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Transport

KORENA GREEN INNOVATION DAYS

Smart Travel Demand Management Policies for Developing Green and Sustainable Transportation: Deep Dives in LAC Cities

GREEN GROWTH THE PATH TO SUSTAINABLE JOBS

HIGH-LEVEL SUMMARY OF ACTIVITIES

October 2025

1

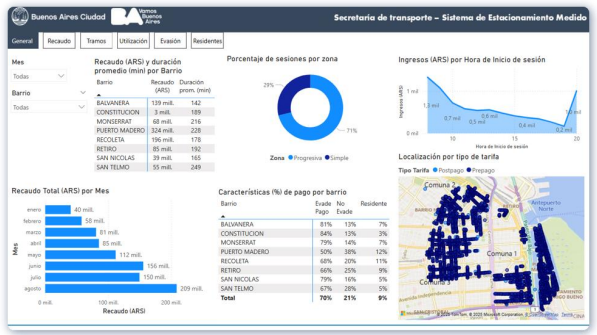
CONTEXT

Transport is a Major Contributor to GHG Emissions in LAC

- In LAC, transportation accounted for approximately **22% of total greenhouse (GHG) emissions** of the regional carbon dioxide emissions in 2020.
- **Vehicle congestion costs cities between 2% and 4% of their GDP** due to factors such as lost time, unnecessary fuel consumption, and the increase in business operational costs.
- According to the TomTom Traffic Index 2022 – a study that examines data from 390 cities in 56 countries and six continents –, **LAC has two cities in the "top 10" cities** with the highest traffic congestion in the world: **Bogotá and Lima.**

The KGGTF provided technical assistance to design targeted Transport Demand Management (TDM) solutions for three cities.

BUENOS AIRES

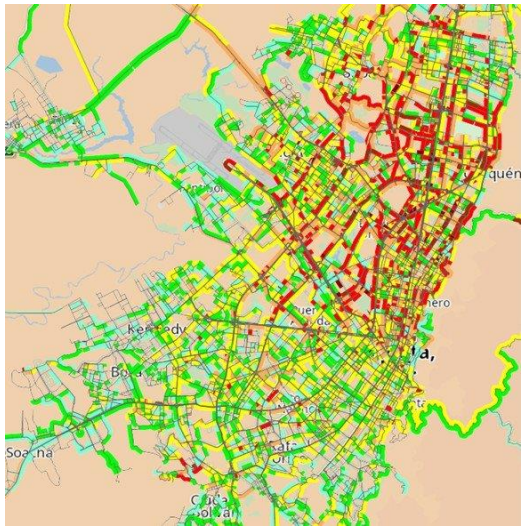


Key Policy Actions to Strengthen the City's Parking Strategy

LIMA

Travel Demand Management Strategies to Implement in Lima

BOGOTA



Pioneering the First Congestion Charge in LAC

2

LIMA
PERU

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CONTEXT

LIMA FACE GROWING CHALLENGES THAT AFFECT THIER QUALITY OF LIFE

Main challenges:

Traffic congestion	Environmental pollution	Lack of public space	Traffic accidents
Leads to loss of productive time and stress among citizens.	This problem causes around 7 million deaths per year worldwide, according to the WHO.	Cities prioritize space for cars, leaving little room for other types of users.	According to the WHO, injuries related to traffic accidents are the seventh leading cause of death worldwide.
Lima is ranked as the seventh most congested city in the world.	In Lima, 54% of citizens report being dissatisfied with the city's air quality.		In 2022, Lima reported 402 fatalities from traffic accidents.

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Solution Developed with KGGTF Support

A Travel Demand Management (TDM) strategy was proposed through programs, plans, and projects designed to achieve the following objective through five approaches

Objective of the TDM strategy

Reduce dependence on private vehicles through policies that discourage their use, promote more sustainable transport modes such as public transport, cycling, and walking, and contribute to the financing of urban mobility projects.

