

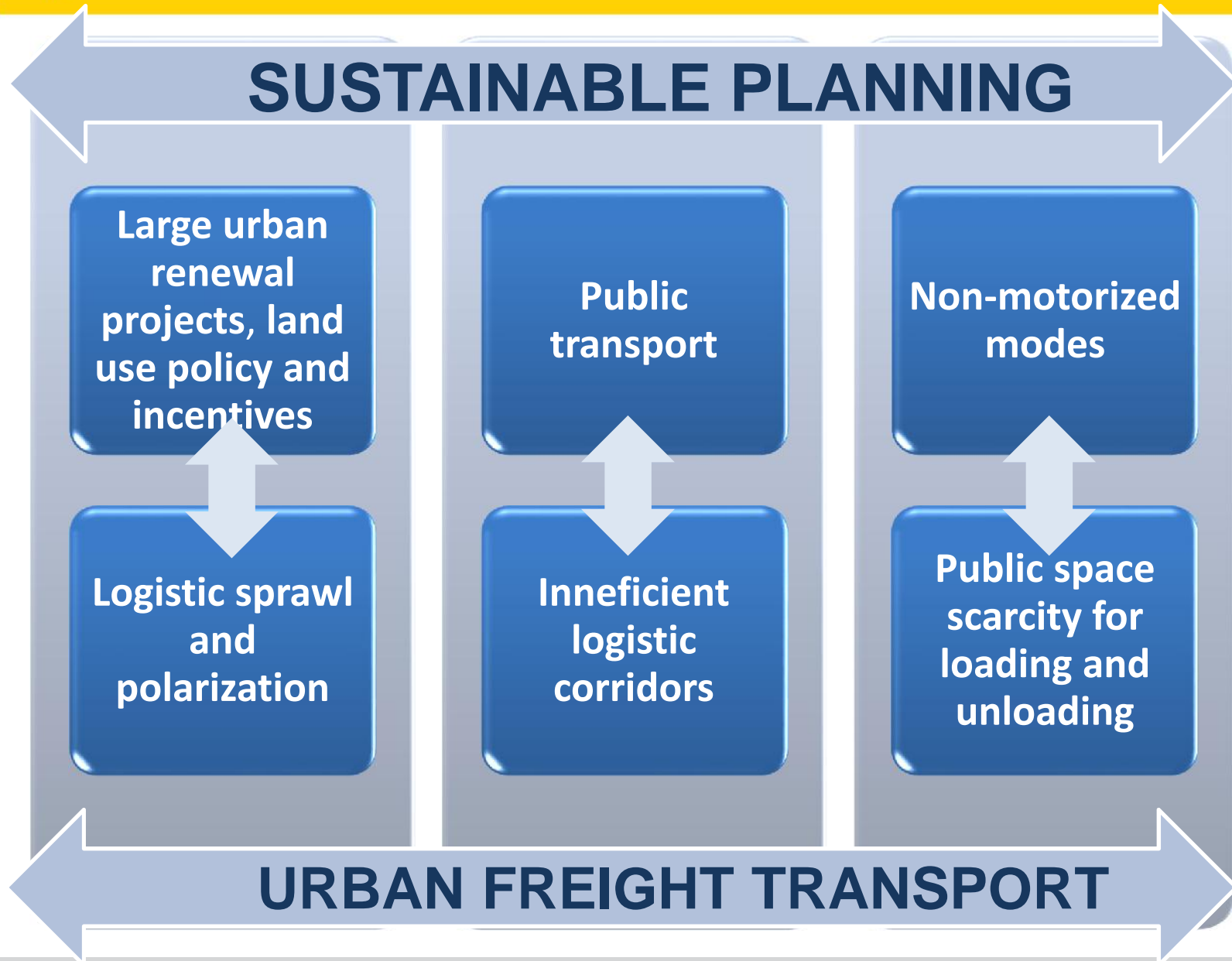
***URBAN FREIGHT TRANSPORT  
VS  
SUSTAINABLE URBAN PLANNING:  
PUBLIC SPACE, PASSENGER PUBLIC  
TRANSPORT AND LAND USE***

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| <i>Geographic Scope</i>        |                    | <i>City</i>   | <i>Corridor</i>  | <i>Area</i>   |
|--------------------------------|--------------------|---|--|---|
| <i>Sustainable Measure</i>     |                    | <i>Densification, Public Space, More Livable Cities</i>                                       | <i>BRT, Public Space, Wider Pedestrian paths</i>   | <i>Traffic Calming, Public Space, Pedestrianization, Low Emissions Zones</i>                              |
| <i>Urban freight situation</i> | <i>Cause</i>       | <i>Land pressure, residential expansion, rising land prices, large urban renewal projects</i> | <i>Parking restrictions, traffic restrictions, Low accesibility, chantiers</i>                     | <i>Parking restrictions, traffic restriction</i>  |
|                                | <i>Problem</i>     | <i>Urban Sprawl and Polarization</i>  | <i>Logistic Corridor Inneficiency</i>  | <i>Infraestructure conflicts among users</i>  |
|                                | <i>Consequence</i> | <i>Congestion, More Costs, Far Jobs, Less taxes for the city</i>                              | <i>Commerce Decay and Migration, Land Use Changes, Valor de la propiedad raíz abajo, less jobs</i> | <i>Congestion, Pollution, Public Space Occupation, Less Road Safety</i>                                   |
| <i>Contradiction</i>           |                    | <i>Logistic Facilities far from the city for a sustainable Life</i>                           | <i>Logistic Corridors are the same passenger transport Corridors, but with opposite principles</i> | <i>More urban freight restrictions in more urban passenger areas when passenger is a freight atractor</i> |

**Paradox 1: Suburban Approach**

Industry and logistic operations are being moved to the periphery.

**Paradox 2: Corridor Approach**

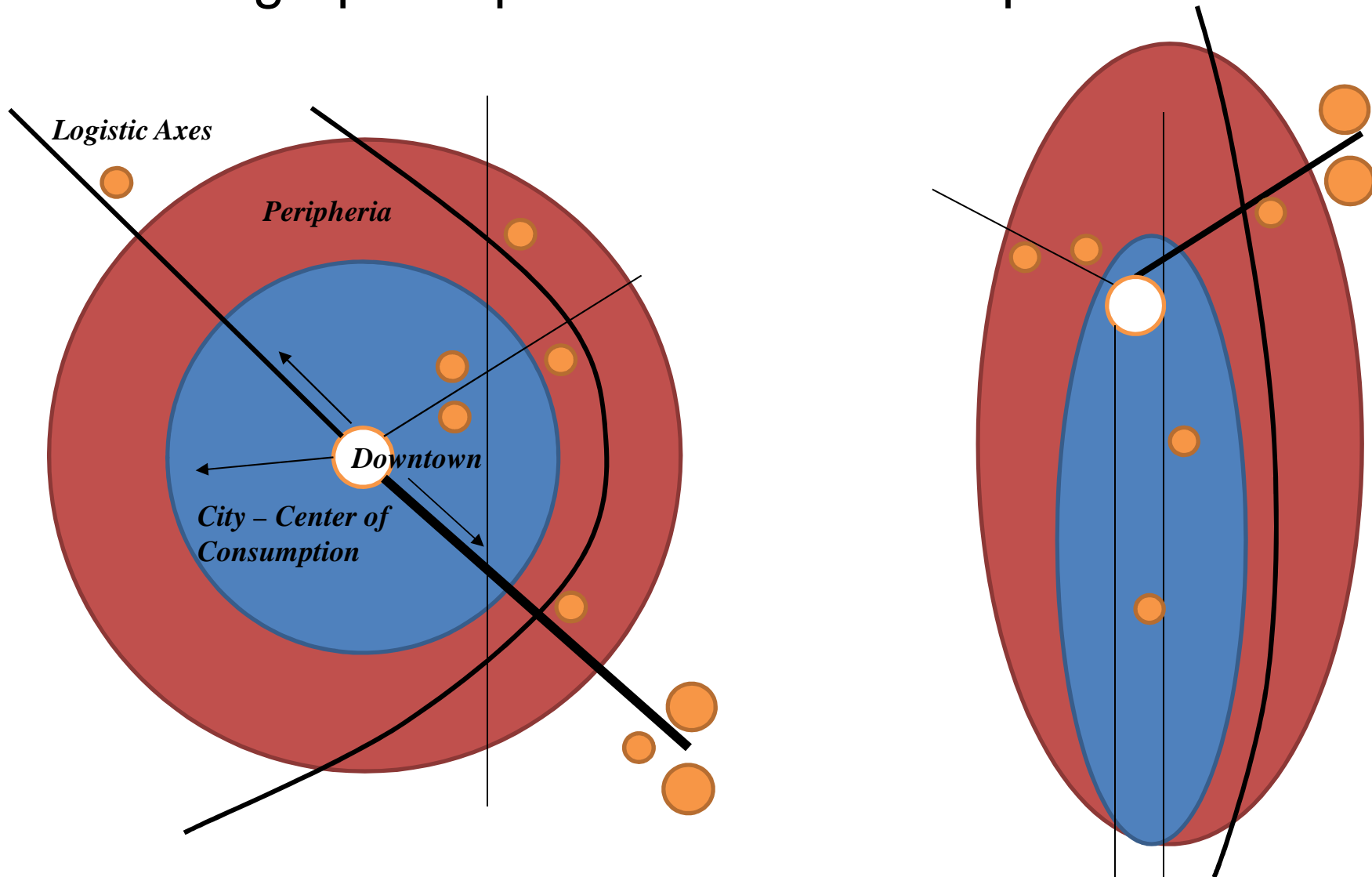
Public Transport Corridors and principal city axes are not provisioned with appropriate urban freight operations infrastructure or measures.

**Paradox 3: Zonal Approach**

Urban freight is not integrated to sustainable urban plans and traffic calming policies in these areas.



## Geographic approaches relationships

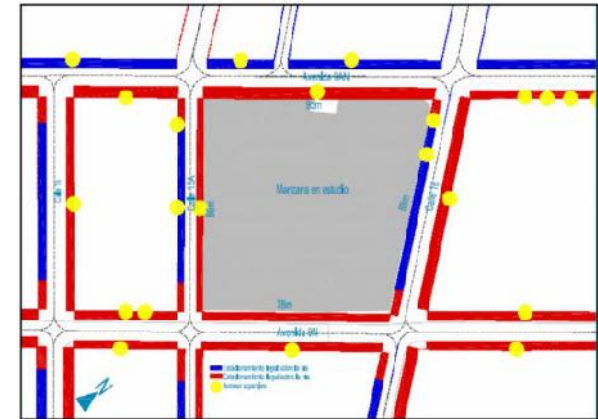


## Objectives

- To evaluate the sprawl of logistic operations in the territory and its impact.
- To propose freight operation schemes and regulations compatible with sustainable mobility policies in city centers and principal axes.
- To design tools aimed at improving cooperative actions between the different stakeholders.

STEP 1: To gather secondary and primary data.

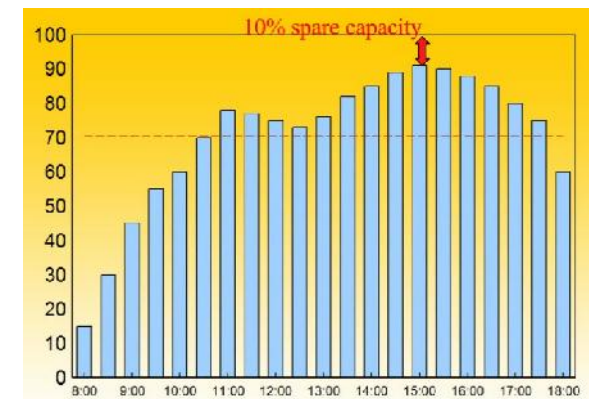
- Flow counts: *INVIAS (Since 1997), Cárdenas (2010)*
- Terrain observations
- Documents analysis
- Load and Unload evaluations



STEP 2: To meet stakeholders to inquiry the problem and the needs, and the activities they are pursuing.

- Meetings: *downtown committee and Logistic Cluster*
- Interviews: *Decision Makers and big enterprises*
- Surveys: *101 to retailers*
- Documents analysis: *Agreements, Local and National*

STEP 3: To analyze the data



STEP 4: To edit technical and political recommendations specially for Colombian cities.

