

Torino

Genova

Milano

Venezia

Trieste

Bologna

Firenze

Roma

Napoli

Bari

Reggio Calabria

Messina

Catania

Palermo

Cagliari

Smart Actions

in Italian metropolitan cities

ARUP

Smart Actions

in Italian metropolitan cities

ARUP

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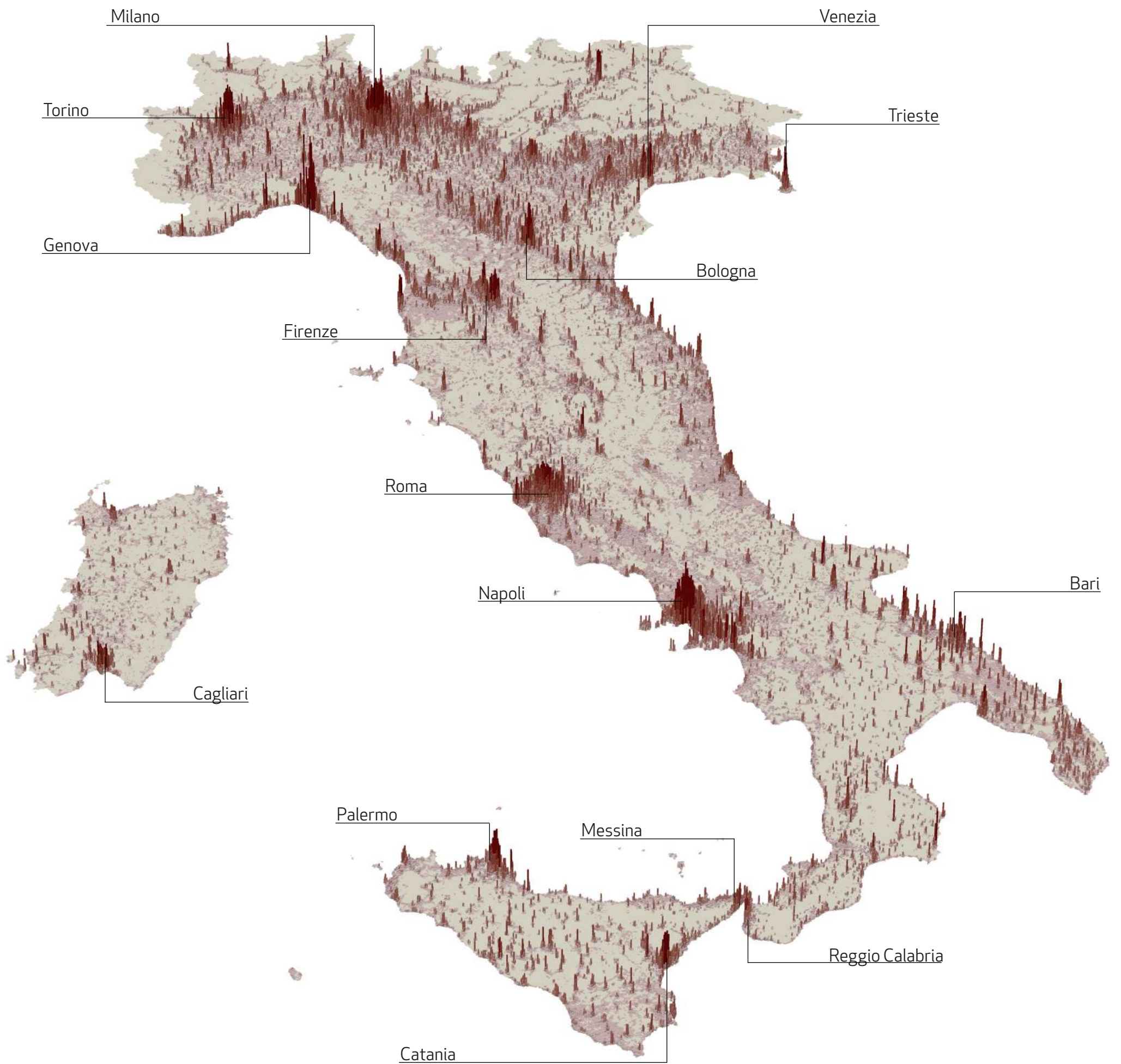
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The author acknowledges from the onset
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Smart Actions

in Italian metropolitan cities



The Italian challenge

This report provides an analysis of the current actions, the critical issues and the future opportunities that the imminent institution of the Italian metropolitan cities can produce in terms of sustainable urban development and it has the aim to promote Arup's experience to the stakeholders (Public Administrations, entrepreneurs, investors, etc.).

We live in an increasingly urbanized context where more than half of the world's population lives in cities that are responsible for 80% of the world's carbon emissions, while the ecological footprint, the human demand on the Earth's ecosystems, is quickly and dangerously growing. In Italy, as in the rest of the world, urban areas are currently the key places on which to focus to implement innovative solutions aimed at challenging climate change.

Currently cities are raising awareness, taking action and investing resources in effective solutions to address the main environmental urban issues (from energy supply to water management, from waste disposal to mobility, etc..) yet a lot still remains to be done.

Divided in three main chapters – overview, metropolitan cities and benchmarks – this report provides a comprehensive analysis based on statistical data from various sources that illustrates, through charts and maps, the transformations occurred in the 15 Italian

metropolitan cities over the past 60 years, in order to capture those trends which will lead to future change.

The first chapter, a general urban comparison between the cities, introduces the second chapter, where a detailed report illustrates each city in terms of population, footprint, density, economy, social, transport and environment. Furthermore, a summary of the smartest measures already adopted by the cities shows the current inadequacy of the Italian urban policies. In the third chapter, Italian cities have been compared with the top seven European cities in order to highlight possible improvements.

In terms of territorial government, the urban growth of the main Italian cities already crossed the administrative boundaries, because of a general tendency to sprawl during the last 60 years, that increased the land consumption incoherently to a demographic evolution showing a decrease of population in the main municipalities.

This scenario, characterized by phenomena like the strong increase of foreign population and demographic dependency, the highest car ownership rate in Europe concurrently to the low use of sustainable transport, the lack of policies in reducing energy consumption and waste production, induces to make an alarming

diagnosis for the future of Italian cities. In an age of global changes, towards the ecological era we are going to live locally, the importance to define a timely prognosis goes over the weak actions - occasional treatments without a general overview - adopted so far by the cities.

Far from being no more than just a statistical survey, this study aims at being a tool to support local governments to interact with the new Italian administrative authority - the metropolitan cities. By taking a snapshot of the current situations and by identifying the possible strategies, it illustrates the potential for action in the cities; not only by emphasising what cities have done to date, but also what they can do to create better living places and counteract climate change.

Arup is a global firm of designers, engineers, planners and business consultants providing a diverse range of professional services to clients around the world.

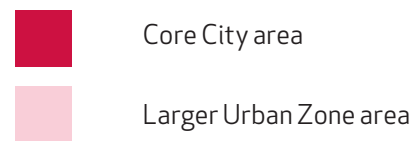
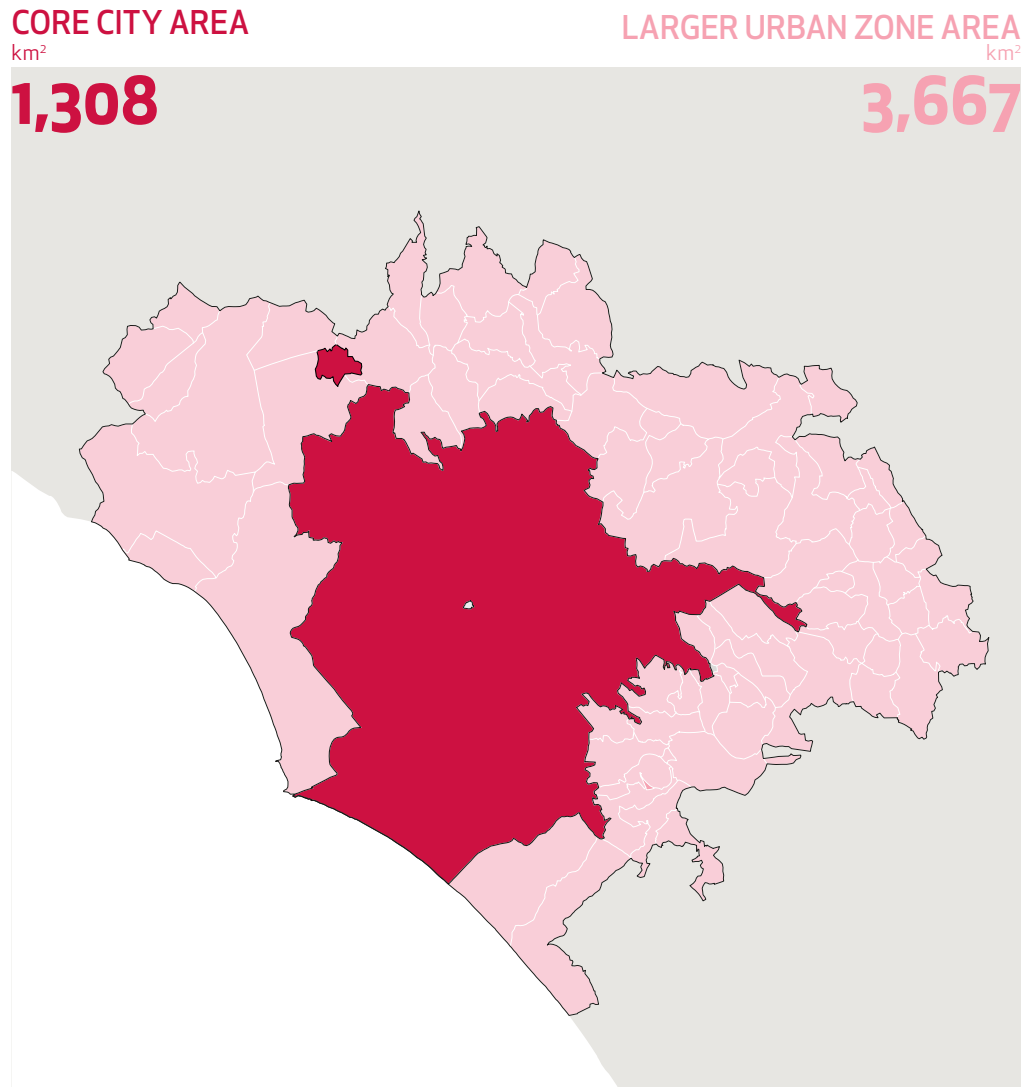
We have more than 10,000 staff located in 92 offices in 37 countries. At any one time, we have over 10,000 projects under design or construction.

We are renowned for our specialist expertise in multiple disciplines encompassing all aspects of the built environment. At the same time, we are dedicated to an interdisciplinary approach that brings our full complement of skills and knowledge to each project. Since our inception in 1946, we have been the creative force behind many of the world's most innovative and sustainable designs.

Arup has three main global business areas – buildings, infrastructure and consulting – although our multi-disciplinary approach means that any given project may involve people from any or all of the sectors in which we operate.

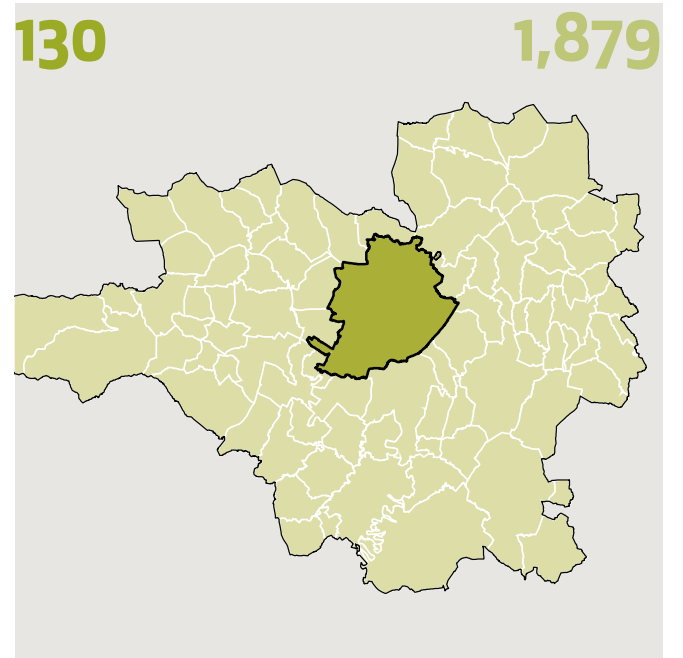
Our fundamental aim is to bring together the best professional team in the world to meet our clients' needs.

Overview



ROMA

DATA SOURCES:
Eurostat, Istat



TORINO

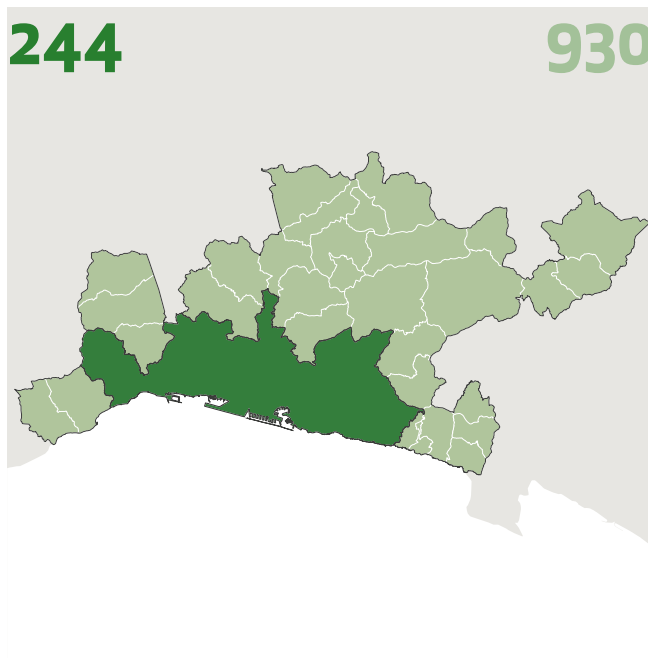
Boundaries

The metropolitan city is a new local authority which is expected to replace the current Province institution, starting from 2014, in fifteen major Italian cities (Torino, Genova, Milano, Venezia, Trieste, Bologna, Firenze, Roma, Napoli, Bari, Reggio Calabria, Messina, Catania, Palermo, Cagliari).

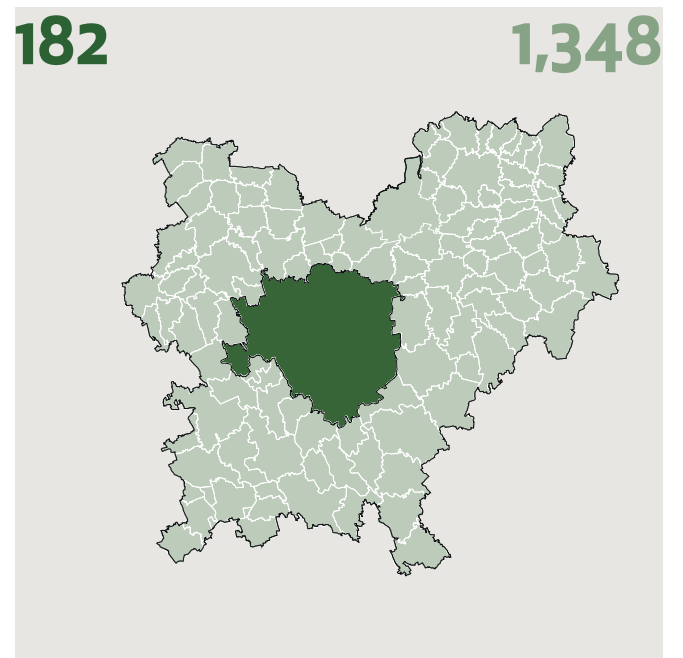
Since the exact boundaries of each metropolitan city are still not confirmed (each municipality included in the metropolitan city may decide to be part of it or not by means of a referendum), the boundaries defined by Eurostat have been used in this research.

In fact, two levels of boundaries have been considered: the Core City - the capital of the current Province - and the Larger Urban Zone (LUZ)*, which consists of the territorial area including the Core City municipality and those surrounding municipalities which have strong ties to the Core City for geographical, economic, environmental or social reasons.

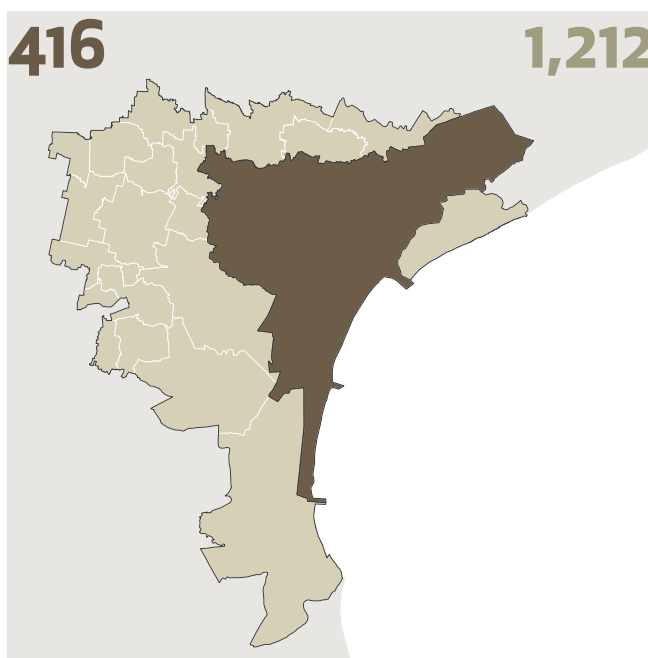
Within such boundaries, a total of 565 municipalities make up the Larger Urban Zones of the 15 metropolitan cities, accounting for a population of 16.9 million (28% of the Italian population) and covering 6% of the total Italian surface area. This further confirms the strong administrative relevance of the new metropolitan cities within the country's institutional asset.



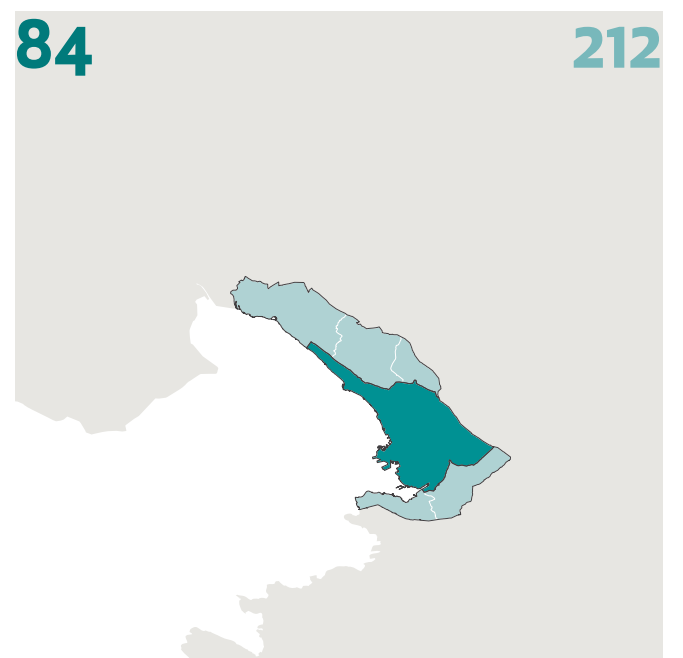
GENOVA



MILANO



VENEZIA



TRIESTE

* the perimeter indicated by the Sicily Regional Law 9/1986 was considered for the city of Messina

Municipalities in the metropolitan LUZ

565

Metropolitan LUZ area

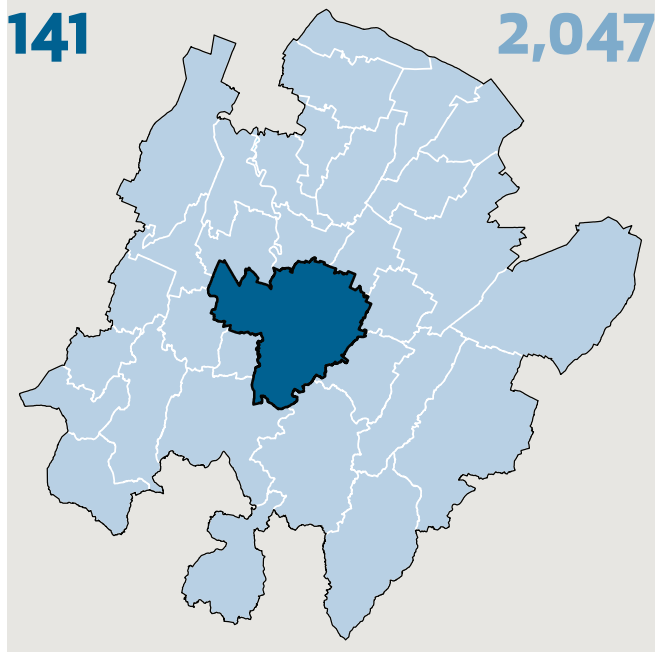
19,083

km²

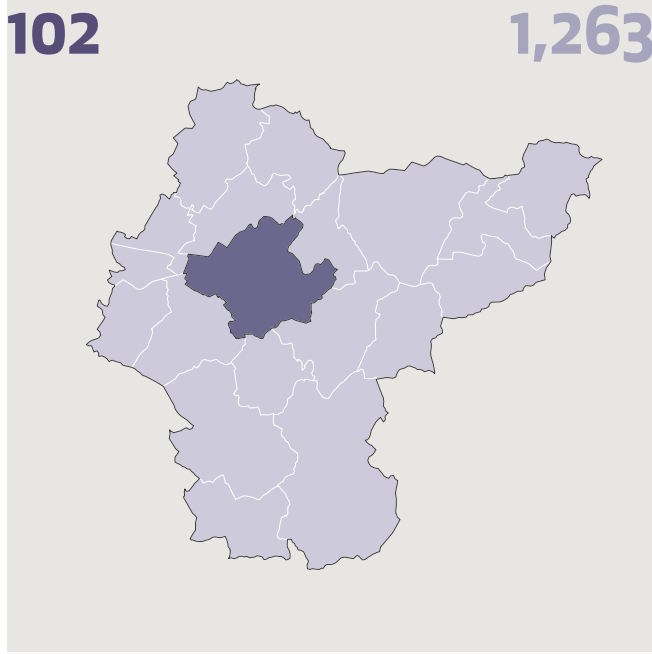
Metropolitan LUZ area

6%

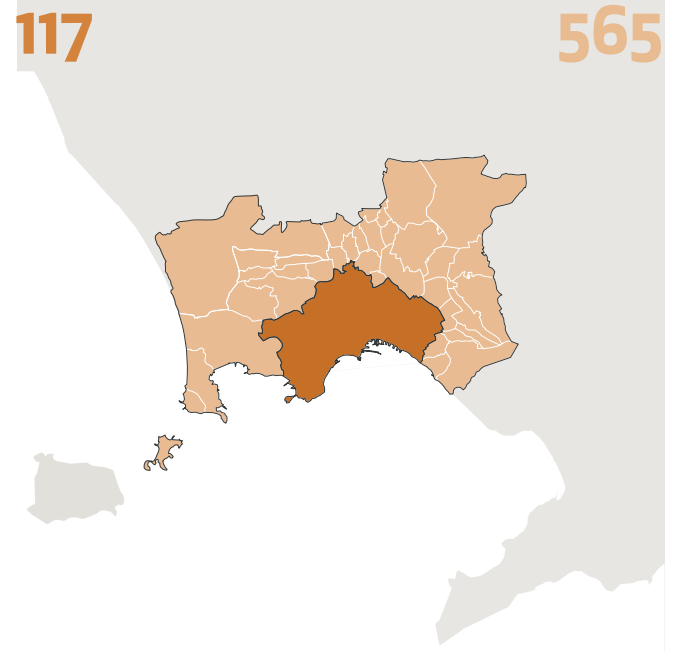
of Italy



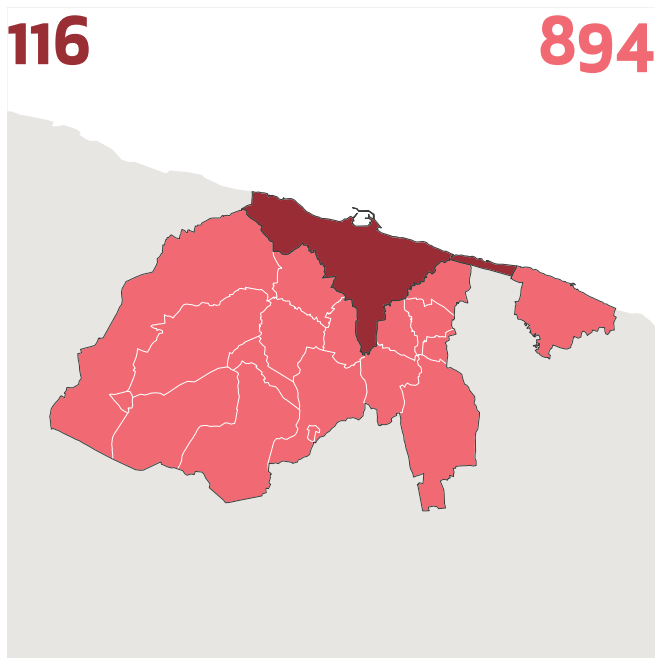
BOLOGNA



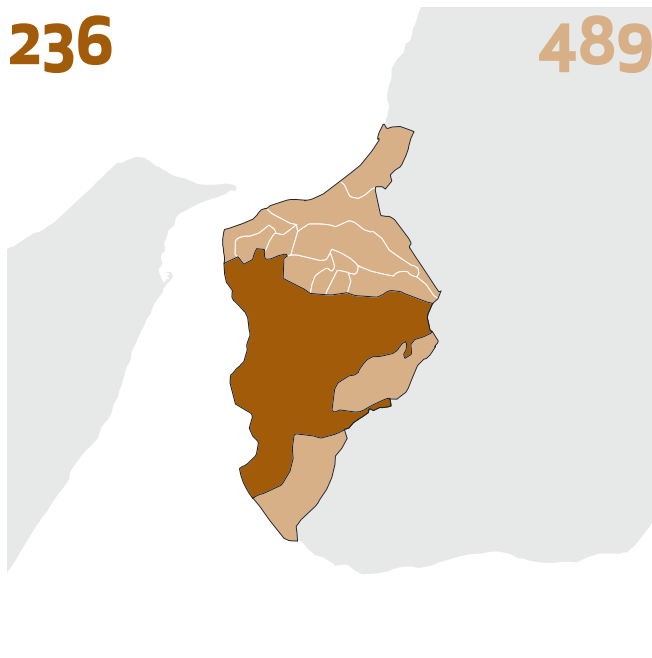
FIRENZE



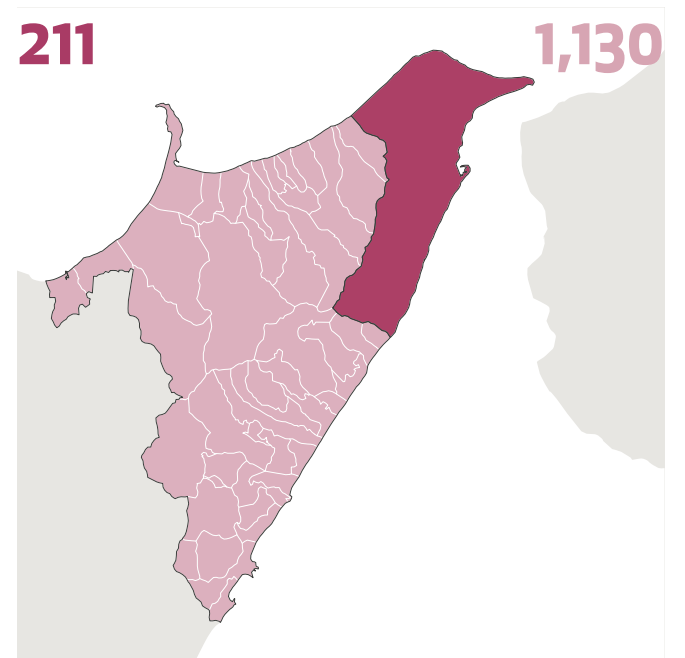
NAPOLI



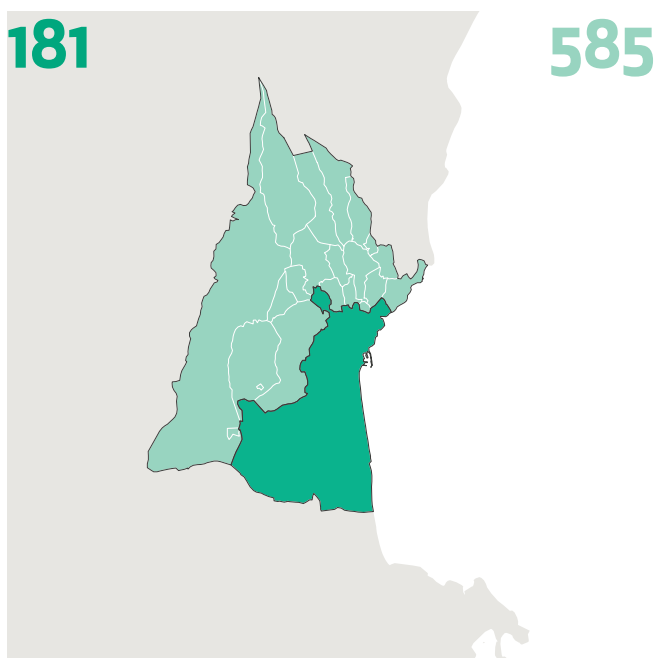
BARI



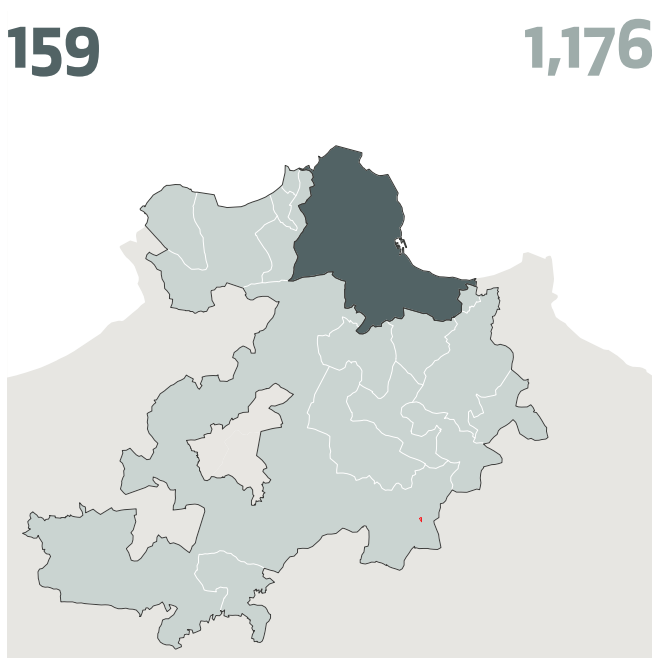
REGGIO CALABRIA



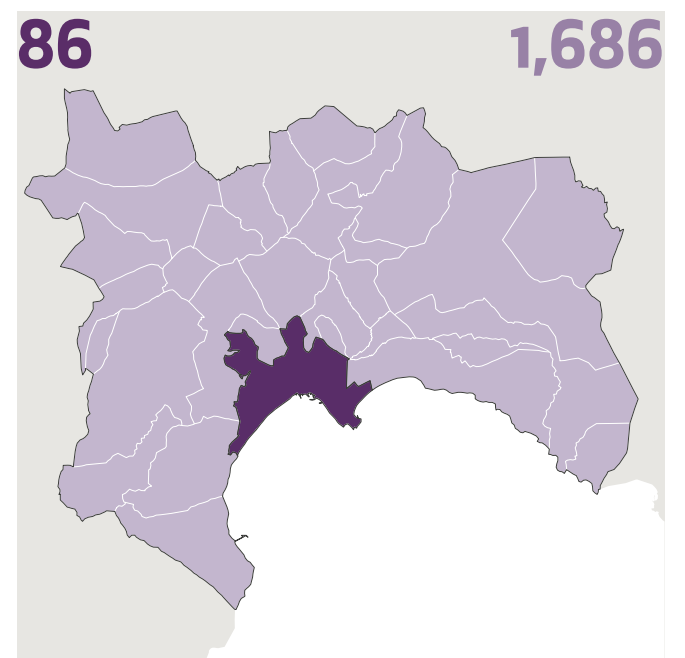
MESSINA



CATANIA



PALERMO



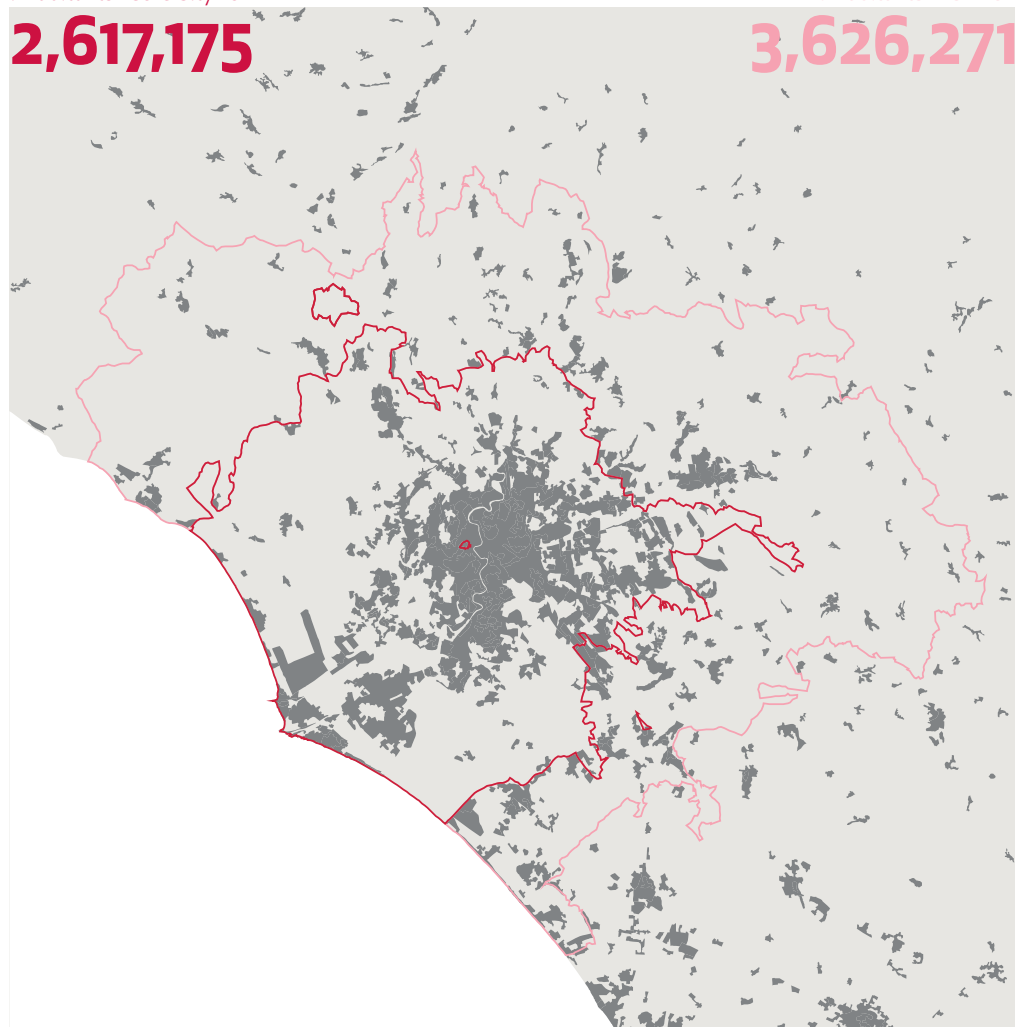
CAGLIARI

CURRENT POPULATION
inhabitants - Core City 2011

2,617,175

CURRENT POPULATION
inhabitants - LUZ 2011

3,626,271

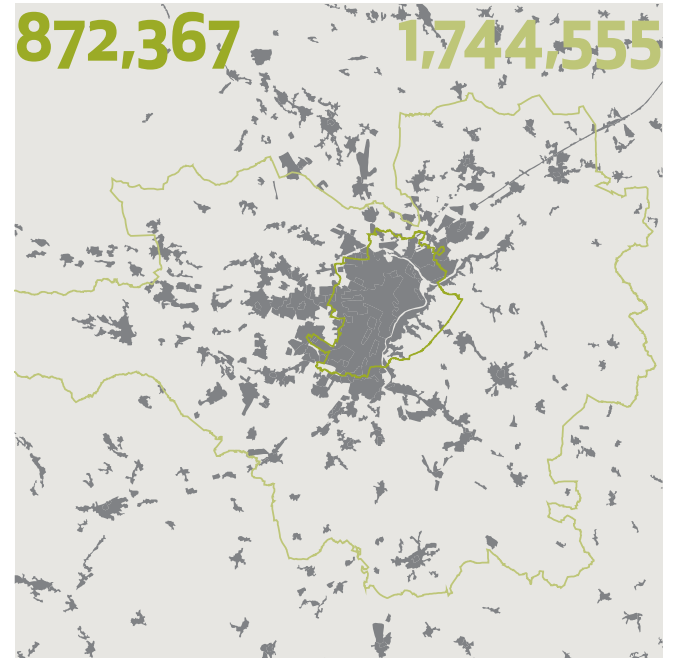


ROMA

DATA SOURCE:
Istat

- Urban Footprint
- Core City area
- Larger Urban Zone area

872,367 **1,744,555**



TORINO

Urban footprint

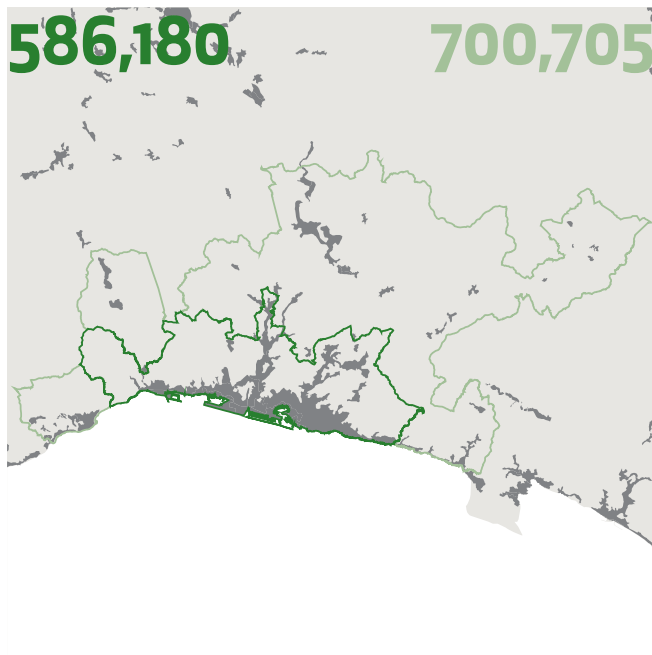
The maps show the urban footprint of each metropolitan city displayed within a standard surface area of 65x65 km (with the exception of Roma, for which a 100x100 km area was considered) and illustrate the boundaries which were taken into account: the Core Cities and the Larger Urban Zones.

The maps, developed using the Corine Land Cover 2006 database (a computerised inventory on the land cover and the land use provided by the European Environmental Agency) allow accurate identification of the specific urban shape of each city, clearly showing the extent of the urbanised area with reference to the current administrative borders, and offering a new picture of the urban settlement in the context of the new metropolitan city boundary.

The relationships between physical dimension, land use and demographics are quite evident by associating the resident population data and the urban footprint. The overall picture is quite heterogeneous ranging from compact cities with population below 250,000 (Trieste and Reggio Calabria), and large urban areas in with population in excess of 3 million (Roma and Milano).

