WORLD RESOURCES INSTITUTE

SOCIAL IMPLEMENTATION

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AGENDA

1. **Global Outlook**

2. **Critical issues**
   a. Speed
   b. Arterial Roads/Urban Highways
   c. Motorcycles

3. **Poverty**

4. **Climate Change**

GLOBAL OUTLOOK

UNITED NATIONS


SUSTAINABLE
DEVELOPMENT
GOALS


DECADE OF ACTION FOR
ROAD SAFETY
2021 - 2030

Stockholm Declaration

Reduce traffic fatalities by at least 50% between 2020 and 2030.

Recognize the interrelationship between road safety and the Global Development Goals


GLOBAL PLAN
DECADE OF ACTION FOR ROAD SAFETY 2021–2030
UN General Assembly Resolution 74/299 declared a Decade of Action for Road Safety 2021-2030, with the target to reduce road traffic deaths & injuries BY AT LEAST 50% during that period
The Global Plan describes what is needed to achieve that target, and calls on governments & partners to implement an integrated SAFE SYSTEM APPROACH
WHAT TO DO?
HOW TO DO IT?
WHO TO DO IT?
Multimodal transport & land-use planning
Safe road infrastructure
Safe vehicles
Safe road use
Post-crash response
Legal frameworks
30
Speed management
Capacity development
Gender
Technologies
Focus on low- and middle-income countries
Financing
Government
academia
NGOs
youth
Civil society
Private sector
Funders
UN agencies
World Health Organization
United Nations
For further information, visit:
DECADE OF ACTION FOR ROAD SAFETY 2021-2030
DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030

World Health Organization

Global status report on road safety 2023

Section 1.

The global burden of road traffic deaths

There were an estimated 1.19 million road traffic deaths in 2021; this corresponds to a rate of 15 road traffic deaths per 100 000 population.

As of 2019, road traffic injury remains the leading cause of death for children and young people aged 5–29 years and is the 12th leading cause of death when all ages are considered.

Globally, 4-wheel vehicle occupants represent 30% of fatalities; followed by pedestrians who make up 23% of fatalities; and powered two- and three-wheeler users who make up 21% of fatalities.

Cyclists account for 6% of fatalities while 3% of deaths are among users of micro-mobility devices such as e-scooters.

92% of deaths occur in low- and middle-income countries.

x3 The risk of death is three times higher in low-income countries than high-income countries despite these countries having less than 1% of all motor vehicles.

How often do we lose someone to a traffic crash?

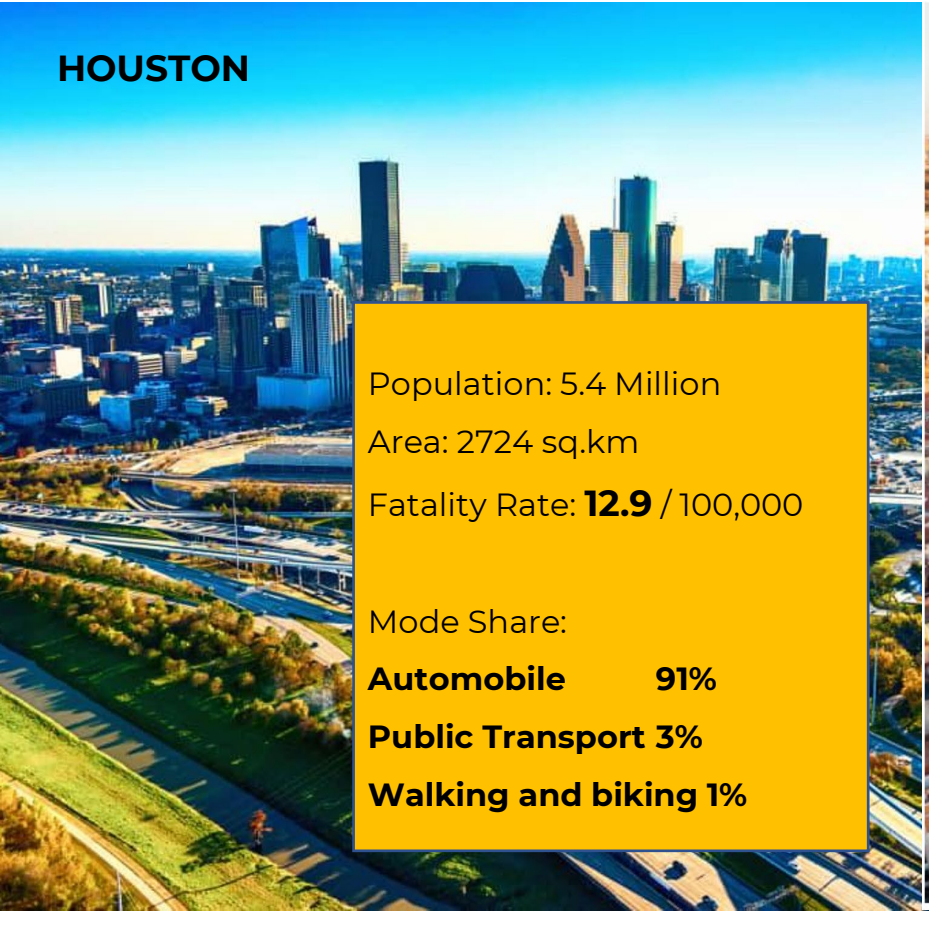
Let’s find out

According to the World Health Organization (WHO), approximately **227,000 children under the age of 20 die in road traffic crashes annually.**

This makes road traffic injuries the leading cause of death for children and young adults aged 5–29 years globally.

SPEED

A Story Of Two Cities



HOUSTON

Population: 5.4 Million

Area: 2724 sq.km

Fatality Rate: **12.9** / 100,000

Mode Share:

Automobile 91%

Public Transport 3%

Walking and biking 1%

MADRID

Population: 5.3 Million

Area: 560 sq.km

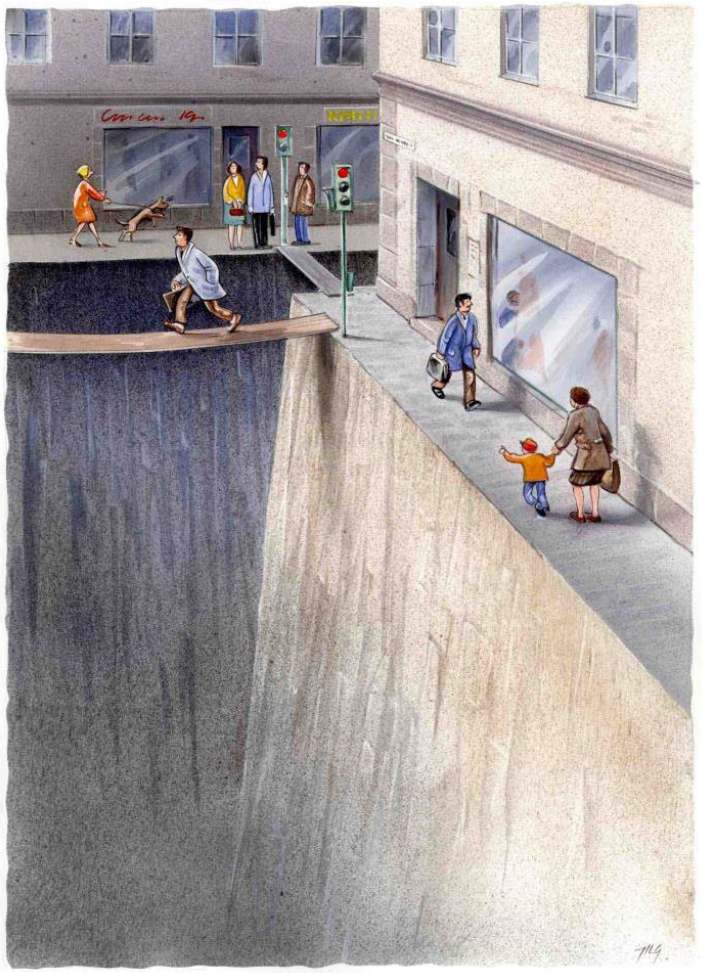
Fatality Rate: **2.2** / 100,000

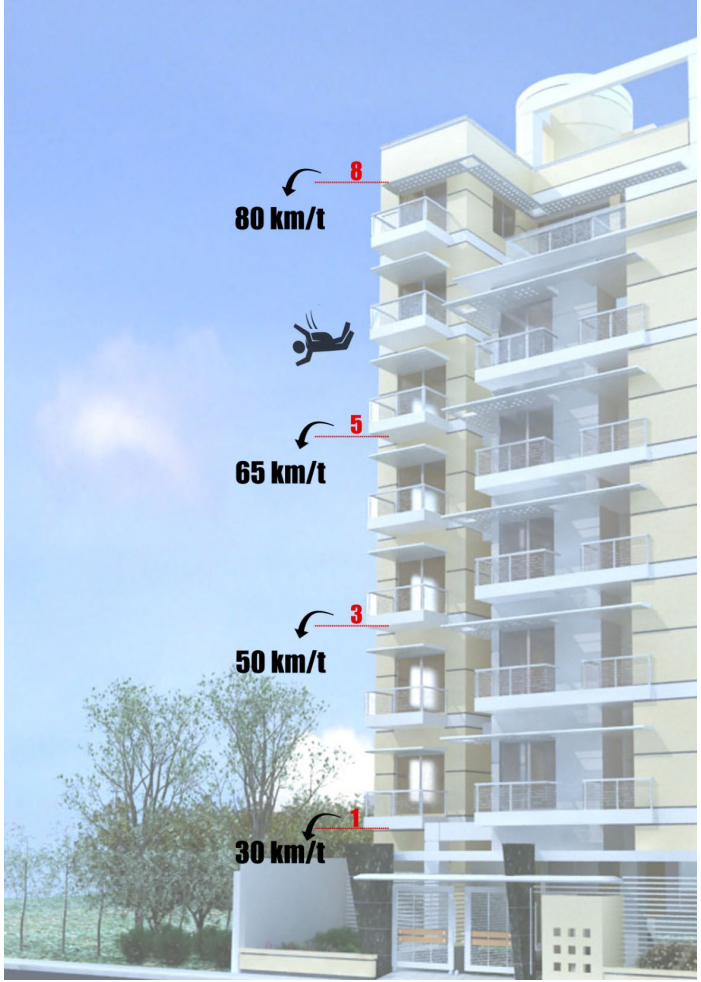
Mode Share:

