Teresina, Brazil

Partner city

Status of the project: **Completed pilot project**

Basic Information

Urban area: **1,392 km^2**

Population: **1,203,922** | Growth rate: **1.21%**

Region capital city

GDP per capita: **USD 6,729**

Modal Share:

- **Formal public transport: 21.3%**
- **Walking: 32.6%**
- **Cycling: 11.8%**
- **Private cars: 24.8%**
- **Private motorbikes or 2-wheelers: 5.8%**

National GHG emissions per capita: **5.12 (tCO_2eq)**

Exposure to climate change: **MEDIUM**

Context

Teresina is a low-density agglomeration of 1.2 million inhabitants, located in north-east of Brazil. The city is located at a crossroads near major cities on the north coast of the country, notably Fortaleza and Sao Luis, which significantly contributes to its economic development. However, the city suffers from urban sprawl, which increases travel time, costs and reduces the efficiency of public transport.

The 2008 Master Plan for Transport and Urban Mobility states that 1.91 million trips are made per day in the greater Teresina. The most common of these is made by foot (32.6%), followed by private car trips (24.8%) a nd municipal public transport (21.3%). The least common modes of transport are bicycles (11.8%) and motorcycles (5.8%). The relatively low share of public transport illustrates existing issues related to efficiency, accessibility and affordability of public transport. Public transport in Teresina is currently provided by about 100 bus lines, as well as a BRT system- currently under development. This network is operated by four main companies with a total fleet of 550 vehicles. The network is supplemented by eight alternative service routes, operated by 45 vehicles from minor operators organised under the SINTRAPI (Alternative Passenger Transport Operators Union).

During the last year, the current "conventional" bus system has gradually been replaced by the new Integrated BRT System. This evolution has redesigned the bus routes. These were previously classified into (i) radial, (ii) circular, and (iii) *diametrais*, meaning from one side of the city to the other, going through the city center, all converging to the Central Business District, and leading to overlapping itineraries and a saturation of some segments in the system.

The Integrated BRT System introduces a new feeder-trunk system, operating with a set of feeder lines that connect neighborhoods to the zone terminal, and trunk lines (BRT) departing from the terminals to city center or linking terminals. It divides the city into four main zones, namely South, Southeast, East, Center-North - Teresina doesn't have West zone inside the municipal jurisdiction. Each zone has two bus terminals, and the CBD has four unloading terminals. The bus route concession was allocated by zone, and each operator holds the concession for the set of routes of a particular zone.

Teresina Municipality Town Hall, the local counterpart, has the mandate and responsibility to finance mass public transport infrastructure. It has the authority to borrow from international finance sources. Systems and procedures are partially in place to monitor, evaluate and report on urban transport.

The project supported by the MobiliseYourCity Partnership implements an Open Innovation approach which aims at (i) identifying the key issues of the transport system management and (ii) developing relevant digital solutions that can address those issues and scale up strategy.

The specific objectives of the Project are to:

- Provide a rapid assessment of the current public transportation system of Teresina;
- Co-identify and prioritise the main issues faced by the public transportation system;
- Identify solutions and technologies which could address those prioritised issues, including blockchain;
- Provide methodology and resources to prototype pilot projects;
- Lessons learned from the pilots, documentation and definition of the pilot implementation strategy.

The technical assistance contributes to institutional strengthening by tackling trust issues between all the stakeholders of the mobility sector through data and technological solutions.

Support from the Partnership

Technical assistance: Pilot Project development

Funded by: EUROCLIMA+

Funding amount: EUR 500,000

Implemented by: AFD through the project

Local counterpart: Teresina Municipality Town Hall, Secretary of Planning and Coordination (SEMPLAN)

Supported activities:

- Install the blockchain platform and promote its use by the actors involved in the Teresina transport system.
- Implement a public transport governance system based on co-management and the opening of data and processes whereby the municipality, companies, users and the treasury interact in a collaborative way.

Status of implementation

Project start: 2019 Q4

Project completion: 2022 Q1

Completed outputs:

- Signature of a MoU between Teresina and AFD
- Diagnosis
- Setup of The Open Innovation
- Pilot conception
- Proof of concept
- Scale-up strategy

Core impact indicators baselines

Indicator	Baseline - 2020
Total annual transport related GHG emissions (Mt CO_2eq)(Brazil)	1,070.08 Mt CO_2eq
Annual transport related GHG emissions per capita (kg CO_2eq)(Brazil)	5,120 kg CO_2eq / capita
Air pollution Mean urban air pollution of particulate matter (in µg PM2.5) at road-based monitoring stations	13 µg/m³ of PM2.5
Road safety Annual traffic fatalities in the urban area, per 100,000 inhabitants	22.8 fatalities / 100,000 hab

Insights from practice: key pilot project takeaways

Breaking Down Barriers: How Teresina's Pilot Project overcame Data Inefficiencies in Transport Management

The pilot project in Teresina aimed to improve the efficiency of the BRT system by implementing an innovative information and interrelationship system. By reducing information asymmetries between stakeholders, decision-making was improved, making it easier to adjust to the interests of each actor. The project successfully tackled the challenges of inefficient data management and analysis, paving the way for more effective traffic reorganisation policies in the future.

The use of this information system is also intended to reduce the levels of traffic norm infringement by private companies in terms of fines and infractions committed, in addition to providing better traceability of the process.

Open innovation processes are allowed for public interest and the sharing of data. However, political will is lacking to expand solutions

Implementing blockchain technology in the transportation sector is very innovative and became a challenge in the open innovation process, as there were few participants who could integrate it into the solutions. The open innovation process allowed for citizen participation and interest in the management of the transportation system, while internally ensuring that the municipality coordinated to share data and public information. As a result, the information has been shared publicly at the following website: https://observatorio.stardust.dev.br/. Regardless, the lack of political interest from the high officers and the remaining basic challenges of the public transport system, did not allow for systemic change.

In parallel and inspired by the success of the #moveteresina participatory challenge, the city implemented two tactical urban planning interventions in two public spaces in the city. These two interventions communicated information about the project, shared the main data on the city's transportation and raised awareness about the challenges of climate change.

On April 1, 2022, the city partnered with the consulting firm SYSTRA-UNIFOR and carried out a closing mission of the pilot "Mobility Observatory: Blockchain Technology to improve data management for citizen participation in Public Transportation in Teresina, Brazil".

Results and perspectives for scaling

Scaling-up strategy developed from the outset connects to potential funding for the city

The scaling up of Teresina's pilot project was included from its inception. Solutions developed in the Open Innovation process were structured into a strategy to be implemented by the city. This strategy is to be included as part of potential funding for the expansion of the Proof of Concept, through the AFD Project "Teresina 2030".

For this project, it is important to highlight that open data tools are necessary for the better planning of urban sustainable mobility strategies. Therefore, the resulting platforms, such as the observatory and the applications, are an appropriate scalability model- in its participatory methodology of construction. On the other hand, international visibility of these solutions is crucial to replicate this pilot project in other contexts and cities. For 2022, the municipality of Teresina continued to be accompanied to support the next steps in the financing of the project.