educational opportunities for their citizens. Our transport and climate change mitigation strategy has four elements that reflect this strong alignment between cost-effective, low-carbon strategies in the transport sector, and broader strategies for sustainable development that deliver local benefits:

- **EXPAND THE GEOGRAPHICAL REACH AND AMBITION OF OUR URBAN TRANSPORT PROGRAM.** The World Bank has a strong tradition of financing integrated public transport/non-motorized transport projects, particularly across Latin America and East Asia. This includes rail projects completed or underway in Buenos Aires, Lima, Sao Paulo, Rio, and Kunming, as well as bus rapid transit (BRT) system support across Colombia, Mexico, Argentina, Vietnam, and Philippines. Expanding the reach of this program to the fast urbanizing cities of Africa and South Asia is a key objective of the World Bank transport and climate plan.

Dar es Salaam – a new Bus Rapid Transit

One of Africa's first high capacity BRT, the 21.8km-long phase 1 line already carries about 150,000 passengers a day. This is the first line in a 137km system that is expected to have 6 lines when completed. Phase 2 is under construction (financed by the African Development Bank), and Phase 3-4, financed by the World Bank, is expected to commence construction by mid-2017.

- **CONSOLIDATE THE IMPACT OF THE RAIL PROGRAM.** The World Bank has a large and diverse portfolio of support for rail, including in China, India, and across Central Asia. A strong climate-related focus of this program is to integrate rail systems into overall multimodal transport systems, thus increasing their competitiveness relative to roads.
- **REVIVE WATER TRANSPORT.** Lakes and rivers have significant untapped potential to displace higher-emission modes for freight. But reviving river transport needs a coordinated effort that targets corridors systematically: infrastructure, dredging, information infrastructure, as well as the right incentives for carriers to invest in vessels. For water transport as well, intermodality is key, and thus the World Bank's waterways program includes the building

of terminals and of road and rail connections with ports. Supporting countries in developing and implementing such structured strategies forms the basis for an extensive expansion of that program, particularly in East Africa and South Asia.

- **PROMOTE LOW-CARBON TRUCKING.** Trucks account for at least 50 percent of all freight ton-miles, even in countries with the most extensive and sophisticated rail systems, and in most World Bank client countries, they account for almost half of the transport carbon footprint. Consequently, better, fuller trucks—modern, optimally-sized fleets carrying balanced loads—make for both a more efficient logistics system and a lower transport carbon footprint. Similarly, optimizing the transport chain from a climate, efficiency and safety dimension is key to this effort. Policy and technical-based loans in the Ivory Coast and Burkina Faso and a Global Environment Facility (GEF) project on logistics under preparation in China exemplify a structured effort to expand the World Bank's support for low-carbon trucking.

ELEMENT 3. ADAPTATION & RESILIENCE

Even as the world focuses on limiting carbon emissions, a changing climate is already disrupting communities and economies and impacting economic performance, particularly among the most vulnerable. Supporting communities to become more resilient to climatic events is an essential element of the World Bank's climate strategy. In that context, resilient transport systems are critical to building overall resilience: damage to transport systems can comprise a large share of the destruction caused by climatic eventswhile connectivity losses from disrupted transport can exacerbate the losses they inflict. Climate stressors most directly affecting road networks include temperature (pavement performance, freeze-thaw cycles), increased precipitation and flooding (which affects design of subgrades, cross drainage structures), impacts on river flows (that significantly affect design of bridges and bridge abutments), and sea level rise and associated storm surges (affecting all coastal infrastructure). Well-functioning lifeline infrastructure can help minimize the impacts of climate-related disruptions. Consequently, helping clients develop transport systems that are resilient to current and future climate scenarios is a central element of what we do differently to address the challenge of climate change. There are four complementary parts to this effort:

- **STRATEGIC MAINTENANCE FOR CLIMATE RESILIENCE.** Adequate maintenance is the most critical and efficient way to reduce the impact of a changing climate on the road system. In the absence of an adequate maintenance regime, the damage caused by climatic events is exacerbated. The uncertainty related to climate change further reinforces this dynamic. Thus, the first defense against climate risks includes: maintenance of pavements and sealing activities; regular maintenance of bridges, culverts, and drainage structures to ensure they are functional and not obstructed; maintenance and improvement of slope protection works; and systematic assessments to identify and incrementally address vulnerable and critical road sections. In fact, infrastructure maintenance in most World Bank client countries is inadequately funded, which increases their exposure to climate-related disruption. Supporting countries in their effort to develop adequately funded, well-functioning maintenance systems as key elements of their climate resilience strategy is an important priority for the World Bank.