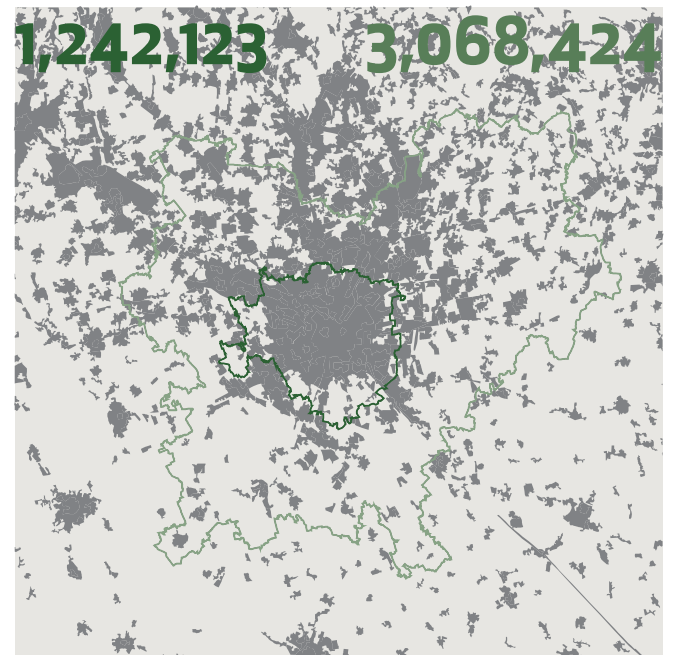
The population living in the fifteen LUZ adds up to 16.9 inhabitants, which accounts to 28% of the Italian population. This datum alone demonstrates the strategic role that the metropolitan cities will play in the context of the country's development.

586,180 **700,705**



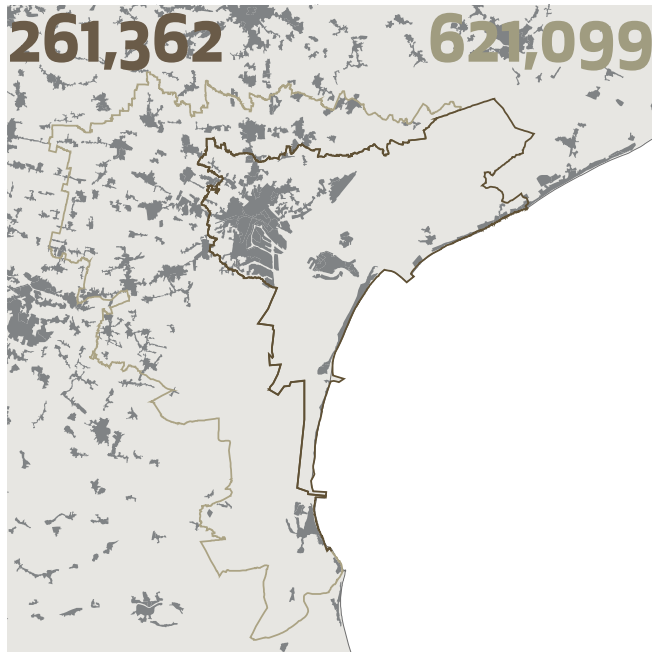
GENOVA

1,242,123 **3,068,424**



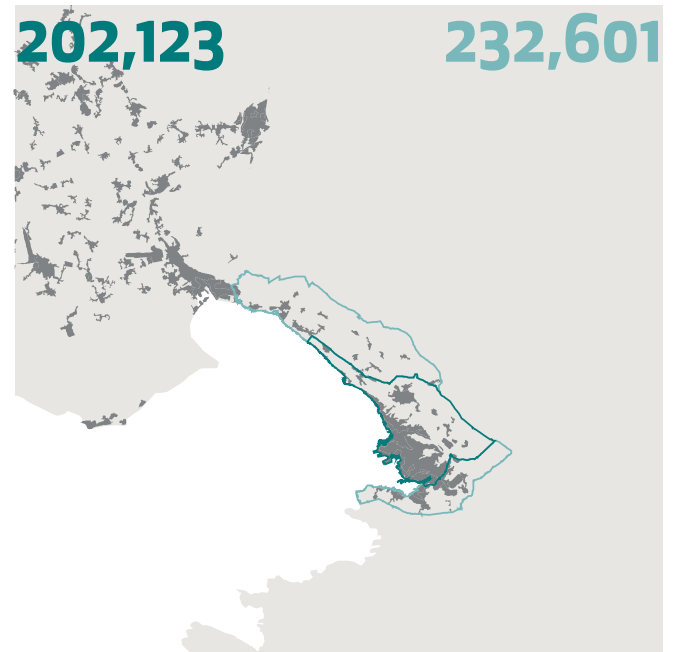
MILANO

261,362 **621,099**



VENEZIA

202,123 **232,601**



TRIESTE

Italian population

59.4

million

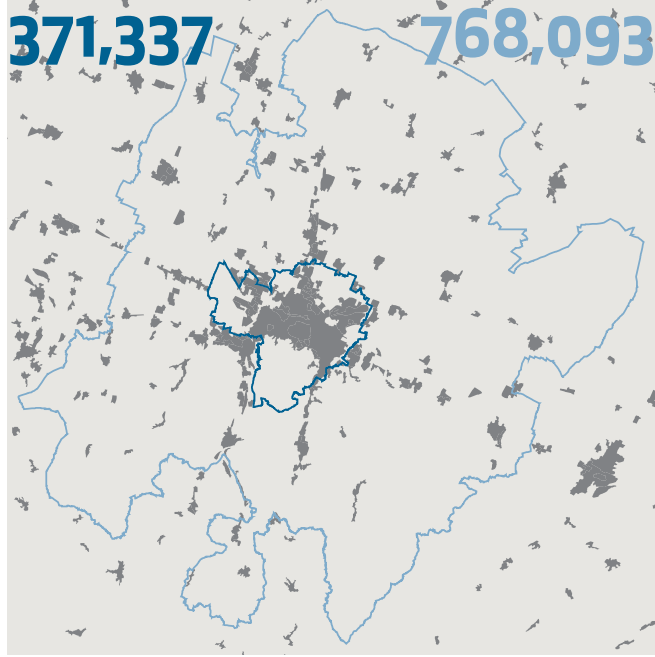
Italian population living in the metropolitan LUZ

16.9

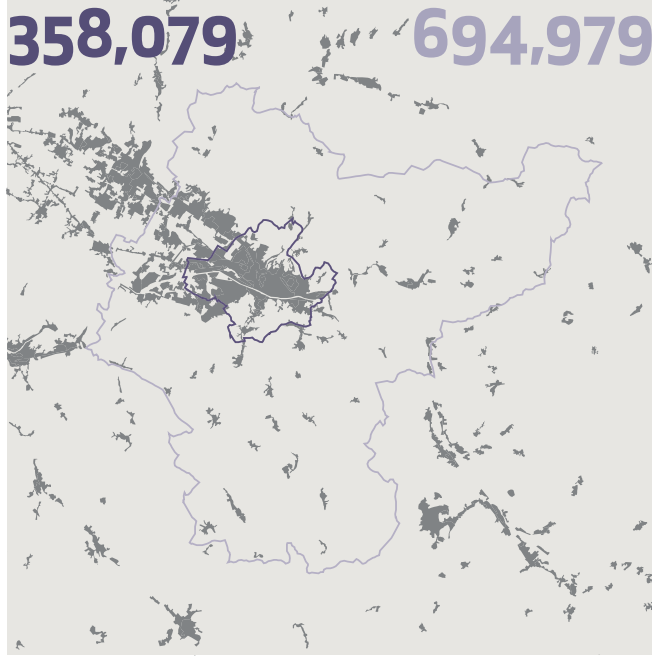
million

% of population living in the metropolitan LUZ

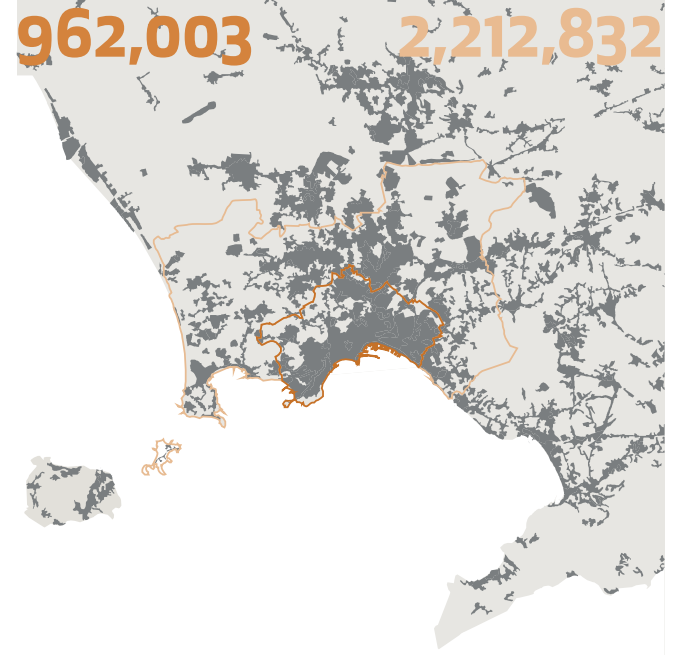
28%



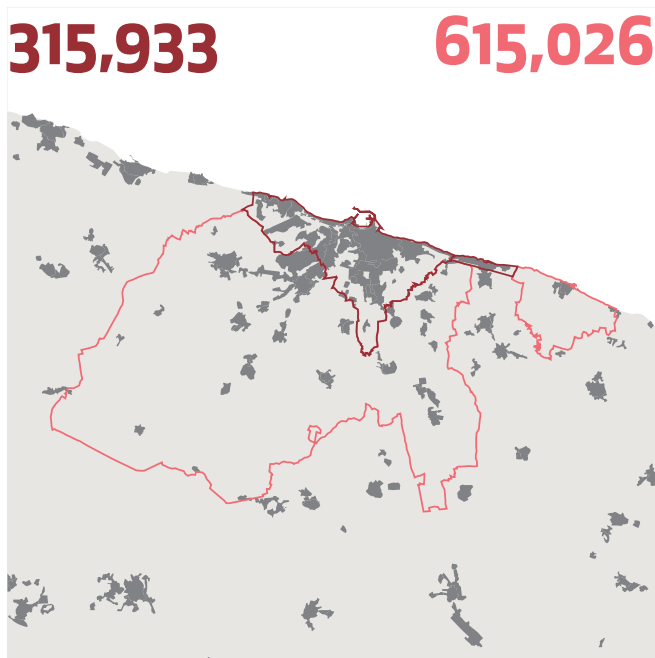
BOLOGNA



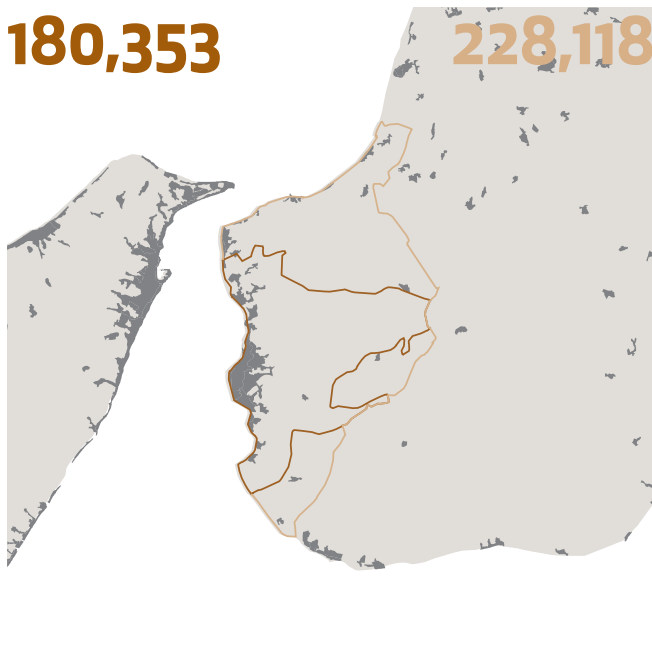
FIRENZE



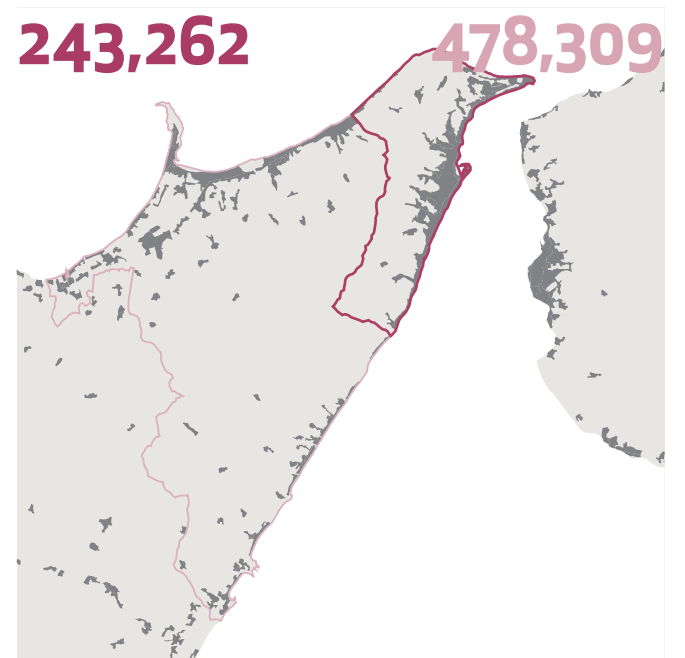
NAPOLI



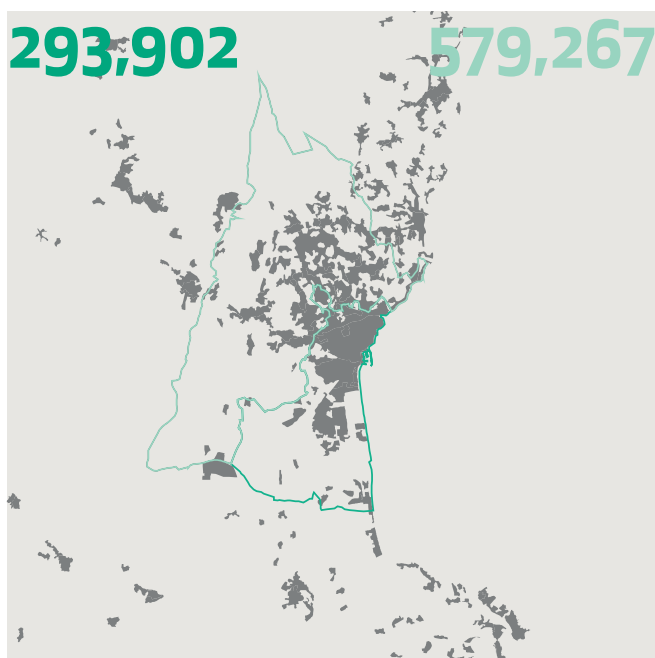
BARI



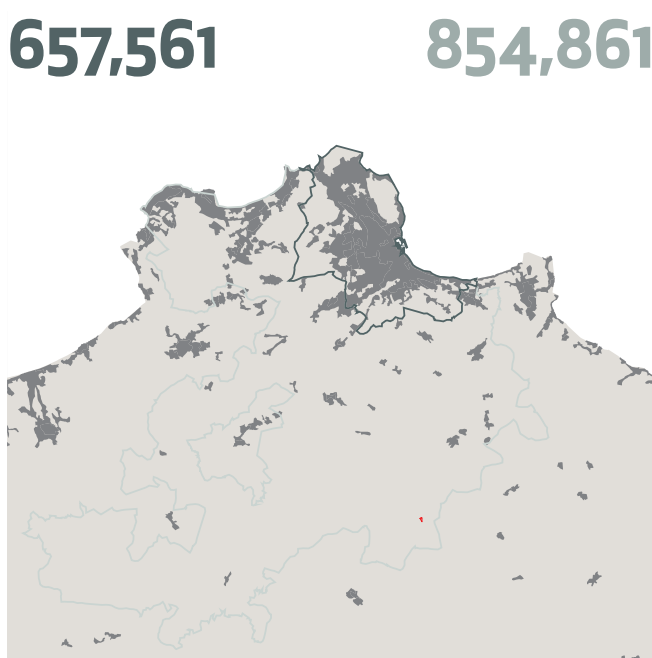
REGGIO CALABRIA



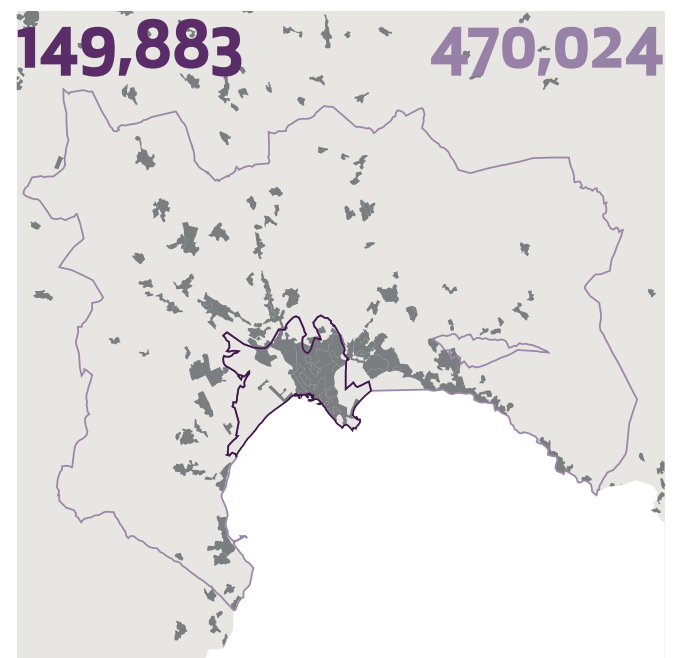
MESSINA



CATANIA

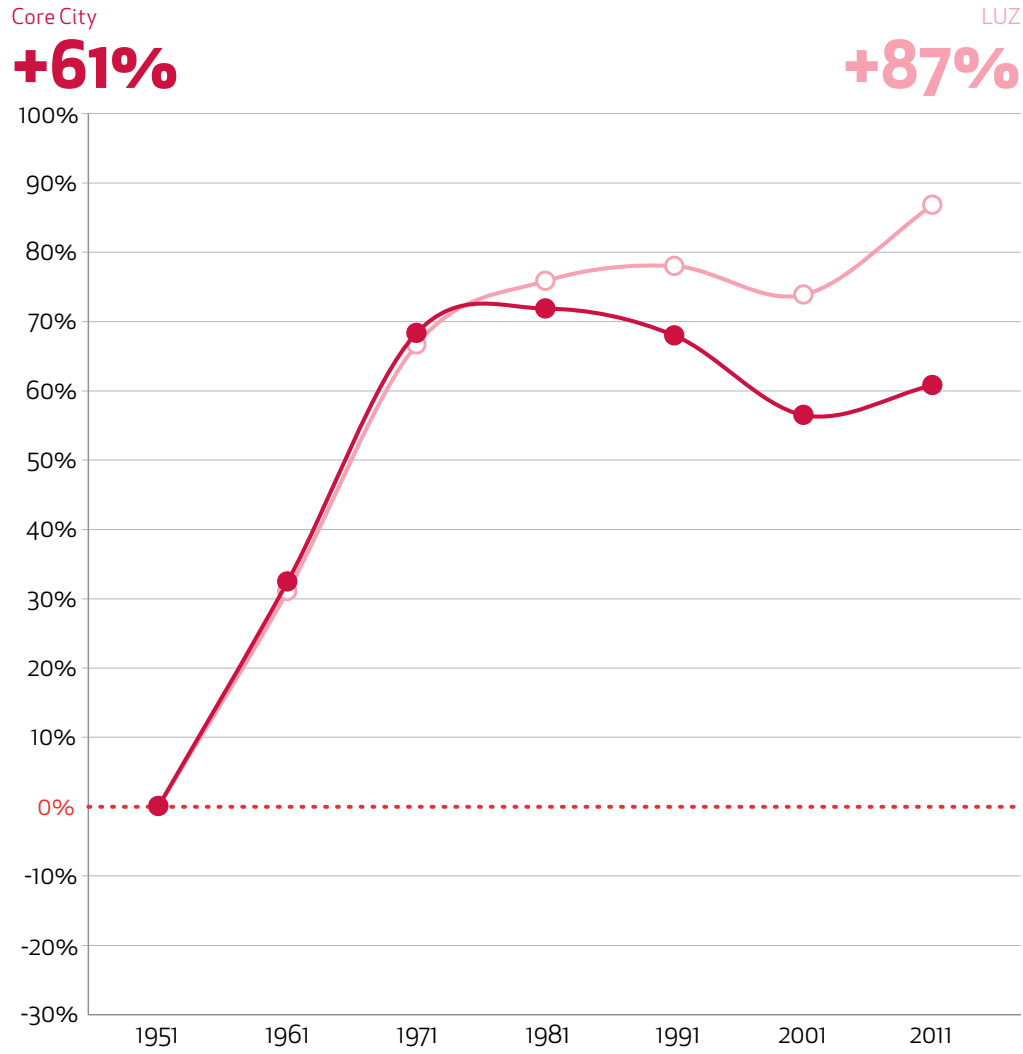


PALERMO



CAGLIARI

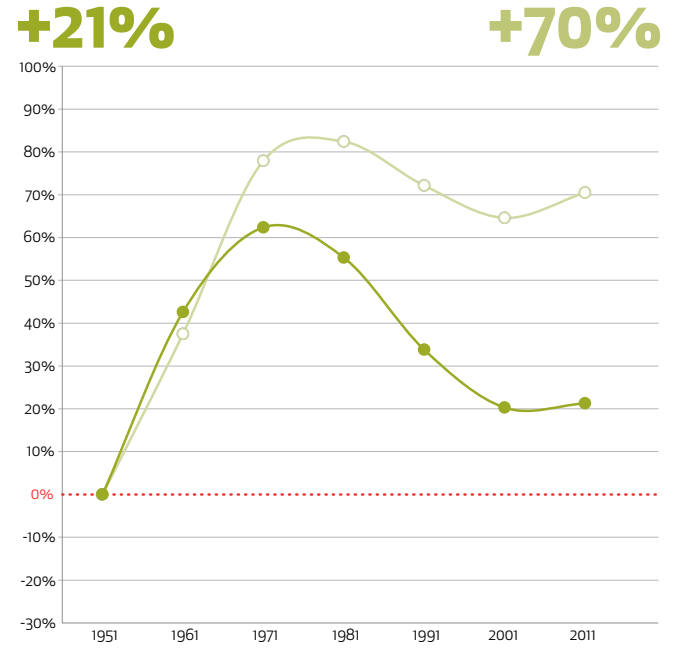
DEMOGRAPHIC CHANGE FROM 1951



ROMA

DATA SOURCE: Istat

● Core City area
○ Larger Urban Zone area



TORINO

Demographic changes

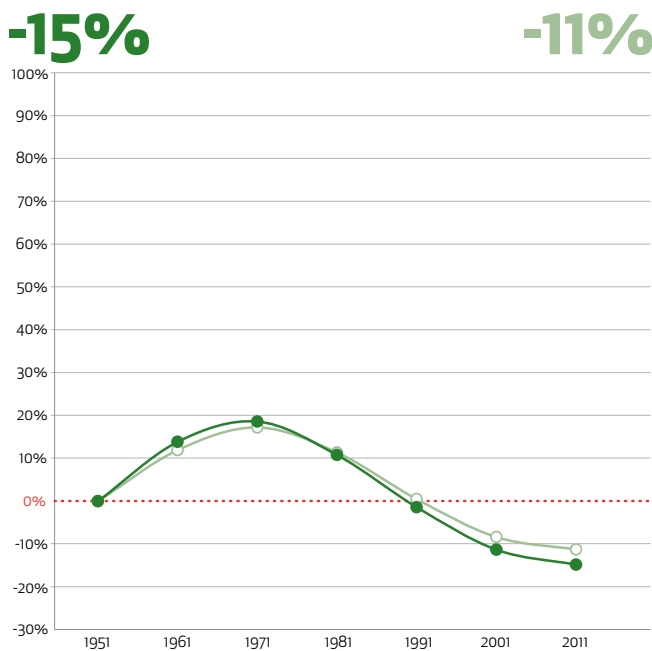
The charts show the demographic change of each Core City and related LUZ in the period 1951-2011, where 1951 is the base year and the change is reported in percentage terms to the population of such base year.

The demographics were sourced from Istat (the Italian National Institute of Statistics) with data for each decade in the period considered. The curves provide an immediate visualisation of the demographic trends and the comparison between the Core City and the LUZ.

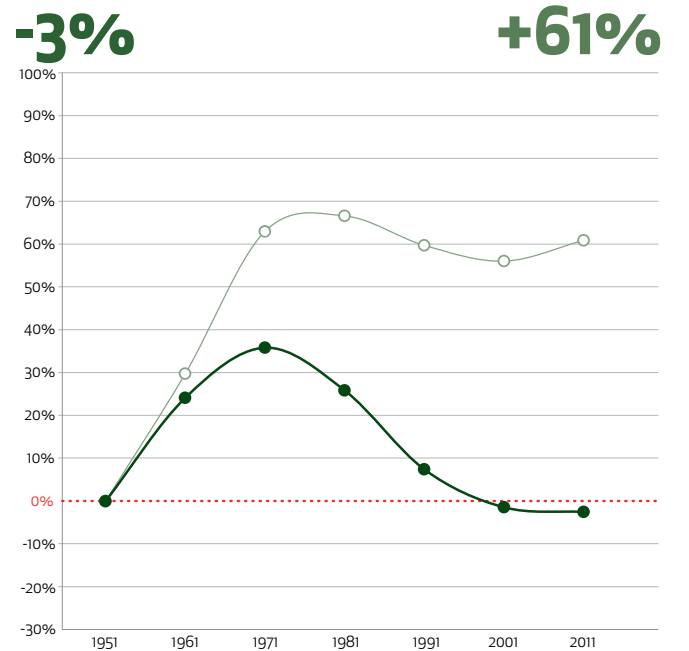
The curves, and the underlying data, show a general trend of increase in population from the post-war period to date which is in line with the national average (+25%). However, a significant difference can be observed in the population growth percentage between the Core Cities (14%) and the LUZs (+48%) in the same period.

The majority of the Core Cities analysed have experienced a significant decrease in population from 1971 onwards, which is often counterbalanced by a strong increase in population in the surrounding suburban municipalities, with a continuing trend to date.

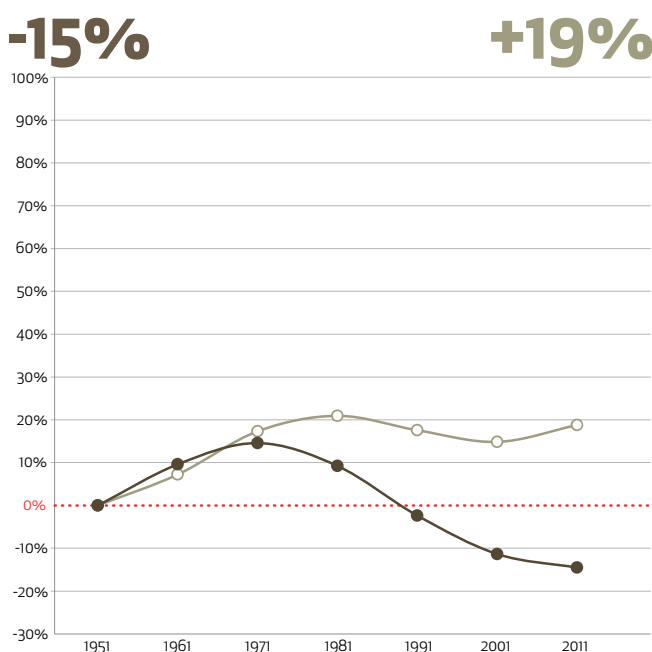
Such trends, associated with those related to urban footprint and land use, suggest that the new institution of the metropolitan cities represent an opportunity for change not only in terms of administrative boundary, but mostly in the overall strategies for policy making, local development and management.



