

ieConnect for Impact

Informing Transport Investments through Data Systems and Evidence



Billions of dollars are invested in the transport sector (16 percent of lending by multilateral development banks since 2000) yet measuring how these investments translate into intended impacts is challenging. The **ieConnect for Impact** program aims to increase the availability and use of rigorous research and impact evaluation (IE) evidence for the selection, design, and implementation of transport infrastructure projects. The program helps realign research priorities to where development financing is spent.

ieConnect was launched in 2015 with funding from the UK government. Under the helm of the World Bank's Development Impact (DIME) Department and the Transport Global Practice of the World Bank, the program has grown to **30 projects in 18 countries**, anchored in a common vision for sustainable development.

The program leverages DIME's "**Trial-and-Adopt**" technology which aims to: (i) wire-in evidence to inform policy design and baseline analysis; (ii) guide mid-course corrections by trialing project modalities early on to test behavioral and implementation mechanisms; (iii) inform scale-up and scale-down decisions by assessing the economic significance of policy effectiveness; and (iv) generate knowledge more broadly across communities of practice.

Program Snapshot

- ▶ ieConnect has enabled the evaluation of over \$5.7 billion in transport investment projects.
- ▶ The program focuses on (i) urban mobility, (ii) transport corridors, (iii) road safety, and (iv) rural infrastructure.
- ▶ There is cross-cutting emphasis on (i) gender, (ii) fragile situations, and (iii) climate change and the environment.

Transport research is typically on a larger scale, has more intensive data requirements, and presents unique methodological challenges compared to research in other sectors. The ieConnect program has prioritized developing and expanding **data systems using new technologies** to harvest large amounts of

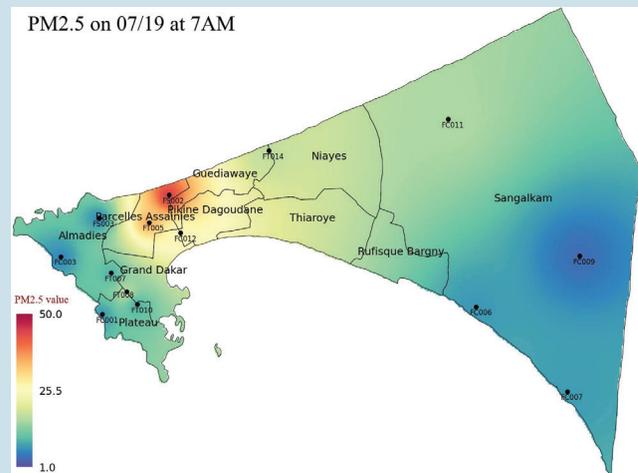
data at higher frequency or with greater geographic coverage and spatial resolution than traditional survey methods allow. This includes geospatial, crowdsourced, and sensor data, coupled with new and existing datasets.

The program has prioritized strengthening countries' transport data systems through **institutional and technical capacity building**, which remains critical for prioritizing and scaling-up evidence-based, and results-driven transport investments in the long term. The ieConnect team has built the capacity of a broad set of stakeholders to make systematic use of data and evidence through a collaborative "learning-by-doing" approach. ieConnect's work to improve data systems and implement impact evaluation processes has highlighted key areas for improvement, in turn **influencing government policy**.

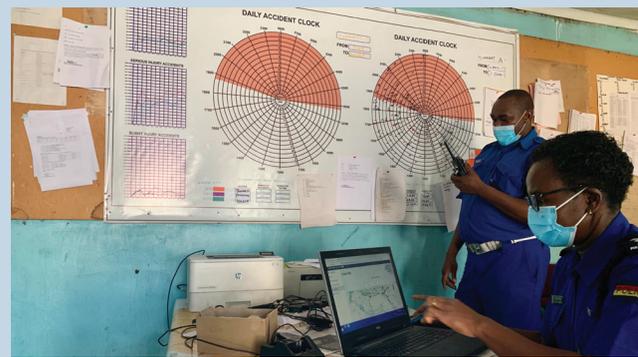


As a heavily polluted capital, **DAKAR** is aiming to shift toward cleaner mass transportation and reduce air pollution through two flagship transportation projects: a modern bus transport system (BRT), and a regional express train (TER). To measure the effects of those projects on air quality, ieConnect partnered with government agencies to collect and monitor **high-frequency pollution data** through a network of low-cost sensors across the city. These sensors, used in conjunction with other government monitors, allow for extensive temporal and spatial coverage. This coverage can be harnessed for a **real-time and granular analysis** of the impact of large-scale transport infrastructure. It also draws attention to the large variation in pollution experienced by residents across the city and the importance of a data system for identifying priority areas for potentially targeting measures to address pollution.

