Cargo bikes: An opportunity to improve deliveries in urban centers

Carlos Andrés Granada-Muñoz

Guillermo Arcila Mena; Carlos A. González-Calderón ; John Jairo Posada Henao

Department of Civil Engineering

Universidad Nacional de Colombia at Medellin

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Outline

1. Externalities of urban centers
   ➢ Urban Population Growth Rate

2. Case Study: Medellín, Colombia
   ➢ Insufficient parking spaces
   ➢ Congestion
   ➢ Environmental problems which generates restrictions

3. Opportunity to improve deliveries in urban centers

4. Cargo Bikes to improve deliveries

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1. Externalities: Population in 2019
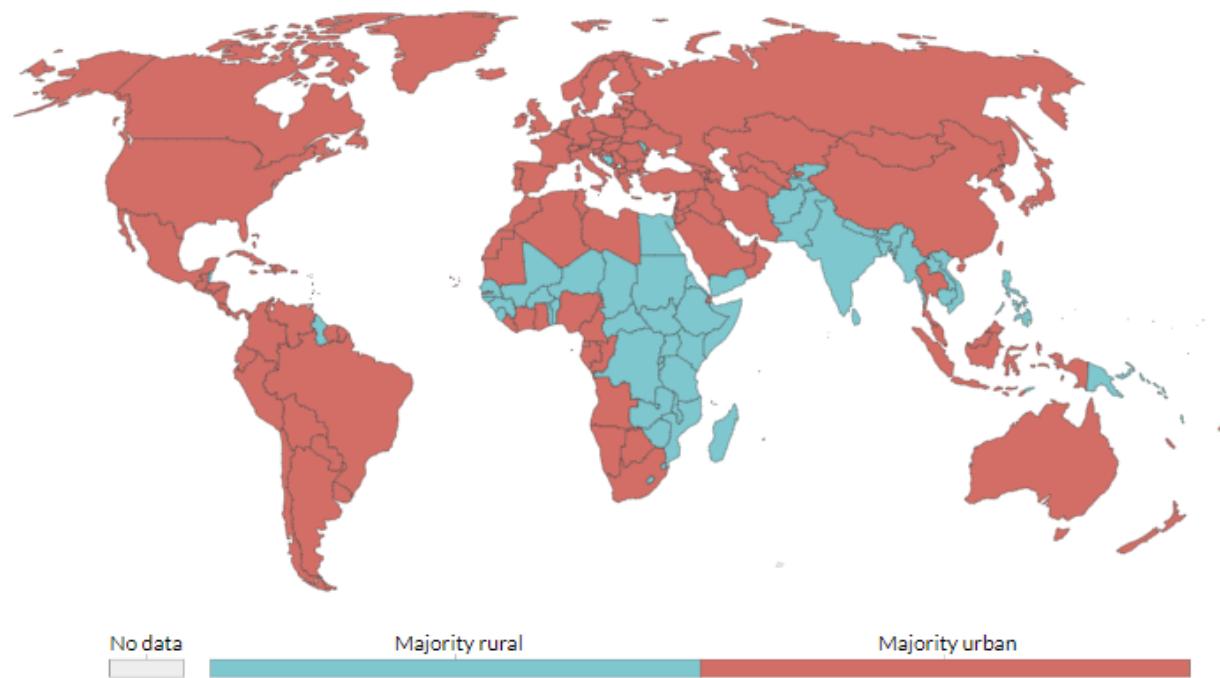
No data   Majority rural   Majority urban

Source: OWID based on UN World Urbanization Prospects (2018) & Historical Sources (see Sources tab)   [1]

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1. Externalities: Population 1950 vs 2050

Source: OWID based on UN World Urbanization Prospects (2018) & Historical Sources (see Sources tab) [1]

1. Externalities: Population growth rate in Latin America
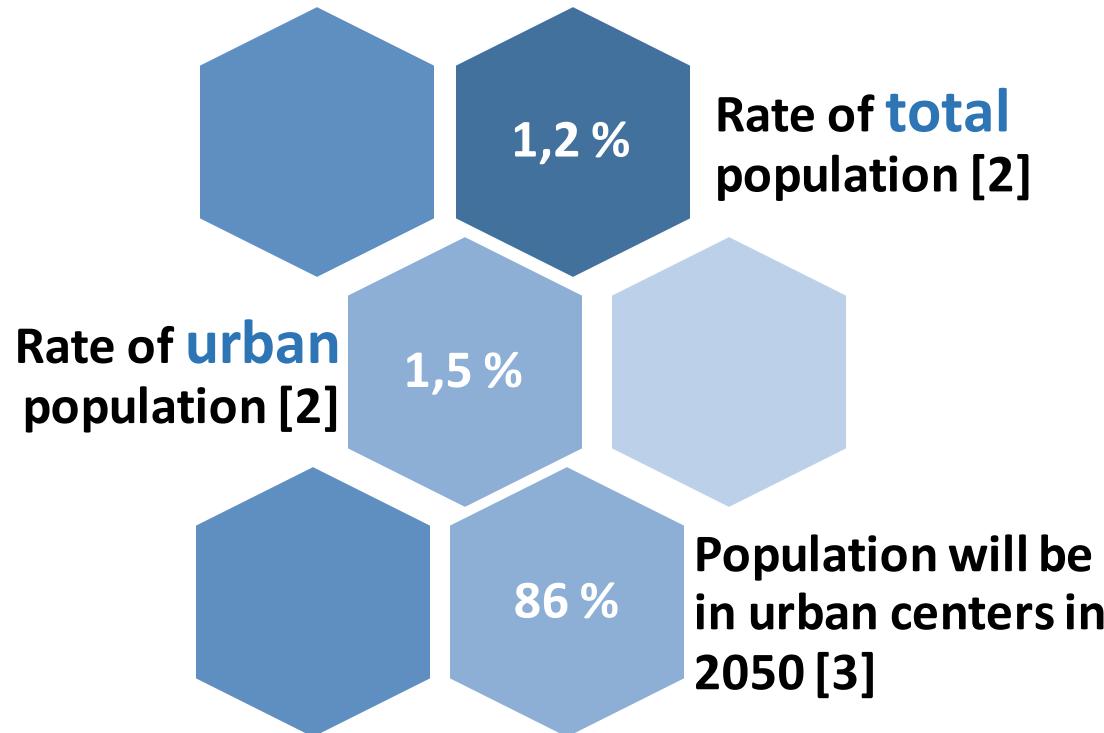
1,2 % — **Rate of total** population [2]