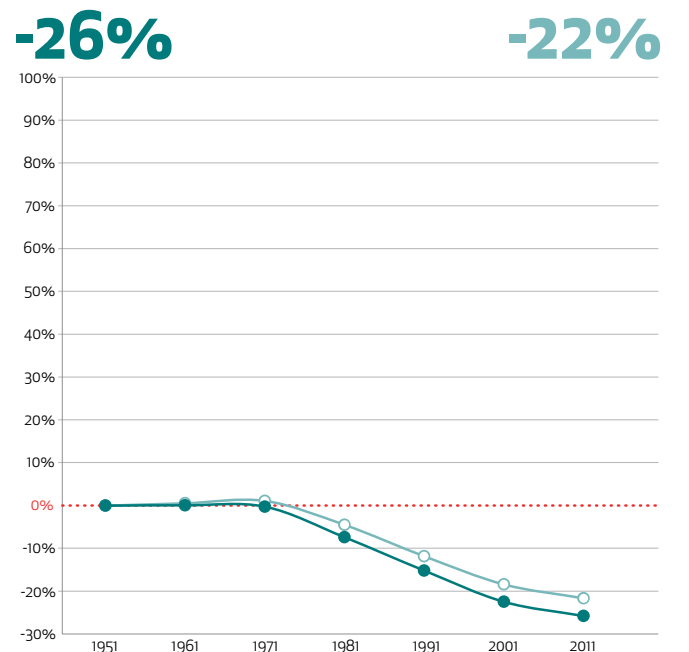
GENOVA



MILANO



VENEZIA



TRIESTE

Population growth from 1951

14%

in the metropolitan Core Cities

Population growth from 1951

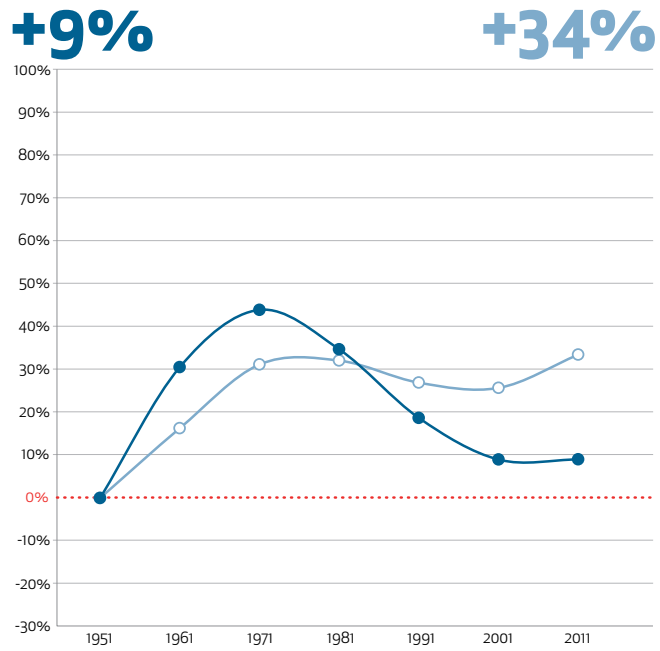
25%

in Italy

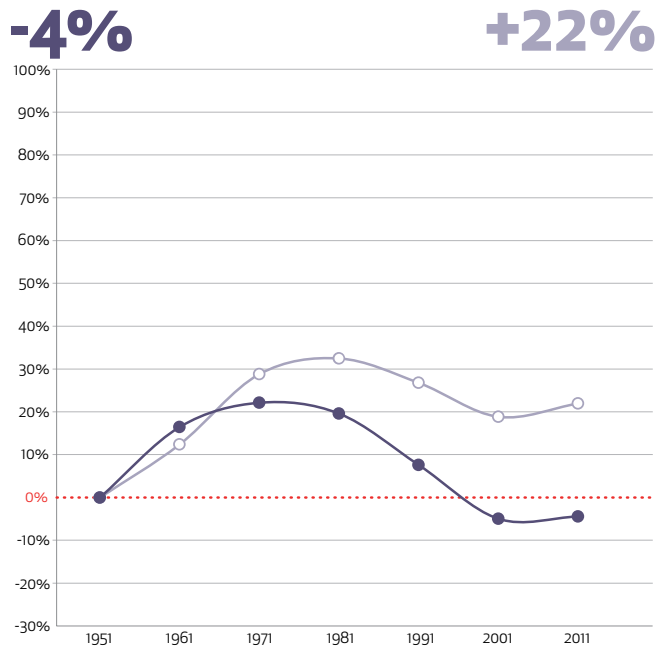
Population growth from 1951

48%

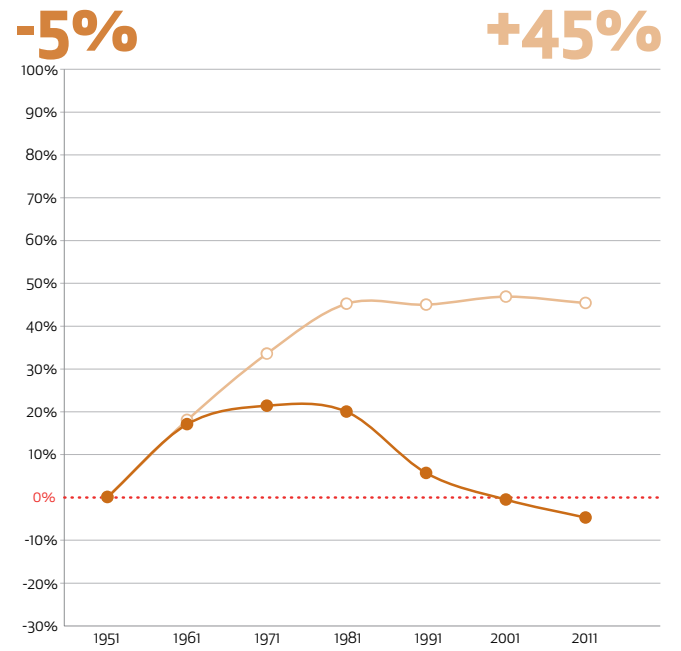
in the metropolitan Larger Urban Zones



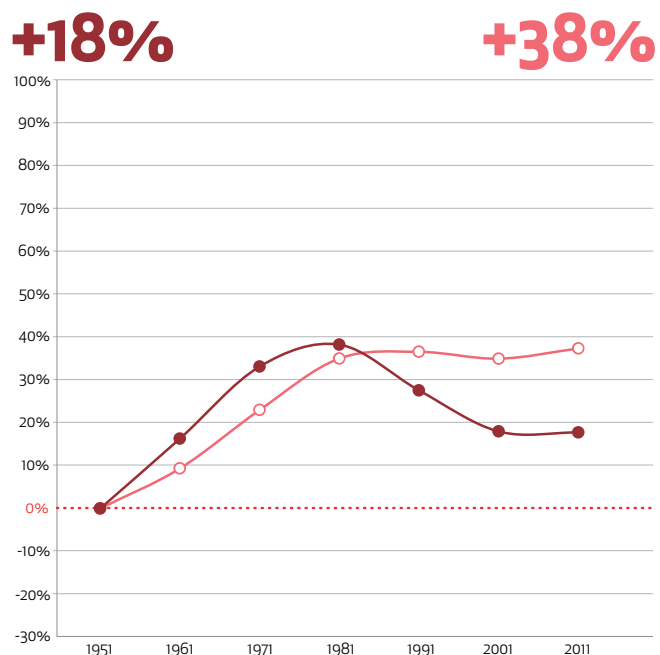
BOLOGNA



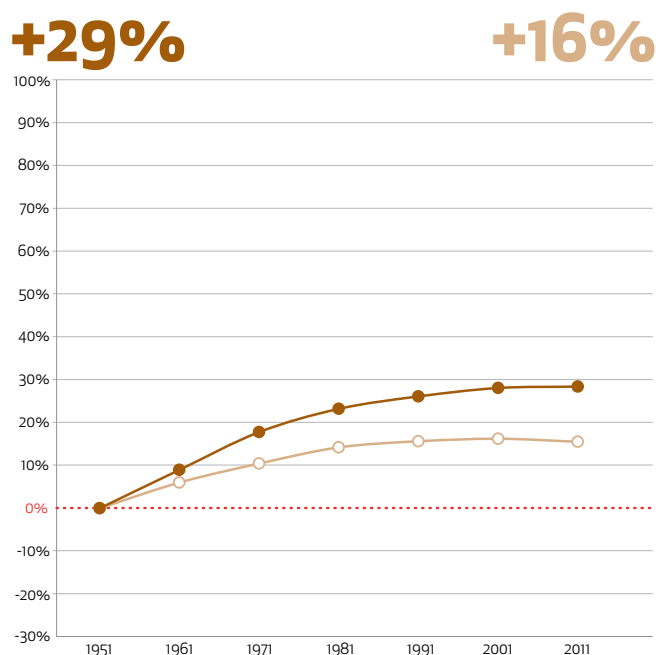
FIRENZE



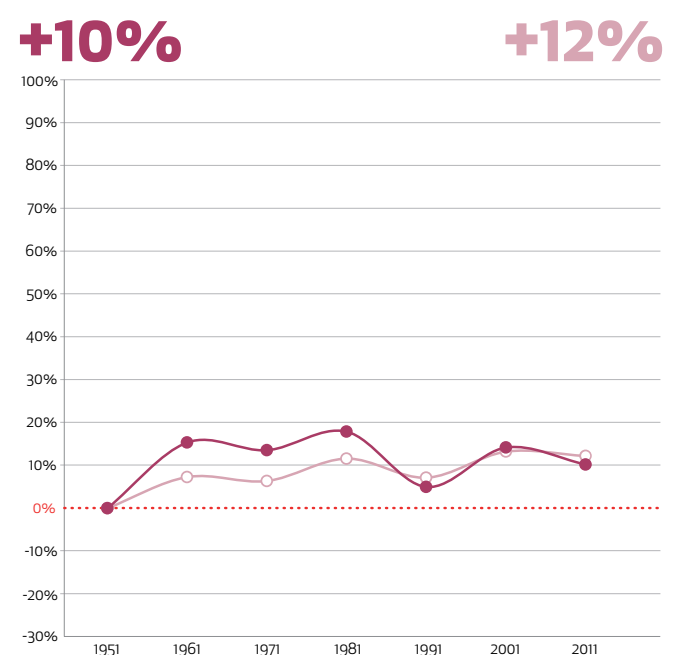
NAPOLI



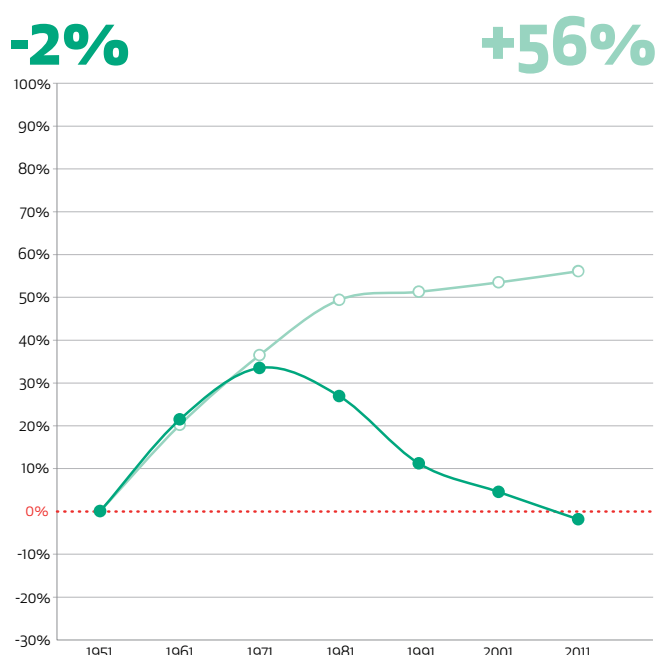
BARI



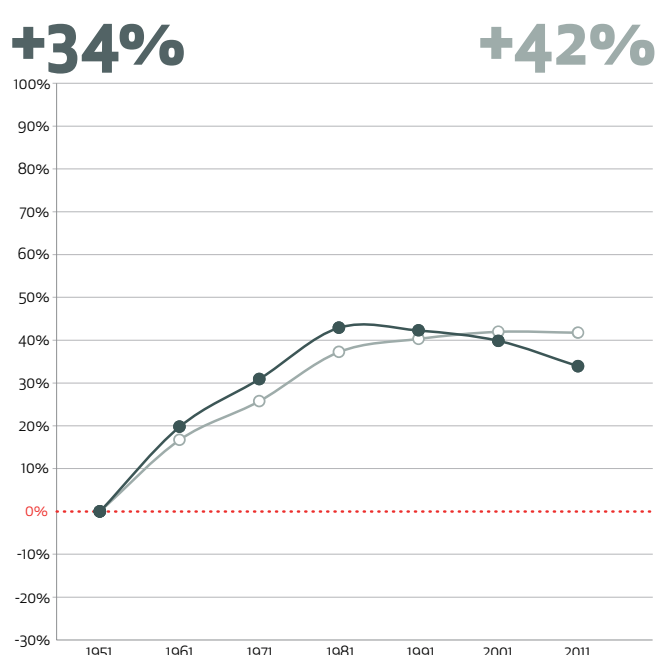
REGGIO CALABRIA



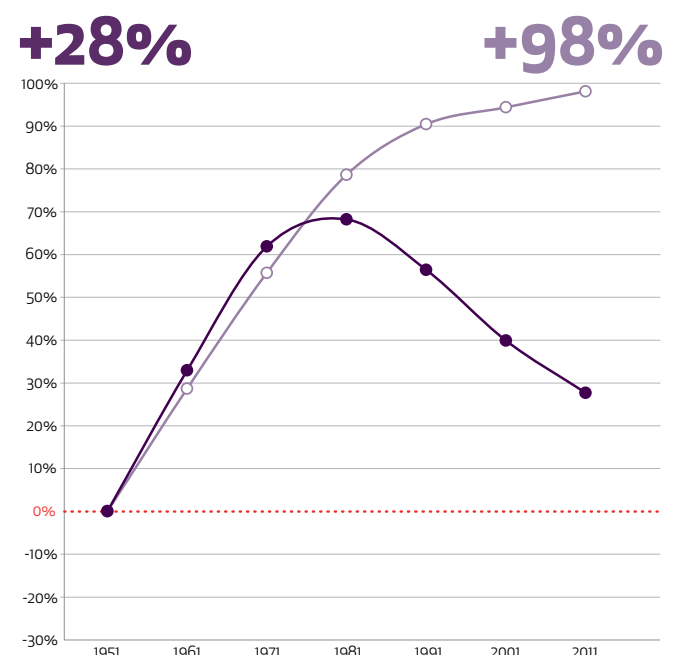
MESSINA



CATANIA



PALERMO



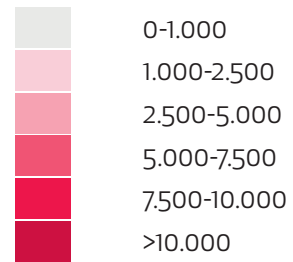
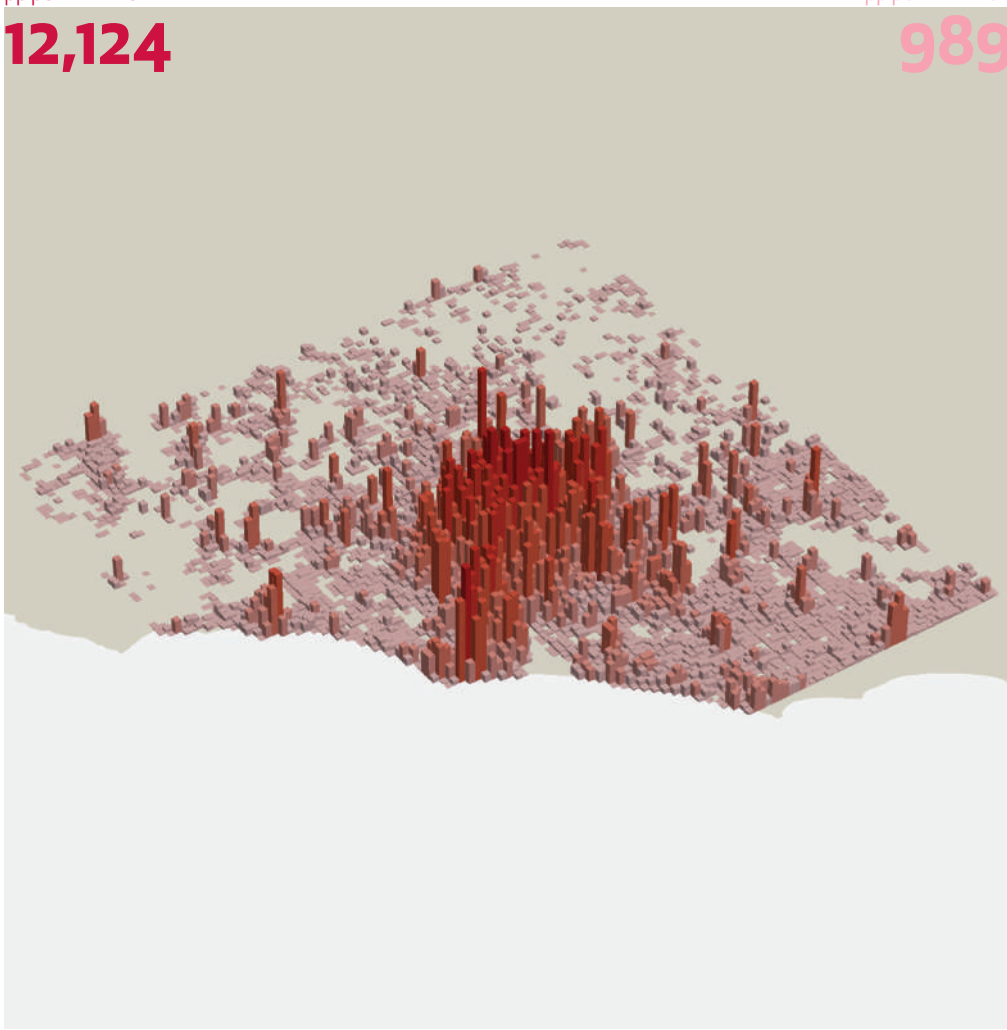
CAGLIARI

PEAK DENSITY
pp per km² - LUZ

AVERAGE DENSITY
pp per km² - LUZ

12,124

989

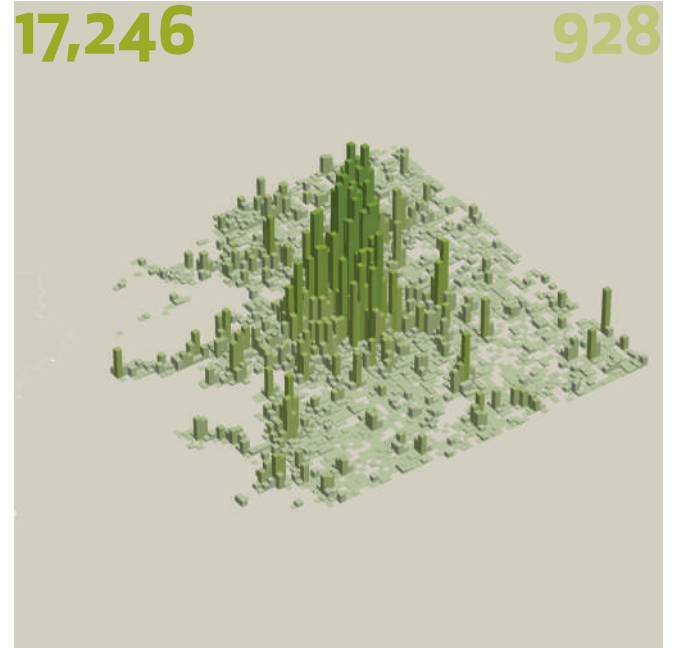


ROMA

DATA SOURCES:
Eurostat, Istat

17,246

928



TORINO

Density

Urban density is illustrated through a three-dimensional representation of the resident population in a portion of land of about 70x70 km for each metropolitan city (an area of 100x100 km is used for Roma).

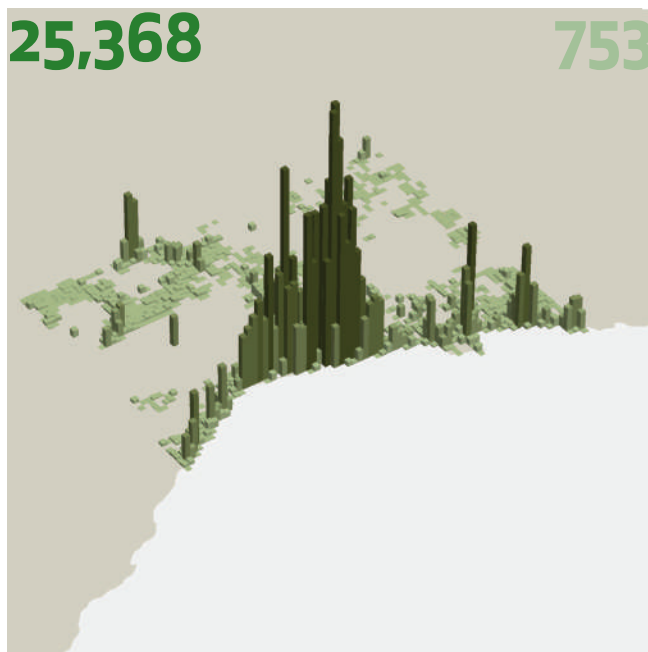
The data was processed using the European database GEOSTAT 2006 Population Grid, a prototype which reconstructs data with respect to a uniform grid of 1 km².

This view allows the identification of the urban structure of each city in relation to the geographical and topographical features, the traditional form of the settlement and the historical development through the phenomenon of expansion - from the highly dense medieval historic centers to the suburban sprawl - identifying, by comparison, similarities and differences.

Some cities have particular characteristics: Genova, with a settlement which is predominantly coastal, is the city that reaches the highest peaks in density in Italy, while Napoli, due to its urban structure, has the highest average density. Milano is the settlement with the larger medium-high density: otherwise Roma and Bologna show a widespread tendency to suburban sprawl which seems problematic to control; Messina is characterized by a continuity of low-density building along the coast, while Bari still has a satellite polycentric structure, typical of its region.

25,368

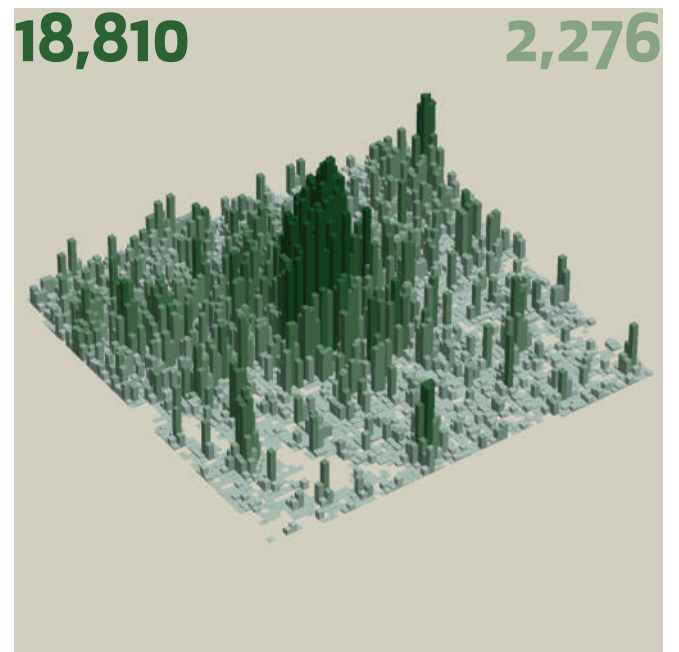
753



GENOVA

18,810

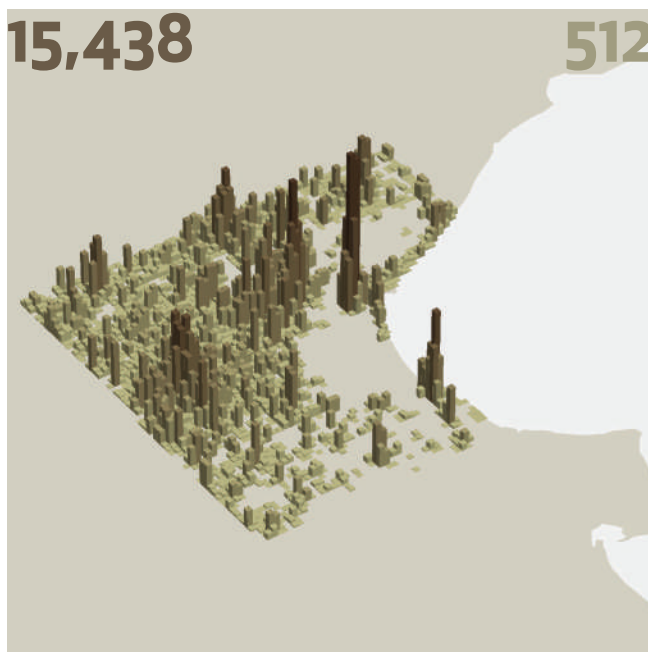
2,276



MILANO

15,438

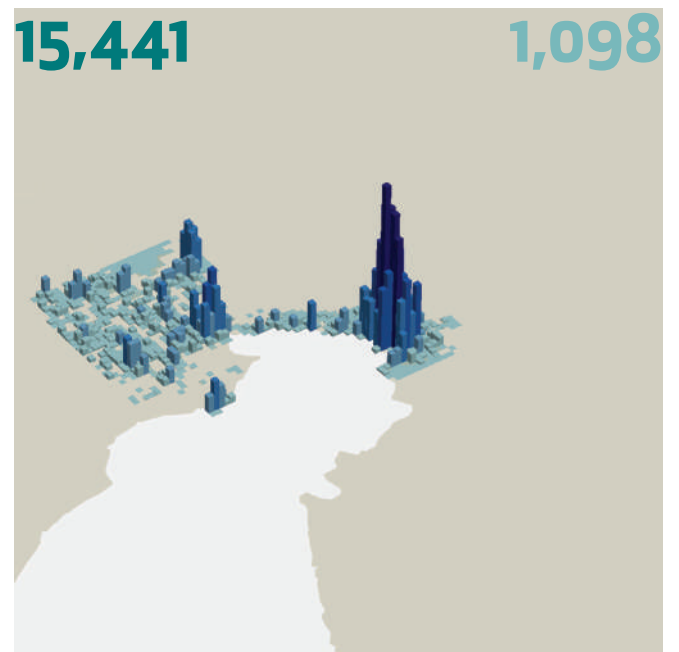
512



VENEZIA

15,441

1,098



TRIESTE

Average density in Italy

197

people per km²

Average density in the metropolitan LUZ

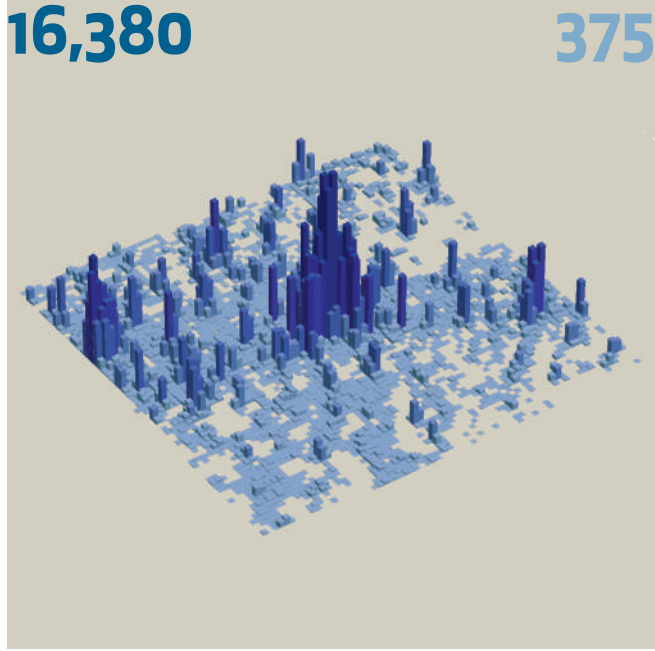
885

people per km²

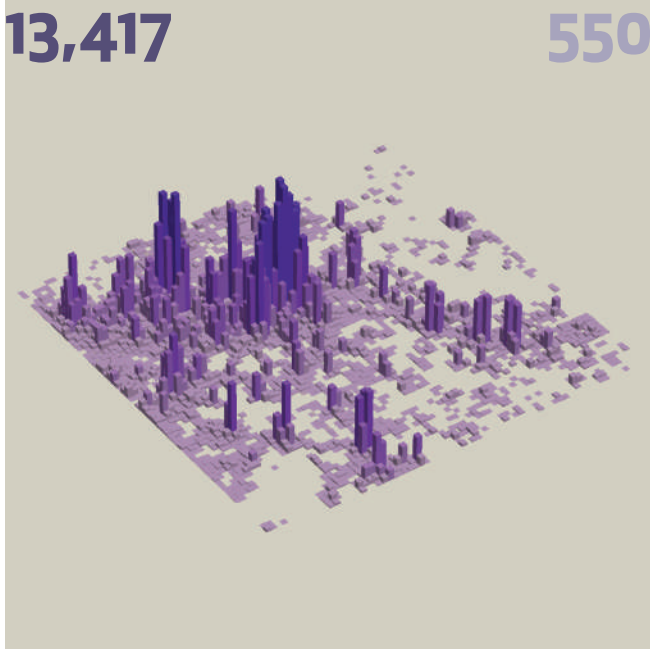
Average density in the metropolitan Core Cities

2,508

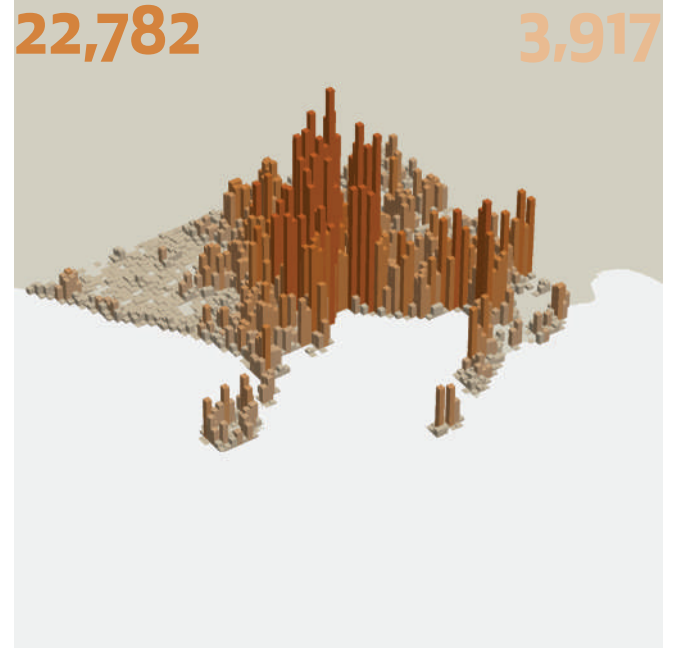
people per km²



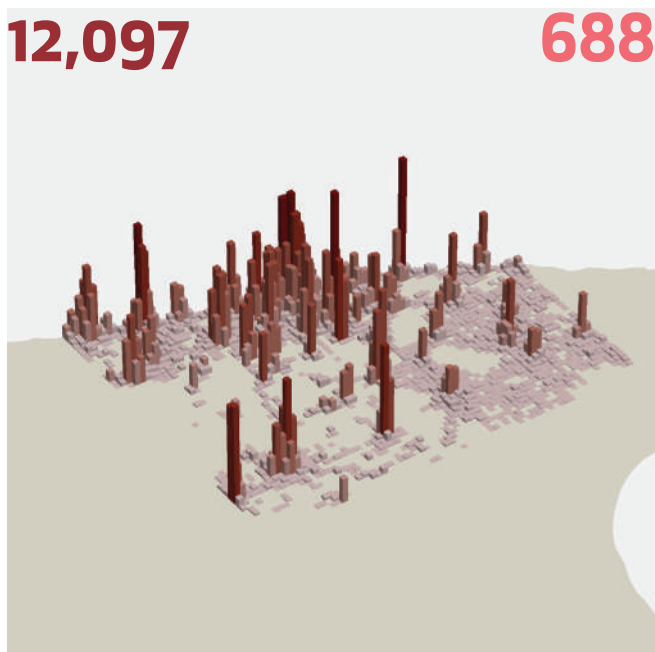
BOLOGNA



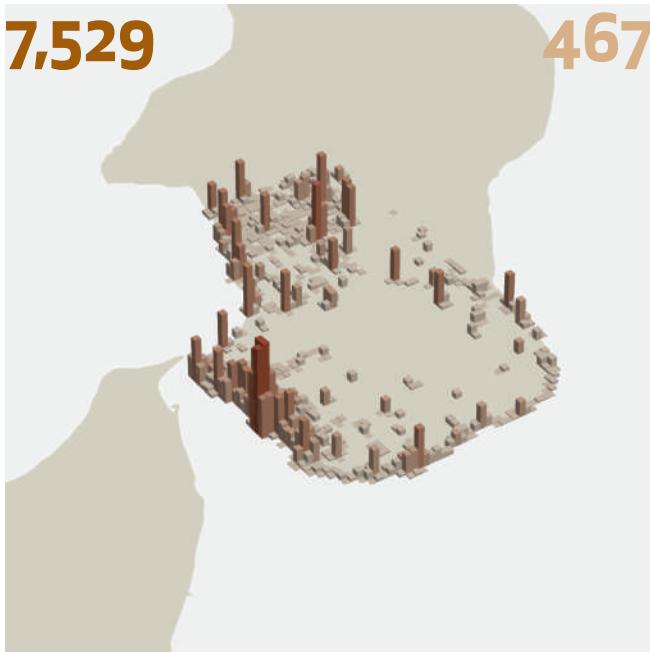
FIRENZE



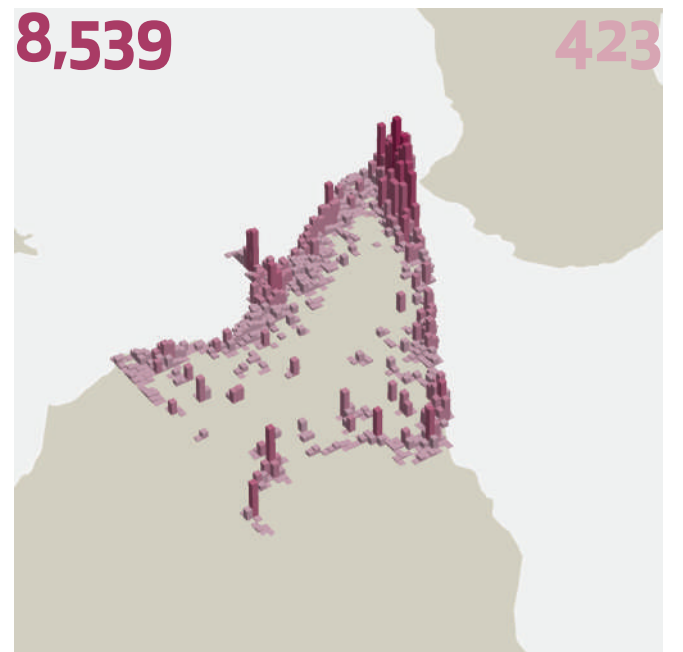
NAPOLI



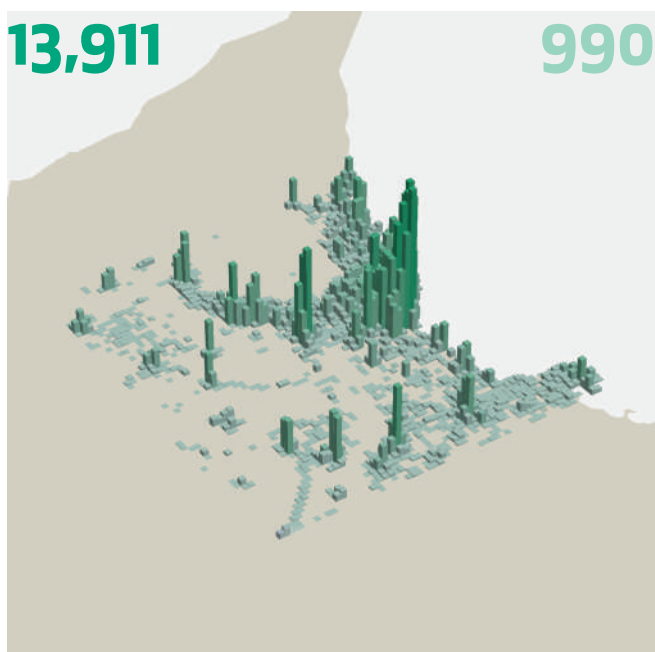
BARI



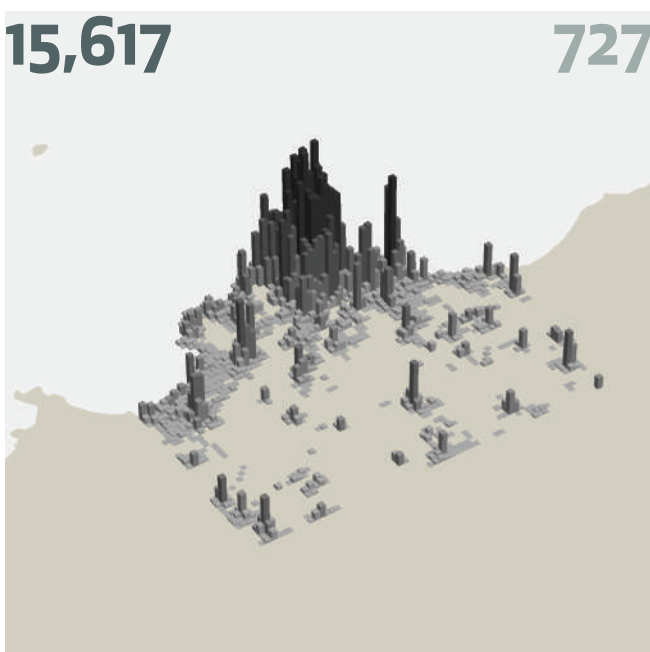
REGGIO CALABRIA



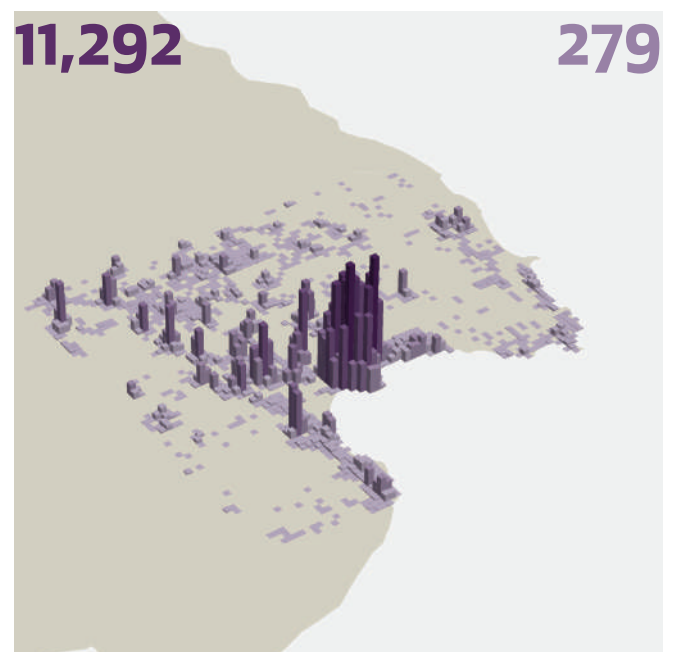
MESSINA



CATANIA



PALERMO



CAGLIARI

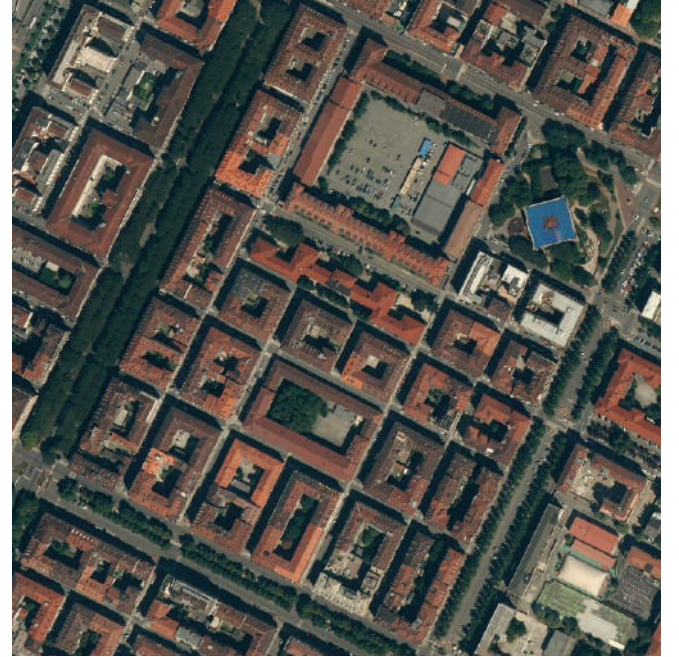
PIAZZA DEL POPOLO



ROMA

DATA SOURCES:
Bing Maps, Istat, World Bank

QUADRILATERO ROMANO



TORINO

Urban grain

The urban fabric comprises buildings, streets and open spaces. In the particular arrangements of these elements and their historical stratification, every settlement is characterised by its own morphological complexity and identity that affects the urban quality of life.

Representative plots of the urban grain of the fifteen metropolitan cities are illustrated in the aerial views which show a portion of land of about 500x500 m (800x800 m for Roma).

The shape of the built environment, the spatial arrangement of the road infrastructure and of the public spaces, give each part of the city a precise meaning in terms of density, flexibility of use and adaptability to evolution and change.

The following images - the orthogonal grid of the Quadrilatero Romano of Firenze, the medieval fabric of the narrow alleyways (caruggi) in Genova and the Venetian canals, the perspective axes of the Baroque Rome, the pattern of Spaccanapoli in Napoli and Quattro Canti in Palermo; the accuracy of the expansion plans, as the Borgo Murattiano in Bari and the blocks of the Beruto Plan in Milano - are just a few testimonials of the urban history of these cities.

This is a unique blend of historical and artistic heritage, generally ignored by the latest urban developments which have often been characterized by uncontrolled expansion phenomena.

CARUGGI



GENOVA

VIA MORGAGNI



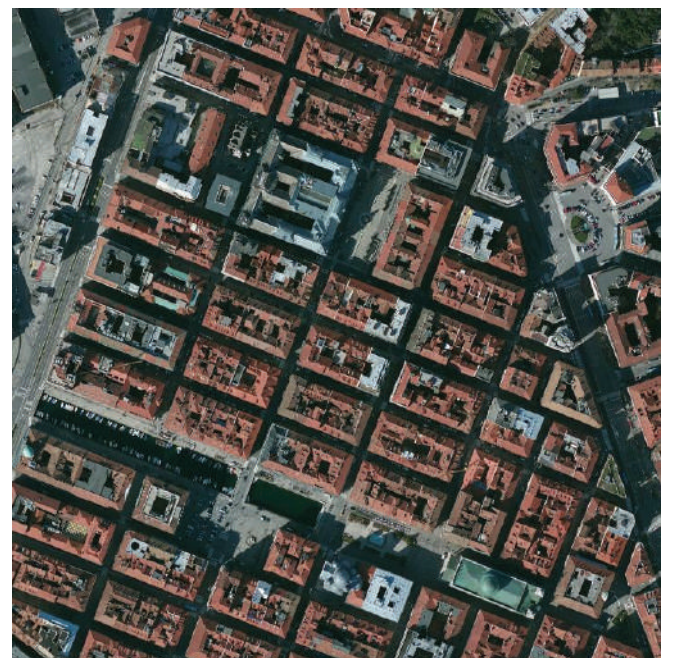
MILANO

SESTIERE CANNAREGIO



VENEZIA

BORGO TERESIANO



TRIESTE

Italian urban population

68%

Italian population in the metropolitan Core Cities

16%

Metropolitan Core Cities area

1%

of Italy

SAN VITALE



BOLOGNA

QUADRILATERO ROMANO



FIRENZE

SPACCANAPOLI



NAPOLI

BORGOMURATTIANO



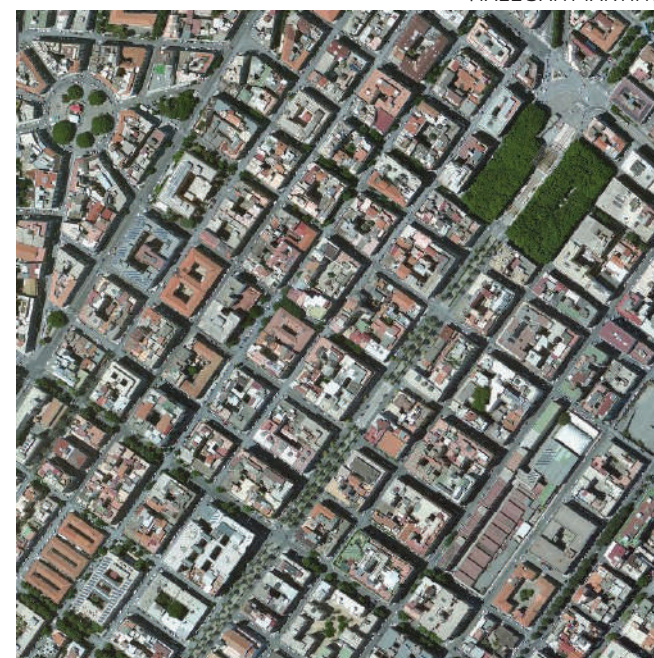
BARI

CORSO GARIBALDI



REGGIO CALABRIA

VIALE SAN MARTINO



MESSINA

QUATTRO CANTI



CATANIA

QUATTRO CANTI

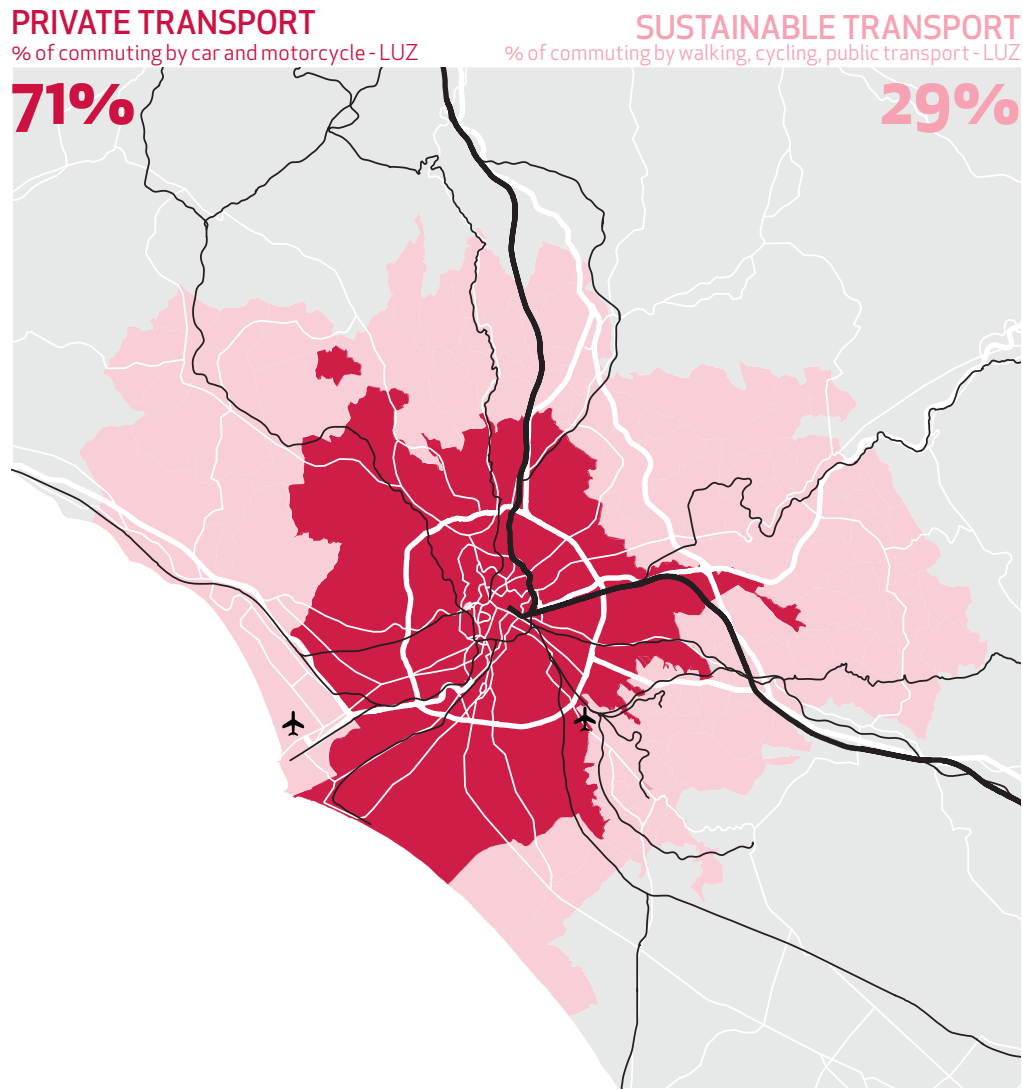


PALERMO

VILLANOVA



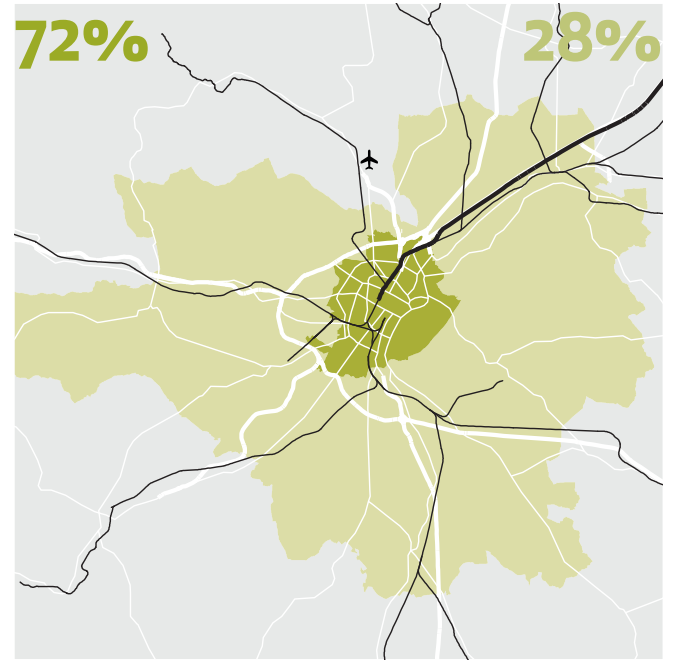
CAGLIARI



ROMA

DATA SOURCES:
Eurostat, Istat

- Core City area
- Larger Urban Zone area
- High speed railway
- Railway
- Motorway
- Expressway
- ✈ Airport



TORINO

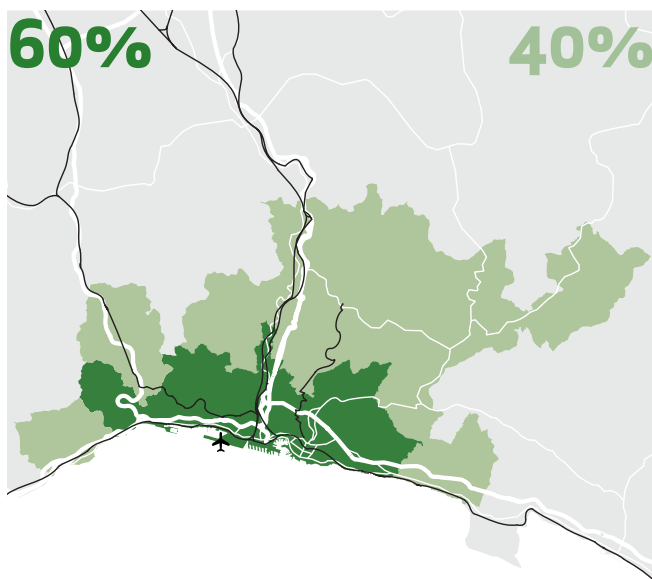
Infrastructures

Transport infrastructure plays a key role in the definition of the urban shape, defining the city's main axes of development and expansion, creating a complex morphological, functional and economical relationship with its territorial area.