FIGURE 1: Variation of PM2.5 levels across space and time captured by PurpleAir monitors in Dakar, Senegal



In **KENYA**, poor data, limited analytics, and a lack of policy experimentation constrain the government's ability to develop policies and interventions to effectively regulate, monitor, and enforce road safety. The ieConnect's *Smart and Safe Kenya Transport* team has been working closely with key government agencies in Nairobi, including the National Transport and Safety Authority, the Kenya Urban Roads Authority, the Kenya National Highways Authority, and the National Police Service, to **strengthen their institutional**

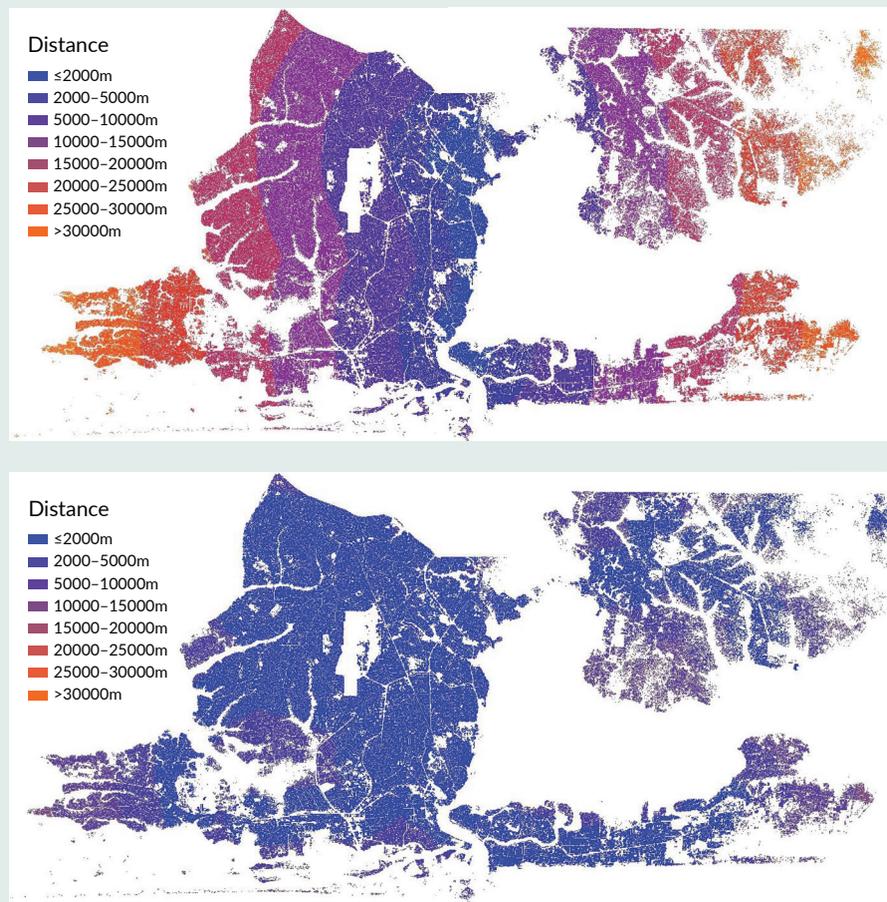


capacity for monitoring, evaluation, and learning through better use of road safety and urban mobility data. The team's "learning-by-doing" approach focuses on: (i) identifying a research and analytics core team within each institution and providing ongoing, hands-on trainings and capacity building; (ii) placing local team members within key institutions to provide day-to-day technical assistance needed to build up capacity; and (iii) facilitating cross-agency learning through meetings, workshops, and forums linking teams on advances in the application of data, analytics, and research. A key outcome from this approach is **requests for continued engagement to build better data systems, build capacity for data analysis, and engage in research to inform priority investments, policies, and activities**. The results of the collaborative analysis are also helping to inform Kenya's National Road Safety Action Plan 2023–2027.

In **LAGOS**, Sub-Saharan Africa's largest megacity, the average commute takes four hours a day. Congestion also has pollution impacts: most vehicles on the road are over 15 years old, using old emission technologies with sulfur levels 200 times higher than US standards for diesel. The research team is **partnering with the Lagos Metropolitan Area Transit Authority to strengthen the agency's analytical capacity, building data and evidence on the roll-out of an ambitious transit reform aiming at providing cleaner public buses** where only informal minibuses existed. The team finds that while the reform had limited effects on congestion, introducing new public blue buses on a line is estimated to have decreased paratransit minibuses departures by 5 percent, and decreased informal transit passengers by 10 percent in the long run. On the routes where the public option was cheaper, informal minibuses prices fell, which benefitted commuters relying on informal transit.