Strategy approaches

On-street parking

- Regulatory guidelines
- Willingness to pay
- Tariff scheme
- Technological tools
- ‘Enforcement and control

Road pricing

- Regulatory guidelines
- Willingness to pay
- Tariff scheme
- Technological tools
- Enforcement and control

High-occupancy vehicle (HOV) lanes

- Regulatory guidelines
- Technological tools
- Enforcement and control

Off-street parking

- Regulatory guidelines
- Tariff scheme

Vehicle taxes

- Regulatory guidelines
- Tariff scheme

→ **Formulation of TDM programs, plans, and projects**

Supply management

Regulations for the design and prioritization of road space

3

BUENOS AIRES ARGENTINA

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CONTEXT

BUENOS AIRES CURRENT PARKING STRATEGY

1

There are currently more than **10.000 metered parking spaces** distributed across **8 neighborhoods.** An **expansion of 59.000 spaces** is planned for the Northern Corridor.

2

In the current metered area, on average, **21% of vehicles pay for parking**, 9% are registered to residents, and **70% evade payment.**

3

Based on the data collected, it was found that in the initial expansion stages (referred to as zones 1, 2, and 3), **zone 3** — which is predominantly commercial — **shows nighttime occupancy rates above 80%.** In residential areas (zones 1 and 2), **occupancy ranges between 55% and 60%.**

4

Neighborhoods such as **Monserrat, Retiro, and San Nicolas could reach optimal occupancy levels** under the projected growth scenarios.

BUENOS AIRES OPPORTUNITIES FOR IMPROVEMENT

Low enforcement and penalty application

Control coverage is inadequate, and enforcement devices suffer from technical issues. It is recommended to strengthen patrol operations, device maintenance, and infraction validation mechanisms.

Centralized administration system

There is no comprehensive tool for system oversight. A real-time monitoring platform is needed to manage zones, time schedules, and rates effectively.

Lack of loyalty programs and discounts

There are no benefits for frequent users nor incentives for environmentally friendly vehicles. The introduction of such measures is proposed, subject to regulatory approval.

Lack of satisfaction indicators

The user experience is not being evaluated. The implementation of regular measurements is proposed to support better decision-making.

Ineffective penalties

Existing penalties are not deterring non-compliance. Improvements are recommended in license plate reading, and validation and notification procedures.

Restructuring the strategy to reduce evasion

The current control approach fails to reduce evasion. A new strategy should be developed that integrates technology, operational enhancements, and targeted communication.

Strategies to Strengthen Buenos Aires' Parking Policy

Regulatory/legal

A clear and updated legal framework facilitates enforcement and ensures transparent allocation of revenues. The absence of such a framework limits the system's ability to apply sanctions effectively.

Institutional

Successful public-private coordination supports the operation of the system, and clearly defined roles and responsibilities are key to its sustainability.

User

Offering multiple payment options, differentiated rates for residents, and flexible payment packages improves the user experience and encourages long-term engagement.

Operation and control

Dynamic pricing helps regulate occupancy. Extended hours and charging during special events increase revenue. Facilitators and vehicle immobilizers are effective, but costly. Effectively enforcing sanctions is key to maximizing their pedagogical impact and preventing improper

Commercial, pricing and contractual

Parking rates should be aligned with demand patterns. Periodic reviews are necessary to maintain system relevance. The management model should be tailored to local technological and operational capacities.

Economic-financial

Zone-specific strategies are required. Transparent use of funds increases public support. Self-sustainability is achievable with strong regulatory and operational foundations.

Technological

A wide range of digital channels facilitates system use. Tecnological integration improves operational efficiency and supports real-time data availability.

