



ECOMOBILITY WORLD CONGRESS 2017
KAOHSIUNG, TAIWAN



TRANSPORT INTEGRATION AS AN ECOMOBILITY COMPONENT IN THE METROPOLITAN AREA OF ABURRA VALLEY - COLOMBIA

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- **WHO ARE WE?**
- **WHERE ARE WE?**
- **CURRENT PROBLEMS**
- **HOW DO WE MOVE?**
- **WHAT HAVE WE DONE?**
- **WHAT DO WE WANT TO DO? – INSTITUTIONAL PLANS**

THE ENTITY “ÁREA METROPOLITANA DEL VALLE DE ABURRÁ”

It is a Colombian public entity that associates 10 conurbated municipalities located geographically in the called Aburra Valley, with the city of Medellín, second city of the country, as nucleus city.





ÁREA METROPOLITANA DEL VALLE DE ABURRÁ

- Territorial Planning and Coordination Function
- Urban Environmental Authority
- Metropolitan and mass transportation authority
- Builds metropolitan strategic projects

**10 MUNICIPALITIES
ASSOCIATES**

FOUNDATION YEAR: 1980

WHERE ARE WE?

THE TERRITORY WE LIVE IN AND HAVE BUILT



TERRITORY



TERRITORY

World



Colombia | In América
■ 48'747.632 Inhabitants
Surface:1'141.748 [km²](#)

National



Antioquia | In Colombia
■ 6'534.857 inhabitants
Surface:63.612 [km²](#)

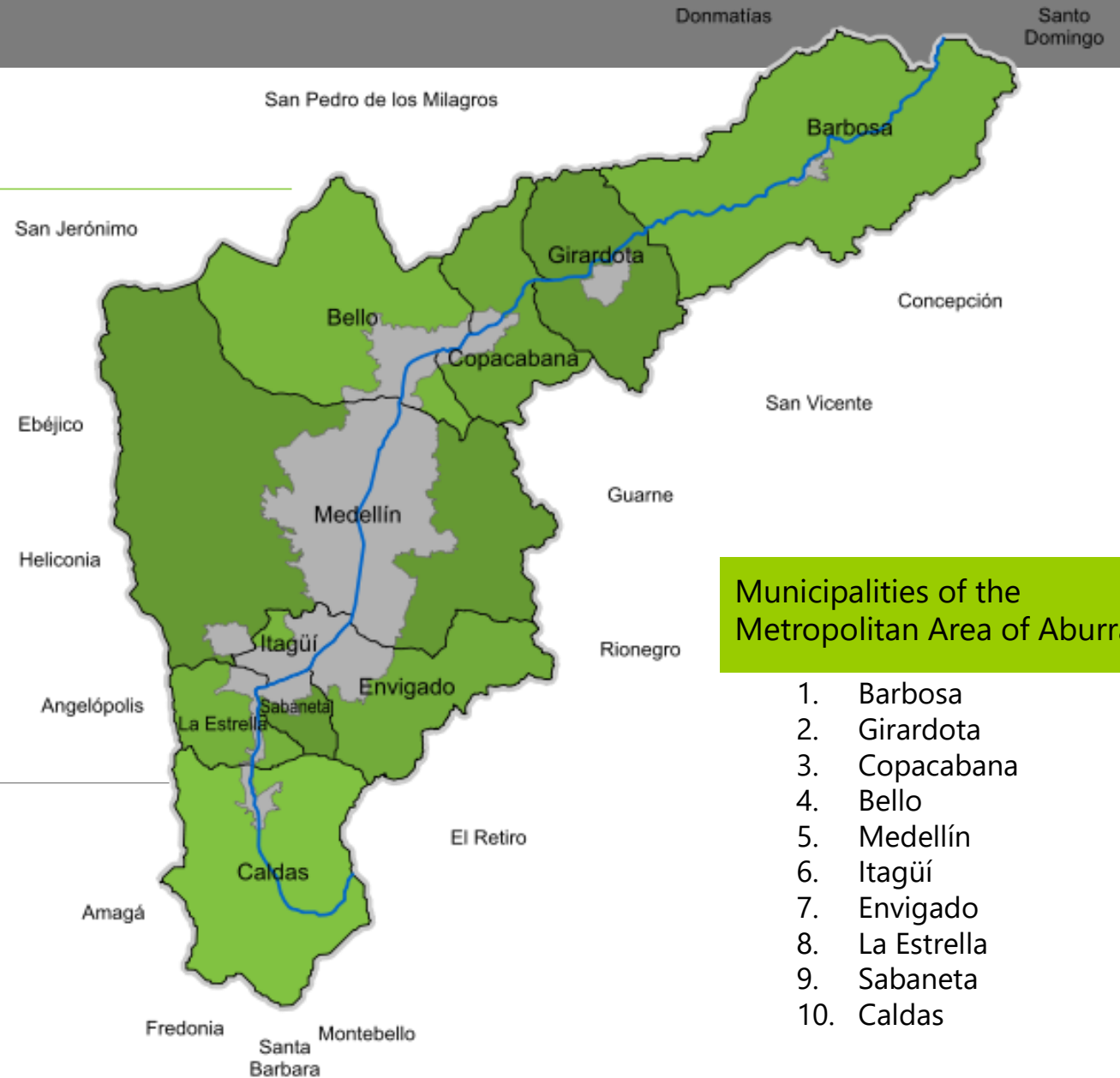
Regional



Valle de Aburrá | In Antioquia
■ 3'821.797 inhabitants
Surface:1.157 [km²](#)

TERRITORY

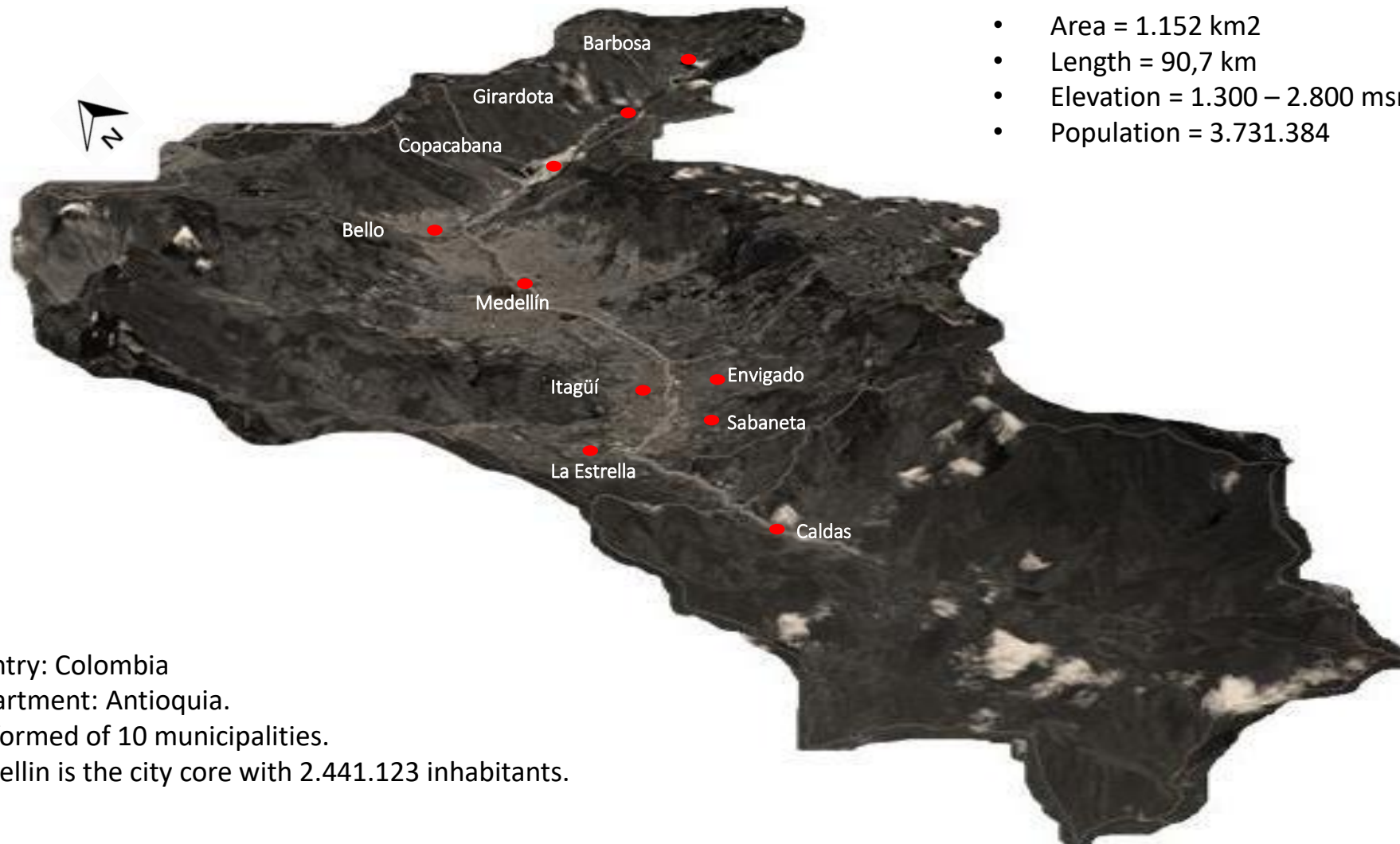
Metropolitan Aburra Valley



Municipalities of the Metropolitan Area of Aburra Valley

1. Barbosa
2. Girardota
3. Copacabana
4. Bello
5. Medellín
6. Itagüí
7. Envigado
8. La Estrella
9. Sabaneta
10. Caldas

GENERAL CONTEXT OF THE ABURRA VALLEY RELIEF



- Area = 1.152 km²
- Length = 90,7 km
- Elevation = 1.300 – 2.800 msnm
- Population = 3.731.384

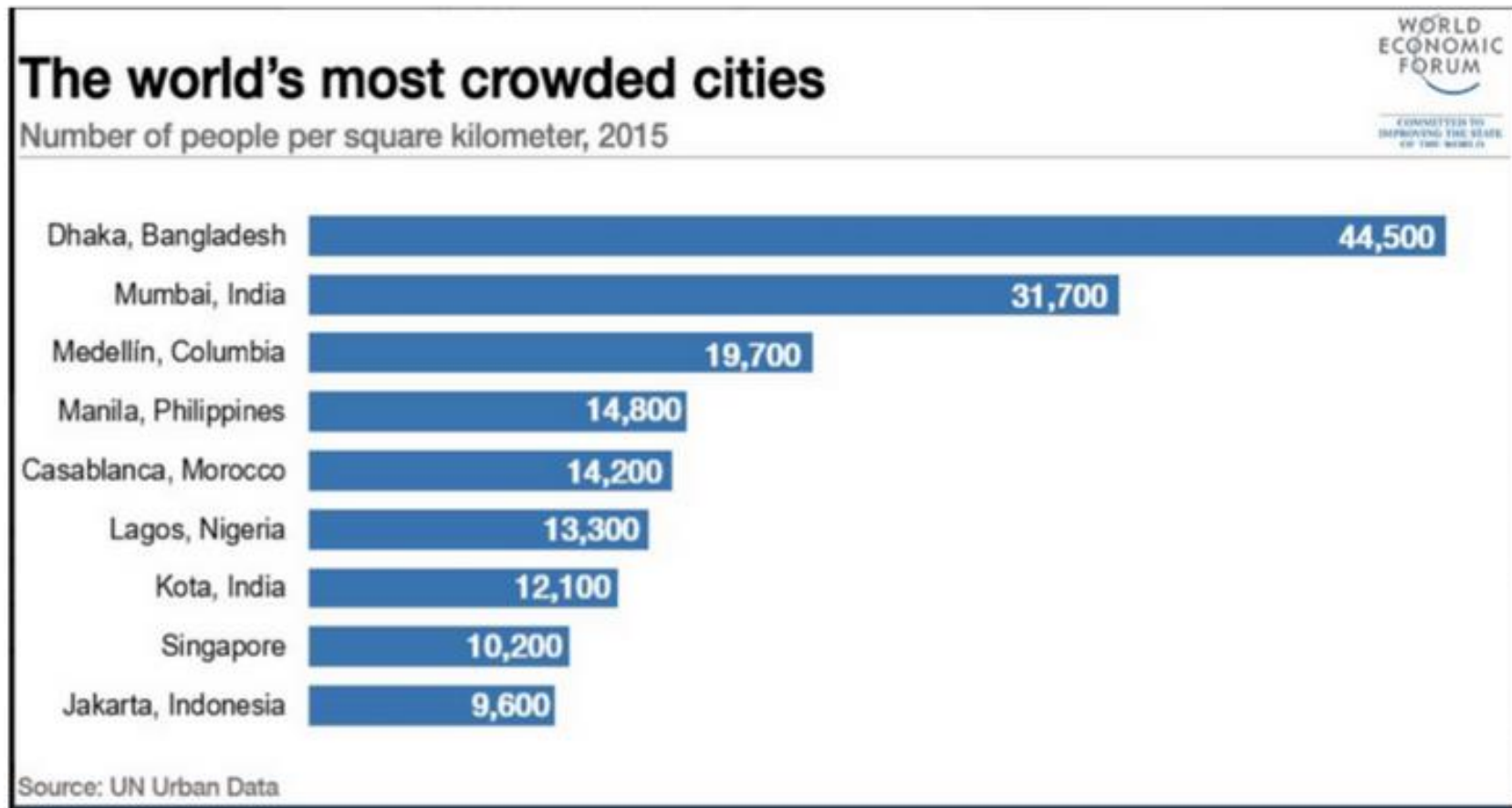
- Country: Colombia
- Department: Antioquia.
- Conformed of 10 municipalities.
- Medellín is the city core with 2.441.123 inhabitants.