FIGURE 2: Travel distance to public transit over time

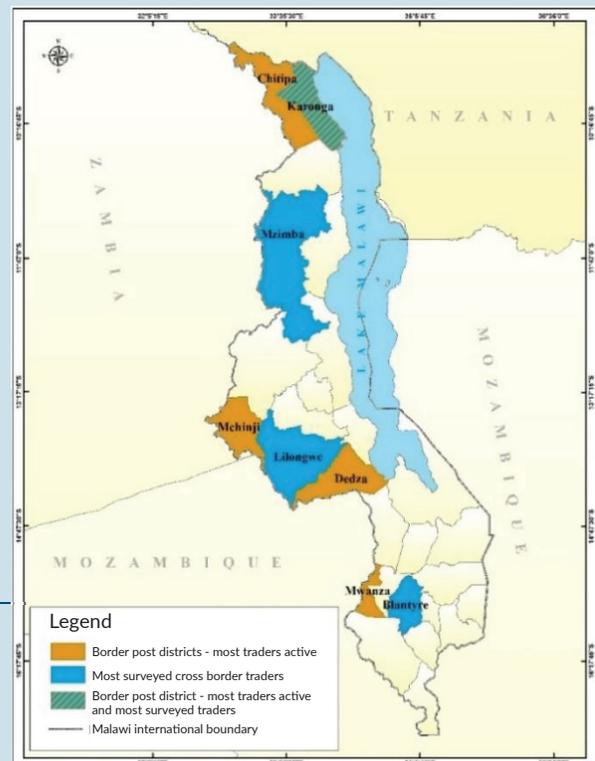
(a) Top, public transit access 2015; (b) Bottom, public transit access 2023



In **MALAWI**, the ieConnect team works closely with the Malawi Revenue Authority to evaluate the impact of the ambitious trade facilitation program aiming to **alleviate constraints on traders** in the landlocked country. This impact evaluation studies an ongoing standard trade facilitation intervention in Malawi which is anticipated to augment revenue collection by the Malawi customs authorities, reduce time spent at the border, decrease trade-related costs, and increase trade. The team adopts the **trial-and-adopt technology** with the government of Malawi: as the pilot intervention is deployed at selected border posts, **feedback is provided on key metrics such as time for clearance of goods and trader costs**. In addition, the team is **strengthening the capacity of the Malawi Revenue authority to use routinely collected customs data** to closely monitor activities at the border posts and their impacts on revenue.

FIGURE 3: Malawi traders survey—where are the importers?

Map of small, medium and large traders recruited to be surveyed on the constraints and costs of doing business across border in Malawi



In **BRAZIL**, the ieConnect program crowdsourced information on train rides undertaken by women commuters in Rio de Janeiro to study **sexual harassment in trains** and its' effects on demand for women-reserved space. The data highlights that harassment is shockingly common on the public transit system and that the reserved space offers women commuters a relative respite: women traveling in the public space experience harassment on average once a week; randomly tasking them to ride in **reserved spaces reduced harassment by 50 percent**. We show stark differences in who uses and values the space most: high-level users are not only most vulnerable to sexual harassment but also benefit most from the protection the reserved space offers. However, while the reserved space has a protective value, data on commuters' attitudes and use of the reserved space show perceptions of norms around the reserved space may limit women's agency. **Over half of male and female commuters associate women in the public space (rather than in the reserved space) with more sexual openness.**

A Collaborative Approach to Development

The ieConnect program has influenced the design and implementation of transport projects financed by the World Bank, other multilateral development banks, bilateral development institutions, and government agencies by partnering at the operational level of the impact evaluation to transfer IE knowledge and tools. ieConnect will continue working across institutions collaboratively to address emerging priority development challenges including: transport decarbonization, the link between transport and health, gender, urban mobility and trade, building evidence to inform and strengthen the future pipeline of global transport investments.

The ieConnect for Impact program is a collaboration between the World Bank's DIME Department and the Transport Global Practice. This program has been funded with UK aid from the UK government. For more information about the ieConnect for Impact Program, visit the [ieConnect Website](https://ieconnectforimpact.org) or contact ieconnectforimpact@worldbank.org.

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