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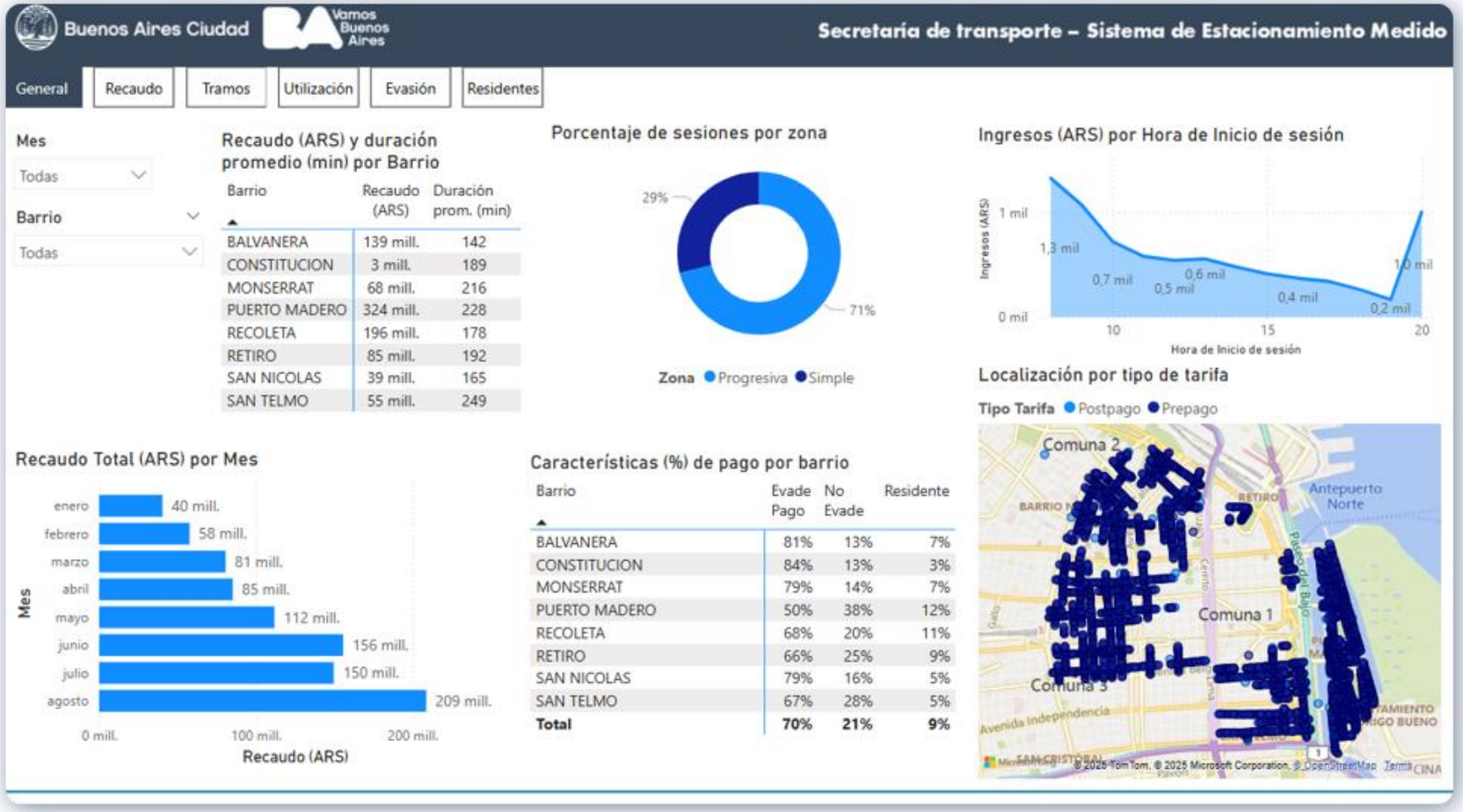
Solution Developed with KGGTF Support

A visualization tool was developed that will allow the Autonomous City of Buenos Aires to easily access relevant Metered Parking System (MPS) data

This tool, with a clear and attractive design, allows the visualization of specific information, such as:

- **Monthly revenue**
- **Occupancy rates**
- **Session durations**
- **Evasion levels**
- **Resident usage patterns**

It integrates filters, maps, and key performance indicators to support detailed and segmented analysis of the system.



A comprehensive set of strategies was developed to strengthen the MPS as a demand management tool, addressing aspects related to technology, enforcement, pricing, service levels, among others

1 Enforcement and control

- Deploy on-street personnel to support enforcement and system outreach
- Implement saturation-based enforcement in priority zones

2 Payment media and automation

- Send automatic notifications to users about their parking sessions
- Use the payment app to increase compliance with fine payments
- Implement a WhatsApp chatbot for parking rate payment

3 Data

- Regularly analyze system usage patterns and make data-driven adjustments
- Install measurement devices in metered sections to obtain performance indicators
- Analyze the urban environment when implementing the system near major trip generators (for example, hospitals)

4 User and citizen participation and perceptio

- Assess user, resident, and merchant satisfaction in metered areas
- Promote community dialogue roundtables to tailor policies to specific local needs

A comprehensive set of strategies was developed to strengthen the MPS as a demand management tool, addressing aspects related to technology, enforcement, pricing, service levels, among others

