LEDS GLOBAL PARTNERSHIP

LEDS in Practice

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Fight poverty

by reducing greenhouse gas emissions from urban transport

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Key messages

- Poor households benefit greatly from low carbon transport options.
- More affordable, efficient, and safe travel connects people to more employment and social opportunities.
- Low carbon transport in combination with pro-poor city development can improve the inclusion of poor and marginalized neighborhoods.
- As well as lifting people above the poverty line, these solutions boost local economies, with additional long term advantages from carbon emission savings for the local regions.
- Thus low carbon transport solutions pay multiple dividends resulting in poverty alleviation—they are affordable and climate friendly investment options for city governments that address both transport related poverty issues and climate change mitigation.
- For example:
  - The bus rapid transit system in Lagos, Nigeria reduced the amount of income spent by residents on public transport from 17% to 11% and cut greenhouse gas emissions by 13%.
  - In Medellín, Colombia, the Metrocable system offers 33% cheaper fares than the traditional bus system and has reduced carbon dioxide equivalent (CO_2eq) emissions by 120 kilotons.

Also in the LEDS GP series on the benefits of reducing greenhouse gas emissions from urban transport:

- *Make roads safe*
- *Create jobs*
- *Save money and time*
- *Breathe clean*

This series of short papers aims to exemplify how low carbon transport options can efficiently support national and local development agendas.

Introduction

This paper shares two case studies from cities that have taken action in the transport sector to fight poverty and have realized the benefits of reduced emissions from traditional public transport options.

Today over 540 million people worldwide live in multidimensional poverty[1]. These people not only lack financial resources, but also suffer from limited access to social institutions and face obstacles to earning a livelihood. Low carbon transport is critical to reduce poverty in cities and ensure a sustainable future for all. Car oriented

urban development and other traditional forms of transport, deemed to connect the poor with more economic and social opportunities, have not been significantly successful.

Transport systems that depend on motorized vehicles make travel unsafe for those using more active modes such as cycling and walking. And urban development based on business as usual transport systems pushes the poor towards the peripheries of cities, increasing their travel times and financial costs for connecting to places of work and social opportunities.

Low carbon transport infrastructure brings a paradigm shift in traditional urban development and transportation planning—one that pursues principles of sustainable development of equitable, environmentally friendly, and economically viable transformation for investors and decision makers as well as the community of users. As well as being a source of high greenhouse gas emissions, motorized transport is increasingly land intensive due to the massive infrastructure required to construct roads and highways.

Figure 1. Paradigm shift to fight poverty through low carbon transport

Shifting to low carbon transport, as opposed to just increasing the supply of public transport, brings more sustainable benefits for the poverty afflicted population than motorized solutions.[2] The 'avoid and shift' mechanism uplifts the poor while using the transport sector to prevent a 2°C warmer world (see box).[3] Low carbon transport avoids motorized transport and brings a shift to increased public transport integrated with mixed land use and a better infrastructure for walking and cycling, which provides for increased mobility and accessibility.

The avoid–shift–improve strategy has three parts:

- **avoid** refers to avoiding motorized travel altogether through high density urban planning or substituting travel with telecommunication
- **shift** policies focus on enabling and encouraging a shift from private motorized travel to more energy efficient modes, including public transit, walking, and cycling
- **improve** seeks to build on the gains from modal shifts by introducing more energy efficient fuel and vehicle policies.

In sum, low carbon transport solutions are better for poorer populations than carbon intensive systems. Many cities and subnational governments have taken the path of fighting poverty in their region through low carbon transport based measures. Over time these cities have recorded significant savings in carbon emissions and better connections to improved livelihood and social development opportunities for a growing population.

Case study

‘BRT-Lite’ bus rapid transit system of Lagos, Nigeria

Lagos is the sixth largest and fastest growing city in Nigeria. The Lagos metropolitan area has a population estimated at between 15 and 18 million. It is projected to go beyond 25 million by 2025, making Lagos the third largest agglomeration in the world, after Tokyo and Mumbai. About 61% of Nigerians were living in ‘absolute poverty’ in 2010 and almost 100 million people were living below US$1 per day.[4] An average working person spends about 17% of their income on transport.[5] This condition is exacerbated for low income communities due to inadequate road networks and poor quality public transport in the form of traditional yellow buses (*molues*) and minibuses (*danfos*). About 27,500 noncommercial vehicles take to the streets every day, resulting in high travelling costs.[6]

Lagos’ BRT system reduces income spent on transportation from 17% to 11% and cuts greenhouse gas emissions by 13%.

Launched in March 2008, the bus rapid transit (BRT) system of Lagos is first of its kind in sub-Saharan Africa. It is based on existing BRT models such as the one in Bogotá, Colombia, adapted to the African context as ‘BRT-Lite’.[7] The project was launched with the goal of incorporating efficient service (low cost, high frequency, high speed, high occupancy, high safety, low emissions); realizing significant socioeconomic benefits, especially for the low income population; and achieving adequate mitigation of environmental and social impacts.[8] Lagos Metropolitan Area Transport Authority was responsible for building this project on the ground. Its relatively short 15 months from conception to operational stage and lower delivery cost of US$1.7 million per km (the TransMilenio in Bogotá cost about US$6 million per km) make the development of BRT-Lite unique.[9]