Rate of urban population [2] — **1,5 %**

86 % — **Population will be in urban centers in 2050 [3]**

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1. Externalities Population Growth in Colombia
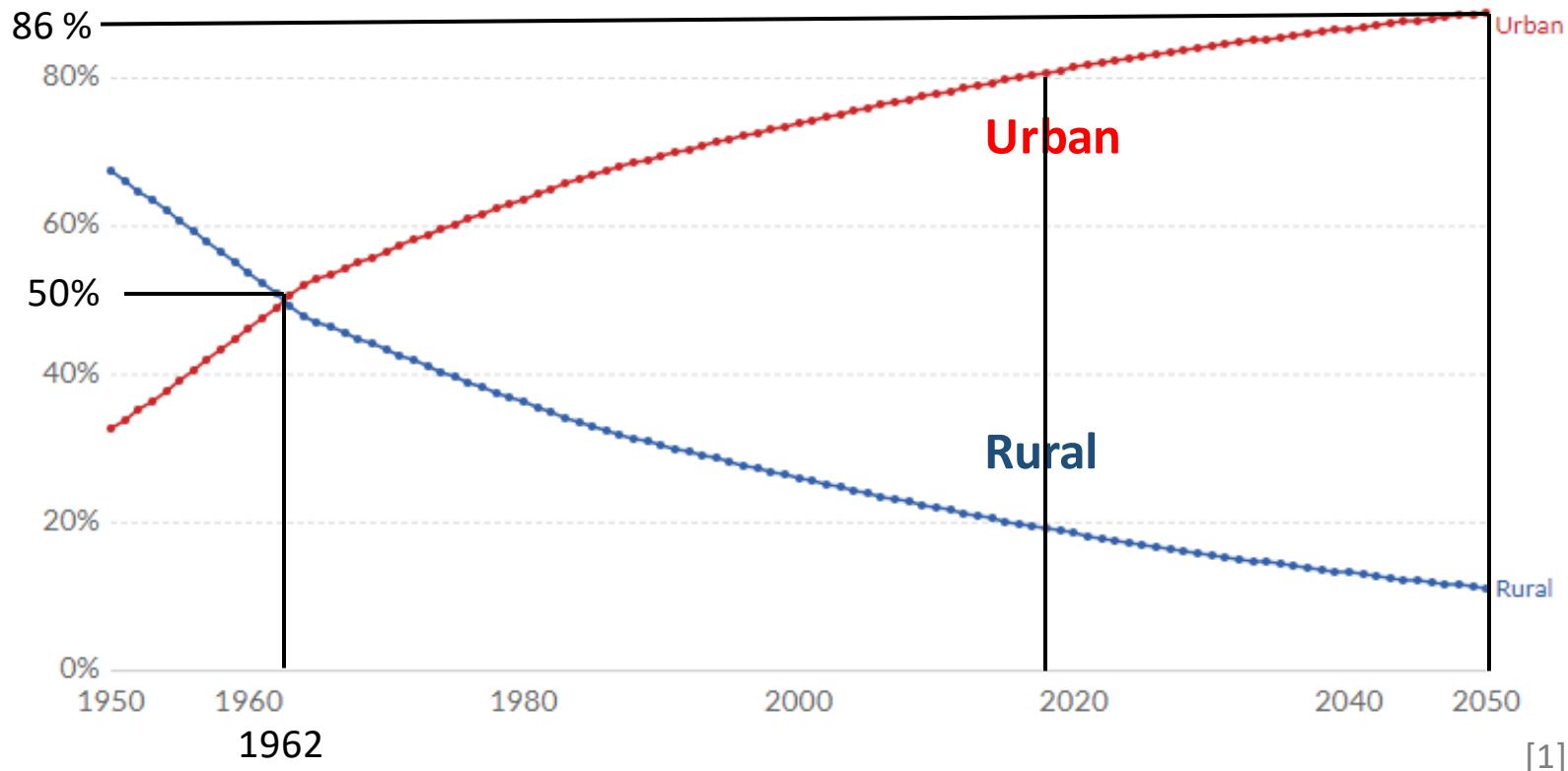
2. Case study

2. Case study

MUNICIPIOS

Encuentre aquí los conjuntos de datos abiertos de cada municipio.