Automobile 30%

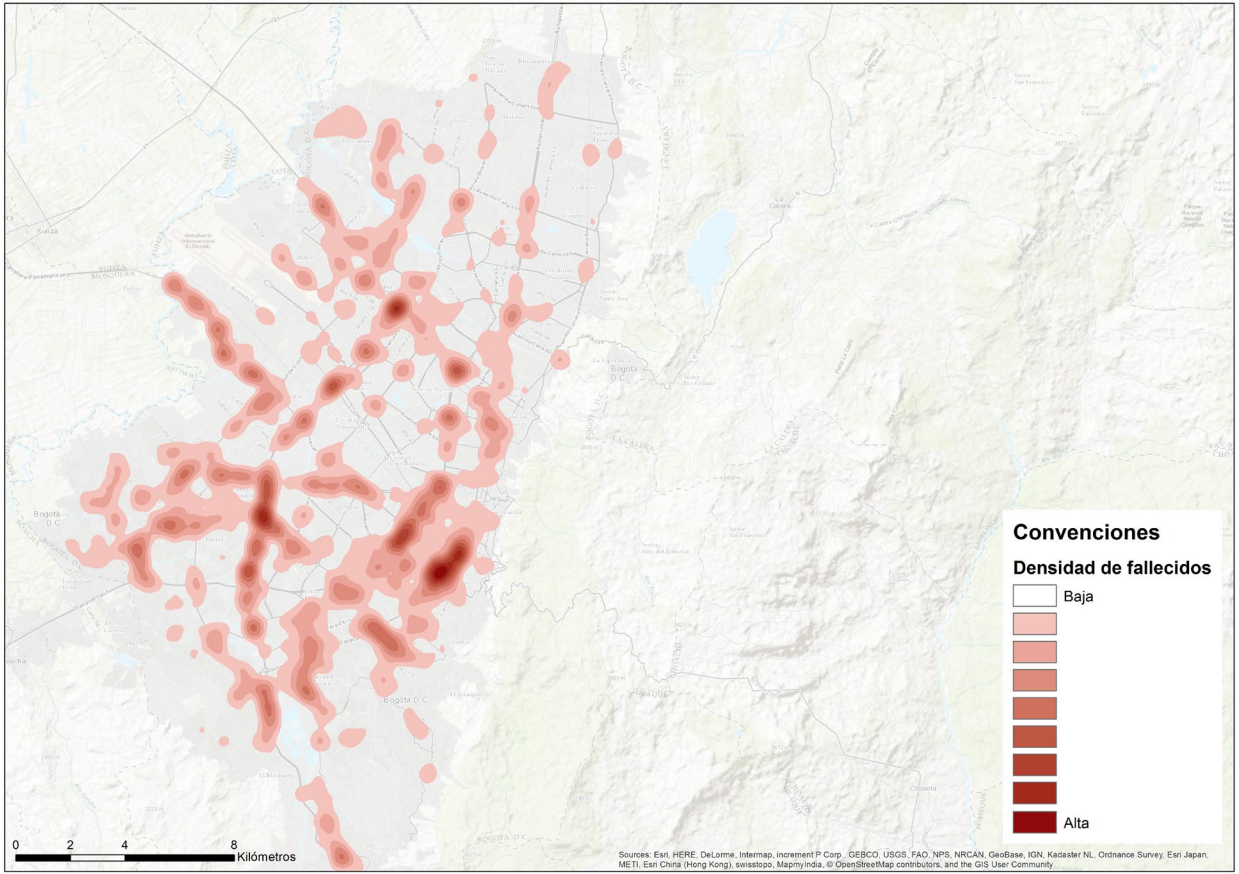
Public Transport 34%

Walking and biking 36%

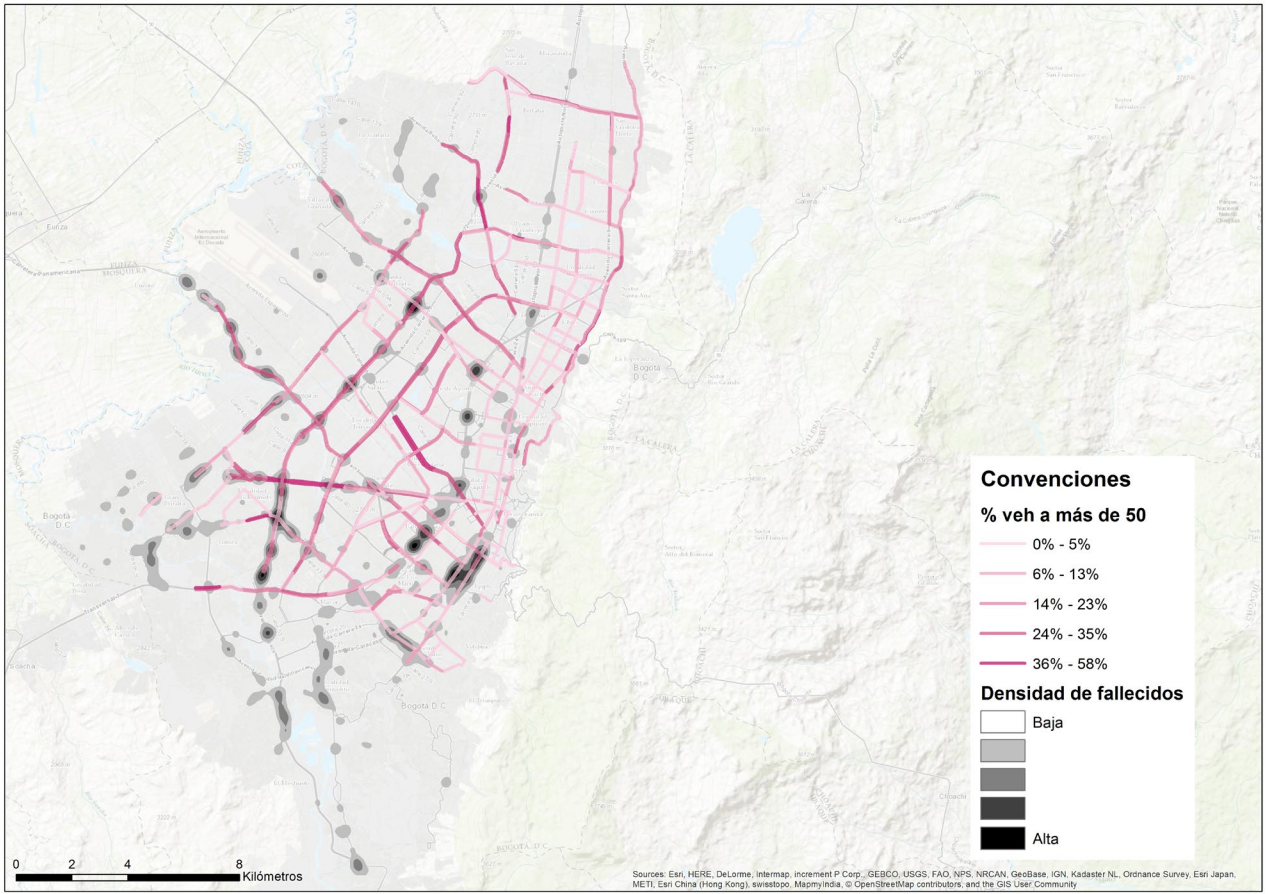



8
80 km/t
5
65 km/t
3
50 km/t
1
30 km/t

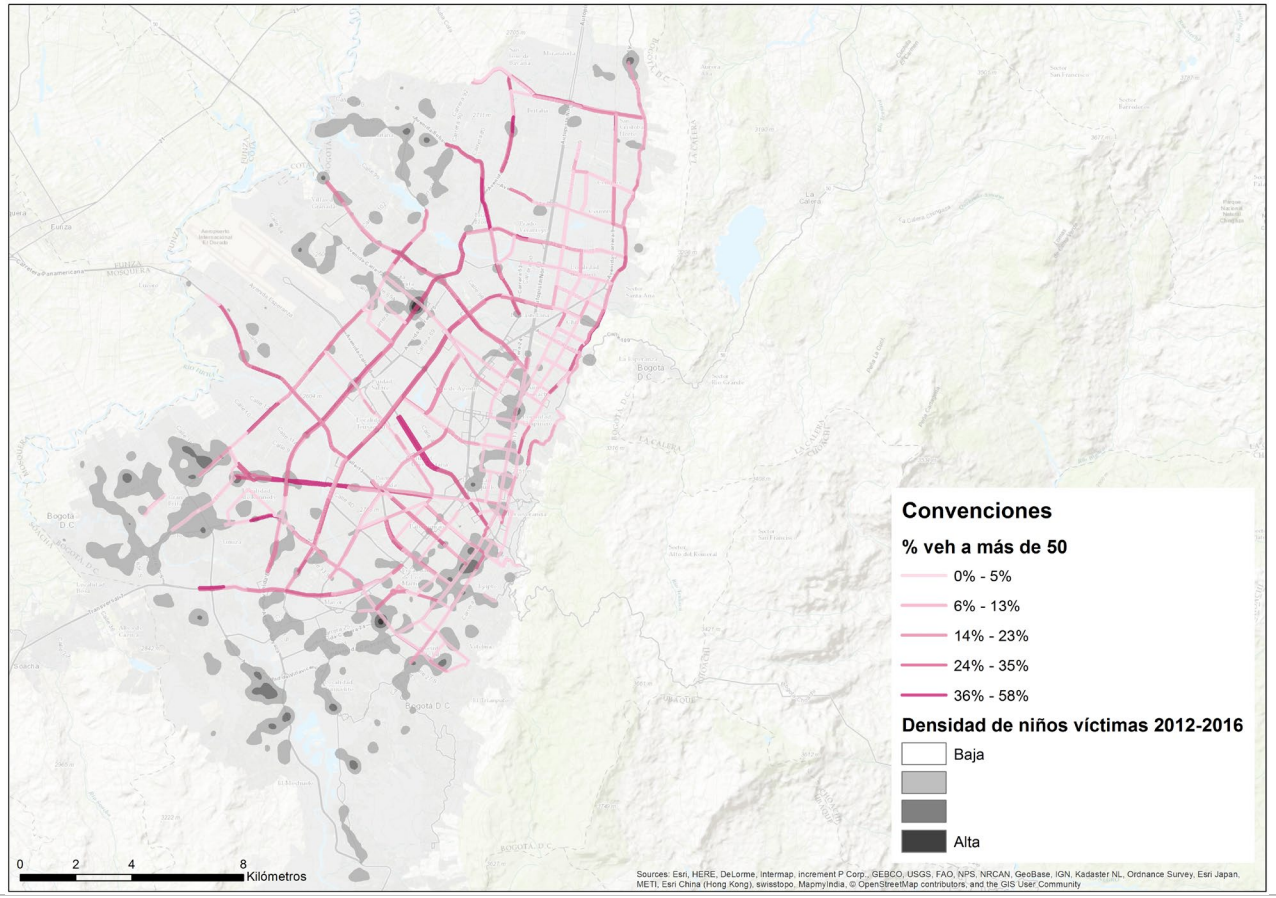
FATALITIES IN BOGOTA



SPEED AND FATALITIES IN BOGOTA



CHILDREN VICTIMS AND SPEED IN BOGOTA

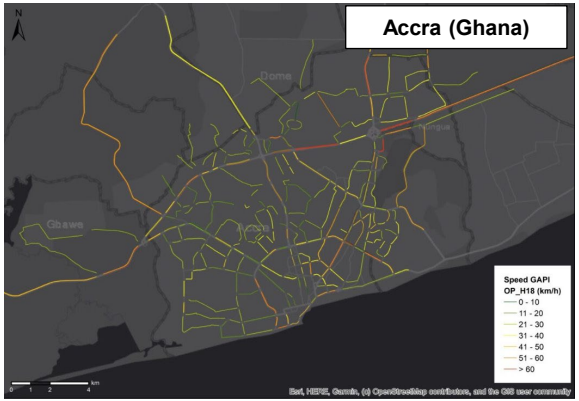


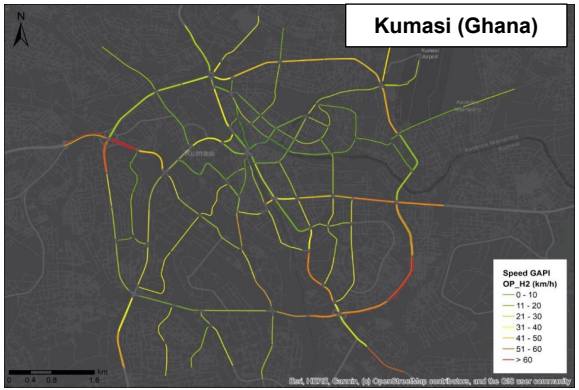
WRI DATA ON SPEED

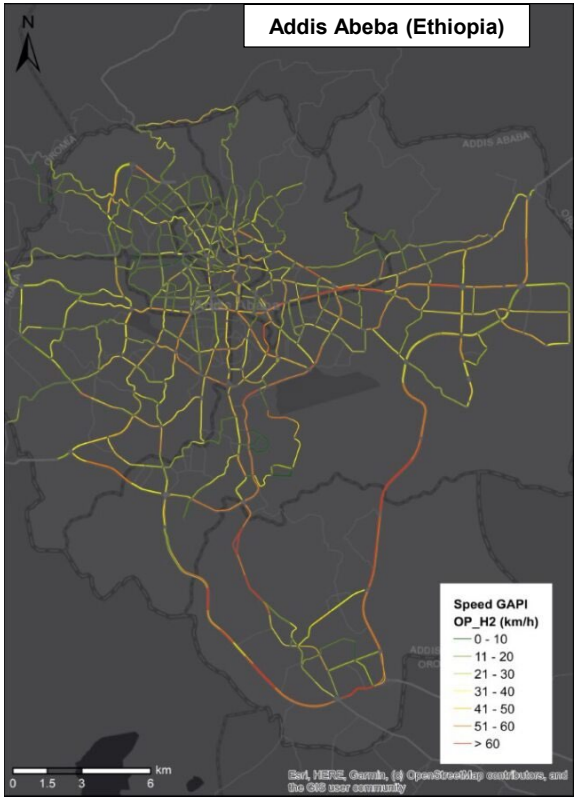
COUNTRIES
10

CITIES
16

BIGRS DATA ON SPEED







We divide the arterial network of selected cities into segments.

For each segment, we can obtain the average traffic speed data, at selected times of the day, and different traffic conditions.