5 Pricing structure

- Conduct a price-demand elasticity and willingness-to-pay study to define optimal rates for the system
- Implement differentiated rates to encourage rotation during peak hours
- Align on-street parking rates with those of commercial garages
- Extend paid parking hours in areas with high nighttime activity
- Implement a flat rate for parking during large-scale events
- Implement discounted rates for low-emission vehicles
- Explore the possibility of creating monthly rate packages
- Explore the possibility of implementing discounts for recurring system use
- Partner with commercial establishments to build loyalty among on-street parking users

4

BOGOTA

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CONTEXT

Bogotá Faces Growing Motorization and Prolonged Travel Times

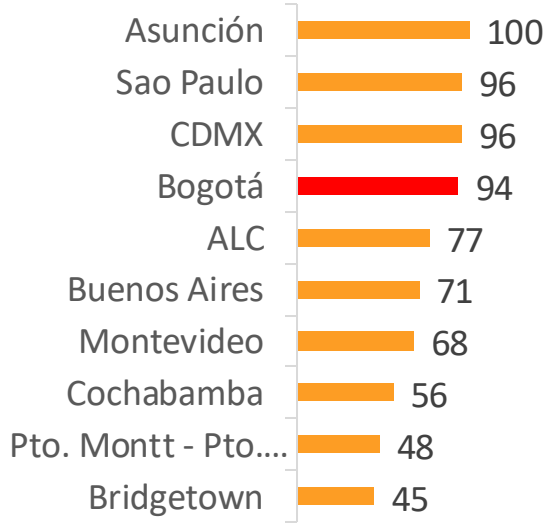
Effect of increasing motorization

Effect of increasing motorization

75% in cars between 2011-2022

158% on motorcycles between 2011-2022

Long travel times and opportunities to improve service quality



Average travel times (min)

Source . Mobility Survey per city

42.9%

Of 2.9 million Bogotá households, there is a car and/or motorcycle.

55%

Of the households with a car, the income is more than 2.5 M/month.

- 70% internet access
- 85% banking

86%

Of households have incomes between 0 - 2.5 M/month

- 30% internet access
- 54% banking

Pico y Placa – Key Traffic Demand Management Policy in Bogotá

•Objective:
Reduce private vehicle use and manage traffic congestion.

•Mechanism:
Restricts vehicle circulation based on license plate numbers.

•Implementation Timeline : Introduced 1998

•Current Scope :

- Applies to **private vehicles** , **taxis** , and **special service vehicles** .
- Limits circulation **2 to 3 times per week** .
- Affects up to **730,000 vehicles during peak hours** .

•Impact:
Continues to be the central strategy for demand management in the city.

Effect of movement restriction measures

Increase in the acquisition of second vehicles

6.5% households with more than one vehicle according to EDM 2011

11.7% Households with more than one vehicle according to EDM 2019

Source . Mobility Survey Bogotá

Bogotá's Road Pricing Scheme for Sustainable Mobility

What is it?

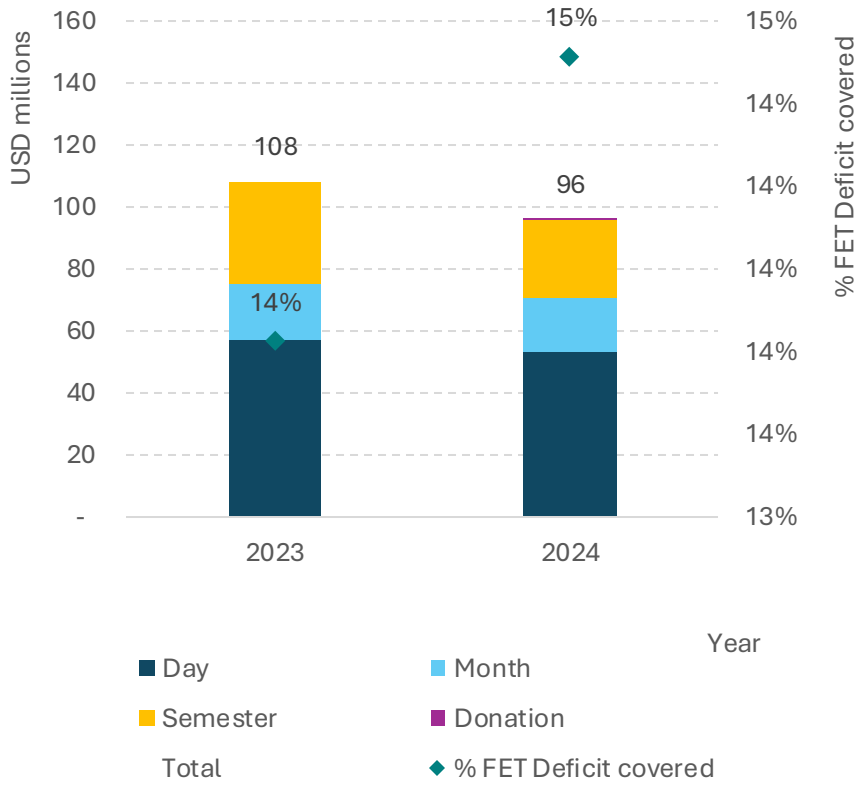
- The Special Access Permit for Restricted Vehicle Areas allows circulation during restricted hours in exchange for a variable fee based on vehicle characteristics