The BRT-Lite system operates on a 22 km route, with 65% of the route physically segregated from the regular roadway and 20% separated by road markings.[10] Reforms beyond those in the infrastructure also play a crucial role in making this system a success, including a holistic approach with reorganization of the bus industry, financing new buses, creating a new institutional structure and regulatory framework to support the system, and training the personnel needed to drive, maintain, enforce, and manage the BRT-Lite system.[11] As BRT officials were bringing in these reforms, they also engaged with the public and promoted the new system.[12] Within the first 6 months of operation the system was carrying 29 million passengers.[13]

Bankole Oluwafemi

Lagos' BRT-Lite system has proved to be a success in both reducing greenhouse gas emissions and benefiting low income communities. Money spent by poor households on overall travel reduced from ₦150 in 2003 to ₦100 by 2009.[14] Income spent by poor households on public transport reduced from 17% (2003) to 11% (2009) of total household income.[15] The project so far has decreased greenhouse gas emissions by 13% in the areas where the BRT system is operational.[16] It has also reduced commuters' journey times by 40% and waiting times by 35%. BRT passengers enjoy 30% lower fares than those on traditional public transport (the yellow buses and minibuses).[17] The new BRT system also safeguards passengers from robbery and theft while on board.

Case study
Metrocable system in Medellín, Colombia

With a population of 3.5 million, Medellín is Colombia's second largest metropolitan area. Although it is an economic center of the country, 16% of Medellín's inhabitants live below the poverty line of 187.079 pesos per month (about US$100).[18]

Settlement patterns in the city are highly determined by its topography. The economic center sits in the valley and the most marginalized communities are based in the surrounding peripheral hills. In Medellín, 46% of housing is located in the peripheral areas, which have high levels of poverty, unemployment, and crime.[19] The massive density of 400 dwellers per hectare brings additional deterioration in the basic transport amenities and poor road infrastructure, and it is difficult for conventional buses to access these densely populated communities. As well as major restrictions on mobility for the affected residents in peripheral areas, the economic center in the valley also faced a lack of connectivity to its surrounding locations due to underutilization of the mass transit metro system.

The Medellín Metrocable system connects poor people to jobs and offers 33% cheaper fares by reducing 120 ktons of carbon dioxide equivalent and achieving climate finance support.

To overcome poverty and social exclusion, the city of Medellín chose a low carbon transport solution in combination with pro-poor city development. Two public transport lines with cable cars (an aerial gondola system) carry an average 30,000 people daily.[20] These lines make two important connections—between the hilly peripheries and the main city; and between the existing metro system and the valley that houses the economic center of Medellín. The Metrocable system is based on ski lift technology in the densely populated areas, using only a little of the already crowded land in the area. Controlled use of land, affordable travel costs, accessibility, and better connectivity for marginalized populations have resulted in greenhouse gas reductions.[21]

For long term economic investment through reductions in greenhouse gas emissions, the Medellín Metrocable system was also approved for the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism, selling carbon credits to governments of developed countries. With the replacement of fossil fuel powered vehicles by *Plavayushchij Transportyer – Sryednyj* (PTS) (or medium amphibious transport vehicle) hydroelectric powered cable cars, the Metrocable system was projected to save approximately 121,092 tons of CO_2eq emissions between 2010 and 2016.[22]

Considering the low income of its target group, the Metrocable provides a single tariff that is independent of the length of trip and is integrated with the main metro line and conventional bus system. Such a fare system allows an expansion of low earners' activity radius and especially supports the complex travel patterns of women undertaking multiple trips, in close conjunction with urban upgrading of the social infrastructure (e.g. social centers, schools, public libraries) and newly created social housing along Metrocable corridors. The integrated tariff is about 33% cheaper than a conventional two-way bus trip and allows low income households to reduce their expenditure on transport.[23] This integrated approach of a low carbon transport

Photo credit: Jorge Gobbi

system combined with pro-poor city development has created new economic centers in previously marginalized areas, as well as reducing carbon emissions from the area.

The Metrocable system has increased the travel options of poor communities and improved the inclusion of poor neighborhoods by enhancing the accessibility of social institutions, employment, and social contacts in neighboring areas that function as protective networks for the poor. Together with an increased police presence, the project has led to a decrease in crime and violence in the neighborhoods surrounding the Metrocable corridors, allowing access by the formal sector and city authorities to previously no-go areas.[24]

Conclusion

Low carbon transport initiatives improve the connectivity of low income neighborhoods to economic centers, reducing the share of household income spent on transport. And low carbon transport solutions make traveling less time consuming and more comfortable, releasing time and energy that can be spent on other productive activities including income generation and education. There are also health benefits (see *Breathe clean* in this series of papers). Altogether, low carbon transport addresses a variety of poverty dimensions and helps cities to reduce poverty related problems.

Endnotes

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The **LEDS GP Transport Working Group** provides technical assistance, tools, and training for LEDS in transport systems.

The group works to:

- share approaches and practices for transport and land use planning
- provide transport analysis methods and tools
- offer peer to peer, transport-specific financial training and expert assistance.

Contact: transport@ledsgp.org

The **Low Emission Development Strategies Global Partnership (LEDS GP)** was founded in 2011 to enhance coordination, information exchange, and cooperation among countries and international programs working to advance low emission, climate resilient growth. LEDS GP currently brings together LEDS leaders and practitioners from more than 160 countries and international institutions through innovative peer to peer learning and collaboration via forums and networks. For the full list of participants and more information on partnership activities, see www.ledsgp.org

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