METROPOLITAN PROBLEM



REGIONAL - URBAN INTEGRATION GENERAL CONTEXT OF ABURRA VALLEY

ACCELERATED GROWTH OF ABURRA VALLEY MEDELLÍN ONE OF THE MOST CROWDED CITIES



CONTEXT - PROBLEMATIC ISSUE CONGESTION

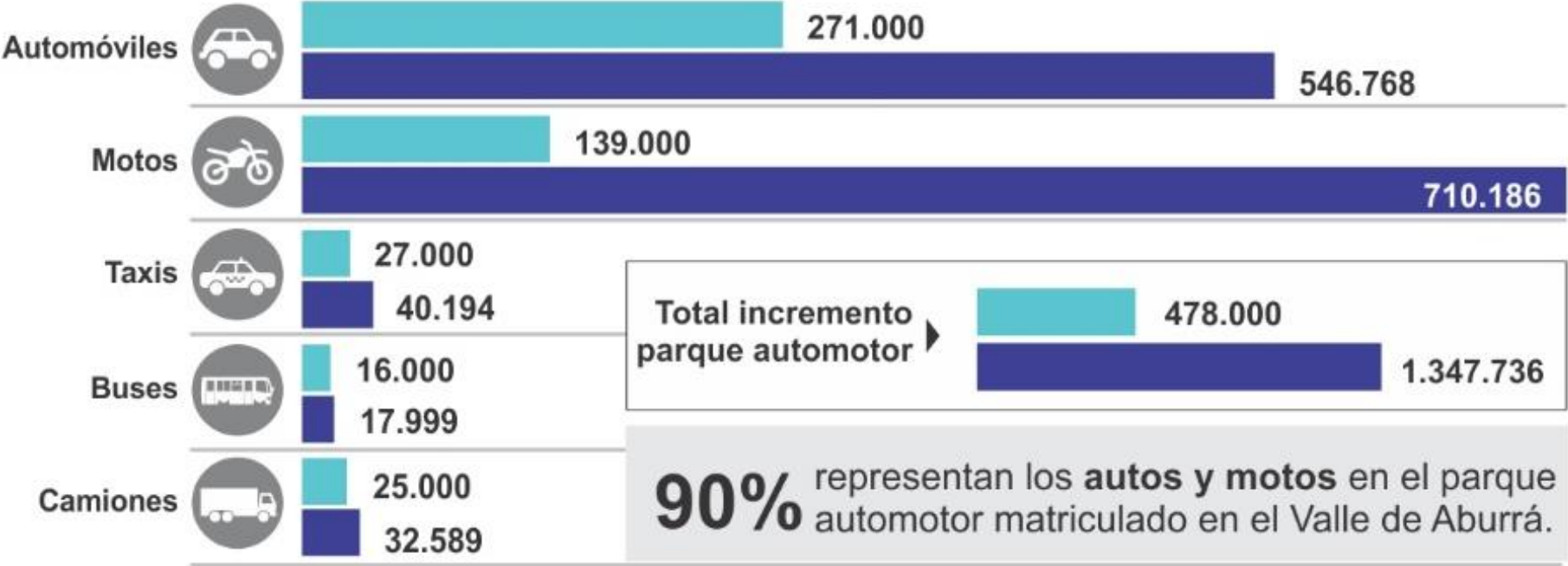


CONTEXT - PROBLEMATIC ISSUE

MOBILITY

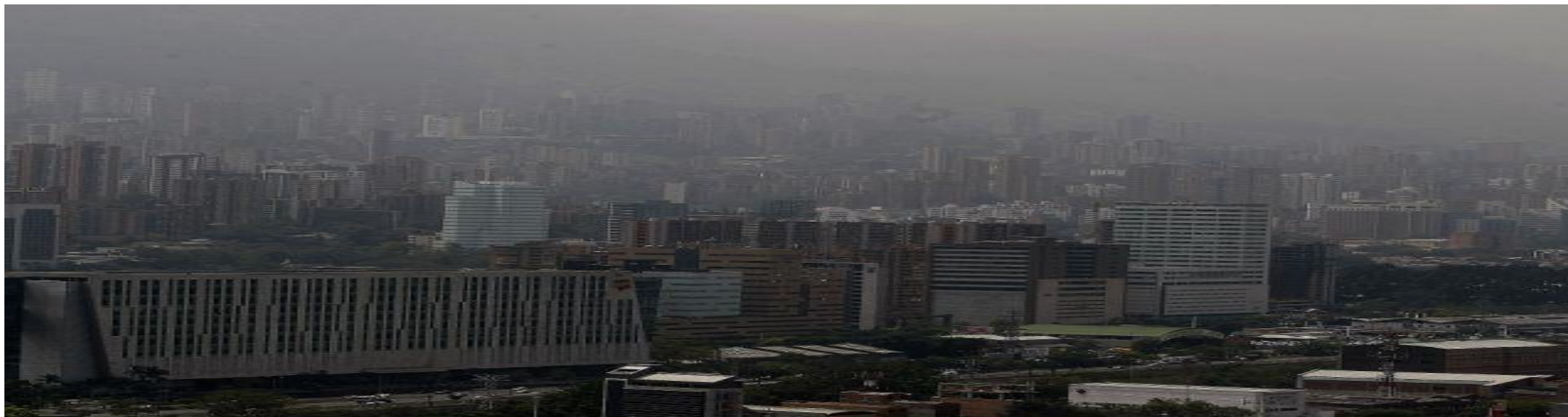
INCREASE OF AUTOMOTIVE PARK BETWEEN 2005 AND 2015