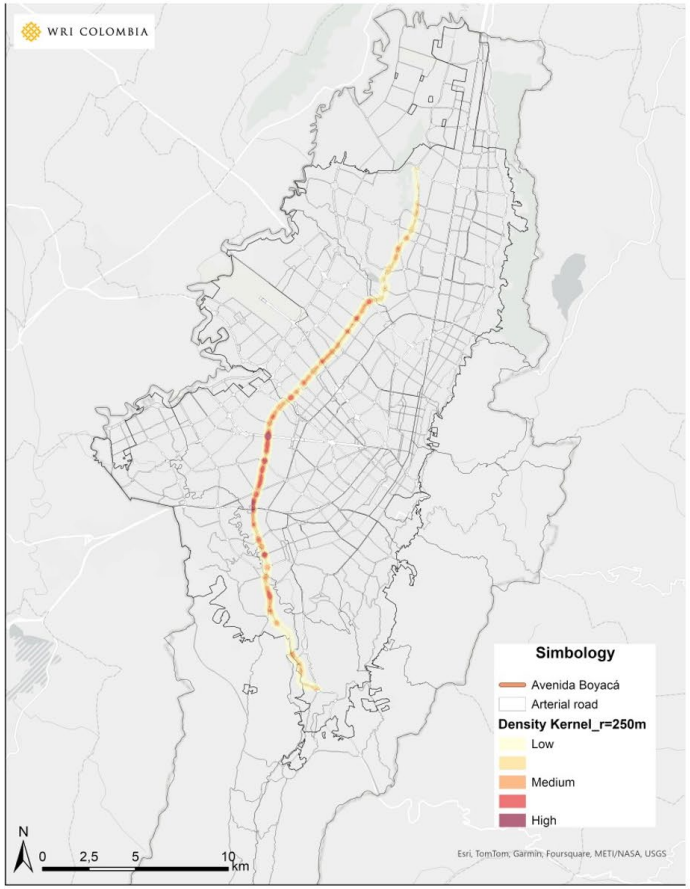
ARTERIAL ROADS

Av. Boyaca

BOGOTA, Colombia

Context (2023)

- Length: 29 km
- BRT planned (still)
- 30km of cycling infrastructure, most of it is bidirectional, located on west side at sidewalk level.
- **51 fatalities and 1295 serious injuries** reported in 2023.
- (Almost 1 person and 25 injuries per week)
- 17 out of 51 fatalities were **pedestrians**
- 24 out of 51 fatalities were **motorcyclists**
- **9.4% of the total fatalities** in Bogota



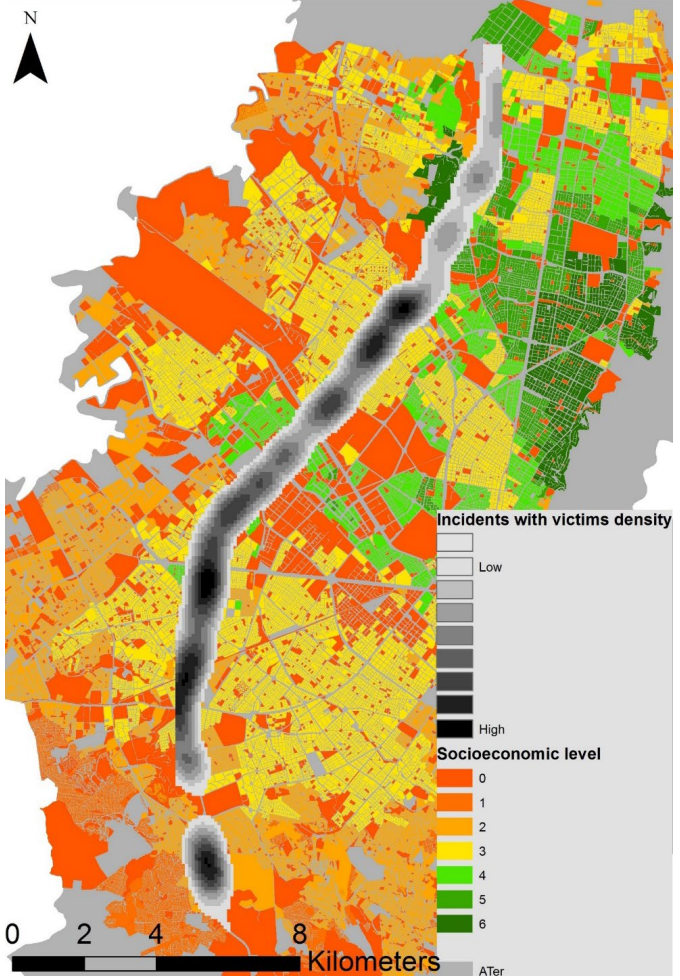
Problems Identified

- High speeds
- Lack of pedestrian crossings
- Priority to motorized vehicles
- Pedestrian infrastructure in bad conditions and/or poorly designed (specially in the south)
- Lack of safe pedestrian infrastructure

Problems Identified

- Very wide sections
- Wide turning radii
- Lack of bike infrastructure on the east side. (Av. Boyacá has infrastructure only on the west side from Av. Villavicencio to Calle 170)
- Car-oriented infrastructure
- Lack of safe bike infrastructure

Problems Identified

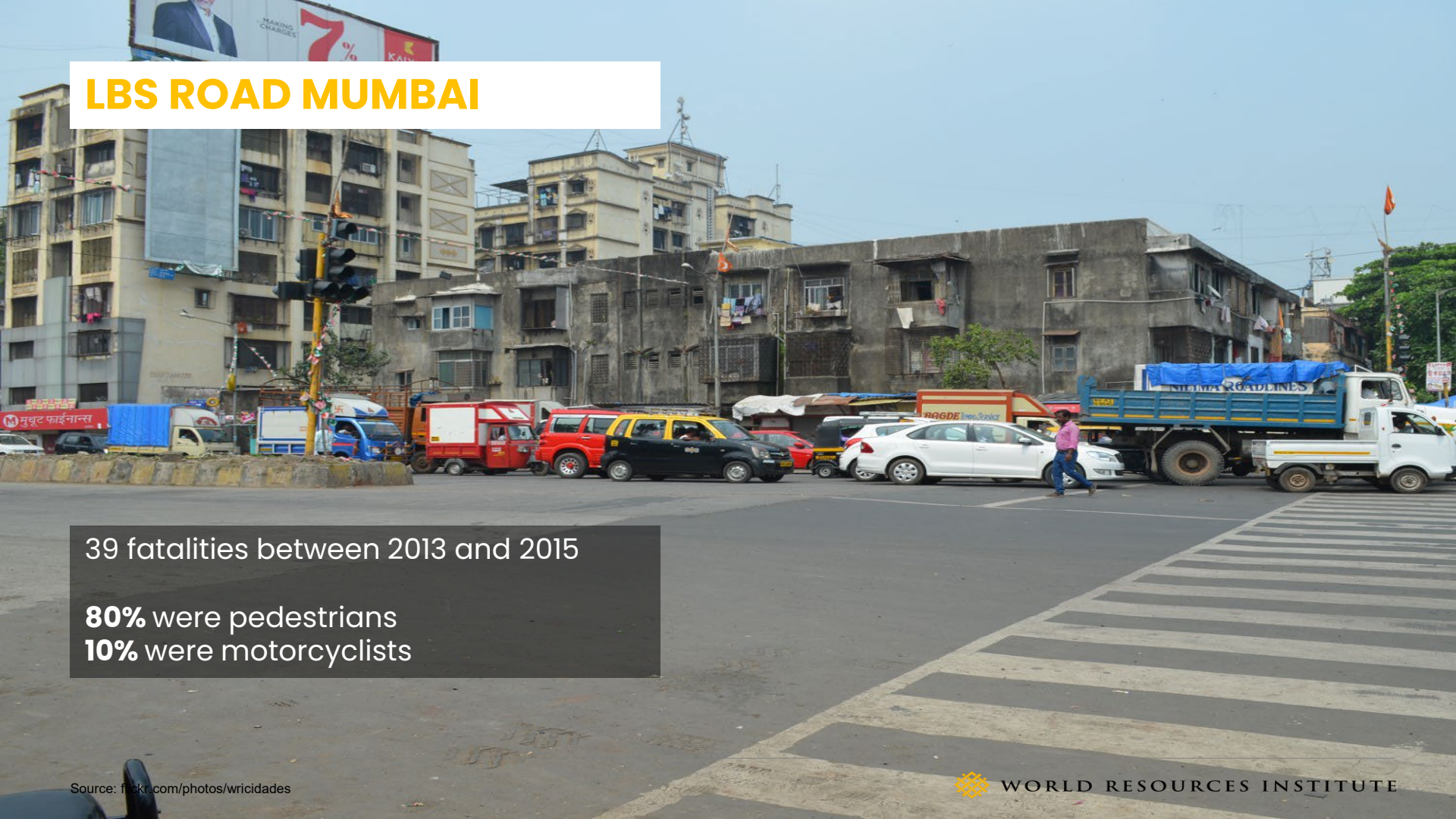


CITIES CHANGE...

N1 HIGHWAY: ACCRA

Source: flickr.com/photos/wricidades

LBS ROAD MUMBAI



39 fatalities between 2013 and 2015

80% were pedestrians
10% were motorcyclists

Source: flickr.com/photos/wricidades

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AV. DAD AMERICA'S: RIO DE JANERIO

Source: flickr.com/photos/wricidades

RINGROAD NAIROBI, KENYA

Include road safety in mobility project evaluations and investment considerations

This can also mean that negative impacts are ignored.

For example, the outer ring road in Nairobi, Kenya, upgraded with an investment of $120 million, is now the deadliest road in the country.

Include road safety in mobility project evaluations and investment considerations

Today, the outer ring road is considered the deadliest road in the country: **44 deaths in 2022, 50 deaths in 2023.**

More than 300 people arrested for trying to cross the street

Guayacanes Avenue

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GUAYACANES AVENUE

Opening date of the entire corridor: April 10, 2024

Located on the southwest city outskirts

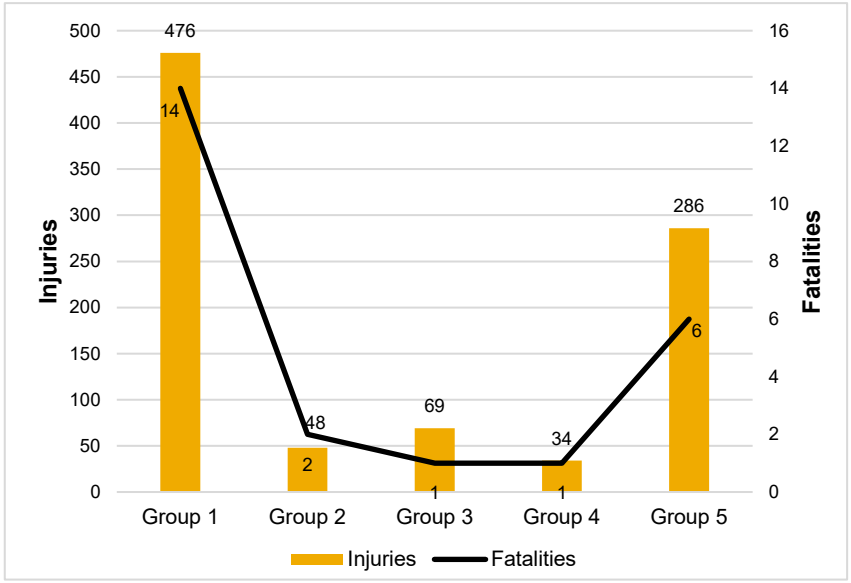
Approximate length: 11.5 km

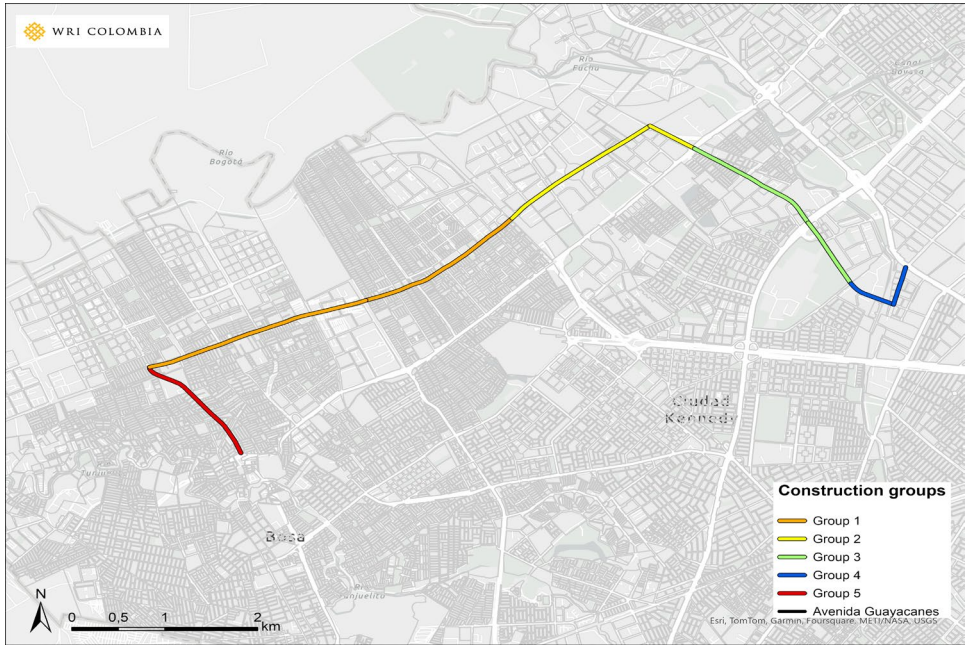
Low and mid-low income levels

High population density (highest in Bogota)

