# ONE OF THE LARGEST TRAFFIC AND TRANSPORT ENGINEERING COMPANIES IN BRAZIL

ENGINEERING AND MOBILITY

imtraff — iRAP ACCREDITED

# WORLDWIDE PRESENCE

México
Panamá
Equador
Peru
República Dominicana
Angola
Brasil
Moçambique

With over 550 projects developed and technically recognized in 08 countries and 24 Brazilian states, for more than 200 private companies and public agencies, ImTraff positions itself as one of the mobility and transportation leaders in Latin America.
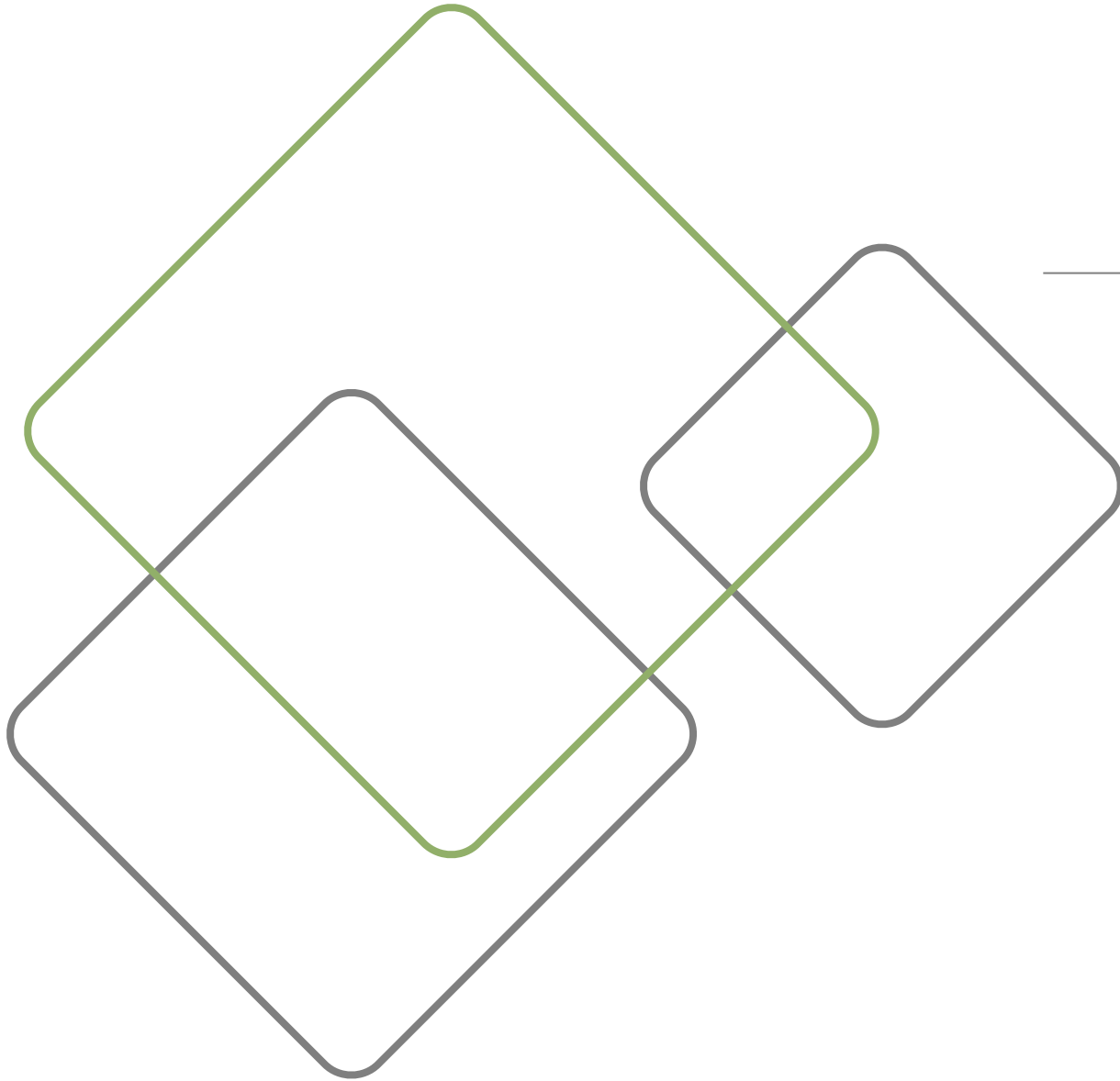
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# iRAP ACCREDITED

- ✓ Survey
- ✓ Coding
- ✓ Analysis

ImTraff is one of the few companies in the World with full Accreditation to implement the iRAP methodology.

## iRAP
International Road Assessment Programme

## imtraff
ENGENHARIA E MOBILIDADE
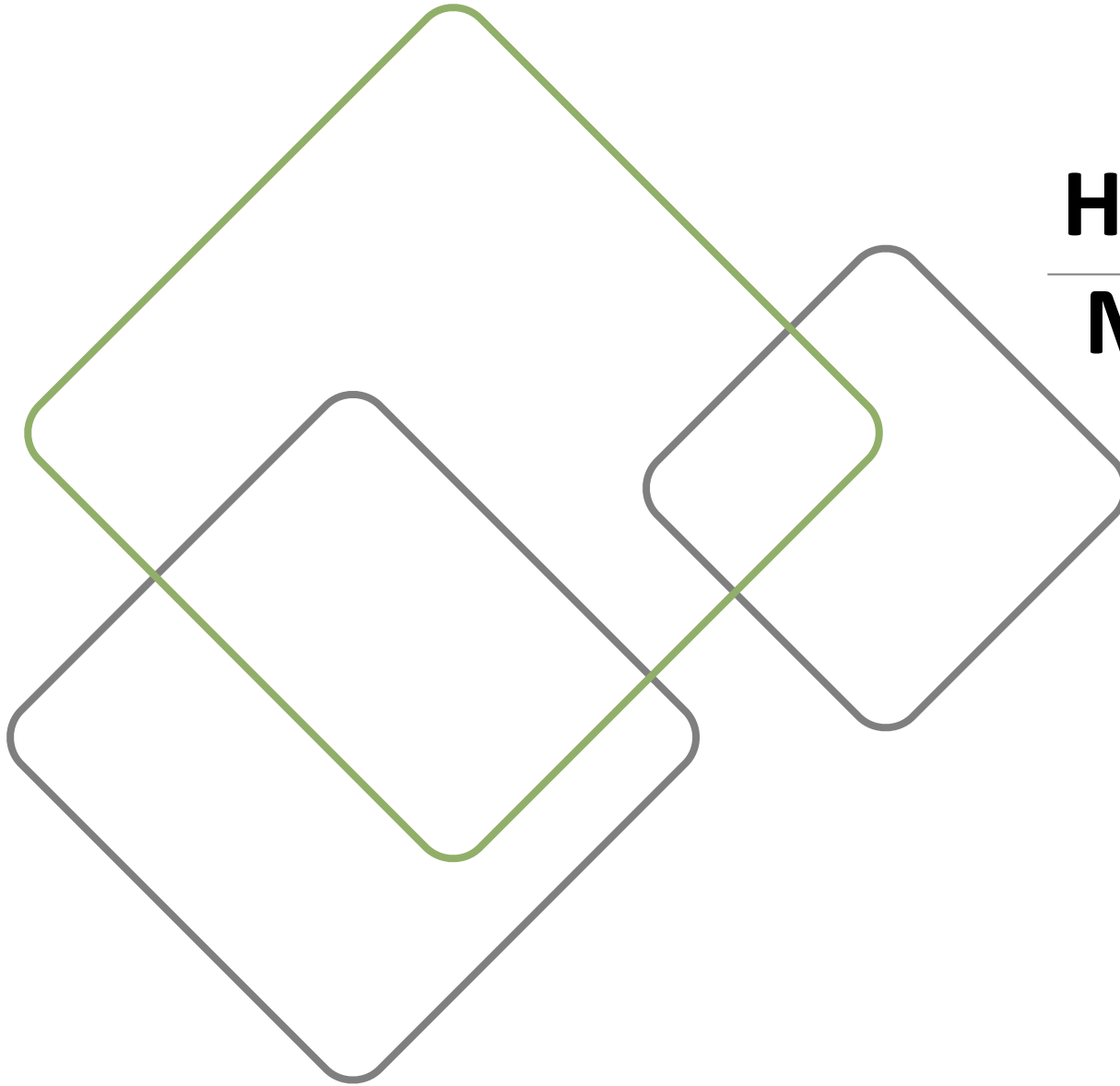
# URBAN MOBILITY

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## The needs of an urban life…

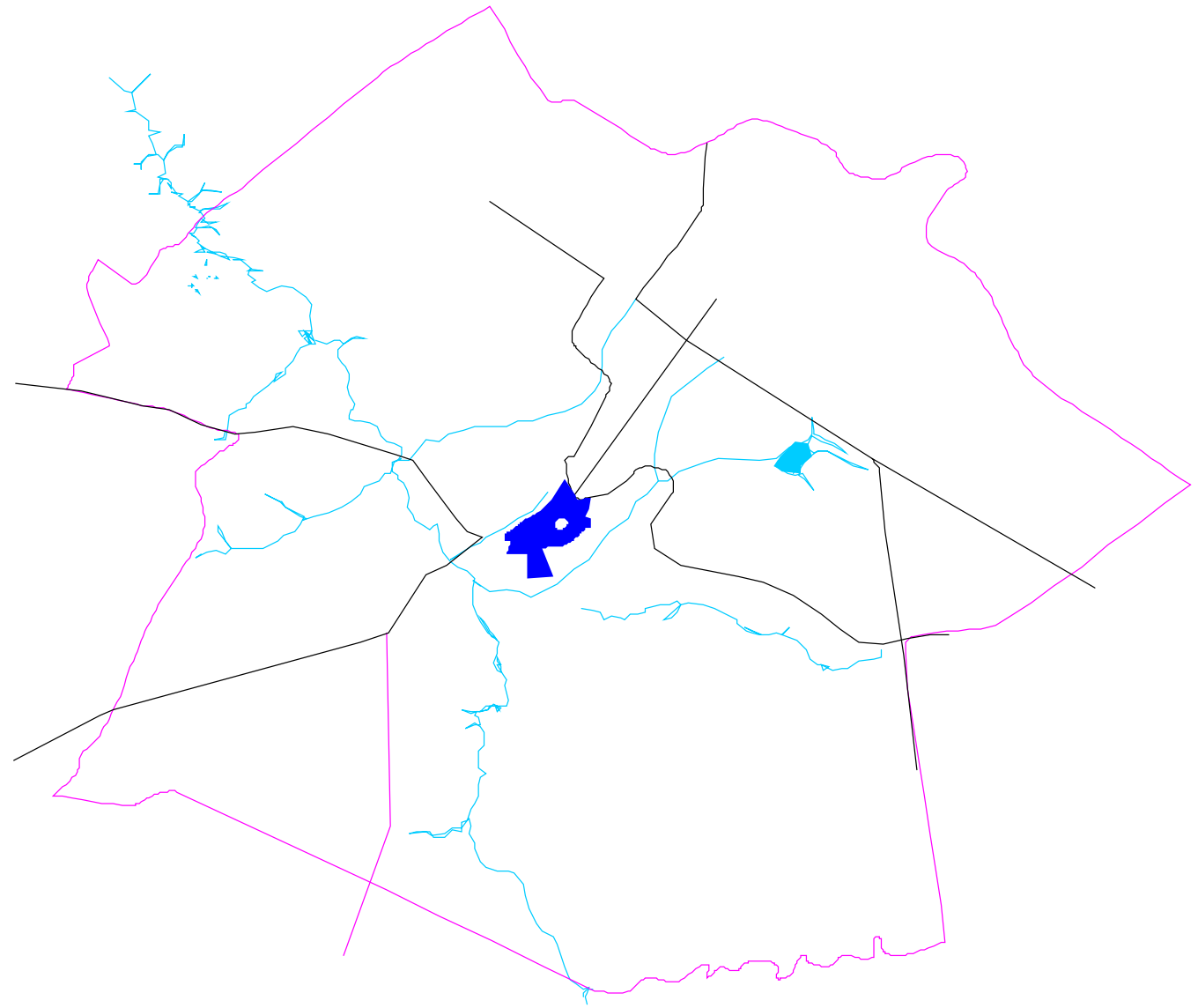How **easy, safe, inclusive and sustainable** is to move within a city, for any reason?

How much the urban mobility conditions are prepared to make people's life easier, in developing countries?