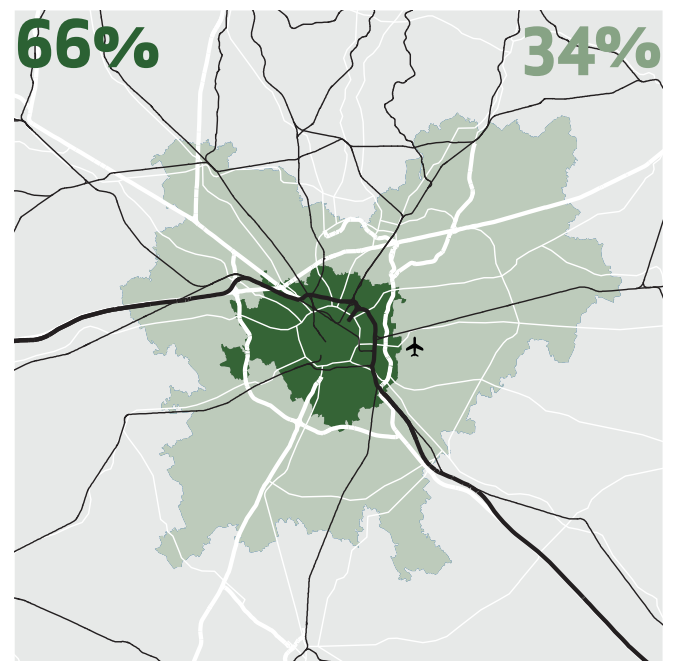
The main roads and railways serving the urban centers have been reproduced in the illustrations, which represent a portion of land of approximately 65x65 km for each metropolitan area (100x100 km for Roma).

Roads and railways are the backbone of the urban structure: a good transport network can make the difference in terms of livability of cities. The disproportion between private and public transport network is one of the major causes of sprawl and massive land use.

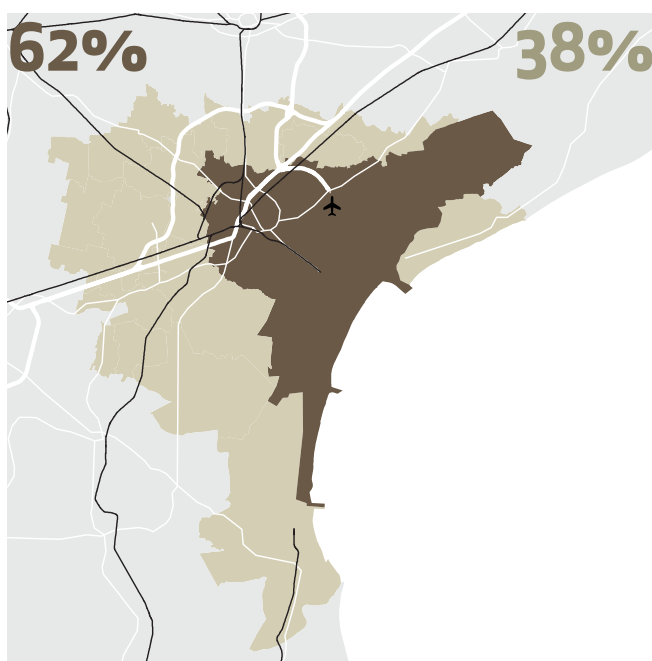
The maps show the main transport infrastructure related to the modal split data for daily commuting in the fifteen metropolitan Larger Urban Zones, focusing on the separation between private and sustainable transport. The minimal percentage of commuting by walking, cycling and public transport, particularly evident in the cities of Southern Italy, clearly explains the traffic congestion in Italian cities, resulting in a lower level of urban quality.



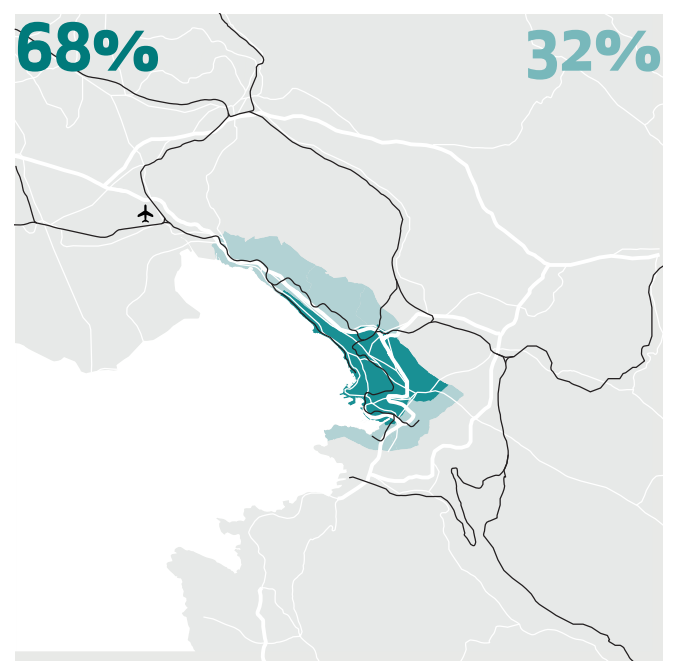
GENOVA



MILANO



VENEZIA



TRIESTE

Commuting by private transport

70%

in Italy

Average car ownership in Italy

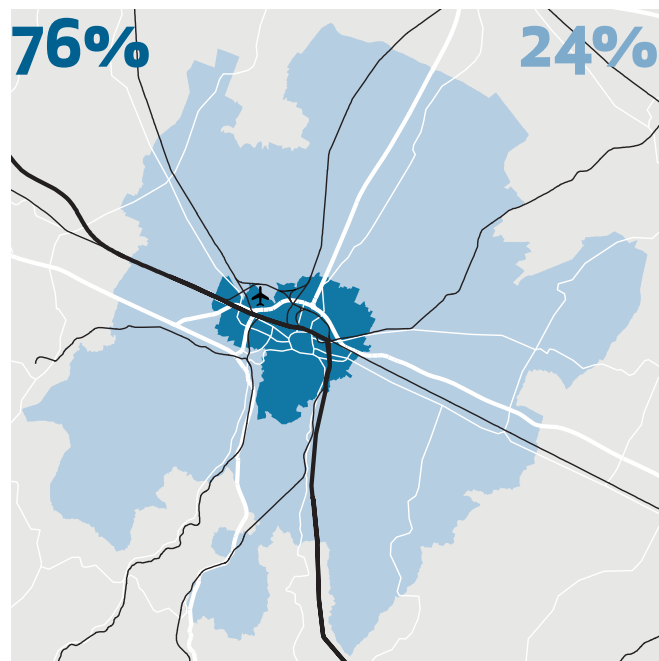
610

per 1,000 inhabitants

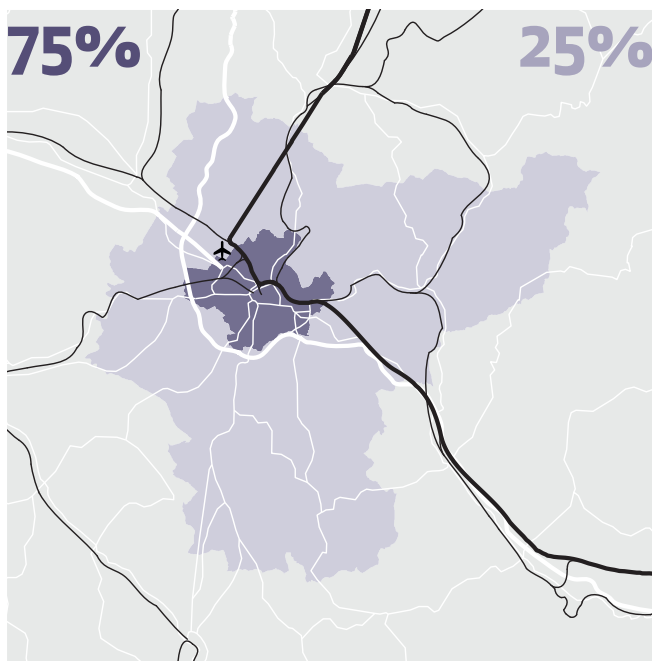
Commuting by sustainable transport

30%

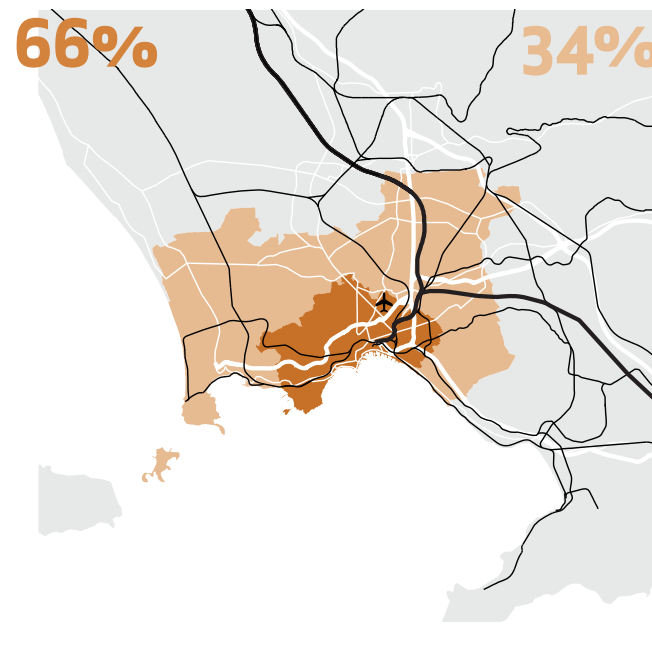
in Italy



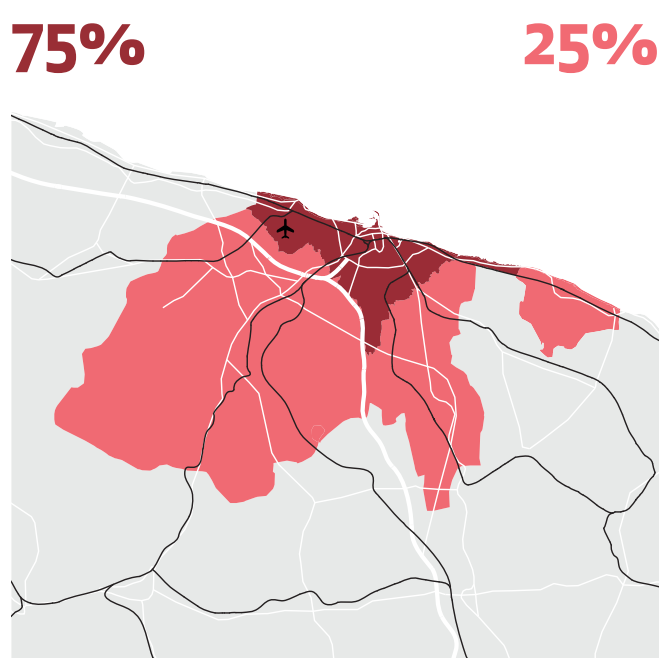
BOLOGNA



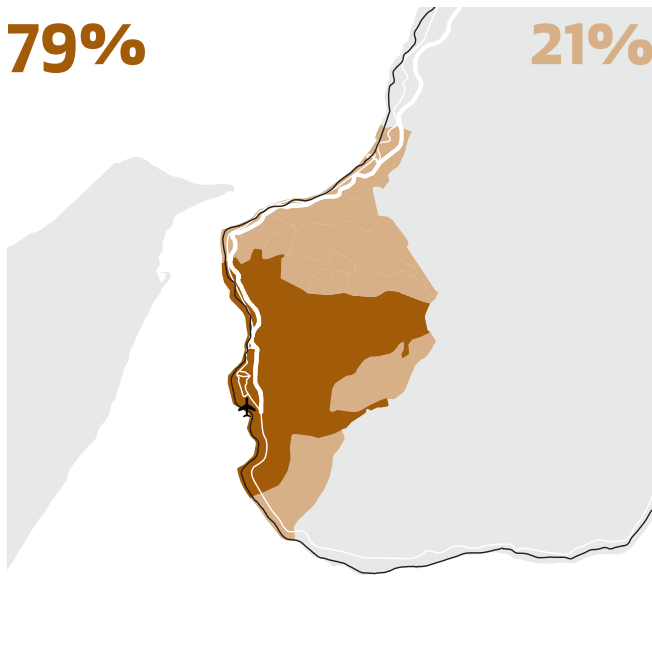
FIRENZE



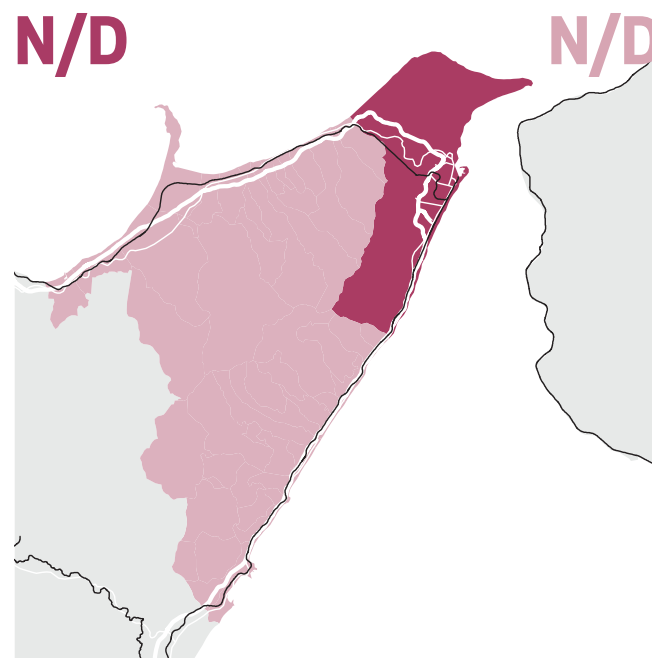
NAPOLI



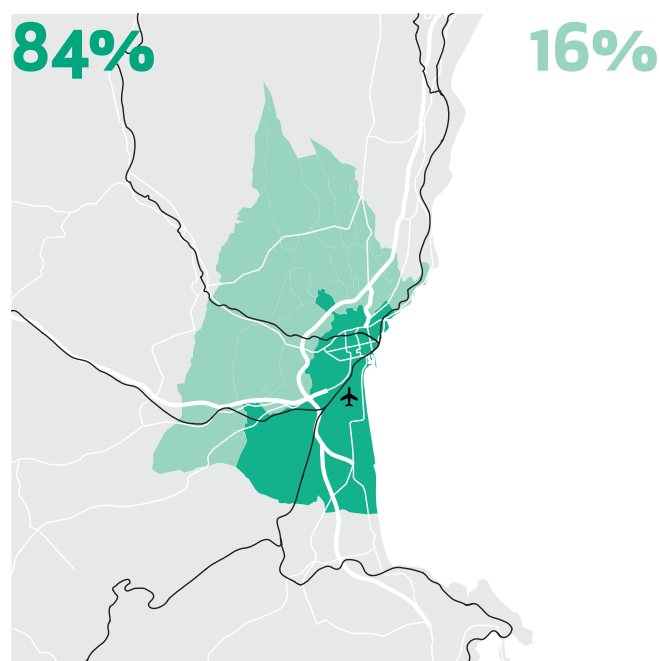
BARI



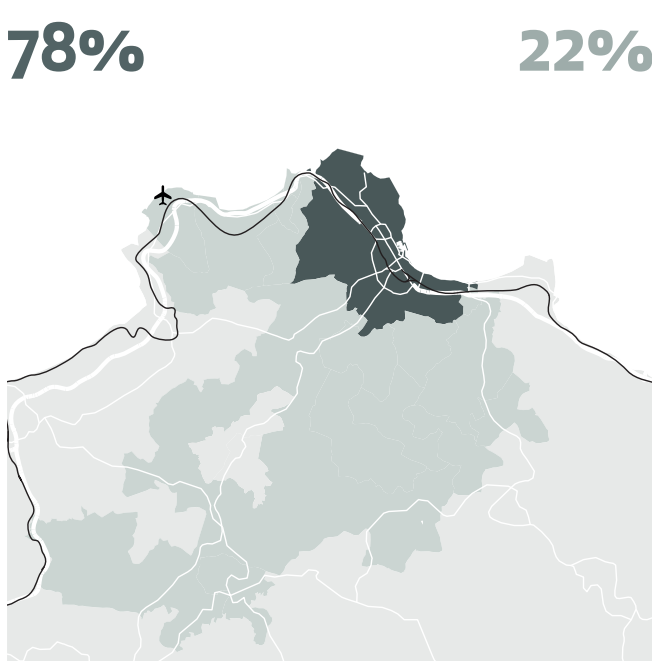
REGGIO CALABRIA



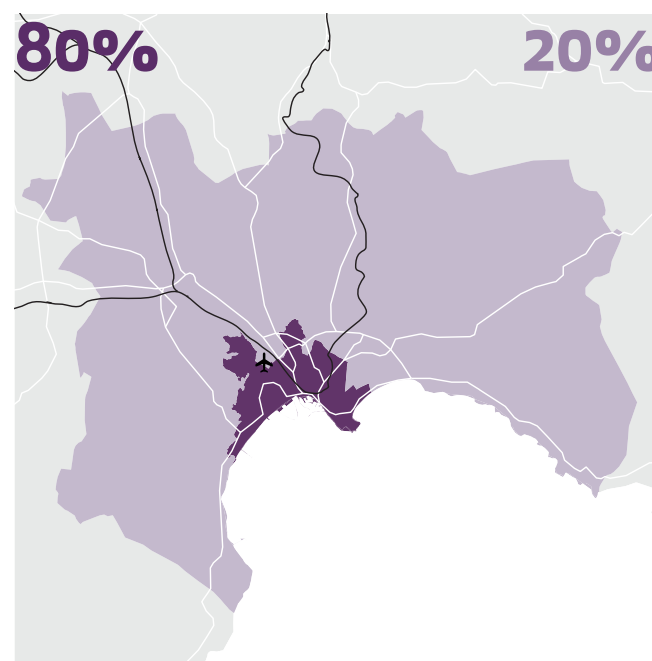
MESSINA



CATANIA



PALERMO



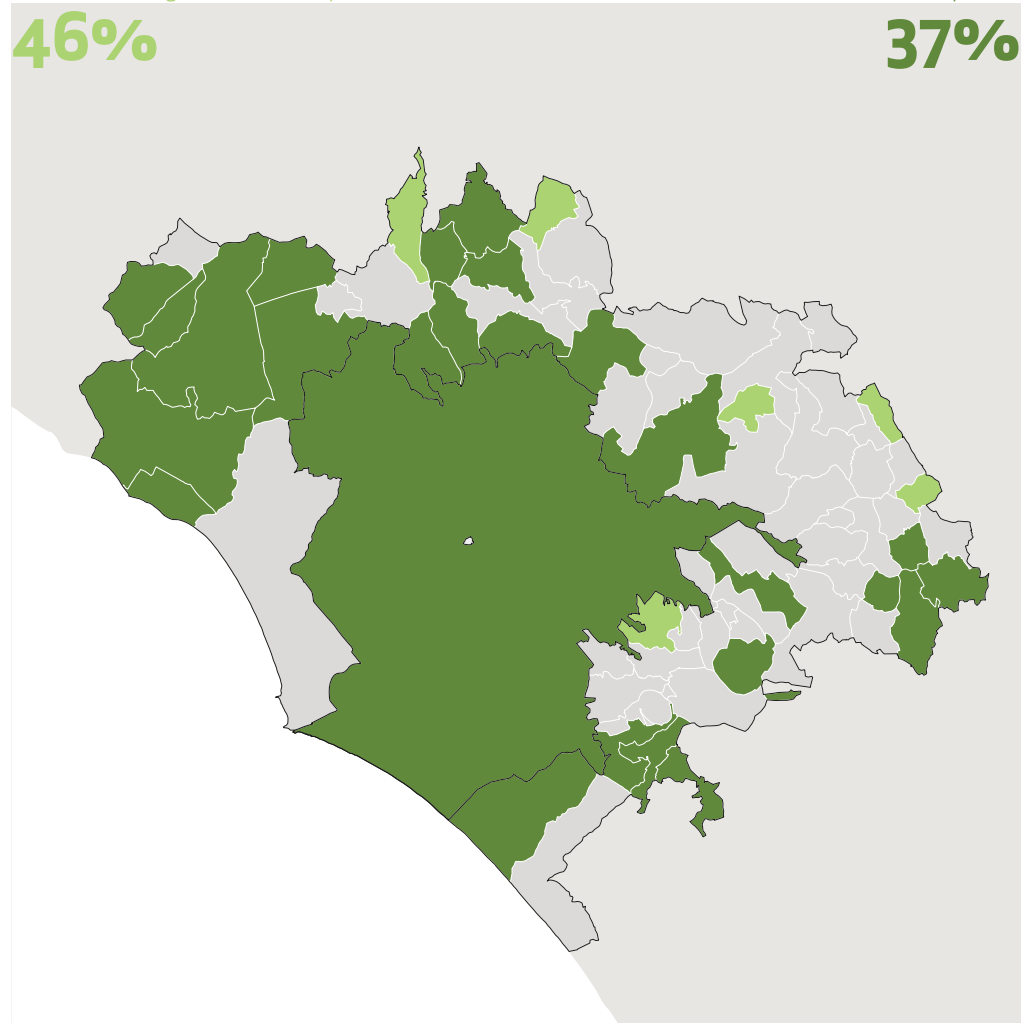
CAGLIARI

COVENANT OF MAYORS
% of Covenant signatories - Municipalities

SEAP
% of Action Plan submitted - Municipalities

46%

37%

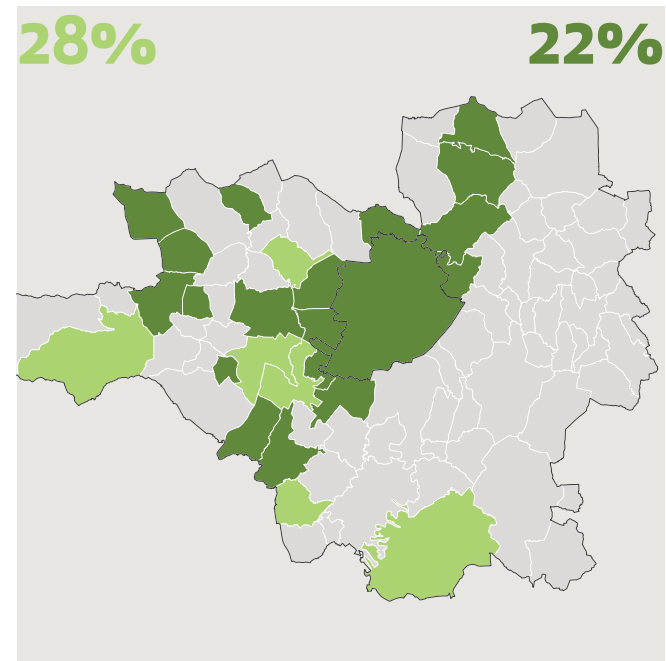


ROMA

DATA SOURCE:
Covenant of Mayors 2013

- Action Plan submitted
- Covenant signatories
- No measures planned

28% **22%**



TORINO

CO₂ governance

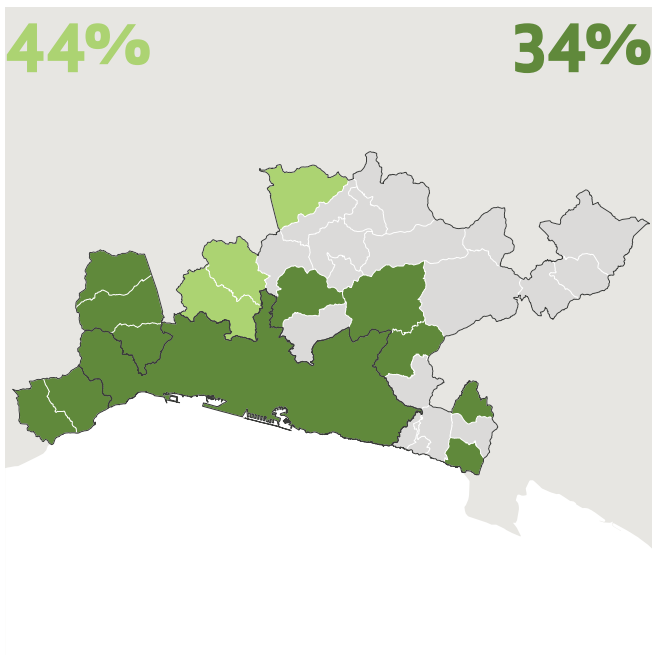
In Italy, as in the rest of the world, urban areas are now the key area on which to focus in the future in order to challenge climate change. Europe's urban population uses about 80% of the continent's energy consumption. This shows how the cities, and in particular the metropolitan cities, are the local authorities that can make the difference in the pursuit to reduce GHG emissions.

The maps show within each metropolitan area those municipalities who have signed the Covenant of Mayors, a European cooperation movement involving local and regional authorities who voluntarily commit to increasing energy efficiency and the use of renewable energy sources on their territories. By their commitment, they support the European Union 20% CO₂ reduction target to be reached by 2020.

Signatories commit to three steps: signing of the Covenant of Mayors; submission of a Sustainable Energy Action Plan (SEAP) and submission of an implementation report two years after the submission of SEAP. The maps show in shades of green, the municipalities who have undertaken the first two steps. A clear disproportion is highlighted between cities in Northern Italy and those in Centre-South of Italy, and between of the Core Cities and neighboring municipalities.

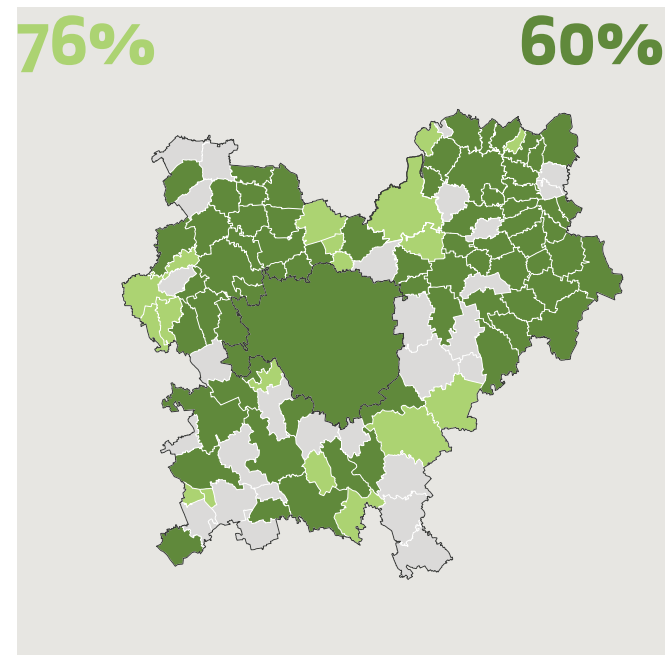
In general terms, of the 565 municipalities forming the fifteen Larger Urban Zones, 46% have signed the Covenant of Mayors, and only 28% have already developed the SEAP. The remaining 54% of the municipalities that still have to make an action, will play a major role in the future development of the country.