Predominant land uses: residential and commercial

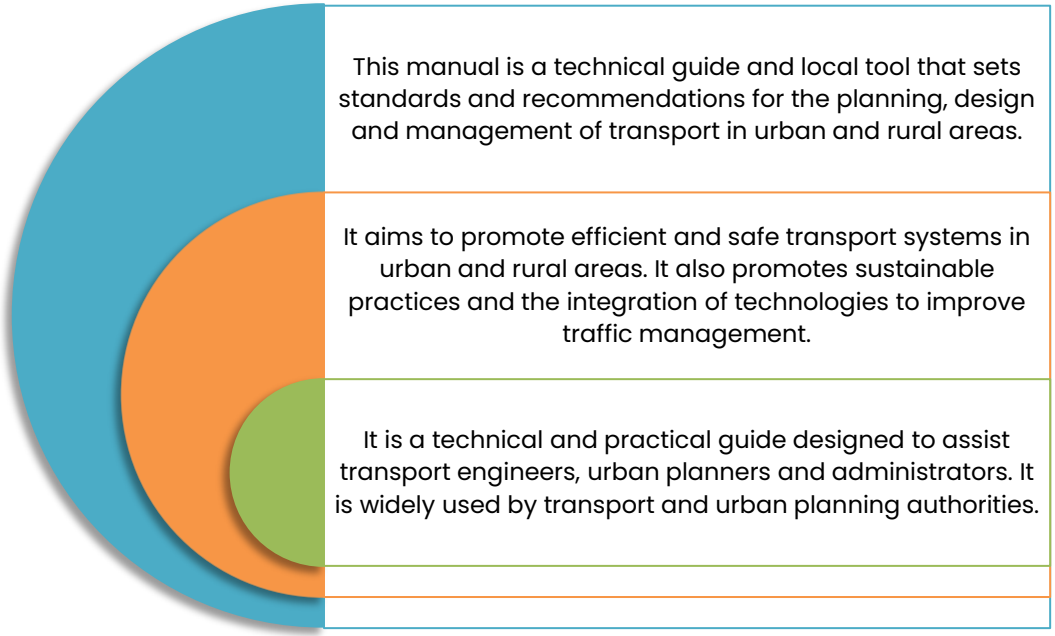
TRAFFIC CAUSALITIES – GUAYACANES AVENUE

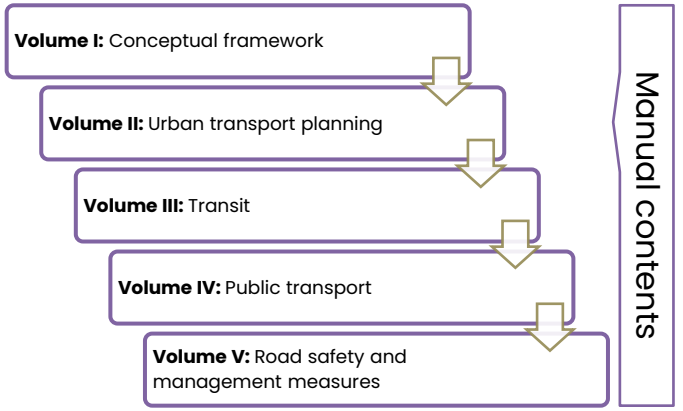




Guayacanes Avenue has concentrated **913 injuries** and **24 fatalities** across its 5 construction groups.

PLANNING AND DESIGN MANUAL (2005)





The manual is based on the **Highway Capacity Manual** (HCM) 2000, which fundamentally focuses on concepts such as *road capacity*, *levels of service* and *traffic flow*. **It doesn't consider safe street design**.

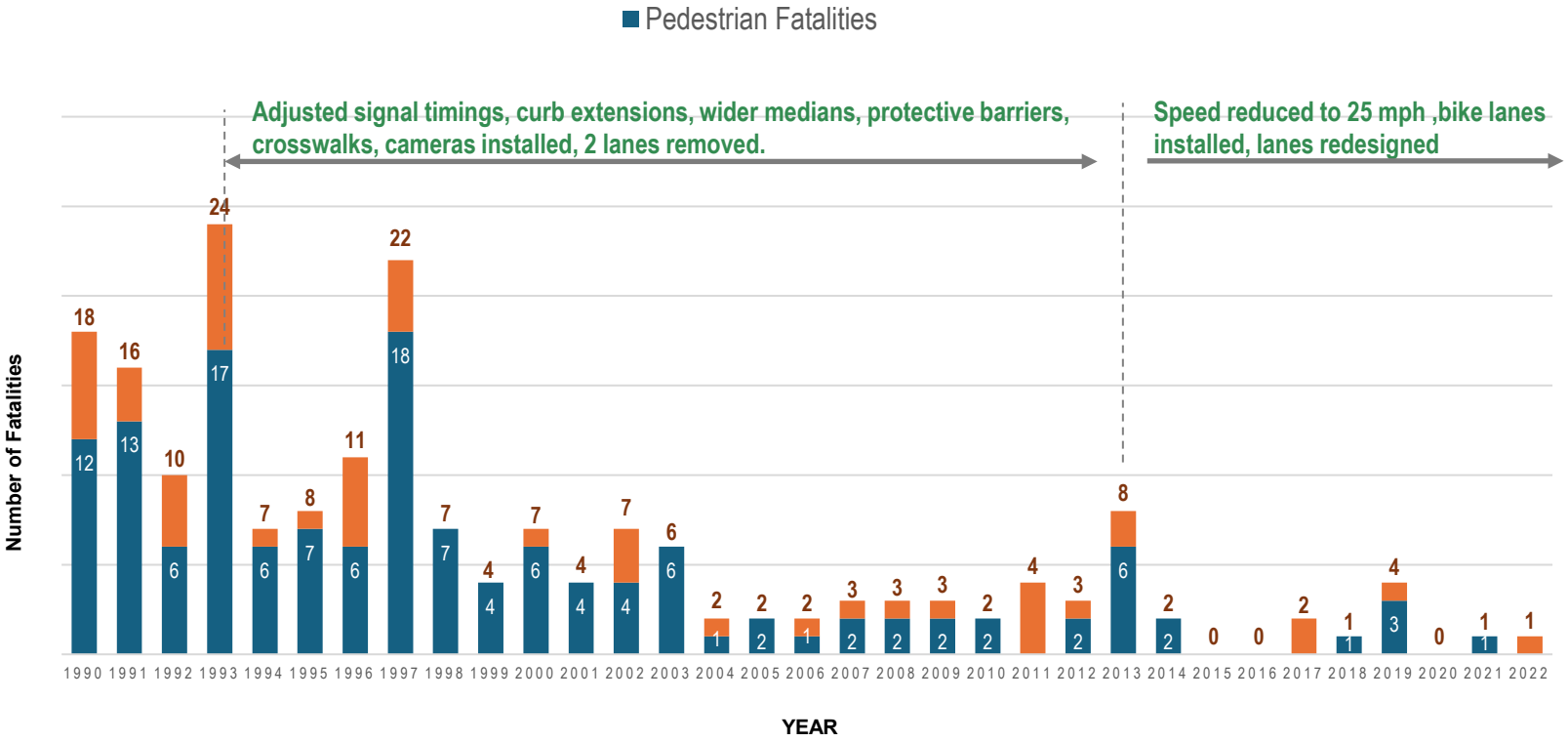
The streets are dangerous by design, designed primarily to move cars quickly at the expense of keeping everyone safe

Source: https://biblioarchivo.bogota.gov.co/cgi-bin/koha/opac-detail.pl?biblionumber=207121&shelfbrowse_itemnumber=198132#shelfbrowser

The boulevard of death: Queens BLVD, NYC

Between 1990 and 2022, a total of
194 people
have been killed on this one street
143 were pedestrians

QUEENS BOULEVARD FATALITIES 1990-2022



Source: NYC Open Data: NYPD Motor Vehicle Collision Database 2024, NYT 2017

NO LONGER The boulevard of death

Total Fatalities
decreased by 68%

Total injuries
decreased by 35%

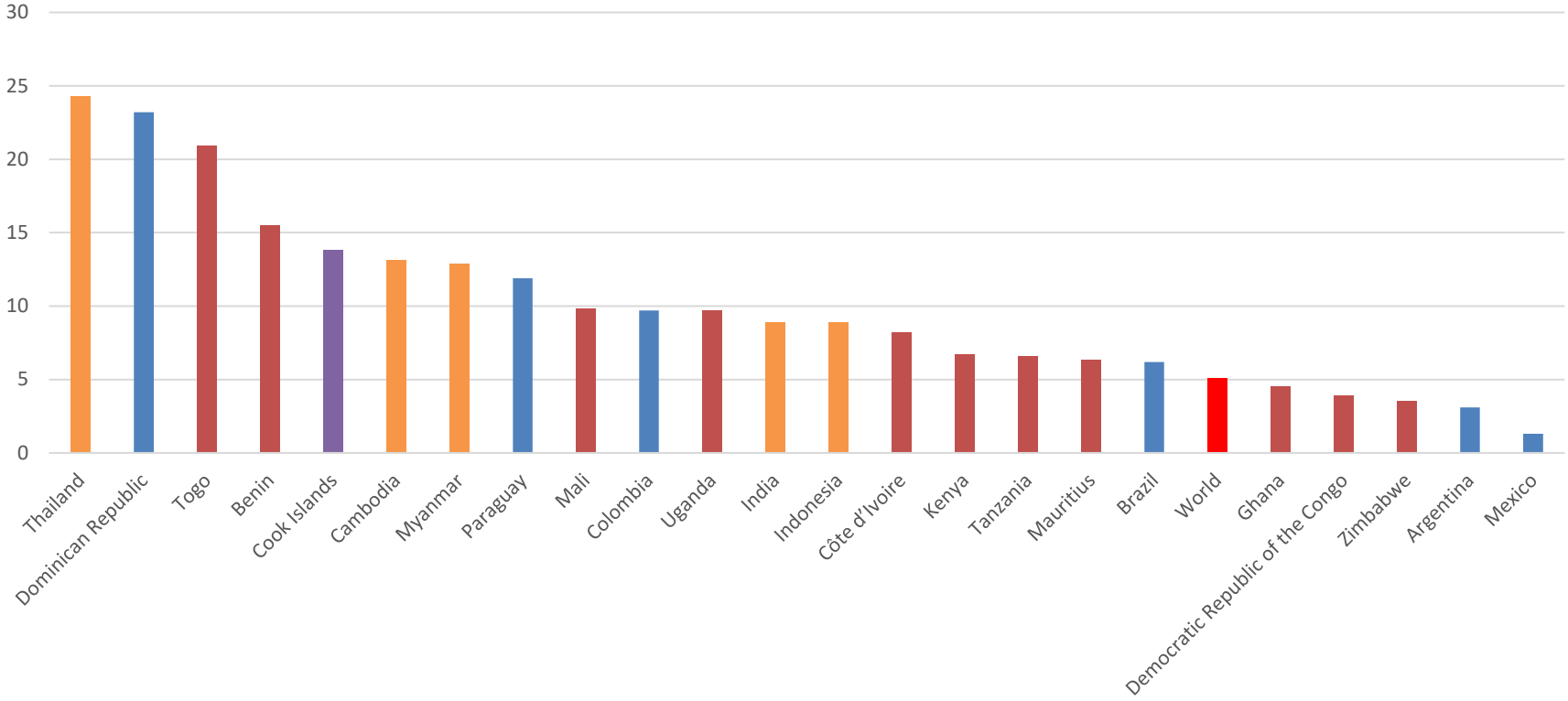
Pedestrian injuries
decreased by 45%.