Year 2005 Year 2015



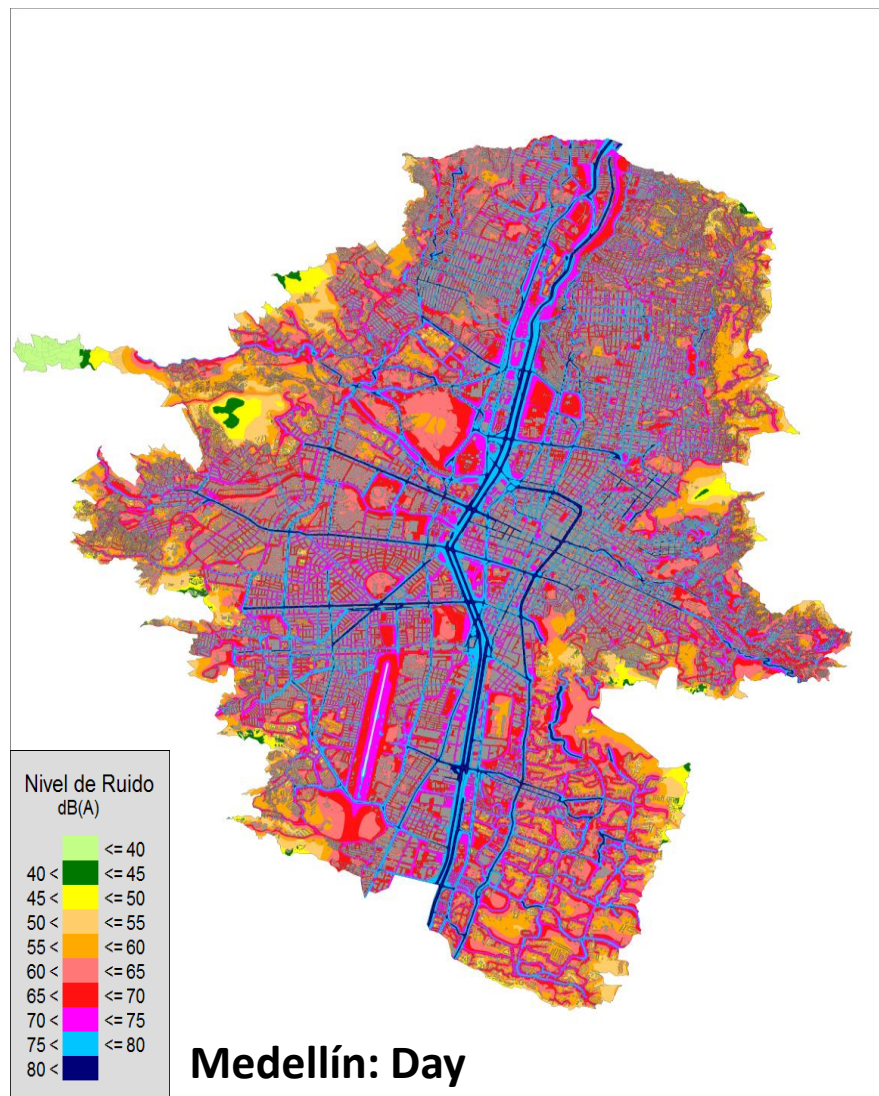
CONTEXT > PROBLEMATIC ISSUE

POLLUTION AND DECLINE OF AIR QUALITY



CONTEXT > PROBLEMATIC ISSUE

ENVIRONMENTAL NOISE



Medellín: Day

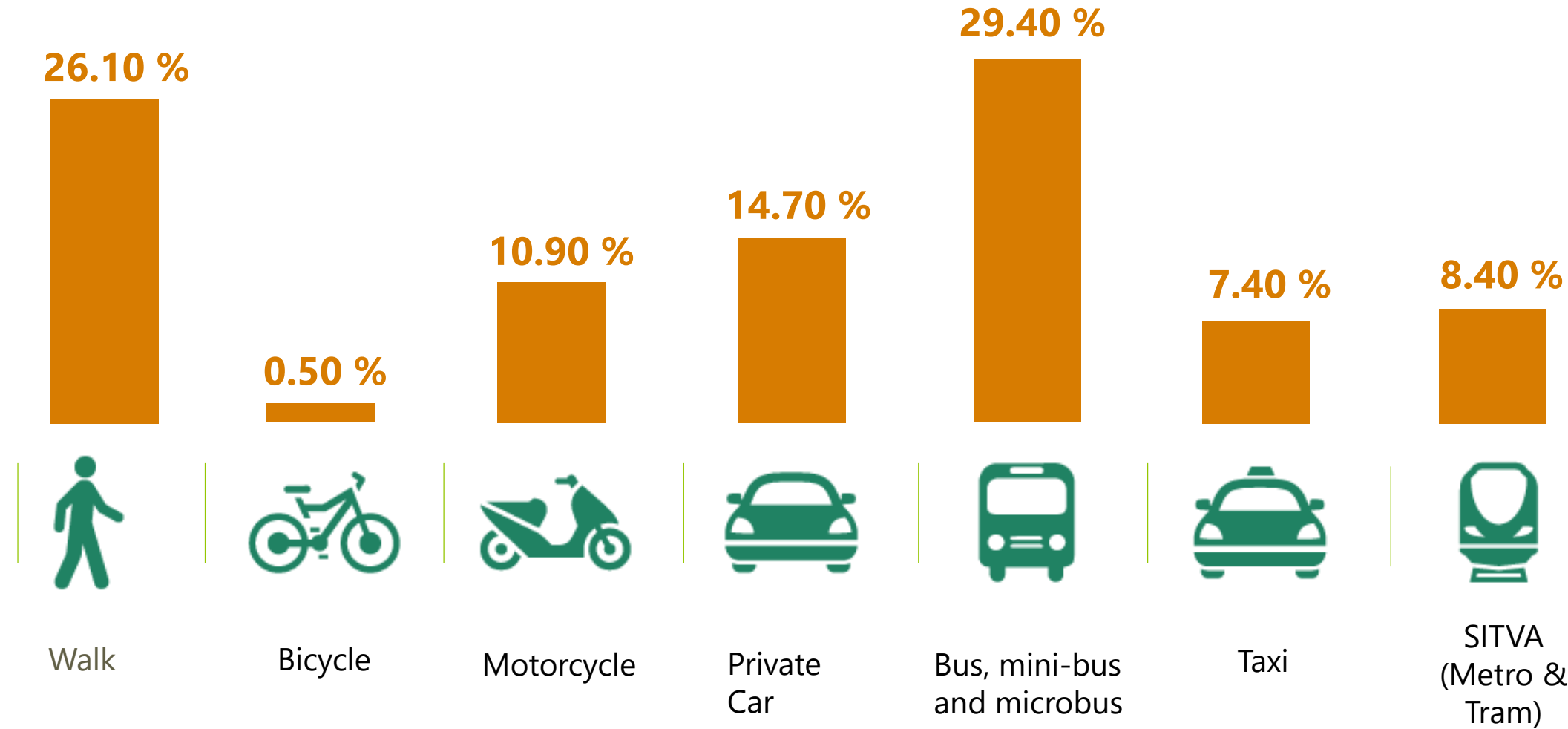
Affected population - residential sector

Indicador:	POBLACION (Miles de Habitantes)			% SOBRE EL TOTAL DEL MUNICIPIO		
Población expuesta a:	MEDELLIN	BELLO	ITAGÜÍ	MEDELLIN	BELLO	ITAGÜÍ
> 65 dB(A) Día	985	212	88	45	51	38
> 55 dB(A) Noche	1.611	313	153	73	75	66



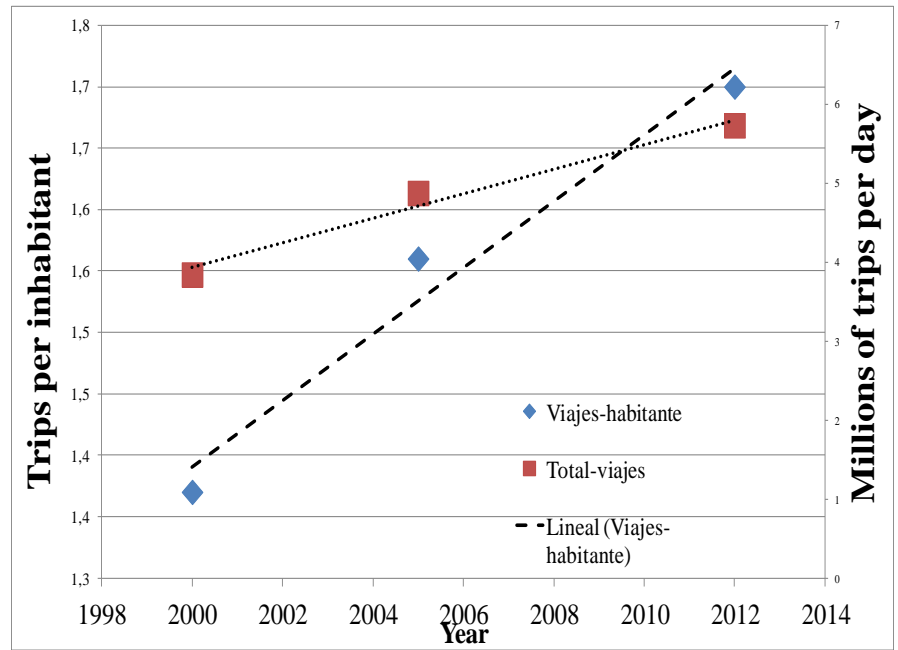
Road corridors are the main focus of environmental noise

HOW DO WE MOVE?



• Agency for Cooperation and Investment of Medellín and the Metropolitan Area – ACI Medellín

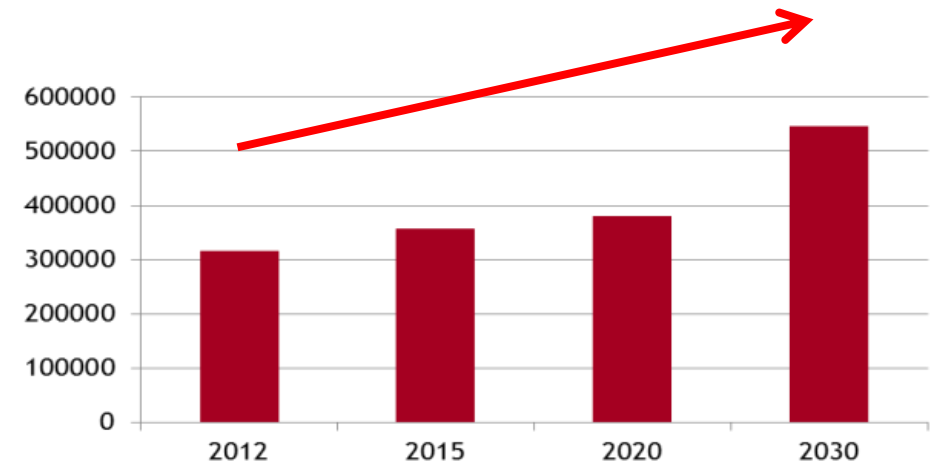
MOTORIZED TRIPS INCREASE AND PERCENT MODE SHARE TO PUBLIC TRANSPORT DECREASE



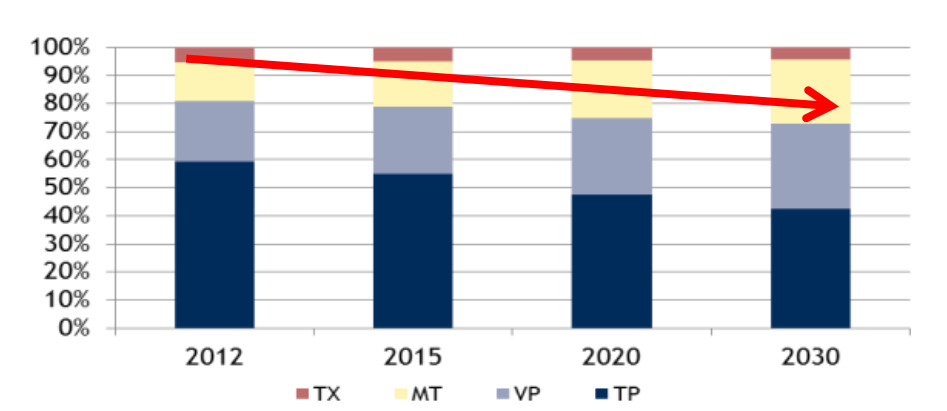
Contrast scenery:
Implementation of all planned interventions (programs, plans and projects) - optimistic

Fuente: Elaboración propia con base en Aplicación del Modelo de Cuatro Etapas EMMME 3

Total Motorized trips | Contrast scenery



% Trips by mode | Contrast scenery



TX: taxi, MT: motorcycle, VP: private car, TP: public transport

A CULTURE AND AWARENESS PROBLEM



The preference for individual transport over public transport remains a problem in the region, which makes it unviable in the medium and long term

LAST 15 YEARS

WHAT HAVE WE DONE?



INTEGRATED SYSTEM OF TRANSPORT FOR THE ABURRA VALLEY – SITVA



Metro. In operation since 1995
2 lines – 34 Km



Metroplus. BRT system
In operation since 2011
2 lines – 26 Km



Tramway
In operation since 2015
1 lines – 4.3 Km

Integrate urban bus
150 routes



Metrocable -Urban Cable cars.

In operation since 2004
4 lines – 11 Km



City card



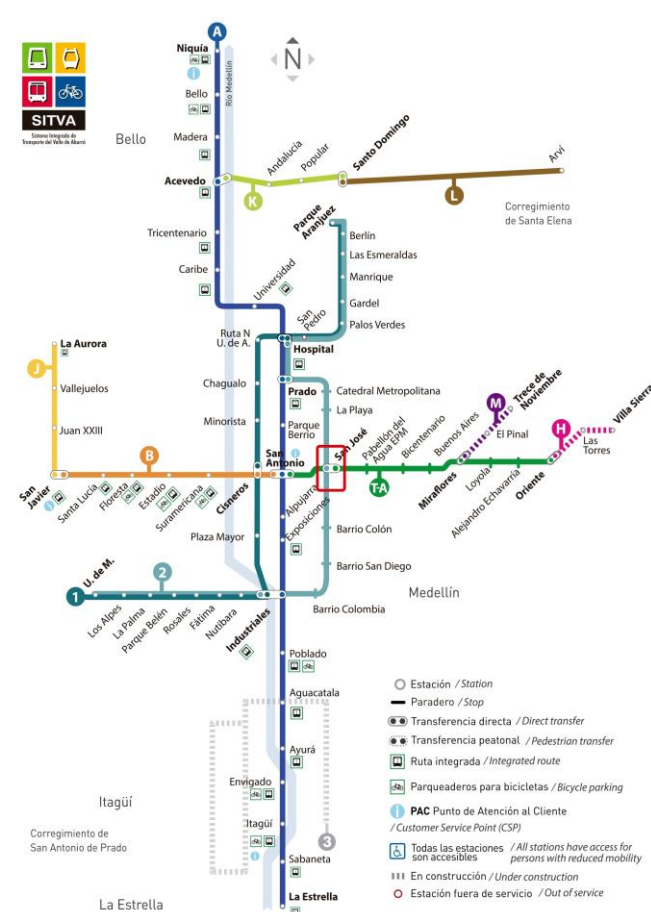
Encicla – System of public bikes – Free rate
In operation since 2011
51 Stations – 1200 bikes



CURRENT MOBILITY SYSTEMS IN THE ABURRA VALLEY CLEAN ENERGY TRACTION



SCHEMATIC MAP OF MULTI-MODAL PUBLIC TRANSPORT NETWORKS



METRO / Metro Urban Train

- Linea 4 Niquia - La Estrella - Niquia
- Linea 5 San Antonio - San Javier - San Antonio

CABLE / Aerial Cable Car

- Linea 6 Oriente - Villa Sierra - Oriente (en construcción)
- Linea 7 San Javier - La Aurora - San Javier
- Linea 8 Acevedo - Santo Domingo - Acevedo
- Linea 9 Santo Domingo - Avil - Santo Domingo
- Linea 10 Miraflores - Trece de Noviembre - Miraflores (en construcción)

TRANVÍA / Tramway

- Linea 3 San Antonio - Oriente - San Antonio

BUS / BRT (Bus Rapid Transit)

- Linea 1 U. de M. - Av. del Ferrocarril - Parque Aranjuez - Av. del Ferrocarril - U. de M.
- Linea 2 U. de M. - Av. Oriental - Parque Aranjuez - Av. Oriental - U. de M.

HOLA METRO 444 95 98



TRANVÍA / Tramway

- Linea 3 San Antonio - Oriente - San Antonio

BUS / BRT (Bus Rapid Transit)

- Linea 1 U. de M. - Av. del Ferrocarril - Parque Aranjuez - Av. del Ferrocarril - U. de M.
- Linea 2 U. de M. - Av. Oriental - Parque Aranjuez - Av. Oriental - U. de M.