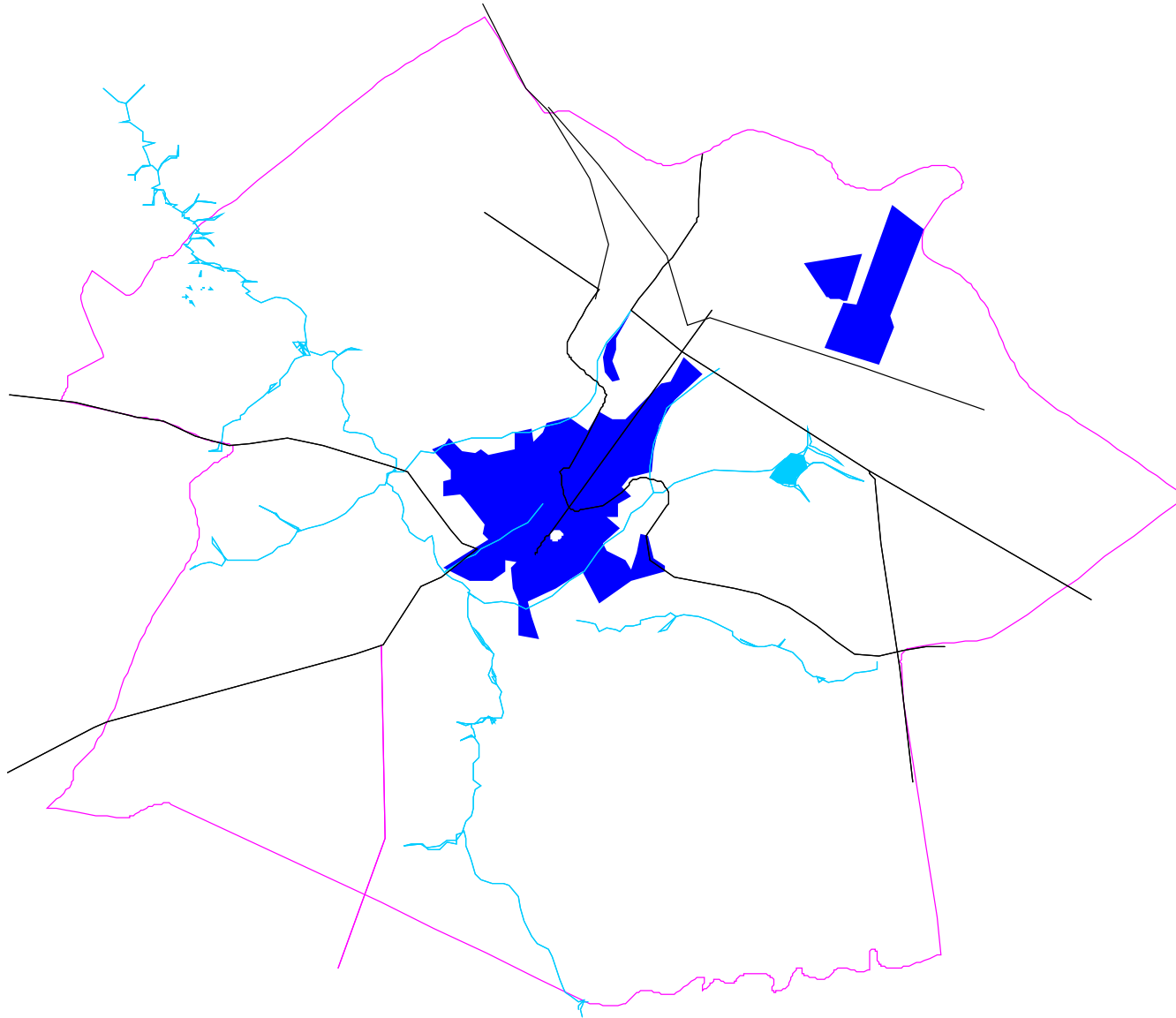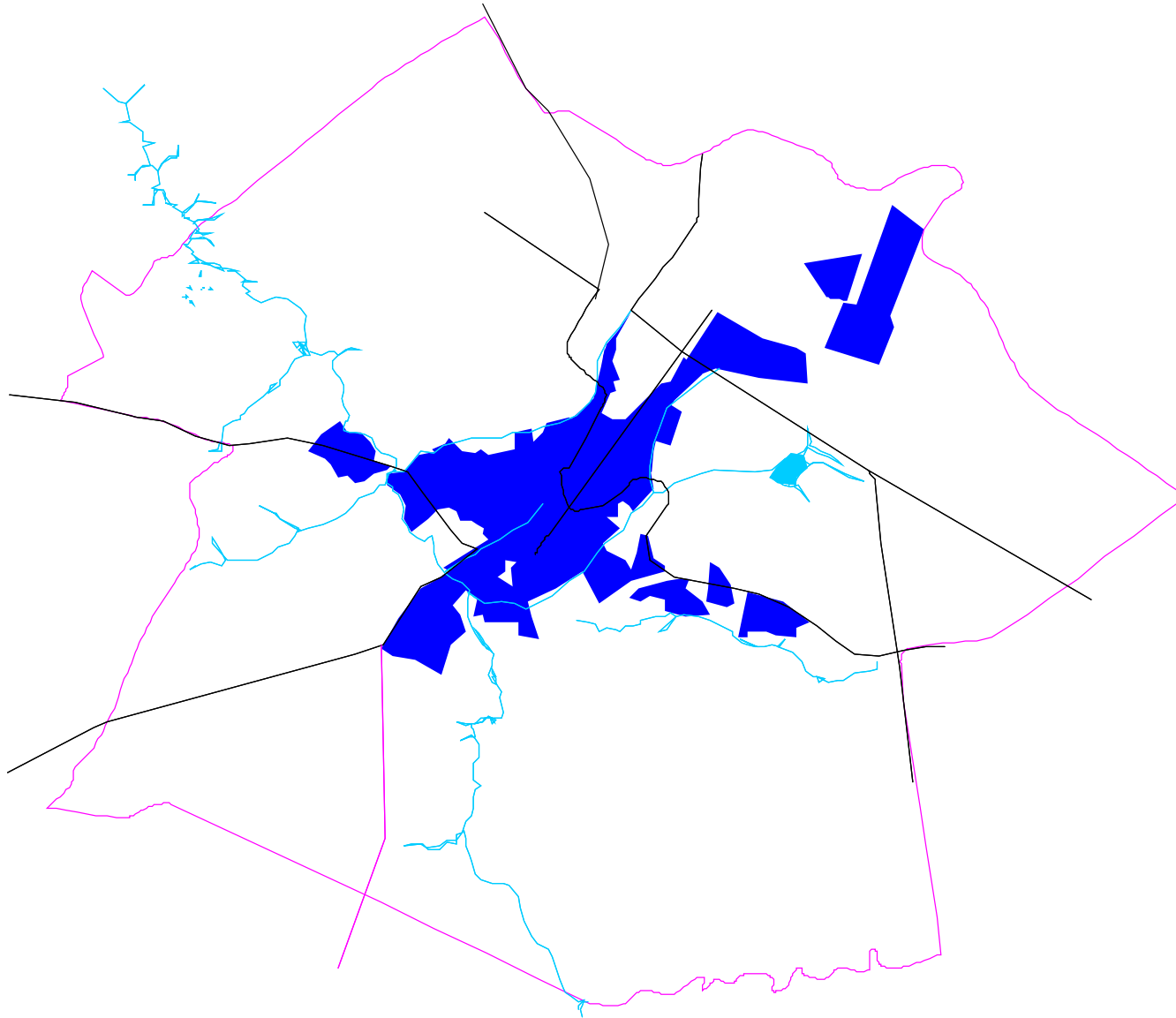And what are we doing concerning that?

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# HOW DID OUR URBAN MOBILITY PROBLEMS BEGIN ?

**1927**



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## 1940

**1950**

# AND IT WAS LIKE THAT FOR MANY YEARS...

## 1960

## 1970



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**1980**

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# How are our cities today?
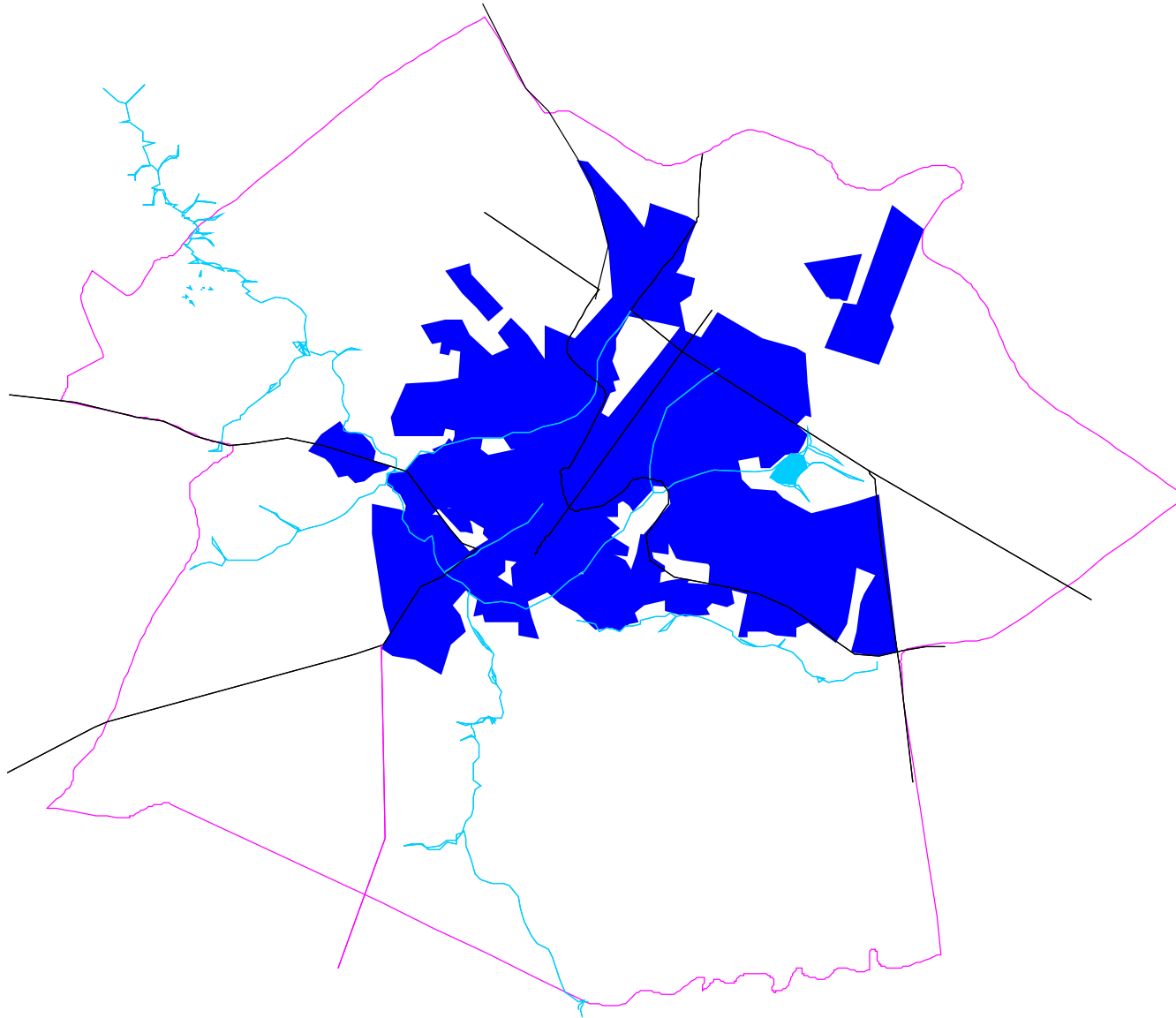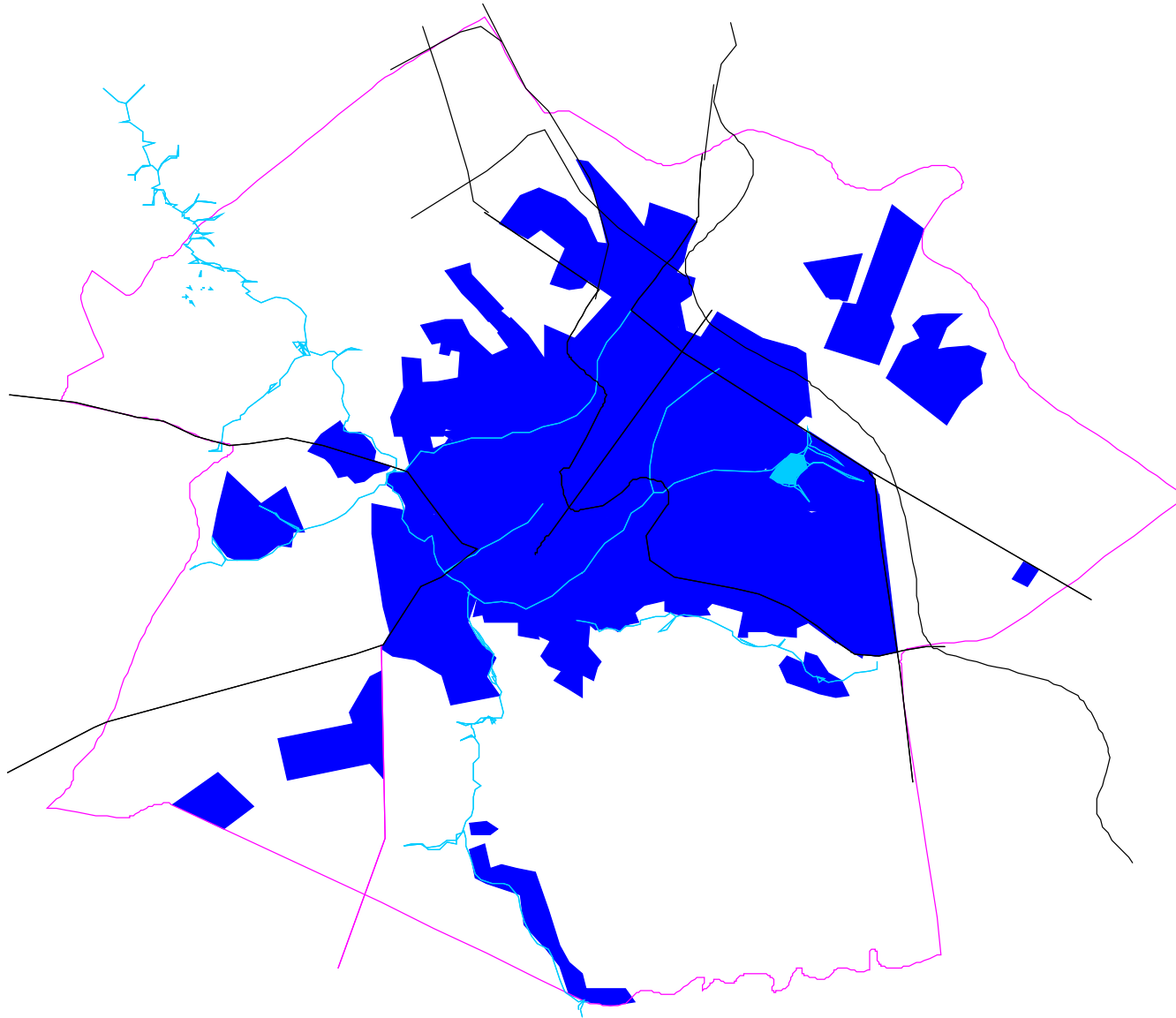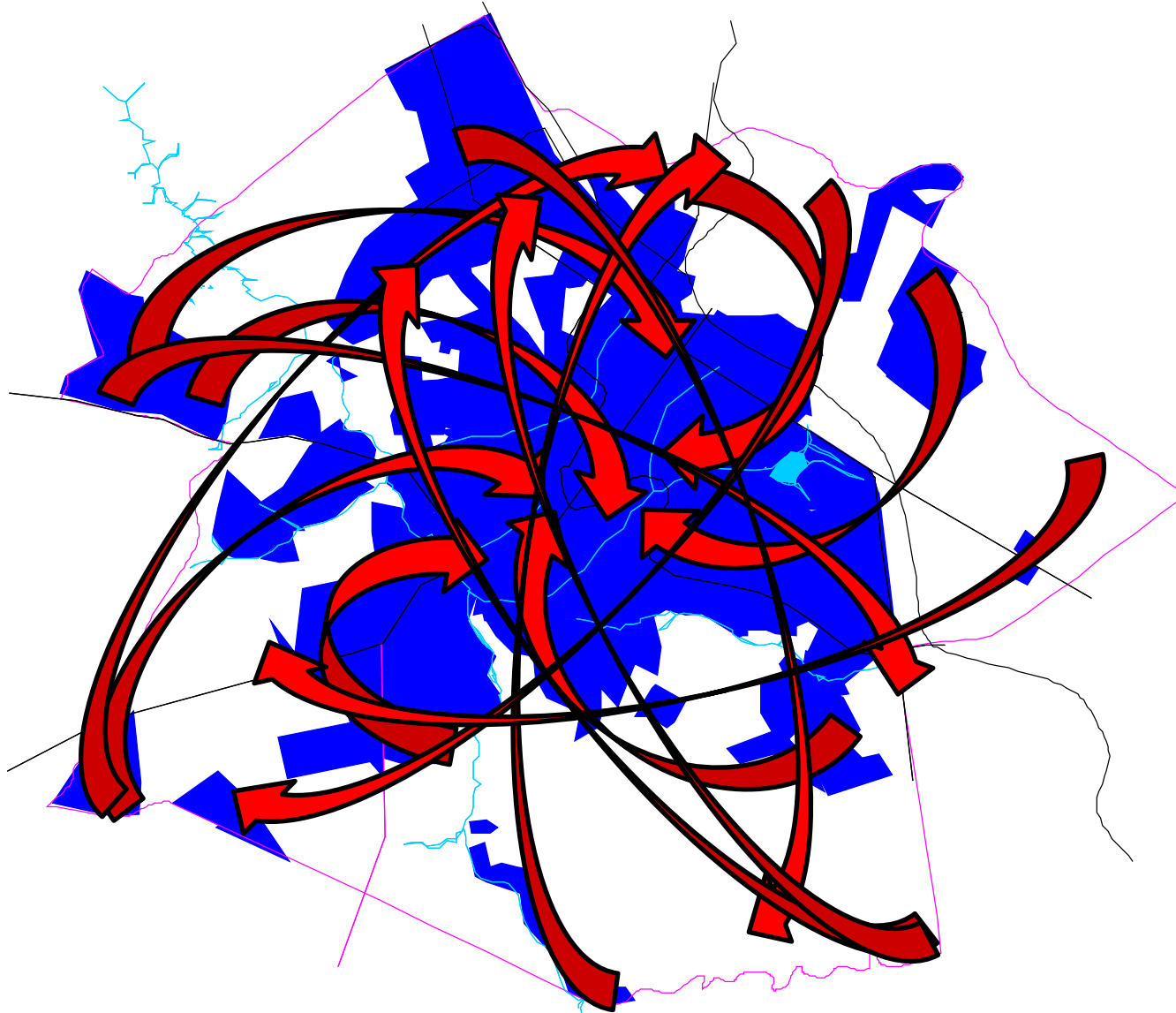