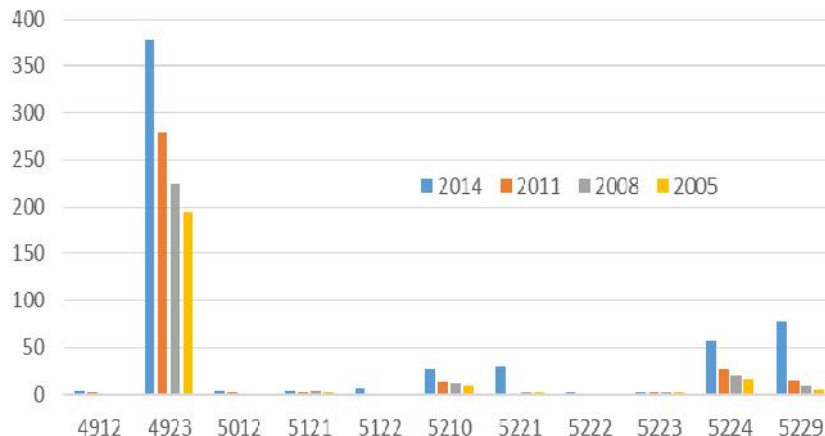


*Lack and dispersion of data*

| Cali                      |                      |            |               |                        |               |
|---------------------------|----------------------|------------|---------------|------------------------|---------------|
| Source                    | Data                 | Type       | Georeferenced | Observation            | Year          |
| Chamber of Commerce       | Commercial license   | Industries | points        | By Planning office     | Since 2012    |
| Chamber of Commerce       | Commercial license   | Logistics  | No            | Bought directly        | 2005 and 2011 |
| Chamber of Commerce Valle | Commercial license   | Logistics  | No            | Logistic Cluster Group | Since 2012    |
| Planning office in Cali   | Land Use permissions | Warehouses | Points        | By Planning office     | Since 2012    |
| Planning office in Yumbo  | Construction licence | All        | Points        | By Planning office     | Since 2009    |

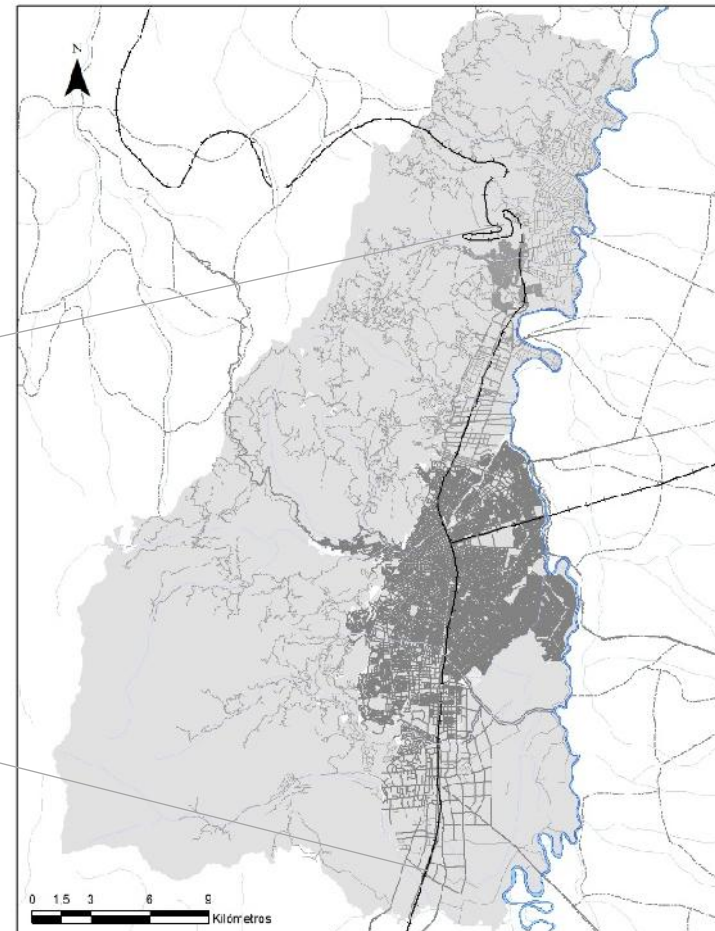
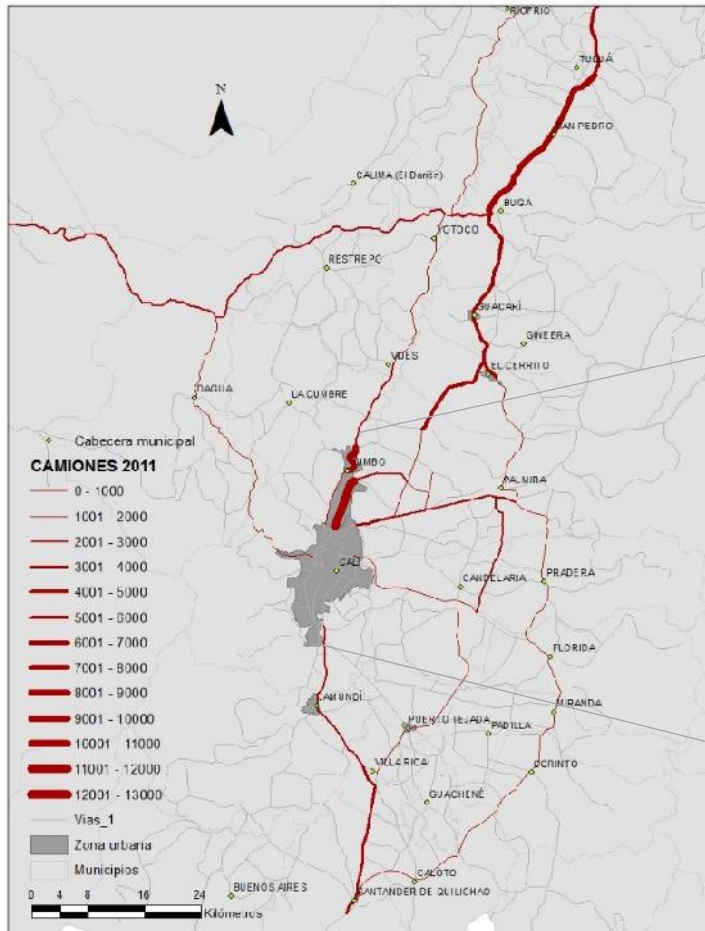
  

| Bogotá                       |               |            |                       |             |               |
|------------------------------|---------------|------------|-----------------------|-------------|---------------|
| Source                       | Data          | Type       | Georeferenced         | Observation | Year          |
| Cadastre office Bogotá       | Land registry | Warehouses | Area - Building       | By Uniandes | 2005 and 2011 |
| Cadastre office Cundinamarca | Land registry | Warehouses | Area - Lots - Parcels | Convention  | Dispersed     |



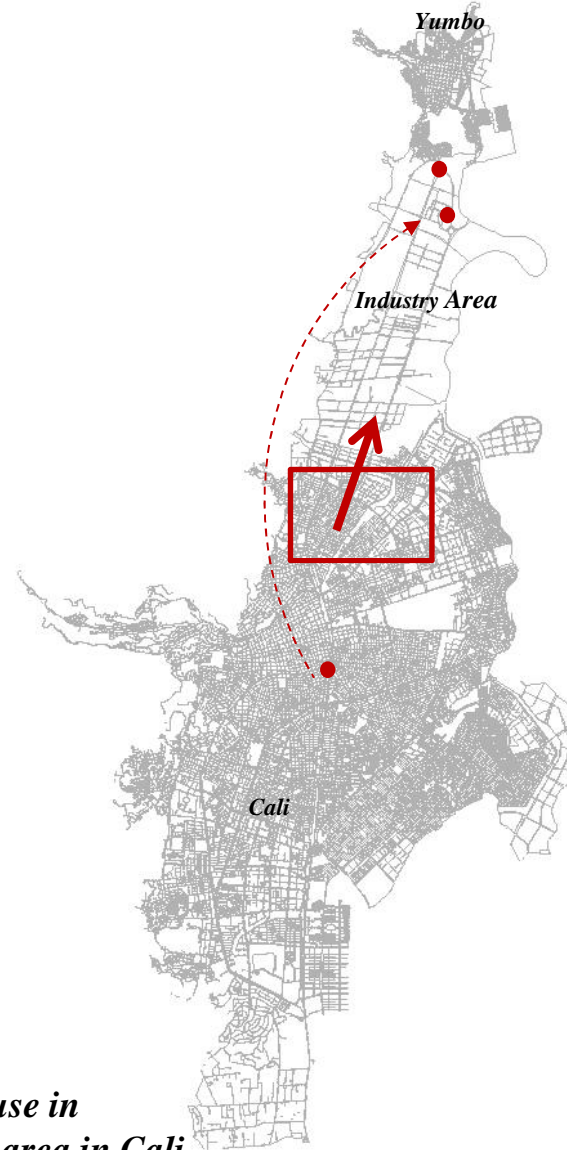
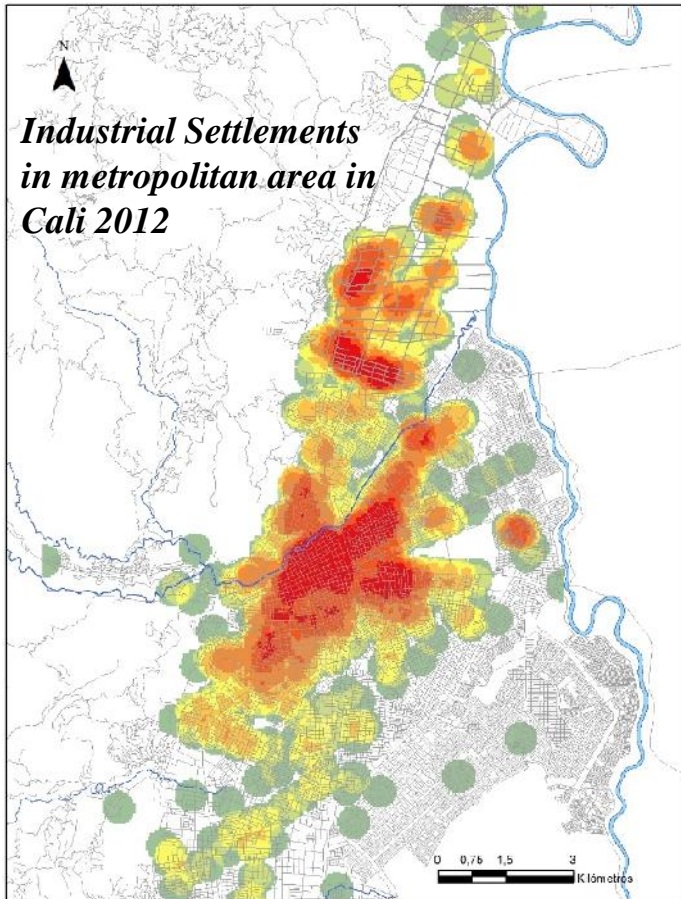
|      |  |
|------|--|
| 4912 | Freight railway transport                            |
| 4923 | Freight road transport                               |
| 5012 | Freight short sea shipping                           |
| 5121 | Freight air transportation                           |
| 5122 | International freight air transport                  |
| 5210 | Warehousing and storing                              |
| 5221 | Services for road transport                          |
| 5222 | Ports and complementary services for water transport |
| 5223 | Complementary services for air transport             |
| 5224 | Cargo - load handling                                |
| 5229 | Complementary activities to transport                |

*Different code and classification in each data institution*



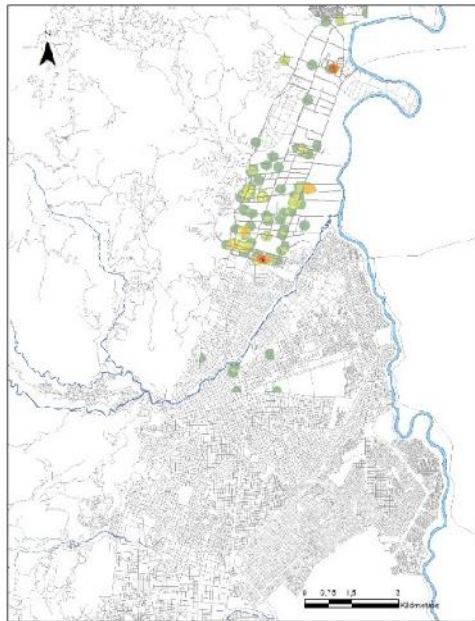
*Trucks traffic in the metropolitan area*

Source: Ministerio de Transporte, Invias (2011).