Revenue Use and Impact :

- **Funds are reinvested directly into SITP**, serving as a **cross-subsidy for equitable mobility**
- By 2024, it became the largest alternative funding source for SITP
- **Contributes up to 15% of fare stabilization needs**

Broader Benefits :

- Aligns pricing with environmental impact and user ability to pay , reinforcing Bogotá's goals for sustainable and inclusive urban transport .



Source . Bogota Mobility Secretariat

The purchase of solidarity peak and plate is a relevant source of income

Solidarity Peak and Plate Permit

An average of
25-31 thousand vehicles per day

They circulate daily in Bogotá with the solidarity license plate permit.

This represents a
increase of 6.1%
in the vehicle fleet in circulation compared to a baseline scenario without permits

Elements that make the permit ineffective:

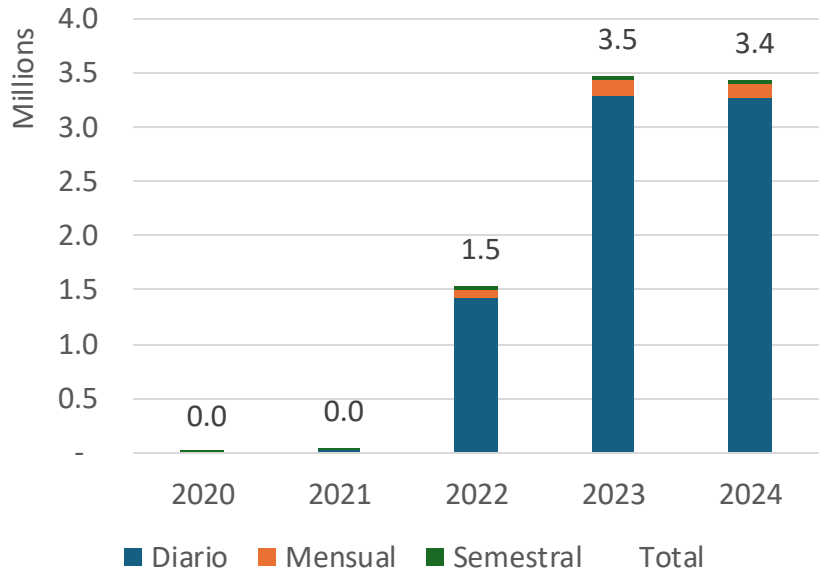
1 KM

Due to a lack of control over the distance traveled, the permit is perceived as a sunk cost and encourages frequent use.

2

Legal entities with daily trips above the city average.

Number of permits sold



Source: Prepared by the authors using a database provided by SDM.

Bogotá's Traffic management evolution

Restriction TDM

Start of PYP

- 1995 – Temporary restriction measures on weekdays in a 4 month period
- 1998 – Starts PYP Restriction applied on weekdays from 7:00 - 9:00 a.m. and 5:30 - 7:30 p.m.
- Plates restricted based on last digit, alternating days.

Adjustments

- 2002 –Schedule Adjustment
- 2003 – **Annual Plate Rotation** Introduced to counteract increased car sales aimed at evading restrictions.
- 2009 Schedule adjustment and Unified rules to all vehicles, regardless of registration location.