São Paulo - Brazil



Belo Horizonte - Brazil



Jakarta - Indonesia



Mumbai - India



Santo Domingo – Dominican Republic



Addis Ababa - Ethiopia

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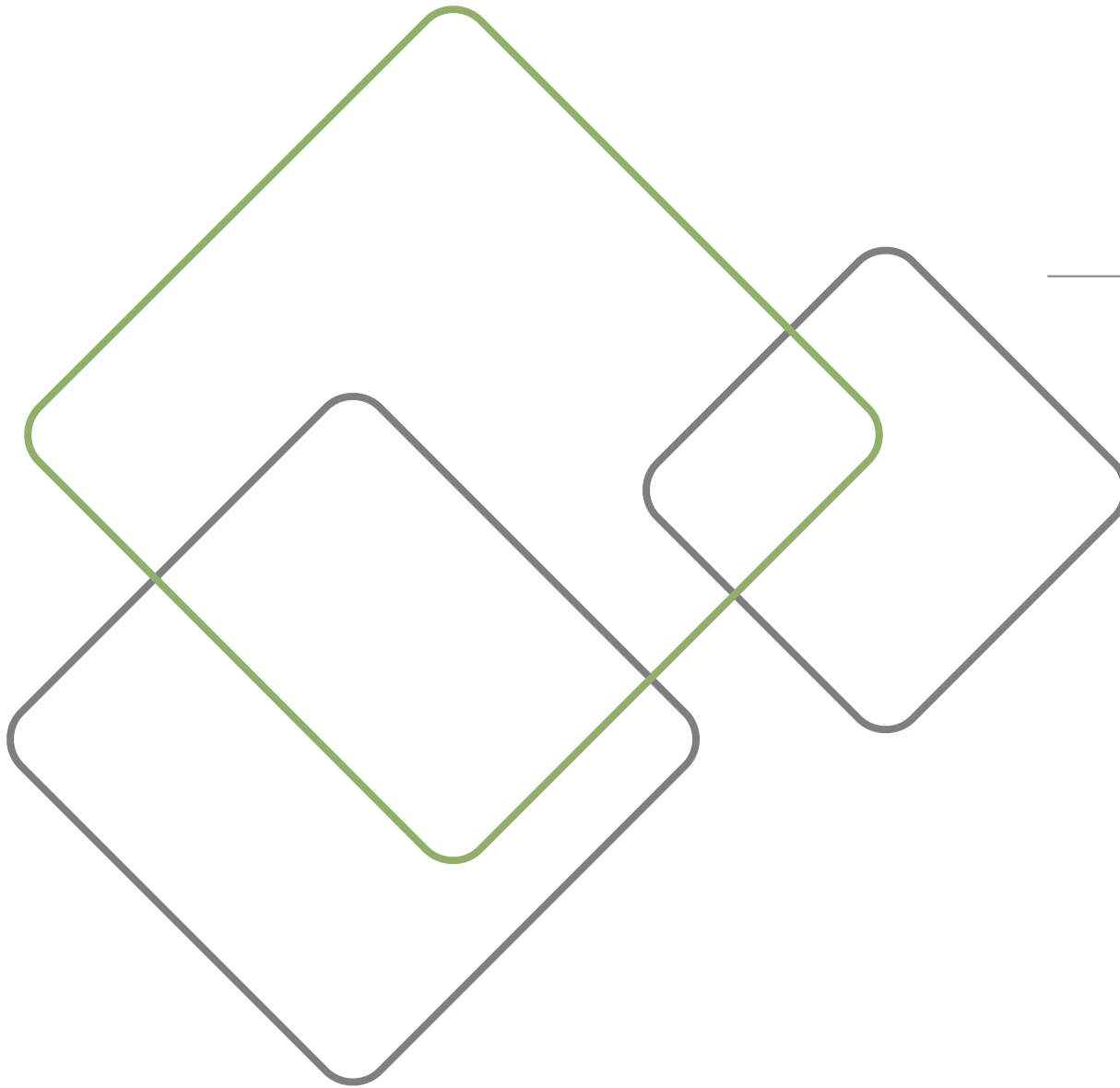
# But more than that…
## Curiosities in Developing countries

# Car pooling...

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Freight transport



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And what about respecting
the speed limits?

# Anyway…

# Joking or not,

# We have a lot of issues to solve in developing countries…

# And how about now?

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Fix our present

+

Planning our future

→

Better cities for everyone
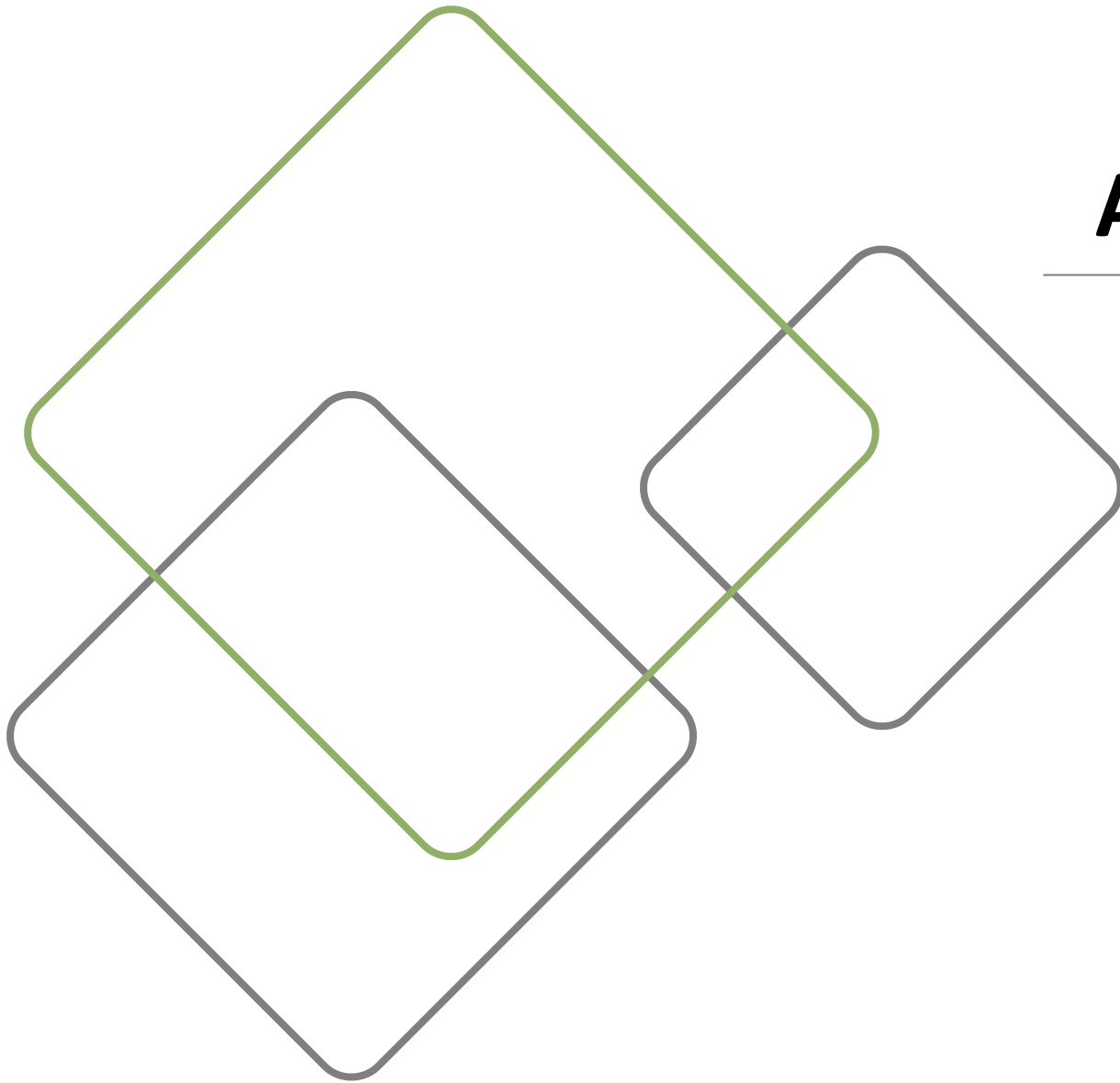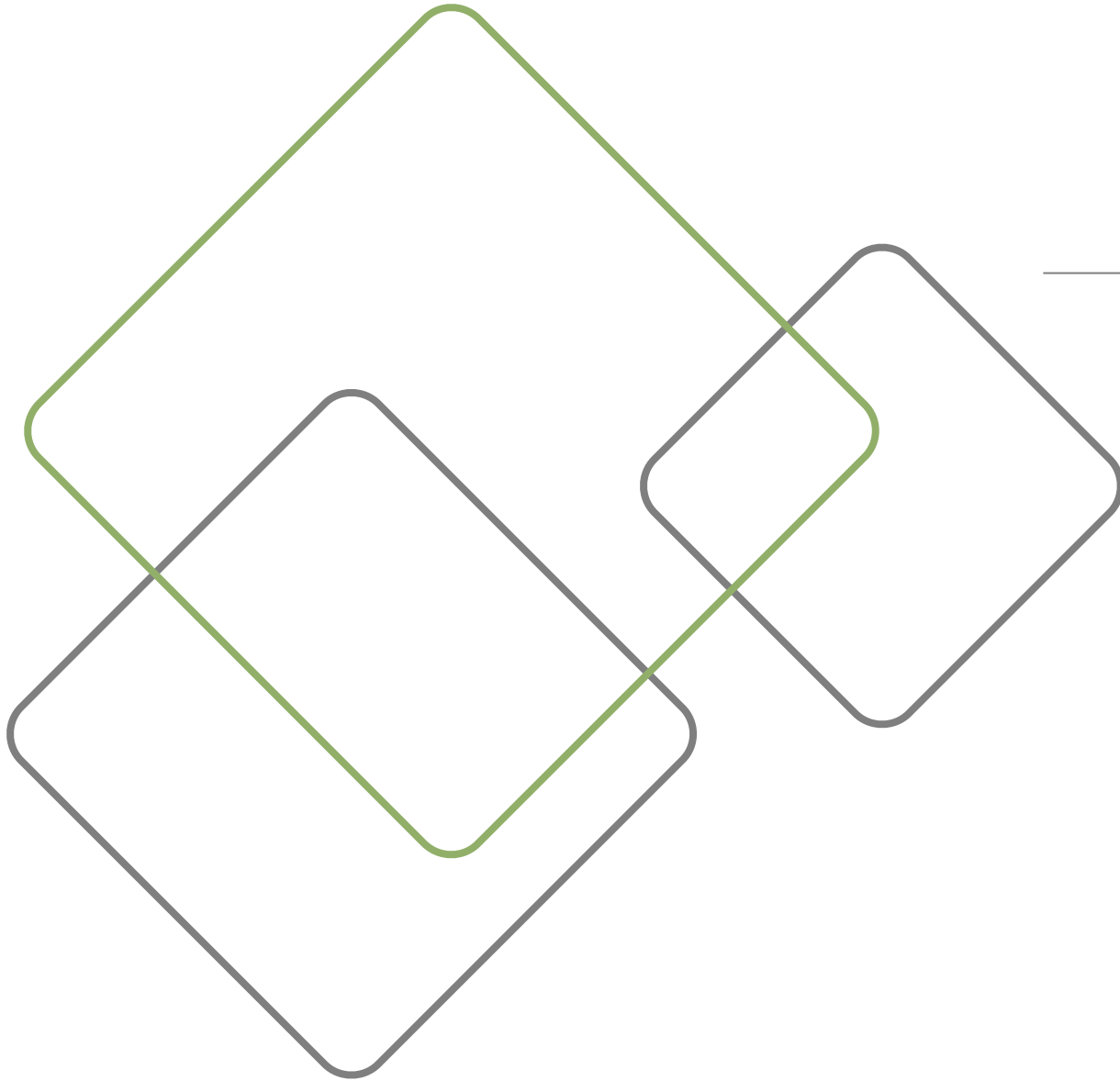
# But what about the actual revolution in urban mobility?