Cyclist volumes
increased by 100% - 450%

“The Boulevard of Death has become the Boulevard of Life”: Mayor Bill de Blasio

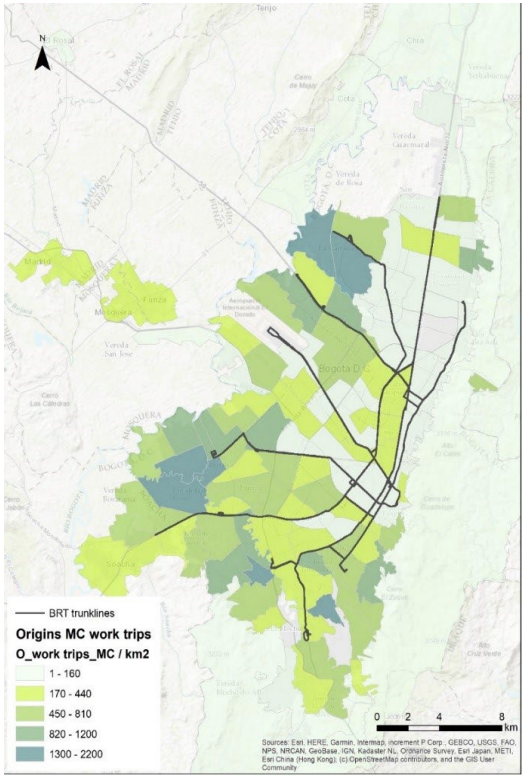
MOTORCYCLES

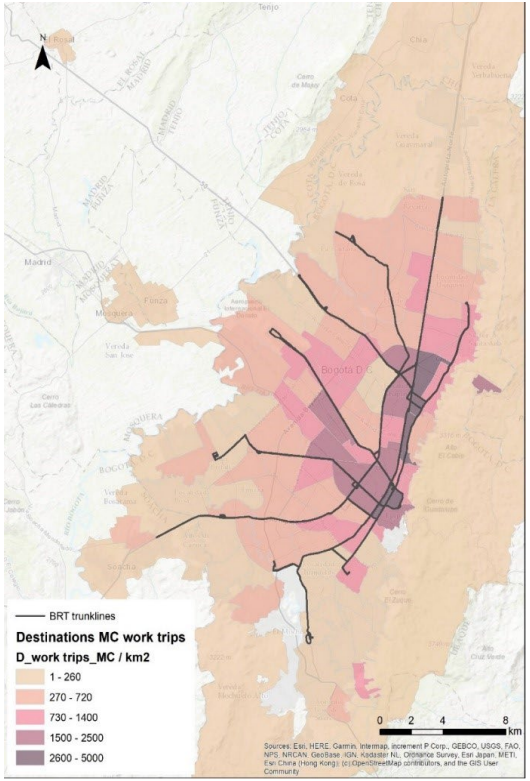
Global Motorcycle Fatality Rates per 100,000 population



EQUITY AND MOTORCYCLE USE

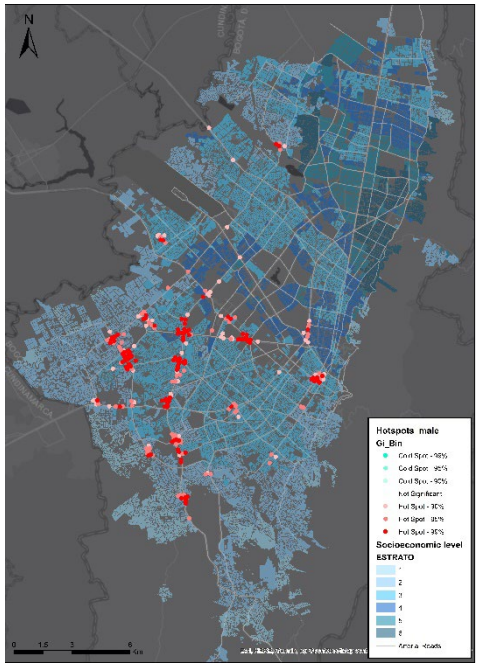
95% of trips made in low- income households

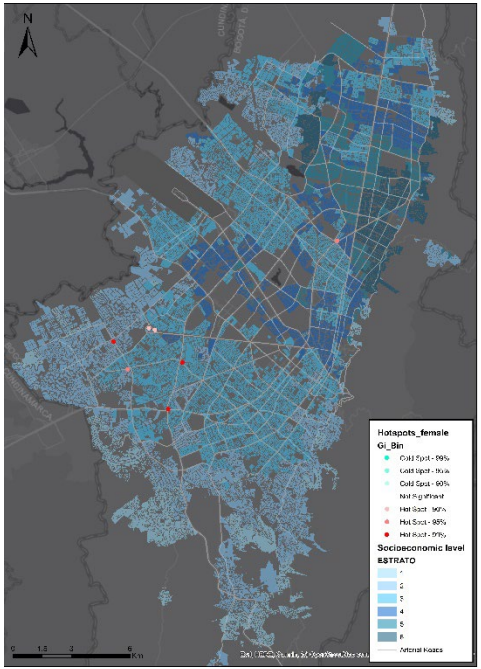




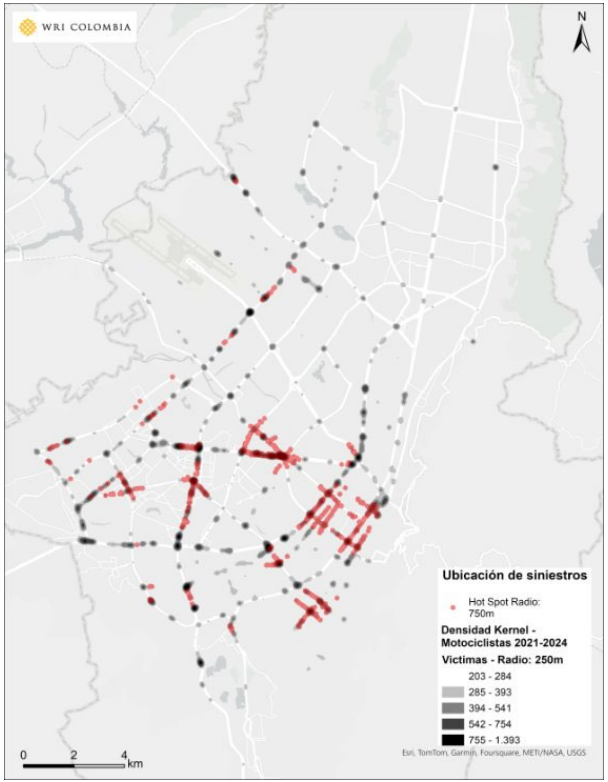
EQUITY AND MOTORCYCLE USE

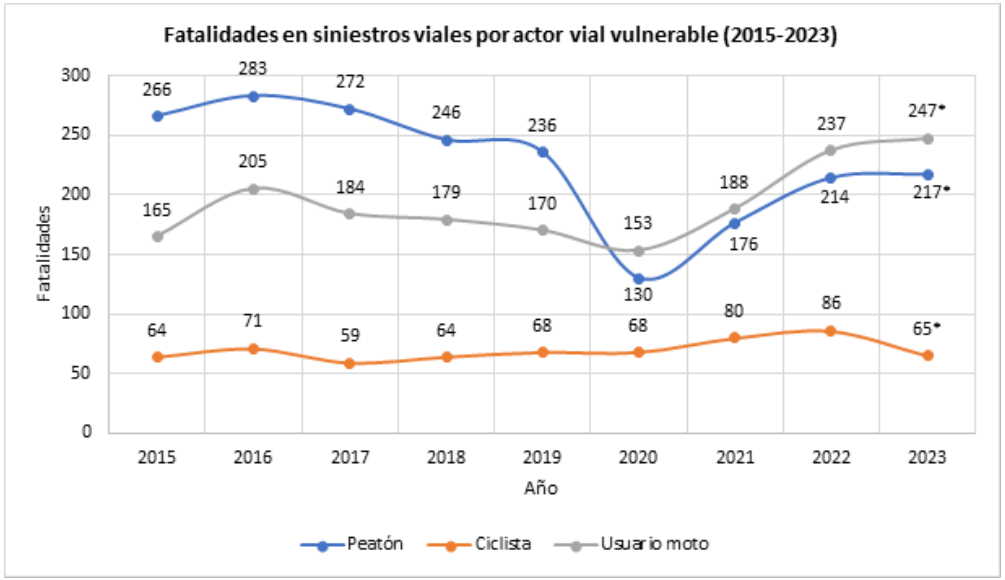
Hotspots are in low- income areas exclusively





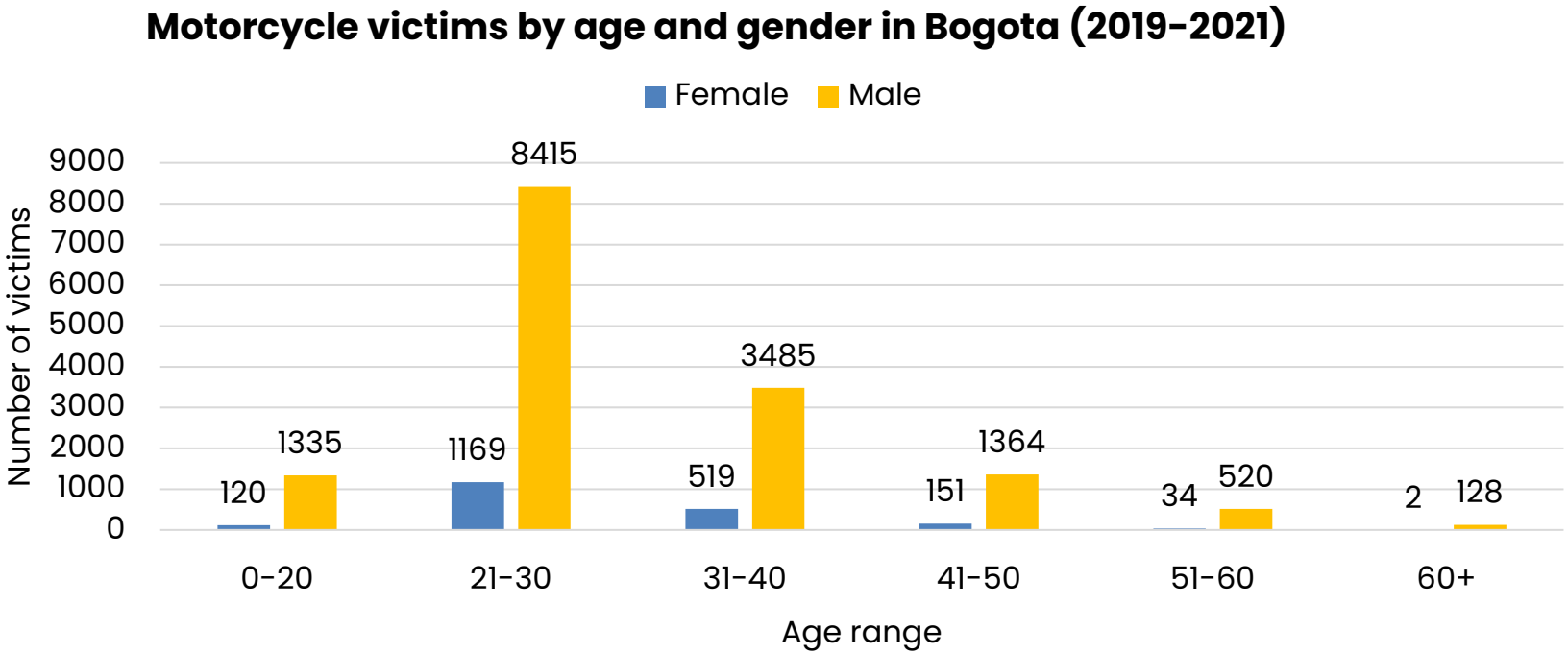
TRENDS ARE CHANGING





217 killed pedestrians, **113 motorbikes were involved**!!

WHO GETS AFFECTED THE MOST?