MEDELLÍN
380.64 km2   2.441.123

BARBOSA
206 km2   50.052

BELLO
149 km2   482.255

CALDAS
133.4 km2   80.528

ENVIGADO
78.78 km2   238.173

LA ESTRELLA
35 km2   62.344

ITAGÜÍ
21.09 km2   276.936

GIRARDOTA
78 km2   54.219

SABANETA
15 km2   53.914

COPACABANA
70 km2   70.171

[4]
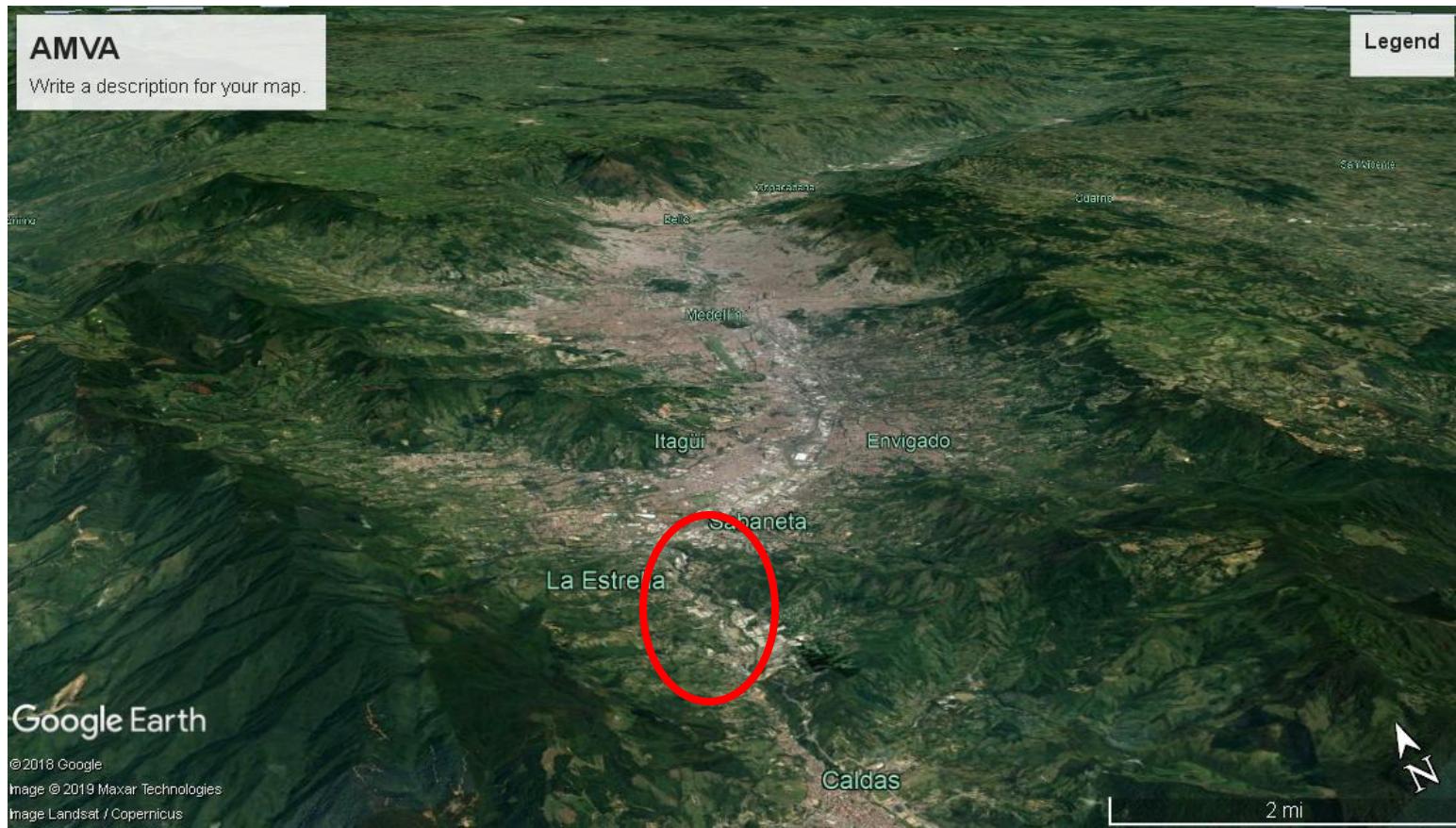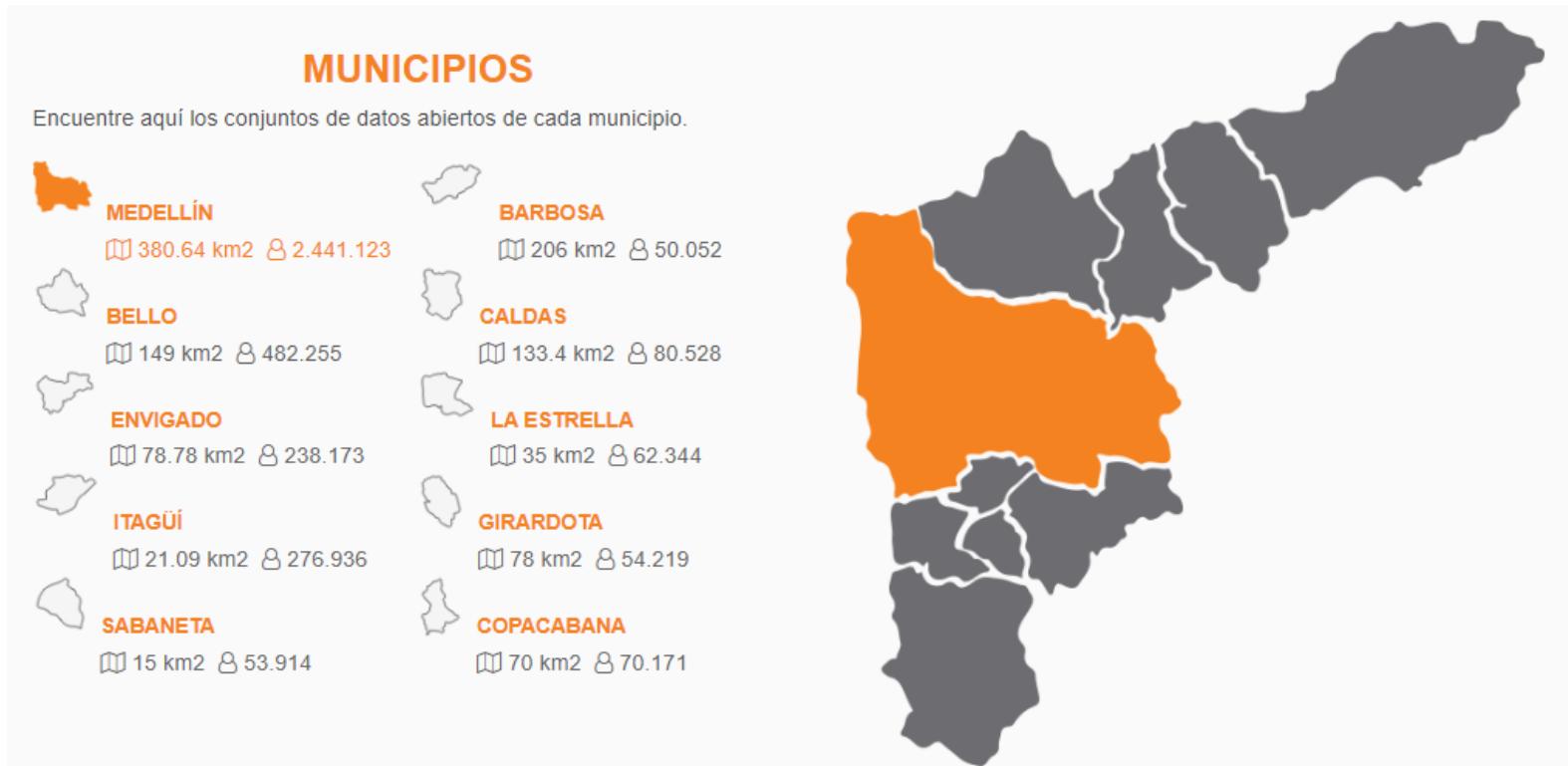
2. Case study: Slope Map of Medellin
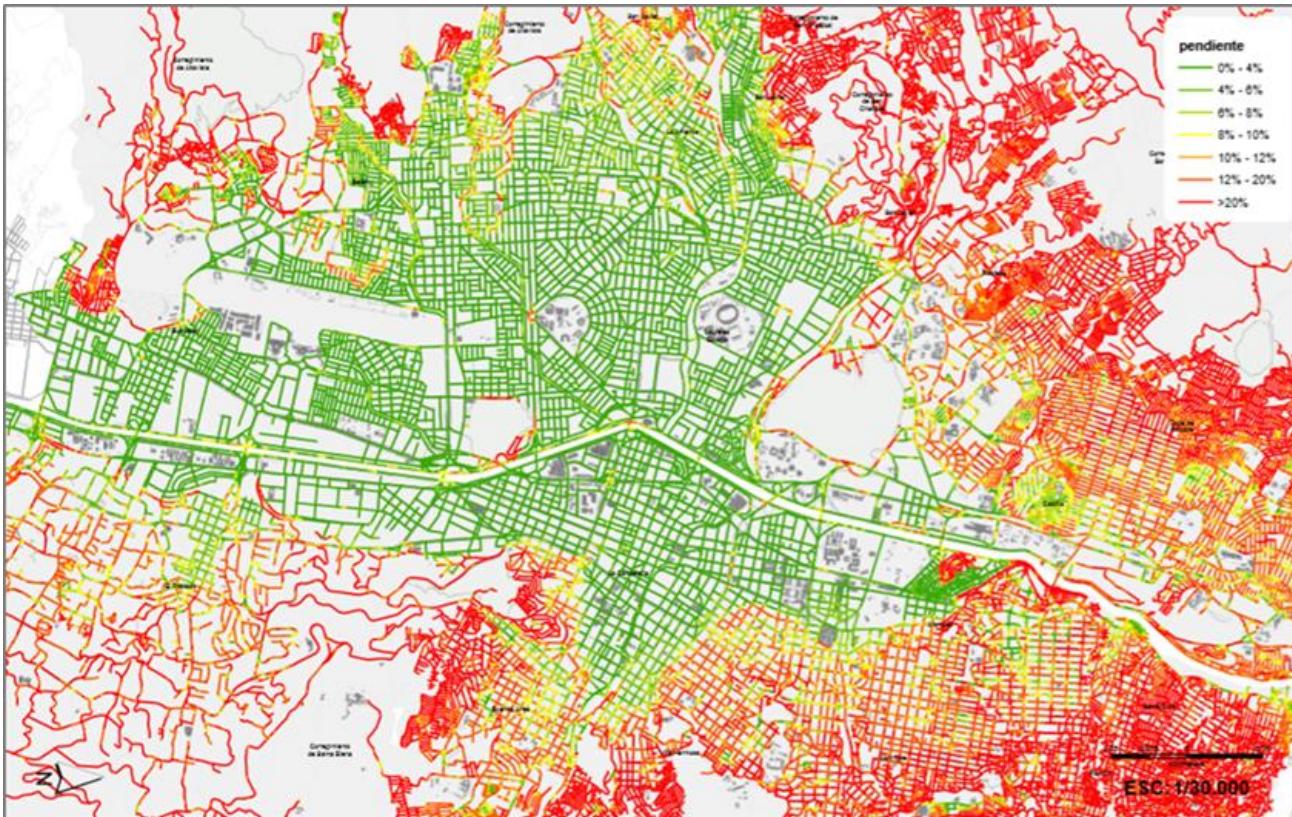
[22]