- The advent of mobility applications (Uber, Cabify, etc);
- The fast growth of e-commerce;
- The changes in young 18$^{th}$ behavior (driver license);
- Electric cars;
- Autonomous cars;
- Flying cars;
- Car sharing;
- Working/Studying remotely;
- Smart and connected cities;
- Mobility-as-a-Service (MaaS);
- A world after Covid-19...

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# Are the cities from developing countries prepared for this revolution?

- Public transportation is in decline;
- The growing use of cars and motorcycles;
- Poor infrastructure for active modes and disabled people;
- Poor prioritization of public transport;
- Insufficient traffic safety measures;
- Lack of effective public policies to urban mobility;
- Lack of technical professionals;
- A poor vision of sustainable mobility;
- A poor vision of environmental issues;
- Among others.

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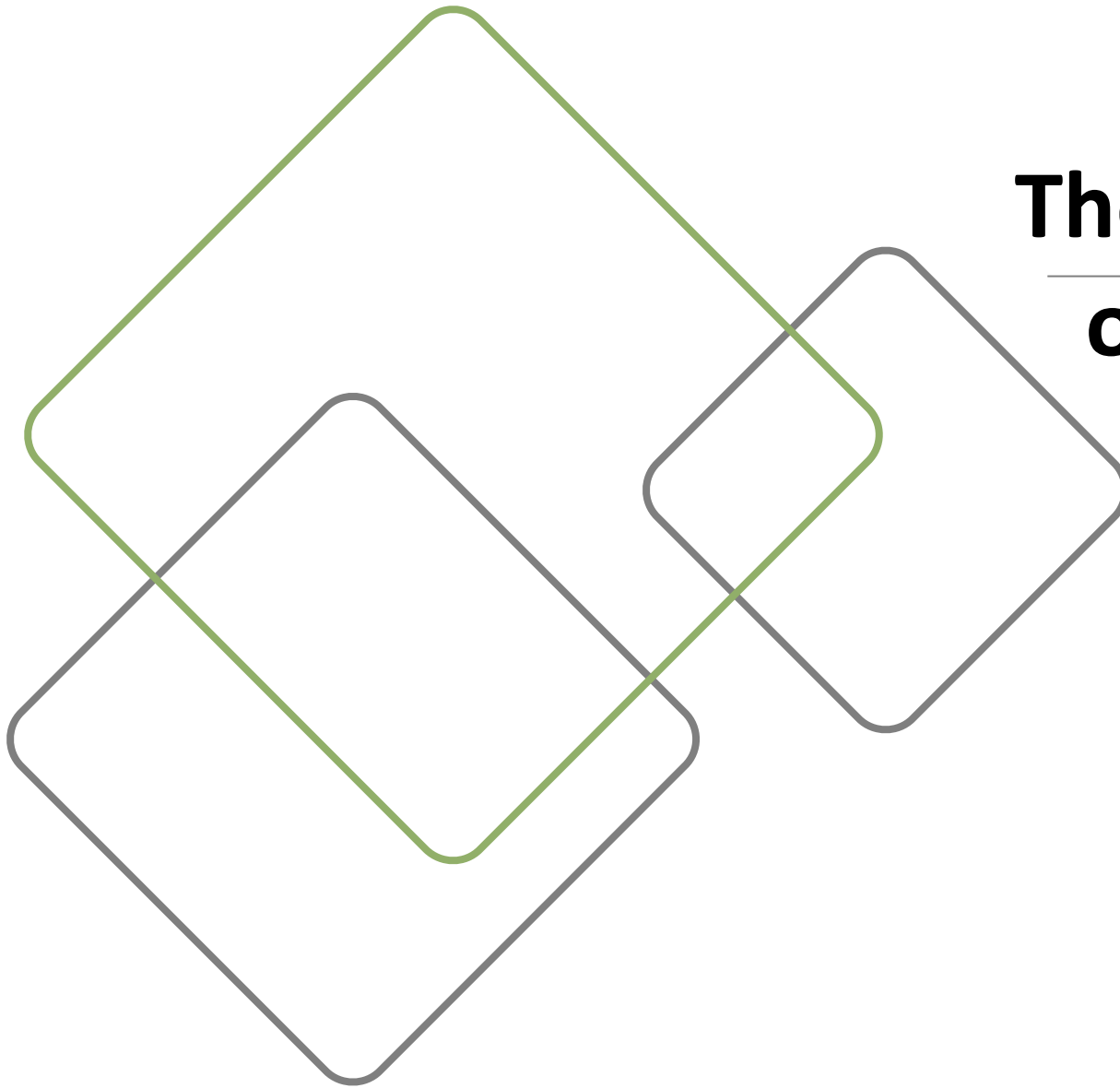
# Therefore, we have a lot of issues to work on! Let´s do it!

**Pray for the best, but be prepared for the worst...**

**If we want a different city, let´s make it happen!**

**And how do we do that?**

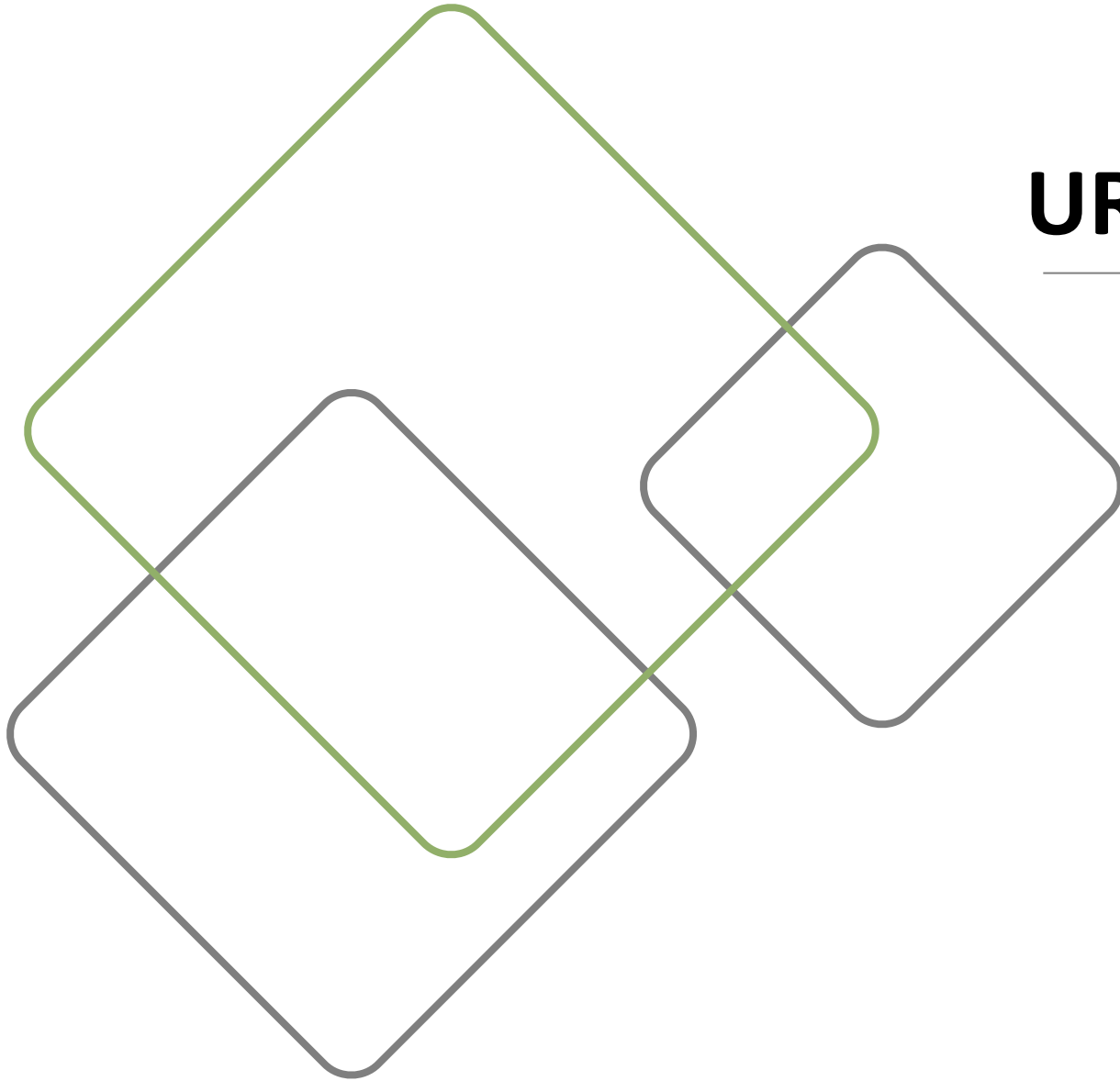**Fixing our present, and planning our future...**