WRI RESEARCH

Relationship between motorcycle safety and built environment in 6 cities of the global south

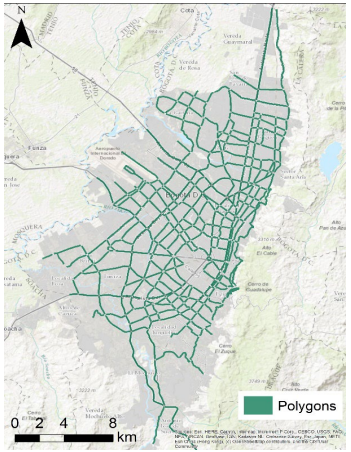
DATA AND METHODS

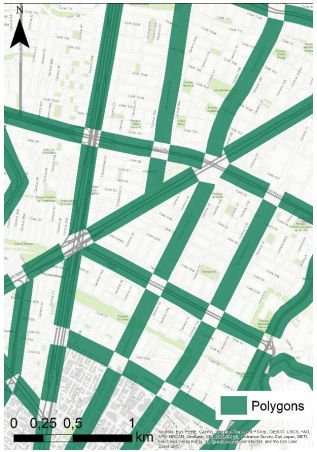
SPEED
Google API in segments
- 3am optimistic model

GEOMETRY
- Number and width of lanes by direction
- Width of corridor: **roadbed width**
- Markings and condition
- Median
- BRT trunk lanes

LAND USE
- % per use
- Blocks per km
- Population, employment density

INFRASTRUCTURE
- Signals
- Pedestrian bridges
- Intersections





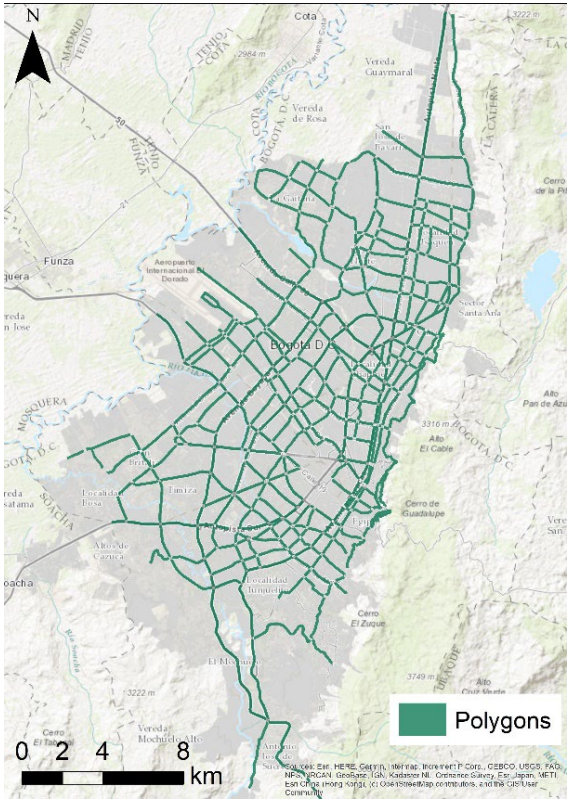
Number of casualties (injuries or fatalities)

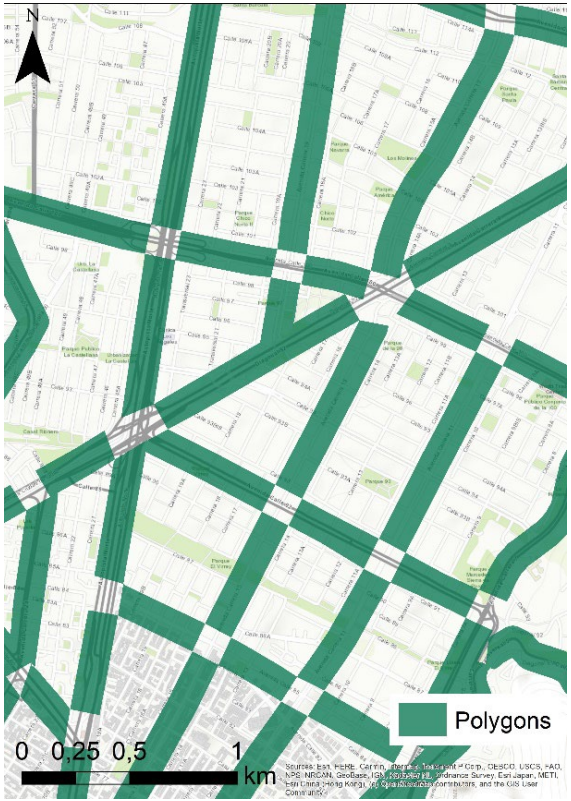
Data was collected in six cities: Bogota, Cali, Buenos Aires, Nairobi, Accra, Bangkok.

METHODOLOGY

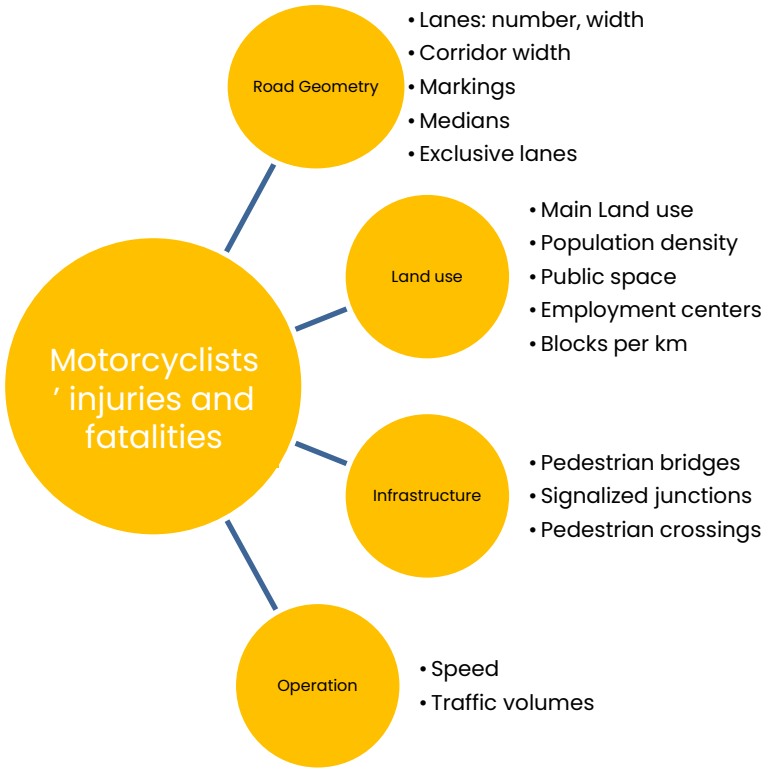
DATA USED

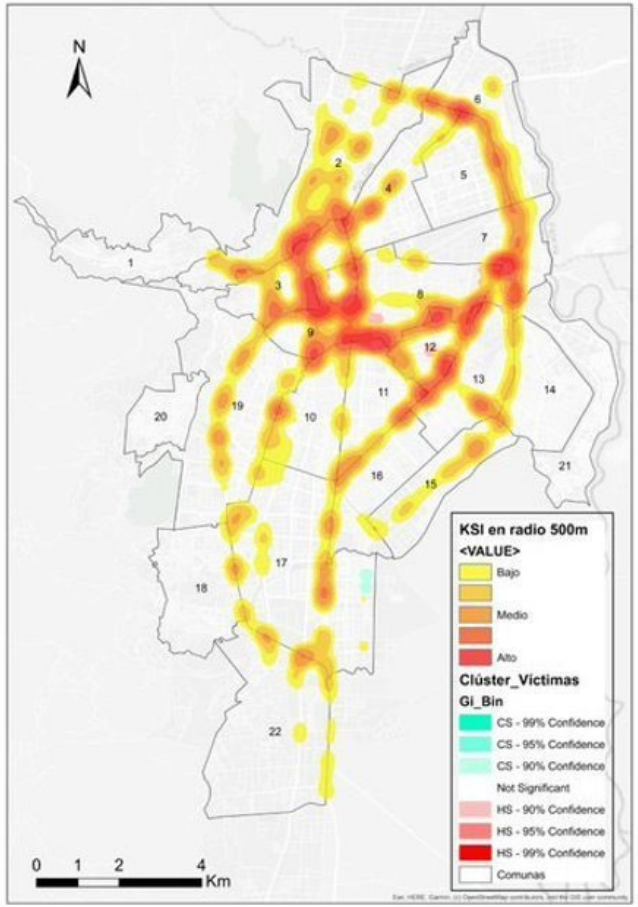
- Geocoded road safety
- Speed
- Built environment
  - Lane width, carriageways, pedestrian bridges, population density, land use



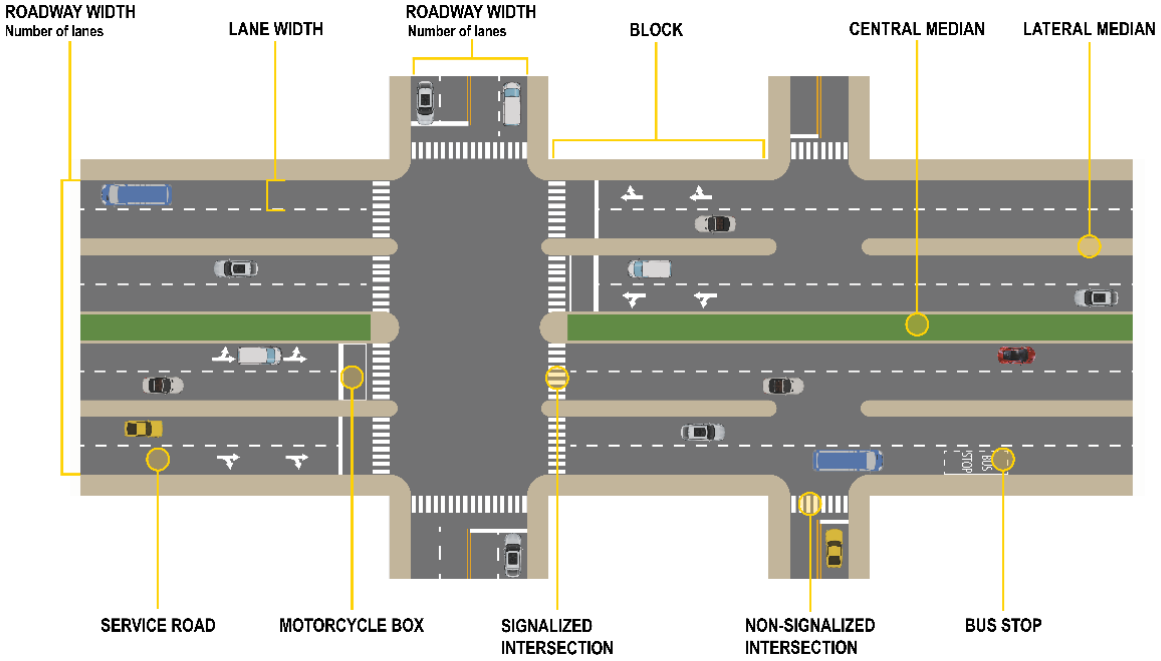


DATA


Motorcyclists ' injuries and fatalities
Road Geometry
• Lanes: number, width
• Corridor width
• Markings
• Medians
• Exclusive lanes
Land use
• Main Land use
• Population density
• Public space
• Employment centers
• Blocks per km
Infrastructure
• Pedestrian bridges
• Signalized junctions
• Pedestrian crossings
Operation
• Speed
• Traffic volumes


N
KSI en radio 500m
<VALUE>
Bajo
Medio
Alto
Clúster_Victimas
Gi_Bin
CS - 99% Confidence
CS - 95% Confidence
CS - 90% Confidence
Not Significant
HS - 90% Confidence
HS - 95% Confidence
HS - 99% Confidence
Comunas
0 1 2 4
Km

DATA

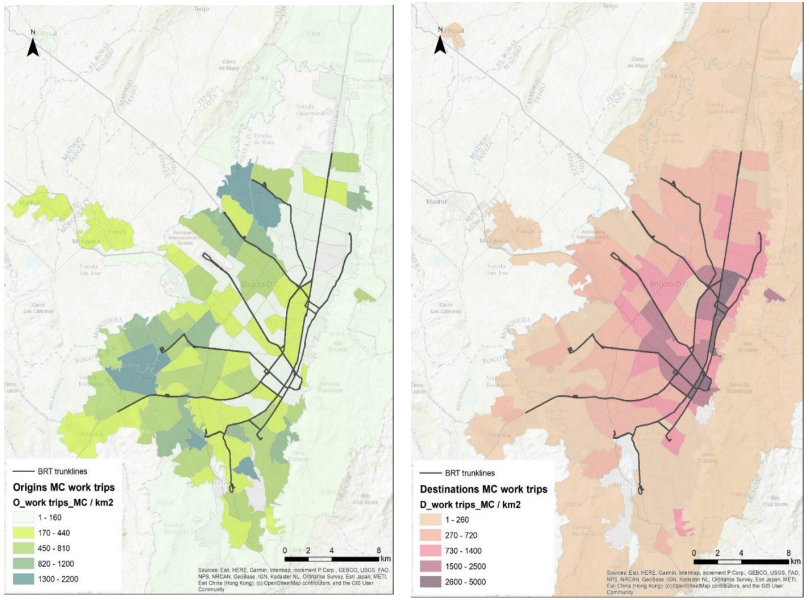


Google Earth / Google Street View

Google Distance Matrix API

RELEVANT FINDINGS – CASE OF STUDY: BOGOTA

Wider roadways and lanes – associated with higher speeds, filtering and weaving



Motorcycle trips originate mostly where accessibility to public transport and BRT is the lowest.

FINDINGS AND RECOMMENDATIONS

Variable	Finding	Recommendations
Speed	Traffic speed is the best predictor of motorcycle crashes and victims	**SPEED MANAGEMENT** strategies at corridor and area level, not just spot-based
Land use	Population density, commercial land use and lower income levels are associated with higher risks for motorcyclists	Special focus on minimizing conflicts and reducing speeds in dense urban environments with commercial activity, review investment in infrastructure for low-income neighborhoods and allocating resources equitably
Intersections	Motorcyclists are particularly vulnerable in intersections, compared to other users	Safe intersection design for safe approaching speeds is needed. **Compact, simple, and controlled** intersections are safer
Road design	Wider roads with multiple lanes – associated with filtering and weaving. Medians are associated with increases in injuries, likely due to merging at high speeds	Redesign of lane width for speed management, redesign or close median openings might be needed
Other users	Actions that guarantee safety for pedestrians and passengers bring positive outcomes for motorcyclists' safety	Remove pedestrian bridges for safe crossings, speed management measures, design public transit stations and stops to minimize conflicts.