BICICLETA/PEATÓN / Bicycle/Pedestrian

- Linea 3 Cicloruta
- Linea 5 Red Caminera



METRO / Metro Urban Train

- Linea 4 Niquia - La Estrella - Niquia
- Linea 5 San Antonio - San Javier - San Antonio

CABLE / Aerial Cable Car

- Linea 6 Oriente - Villa Sierra - Oriente
- Linea 7 Miraflores - Trece de Noviembre - Miraflores (en construcción)

🚲 Parqueaderos para bicicletas / Bicycle parking

○ Estación / Station

▬ Paradero / Stop

● Transferencia directa / Direct transfer

● Transferencia peatonal / Pedestrian transfer





CALIDAD DE VIDA



Alcaldía de Medellín
Cuenta con vos



LAST 15 YEARS

HOW HAVE MEDELLIN AND THE METROPOLITAN AREA CHANGED?





EDUCATION AND CULTURE TOOLS OF TRANSFORMATION



Build on what is already built

Social Acupuncture

Dignity of the public

Involving the community in the change



Antioquia's Museum



We used the Cable Car as
public transportation for
social transformation



West Cable Car

GEOGRAPHICAL CHALLENGE

A narrow and hilly territory drove the development of a technology that allowed climbing through the strong slopes of Medellín's neighborhoods to solve the accessibility needs of low income inhabitants and integrate them to a mobility network.



Equity came by cable...

ENGINEERING FOR EQUITY AND INCLUSION

Cable cars were outlined as the most technically appropriate solution for climbing the hills, brought development to slums located there by allowing their inhabitants to commute to downtown city in about 20 minutes, a trip that used to last one hour.

Line K: First cable car used to public massive transportation, built in 2004.

Line J: Built in 2008.

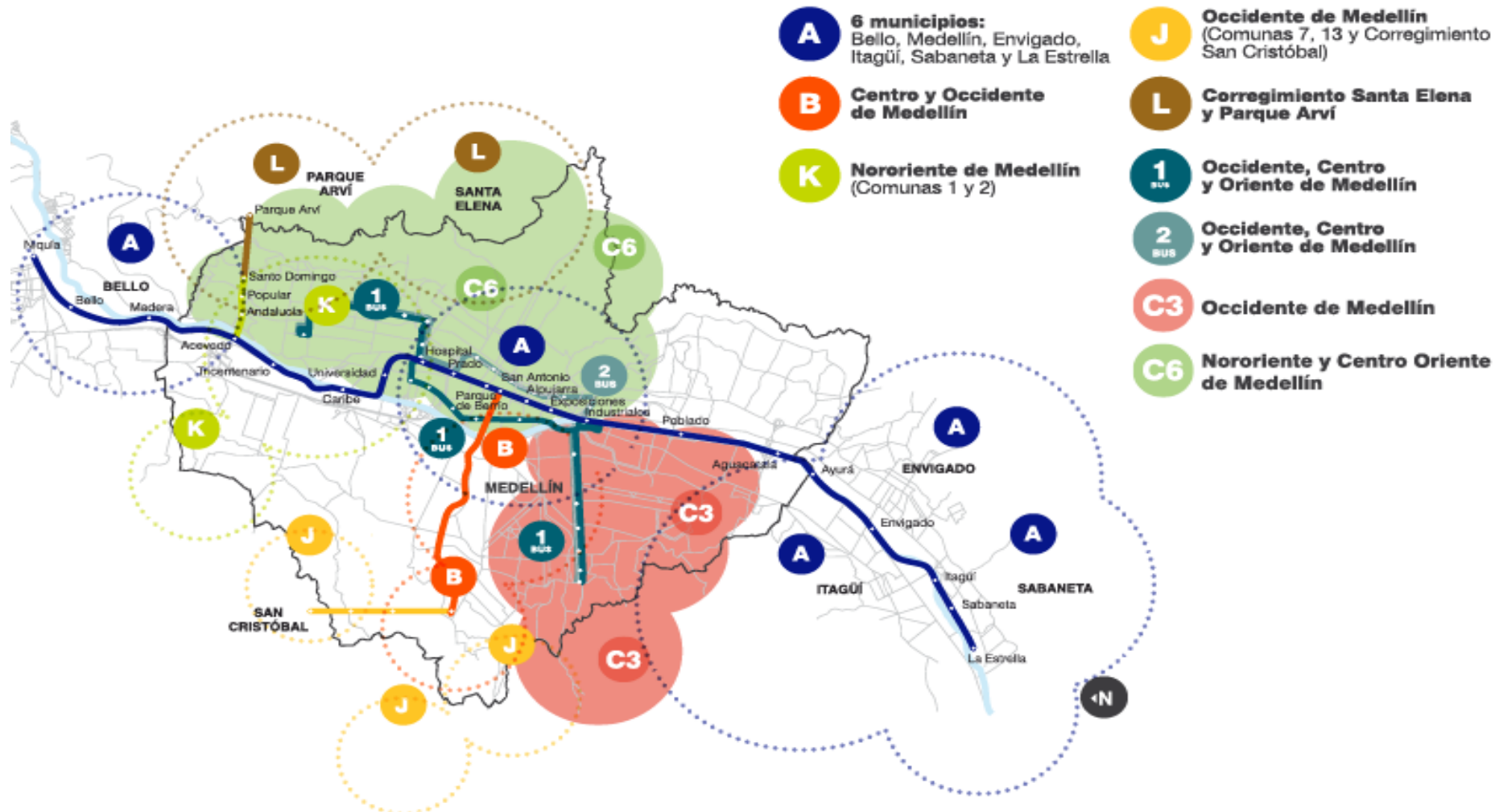
Line L: Touristic cable car, integrated to Line K, built in 2010.

Line H: Integrated to the new tram system, built in 2016. **Line M:** Integrated to the new tram system, in construction

Line P : in bidding process



COVERED AREA



A POPULAR NEIGHBORHOOD OF MEDELLÍN LANDSCAPE WITH A CABLE WAY SYSTEM





Linking the city : implementing a creative solution to improve the transport system and the quality of life.



Linking the city : responding to population's needs.



Linking the city: generating social inclusion and articulating the territory.



Linking the city : promoting rules and norms from the new dynamic of the territory.