Extended restriction

- 2009 – **PYP runs from 6am to 8pm**
- 2012 - Rotating Plate Groups & Zone-Specific Adjustments
- 2013 - Center-Specific Adjustments
- 2016 **Citywide Standardization**
- 2019 - Removal of Exemptions & Expansion to Cargo Vehicles

Introduction of New Exceptions

- 2021 Added exemptions for hybrid vehicles and health personnel.
- 2022 Eliminated exemptions for health personnel

Unification

- 2023 Standardized restrictions citywide.
- Revised digit-based restrictions for greater fairness.
- Defined the administration can periodically rotate the restricted digit plates.

HOV TDM

- **2021 Exemption for HOV**
- 2023 HOV exemption eliminated due to inefficacy.

Road pricing TDM

- 2021 SAPRVA initial regulatory framework
- **2021 SAPRVA program starts**
- 2022-2024 Updates to PYP Solidatrio permit types and fee setting

City access TDM

- **2022 PYP Regional**

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Solution Developed with KGGTF Support

Components of an externality charging solution

Technological Solution

Includes the stages of development, implementation, maintenance and operation of the solution

1

Mobility indicators technique

Generation of indicators on the use of private vehicles based on the technological solution, and mobility conditions with the transport model

2

Tariff policy

Evaluation of new fare policy scenarios based on the transport model and the economic evaluation model

3

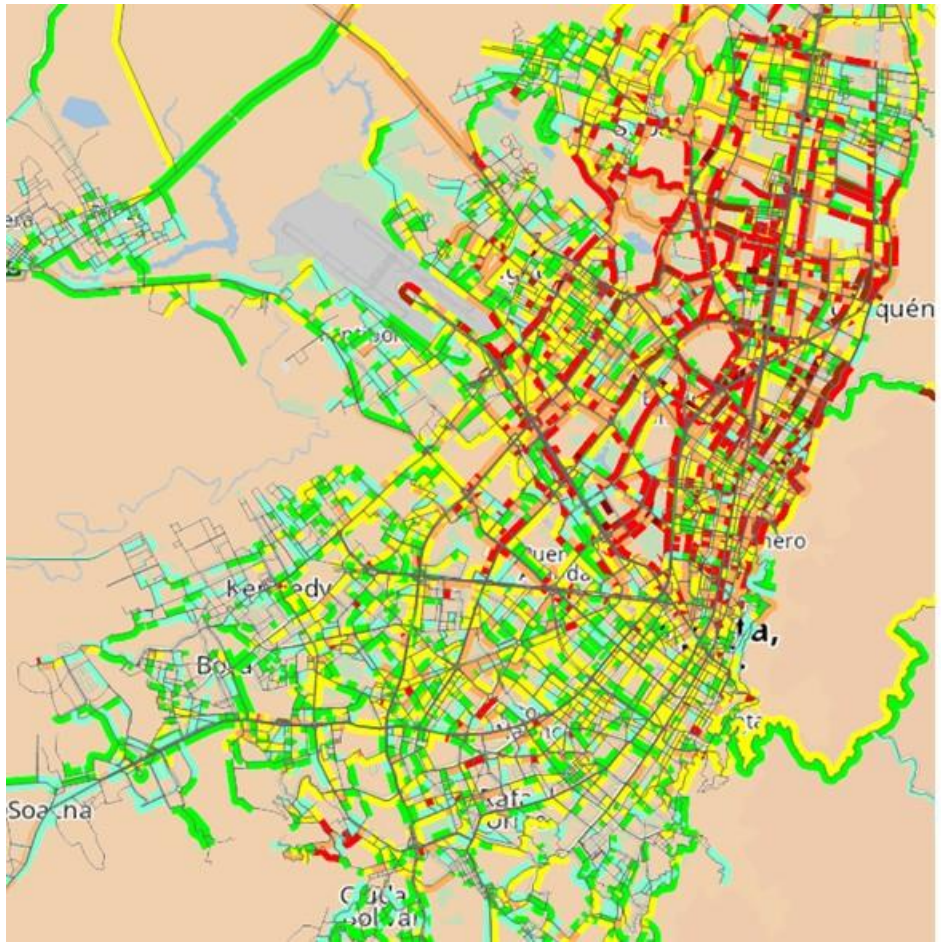
Communications

Support in the process of defining strategies and socializing the solution

4

Modeling results: Left: fare level 0 for HOV and Intermediate fare for all vehicles