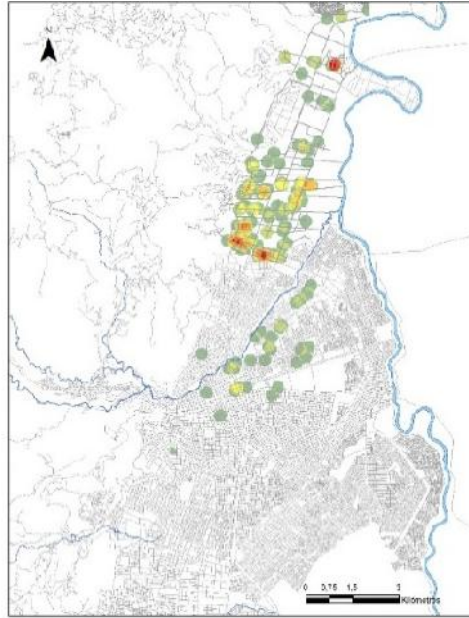


*New warehouse in metropolitan area in Cali*

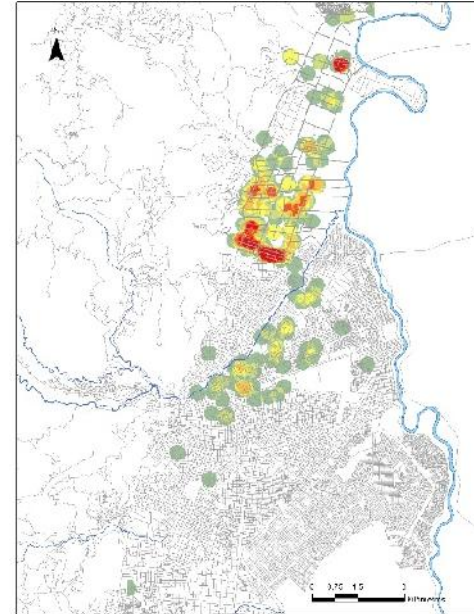
*Industrial Evolution in metropolitan area in Cali*



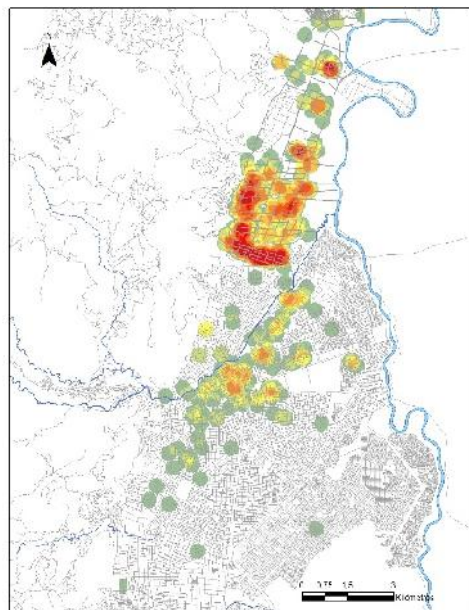
1950



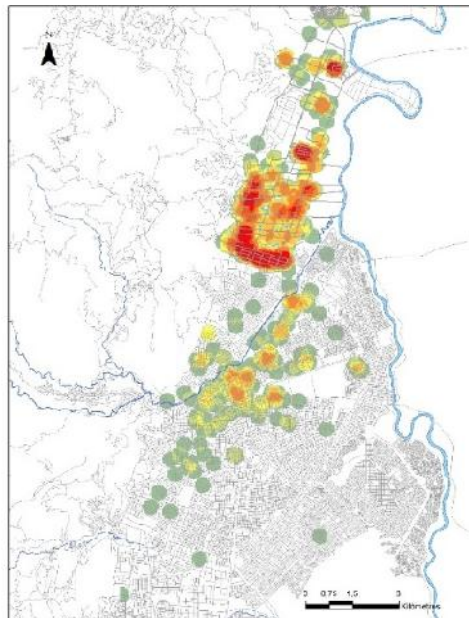
1970



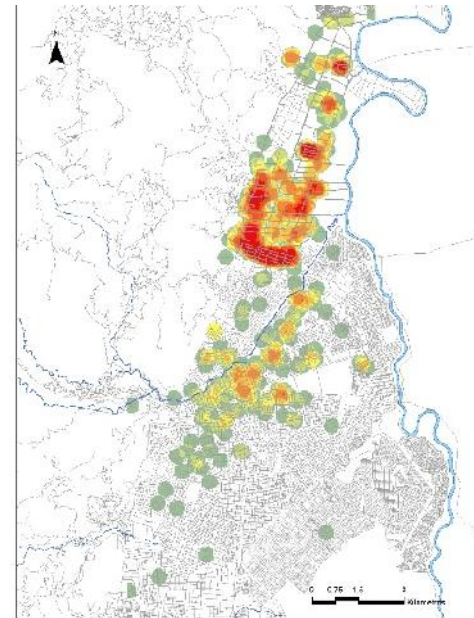
1980



2000

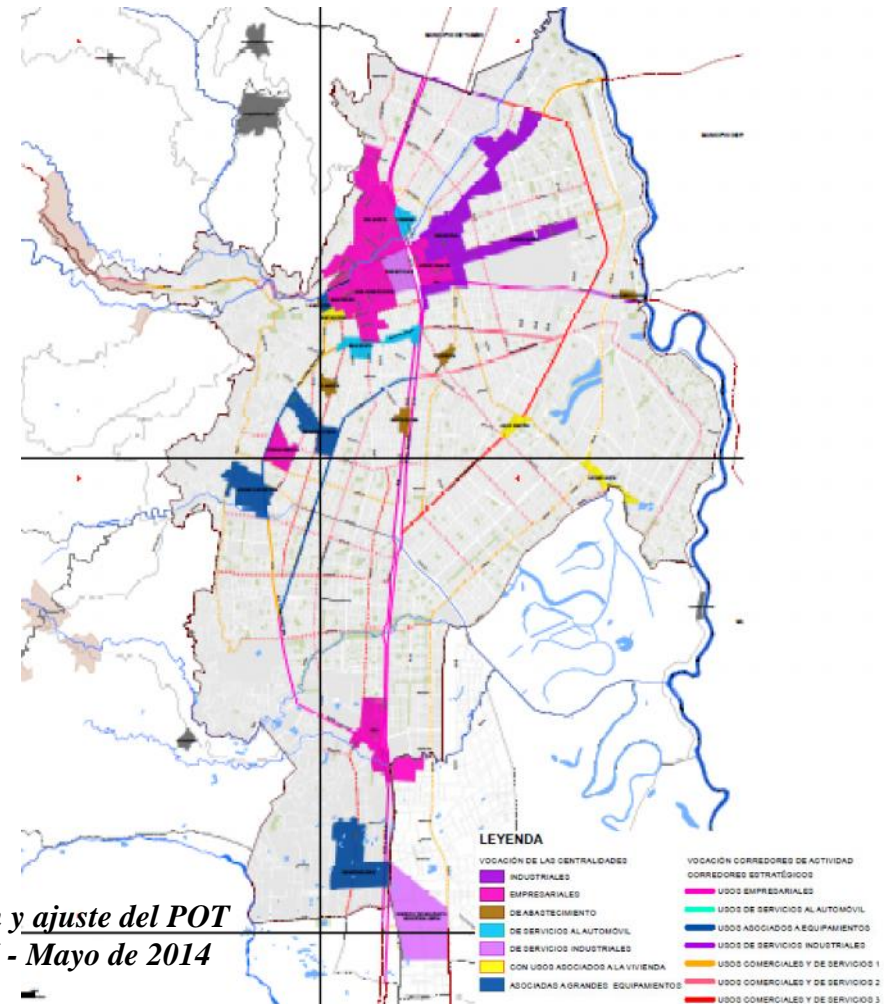
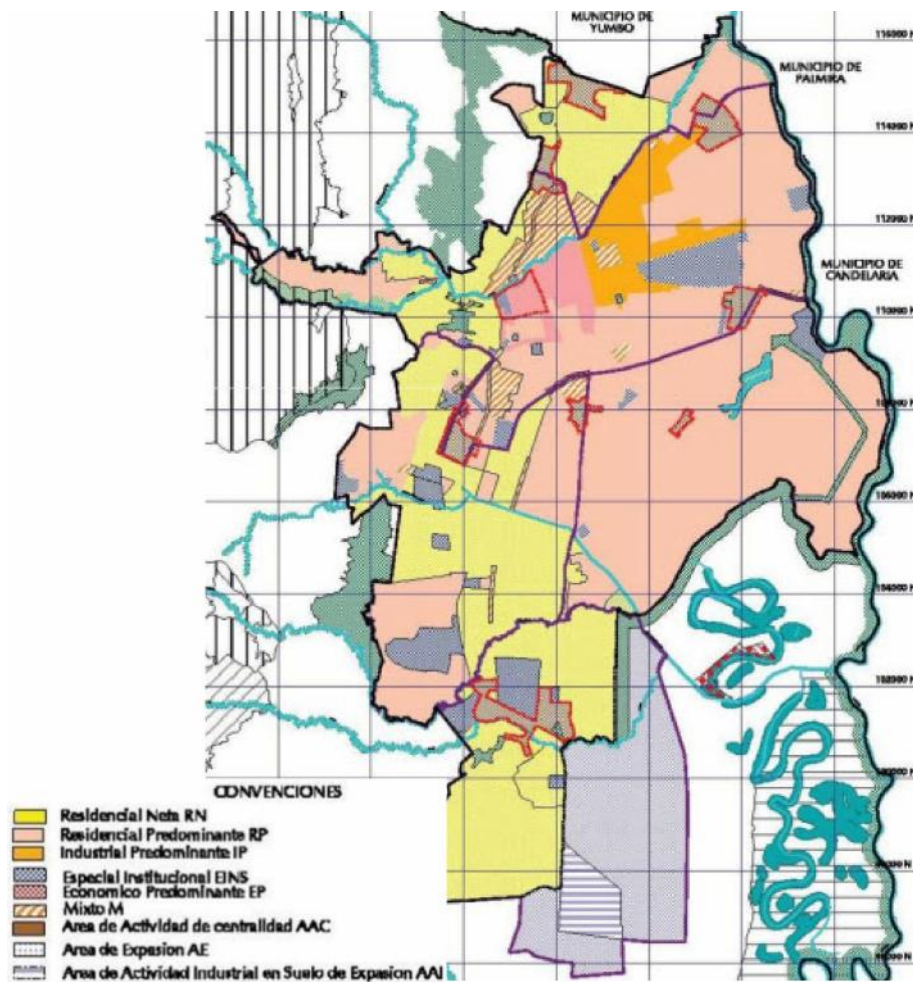


2005



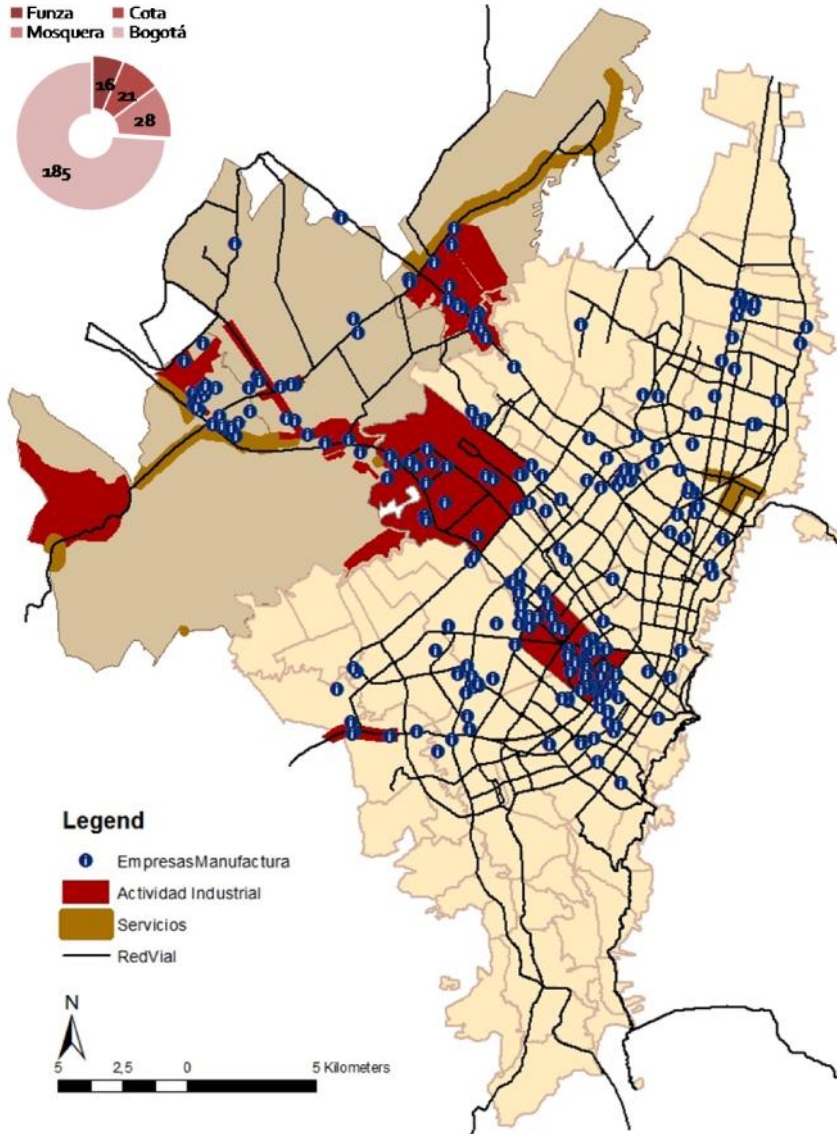
2009

Industry is being moved to the periphery, in spite of the strong historical productive and logistical character of the city and its intermodal potential.