# 2. Case study: Medellin downtown

- Polycentrism [7]

- Not large stores, but are a set of small stores, which together generate a large amount of cargo and money.

- **Nano-stores** can receive about 30 deliveries per week making this a complicated puzzle for logistics operations. [3]


[14]

2. Case study: Insufficient parking spaces in downtown

- 7,269 of them in downtown [7]

- Total parking deficit: 18,695 parking spots in the city
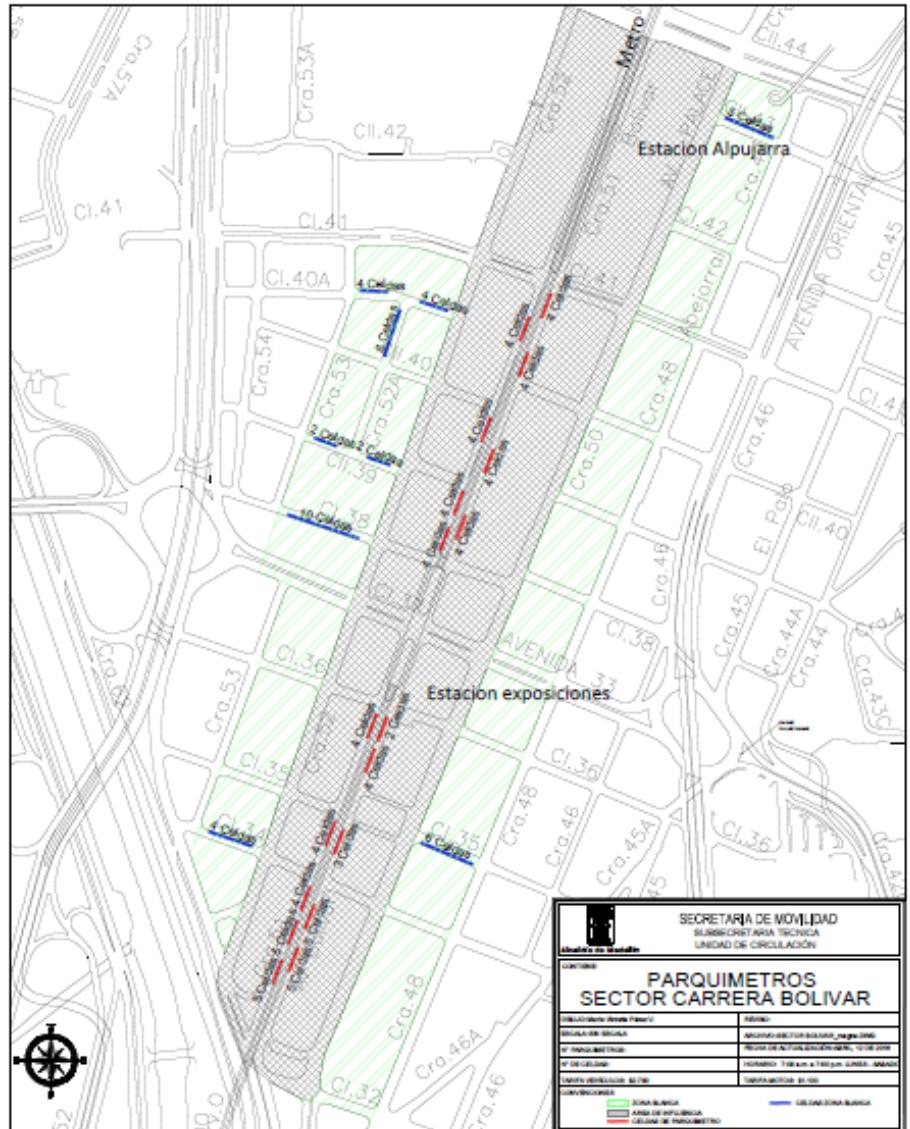
[14]

NOTA:
AREA DE INFLUENCIA: Las ZER-C designadas mediante Resolución N° 832 de septiembre 7 de 2009 no contarán cpn areá de influencia toda vez que se encuentran comprendidas dentro de la zona amarilla y por lo tanto esta sometida a horarios de cargue y descargue y restricciones especiales.
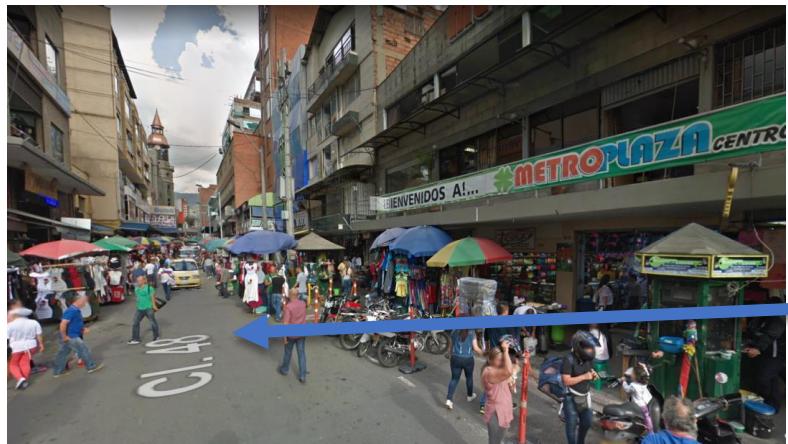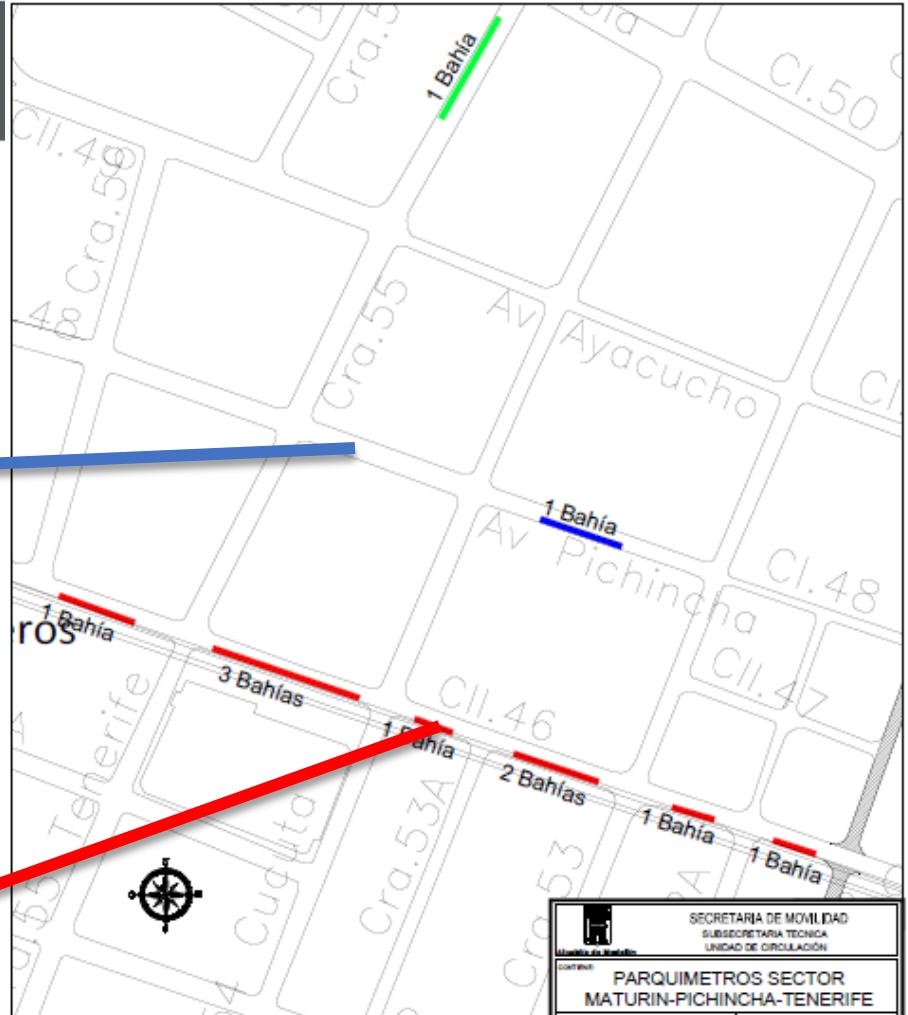
SECRETARIA DE MOVILIDAD
SUBSECRETARIA TECNICA
UNIDAD DE CIRCULACIÓN