SPEED MANAGEMENT IS CRITICAL

RECOMMENDATIONS

- **EXTENDED:** Speed interventions should be comprehensive and continuous and not just point-based.
- **ALL THE TRAFFIC:** speed management should target all vehicles and not just motorcycles.
- **SAFE DESIGN:** design roads with clear and consistent lane widths.
- **RECONSIDER:** speed limits: safe speeds for motorcycles may be different from safe speeds for other road users

3. IMPROVE DESIGN AND REDUCE COMPLEXITY OF INTERSECTIONS

FINDINGS

- Intersections increase number of conflicts but can help reduce speeds
- **Reducing complexity** and conflicts are key to safer intersections

RECOMMENDATIONS

- **Compact, simple**, and controlled intersections are safer
- Access at low speeds

4. ROAD WIDTHS, MEDIANS AND MERGING

FINDINGS

- Wider roads with multiple lanes – associated with filtering and weaving
- Medians are associated with increases in injuries, likely due to merging at high speeds

4. ROAD WIDTHS, MEDIANS AND MERGING

RECOMMENDATIONS

- Redesign or close median openings
- Controlled lane width and roadway width

5. COMBINE ACTIONS FOR MOTORCYCLIST SAFETY WITH ACTIONS FOR OTHER ROAD USERS

FINDINGS

Pedestrian bridges, wider external lanes and public transit are associated with increases in motorcycle crashes

ENVIRONMENTAL ELEMENTS WE DIDN'T LOOK AT

- Motorcycle dedicated infrastructure
- Road and surface quality
- Road and roadside hazards
- Weather
- Motorcycle speeds
- Conflict analysis at critical locations

Source: Bloomberg News

POVERTY

ECONOMIC IMPACTS OF ROAD ACCIDENTS

Countries that do not invest in road safety have potential losses in GDP per capita growth between 7 and 22% over a 24-year horizon

POVERTY

92% of traffic deaths occur in low- and middle-income countries.

Research in South Korea has shown that 1/3 of road accident victims have lost their jobs due to loss of physical abilities.

The average income level of the victims was 40% lower than the national average

Road Safety and Climate Change

Transformational change is needed

Achieving climate mitigation goals would require transformative changes in the transport sector.
IPCC AR6

Una imagen de la ciudad de Lajeado, Rio Grande do Sul, inundada por las lluvias. Foto Reuters Imagen. Clarín 20/Feb/2024

CLIMATE CHANGE AND ROAD SAFETY ARE INTERLINKED

Transportation produces about 25% of global carbon emissions

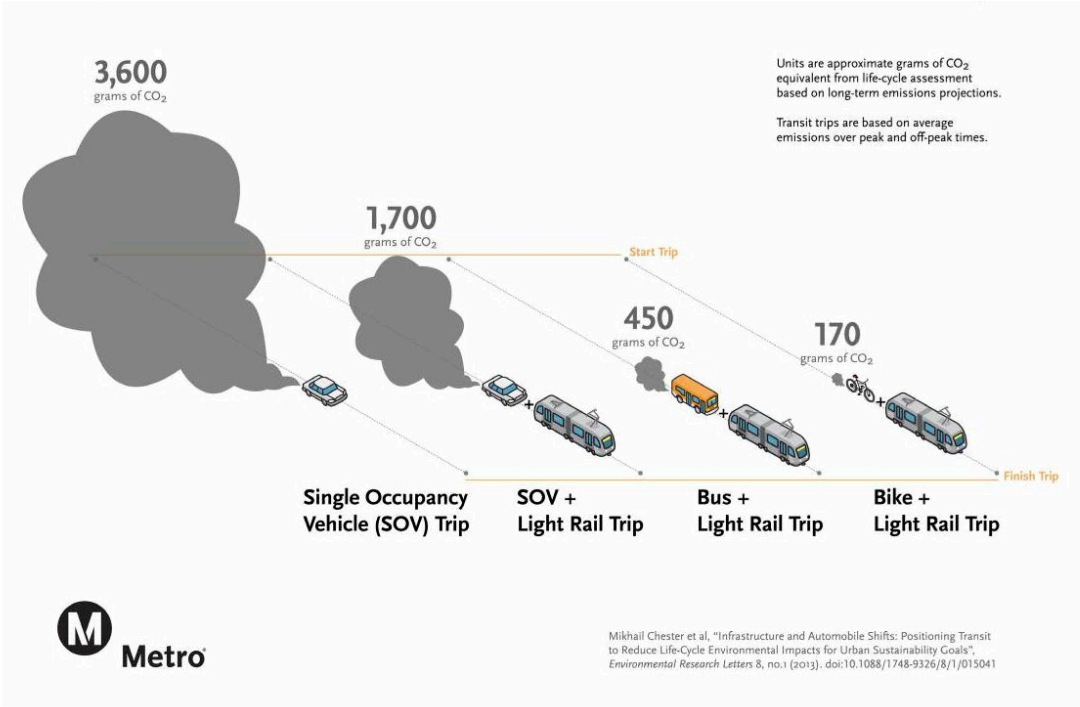
According to the TUMI Transport Outlook report, to reach the 1.5°C target, public transport capacity needs to be doubled and **50% of journeys should be made on foot or by bicycle.**

The Impacts of Climate Change

Greenhouse gas emissions from private transportation are projected to grow from 23% to 33% through 2050.

The decarbonization of the transport sector requires the shift of mobility options to high-efficiency modes, as well as planning to facilitate walking and cycling (IPCC Report, 2018).

Greenhouse gas emissions per person per trip



2023 Breaks Records And Will Be The Hottest Year

The New York Times

See How 2023 Shattered Records to Become the Hottest Year

Month after month global temperatures didn't just break records, they surpassed them by far. This year could be even warmer.

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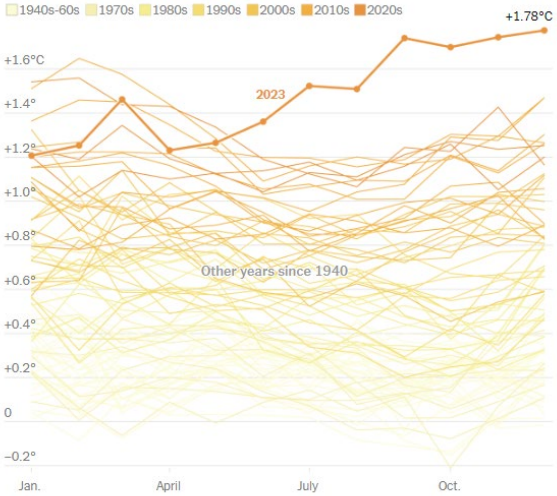
Monthly global temperature compared with pre-industrial levels



Source: Copernicus/ECMWF

Another way to grow: Planning mobility on a human scale

Juan Carlos Escudero. Center for Environmental Studies
Vitoria-Gasteiz City Council

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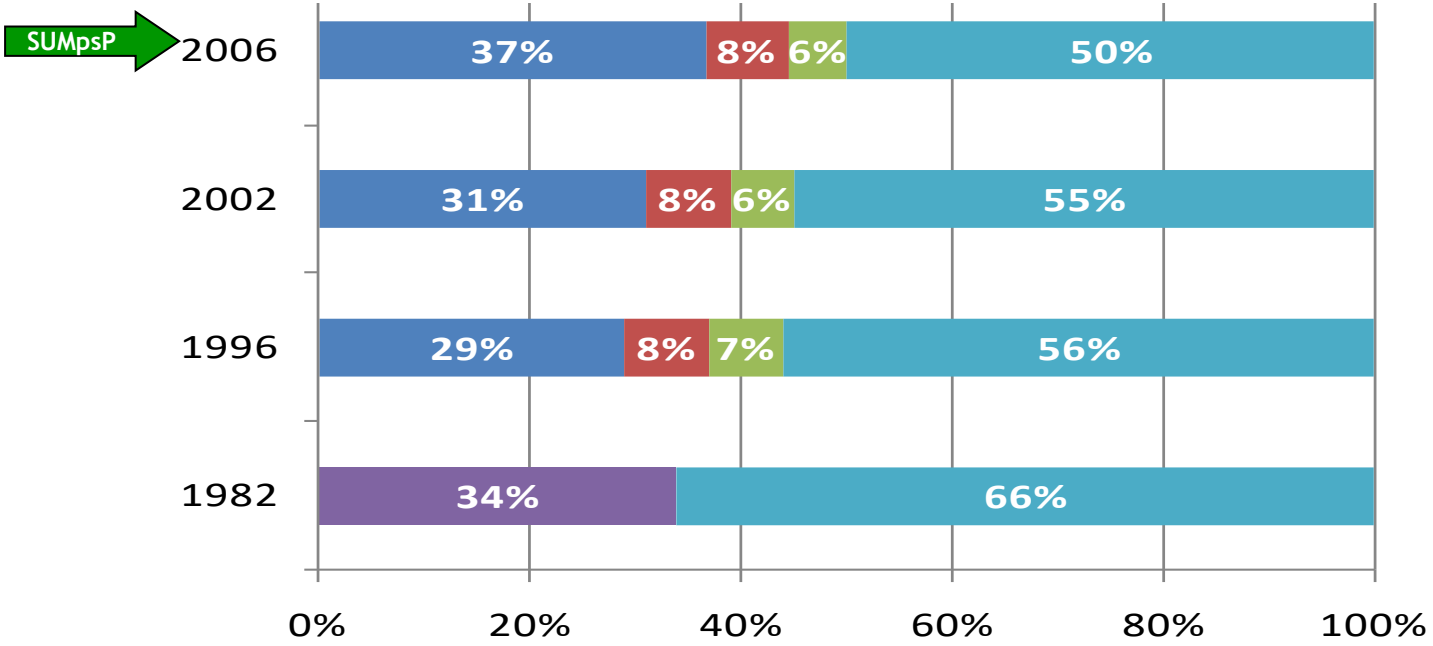
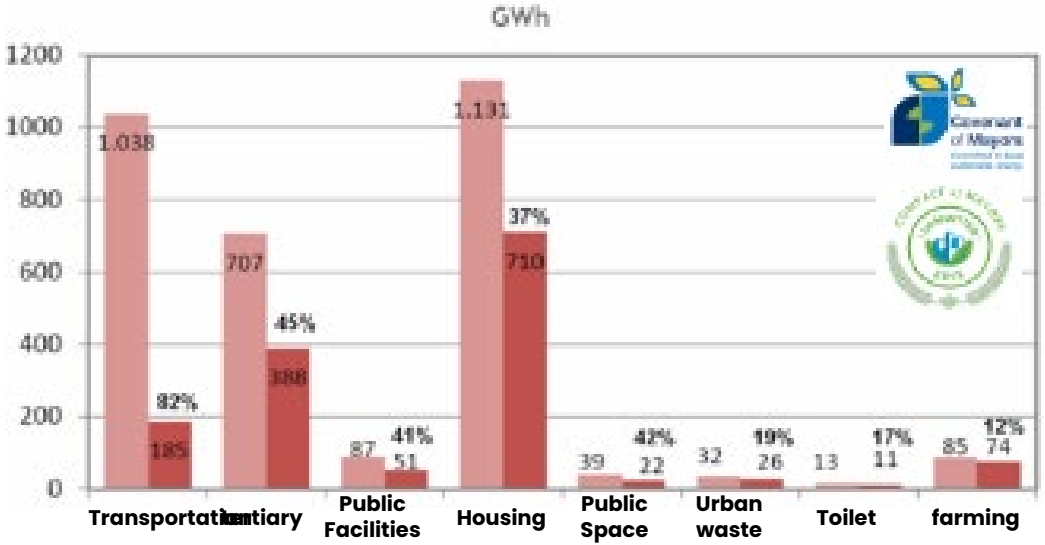
donde el verde es capital
bertan berdea nagusi
where the green is capital

VITORIA-GASTEIZ
EUROPEAN GREEN CAPITAL

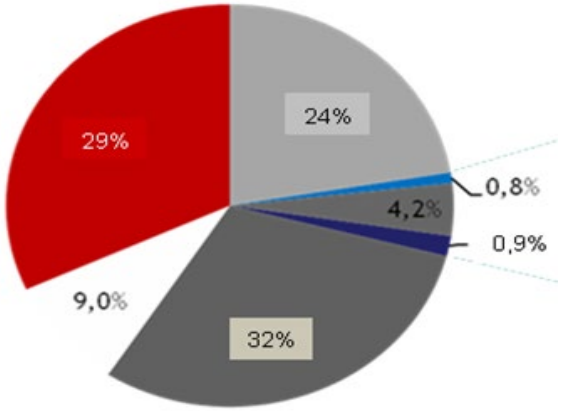
A worrying development...