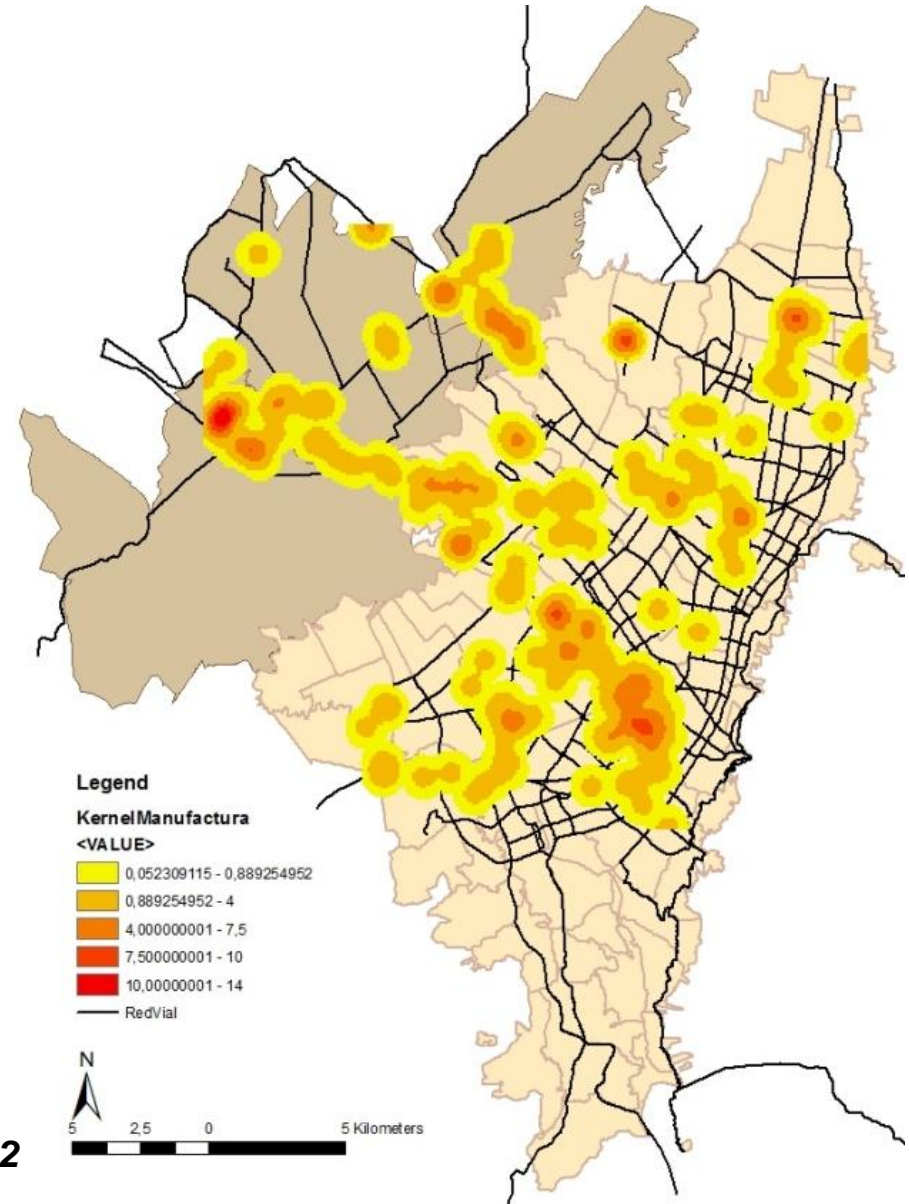


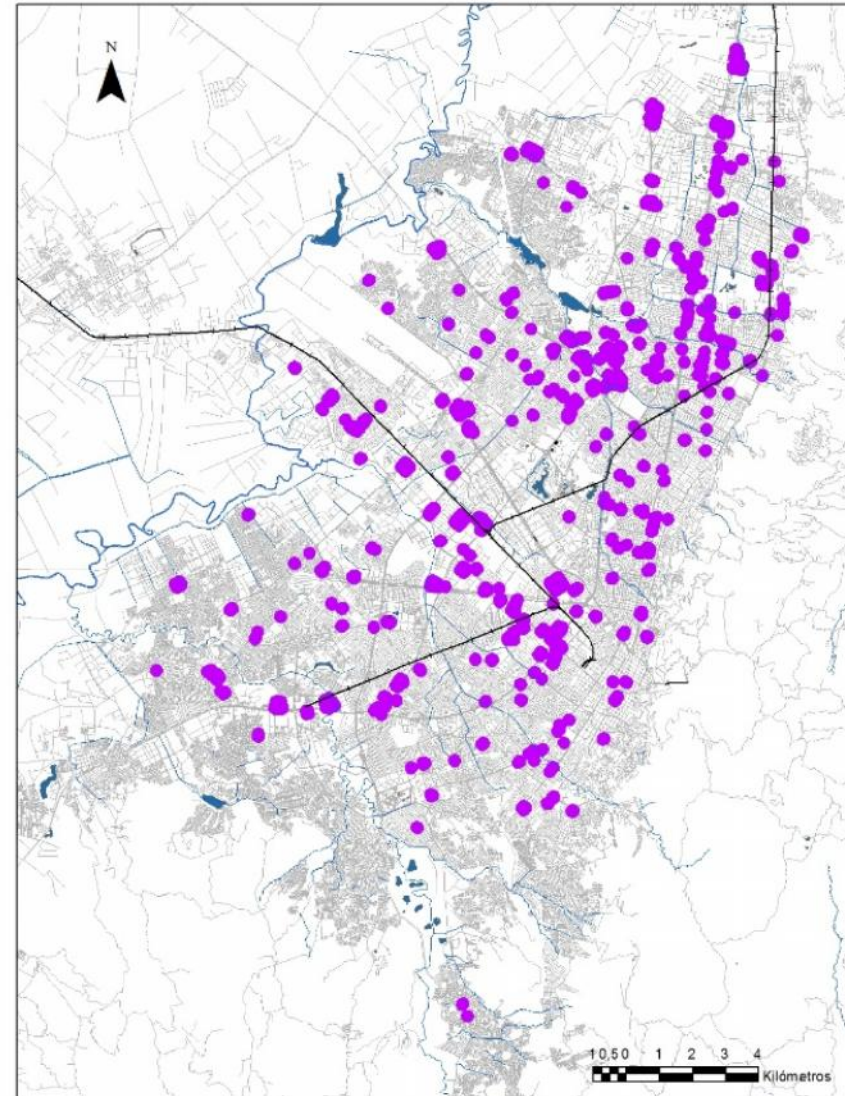
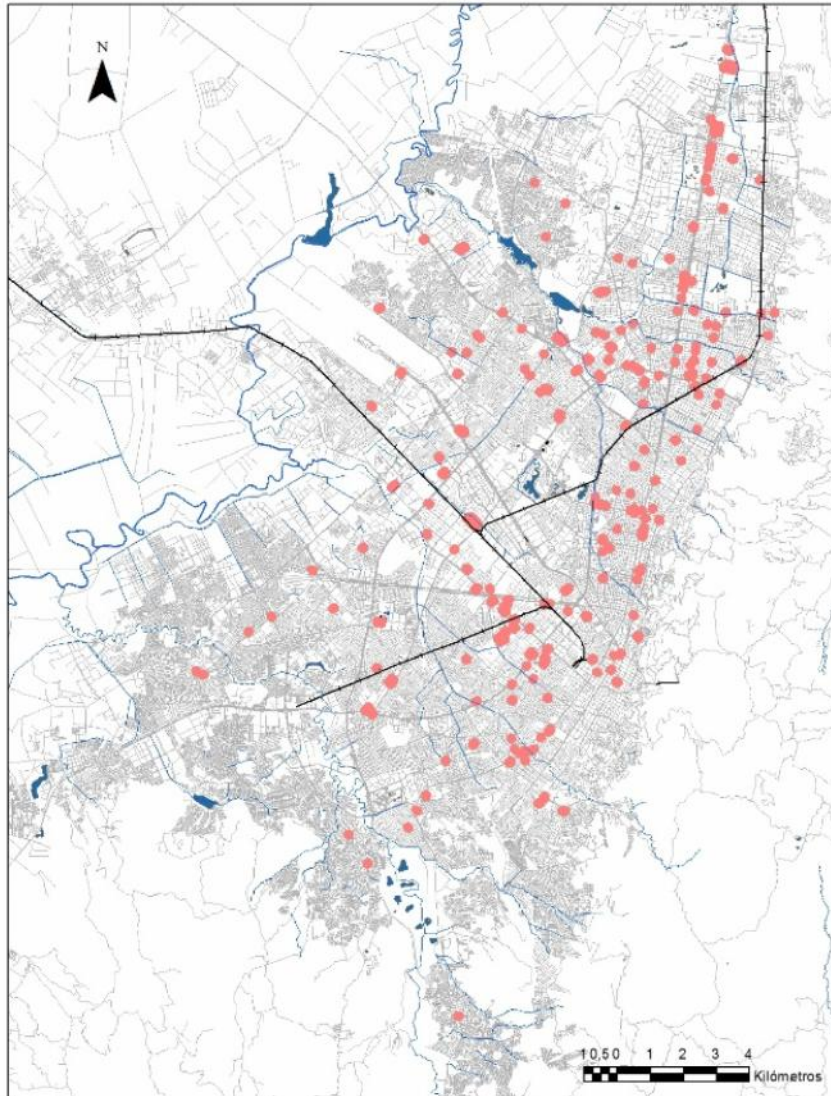
*Revisión y ajuste del POT  
DAPM - Mayo de 2014*