PARQUIMETROS SECTOR
MATURIN-PICHINCHA-TENERIFE

2. Case study: Congestion

Average travel distance [4]

- 6.9 km

Average travel time [5]

- **25 min (2012)**
- **36 min (2017)**

Passenger trip generation [4]

- 6'131,727 trips per day

Freight trip generation [6]

- 249,298 freight trips per day

[4]

2. Case study: Environmental problems
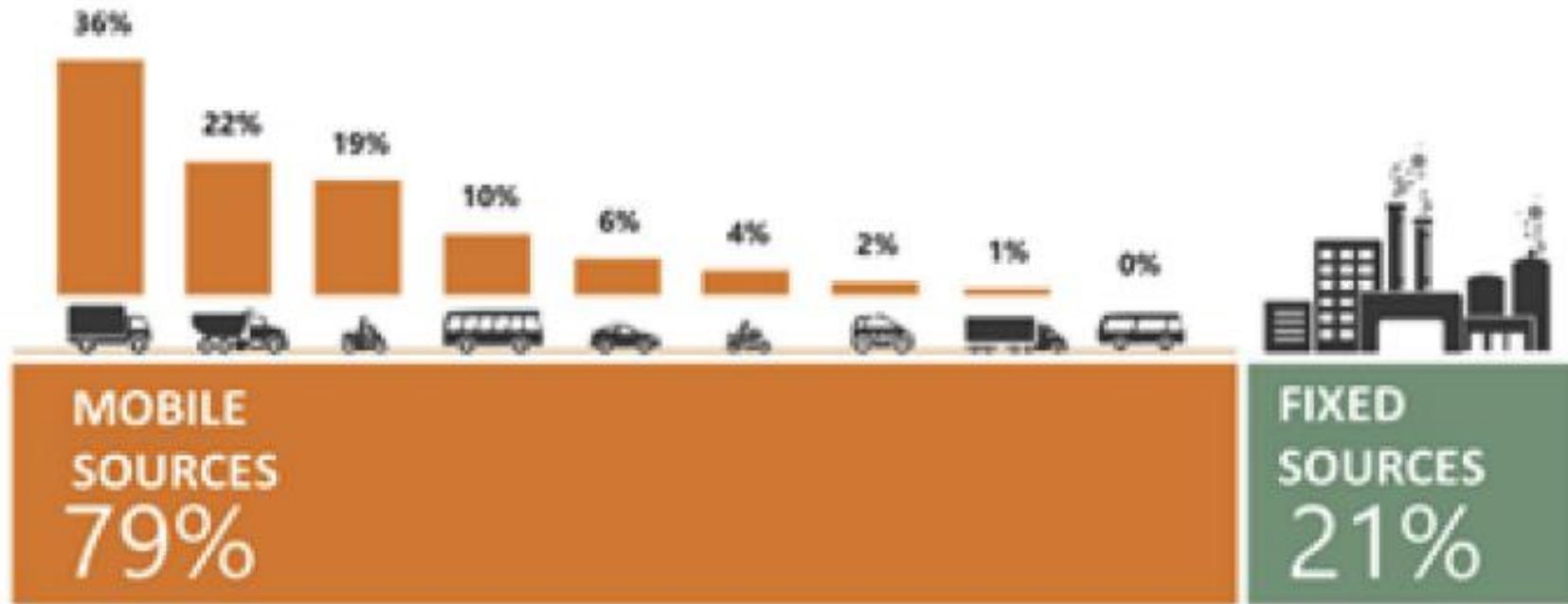
[8]

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2. Case study: Environmental problems

[8]

2. Case study: Concentrations for prevention, alert and emergency

Contaminante	Tiempo de Exposición	Concentraciones (µg/m³) para los niveles normal, prevención, Alerta y Emergencia				
		Nivel I		Nivel II	Nivel III	Nivel IV
		Buena Verde	Aceptable Amarillo	Prevención Naranja	Alerta Rojo	Emergencia Púrpura
PM_{10}	24 horas	0 - 54	55 - 154	155 - 254	255 - 354	≥355
$PM_{2.5}$	24 horas	0 - 12	13 - 37	38 - 55	56 - 150	≥151
O_3	8 horas	0 - 106	107 - 138	139 - 167	168 - 207	≥208
SO_2	1 hora	0 - 93	94 - 197	198 - 486	487 - 797	≥798
NO_2	1 hora	0 - 100	101 - 189	190 - 677	678 - 1221	≥1222
CO	8 horas	0 - 5094	5095 - 10819	10820 - 14254	14255 - 17688	≥17689

Fuente: Plan operacional para enfrentar Episodios por Contaminación Atmosférica.