44% **34%**



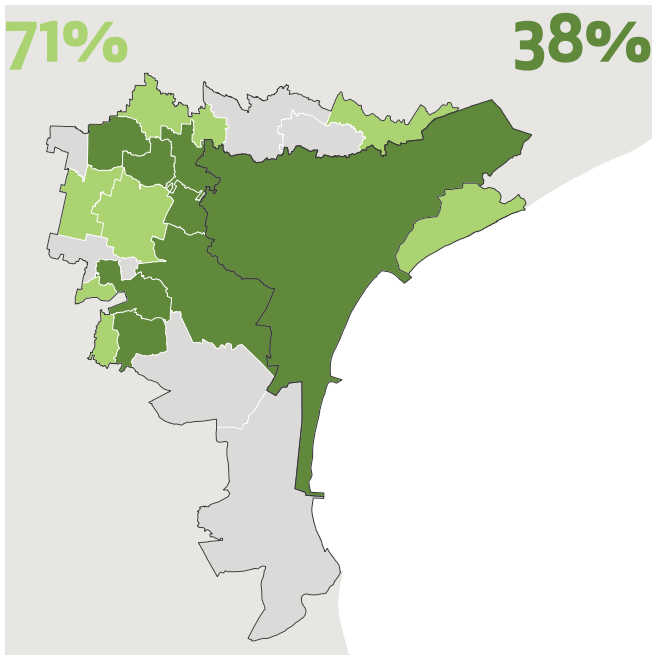
GENOVA

76% **60%**



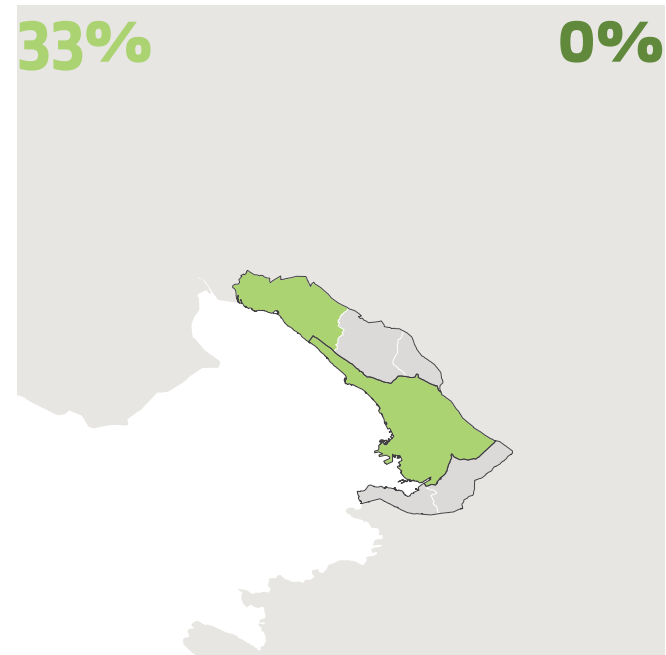
MILANO

71% **38%**



VENEZIA

33% **0%**



TRIESTE

Municipalities

565

Covenant signatories

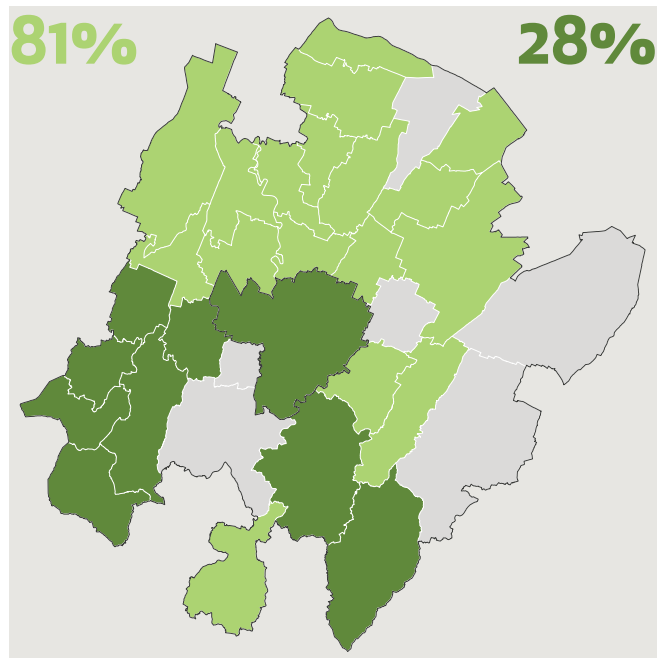
46%

as of November 2013

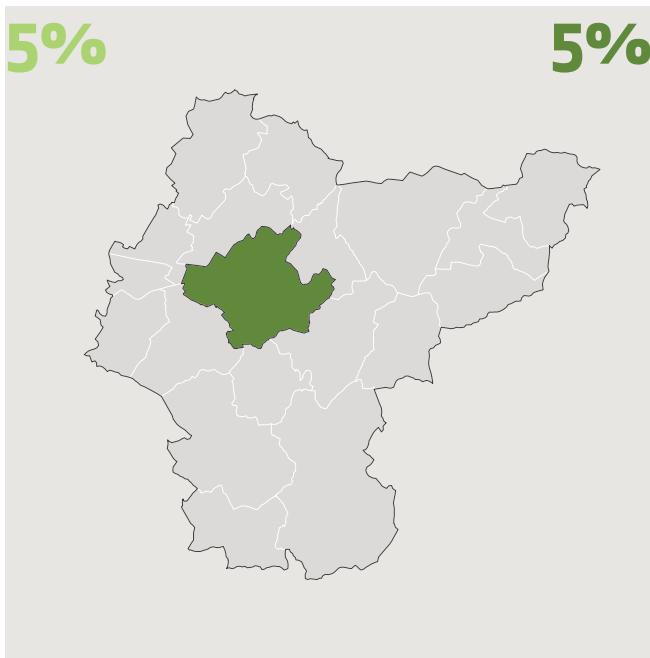
Action Plan submitted

28%

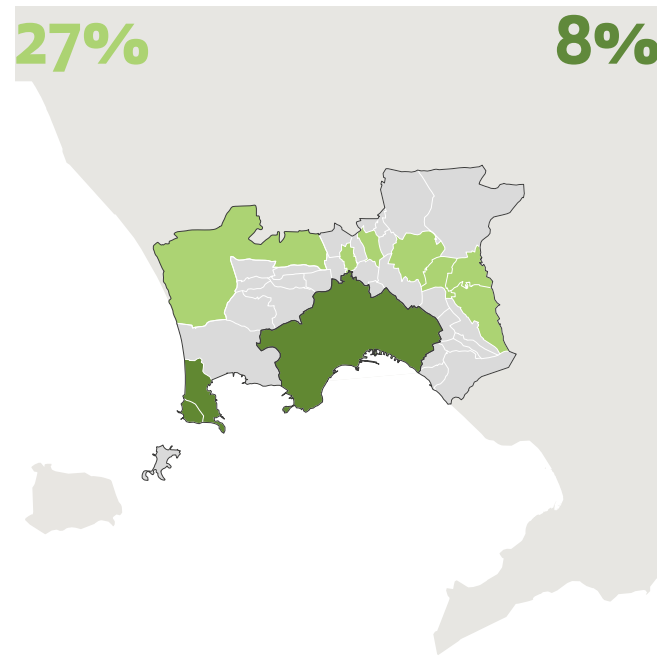
as of November 2013



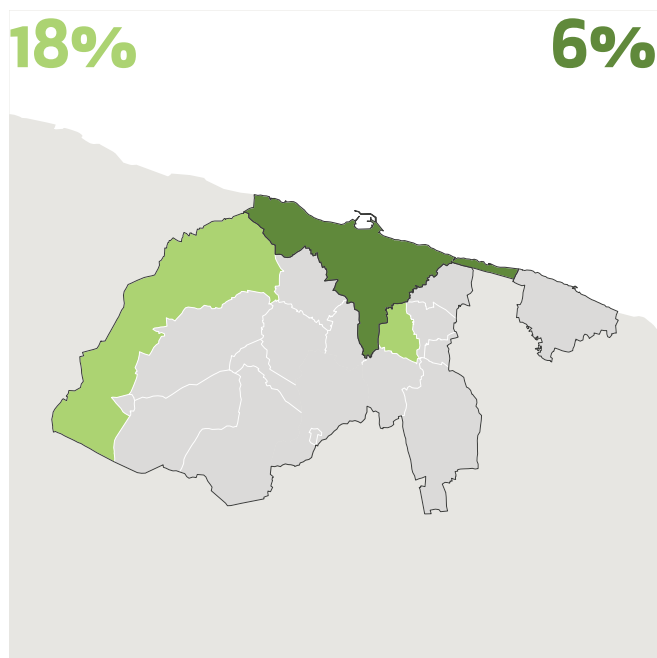
BOLOGNA



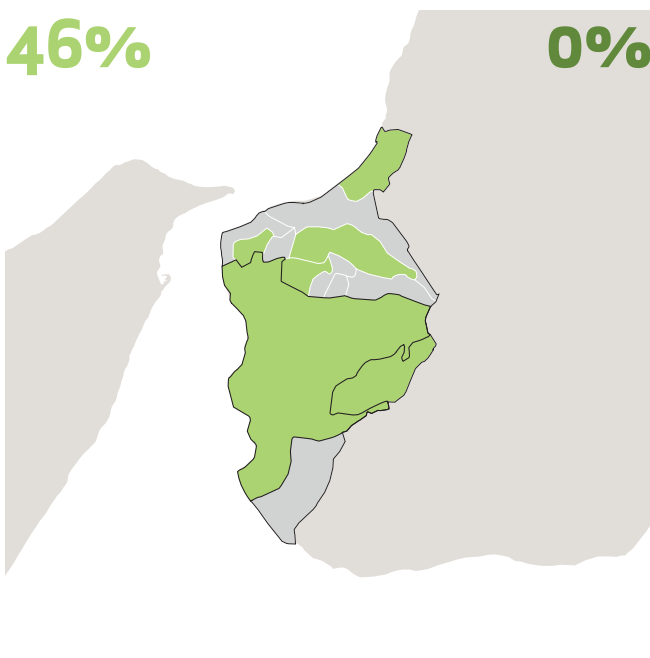
FIRENZE



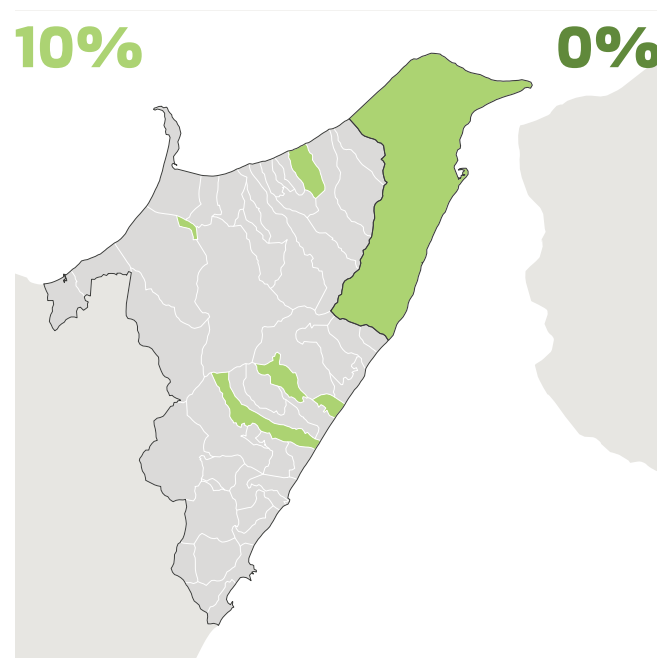
NAPOLI



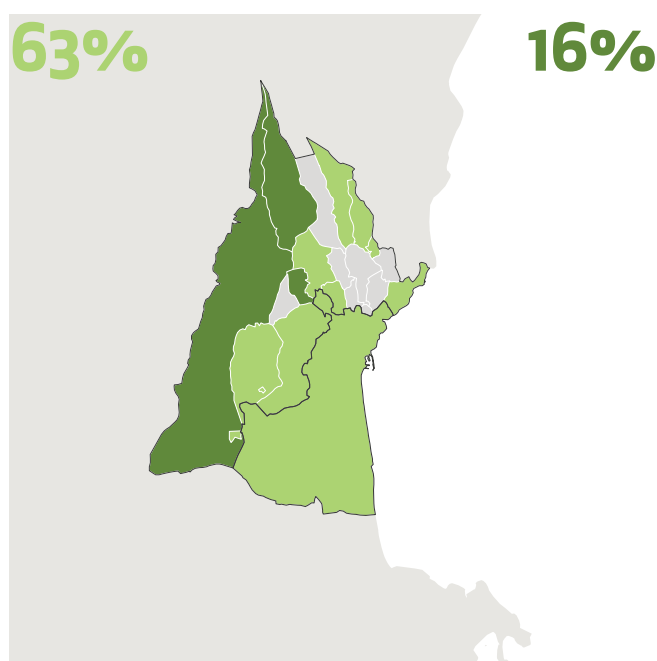
BARI



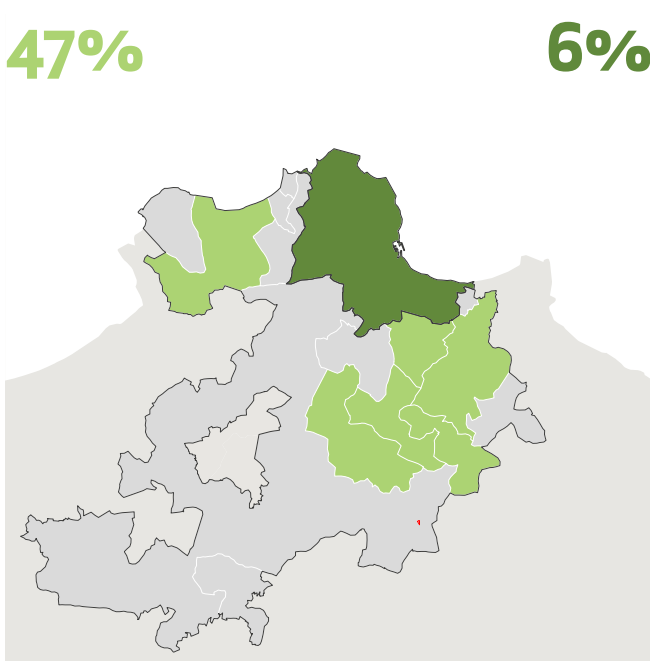
REGGIO CALABRIA



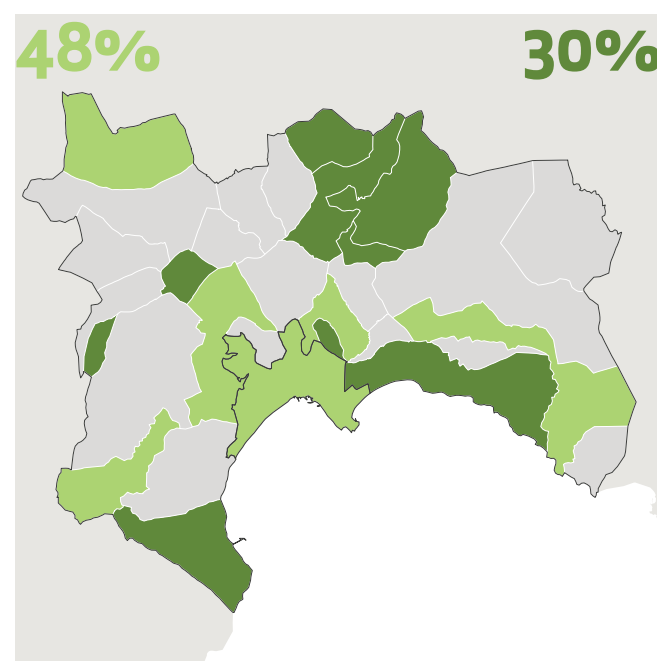
MESSINA



CATANIA



PALERMO



CAGLIARI

Metropolitan cities

TORINO

Region

Piemonte

Municipalities

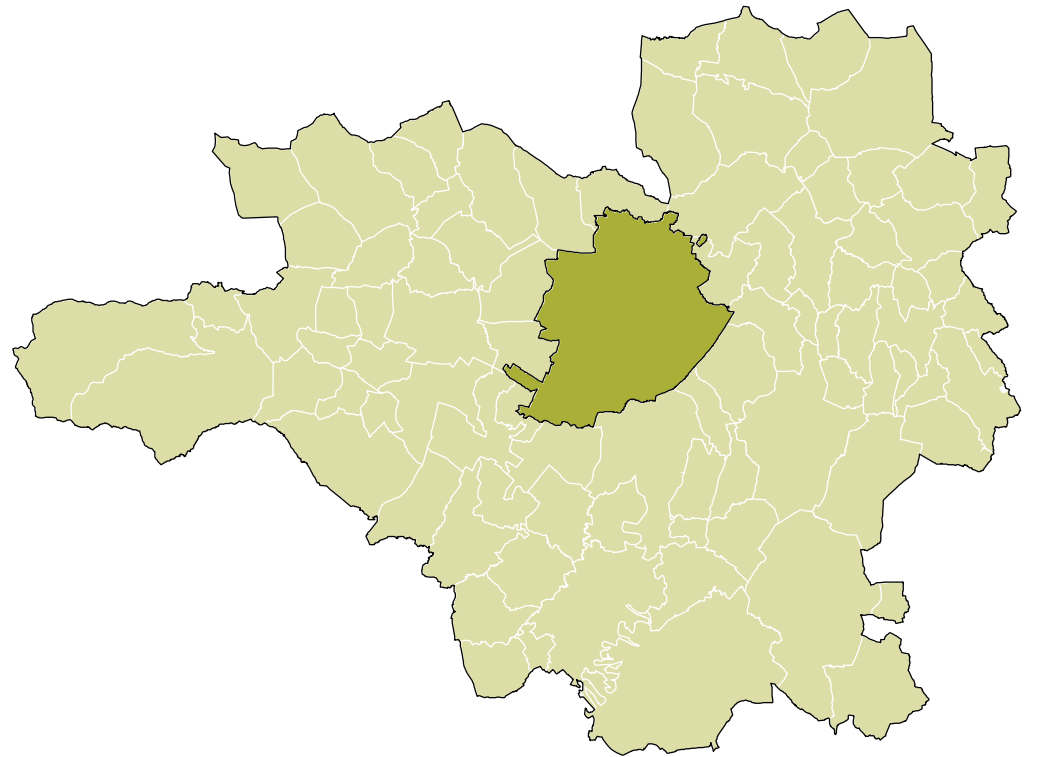
88

Larger Urban Zone area

1,879 km²

Core City area

130 km²



Torino is the capital city of the Piemonte region, the fourth Italian city by population after Roma, Milano and Napoli and the third most economically relevant city of the country. The metropolitan city, includes 88 municipalities, covers an area of approximately 1,879 km² and has a population of approximately 1,744,000 people (2011 Istat survey), of whom 872,000 live in the City of Torino.

The city's name dates back to the third century BC and is linked to the presence of a Celto-Ligurian population known by the name of Taurini who fell under the Roman Empire during the Gallic Wars of Julius Caesar. Capital of the Duchy of Savoy from 1563, the Kingdom of Sardinia

from 1720 and the first capital of Italy from 1861 to 1865, Torino is located on a plain surrounded on the east by the river Po and crossed by its tributaries of the left bank Stura, Dora and Sangone.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the merging of the Core City with the municipalities of the first and second belts, creating a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 1,023,000 people in 1951 to 1,074,000 people in 2011 (+70.5%), while the Core

City's population has grown from 719,300 to 872,367 (+21,3%). These figures, when compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

Detailed mapping of the northern area of the city of Torino clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: particularly with regards to the development of residential settlements between the Dora and Sangone rivers, and the productive areas between the Po river and the A4 motorway.



Image by Claudio Divizia

Urban Footprint

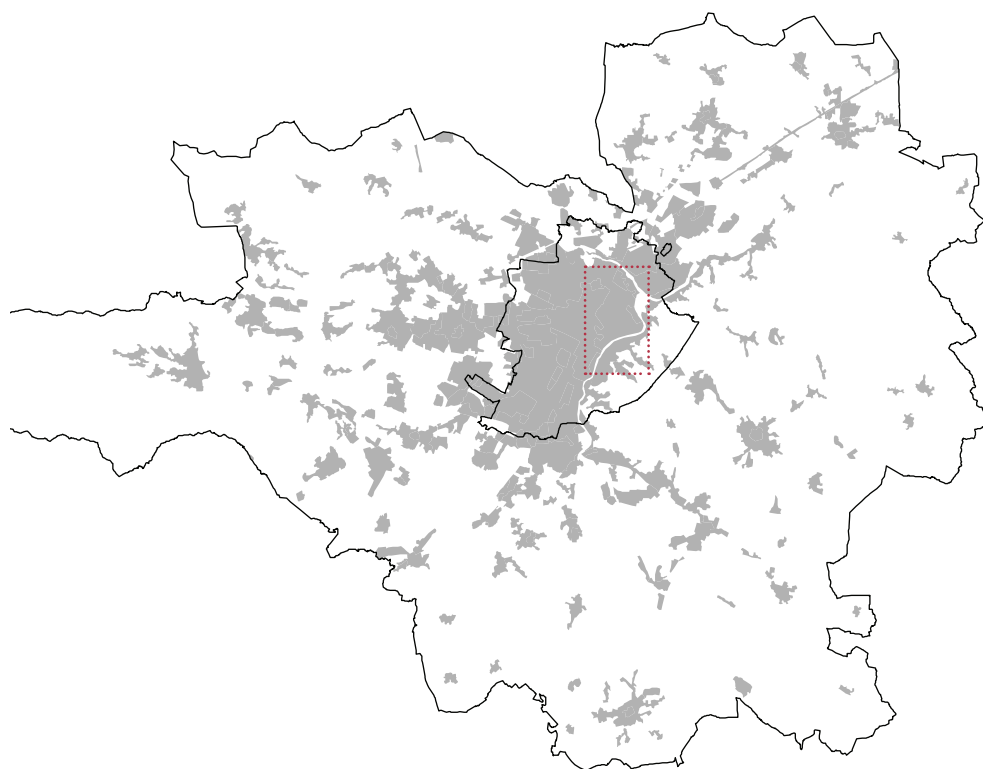
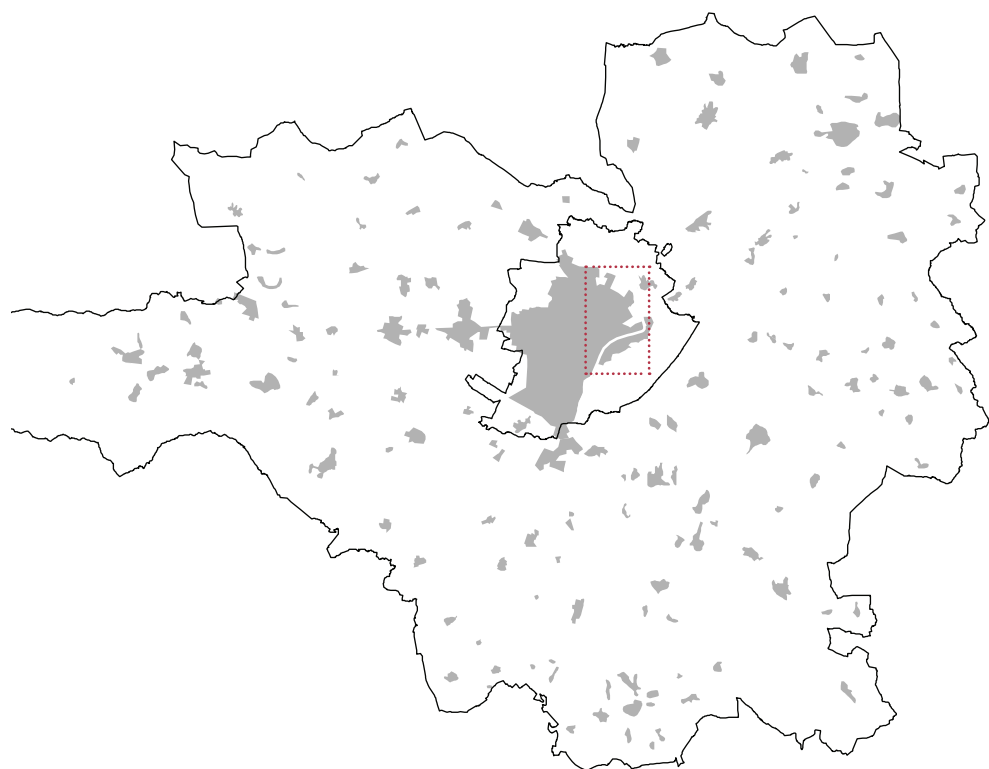
IGM 1960/Corine Land Cover 2006

CORE CITY 1951

719,300
inhabitants

CORE CITY 2011

872,367
inhabitants



LUZ 1951

1,023,260
inhabitants

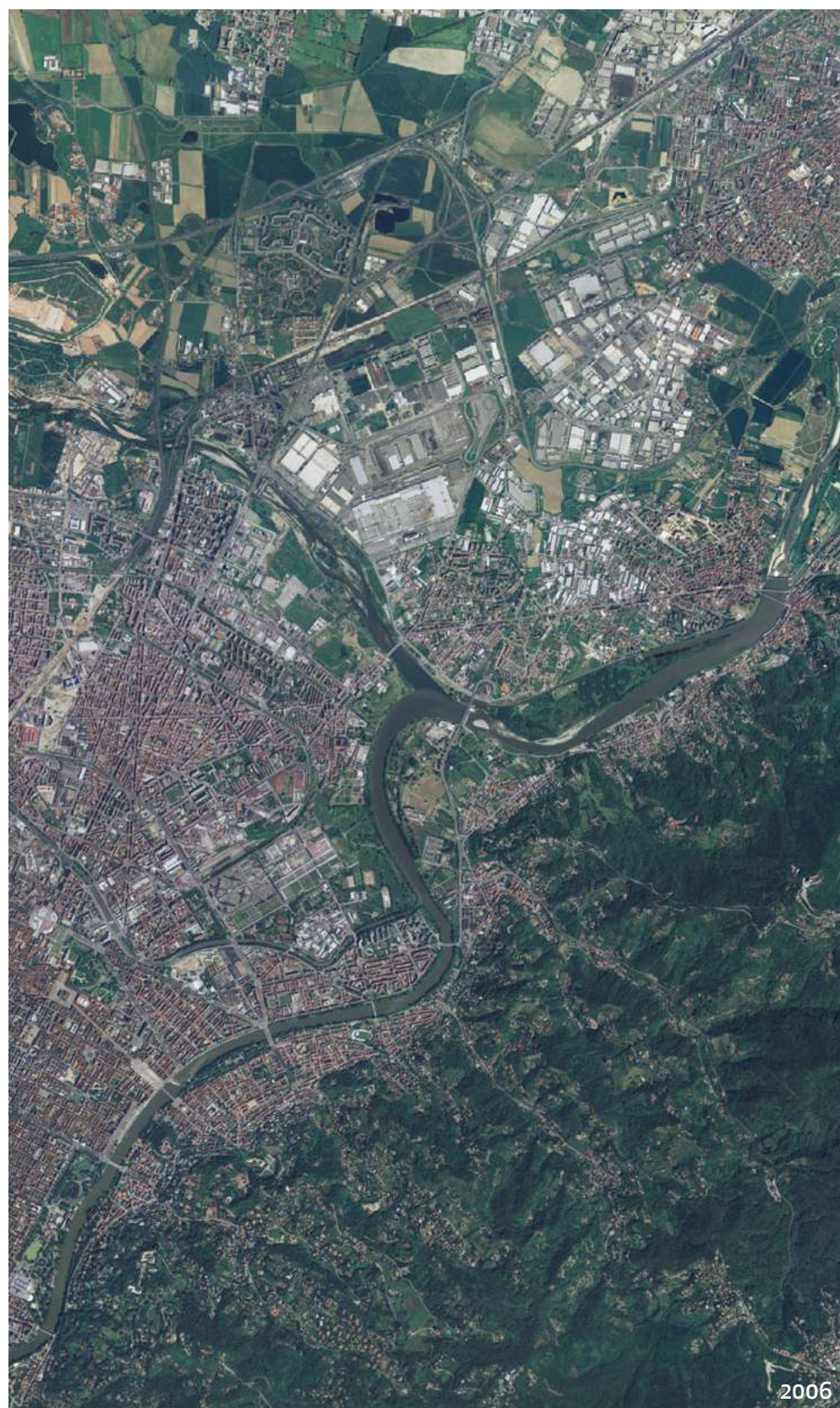
LUZ 2011

1,744,555
inhabitants



1955

Volo GAI



2006

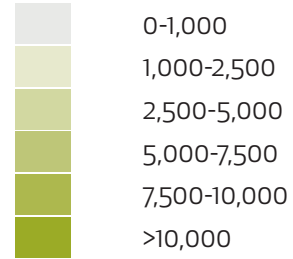
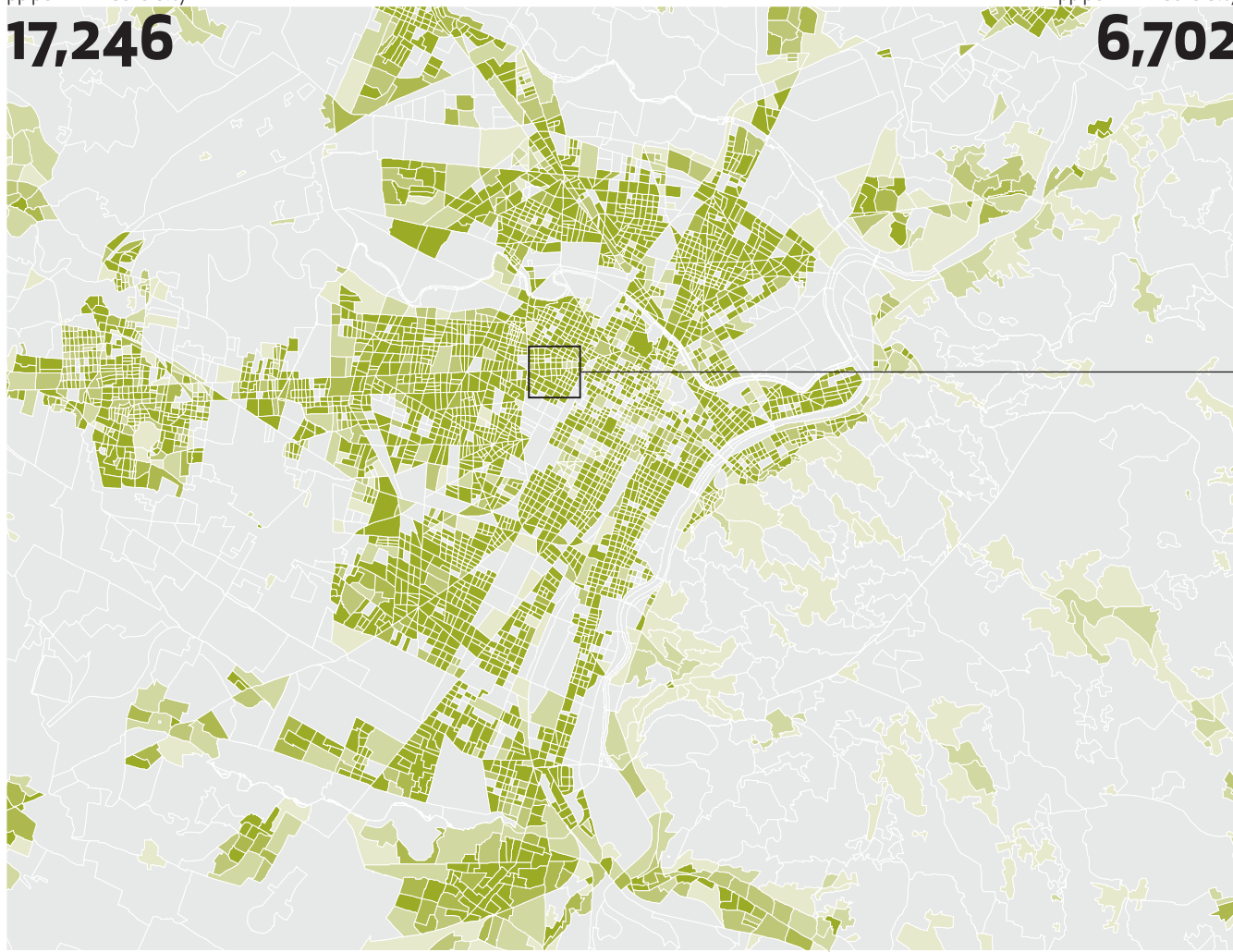
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

17,246

AVERAGE DENSITY
pp per km² - Core City

6,702



Population



URBAN DENSITY

PEAK DENSITY

CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Torino, the ratio between the population of the Core City over the population of the LUZ goes from 70% in 1951 to 50% in 2011.

Changes in population within the LUZ, during three twenty years periods, show a trend which is common to other Italian cities: a strong population growth in the Core City from 1951 to 1971, is followed by a progressive reduction in the two periods from 1971-1991 and from 1991-2011 when growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Torino, the foreign population accounts for 13% of the total population (+219% over the last decade) and for 9% in the LUZ.

13%

+219%
(2001-2011)



9%

+233%
(2001-2011)

CORE

LUZ



10%

+62%
(2004-2011)

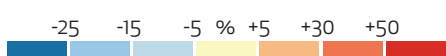
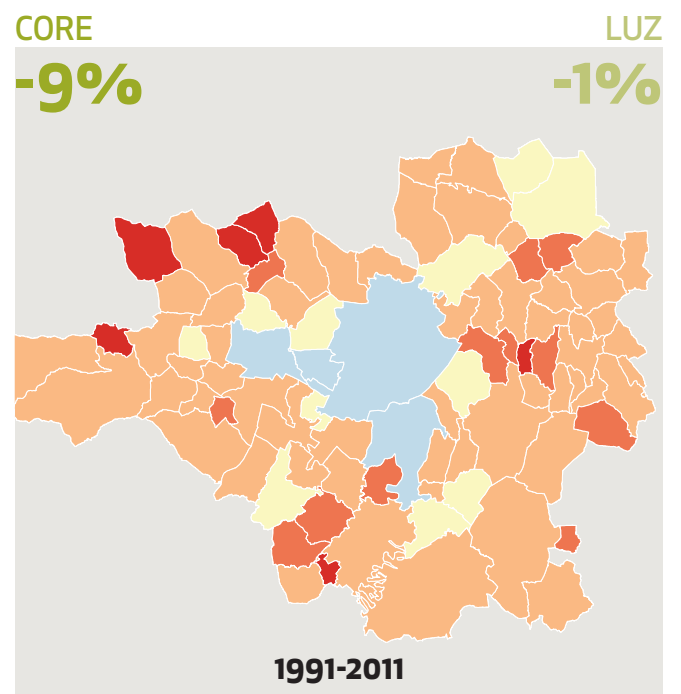
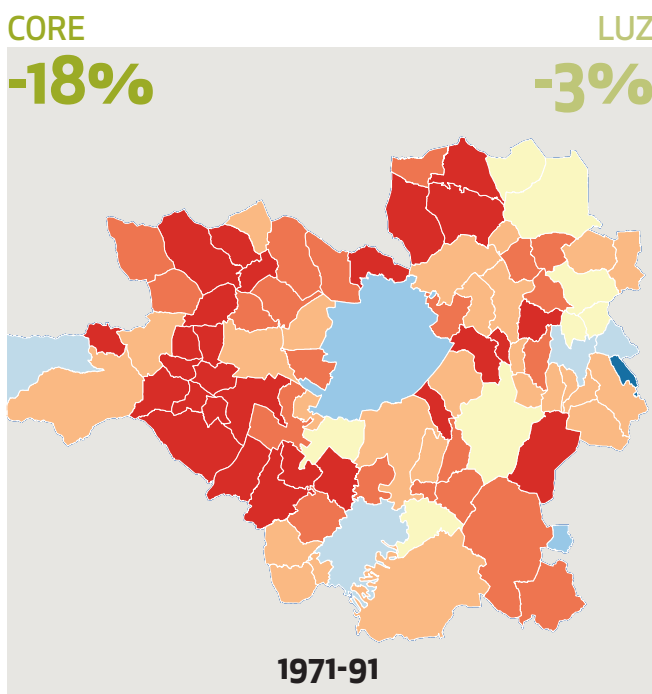
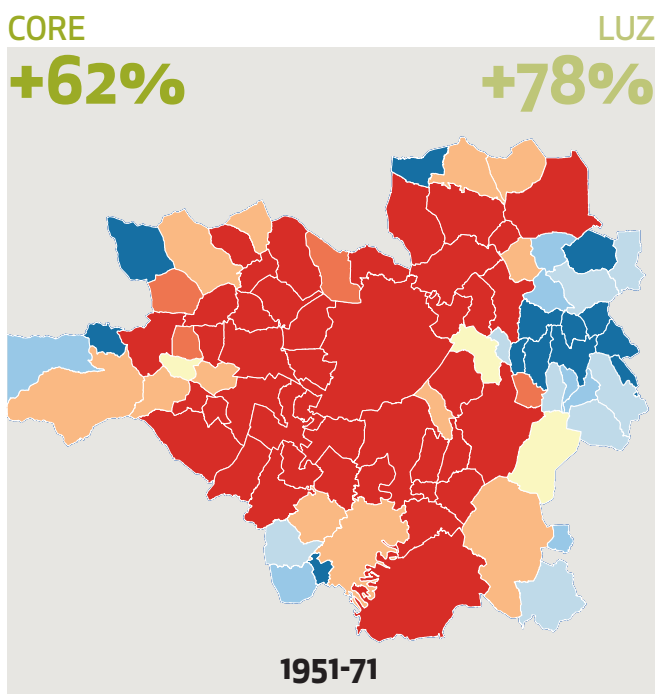
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

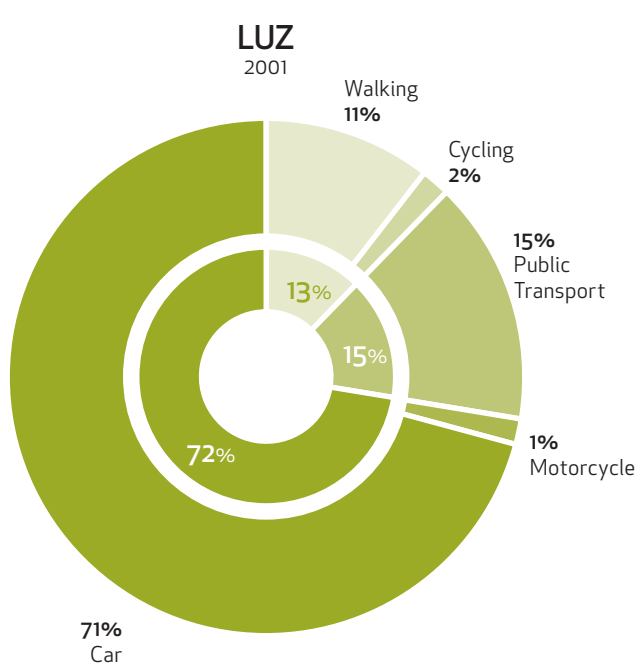
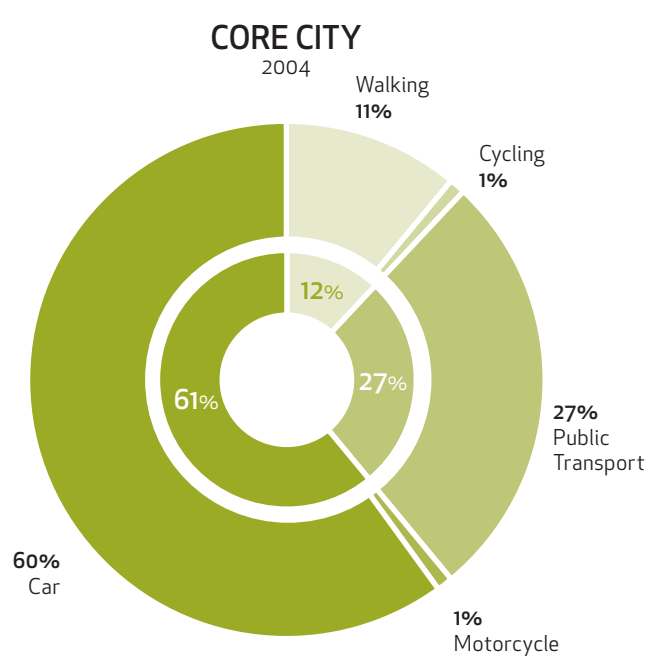
The metropolitan area of Torino, as shown in the images below, is served by a very good rail and road infrastructure. The modal split chart shows that 72% of travellers use private transport, 15% public transport and 13% walk or cycle within the LUZ; the data for the Core City differs

slightly due to the presence of a stronger public transport network: travellers using private transport are 61%, those using public transport 27% and the remaining 12% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 178,000 people compared to about 69,000 of outbound commuters. The motorization rate is one of the highest in Italy, with 623 cars per 1,000 inhabitants in the LUZ and 601 in the Core City.



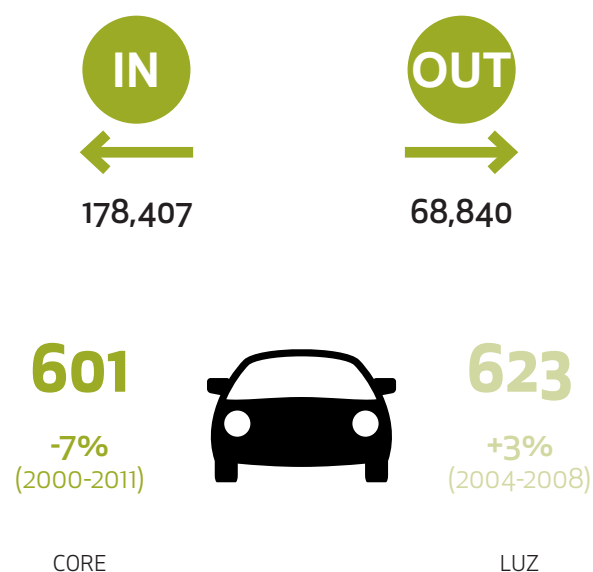
Image by Bass_roll



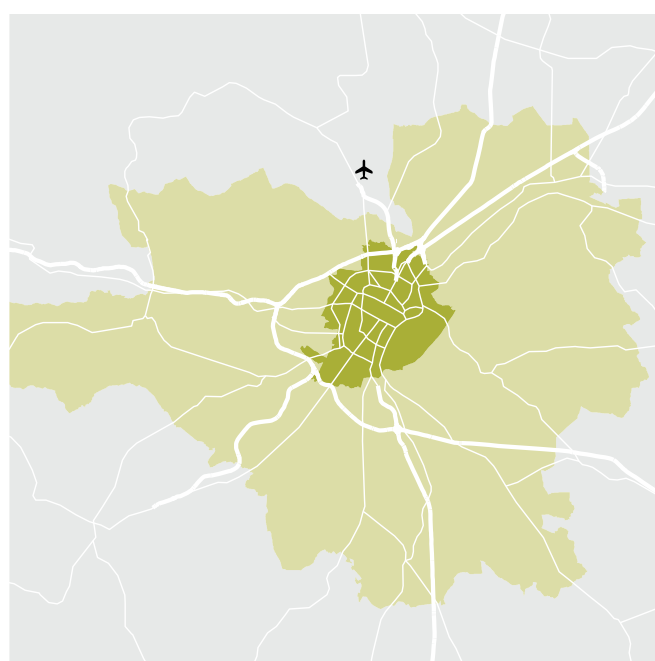
MODAL SPLIT
Eurostat 2004/2001

COMMUTERS

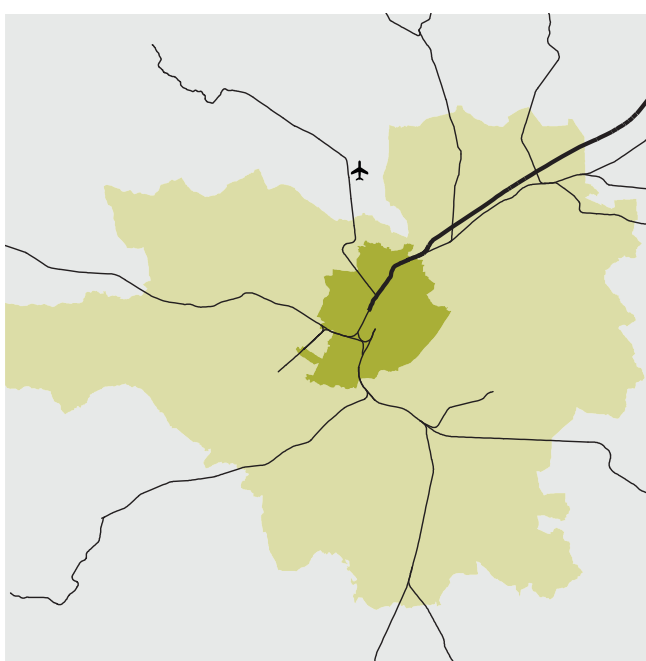
Daily commuters (Core City) - ISTAT 2001



CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



531
kg
-1%
(2000-2011)

WASTE

Annual waste collection per capita (Core City) - Istat 2011



44%
+113%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

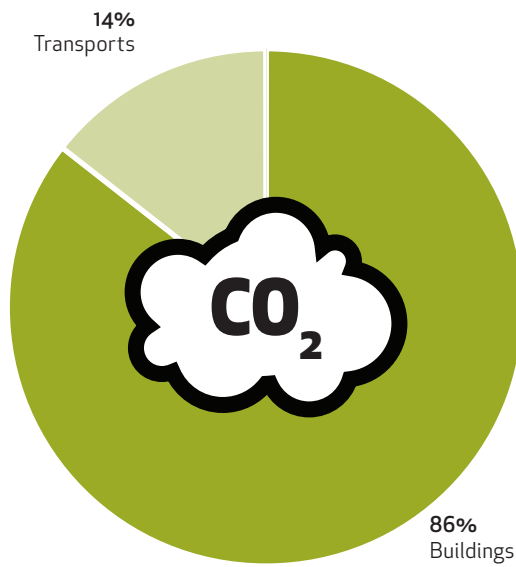
5,100
kt



5.6
t per capita

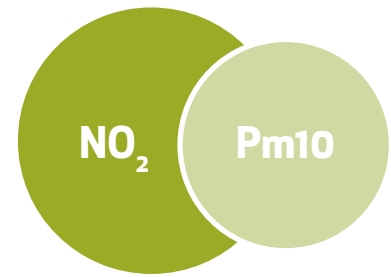
AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2010 (2005)



CO₂ emissions split (Core City) - SEAP 2010 (2005)

55
µg/mc



43
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,159
kWh per capita



-1%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

600
m³ per capita



-14%
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

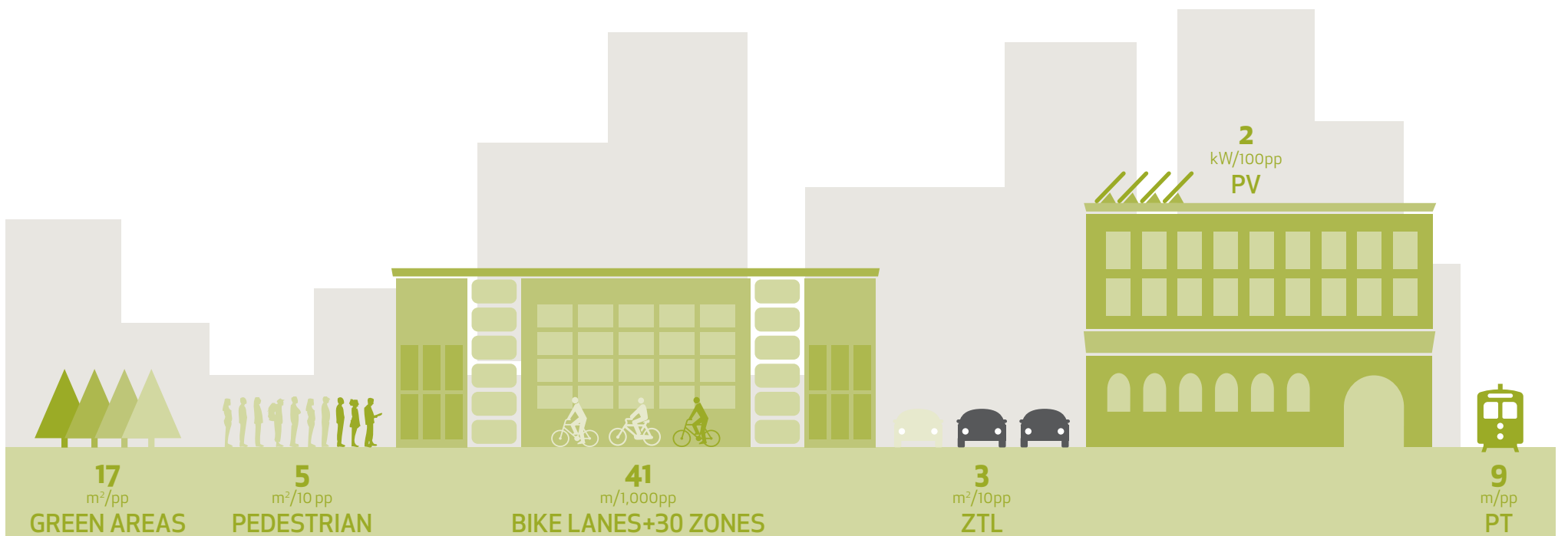
211
l per capita



-29%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-29%

+

65%

use of public transport
for commuting

+

70%

residential gross floor area
connected to district heating

+

118 km

bike lanes

+

1,300

bike sharing vehicles

Annual energy production
from renewable sources

320,000

MWh

GENOVA

Region

Liguria

Municipalities

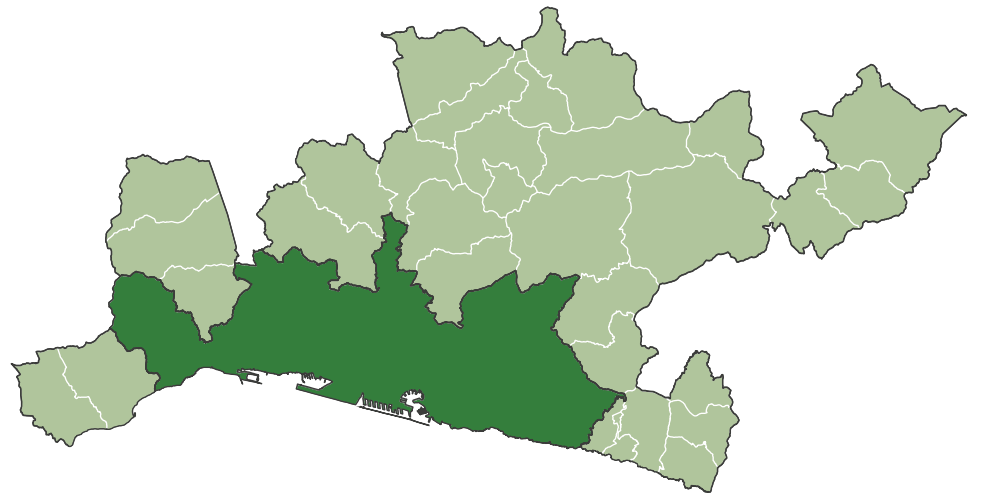
32

Larger Urban Zone area

930 km²

Core City area

244 km²



Genova is the capital city of the Liguria region, the sixth Italian city by population and it is the southern summit of the industrial triangle Milano-Torino-Genova. The metropolitan city, which includes 32 municipalities, covers an area of approximately 930 km² and has a population of approximately 700,000 people (2011 Istat survey), of whom 586,000 live in the City of Genova.

The city is located in the coastal strip bounded from the Apennines of Liguria and stretches along the coast for about 40 km from Vesima to Nervi. The city's name may derive from the Celtic root *genaua*, meaning "mouth" (estuary) of a river on which the city was founded.