■ Funza ■ Cota  
■ Mosquera ■ Bogotá



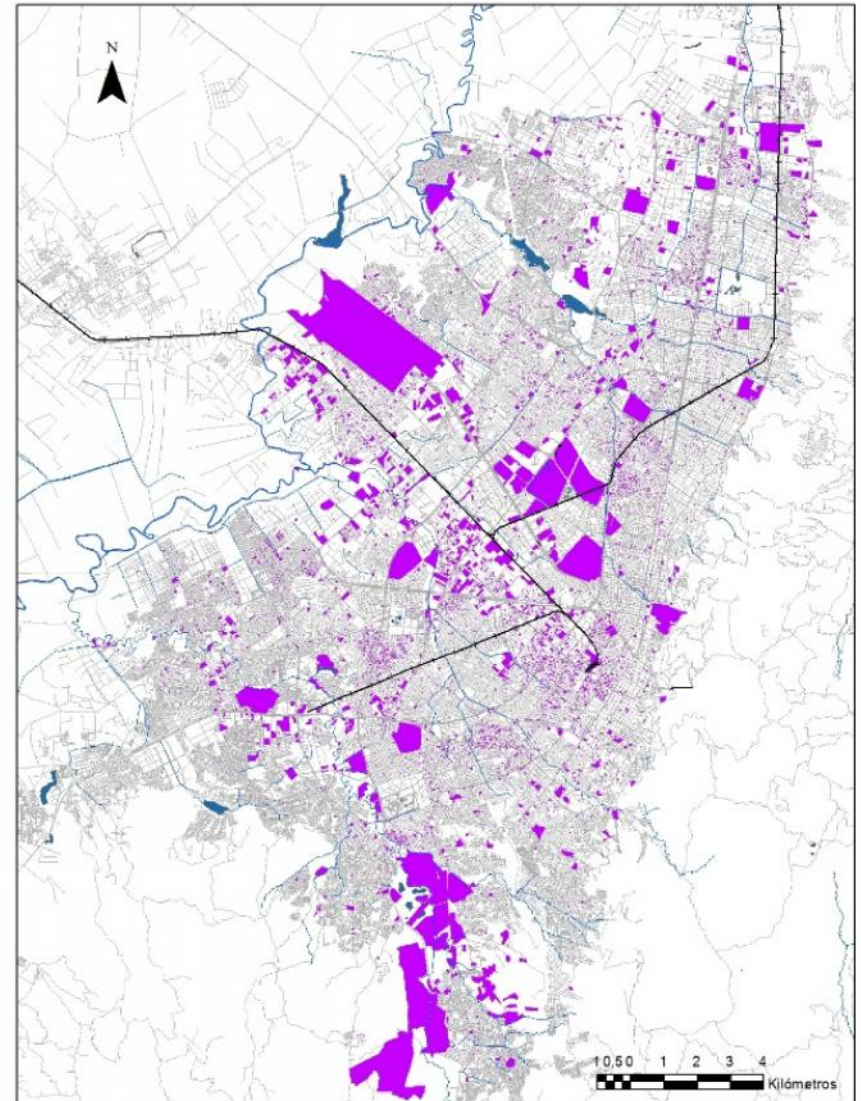
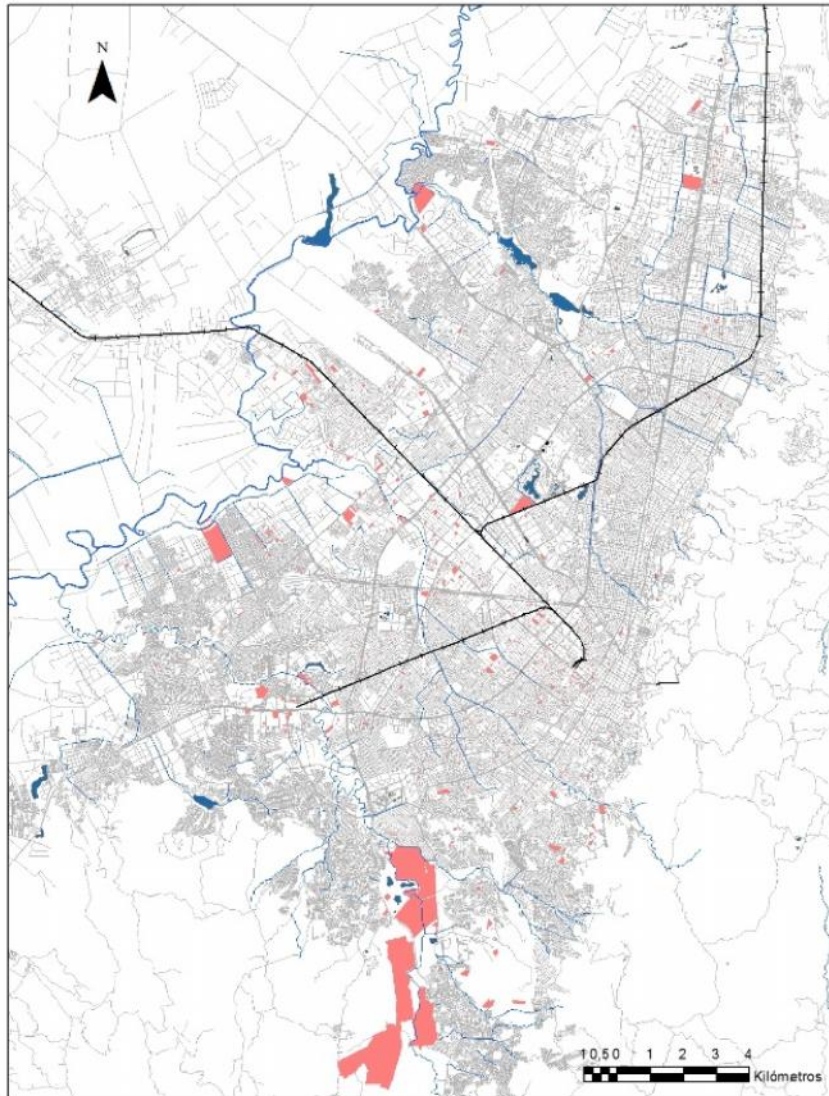
Industrial Settlements in Bogotá – Colombia2012





*Commercial warehouses 2005 and 2011 – Land Use Code 008*

Source: Land Use Office, Capital District of Bogota (2005 and 2012).

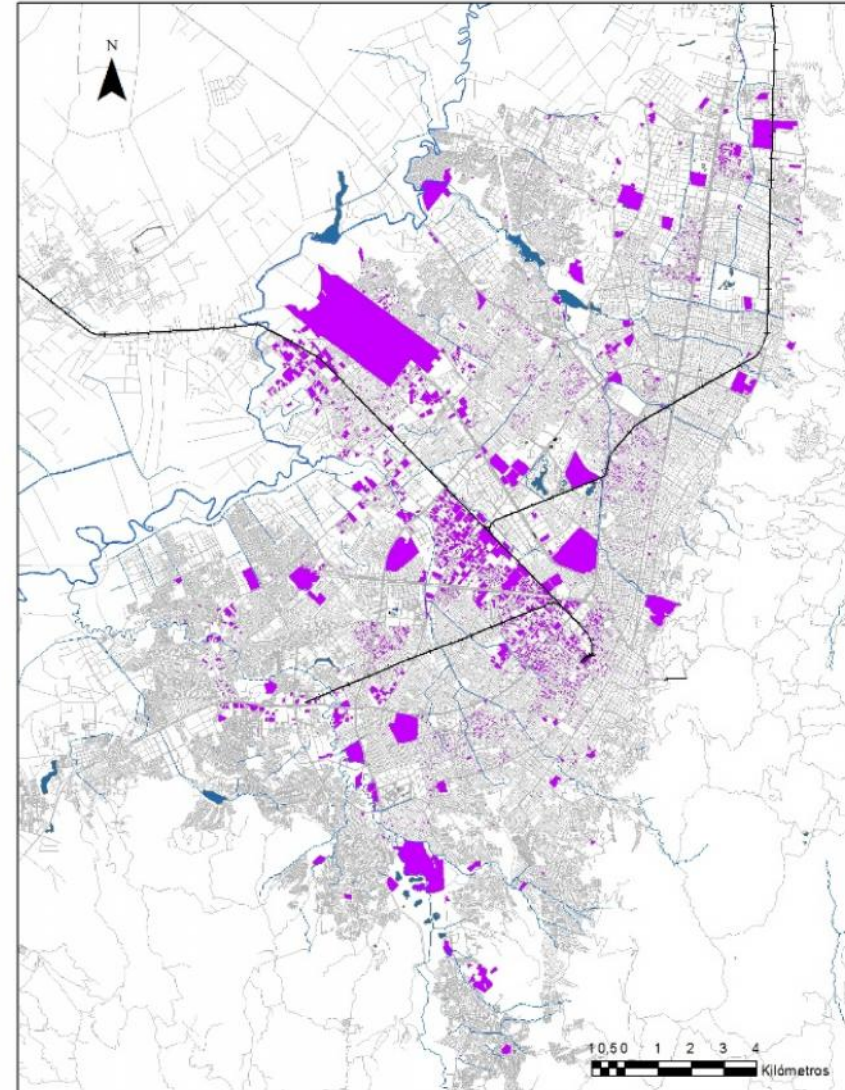
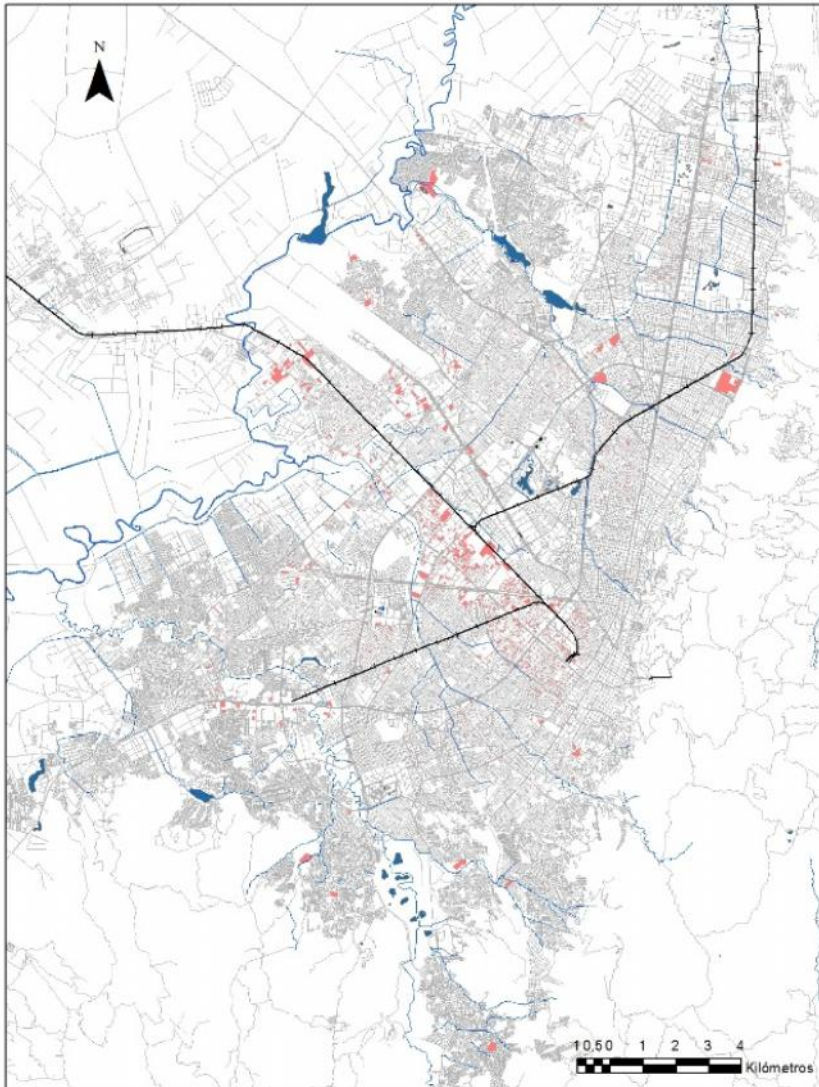


*Small warehousing 2005 and 2011 – Land Use Code 022*

Source: Land Use Office, Capital District of Bogota (2005 and 2012).