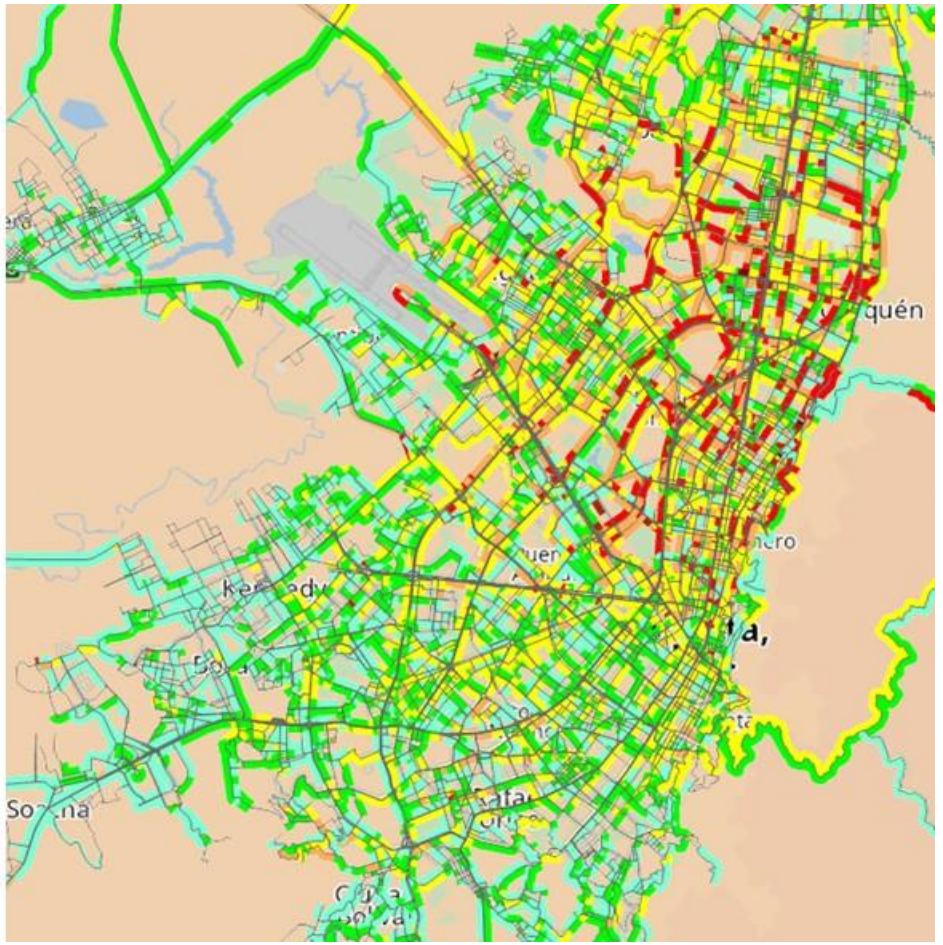
Base rate 2023 + PYPS current rate + HOV rate=0



% Variation compared to the 2023 Base Esc.

Name	Preview
<= 5.000	
<= 10.000	
<= 20.000	
<= 30.000	
<= 50.000	
<= 60.000	
> 60.000	

Base School 2023 + PYPS and HOV with intermediate rate



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KGGTF support paved the way for deeper collaboration with Korea through the ODA Challenge.

Objectives

Design a prefeasibility-level technological strategy for implementing a traffic demand management system in Bogotá, centered on an externalities charge. The project will define the required Intelligent Transport System (ITS) to enable user registration, payments, enforcement, monitoring, and data-driven decision-making.

Propose an optimal enforcement strategy that is technically viable and institutionally applicable

Framework for the strategic use of externalities charge data to inform policy decisions and pricing adjustment

Recommendations for integrating the externalities charge enforcement system with existing platforms managed SDM

Support institutional capacity-building through targeted training and knowledge exchange with Korean experts.

Provide recommendations to improve for user registration, payment, and monitoring of an externalities charge scheme

Assess opportunities to scale enforcement technologies to other mobility management use cases

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Thanks

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