[9]

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2. Case study: Restrictions

[10]

75,000 vehicles stopped circulating every day in Medellín: 35% less vehicles compared to a regular day. [11]

[13]

[13]

3. An opportunity to improve deliveries in urban center

[14]

[14]

3. An opportunity to improve deliveries in urban center - Medellin´s bike area
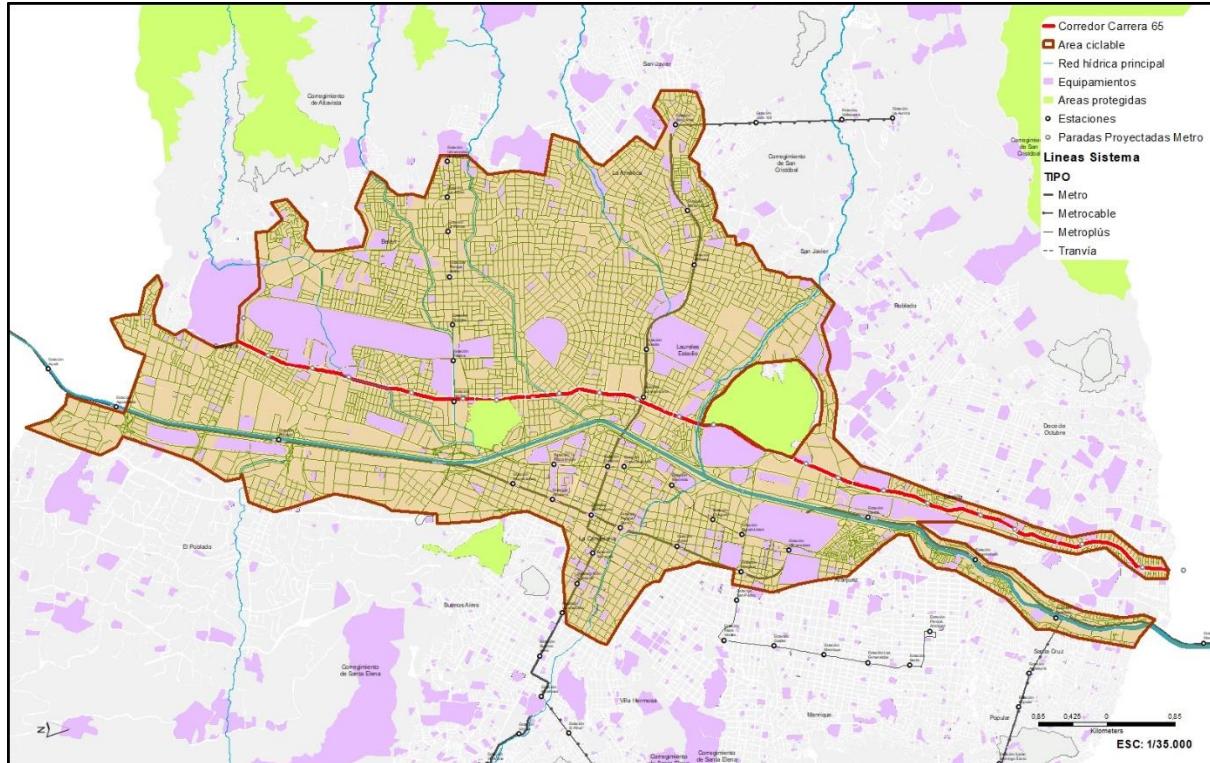
[22]

4. Cargo bikes to improve deliveries

MedeBike

Rappi

[15]

[14]

4. Cargo bikes to improve deliveries

Servientrega

Retail market deliveries

[15]

[14]

4. Cargo bikes to improve deliveries: MedeBike

- Since 2017

- Urban Consolidation Center (UCC) in downtown.

- Distribution around 1 km around

- Two cargo bikes replace one urban van delivery [22]

[15]

4. Cargo bikes to improve deliveries: Rappi

- Since 2015

- Presence in Colombia, Argentina, Brasil, Chile, México y Uruguay

- 2,000 daily orders > Postmates y DoorDash

- 20 % growth every month = Venezuelan migration [17, 18]

[14]

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4. Cargo bikes to improve deliveries: Rappi