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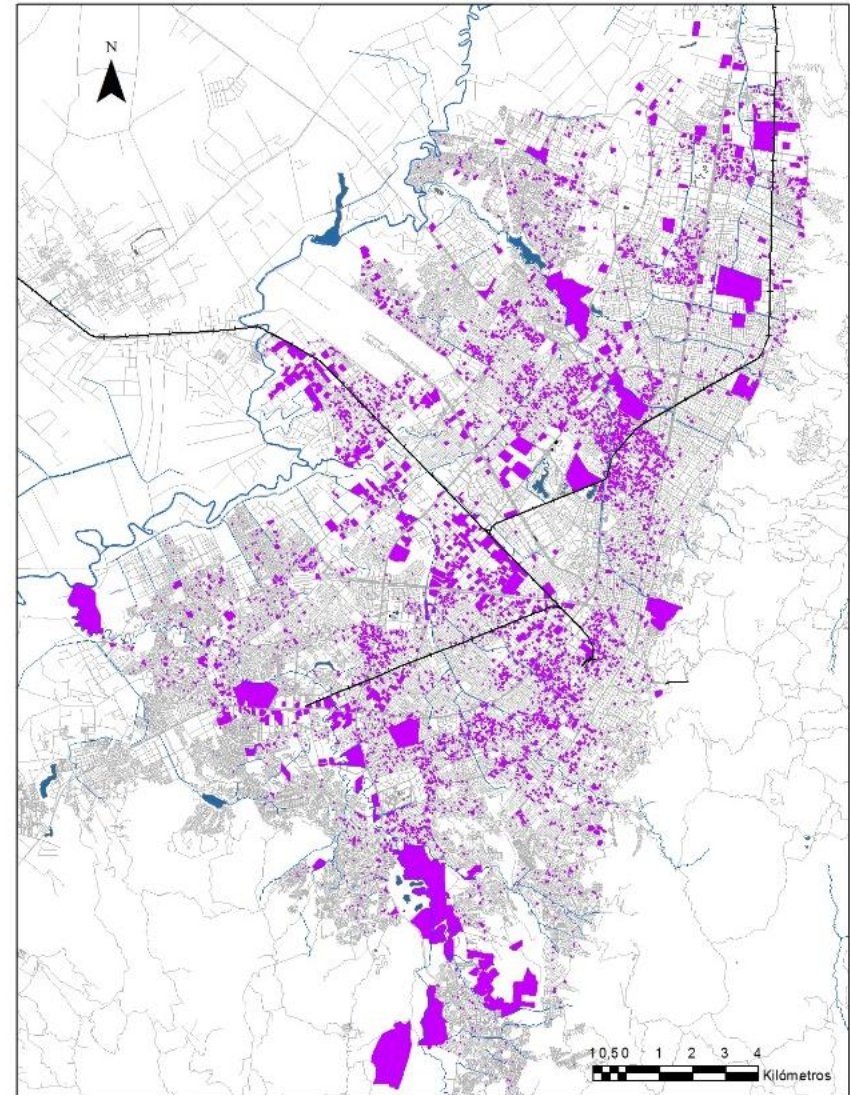
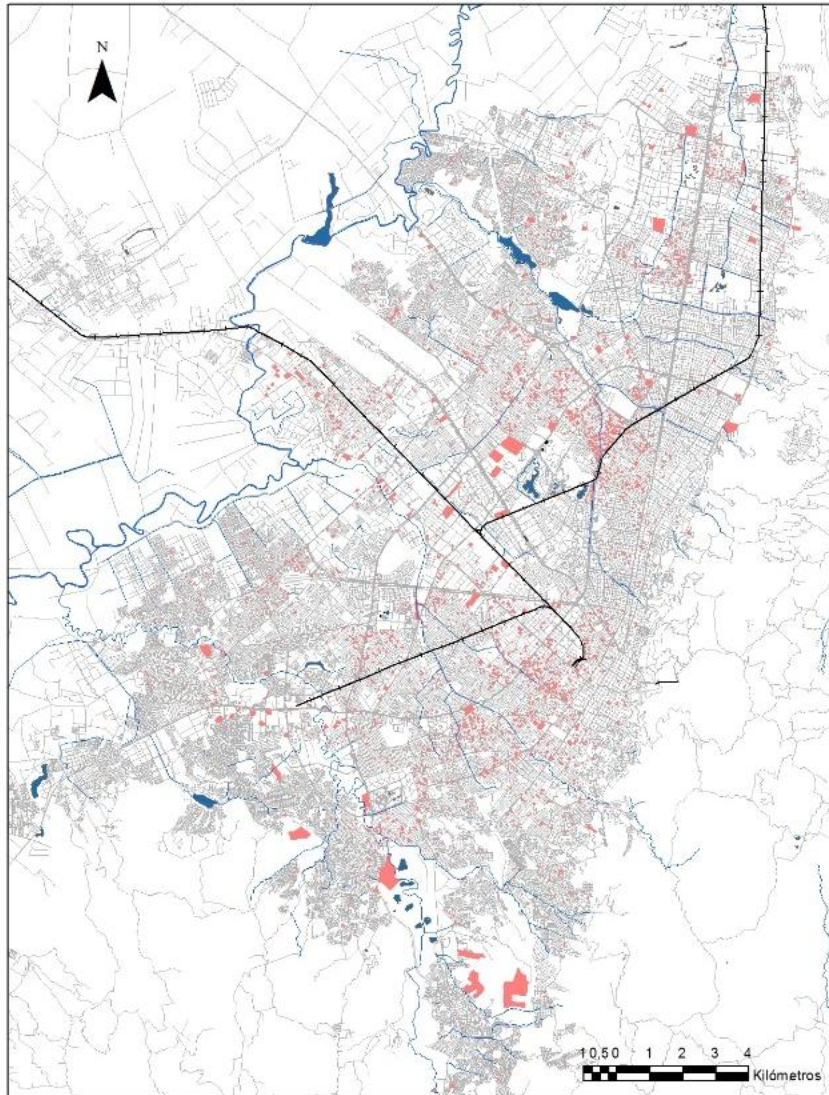




*Big Warehousing 2005 and 2011 – Land Use Code 025*

Source: Land Use Office, Capital District of Bogota (2005 and 2012).

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*Economic Warehousing 2005 and 2011 – Land Use Code 033*

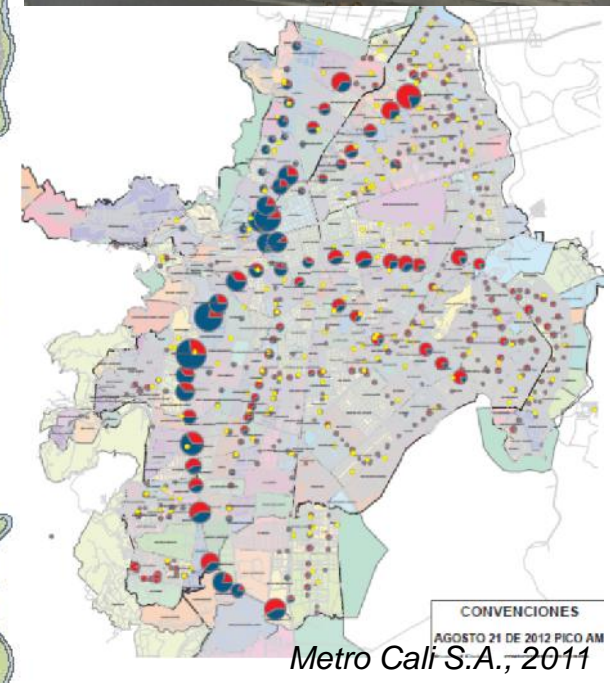
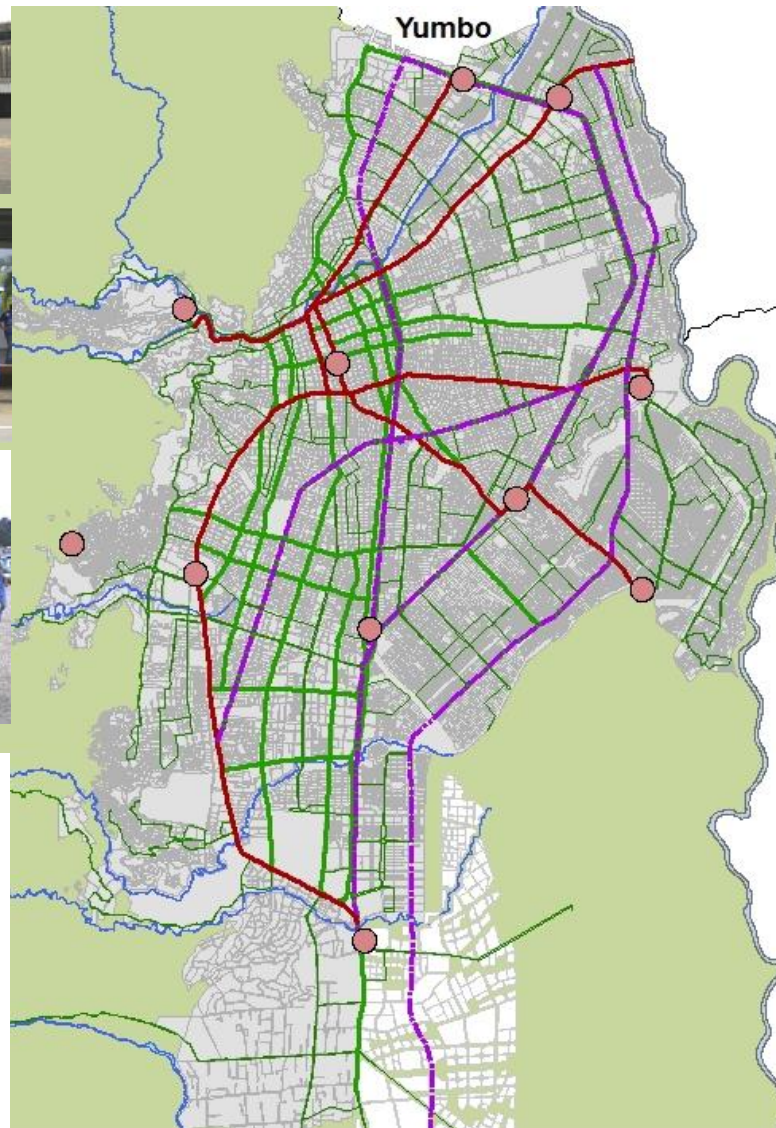
Source: Land Use Office, Capital District of Bogota (2005 and 2012).

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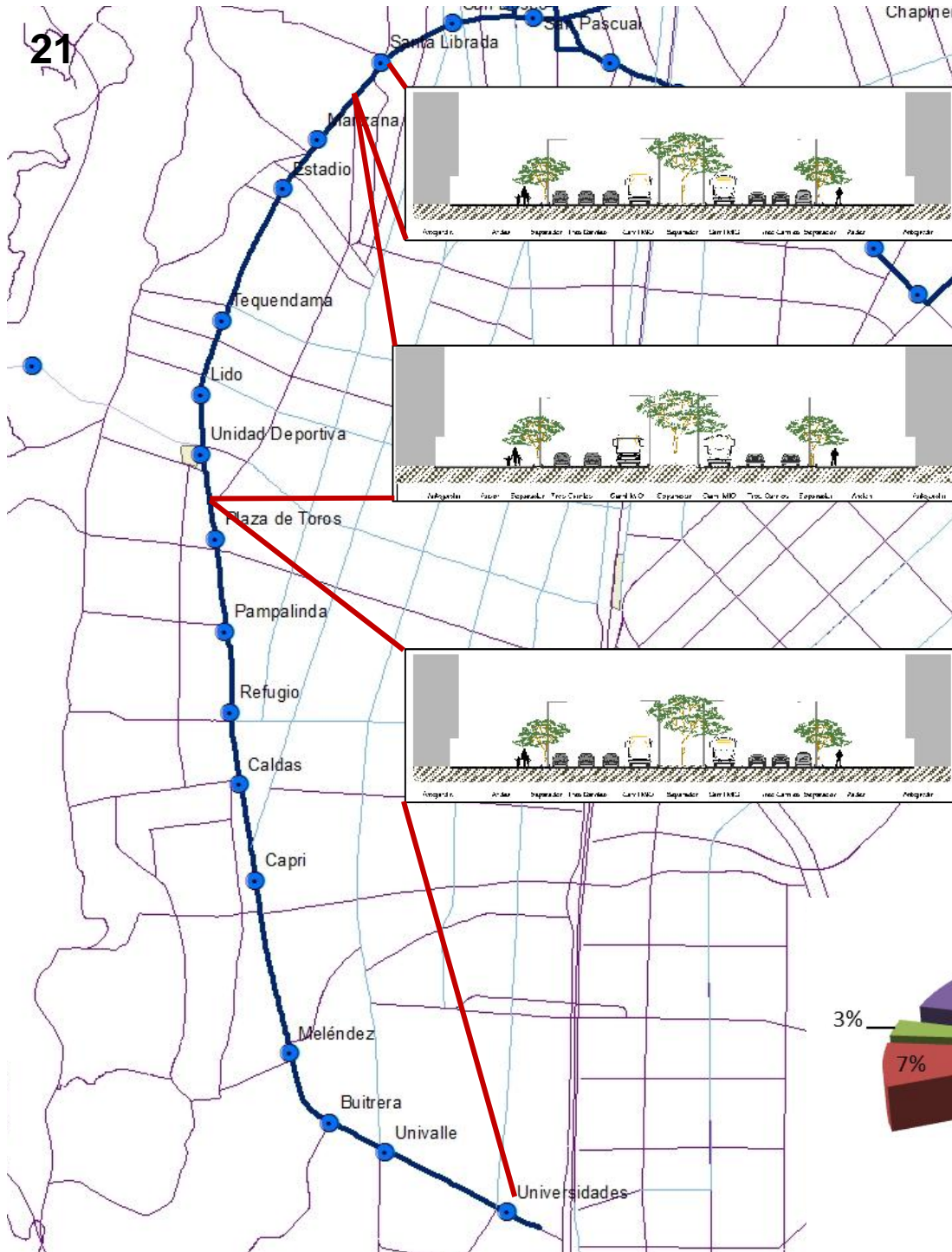
Parking restrictions and passenger transport corridors have been implemented in the most commercial streets and no infrastructure or measures have been implemented to maintain the commercial dynamic.

Código Nacional de Tránsito, Ley 769 de 2012, POT Acuerdo Municipal 069 de 2000, Resolución No.0376 de 1999, Resolución 4152.0.9.9 0025 del 2012.



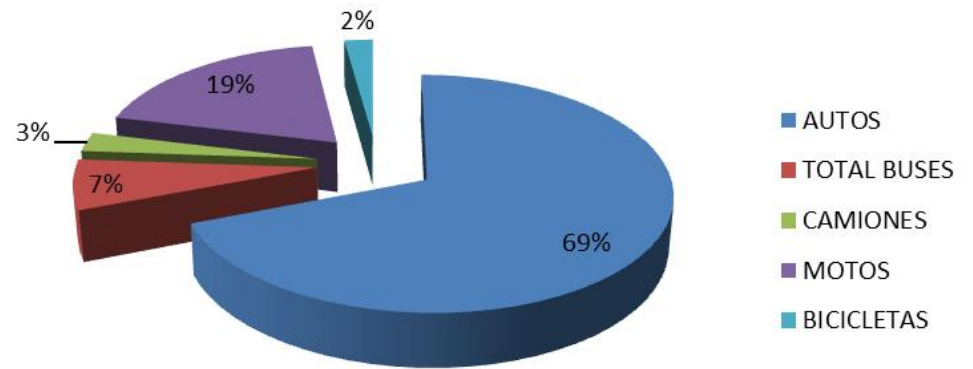


- » 39 Km. Trunk corridors.
- » 243 Km. Pretrunk and complementary corridors.
- » 56 trunk stations.
- » 655 stops
- » 7 terminals and 4 intermediate terminals.