URBAN TRANSFORMATION



URBAN TRANSFORMATION



URBAN TRANSFORMATION



URBAN TRANSFORMATION – Santo Domingo cable

España library park

Cedezo Sto. Domingo

Urban corridor la 106

Santo Domingo Station

la Herrera linear park

Police station

Mirador bridge

Andalucía Station

Popular Station

The peace bridge

La Herrera 2 habitational project

Urban corridor la 107

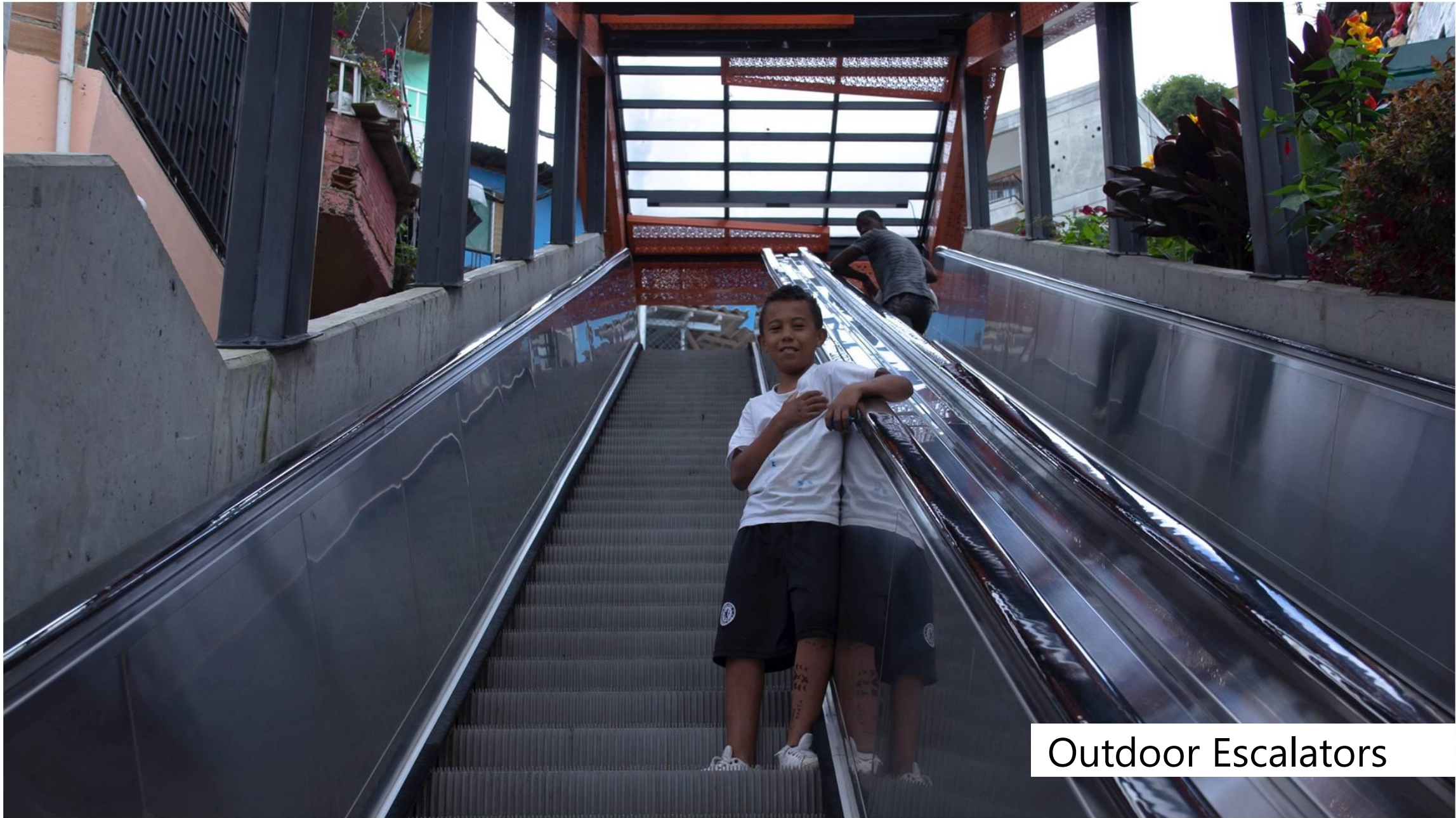
Juan Bobo I y II habitational project

Acevedo Station





We used the escalators to bring
mobility, thus constructing
equity



Outdoor Escalators



Outdoor Escalators

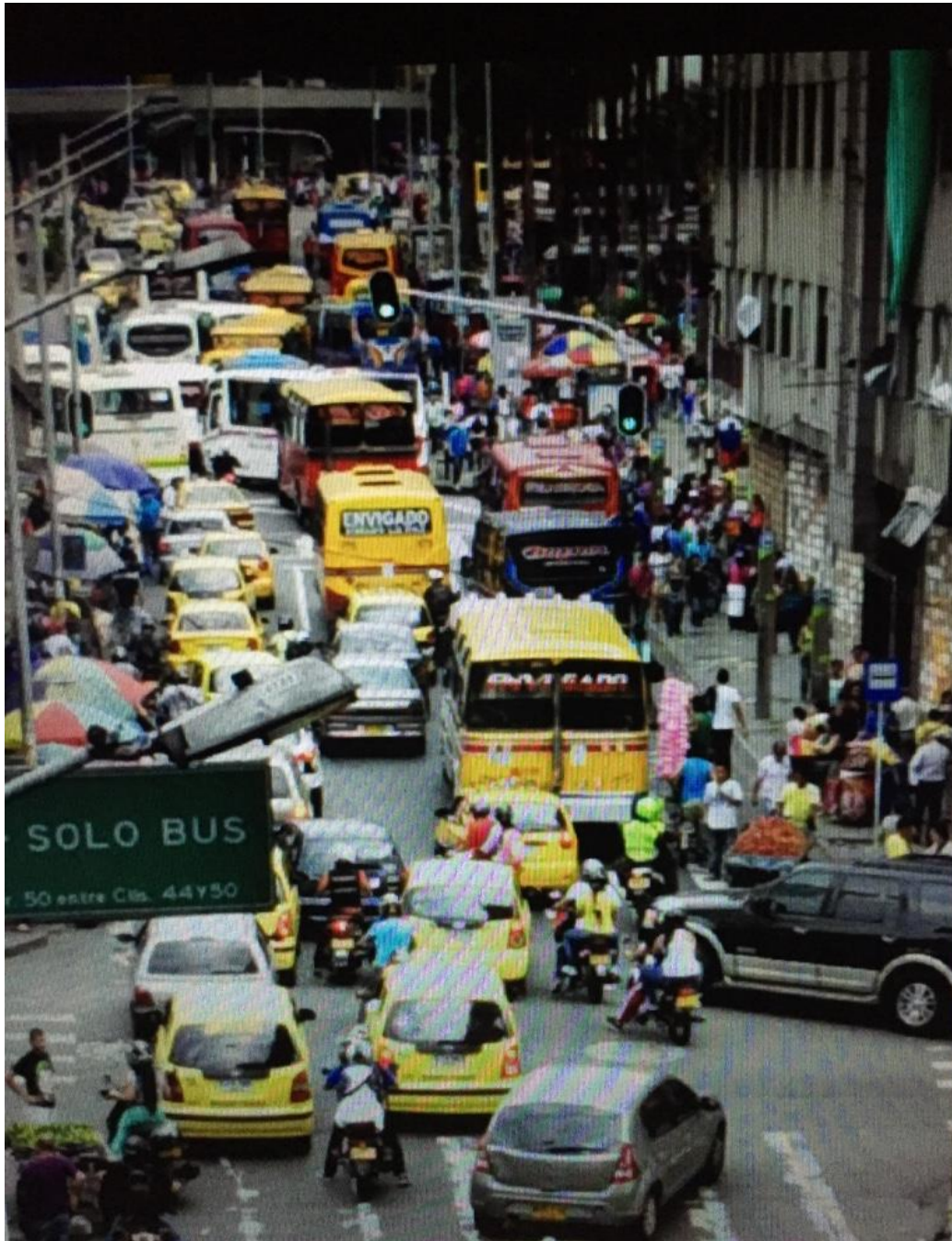


PROJECTS AND INTERVENTIONS IN THE CONTEXT OF STRATEGICAL INTERVENTION AREAS



Ayacucho Tram and associated cables





Ayacucho's Tram
station



Ayacucho's Tram station



Metro is more than a
transport system, it is
a space that
promotes citizen
culture



Metroplus
BRT System

INTEGRATED SYSTEM METRO – CABLEWAY AND BUS



San Javier
Station



ENCICLA THE PUBLIC BICYCLE SYSTEM FOR THE METROPOLITAN AREA

**Today: 51 stations (32 automatic - 19 manual)
1200 bikes**



ENCICLA THE PUBLIC BICYCLE SYSTEM FOR THE METROPOLITAN AREA



San Juan St.



**Today: 70 kms
of bikeways.**



ENCICLA THE PUBLIC BICYCLE SYSTEM FOR THE METROPOLITAN AREA

Automatic stations



PUBLIC TRANSPORT INTEGRATION PROJECTS

The CÍVICA city card is the mean of Sitva payment



PUBLIC TRANSPORT INTEGRATION PROJECTS

CÍVICA CITY CARD

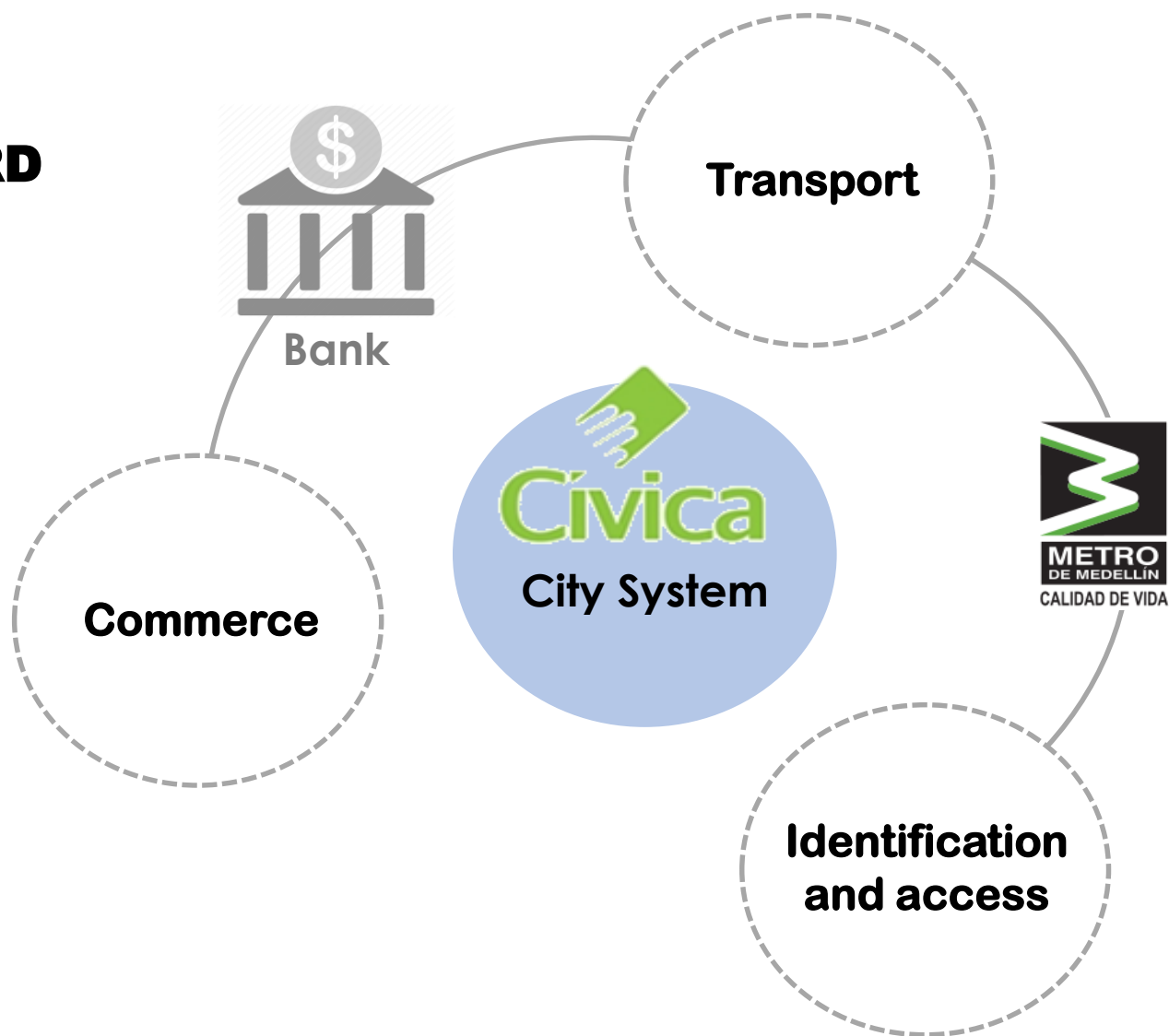


This card allows the access to different services that the city offers in a simple and safe way.

It also simplifies procedures like the admission to transports, public and private location's entrées, low value transactions and many more.

PUBLIC TRANSPORT INTEGRATION PROJECTS

CÍVICA CITY CARD





We think of an
environmentally
friendly mobility

EDGE PARK - TO CONTAIN POPULATION GROWTH ON THE SLOPES



Beltway Garden



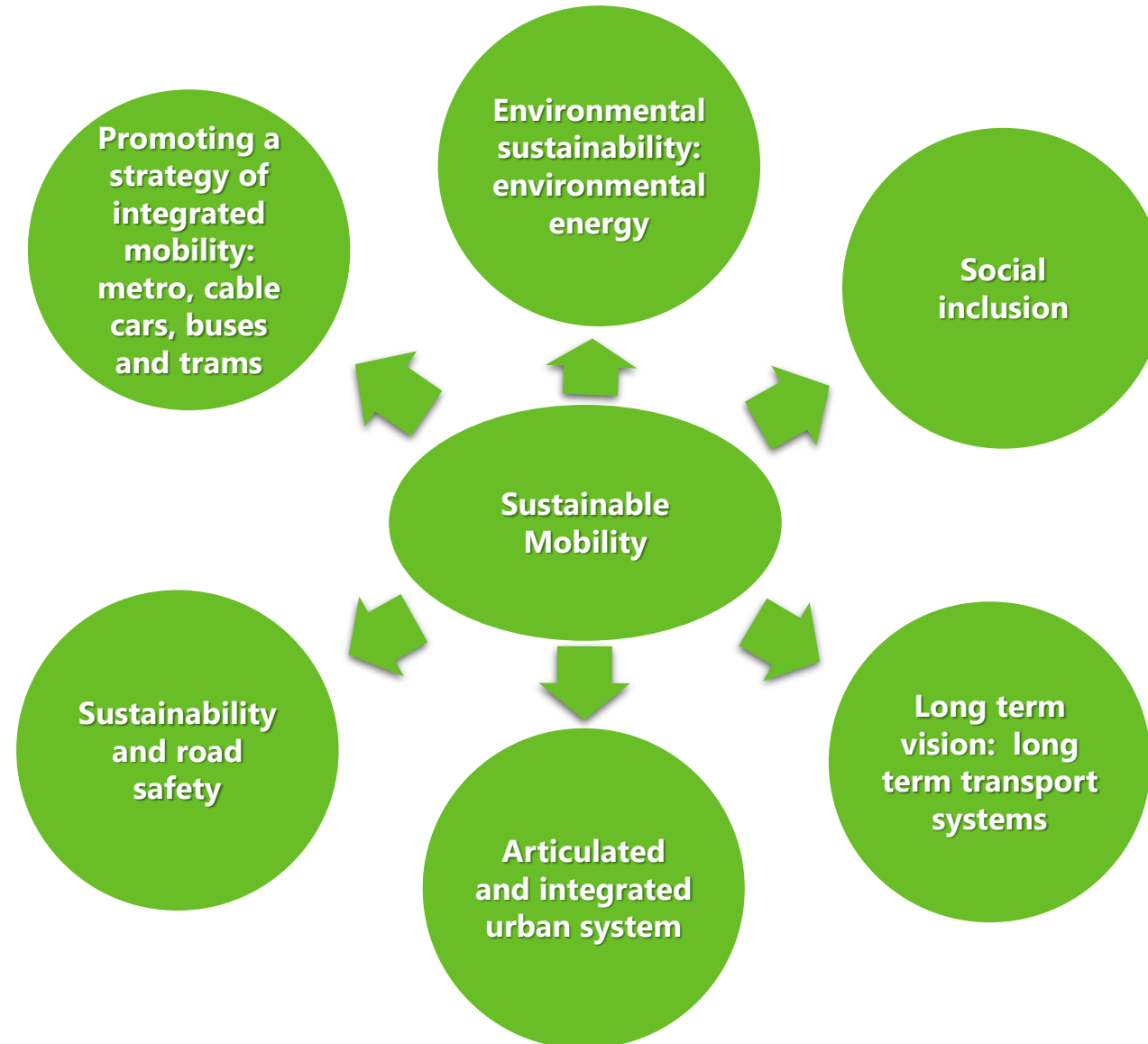
CURRENT INSTITUTIONAL MANAGEMENT

2016 - 2019

WHAT ARE WE DOING NOW?