[19]
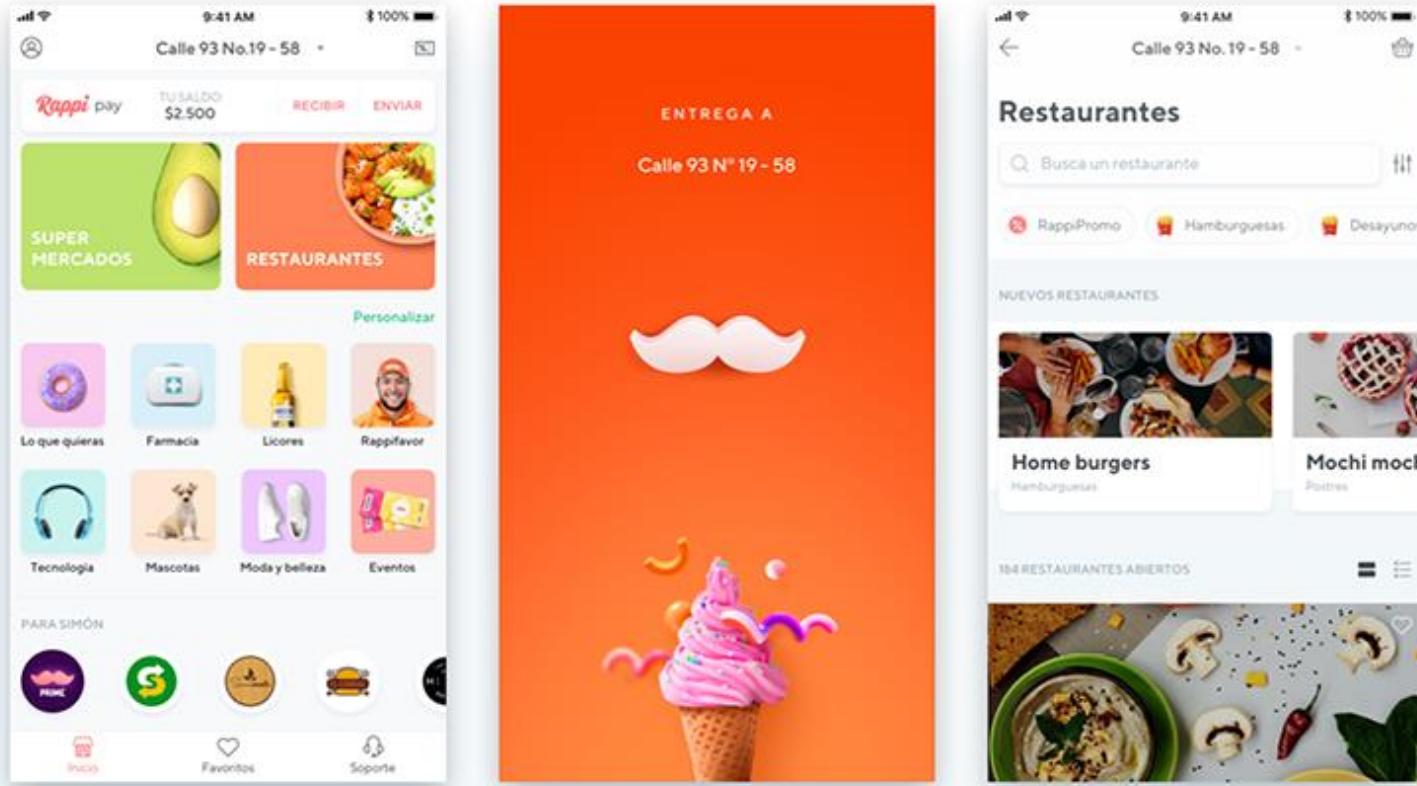
4. Cargo bikes to improve deliveries: Rappi

Characteristics of the bike

Average cargo capacity: 18.5 kg

Cost less than $145 USD ($500,000 COP)

100% mechanical pedaling

[20]

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4. Cargo bikes to improve deliveries: MedeBike

Characteristics of the bike

Average cargo capacity: 120 kg	Vehicles with a cost upon $1,455 USD ($5'000,000 COP)	Assisted pedaling: Power 750 W

[21]

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4. Cargo bikes to improve deliveries: Servientrega

Characteristics of the bike

Max cargo capacity: 200 kg	Performance 50 km	Assisted pedaling: Power 200 W

[20]

4. Cargo bikes to improve deliveries: Characteristics of the cargo
MedeBike

[15]

[15]

4. Cargo bikes to improve deliveries: Characteristics of the cargo

Rappi

[14]

[14]

4. Cargo bikes to improve deliveries: Characteristics of the trip

MedeBike

- Average travel distance
  - ✓ **25 km**

- Average daily deliveries
  - ✓ **60 deliveries/day**

- Operation zone
  - ✓ **Commercial and Residential zones**

Rappi

- Average travel distance
  - ✓ **30 km**

- Average daily deliveries
  - ✓ **10 deliveries/day**

- Operation zone
 - ✓ **Residential zone**

[21, 20]

Best Practices


[15]

[15]

Best Practices

[14]

[14]
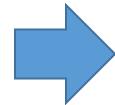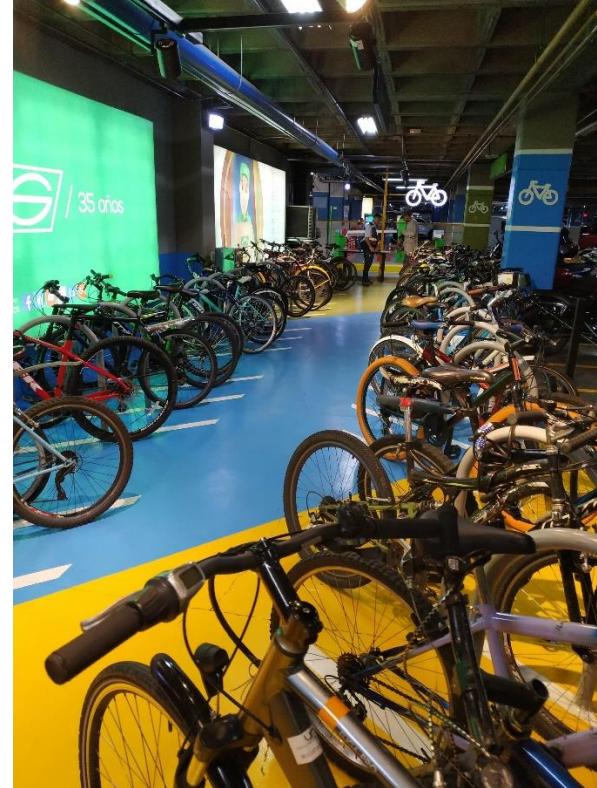
Thank you for listening

Carlos Andrés Granada-Muñoz

cagranadam@unal.edu.co

Undergraduate research student
Department of Civil Engineering
Universidad Nacional de Colombia at Medellin

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