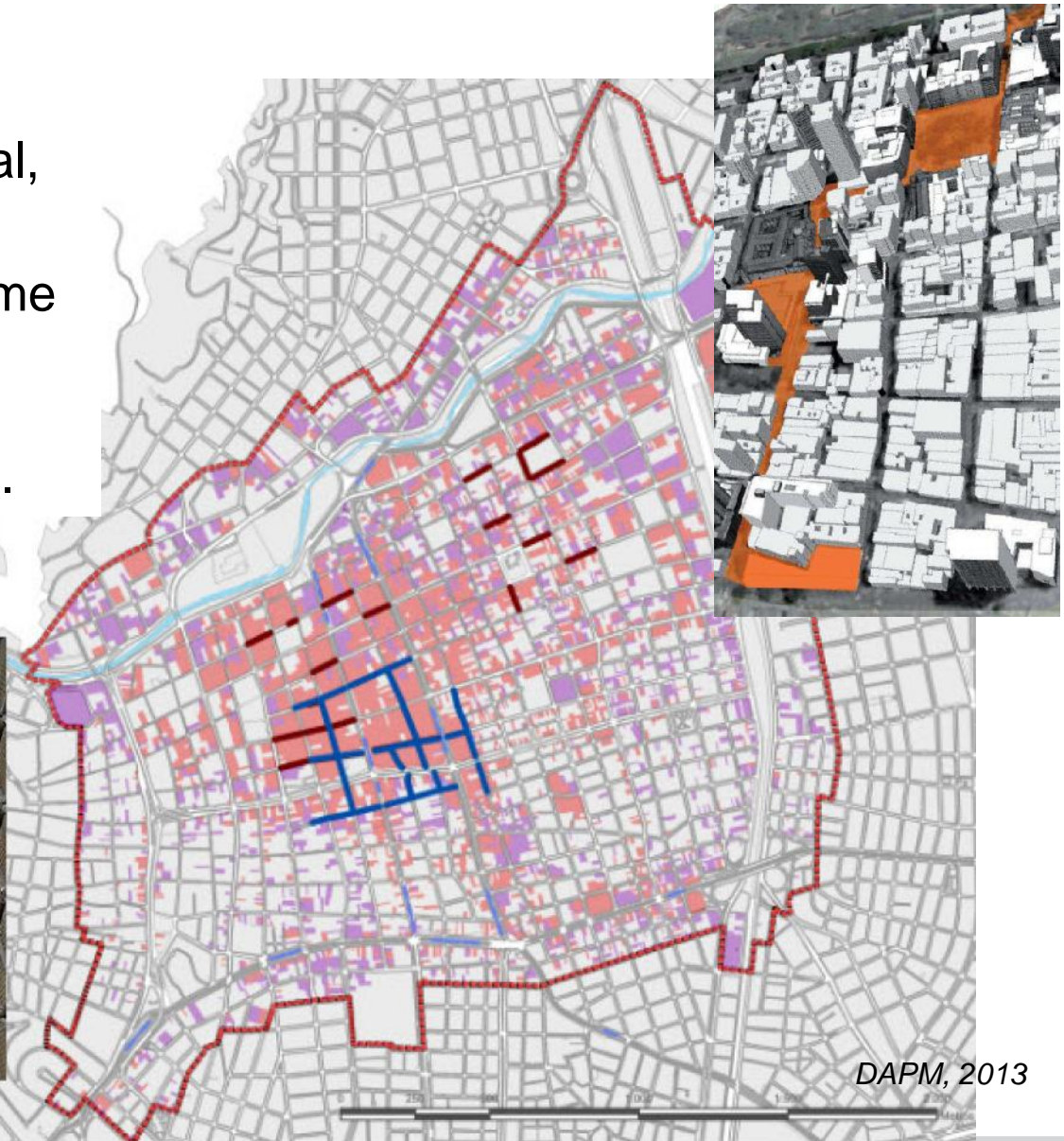


## 5. Paradox 2

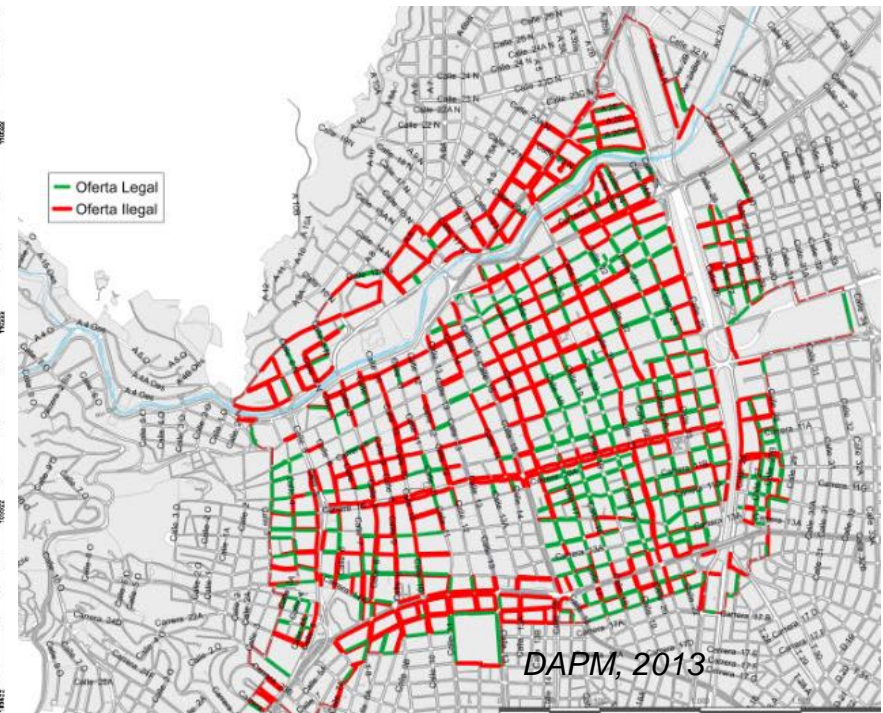
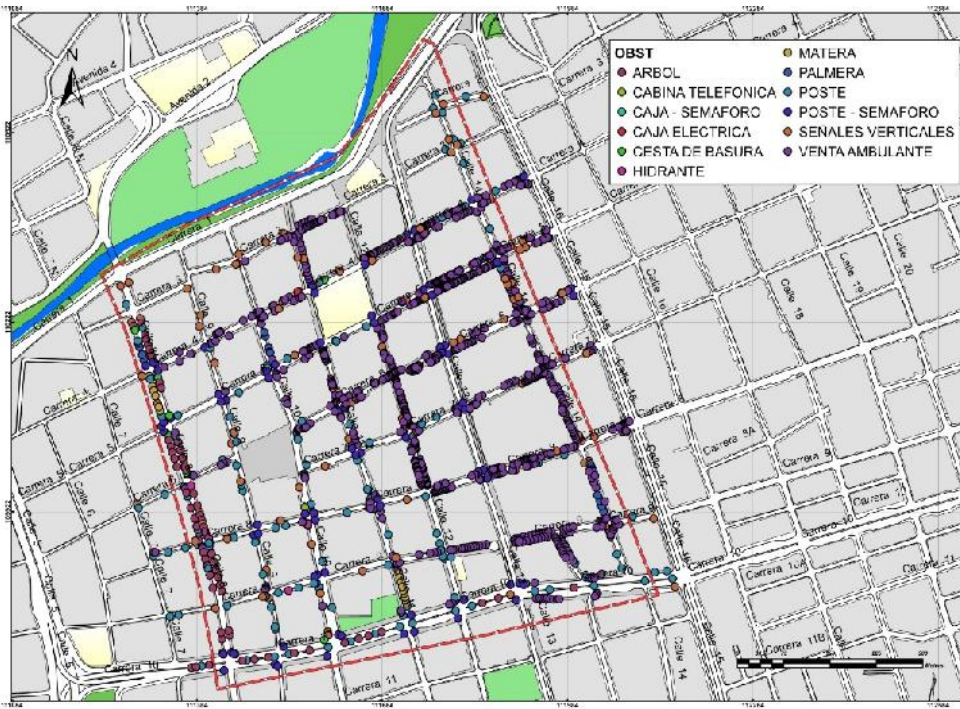
- **Street Cross Section**
- **Average annual daily traffic (TPD)**
- **Modal distribution**
- **Connection function**
- **Land Use Evolution**
- **Travel Length and performance**
- **Land Use Evolution**
- **Traffic light intersections**
- **Pedestrian level crossing –by (Pasos Peatonales a nivel)**
- **Logistic facilities**
- **Georeferenced accident database**



- 59% of land use is commercial, 2% institutional, 15% services.
- The downtown is at the same time a retail market and a wholesale market that provision other city centers.