Important maritime republic, it maintained its independence for nearly eight centuries, from 1096 to 1815. It is currently the main Italian seaport.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the saturation of the Valpolcevera and Valbisagno areas, creating a "π" shape urban structure, which is represented by the coastal line and the two valleys.

The population of the Larger Urban Zone (LUZ) has gone from 789,939 people in 1951 to 700,705 people in 2011 (-11.2%) while at the same time,

the Core City's population has changed from 688,447 to 586,180 (-14.8%). These figures, when compared to the changes in land use, show a clear difference between the numerical reduction and the physical growth of the city.

Detailed mapping of the central western area of the city of Genova clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006, particularly with regards to the productive functions: the construction of the steel plant at the Valpolcevera estuary along the coast line and the construction of the airport in the Sestri Ponente area.



Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951
688,447
inhabitants

CORE CITY 2011
586,180
inhabitants



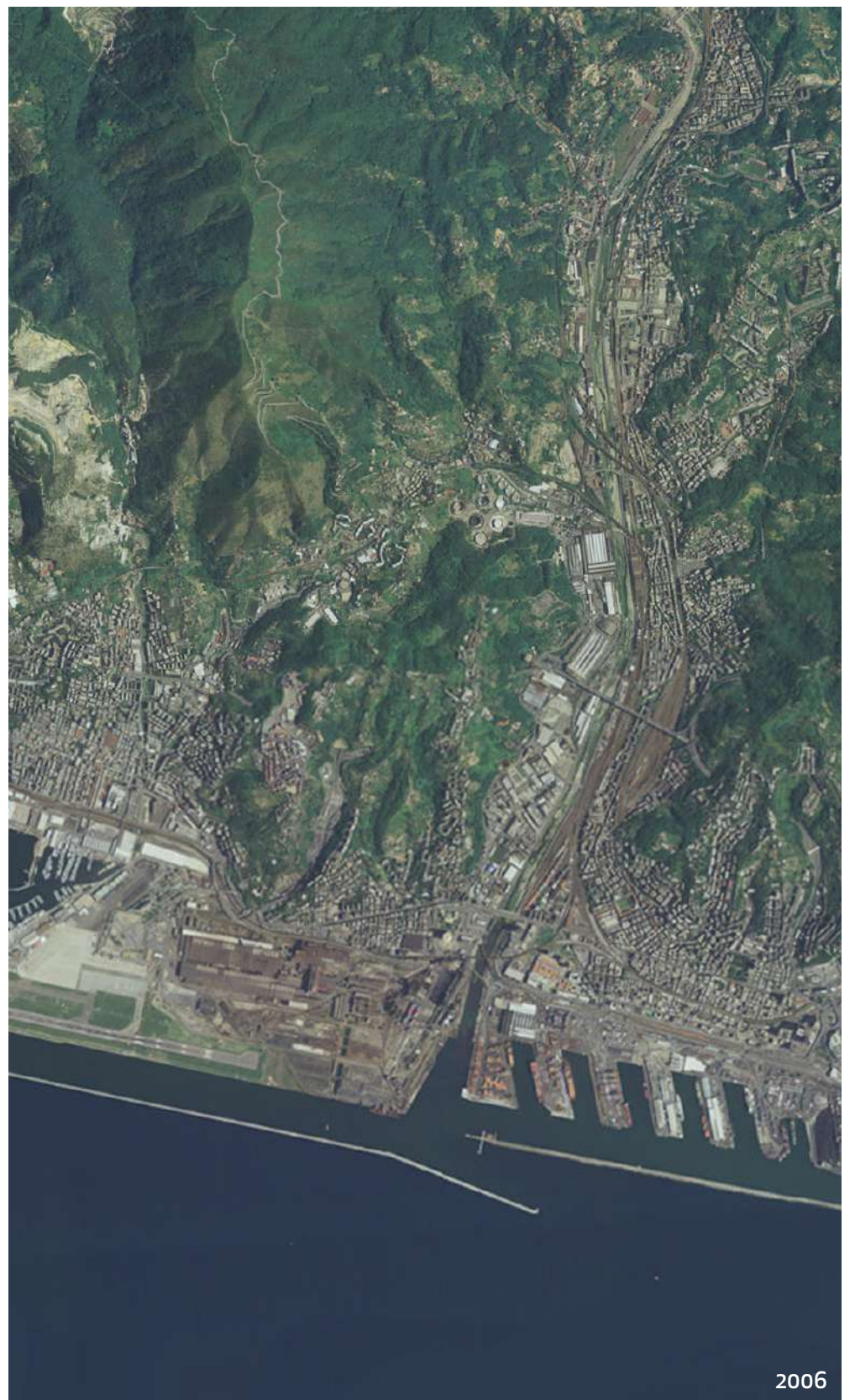
LUZ 1951
789,939
inhabitants

LUZ 2011
700,705
inhabitants



1955

Volo GAI



2006

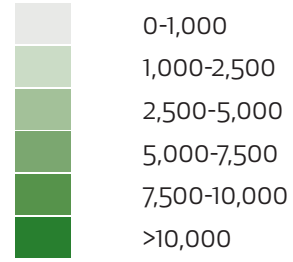
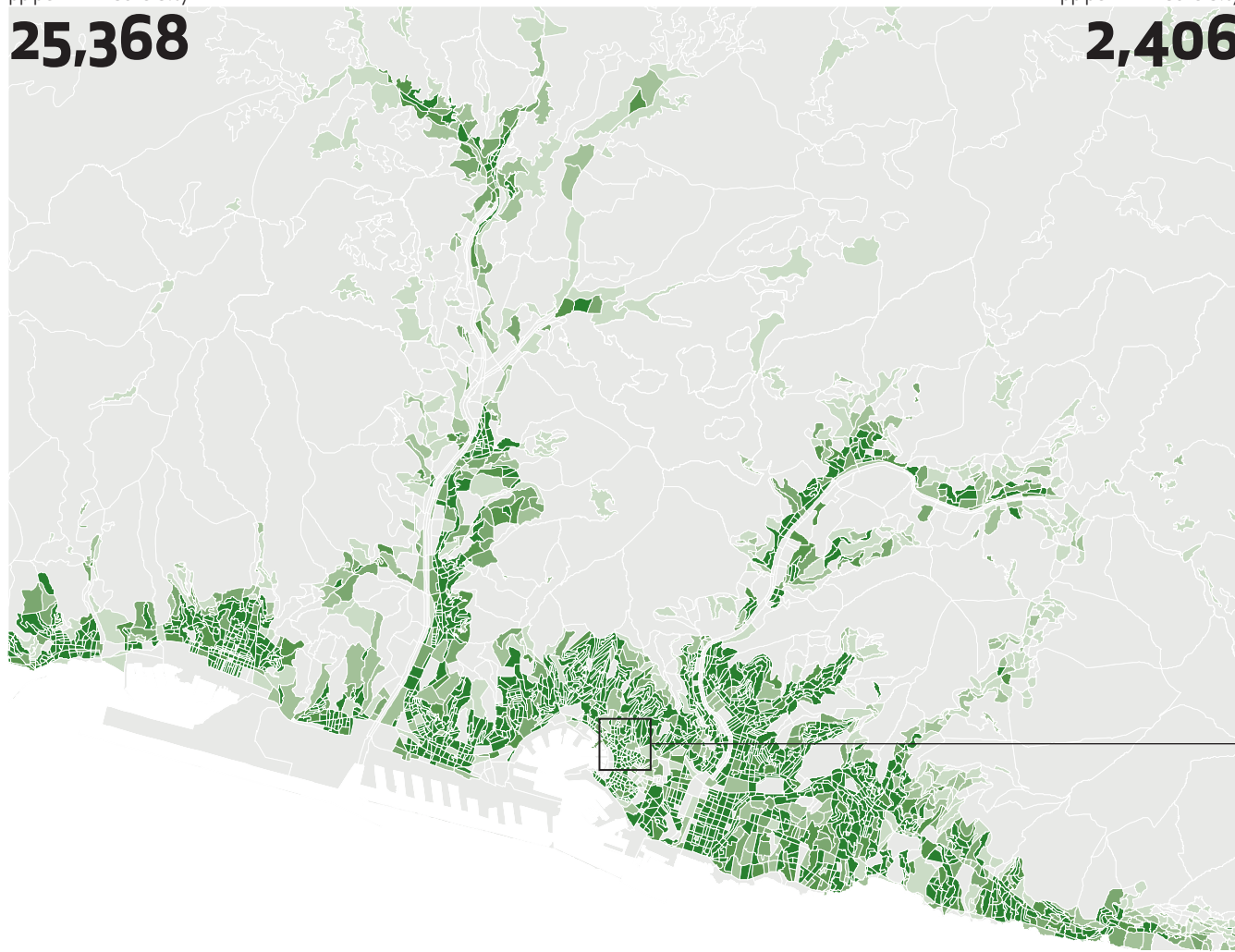
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

25,368

AVERAGE DENSITY
pp per km² - Core City

2,406



Population



URBAN DENSITY

PEAK DENSITY

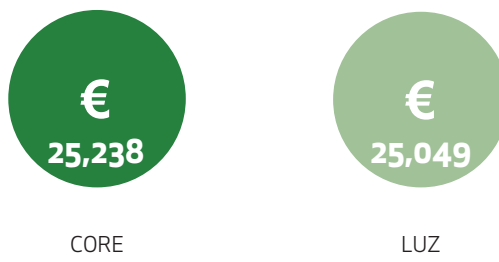
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Genova, the ratio between the population of the Core City over the population of the LUZ goes from 87% in 1951 to 84% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a growth in the Core City and in the surrounding municipalities and a decrease in population in the municipalities of the second belt from 1951 to 1971, in the following two periods (1971-1991 and 1991-2011) population growth is concentrated in the municipalities of the first belt while the Core City and second belts face a decrease in population.

In 2011 within the city of Genova, the foreign population accounts for 8% of the total population (+185% over the last decade) and it accounts for 7% in the LUZ.

8%

+185%
(2001-2011)



7%

+187%
(2001-2011)

CORE

LUZ



7%

+26%
(2004-2011)

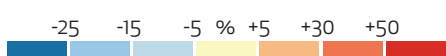
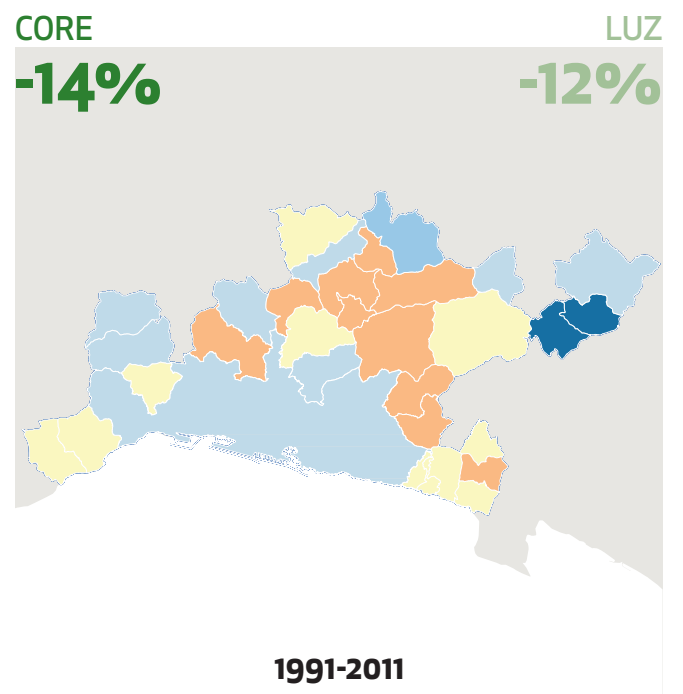
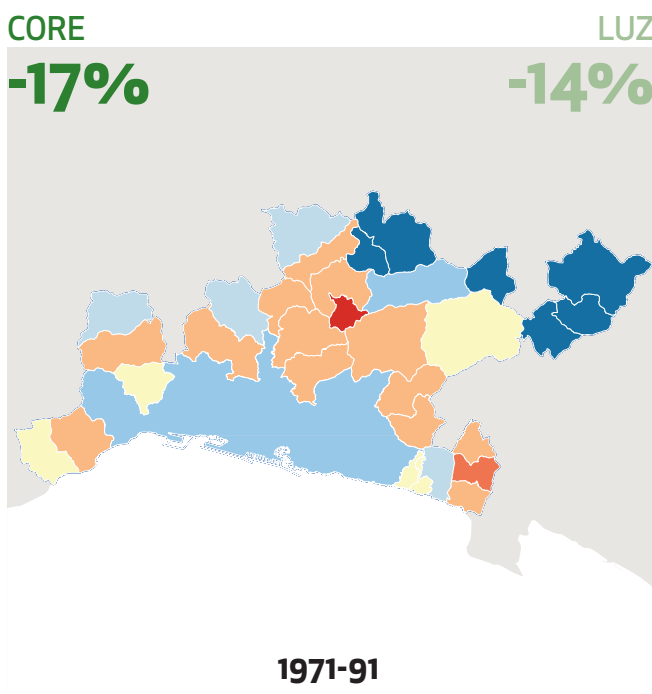
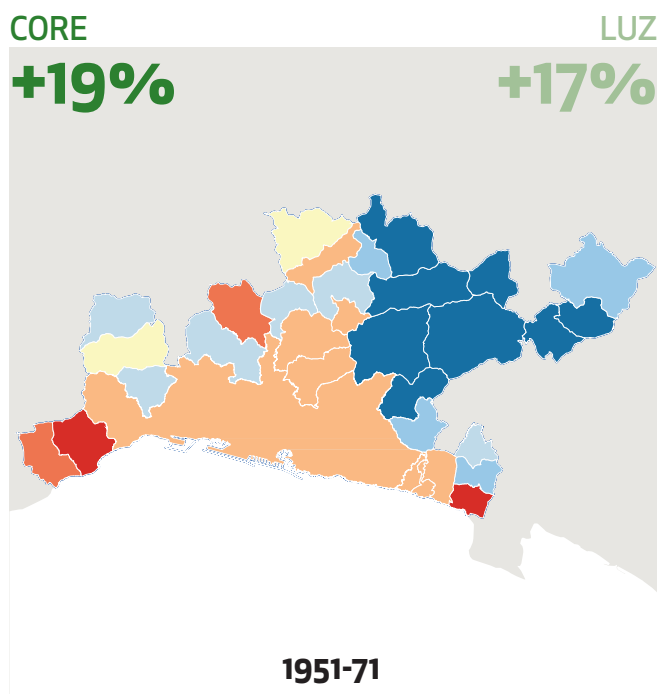
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



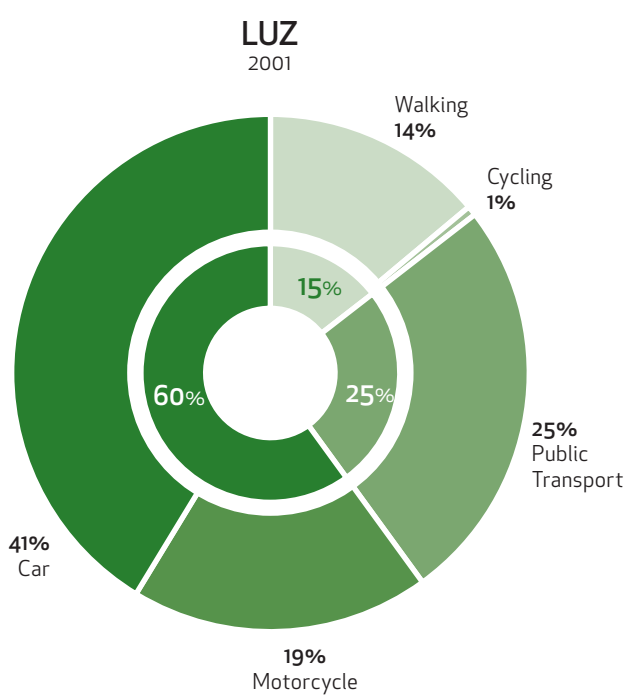
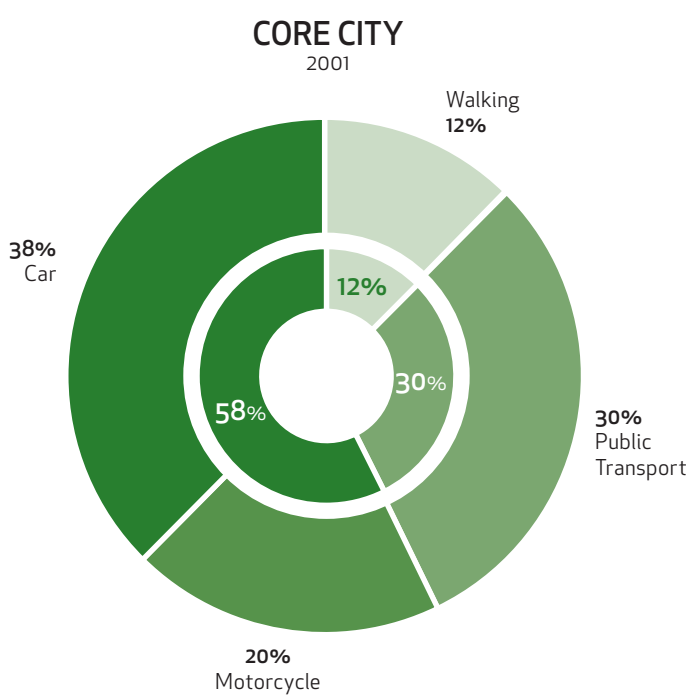
DEMOGRAPHIC CHANGES

Mobility

The metropolitan area of Genova, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that, 60% of travellers use private transport, 25% public transport and 15% walk or cycle within the LUZ; the data for the Core City is quite

similar, travellers using private transport are 58%, those using public transport 30% and the remaining 12% walk or cycle.

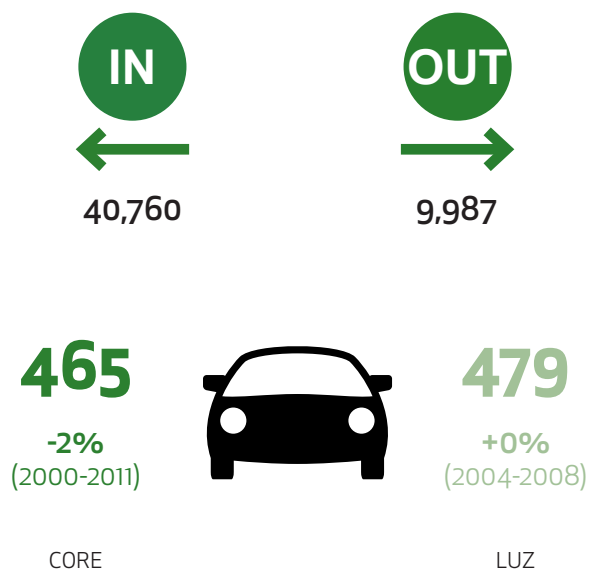
The data on commuting (for work and study) shows the daily inbound commute of more than 41,000 people compared to almost 10,000 of outbound commuters. The motorization rate is one of the lowest in Italy, with 479 cars per 1,000 inhabitants in the LUZ and 465 in the Core City.



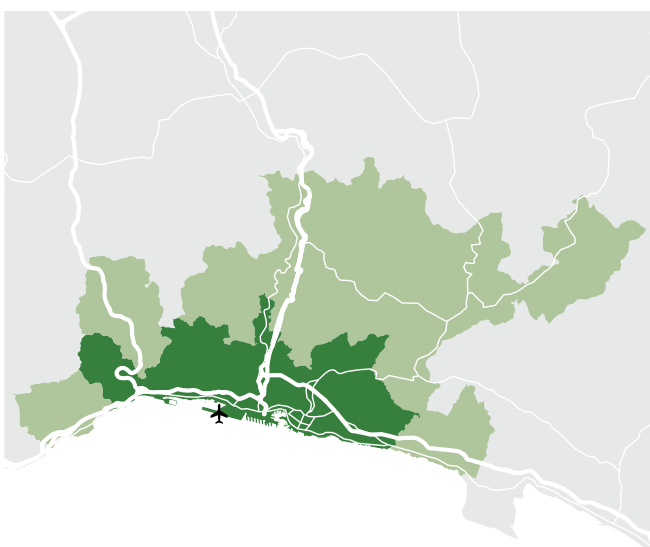
MODAL SPLIT
Eurostat 2001

COMMUTERS

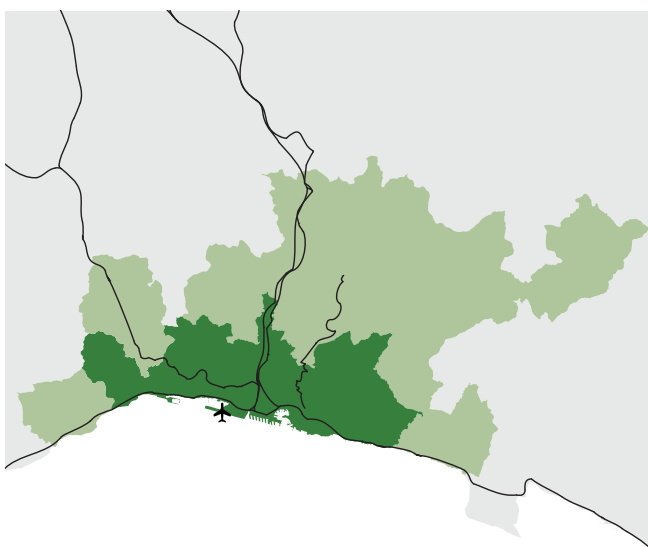
Daily commuters (Core City) - ISTAT 2001



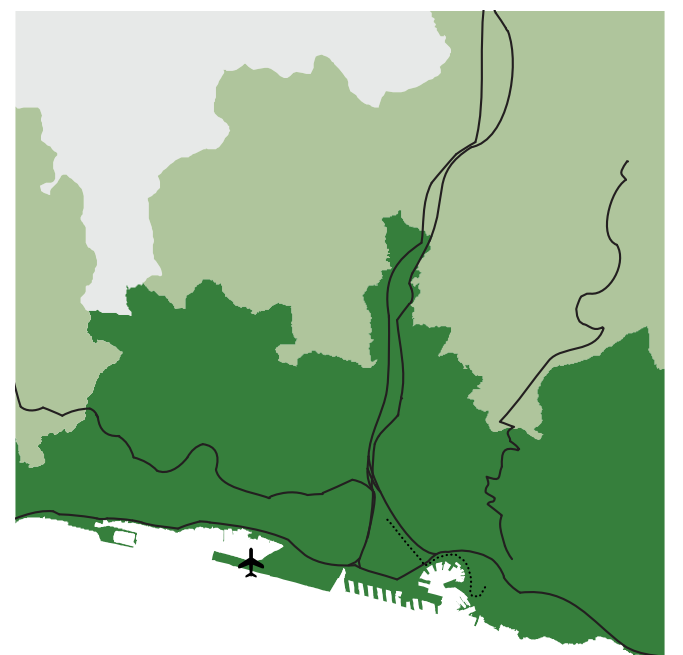
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



552
kg
10%
(2000-2011)

WASTE

Annual waste collection per capita (Core City) - Istat 2011



31%
+199%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

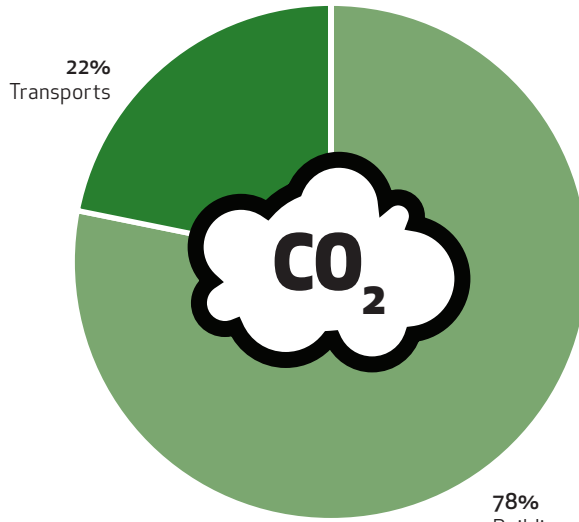
2,272
kt



3.7
t per capita

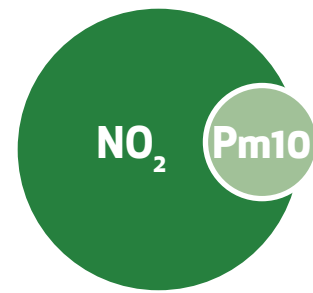
AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2010 (2005)



CO₂ emissions split (Core City) - SEAP 2010 (2005)

58
µg/mc



22
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,104
kWh per capita



+4%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

528
m³ per capita



+17%
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

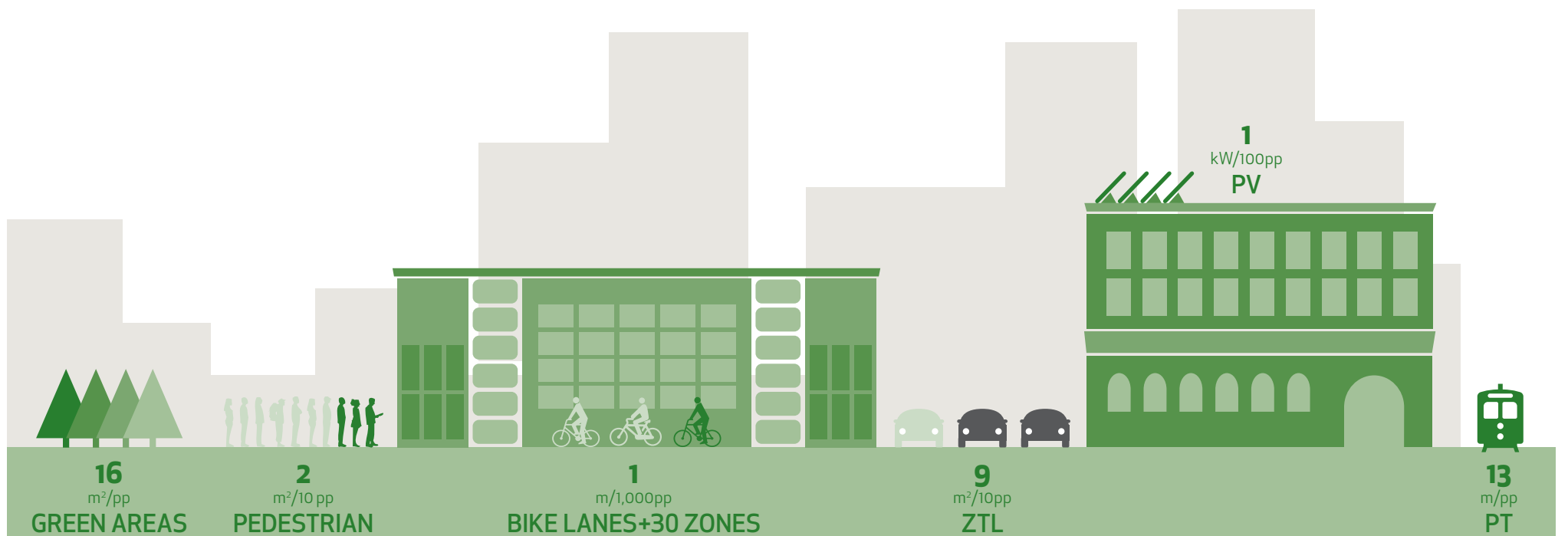
163
l per capita



-31%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-24%

+

6%

use of public transport
for commuting

-40,000

tCO₂/year saved from
installation of micro-CHP plants

+

18 km

bike lanes

new trees

5,000

-32%

street lighting
energy consumption

MILANO

Region

Lombardia

Municipalities

116

Larger Urban Zone area

1.348 km²

Core City area

182 km²



Milano is the capital city of the Lombardia region, the second Italian city by population after Roma and the centre of the most populated metropolitan area in Italy. The metropolitan city, which includes 116 municipalities, covers an area of approximately 1,348 km² and has a population of approximately 3,068,424 people (2011 Istat survey), of whom 1,242,123 live in the City of Milano.

Founded by the Insubres during the sixth century, it was conquered by the Romans in 222 BC who gave it the name of Mediolanum, the "middle ground" between the rivers Ticino and Adda, located within the area of the "fontanili" which separates the high dry plains from the

irrigated lowland. Across the centuries the city has had different institutional roles: from being the capital of the Duchy of Milano during the Renaissance to becoming the capital of the Kingdom of Italy during the Napoleonic period.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the saturation of the northern area of the metropolitan city, and to the loss of identity of the urban polarities which have blended into an urbanized continuum.

The population of the Larger Urban Zone (LUZ) has grown from 1,905,046 people in 1951 to

3,068,424 people in 2011 (+37.9%), while at the same time, the Core City's population has gone from 1,274,187 to 1,242,123 (-2.5%). These figures, when compared to the changes in the land use, show a clear difference between the numerical and physical growth of the city.

Detailed mapping of the western area of the city of Milano clearly shows the extension of the urban expansion between the GAI flight in 1955 and the orthophoto of 2006: particularly with regards to the development of the infrastructure network and the saturation of mixed functions in the areas within the western ring road.



Urban Footprint

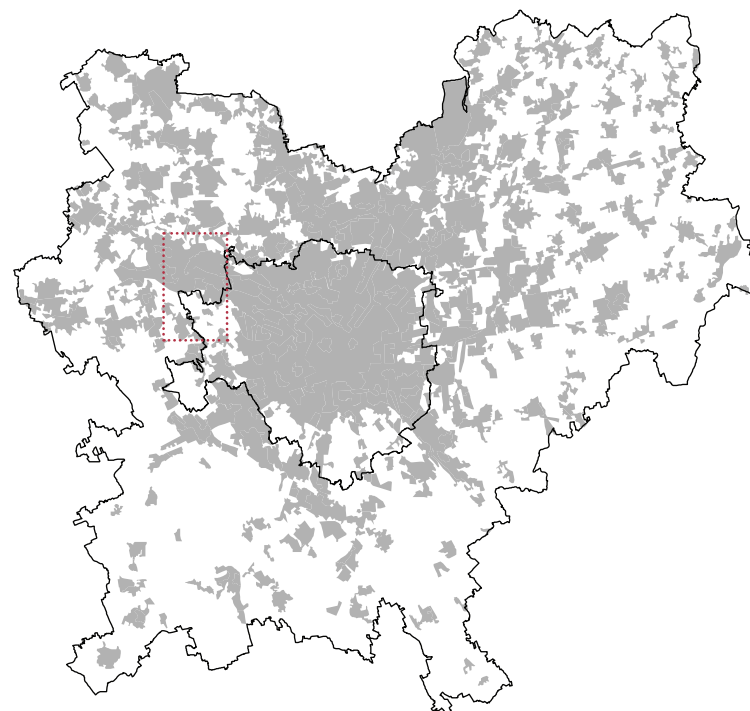
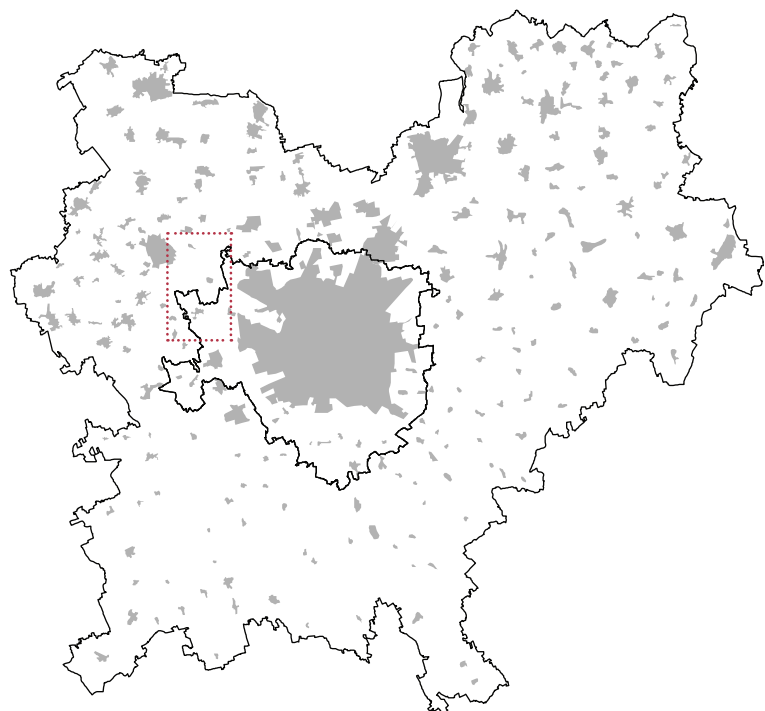
IGM 1960/Corine Land Cover 2006

CORE CITY 1951

1,274,187
inhabitants

CORE CITY 2011

1,242,123
inhabitants



LUZ 1951

1,905,046
inhabitants

LUZ 2011

3,068,424
inhabitants



1955

Volo GAI



2006

Geoportale Nazionale

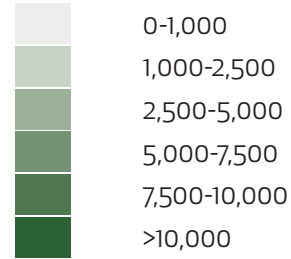
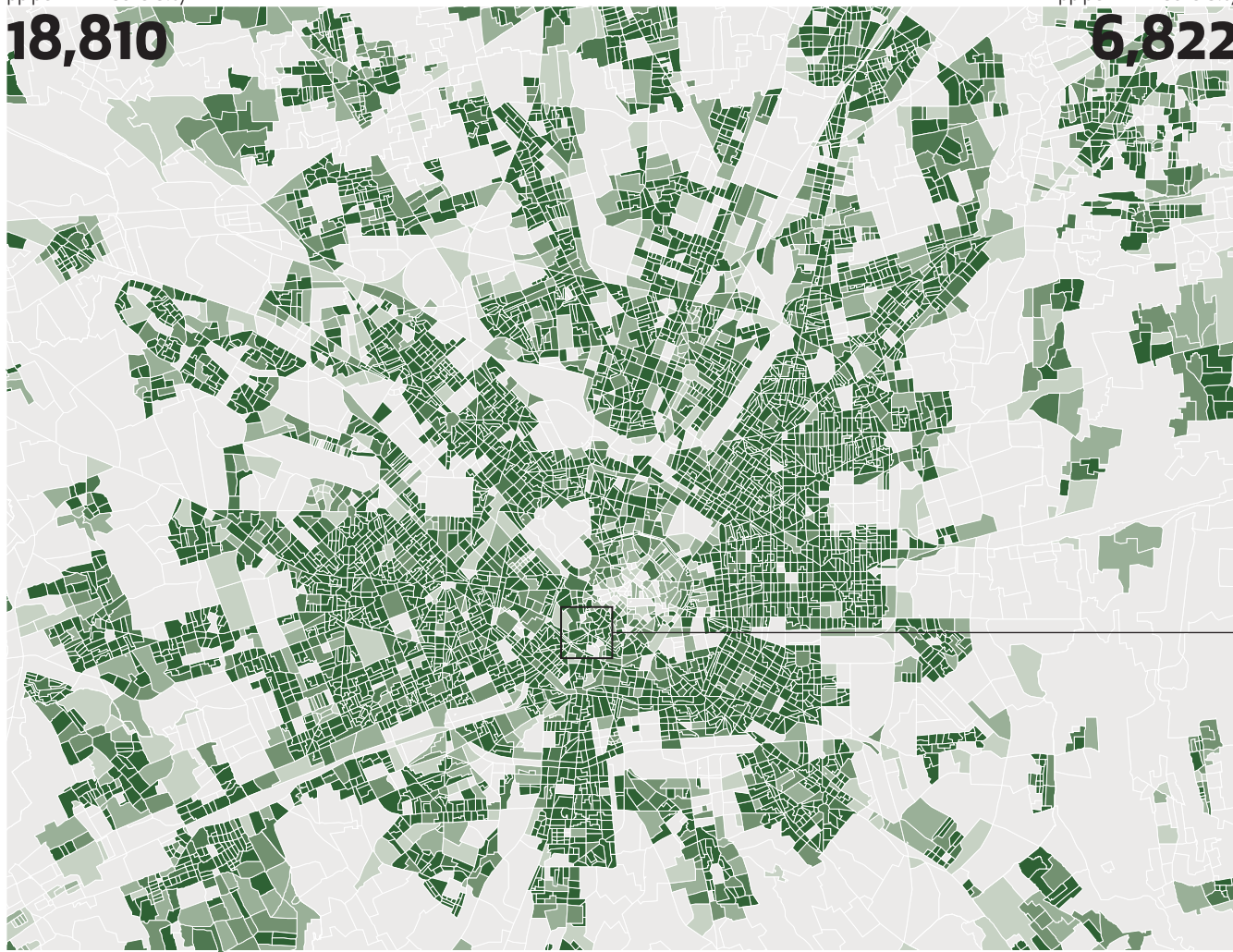
Population

PEAK DENSITY
pp per km² - Core City

AVERAGE DENSITY
pp per km² - Core City

18,810

6,822

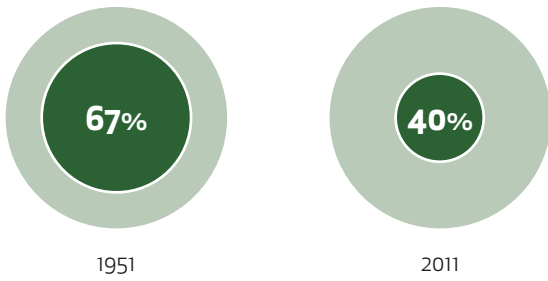


URBAN DENSITY

PEAK DENSITY

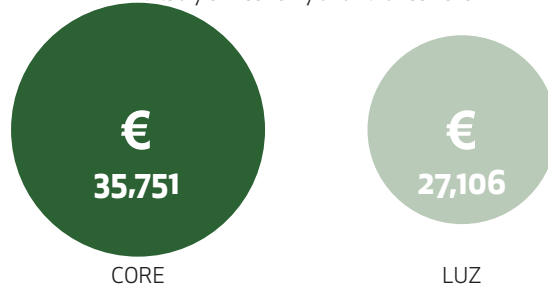
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Milano, the ratio between the population of the Core City over the population of the LUZ goes from 67% in 1951 to 40% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a trend which is common to other Italian cities: a strong population growth in the Core City from 1951 to 1971, is followed by a progressive reduction in the following two periods (1971-1991 and 1991-2011) while population growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Milano, the foreign population accounts for 14% of the total population (+101% over the last decade) while it accounts for 11% in the LUZ.