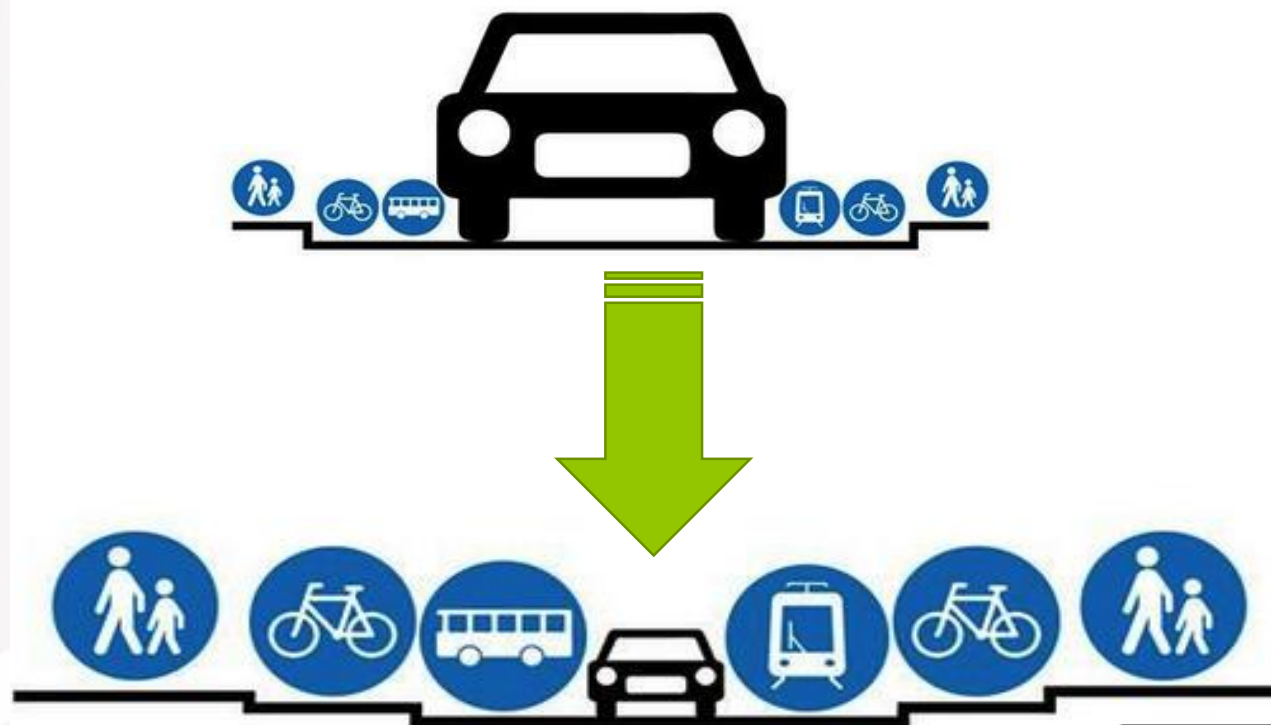
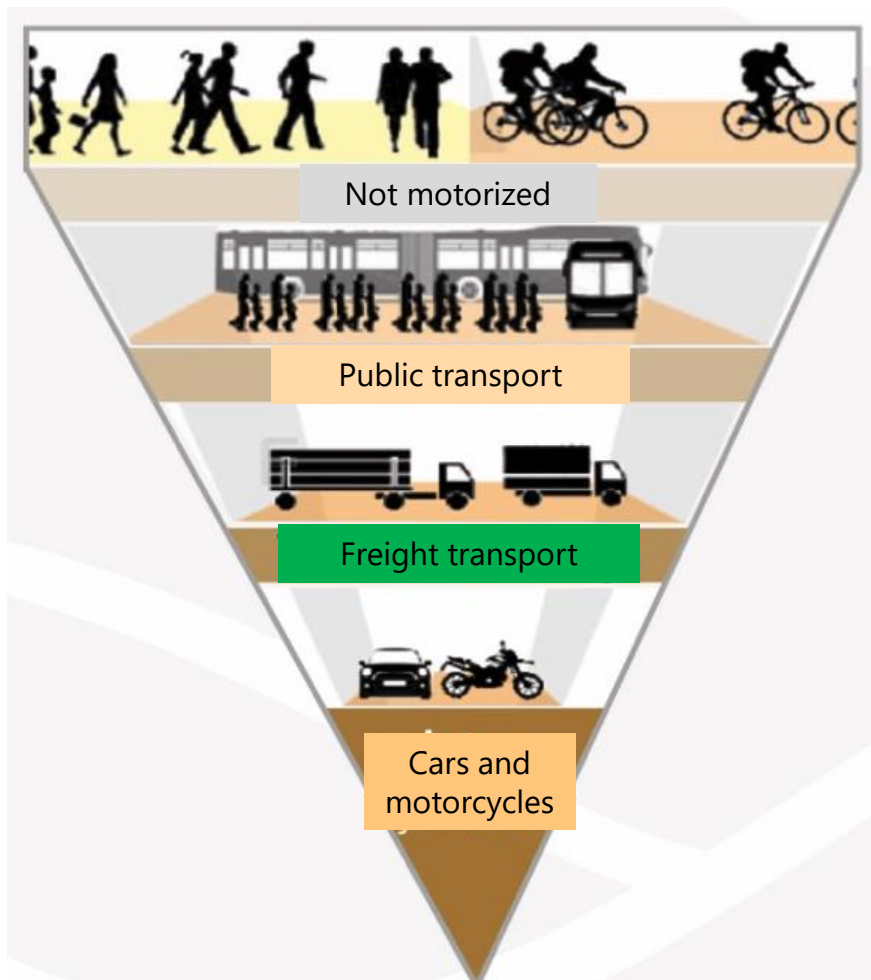


A COMMITMENT TO SUSTAINABLE MOBILITY



SUSTAINABLE AND EQUITABLE MOBILITY

Private vehicle is not longer at top of pyramid, giving its space to pedestrians



Reference: COPENHAGENIZE DESIGN CO. 2013

Reference: Quintana, D.; Sánchez, J.; Triviño, J.; et al. (2011) Ciclo Ciudades. Manual de movilidad integral ciclista para ciudades mexicanas. Chapter IV. Infrastructure. México: ITDP

PROGRAMS BY LINE AND COMPONENTS

LINE 3: SUSTAINABLE, SAFE AND FRIENDLY MOBILITY

Non-motorized mobility



Infraestructura
segura e incluyente



Crosses and intersections operated for
pedestrian and cyclist safety

100%

New road connectivity projects
including infrastructure for non-
motorized mobility



120

Kilometers

infrastructure
built for non-
motorized
mobility

NEW WAYS PROJECTS... BUT WITH A ECOMOBILITY CONCEPT



**including an ecological and
bike-walkability corridor**



PUBLIC TRANSPORT INTEGRATION PROJECTS



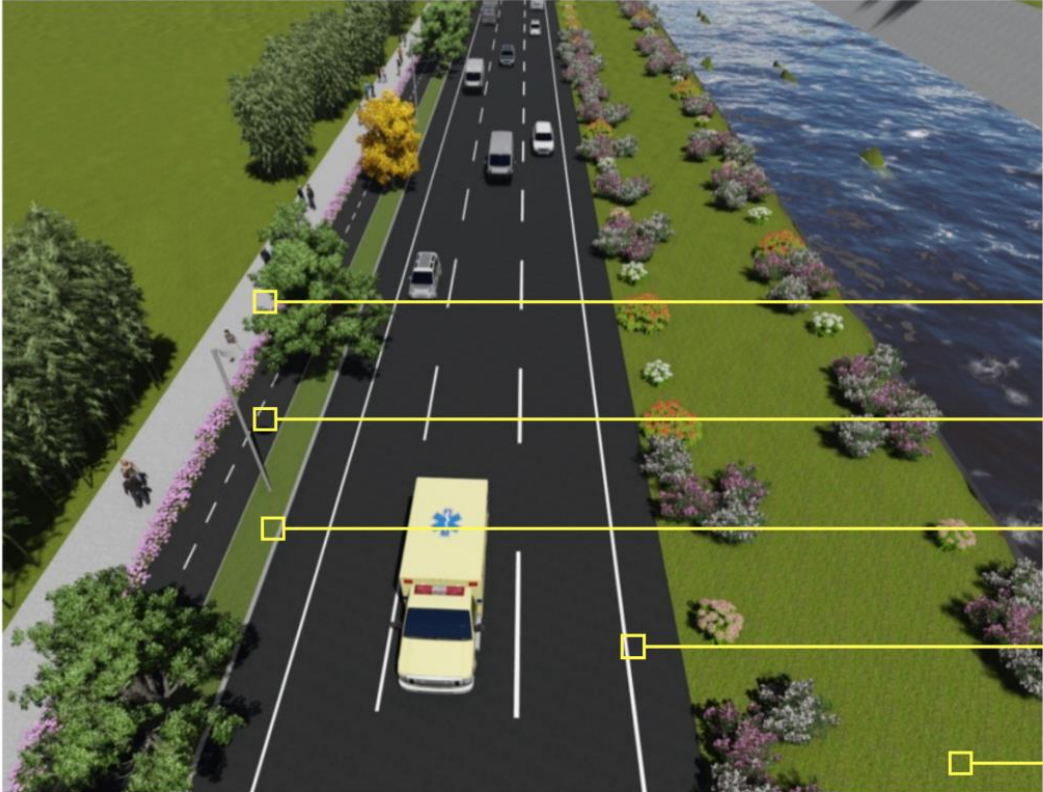
Bidirectional bikeway + pedestrian walkway



DESIGN CONCEPT FOR NEW ROADS

20 Kms of roads with bike-walkability and ecological corridor

DISEÑO CONCEPTUAL



- Sendero de caminabilidad: 3 metros
- Cicloruta bidireccional: 2.5 metros
- Corredor ecológico: 2.5 metros
- Vía regional: 14 metros
- Retiro férreo: 14 metros



Sección típica
Regional Norte.

PROJECT REGIONAL AVENUE

STAGE 1 - MEDELLÍN

N.	Description	Unit	Quantity
1	Avenue lenght	meters	3.250,0
2	Avenue with include 3 lanes and 2 road shoulders.	meters	14,1

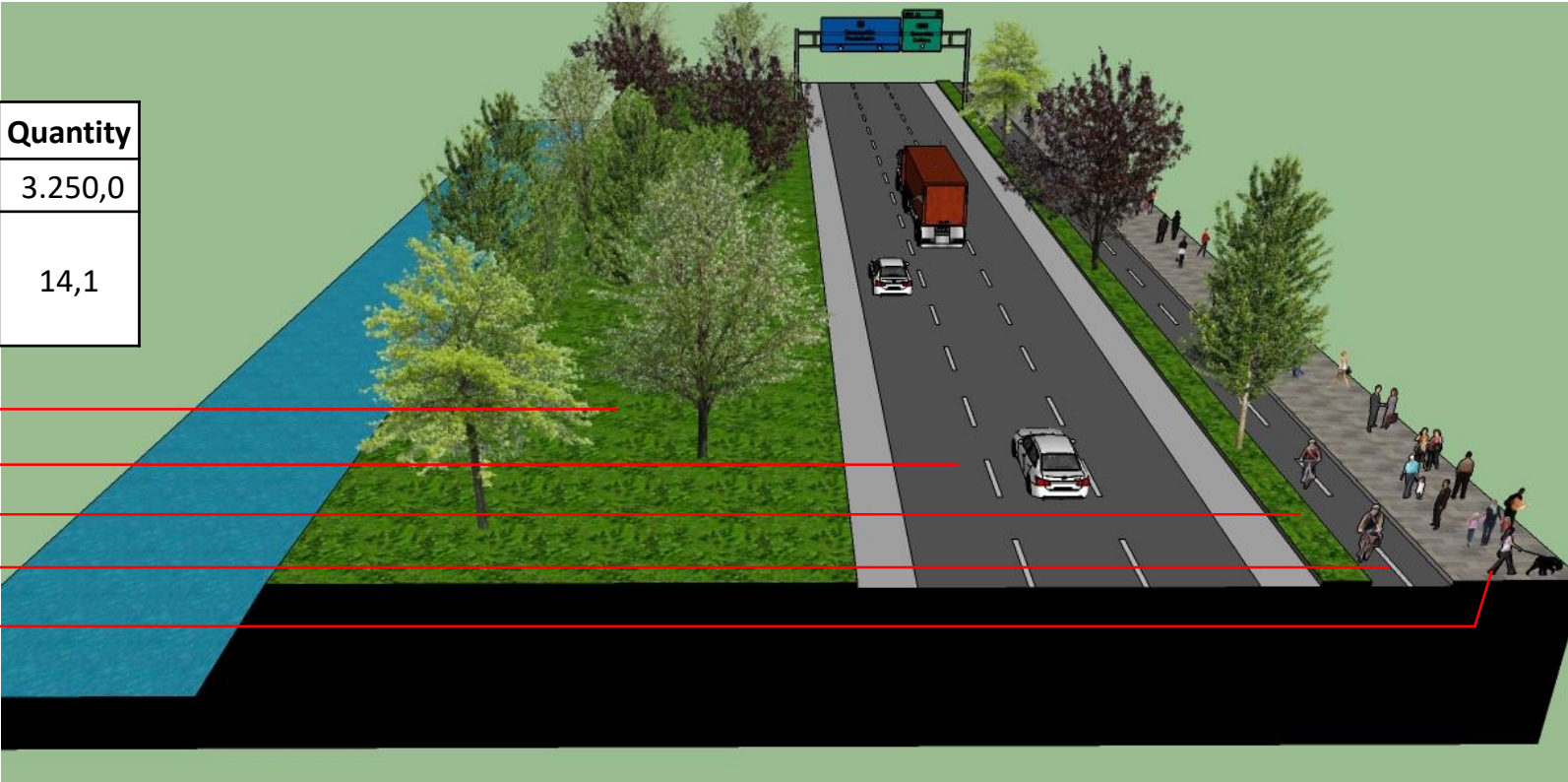
Area set aside for future railway

Regional Avenue 14.2 m

New central reservation 1.5 m

New bidirectional bikeway 2.5 m

Walkway 4 m



CYCLING INFRASTRUCTURE

General description

Construction of sections of cycling in all the municipalities of the Aburra Valley, joining their centralities and allowing active mobility.