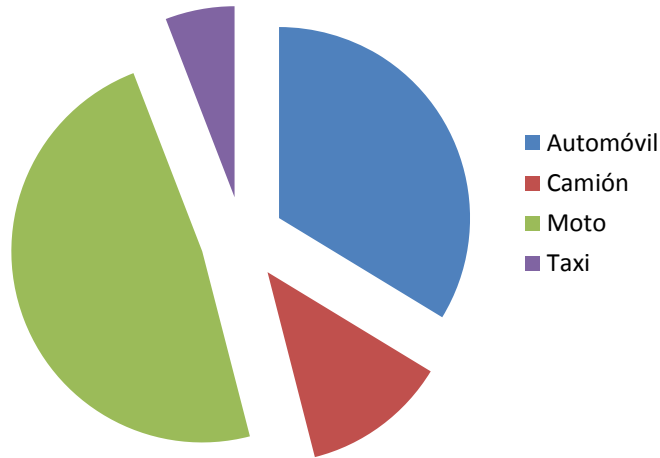


# 6. Paradox 3 - Zonal Approach

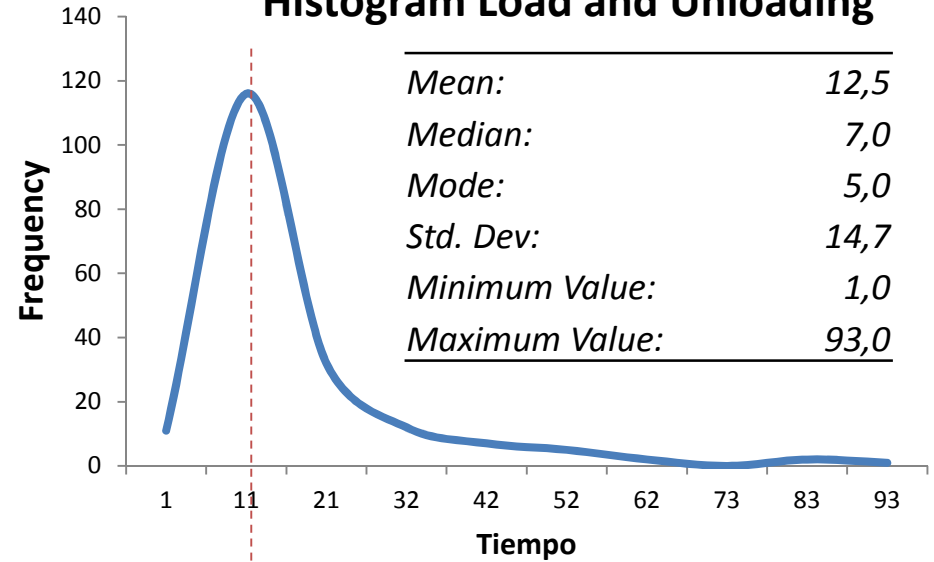


Terrain observations and evaluations

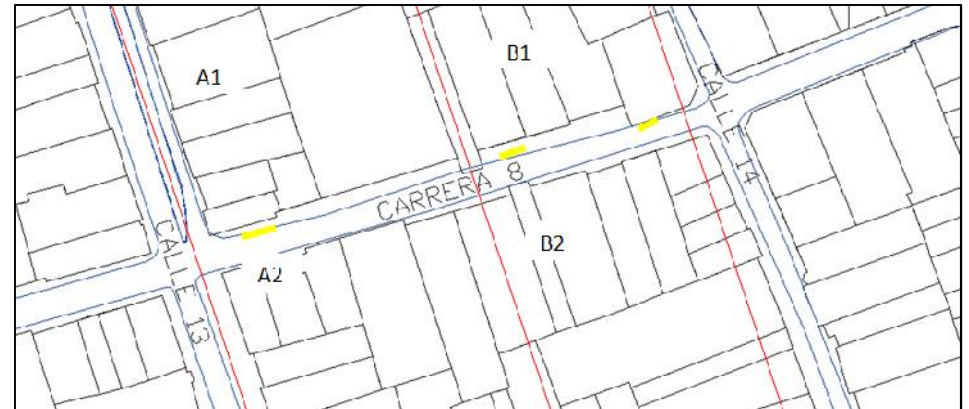
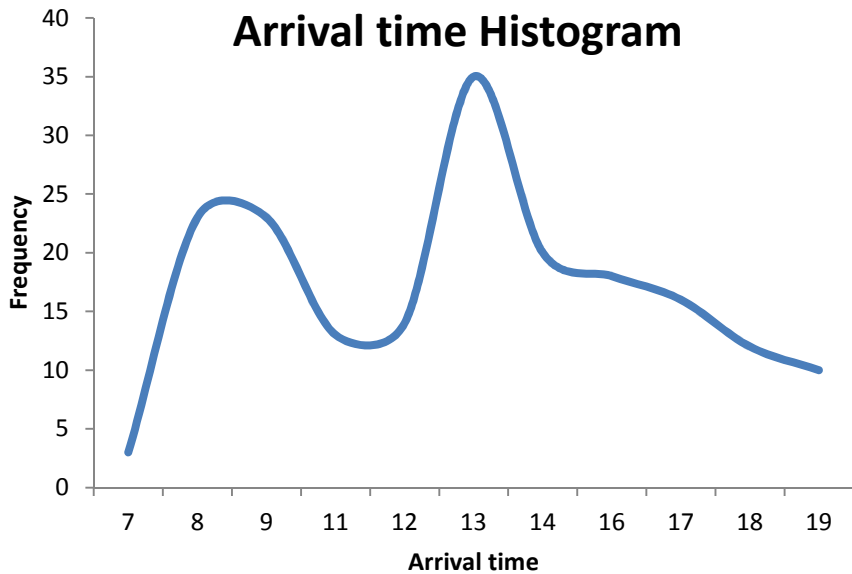
Parked vehicles count



Histogram Load and Unloading



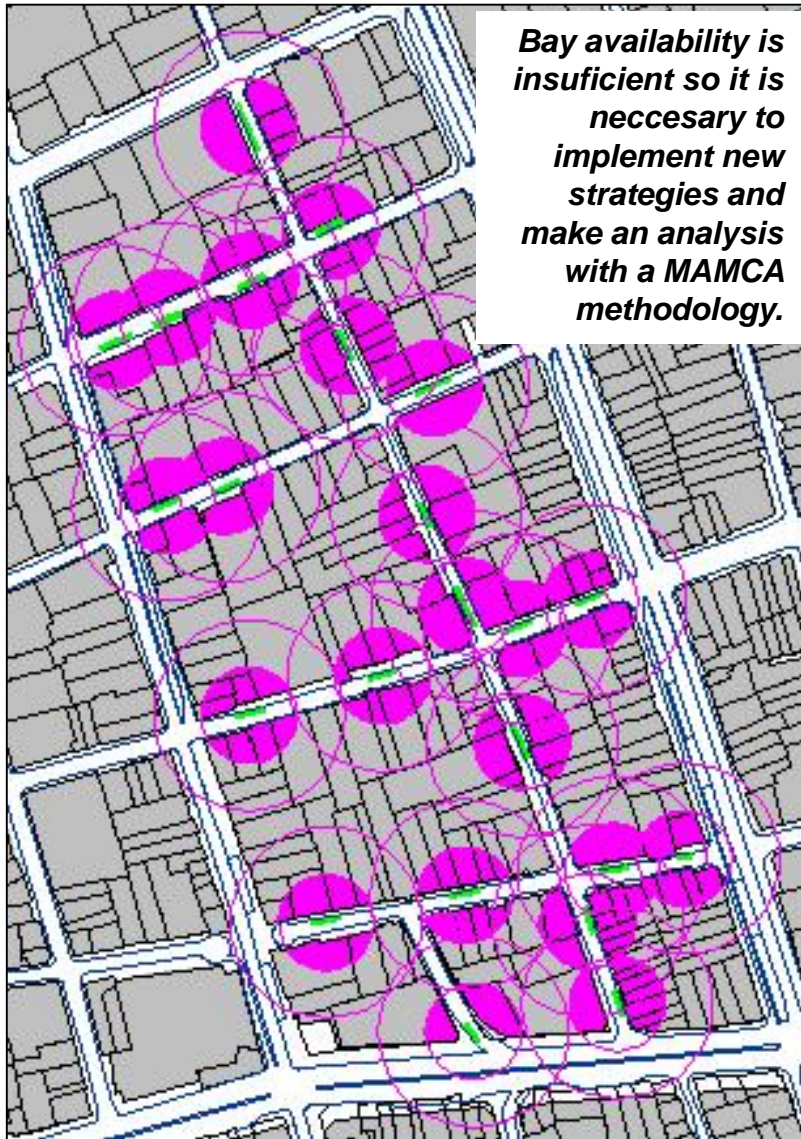
Arrival time Histogram



Freight parking places availability is very random, trucks even park in the middle of the Streets.



## 6. Paradox 3 Analysis- Official Bay availability

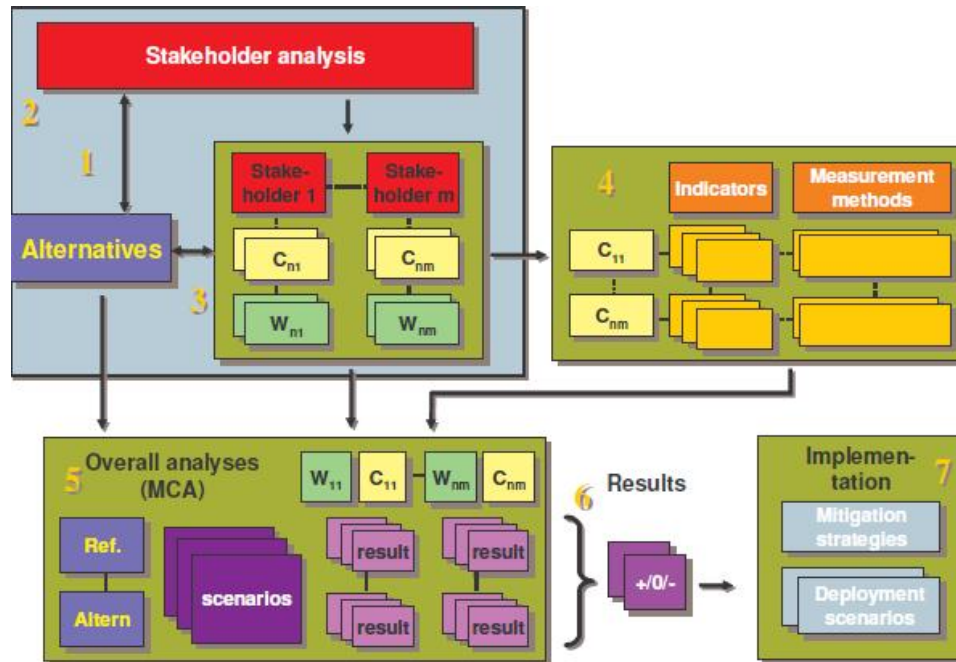


Buffer zones of **25 m** and **50 m** around each loading/unloading bay were defined to estimate the number of establishments that were outside the thresholds of walking distance.

The ratio of establishments served per single bay with a walking distance of 50m (per zone) varies between **6** and **25**, with the average being **14** and the standard deviation is **4**.

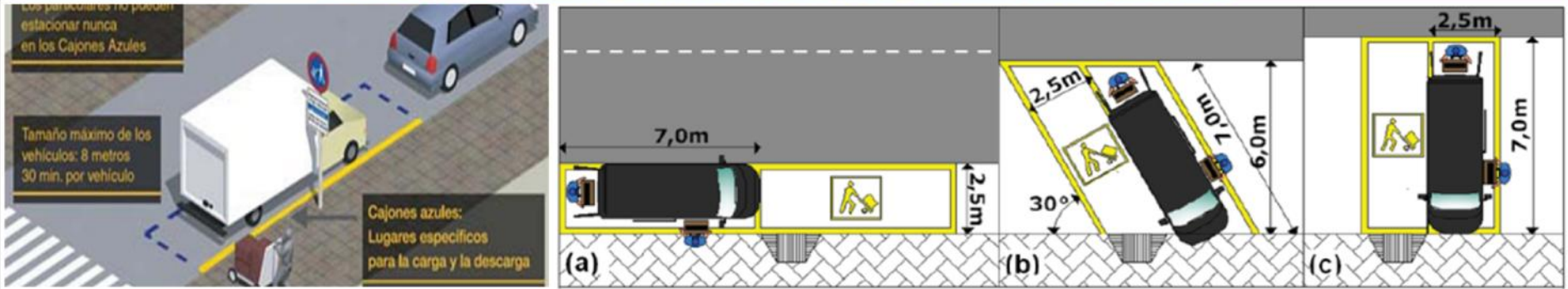
With a walking distance of 50m (per zone) varies between **2** and **10**, with the average being **6** and the standard deviation is **2**.

Of the selected sample, **26%** are not within 50m of a loading/unloading bay and **57%** are not within 25m of a loading/unloading bay.

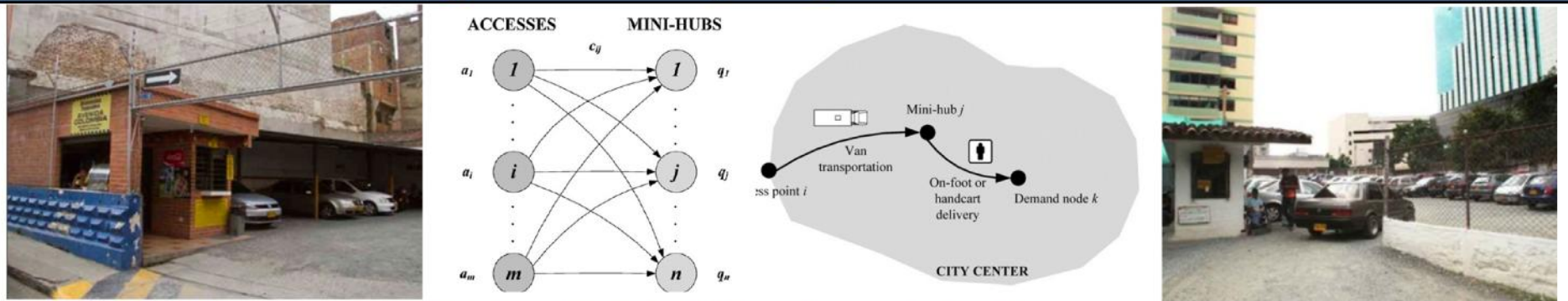


Methodology for a multi-stakeholder, multi-criteria analysis (MAMCA).  
 Source: own set-up. Source: Macharis (2005).

**Strategy 1: loading and unloading bays with new schedules**



**Strategy 2: Minihubs in parking lots or small warehouses**



**Strategy 3: freight bicycles and wheelbarrows**



**Strategy 4: Off hours Deliveries**



**Strategy 5: Urban Micro-Logistical Platform**



**Results from 1 - 5**

|                            | Strategy 1. | Strategy 2. | Strategy 3. | Strategy 4. | Strategy 5. |
|----------------------------|-------------|-------------|-------------|-------------|-------------|
| Establecimientos Receivers | 3,18        | 2,63        | 2,97        | 2,23        | 2,28        |
| Proveedores Shippers       | 3,05        | 2,74        | 3,37        | 2,53        | 2,44        |
| Autoridades Authorities    | 3,00        | 3,69        | 3,81        | 4,36        | 3,74        |
| Comunidad Residents        | 4,00        | 3,21        | 4,14        | 1,71        | 2,36        |
| Academia                   | 3,05        | 2,74        | 3,37        | 2,53        | 2,44        |

| Strategy 1. | Strategy 2. | Strategy 3. | Strategy 4. | Strategy 5. |
|-------------|-------------|-------------|-------------|-------------|
| 3,21        | 3,02        | 3,50        | 2,79        | 2,71        |

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- Ibeas, A., Moura, J. L., Nuzzolo, A., & Comi, A. (2012). Urban freight transport demand: transferability of survey results analysis and models. *Procedia-Social and Behavioral Sciences*, 54, 1068-1079.
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**Thanks!**

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