# 3 basic questions (Urban Mobility Plan):

## What city do we have?
## What city do we want to have?
## What do we need to do to have this city?

# URBAN MOBILITY PLAN

**Mobility Plans in Brazil:** It´s a research/study developed to guide the future of the mobility in that city.
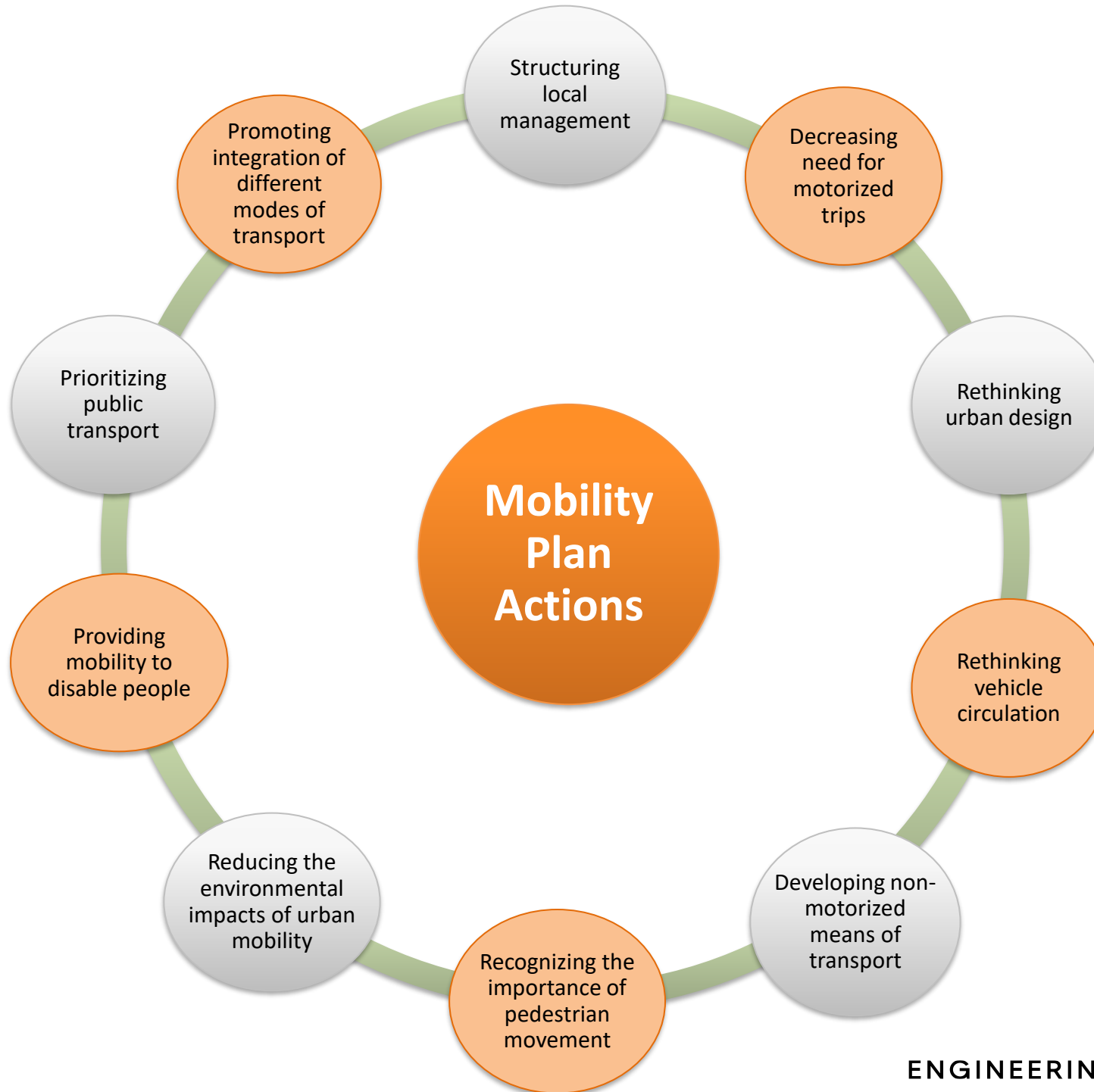
- Law 12.587/2012;

- Cities > 20.000 inhabitants, metropolitan areas and areas of tourist interest;

- Penalty: No access to federal financial resources for urban mobility and infrastructure.

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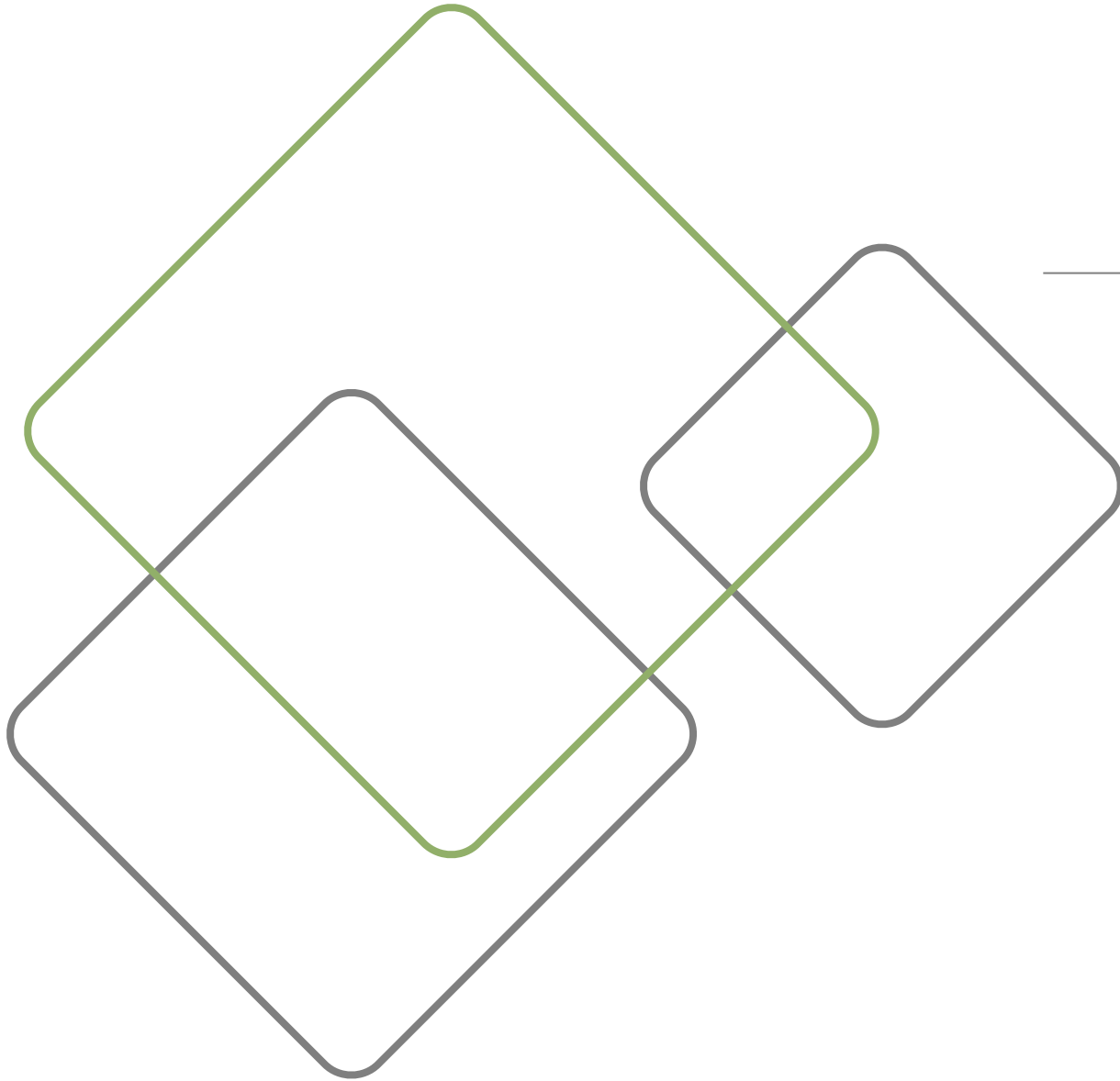
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## Mobility Plans in Brazil: A long way ahead



Legend:
- No plan and isn't preparing one
- Has a plan
- Preparing a plan

76%

6%

18%
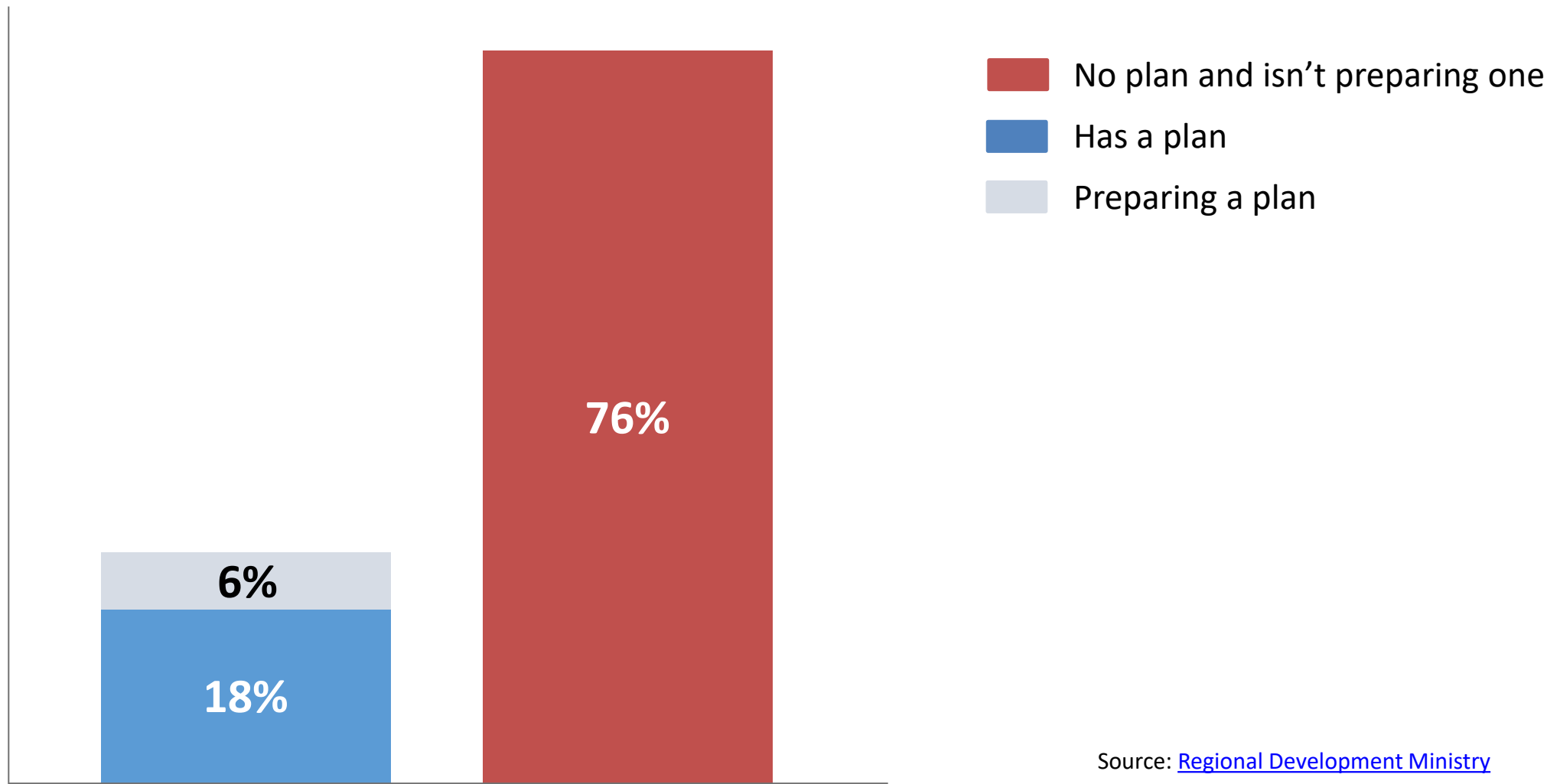
Source: Regional Development Ministry

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**Mobility Plan Actions**

- Structuring local management
- Decreasing need for motorized trips
- Rethinking urban design
- Rethinking vehicle circulation
- Developing non-motorized means of transport
- Recognizing the importance of pedestrian movement
- Reducing the environmental impacts of urban mobility
- Providing mobility to disable people
- Prioritizing public transport
- Promoting integration of different modes of transport

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# HOW TO DO A MOBILITY PLAN?

# OUR EFFORTS AND GUIDELINE MUST FOCUS ON...

ROAD

TRANSPORT

LOGISTICS

GROUND USE AND OCCUPATION

ACTIVE TRANSPORT

SUSTAINABILITY

ROAD SAFETY
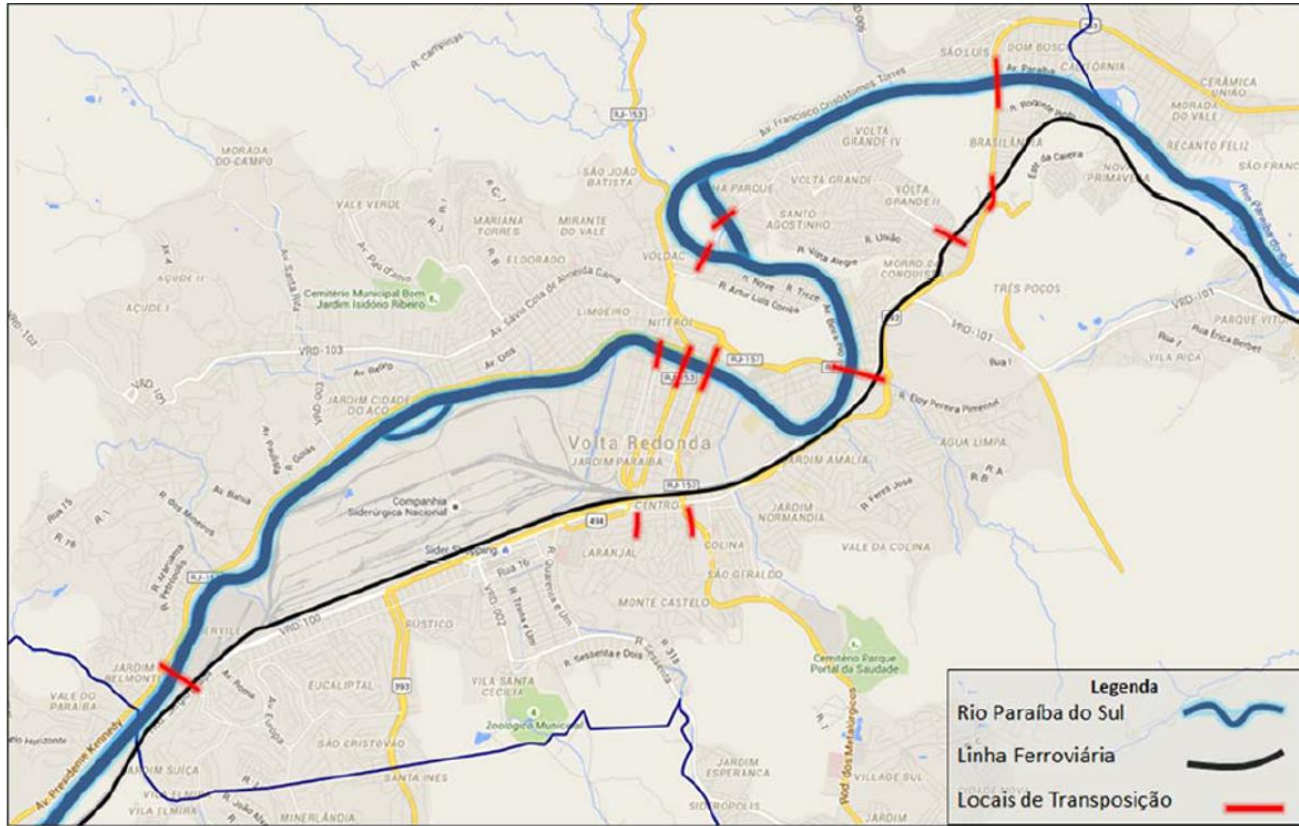
ACCESSIBILITY

GOVERNANCE AND POPULAR PARTICIPATION

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## VOLTA REDONDA, RJ, BRAZIL

**Population:** 275.000 inhabitants
**Area:** 182.11 km² (70,311.13 sq mi)
**Demographic Density**: 1.510 in/km²





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Physical barriers; (Railroad, Rivers), and transpositions points.