14%

+101%
(2001-2011)



11%

+146%
(2001-2011)

CORE

LUZ

FOREIGN POPULATION

Istat 2011



6%

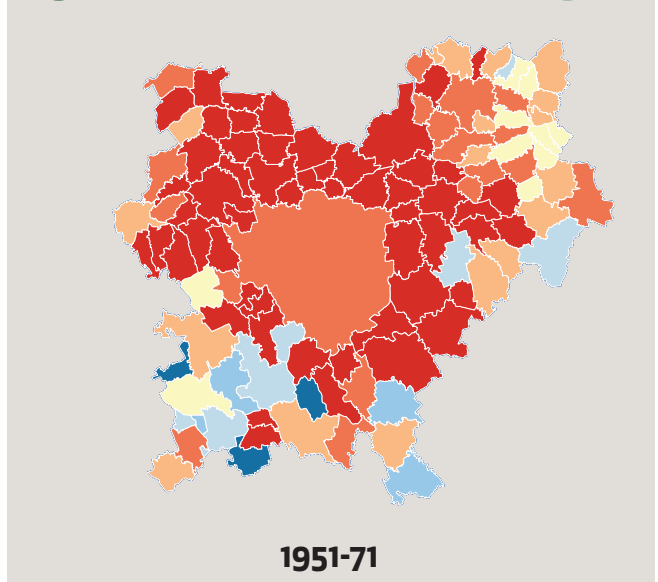
+27%
(2004-2011)

LUZ

UNEMPLOYMENT

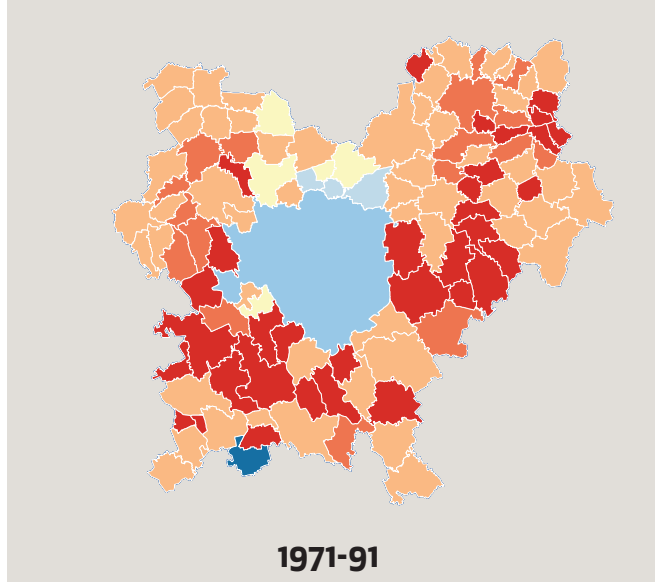
Eurostat 2011

CORE LUZ
+36% **+63%**



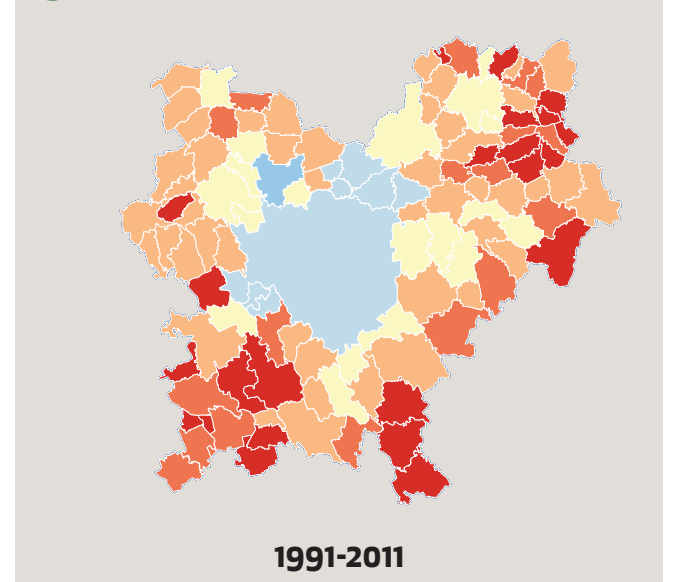
1951-71

CORE LUZ
-21% **-2%**

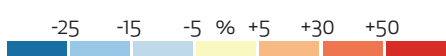


1971-91

CORE LUZ
-9% **+1%**



1991-2011



DEMOGRAPHIC CHANGES

Mobility

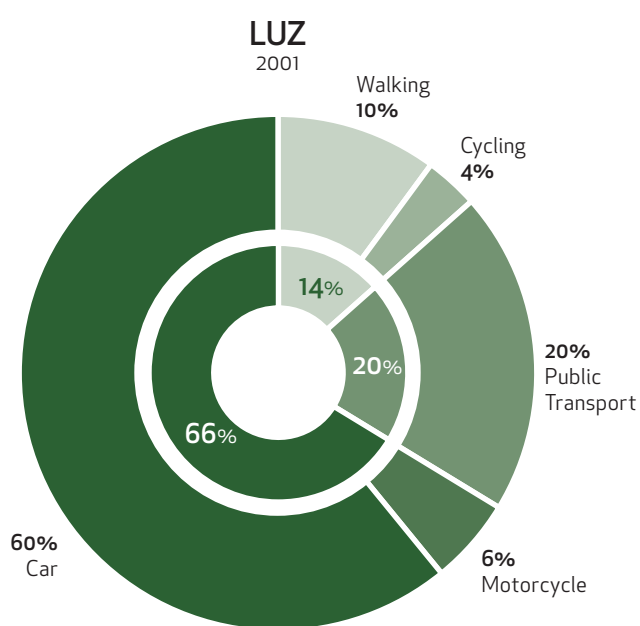
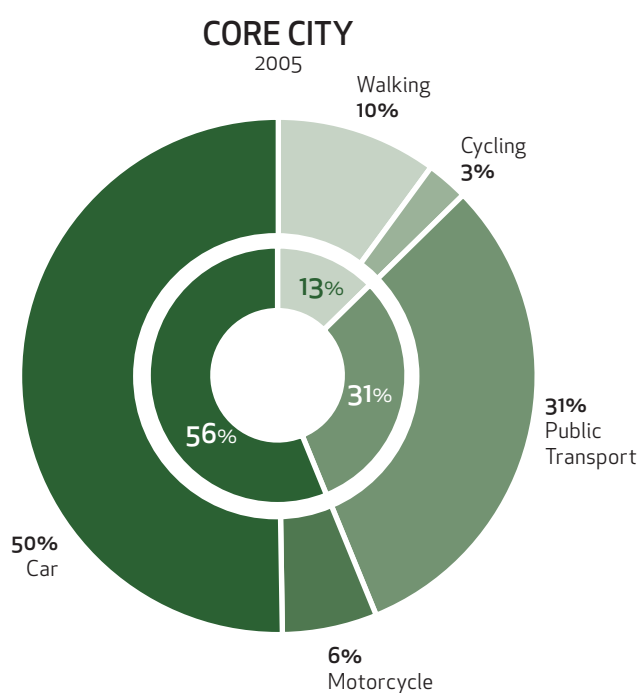
The metropolitan area of Milano, as shown in the images below, is served by a very good rail and road infrastructure. The modal split chart shows that 66% of travellers use private transport, 20% public transport and 14% walk or cycle within the LUZ; the data for the Core City

differs noticeably due to the increase in public transport: travellers using private transport are 56%, those using public transport 31% and the remaining 13% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 436,000 people compared to circa 48,000 of outbound commuters. The motorization rate is very high, with 576 cars per 1,000 inhabitants in the LUZ and 543 in the Core City.



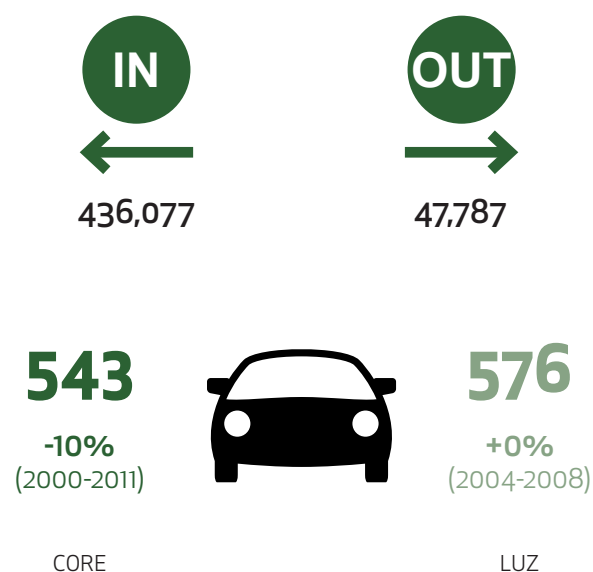
Image by Sainz



MODAL SPLIT
SEAP 2009 / Eurostat 2001

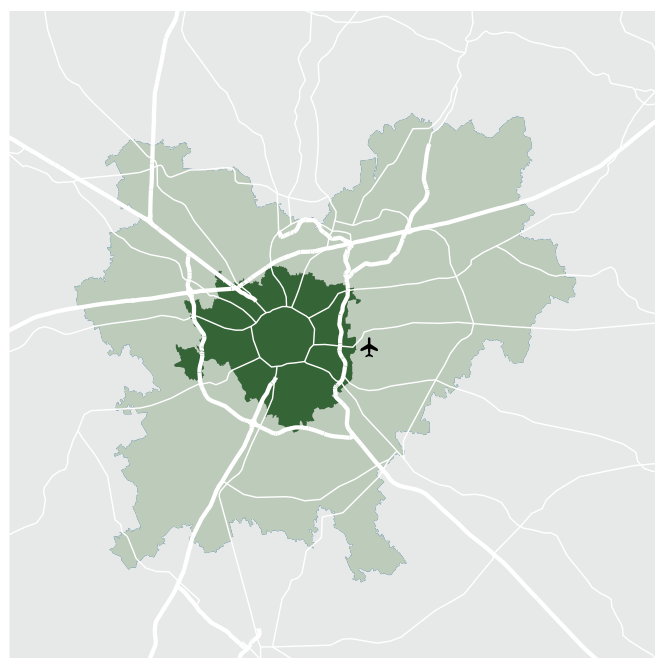
COMMUTERS

Daily commuters (Core City) - ISTAT 2001

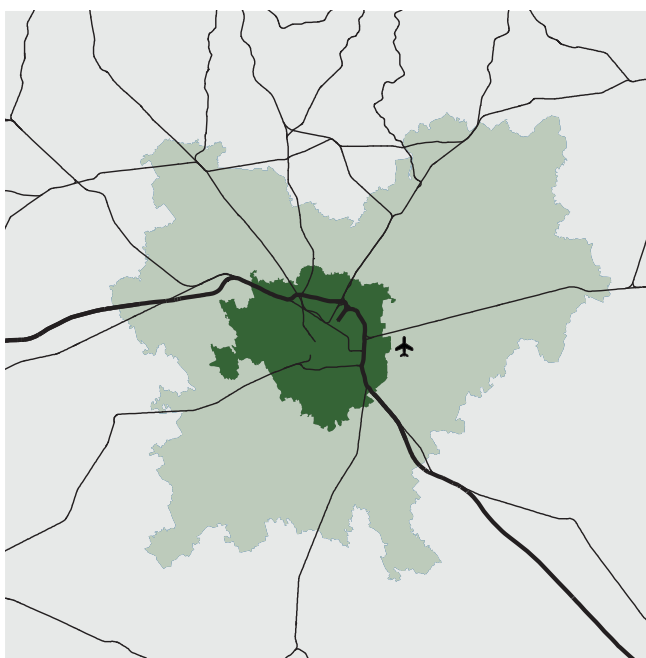


CAR OWNERSHIP

per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



528
kg
-3%
(2000-2011)

WASTE

Annual waste collection per capita (Core City) - Istat 2011



36%
+22%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

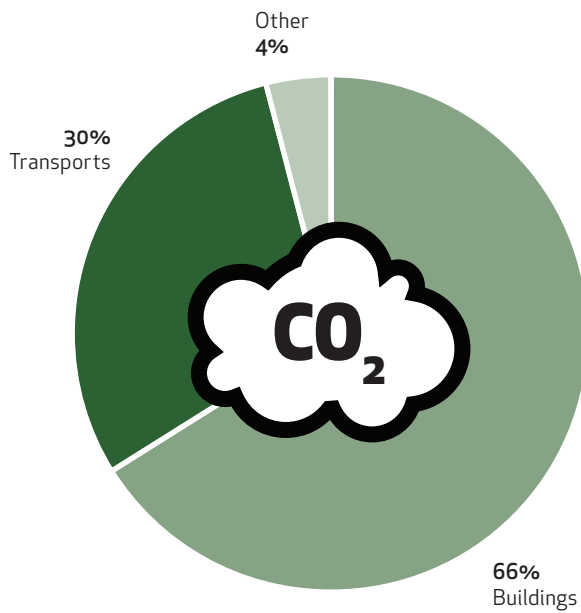
4,795
kt



3.7
t per capita

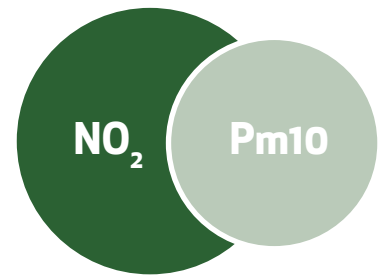
AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2009 (2005)



CO₂ emissions split (Core City) - SEAP 2009 (2005)

55
µg/mc



43
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,141
kWh per capita



+8%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

378
m³ per capita



-26%
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

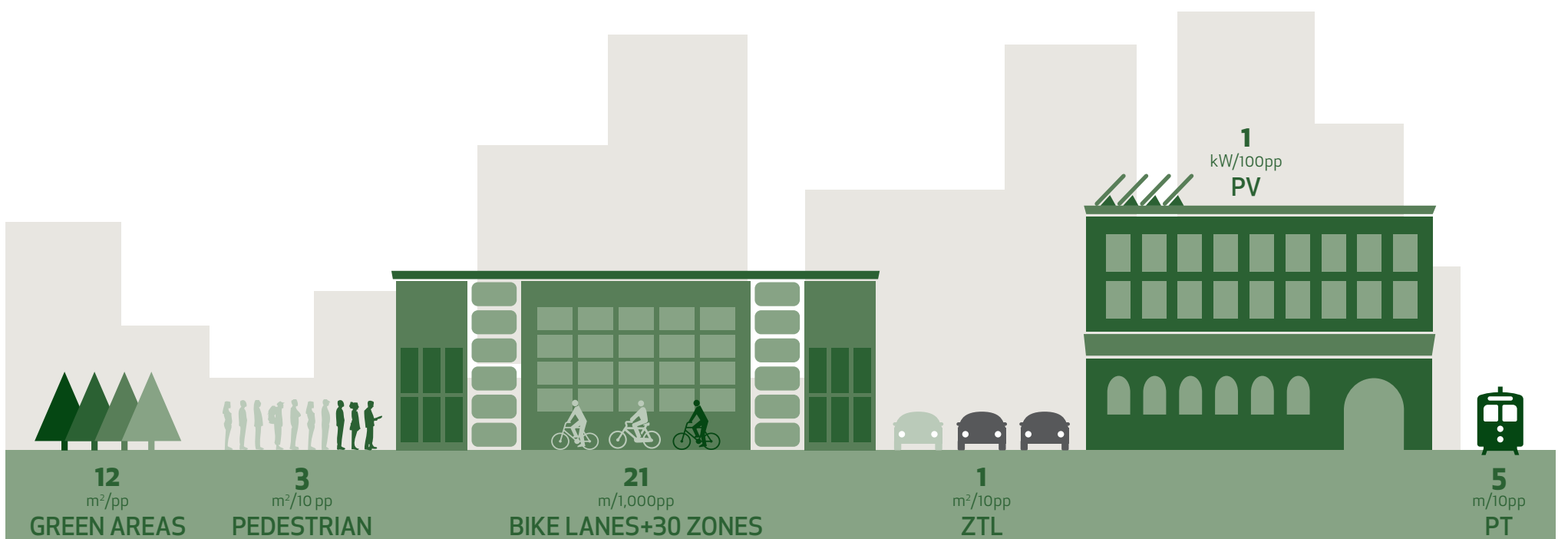
228
l per capita



-10%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-20%

-24%

use of private car
for commuting

150,000

existing buildings upgraded
from Energy Class F to Class D

**+
100 km**

bike lanes

new trees

500,000

-40%

street lighting
energy consumption

VENEZIA

Region

Veneto

Municipalities

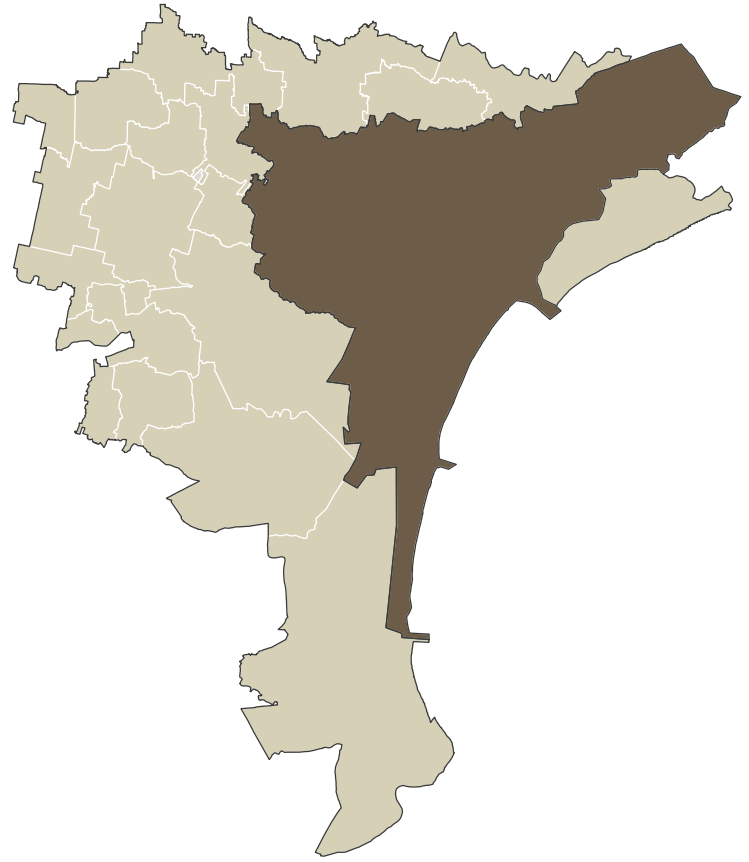
21

Larger Urban Zone area

1,212 km²

Core City area

416 km²



Venezia is the capital city of the Veneto region, a city which has developed on two distinct territories, the Lagoon area and the Mainland of Mestre. The metropolitan city, which includes 21 municipalities, covers an area of approximately 1,212 km² and has a population of approximately 621,099 people (2011 Istat survey), of whom 26,232 live in the City of Venezia.

The city's name, which appears for the first time during the division of Italy in the Augustan age (7 AD), continued to be used in the Byzantine period to indicate the coastline from Chioggia to Grado. With the establishment of the Duchy of Venezia and until its fall in the late eighteenth century, the city was called Serenissima, and it comprised

much of north-eastern Italy, Istria, Dalmatia and most of the Greek islands.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development of the city on the mainland, creating a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 522,899 people in 1951 to 621,099 people in 2011 (+18.8%), while at the same time, the Core City's population has goes from 305,738 to 261,362 (-14.6%). These figures, when compared to the changes in the land use, show a gap between the numerical and physical

growth of the city.

Detailed mapping of the northern area of the City of Venezia clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of the city centre of Mestre, and the productive functions in the area of Porto Marghera.



Image by Ricardobtg

Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951

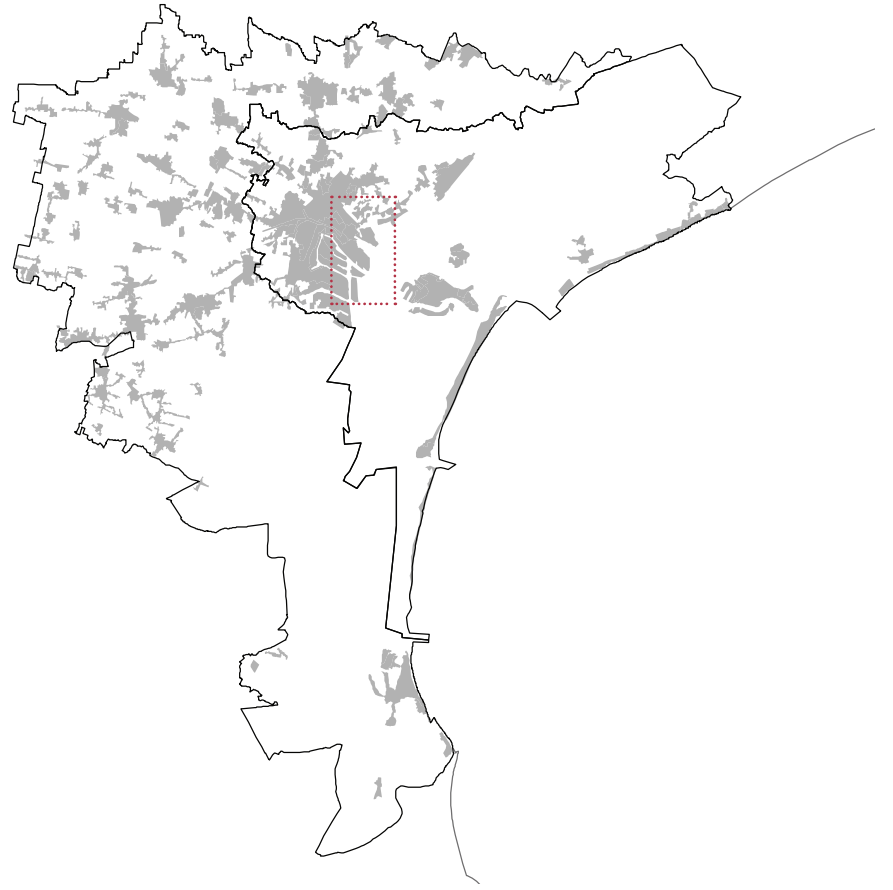
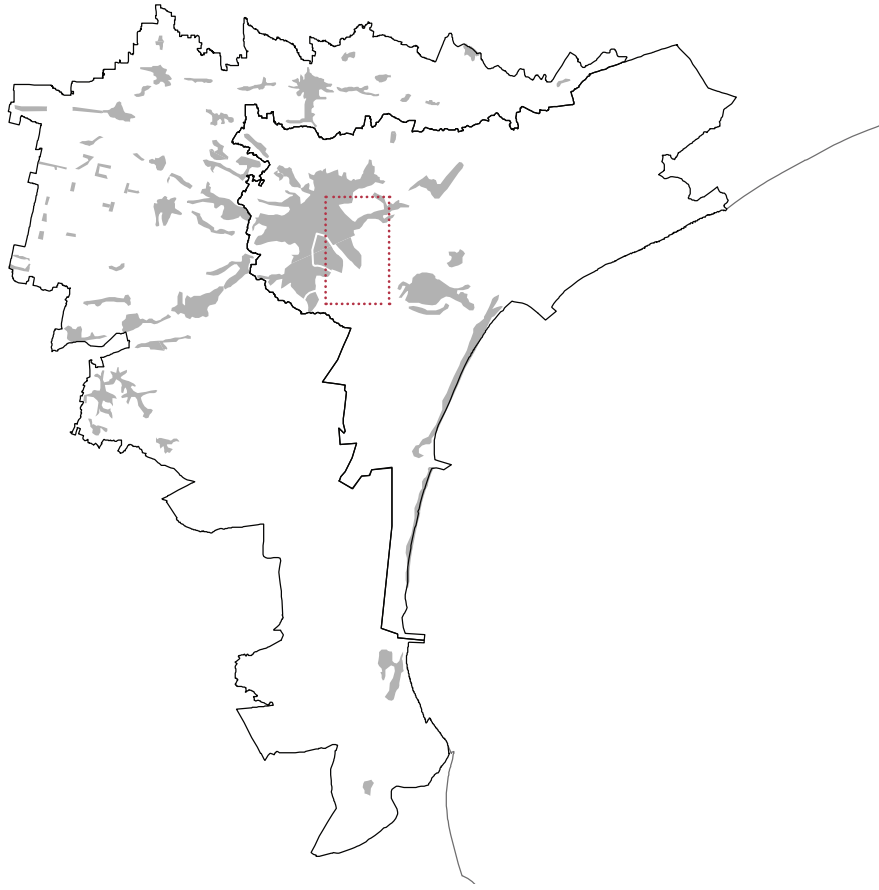
305,738

inhabitants

CORE CITY 2011

261,362

inhabitants



LUZ 1951

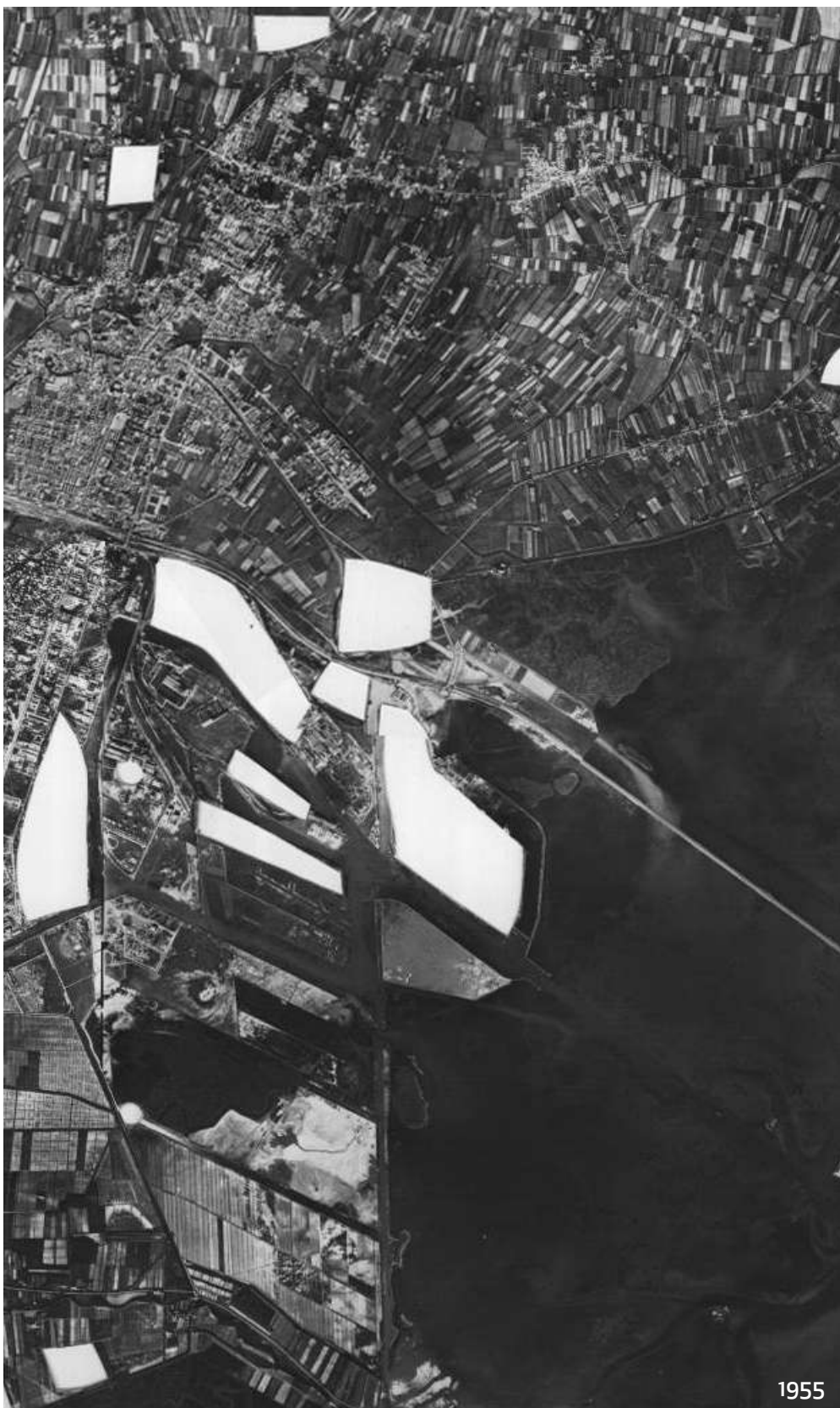
522,899

inhabitants

LUZ 2011

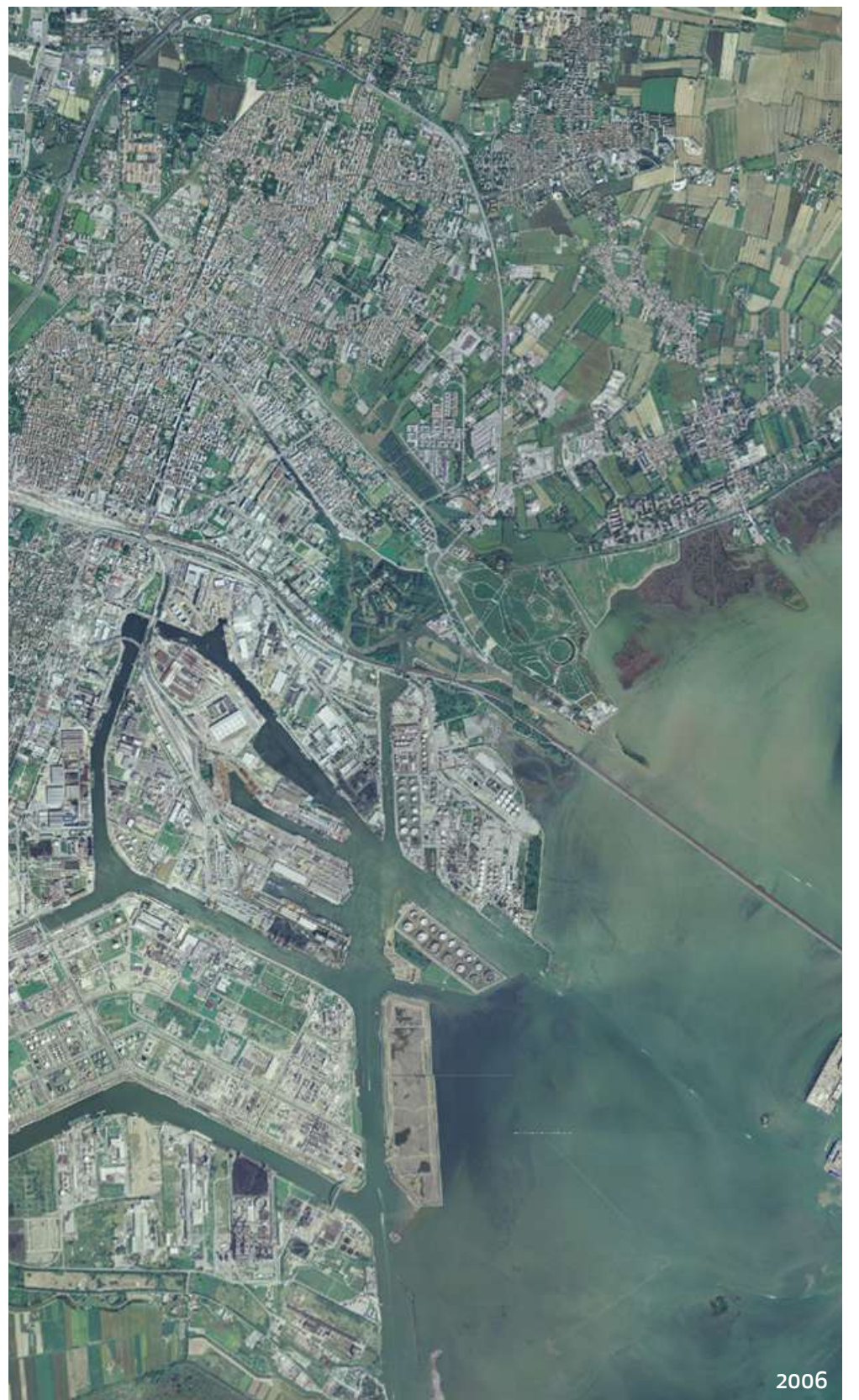
621,099

inhabitants



1955

Volo GAI



2006

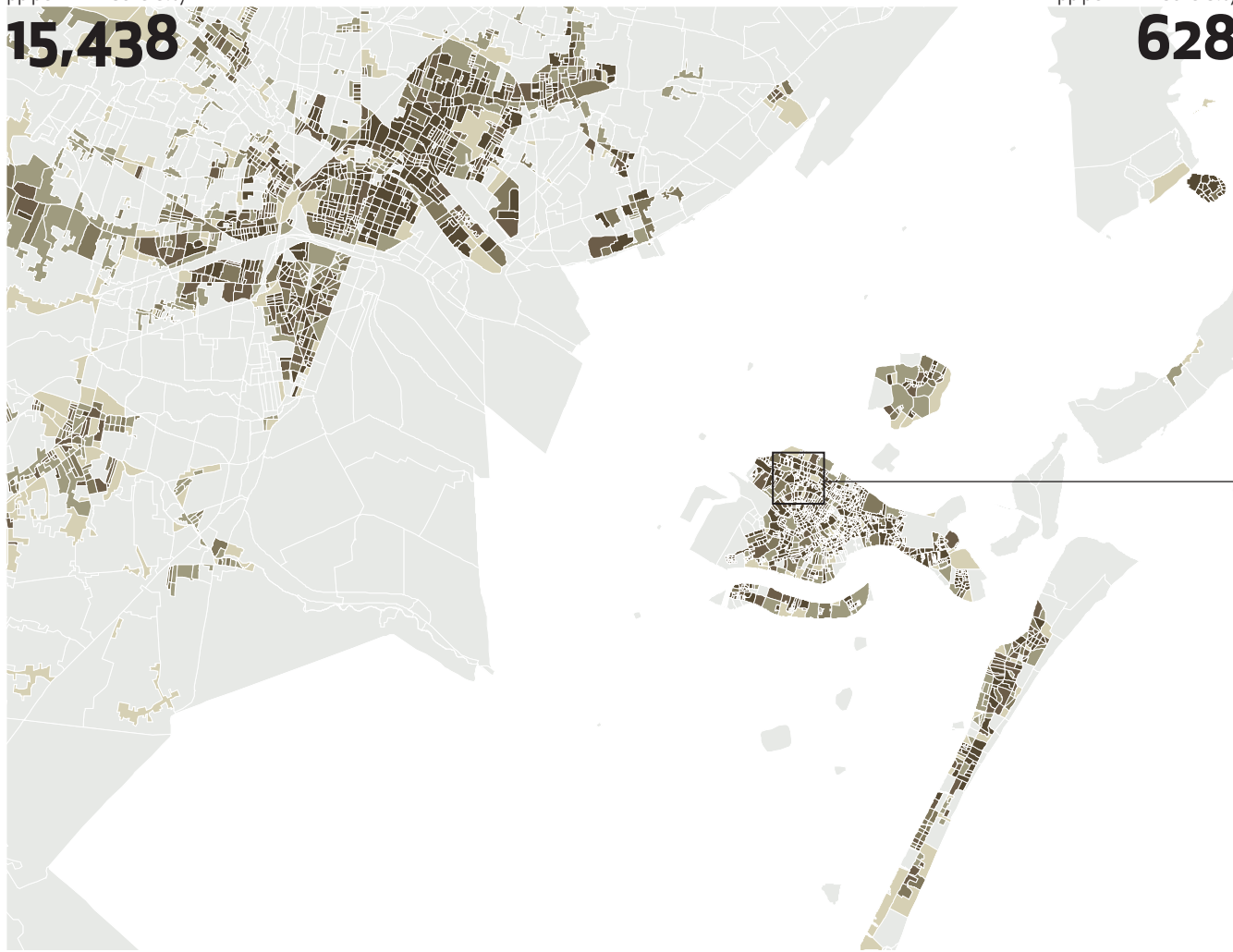
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

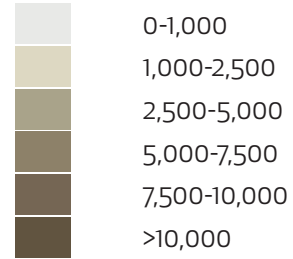
15,438

AVERAGE DENSITY
pp per km² - Core City

628



Population



URBAN DENSITY

PEAK DENSITY

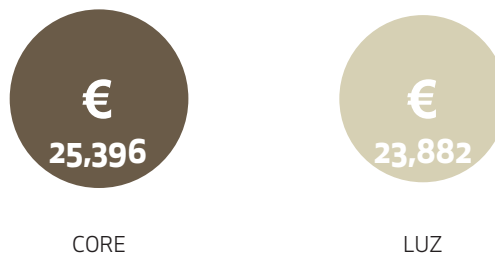
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Venezia, the ratio between the population of the Core City over the population of the LUZ goes from 58% in 1951 to 42% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a growth in the Core City from 1951 to 1971, in the following two periods (1971-1991 and 1991-2011) growth is concentrated in the municipalities of the first and second belts while the Core City faces a steady decrease in population.

In 2011 within the city of Venezia, the foreign population accounts for 10% of the total population (+339% over the last decade) and for 8% in the LUZ.