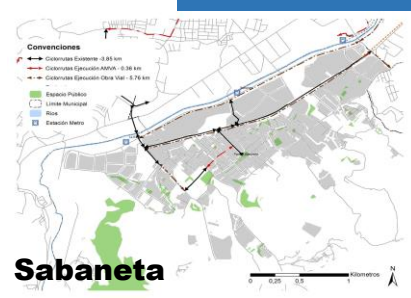
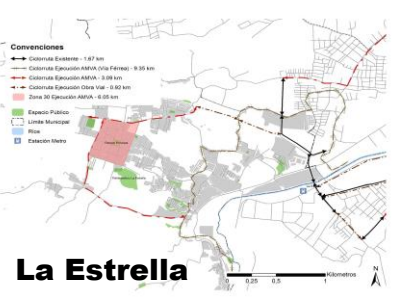
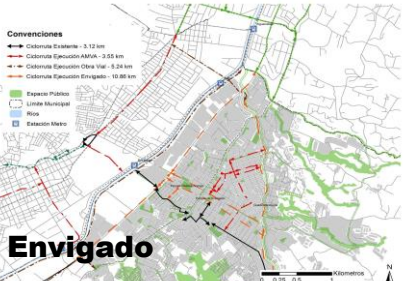
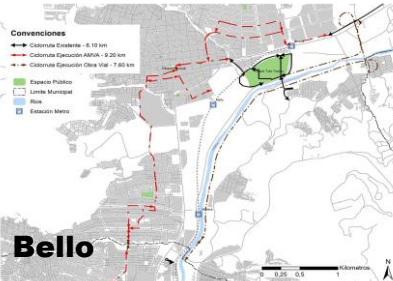
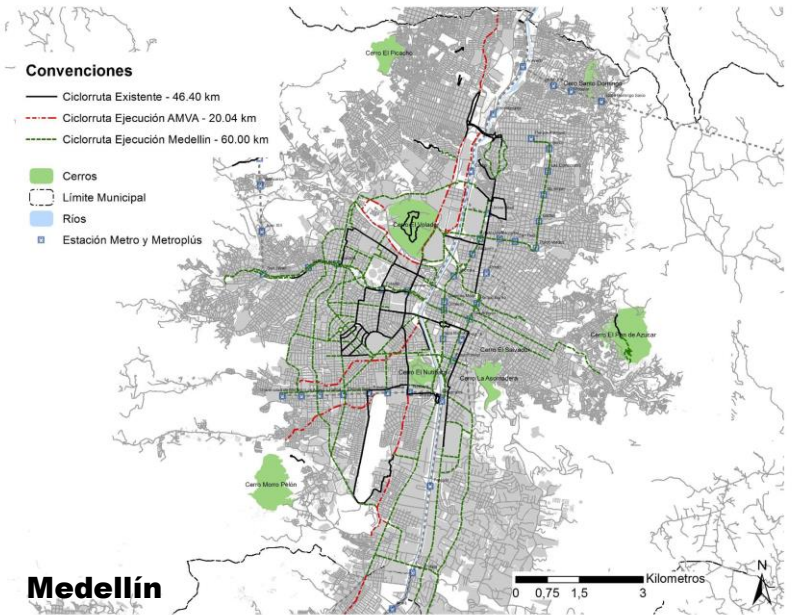
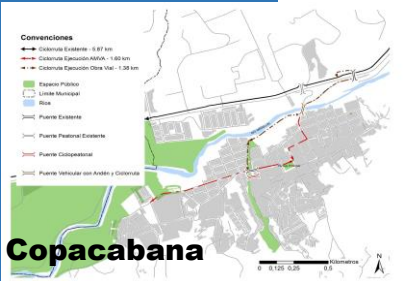
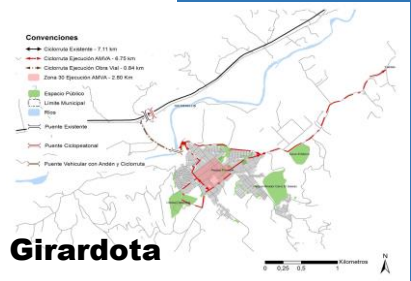
Current condition:

- Detailed designs in Barbosa, Girardota, Copacabana and Bello
- Due date of the designs: July 2017
- In contracting of work: Itagüí

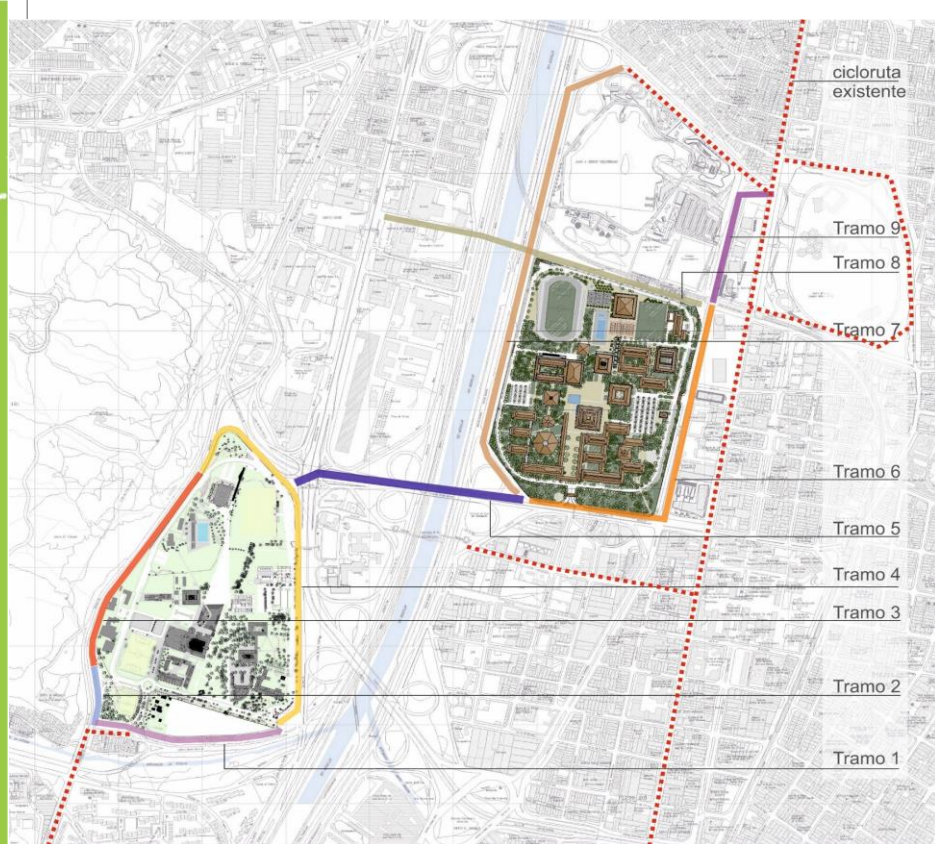


LENGTH:
120 Km

PUBLIC TRANSPORT INTEGRATION PROJECTS



> Encicla
> Bikeways



A nice project.
A bikeway that joins and
surrounds the two main
universities of Medellín