CSN

## General diagnosis

- ✓ Large Industrial company; (CSN – A steelworks company)
- ✓ Several Physical barriers; (Railroad, Rivers);
- ✓ Poor connection between the north and south portions;
- ✓ Lack of cycle infrastructure.



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**General diagnosis**

- Poor infrastructure
- Holes in the pavement
- Narrow streets
- No sidewalks
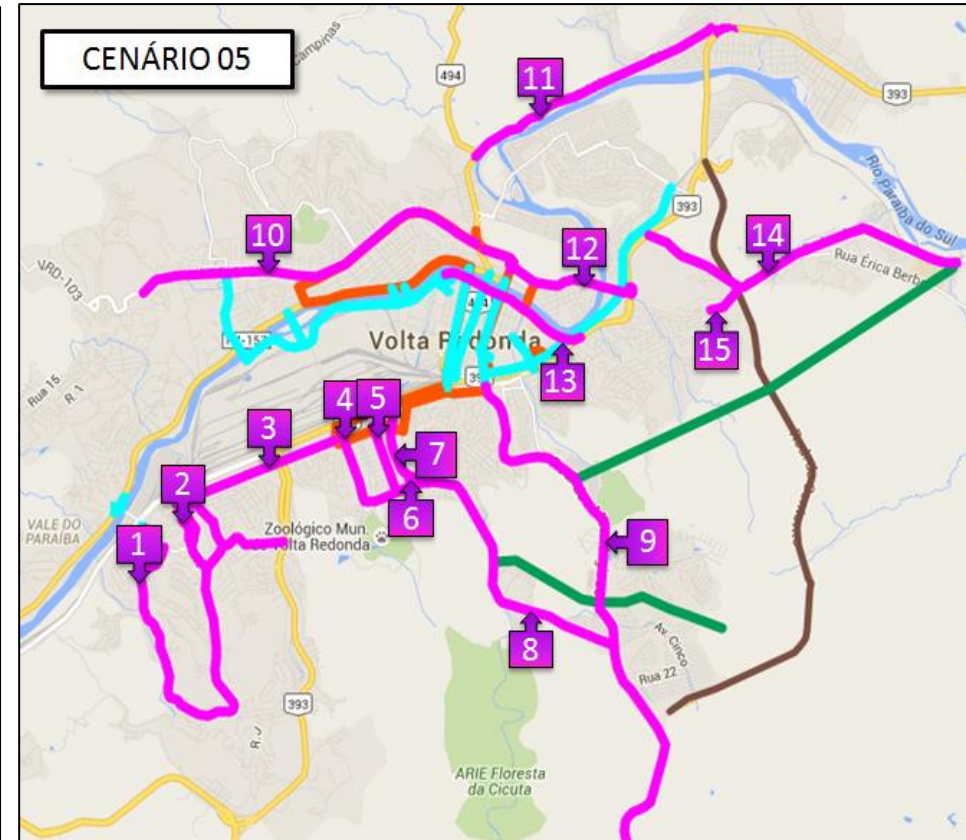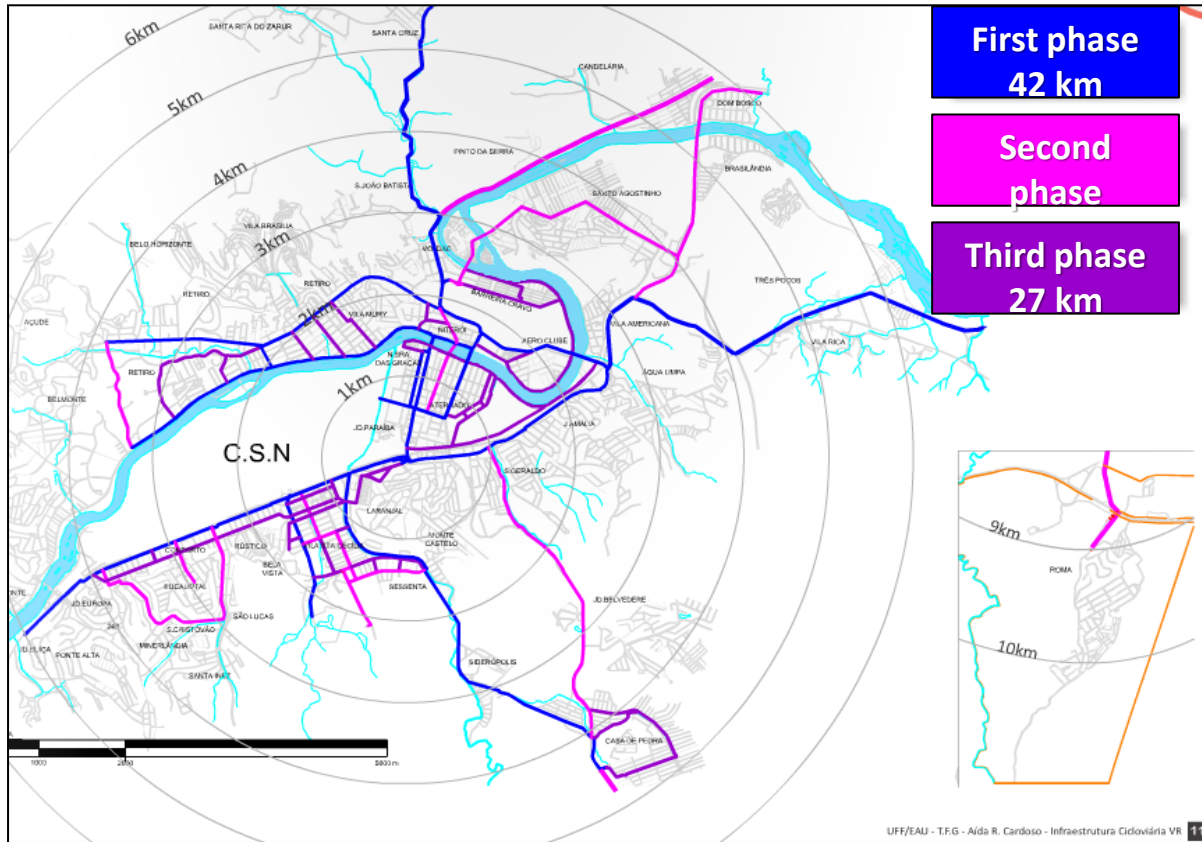- No infrastructure for disabled people

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- ✓ Create **new forms of connection between the northern and southern** regions and cross physical barriers.

- ✓ **Cycling network** planning.

- ✓ **Efficient Public Transport**, serving most of the population.

- ✓ Fewer freight vehicles during rush hours in the central area.

- ✓ Improvement and **revitalization of sidewalks** and pedestrian crossings.
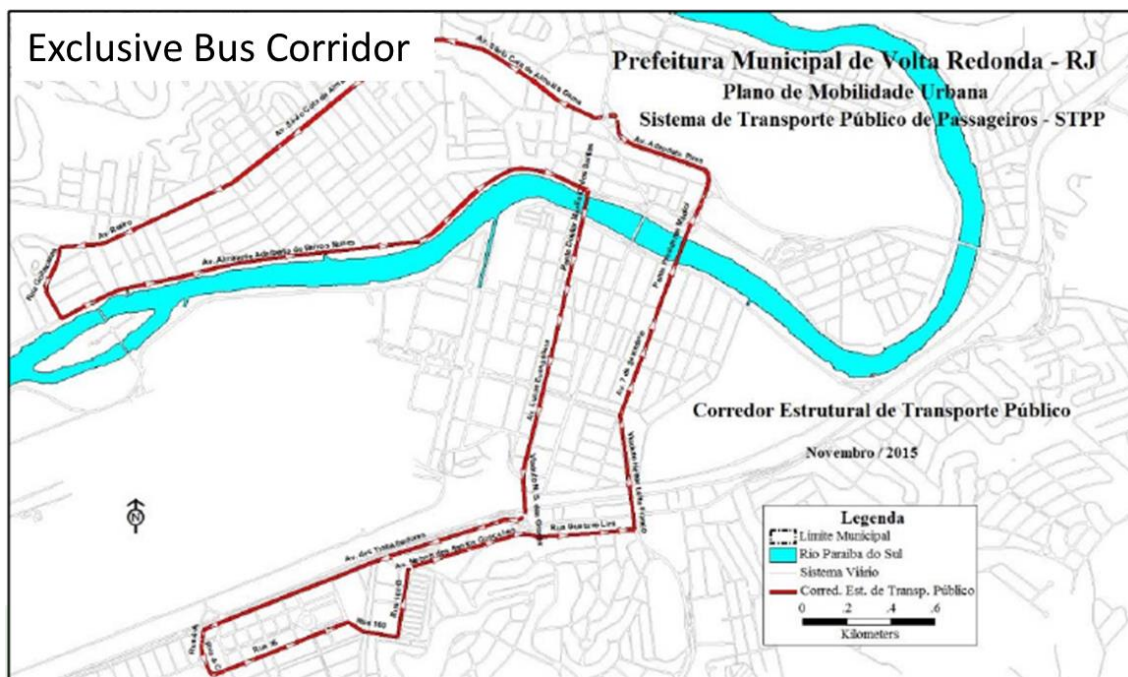
- ✓ Adequate infrastructure for active transport.

## More than 100 km of cycle paths



First phase
42 km

Second phase

Third phase
27 km
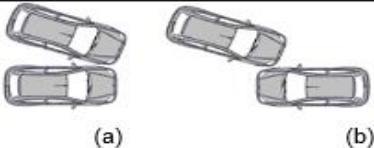
## Several changes at the traffic circulation



CENÁRIO 05

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## Improvements in the Public Transportation (BRT)

## Actions to enhance Traffic safety up to 80%

✓ Immediately reduction in saturated roads up to **50%** until 2015 (P07)

✓ Reduction in $CO_2$ emission up to 25%;

✓ Reduction in travel time up to 37%.

| Number of saturated roads | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CENÁRIO** | 2015 | | 2020 | | 2025 | | 2030 | | 2035 | |
| | km* | %** | km* | %** | km* | %** | km* | %** | km* | %** |
| BASE | 41,4 | 3,6% | 81,6 | 7,1% | 129,9 | 11,3% | 185,9 | 16,1% | 233,8 | 20,3% |
| P01 | 38,4 | 3,3% | 76,2 | 6,6% | 129,9 | 11,3% | 183,2 | 16,0% | 230,6 | 20,1% |
| P02 | 31,8 | 2,8% | 75,7 | 6,6% | 128,9 | 11,2% | 175,9 | 15,2% | 225,4 | 19,5% |
| P03 | 28,1 | 2,1% | 69,6 | 4,2% | 120,5 | 7,6% | 157,6 | 11,3% | 209,0 | 15,7% |
| P03 A | 28,1 | 2,1% | 70,7 | 4,3% | 121,1 | 8,0% | 157,5 | 11,3% | 206,7 | 15,5% |
| P04 | 25,0 | 2,1% | 57,8 | 4,9% | 105,4 | 8,9% | 150,3 | 12,7% | 200,6 | 16,9% |
| P04 A | 24,3 | 2,0% | 62,5 | 5,3% | 108,9 | 9,2% | 152,2 | 12,8% | 197,7 | 16,7% |
| P05 | 22,2 | 1,9% | 45,9 | 3,9% | 92,0 | 7,8% | 132,4 | 11,2% | 179,9 | 15,2% |
| P06 | 18,0 | 1,5% | 35,0 | 2,9% | 74,7 | 6,3% | 128,4 | 10,8% | 174,8 | 14,7% |
| P07 | 19,3 | 1,6% | 40,4 | 3,4% | 72,8 | 6,1% | 119,9 | 10,1% | 166,1 | 14,0% |

But...If we don´t change our modal split, we won´t be able to make significant changes/improvements in the traffic operation in the future