A commitment to the Climate...



How to become a carbon neutral city in 2050?



Mobility:

29% of CO_2 emissions in 2006

A shared learning process

October 2006
1st participatory workshop.
Report on Mobility and Sustainability in Vitoria-Gasteiz

November 2006
2 or participatory workshop.
Mobility in Vitoria-Gasteiz in 2020

January 2007
3rd participatory workshop
Citizen Pact for Sustainable Mobility

- Citizen Pact for Sustainable Mobility
- Signature: April 2007
- Approval in Municipal Plenary. September 2007
- Approval in the Social Council. July 2008

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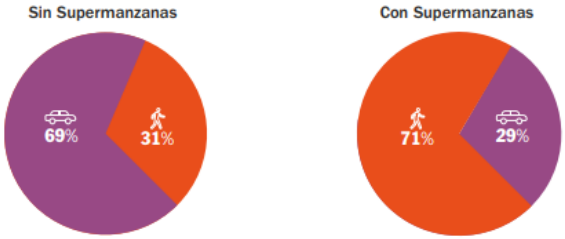
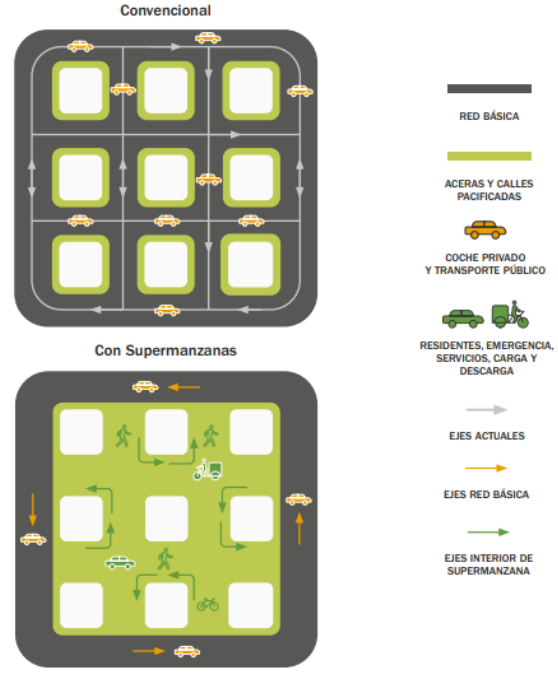


Supermanzanas, un concepto clave para una nueva movilidad y espacio público

Como criterio general, se planteó **abordar la movilidad y el espacio público de forma conjunta**. Fruto de este planteamiento se estableció la supermanzana como unidad urbana básica del futuro esquema de movilidad y espacio público para la ciudad.

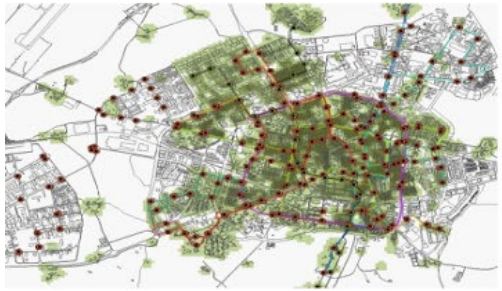


A new public transport network

In 2009, Vitoria-Gasteiz completely remodeled the public transport network, integrating buses and trams.

The old network, based on 18 bus lines, is replaced by a new one with 2 tram lines and 9 bus lines.

The new network topology offers better frequencies (10 min.) and less travel time.



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From a car-oriented public space. . .

Intervenciones de reforma estructural del espacio público

Imagen de la Avenida de Gasteiz, a mediados de los años 80.

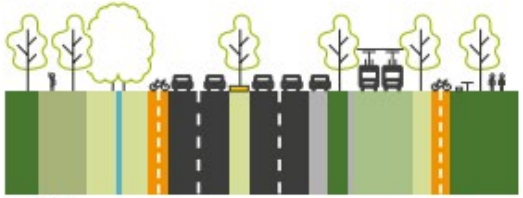
▼ Reforma urbanística integral de la Avenida de Gasteiz

En el año 2015 finalizaron las obras de reforma integral de la Avenida de Gasteiz. La reforma incluyó intervenciones de movilidad a favor de los modos sostenibles y de incremento del arbolado, así como la incorporación de sistemas urbanos de drenaje sostenible (SUDs) y el afloramiento del río Abendaño.

Las actuaciones de mejora de la movilidad consistieron en la peatonalización del carril lateral de servicio entre Beato Tomás de Zumárraga y Basoa, la eliminación de los carriles reservados a aparcamiento, el acondicionamiento de una senda urbana de 5 m de ancho y un itinerario ciclista.

▼ La reforma ha modificado la sección de calle, aumentando el espacio para caminantes y ciclistas.

Antes



Después

▼ Imagen representativa del escenario de coexistencia de diferentes modos de transporte, tras la reforma efectuada.

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... to one oriented to people and nature.

An improved cycling network

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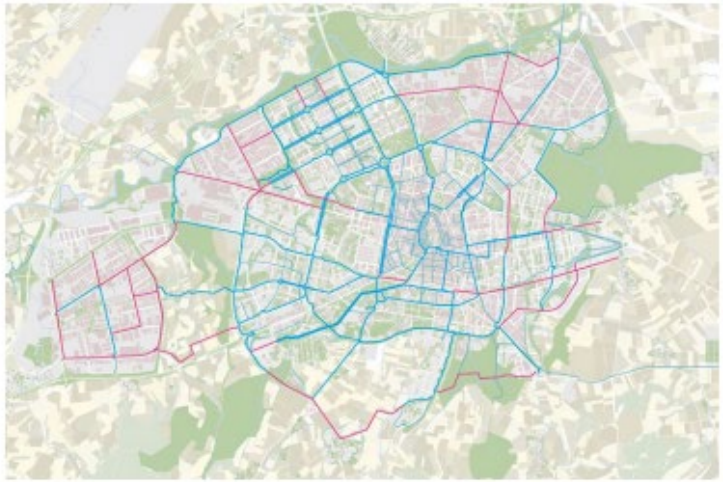
Ampliación y mejora de la red ciclista

Durante estos años se ha extendido la red ciclista, pasando de 55 km en 2006 a más de 150 km en 2020 y se han acondicionado nuevos tipos de vías ciclables, que han mejorado la conectividad de vías y tramos y del conjunto de la red ciclista.

Si antes se planteaban como carriles separados de la acera y de la calzada, actualmente, de acuerdo con el esquema de supermanzanas, se adaptan a la morfología de cada calle, pudiendo estar o no segregadas.

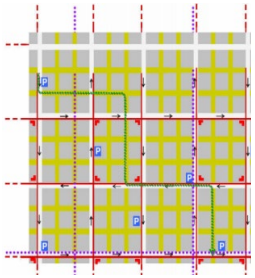
▼ **Red ciclista de Vitoria-Gasteiz**

La **red principal** de vías ciclables, que discurre por las vías básicas, conecta los barrios de la ciudad con el centro y entre sí, con los polígonos industriales, con el Anillo Verde y con los pueblos. La **red de proximidad**, en gran medida en régimen de convivencia, que discurre por calles interiores de "supermanzanas", posibilita el acceso a los equipamientos educativos, sociales y culturales, así como a los centros de trabajo, comercios, zonas de recreo, etc.

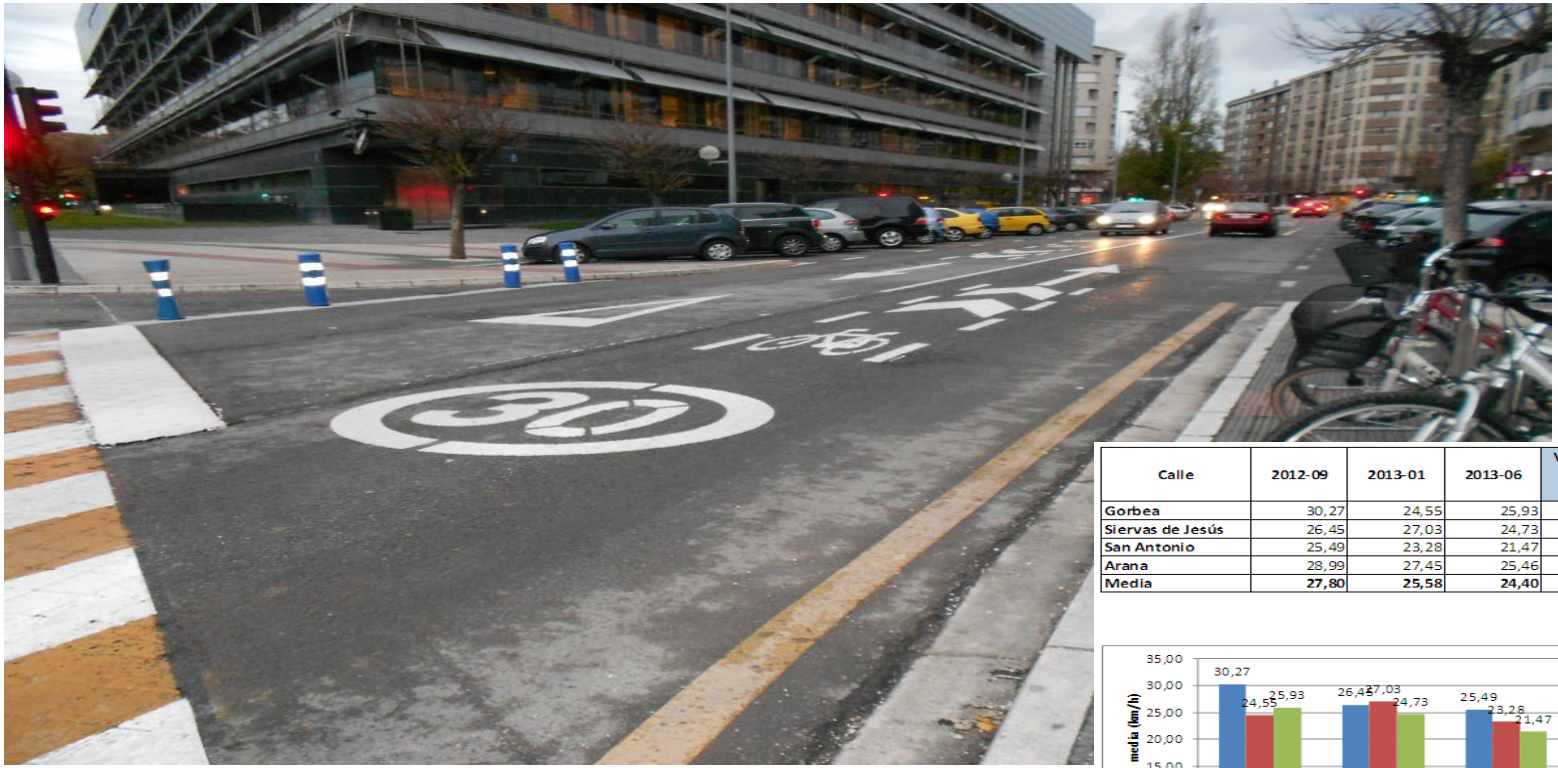


En la actualidad la red ciclista de Vitoria-Gasteiz cuenta con **102,7 km de red principal y 55 km de red secundaria,** formada por vías exclusivas, espacios compartidos y calles peatonales con horarios permitidos para la bicicleta.

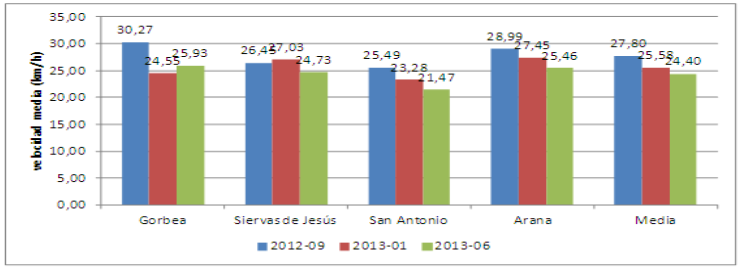
El 29% de la población reside a menos de 100 m de la red (equivalente a 1 minuto a pie) y un 77% a menos de 200 m.



Analysis of the pilot of calm 30



Calle	2012-09	2013-01	2013-06	Variación 2012-09 2013-01	Variación 2013-01 2013-06	Variación 2012-09 2013-06
Gorbea	30,27	24,55	25,93	-18,9%	5,6%	-14,4%
Siervas de Jesús	26,45	27,03	24,73	2,2%	-8,5%	-6,5%
San Antonio	25,49	23,28	21,47	-8,7%	-7,8%	-15,8%
Arana	28,99	27,45	25,46	-5,3%	-7,2%	-12,2%
Media	**27,80**	**25,58**	**24,40**	**-8,0%**	**-4,6%**	**-12,2%**



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THANK YOU!