Photomontage – Outside National University

PROJECT INTERVENTION ARCHETYPES



Current picture

Old railroad corridor



Photomontage

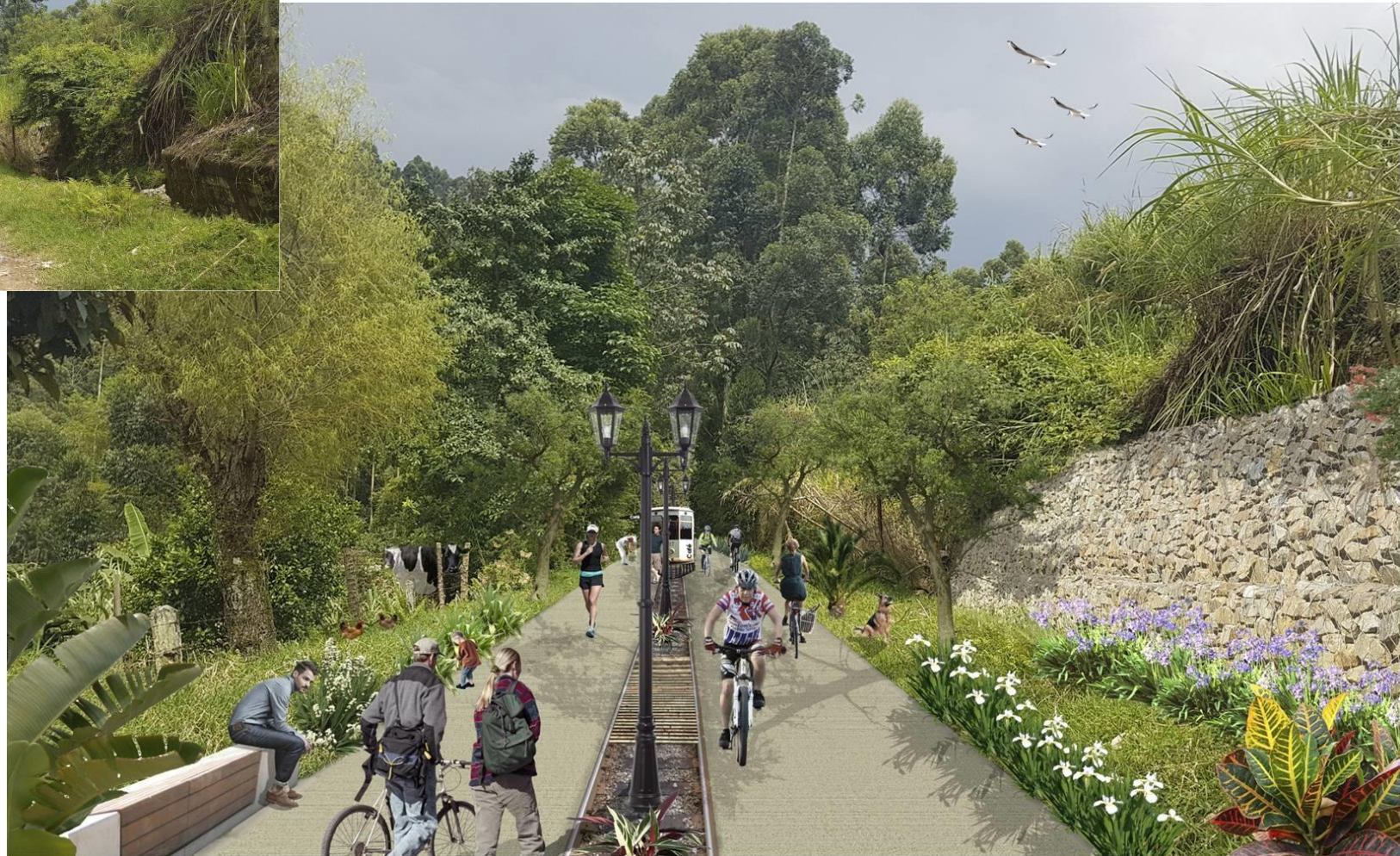
PROJECT INTERVENTION ARCHETYPES

Current
picture



Old railroad corridor

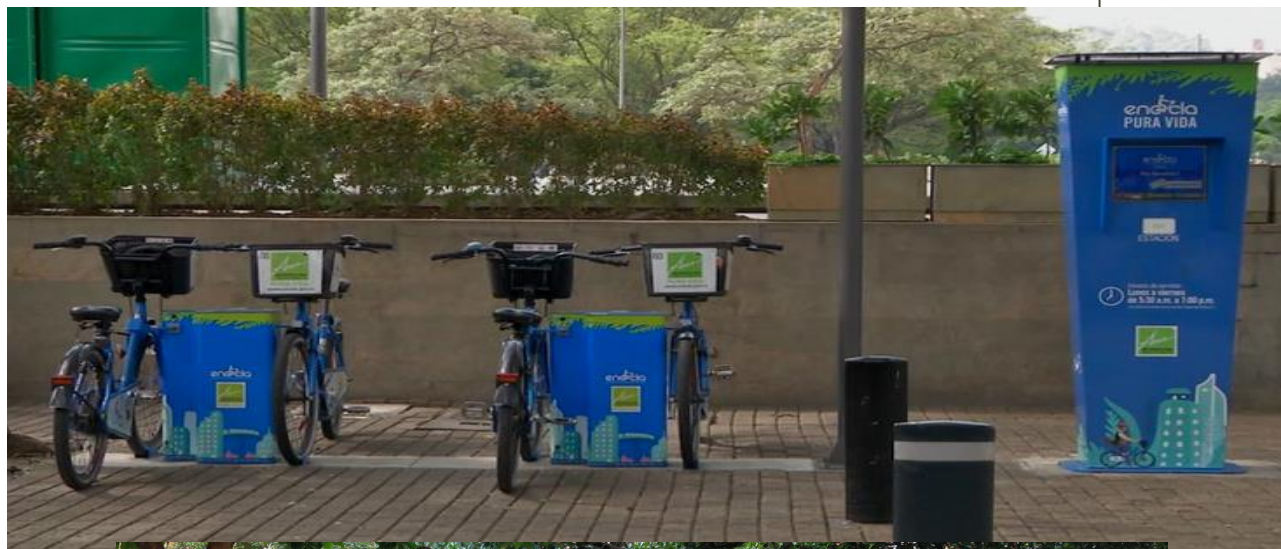
Photo
montage



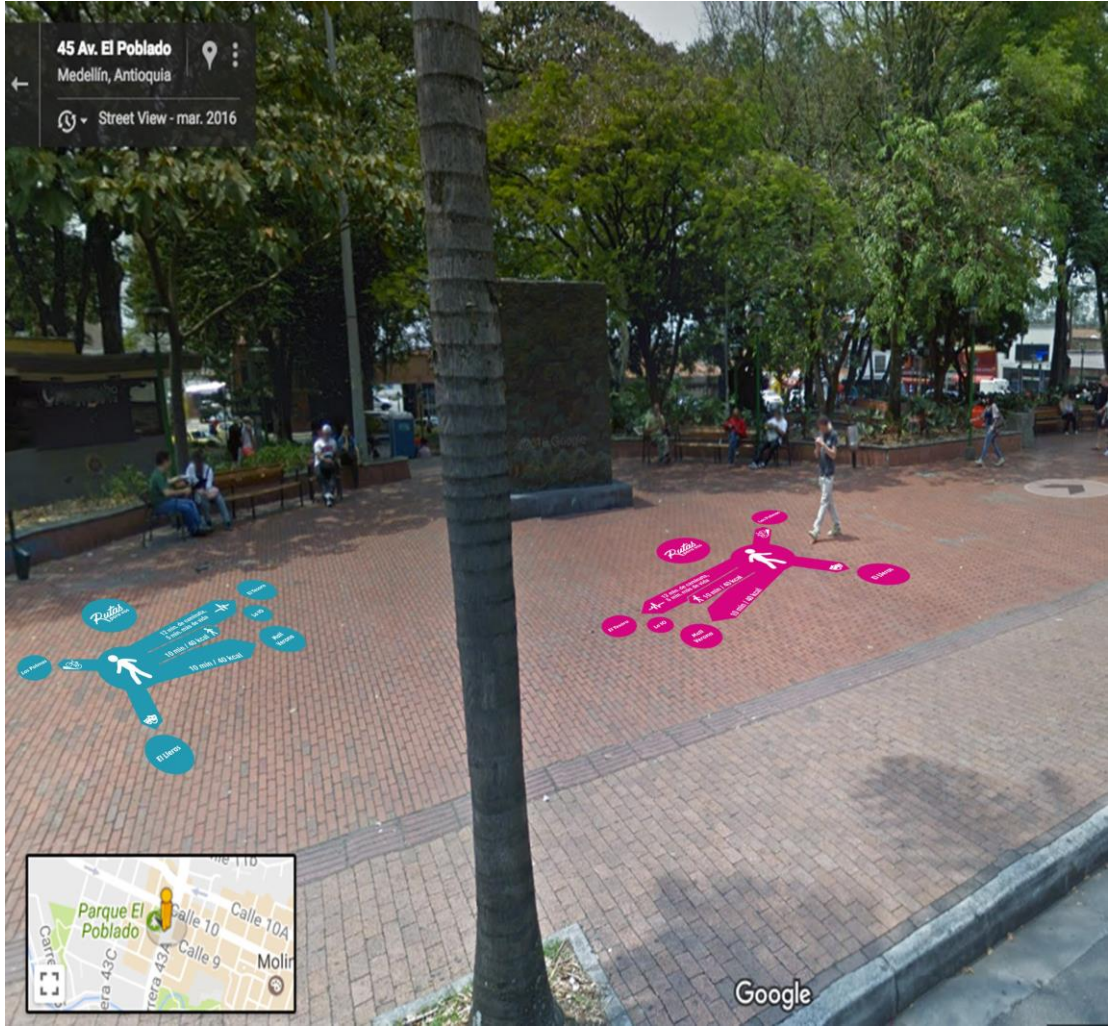
PUBLIC TRANSPORT INTEGRATION PROJECTS – CYCLE PARKING

Provision of cycle parking

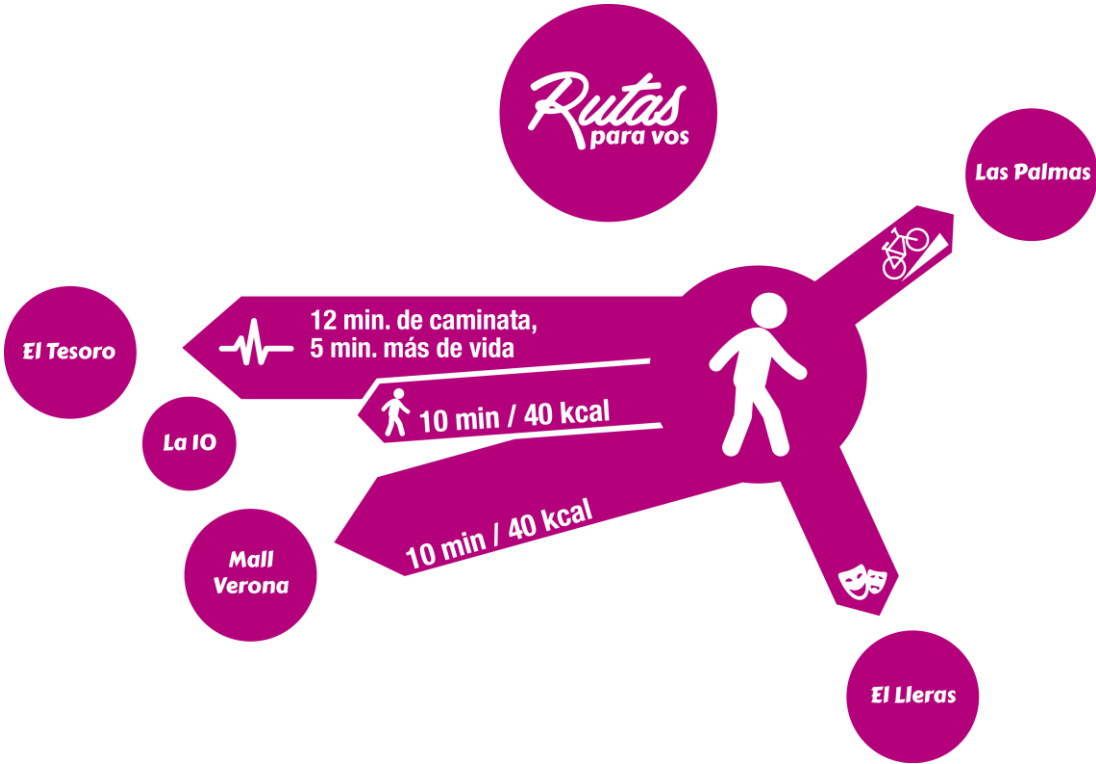
100 NEWS CYCLO PARKING IN THE 10 MUNICIPALITIES



SIGNALING IN WALK/BIKEABILITY



Experience



“LA 80” AVENUE CORRIDOR TRAMWAY



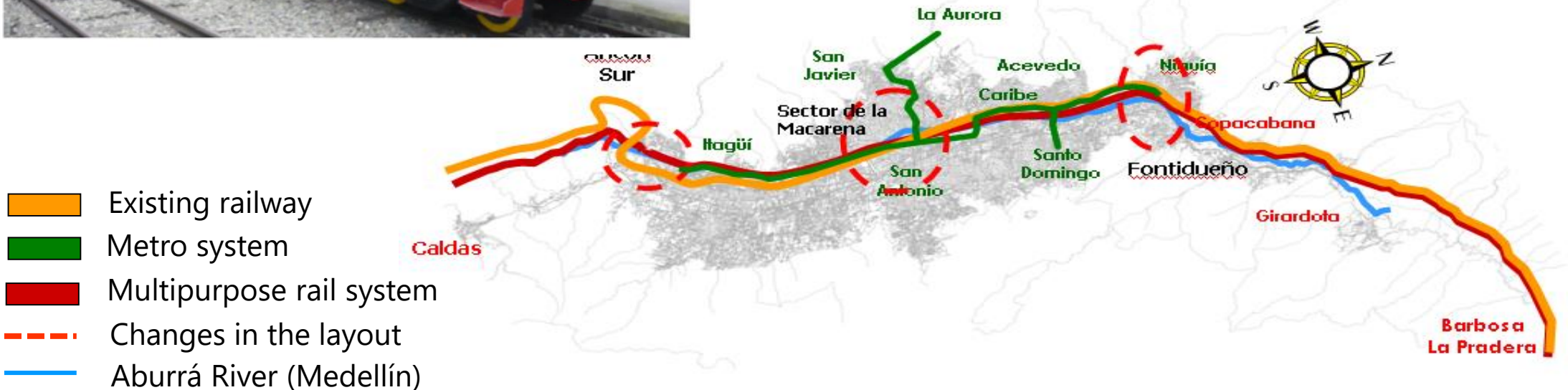
Parameter	Description
Length	13,5 m
technology	Standard tram – steel wheels
Average Speed	25 km/h
Stops	4 stations and 15 stops
Frecuancy	4 minutes HMD

ANTIOQUIA'S RAILWAY – MULTIPORPOSE SYSTEM PASSENGERS, SOLID WASTE AND CARGO



Multipurpose System

Line in study : Caldas - Barbosa
Lenght: 80 Kms



ELECTRIC MOBILITY



ELECTRIC MOBILITY





FOR A SUSTAINABLE MOBILITY



MEDELLIN
BUILDING
TRUST



Alcaldía de Medellín
Cuenta con vos

TRUST

To recover the downtown and start
working again for our territories



Alcaldía de Medellín
Cuenta con vos

TRUST

To protect the environment together

ΕΥΧΑΡΙΣΤΙΕΣ | **Kiitos** | **Takk** | **Gràcies**
謝謝 | **Gracias** | **Terima kasih** | **Obrigado**

THANK YOU

Grazie | **Danke** | ركش | **спасибо** | **Merci** | 감사
Takk | **Bedankt** | **Teşekkürler** | **Хвала** | **Díky**



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