2015
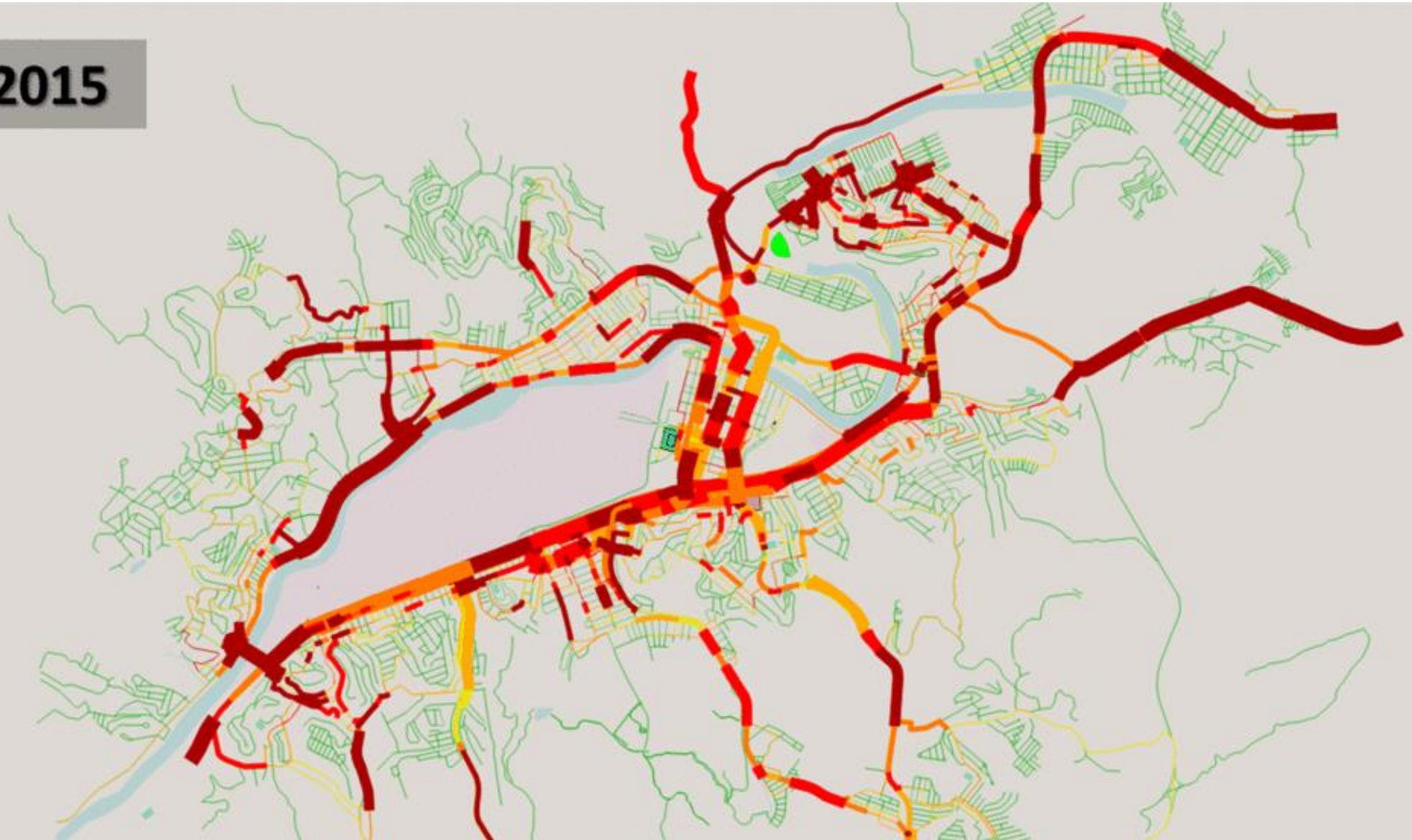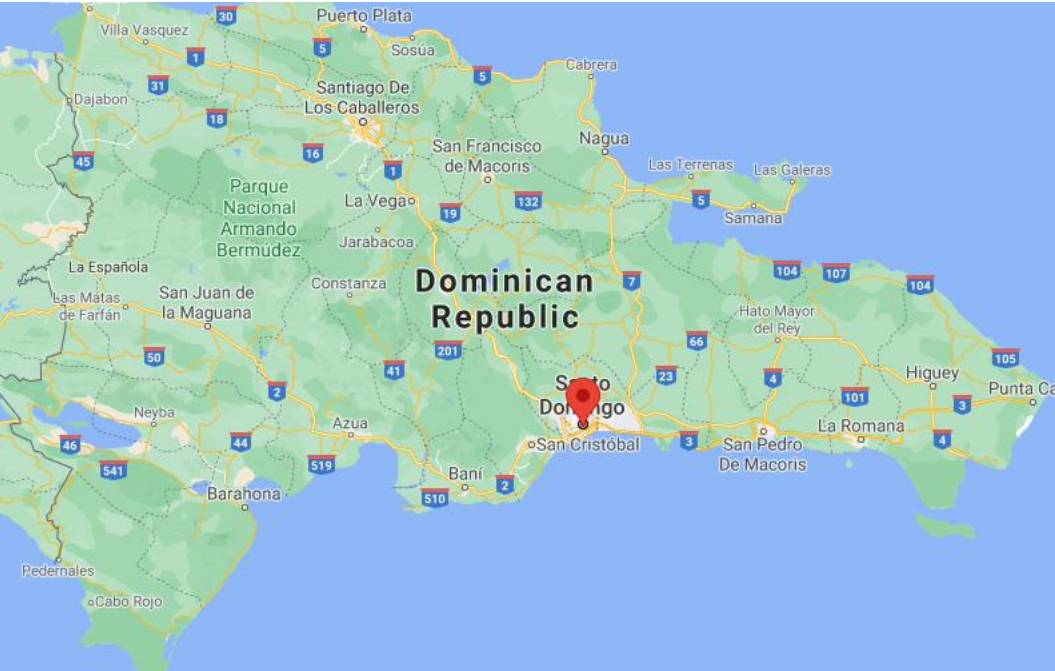
**SANTO DOMINGO – DOMINICAN REPUBLIC CAPITAL**

**Population:** 2,908,607
**Area:** 2,696.69 km² (1,041.20 sq mi)

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- ✓ Discontinuity o the road system
- ✓ Significant through traffic
- ✓ No prioritization of the public transport
- ✓ Poor infrastructure to active modes
- ✓ Unoptimized Intersections
- ✓ Limited access vs. High traffic demand 8 points
- ✓ Among others





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Several traffic simulations
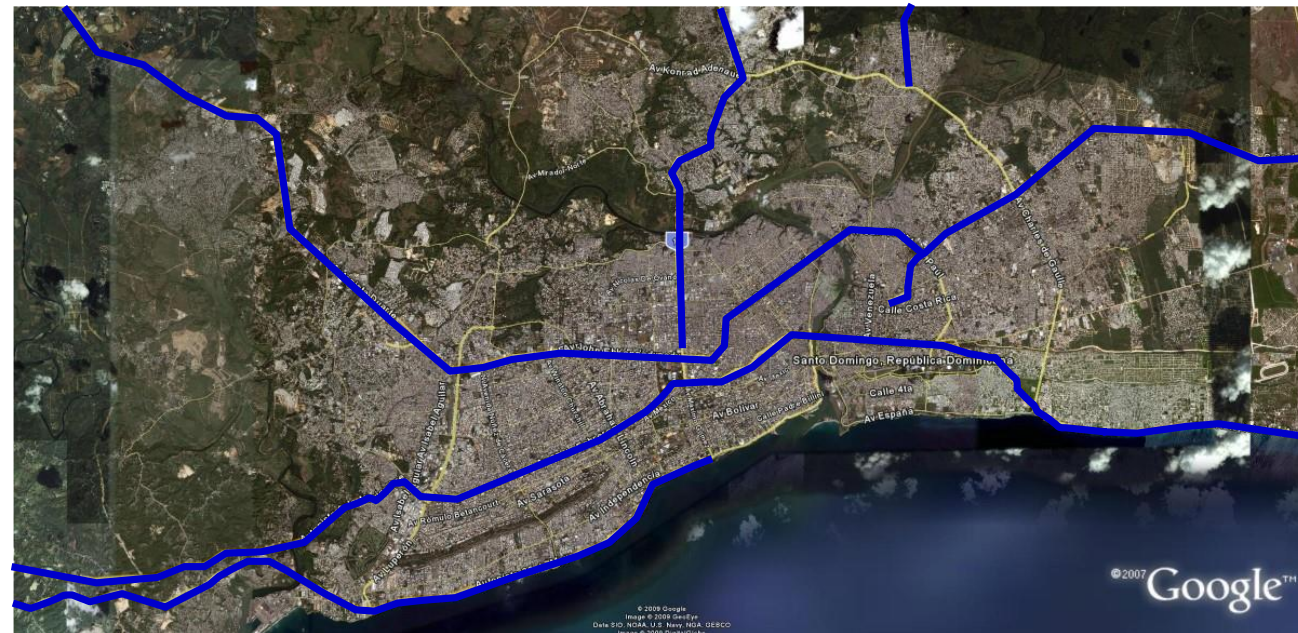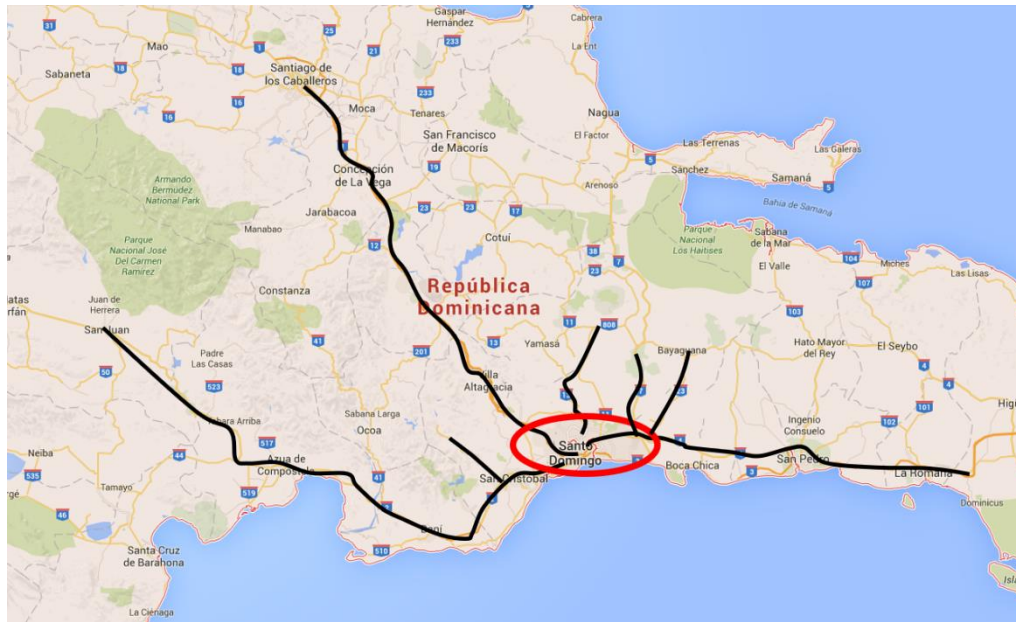
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CONSULTORIA E PROJETOS DE ENGENHARIA

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- ✓ Specific improvement plan (84 points);

- ✓ Traffic Light Reduction Plan;

- ✓ Implementation of Road Corridors;

- ✓ Plan of Optimization of traffic lights;

- ✓ Overpass design;

- ✓ Among others.



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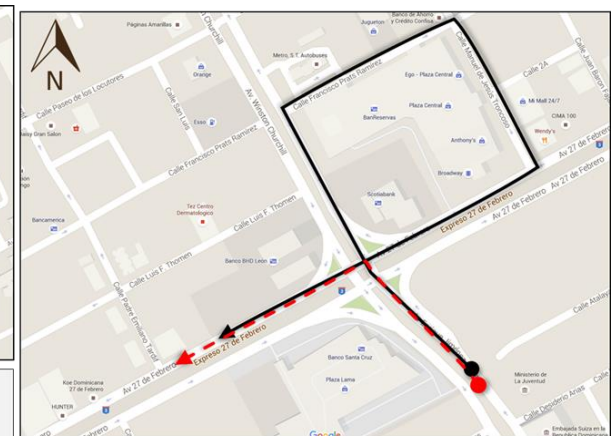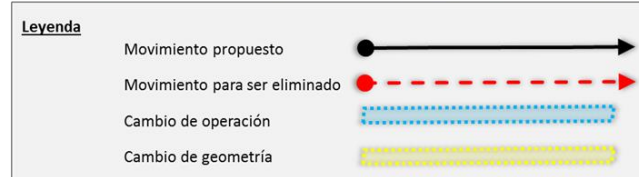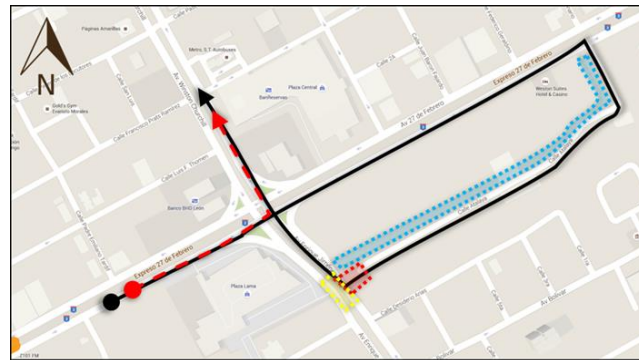
| | Escenarios | Links saturados | % Links saturados | km saturados | % km saturados | Emisión de $CO_2$ (t) |
|---|---|---|---|---|---|---|
| Doing nothing | Actual | 1449 | 1,8% | 212 | 2,9% | 351,6 |
| | 3 Años | 2421 | 3,1% | 317 | 4,4% | 526,4 |
| | 6 Años | 4127 | 5,2% | 527 | 7,2% | 874,7 |
| | 10 Años | 7103 | 9,0% | 817 | 11,2% | 1.355,5 |
| Doing several improvements | 3 Años | 1761 | 2,3% | 248 | 3,4% | 412,2 |
| | 3 Años con Obras | 1647 | 2,1% | 218 | 2,9% | 362,2 |
| | 6 Años | 2899 | 3,7% | 397 | 5,3% | 658,4 |
| | 10 Años | 5139 | 6,6% | 657 | 8,9% | 1.090,7 |
| | 10 Años pares viales | 4980 | 6,4% | 651 | 8,8% | 1.080,7 |
| | 10 Años pares viales + Circunvalación | 4309 | 5,5% | 610 | 8,1% | 1.012,6 |
| Changing the modal split | Con Intervenciones Sencillas | 1493 | 1,9% | 172 | 2,4% | 285,6 |
| | Con Intervenciones Sencillas y Capacidad Mejorada | 864 | 1,1% | 140 | 1,9% | 232,4 |
| | Con todas las Intervenciones | 552 | 0,7% | 81 | 1,1% | 134,5 |

We just achieve traffic improvements if we change the passenger modal split!