Mozambique – A comprehensive approach to building resilience

Mozambique is especially susceptible to extreme weather events, with flooding being a particularly disruptive climate stressor. A project under preparation and another in implementation exemplify the range of activities underlying a transport resilience strategy:

- The projects promote road asset management that focuses on the whole life cycle cost, including maintenance;
- To build network level resilience in Nampula, and Zambezia provinces, critical and vulnerable road sections have been identified for improvement and redundancy enhancement;
- To promote informed decision making, the government has introduced mandatory climate risk screening of all major road infrastructure projects in the country;
- To learn for future scale-up, a pilot to enhance climate resilience of existing road infrastructure using innovative engineering solutions is underway in the Gaza province;
- Emphasis is on initiatives that comprehensively revise the design and construction of standards governing the road sector.

- **INFRASTRUCTURE RESILIENCE.** Much of the World Bank's transport portfolio supports clients' rehabilitation and management of existing road networks. Network resilience requires a combination of measures to increase

robustness of particular prioritized segments and measures to build redundancy. Resilience investment, based on analysis to identify priority cost-effective measures, has been an important feature of road projects in preparation and implementation in over ten countries.

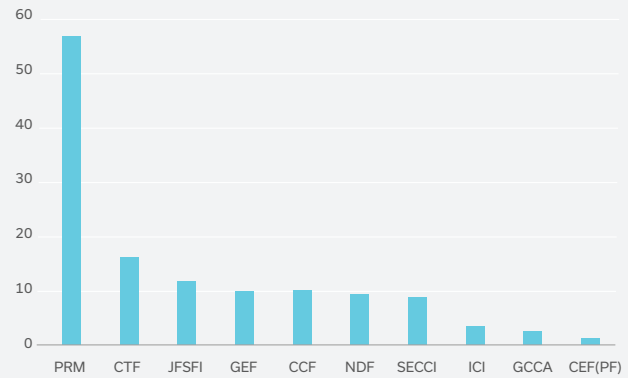
- **SYSTEM-WIDE MEASURES.** A changing climate brings to focus a range of system-wide measures relevant to both new and existing assets. Many of these are proactive measures, such as climate risk screening for new investments, spatial planning that avoids vulnerable and coastal areas, changes in design standards, and innovation in materials and construction methods. Other measures are related to better preparedness for systemic response to incidents: identifying lifeline infrastructure, early warning systems, institutional protocols for post-incident response, as well as procurement and budgeting arrangements that allow responsiveness to incidents without compromising public finance accountability. Such system-wide considerations are increasingly important elements of the World Bank's road projects, in the Pacific Islands and elsewhere.
- **DECISION-MAKING UNDER UNCERTAINTY.** Uncertainty related to unknown future emission levels—limitations of climate models, and a lack of information on the degree of effectiveness of adaptation strategies—fundamentally differentiates climate adaptation from a disaster risk management agenda. Operationalizing principles of decision making under uncertainty (DMU) is becoming the World Bank's signature tool. DMU methods move the focus of climate analysis from understanding future climate outcomes to identifying the thresholds where any particular designs for the infrastructure will fail. They also look for design modifications/operational changes that mitigate the risk of catastrophic failure under a range of climate scenarios.These methods are being piloted and operationalized in transport projects in Mozambique, Tanzania, and India.

ELEMENT 4. ACCELERATE ACCESS TO CLIMATE FINANCE

Greener and more resilient infrastructure imposes additional costs, and a key element of the World Bank's strategy is to facilitate clients' access to concessional finance, in order to help them address climate change. Thus far, this has been challenging for transport: an analysis of 10 climate funds that have committed US$14.9 billion suggests that transport has been able to access only 12%(US$1.7 billion) of these funds—a much smaller amount than would be warranted by either the needs or the emission profile of the sector.

If climate finance can be used for both adaptation and mitigation in the transport sector, there is a potential to significantly leverage public and private funds and, most importantly, deliver a significant contribution to achieving climate goals. A key challenge for the sector's access to climate finance has been the absence of an organized structured narrative that explains the role of transport in development and is able to credibly track the impacts of incremental finance on desired outcomes. Addressing this challenge requires the formulation of a broad, multi-stakeholder coalition composed of national, city and private sector champions, civil society, and international actions. Preliminary consultations indicate that there is a broad-based interest across the transport community for such an initiative (see Box).

Share of climate funds allocated to low-carbon transport in 2012 (%)



SUSTAINABLE MOBILITY FOR ALL

With the endorsement of the SDGs, the Paris Climate Agreement, and the Decade of Action on Road Safety, the global community has committed to take bold and ambitious action to transform the world's mobility. However, to implement this agenda, we need to monitor and track our progress. The *Sustainable Mobility for All* initiative is envisioned as a broad-based, multi-stakeholder effort of transport actors that will develop a roadmap for safe, accessible, efficient, and green transport systems for all. A key component of the proposed initiative is the development of a Global Tracking Framework, which will bring together global goals and country-level performance on a common platform as we implement these agreements.