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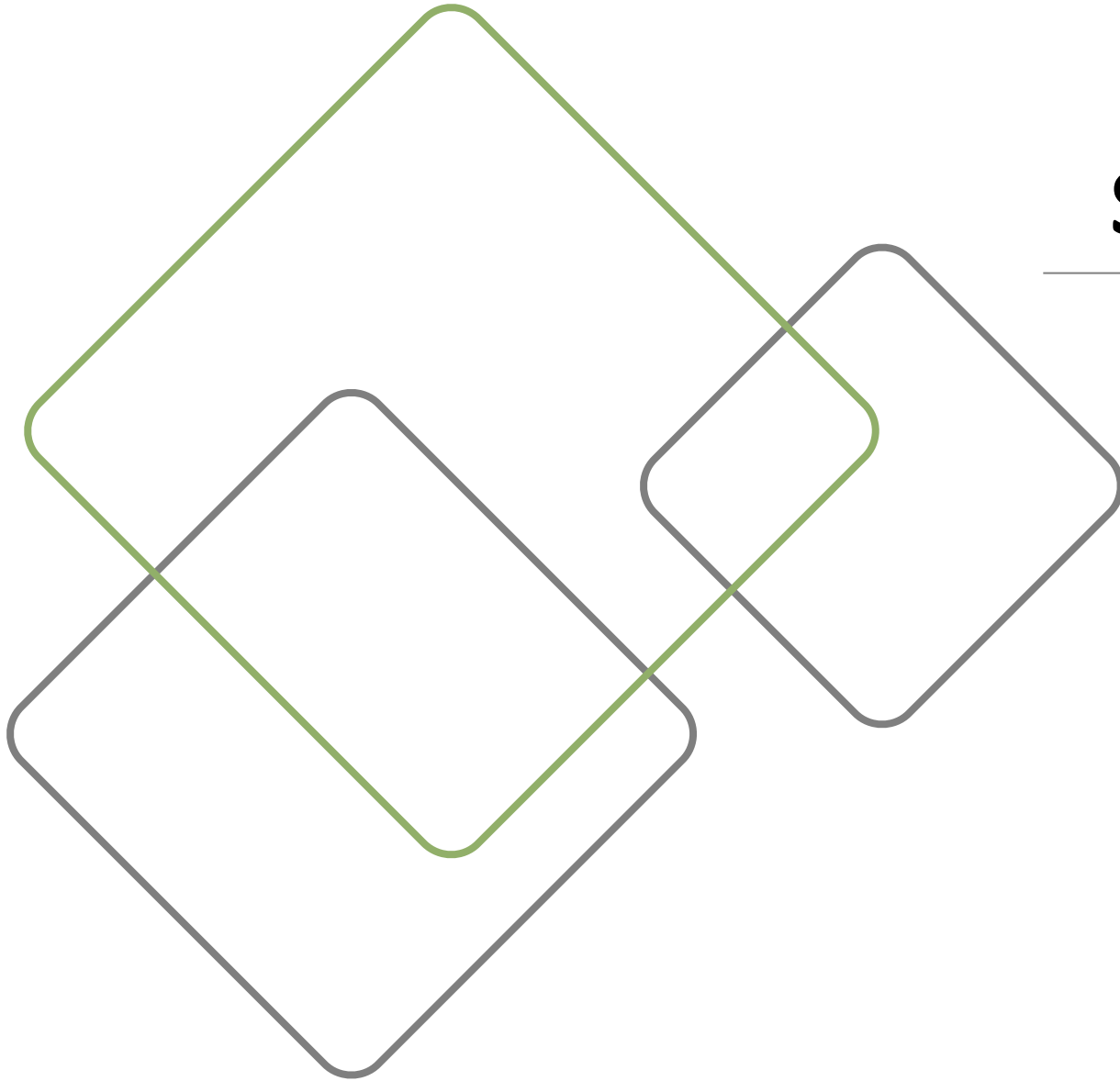
# So, where should we focus on?

**Reducing urban trips**

- Remote work;
- Living close to work;
- Completes land user;

**More People in less space**

- Change our passenger modal split;
- Increase public transportation use;
- Active modes;
- Car pooling/sharing;

**Trips in more sustainable modes**

- Car sharing/pooling;
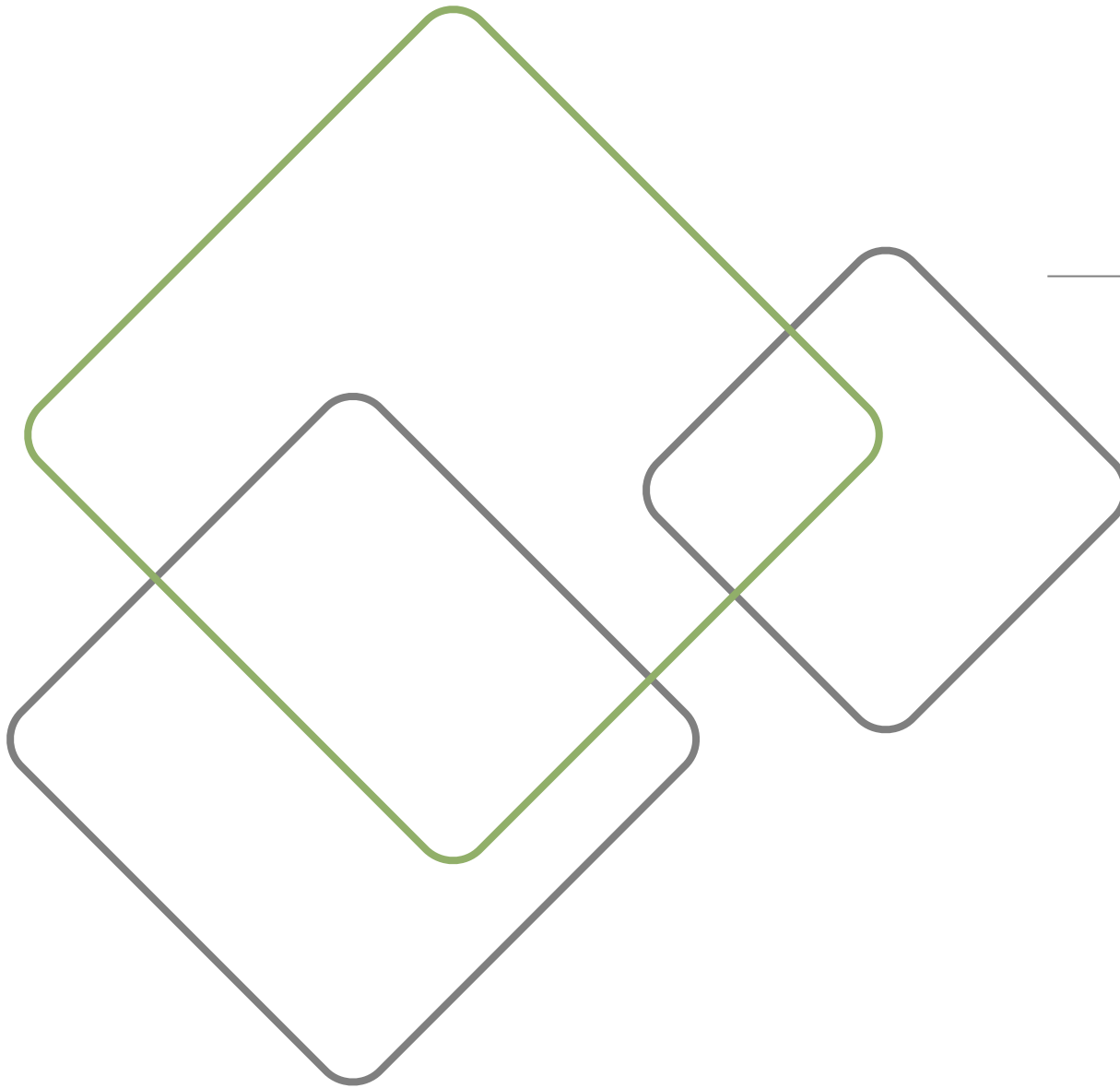- Electric cars;
- Less emission, a better environment

**Cities planned for people, not cars**

- Pedestrian areas
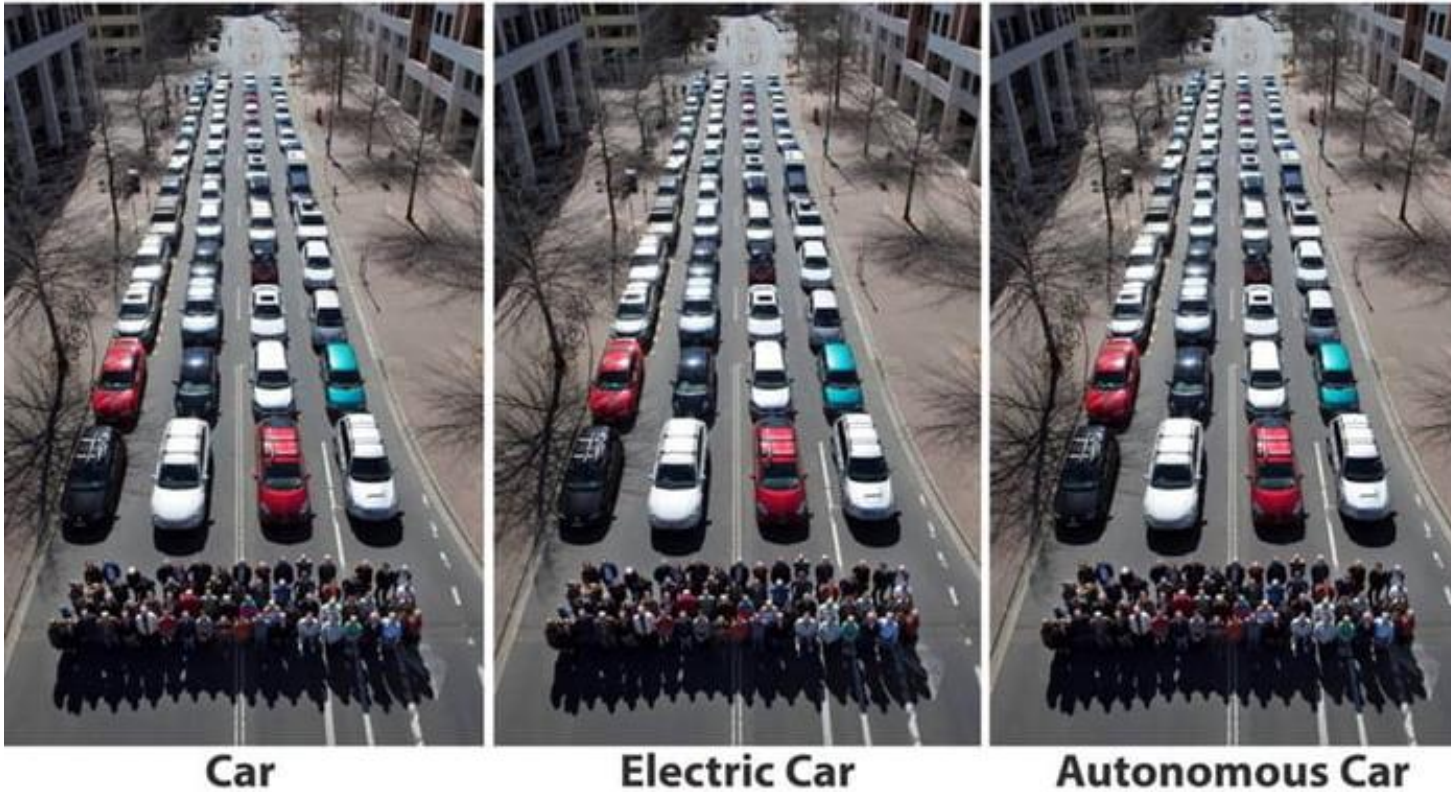- Cycle path/lanes

**Smart and connected cities**

**Optimized urban logistics**

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# Final Reflection

Space Required to Transport 48 People

Car — Electric Car — Autonomous Car

The physics laws will always be the same:
2 different bodies will never occupy the same space at the same time …

The challenge continues: we need an urban mobility with less cars in the streets (moving people occupying less space)

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**Even with all the technology that is changing the mobility nowadays, if we don´t reduce the trips or achieve changes in the passenger modal split, we will not be able to really improve the urban mobility...**

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We need cities...

For Everyone...

# Thank you...

**Eng. Frederico Rodrigues, D.Sc.**

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