10%

+339%
(2001-2011)



8%

+354%
(2001-2011)

CORE

LUZ



7%

+32%
(2004-2011)

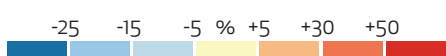
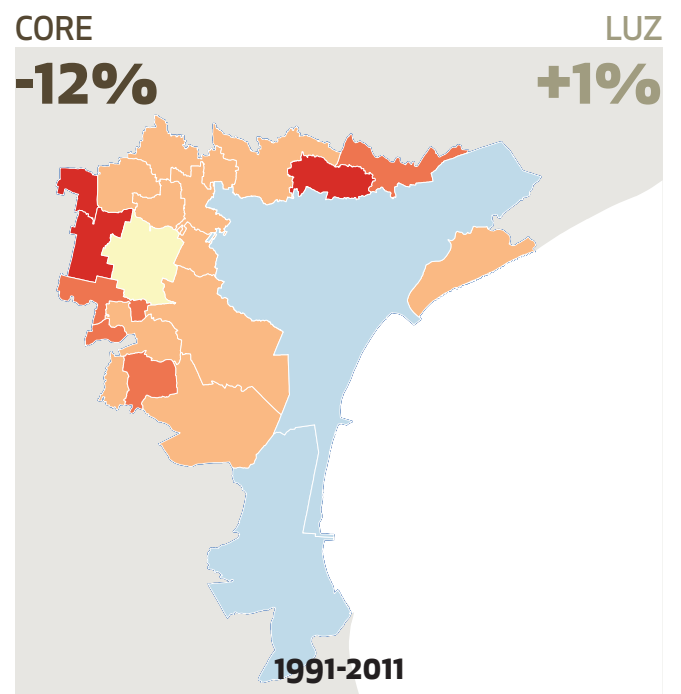
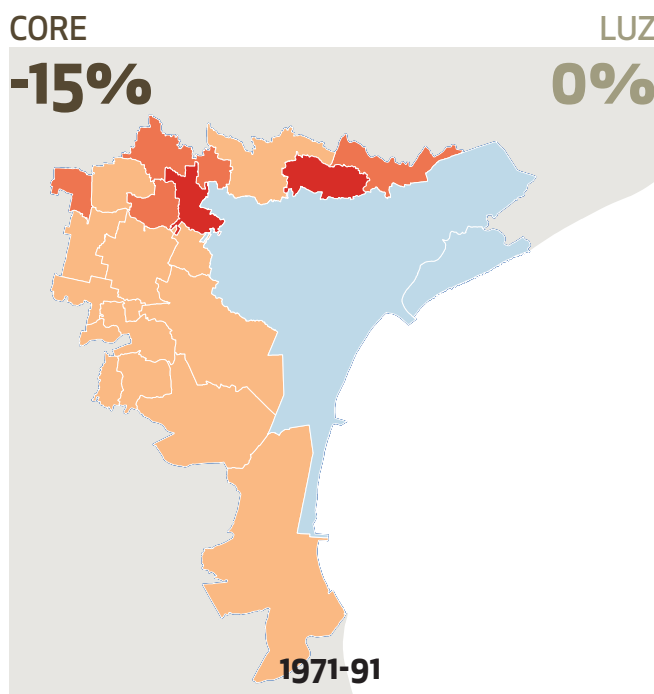
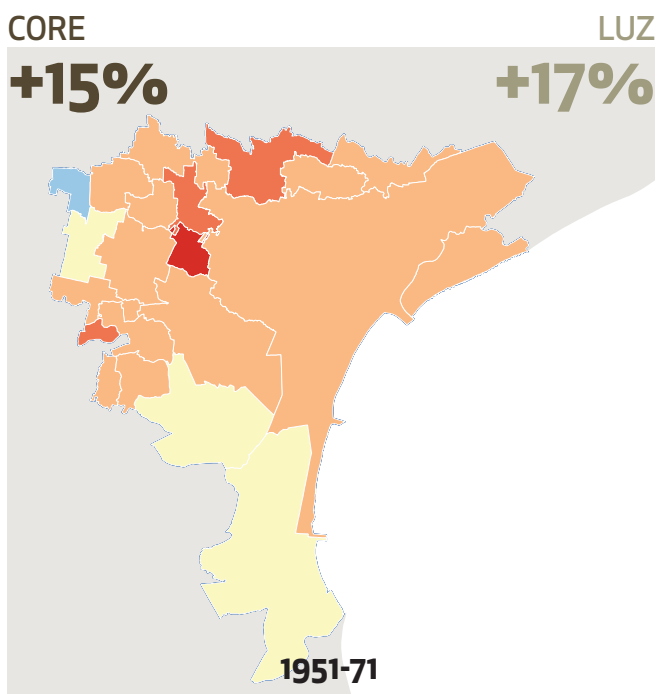
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

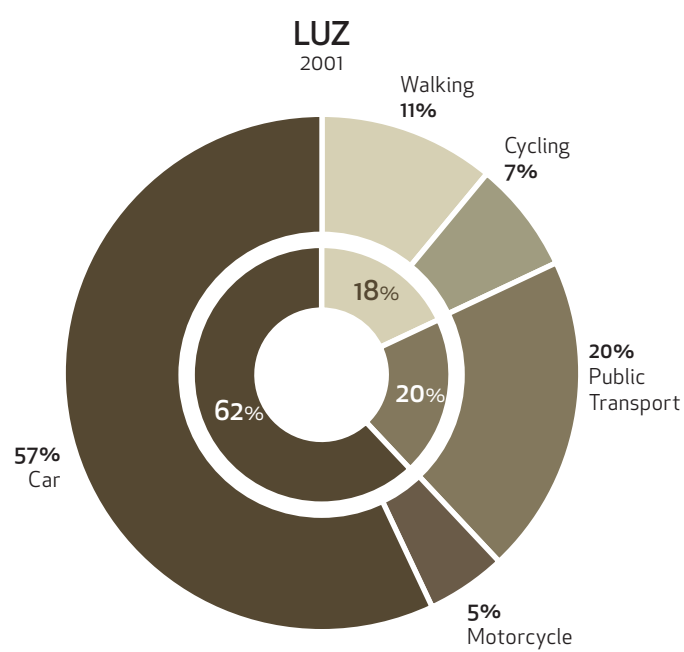
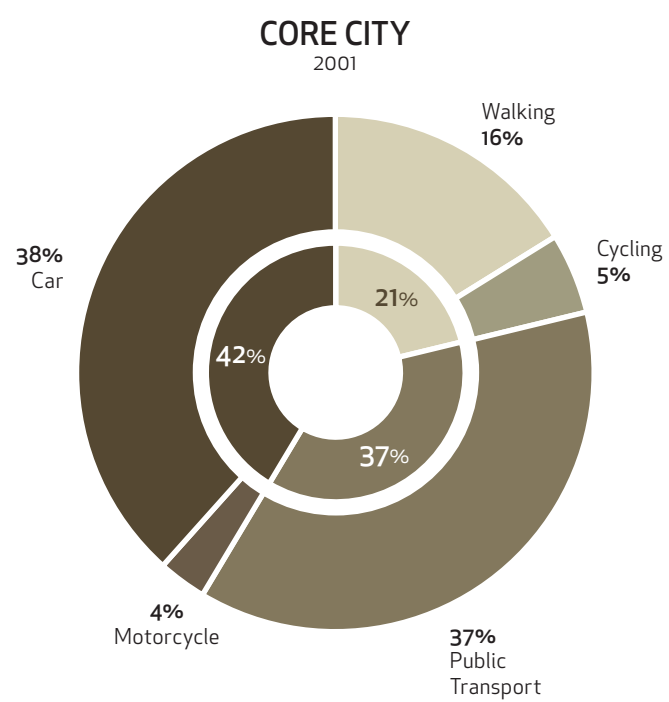
The metropolitan area of Venezia, as shown in the images below, is served by a very good rail and road infrastructure. The modal split chart shows that 62% of travellers use private transport, 20% public transport and 18% walk or cycle within the LUZ; the data for the Core

City differs noticeably as the city of Venezia is totally closed to traffic: travellers using private transport are 42%, those using public transport 37% and the remaining 21% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 62,000 people compared to circa 18,000 of outbound commuters. The motorization rate is one of the lowest in Italy, with 496 cars per 1,000 inhabitants in the LUZ and 412 in the Core City.



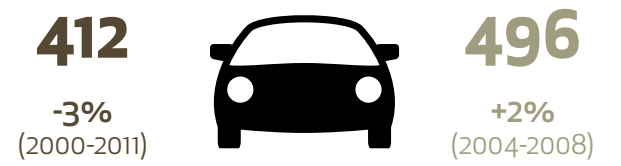
Image by Ricardobtg



MODAL SPLIT
Eurostat 2001

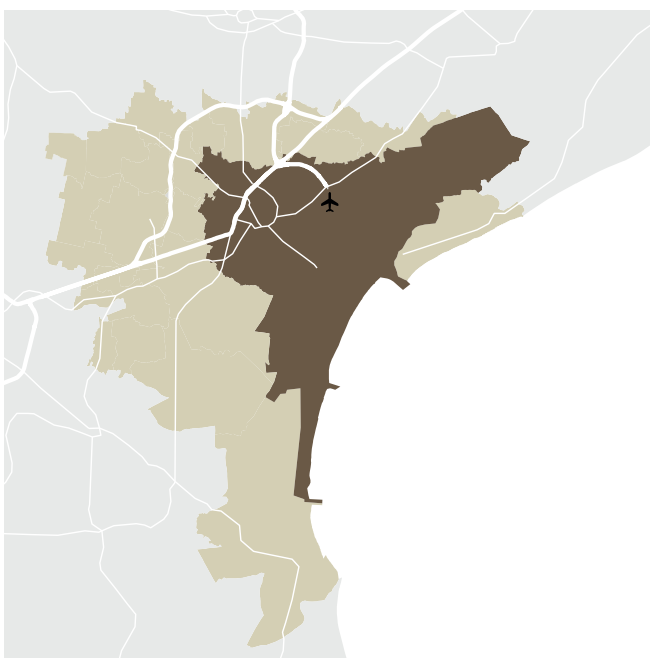
COMMUTERS

Daily commuters (Core City) - ISTAT 2001

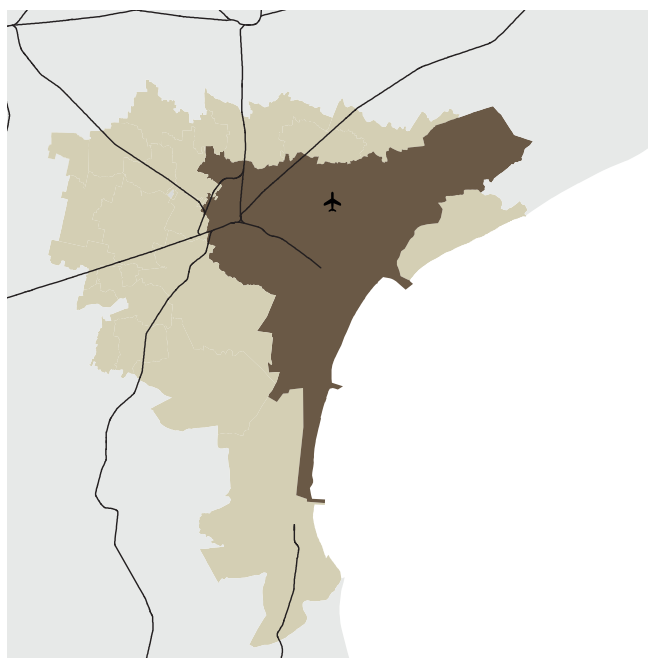


CORE LUZ

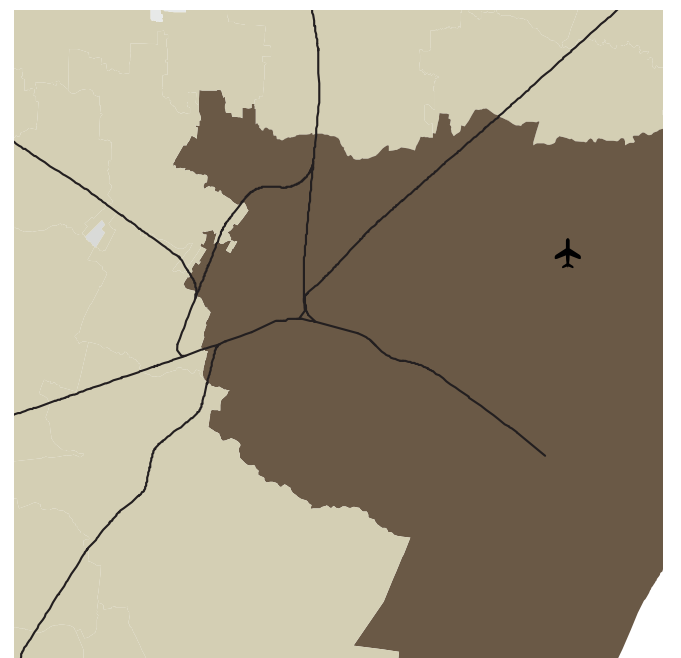
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



673
kg
-2%
(2000-2011)

WASTE
Annual waste collection per capita (Core City) - Istat 2011

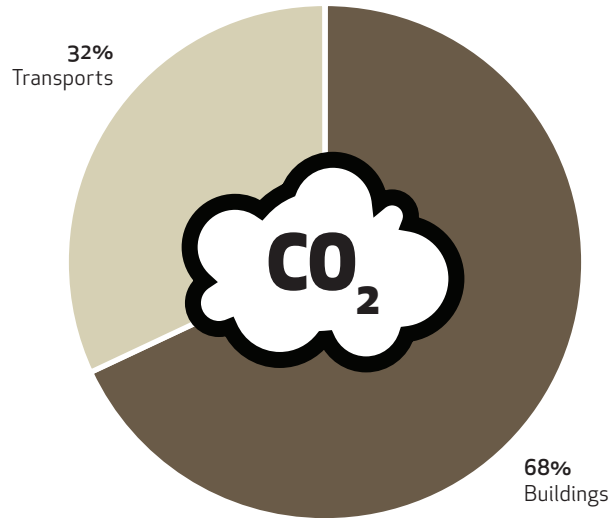


36%
+90%
(2000-2011)

WASTE SORTING
Waste sorting % (Core City) - Istat 2011



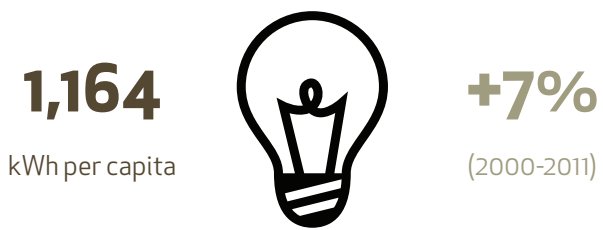
AIR EMISSIONS
Annual CO₂ emissions (Core City) - SEAP 2012 (2005)



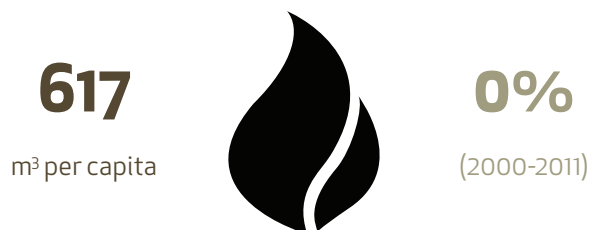
CO₂ emissions split (Core City) - SEAP 2012 (2005)



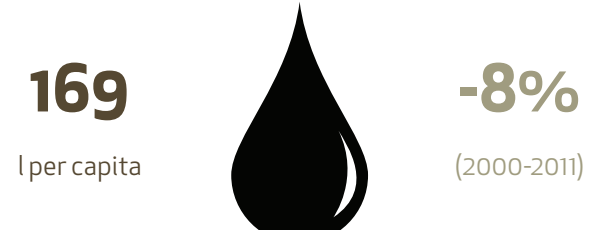
Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013



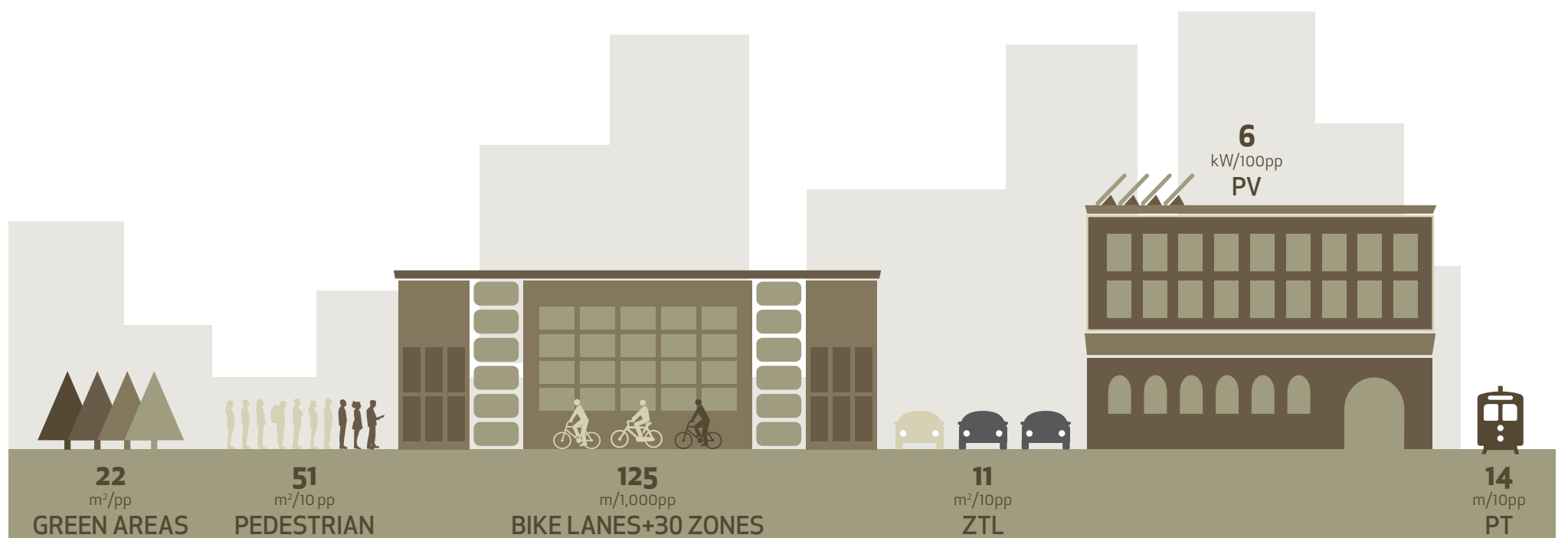
ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011



GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011



WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-23%

+

15%

public transport supply

272,256

MWh saved from energy
efficiency of residential buildings

+

69 km

bike lanes

PV installation to produce

49,338

kWp

Alternative Maritime Power to
simultaneously supply

4

large cruise ships

TRIESTE

Region

Friuli-Venezia Giulia

Municipalities

6

Larger Urban Zone area

212 km²

Core City area

84 km²



Trieste is the capital city of the Friuli Venezia Giulia region, an important rail and seaport at the high end of the Adriatic Sea making it a strategic city in southern and middle east Europe. The metropolitan city, which includes 6 municipalities, covers an area of approximately 212 km² and has a population of approximately 232,601 people (2011 Istat survey), of whom 202,123 live in the City of Trieste.

Located by the Carso mountains, overlooking the homonymous gulf it has origins dating back to the prehistoric settlements of the Castellieri. Conquered by the Romans in the second century BC the city fell under Roman law with the name of Tergeste. Following the imperial splendor the city faced a slow decline, occupying a marginal

role until the establishment of the sea port under the Hasburg Monarchy (1719). Incorporated into the Kingdom of Italy after the First World War, it is now a strategic land-sea exchange hub between the markets of Middle Eastern Europe and Asia.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a development of the urban structure which is aligned to the morphology of the territory for which urbanization has progressively occurred in the flat areas between the mountains.

The population of the Larger Urban Zone (LUZ) has gone from 297,003 people in 1951 to 232,601

people in 2011 (-21.7%), while at the same time, the Core City's population has gone from 272,522 to 202,123 (-25.8%). These figures, when compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

Detailed mapping of the western area of the City of Trieste clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of productive functions in the sea port area towards Muggia and the development of residential functions in the areas between the coast and the new elevated road.

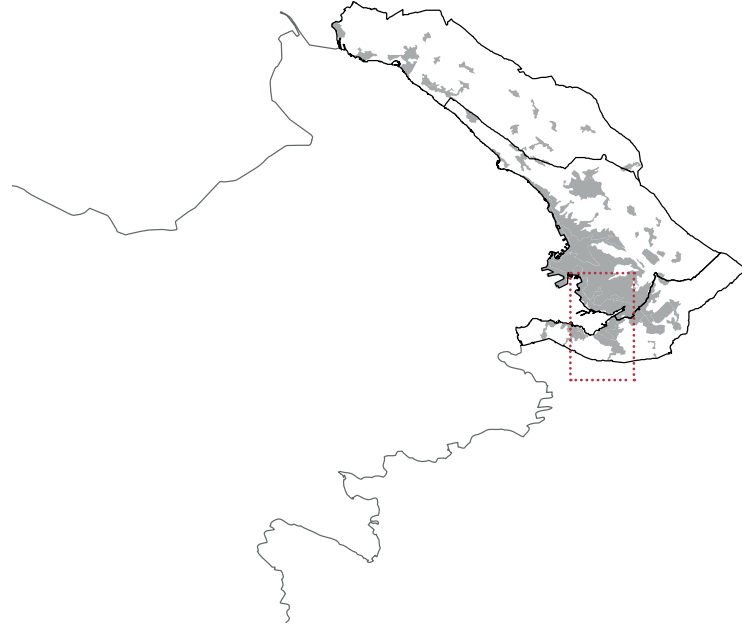


Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951
272,522
inhabitants

CORE CITY 2011
202,123
inhabitants

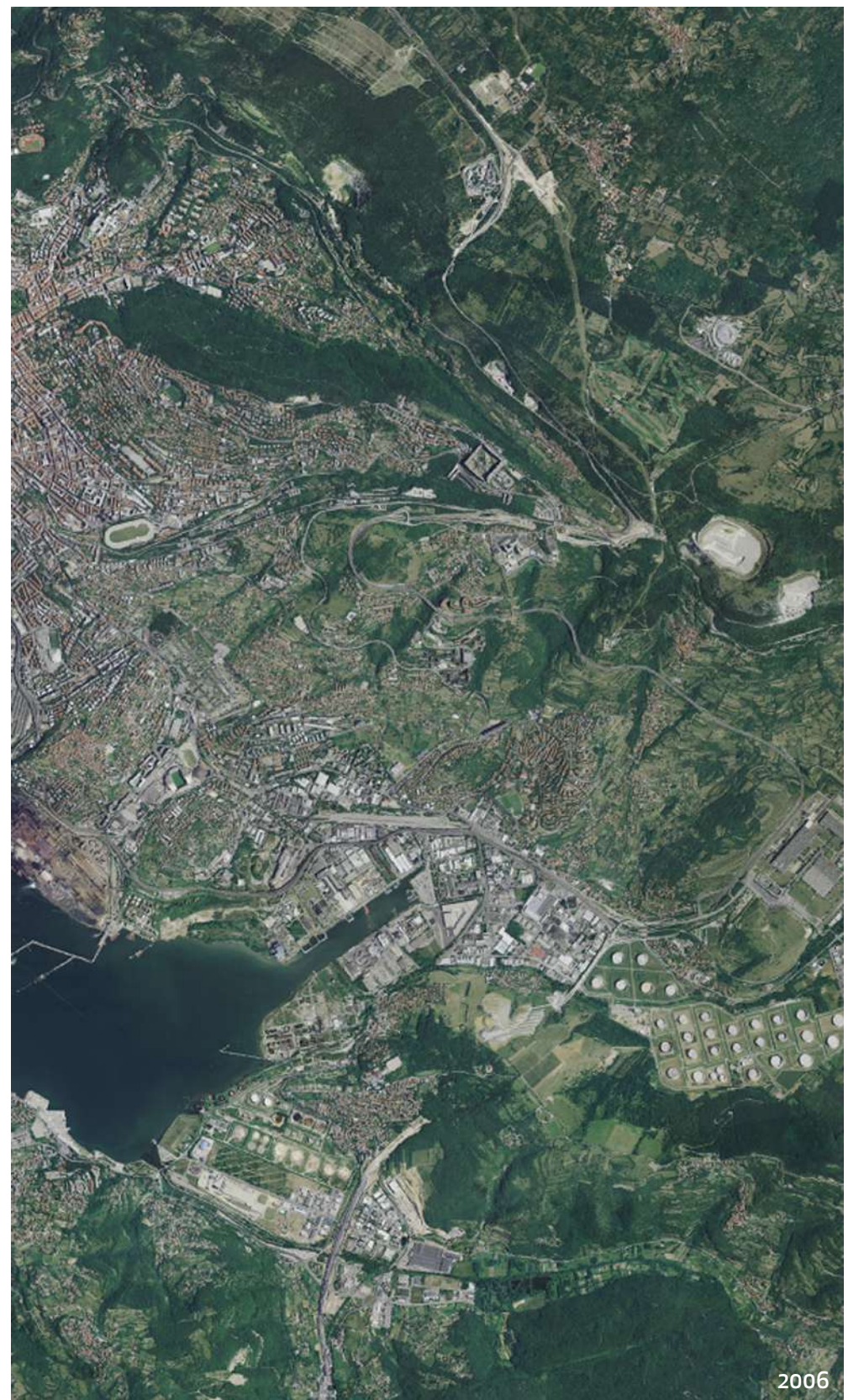


LUZ 1951
297,003
inhabitants

LUZ 2011
232,601
inhabitants



1955
Volo GAI



2006
Geoportale Nazionale

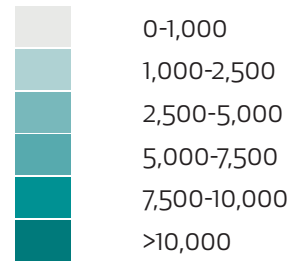
PEAK DENSITY
pp per km² - Core City

15,441

AVERAGE DENSITY
pp per km² - Core City

2,392

Population



URBAN DENSITY

PEAK DENSITY

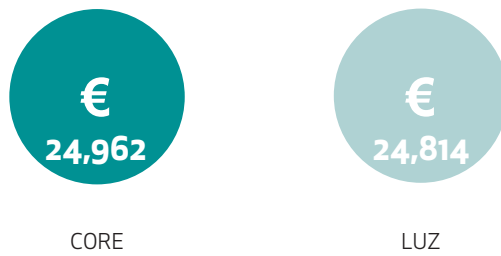
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Trieste, the ratio between the population of the Core City over the population of the LUZ goes from 91% in 1951 to 87% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a negative growth trend: in the Core City there is no growth from 1951 to 1971, while in the following two periods (1971-1991 and 1991-2011) there is a progressive decrease of population. In the neighboring municipalities there is a slight population growth from 1951 to 1991 while there is a reduction in population from 1991 to 2011.

In 2011 within the city of Trieste, the foreign population accounts for 8% of the total population (+74% over the last decade) and for 7% in the LUZ.

8%

+74%
(2001-2011)



7%

+64%
(2001-2011)

CORE

LUZ



4%

-5%
(2004-2011)

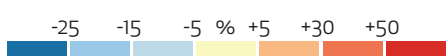
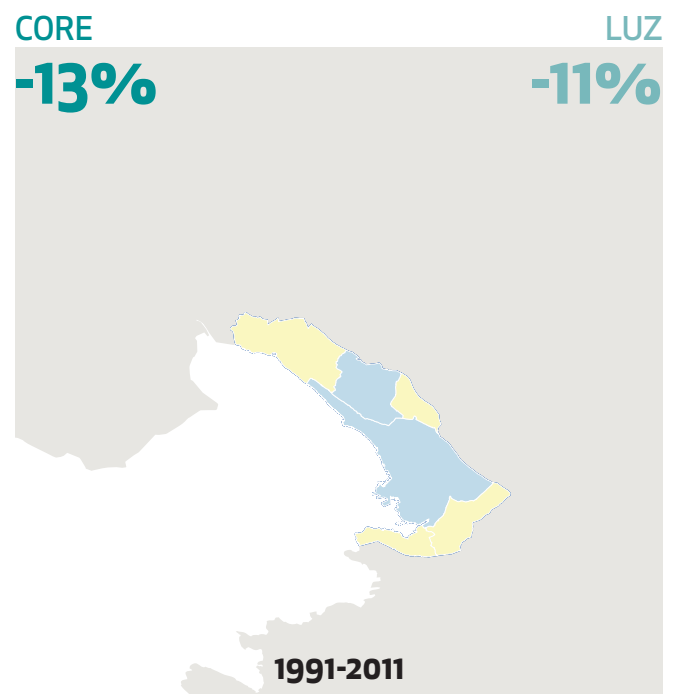
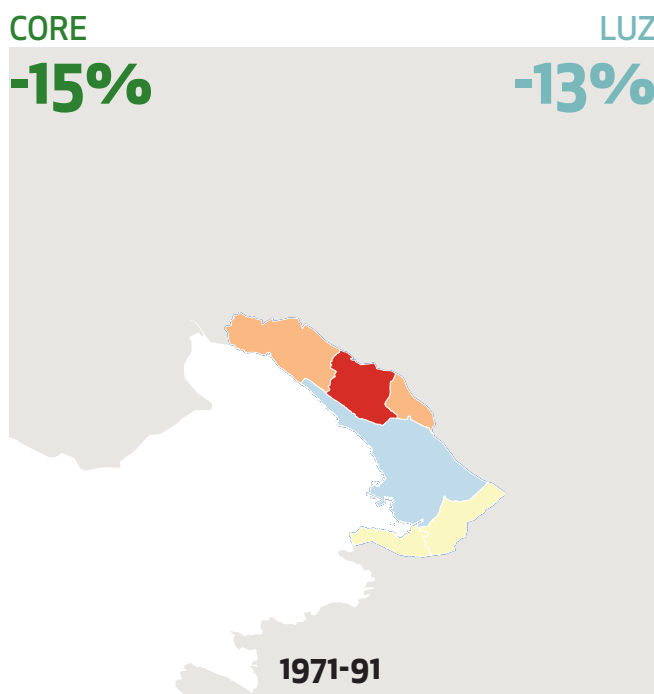
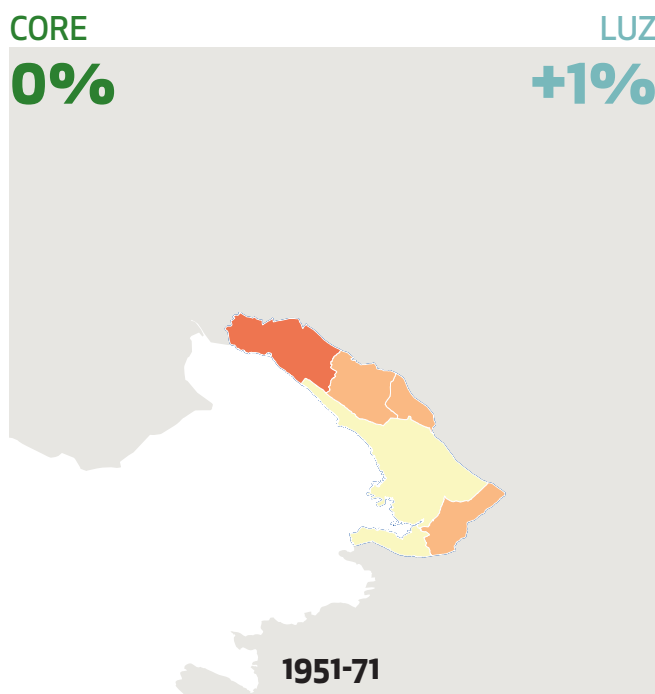
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

The metropolitan area of Trieste, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that 68% of travellers use private transport, 20% public transport and 12% walk or cycle within the LUZ; the data for the Core City are quite similar:

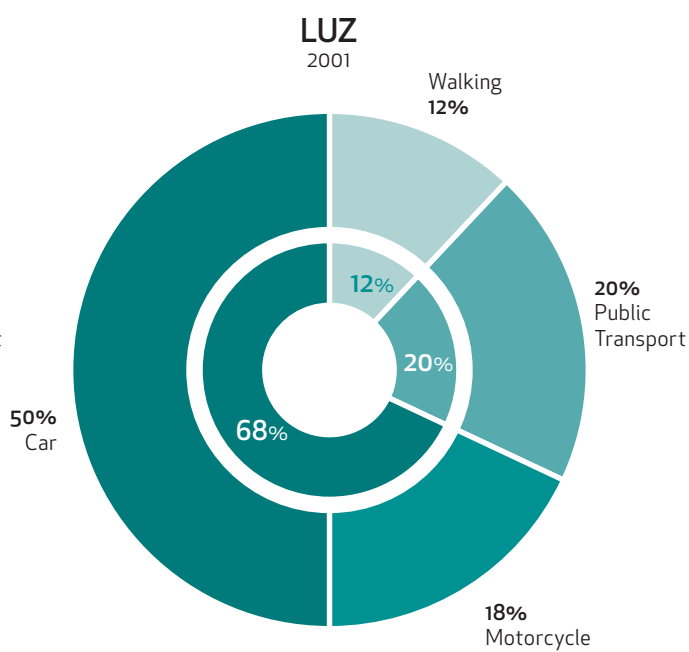
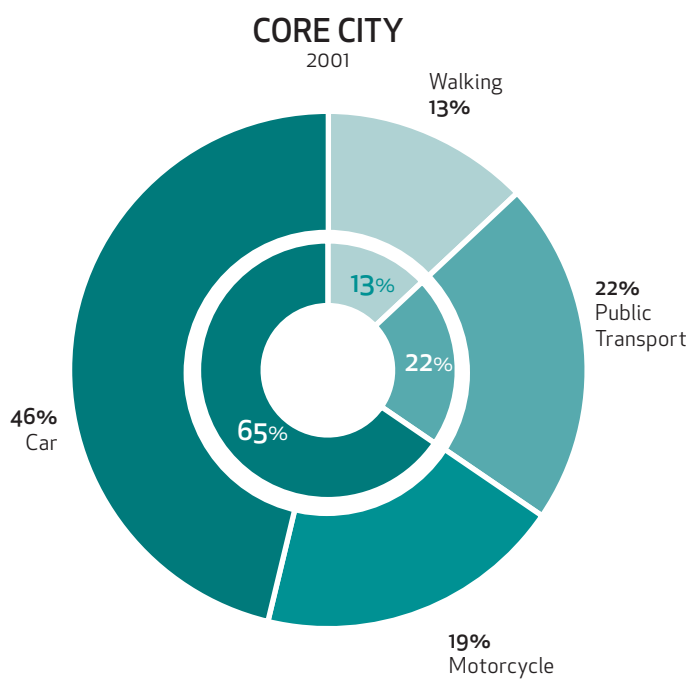
travellers using private transport are 65%, those using public transport 22% and the remaining 13% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more

than 15,000 people compared to circa 8,000 of outbound commuters. The motorization rate is within the national average, with 540 cars per 1,000 inhabitants in the LUZ and 526 in the Core City.



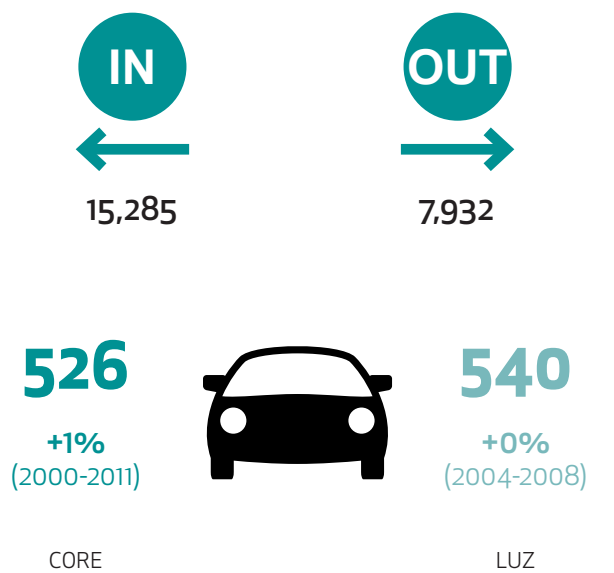
Image by Twice25



MODAL SPLIT
Eurostat 2001

COMMUTERS

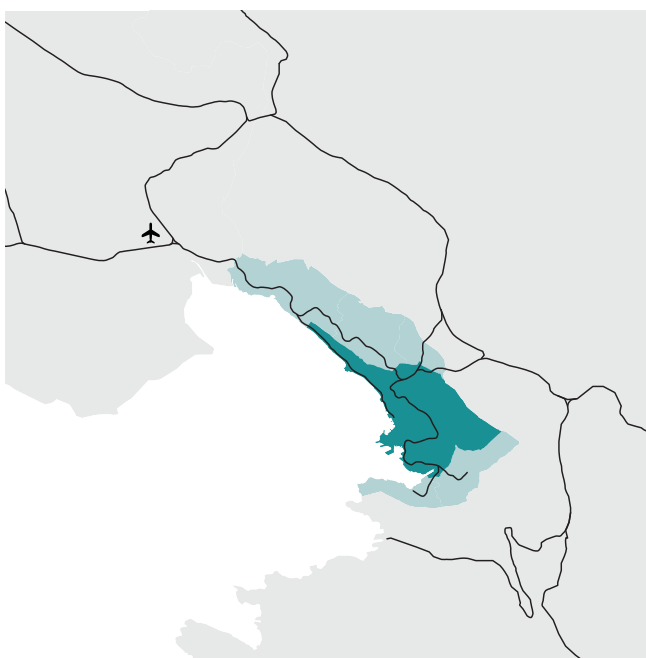
Daily commuters (Core City) - ISTAT 2001



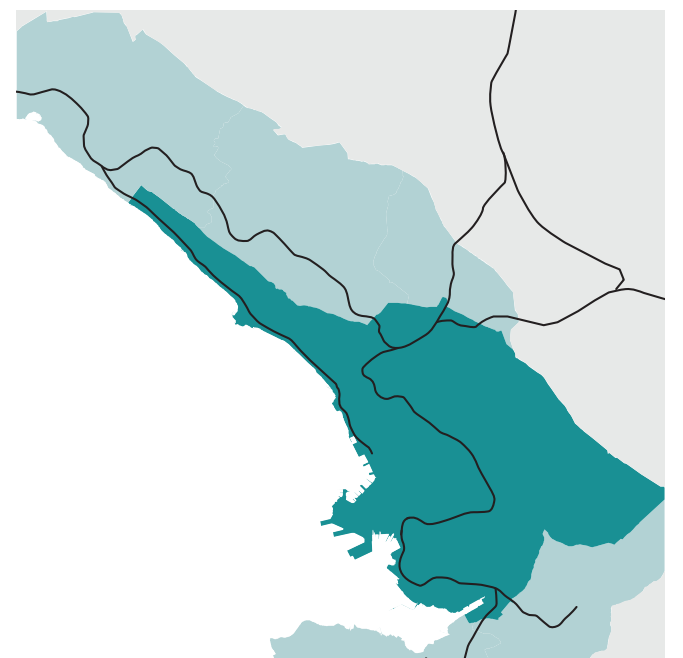
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



482
kg
+6%
(2000-2011)

WASTE
Annual waste collection per capita (Core City) - Istat 2011



25%
+114%
(2000-2011)

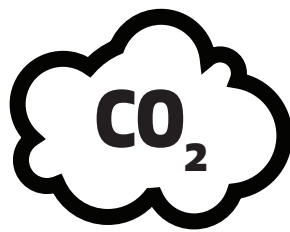
WASTE SORTING
Waste sorting % (Core City) - Istat 2011

N/D
kt



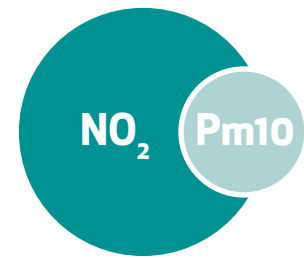
N/D
t per capita

AIR EMISSIONS
Annual CO₂ emissions (Core City)



CO₂ emissions split (Core City)

51
µg/mc



26
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,146
kWh per capita



+3%
(2000-2011)

ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011

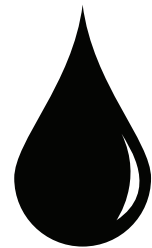
639
m³ per capita



+32%
(2000-2011)

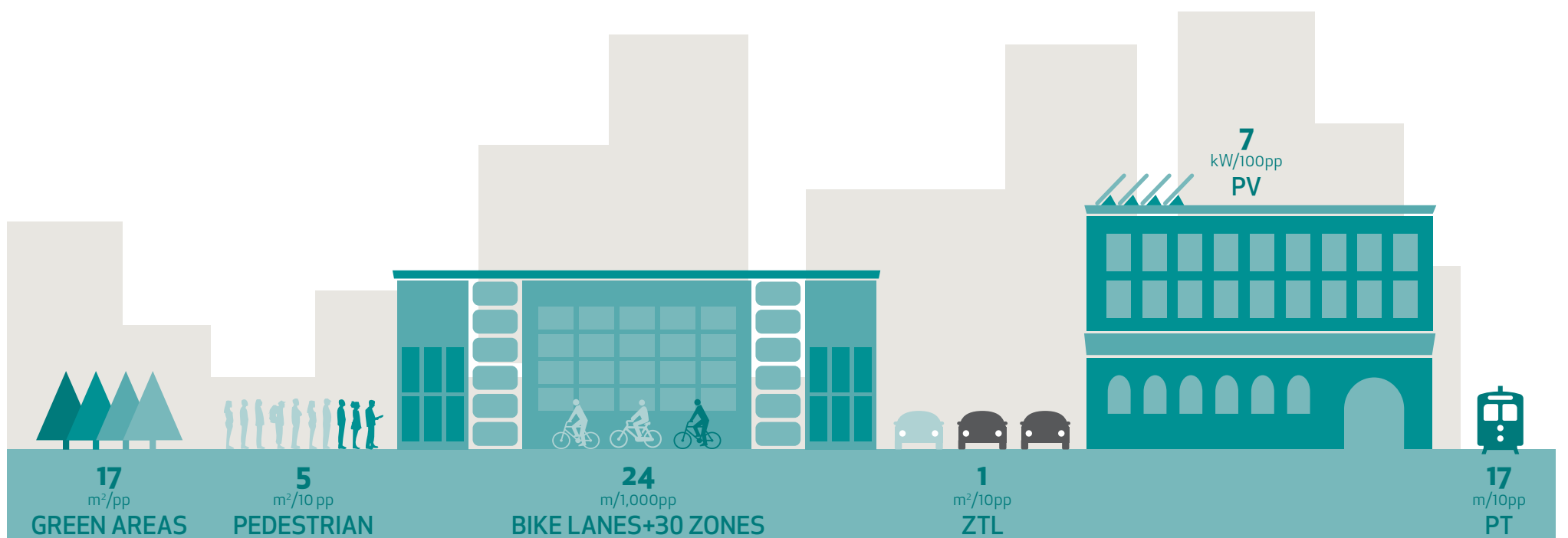
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011

181
l per capita



2%
(2000-2011)

WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

150%

limited traffic zones increase

**+
70 km**

bike lanes

m² of new pedestrian areas

40,000

**+
90%**

dedicated lanes for
public transport

BOLOGNA

Region

Emilia Romagna

Municipalities

32

Larger Urban Zone area

2,047 km²

Core City area

141 km²



Bologna is capital city of Emilia Romagna, the seventh biggest Italian city by population. The metropolitan area, which includes 32 municipalities, covers an area of about 2,047 km² and has a population of 768,093 people (2011 Istat survey, of whom 371,337 live in the Core City).

The city's name derives from Bononia, conferred to the city in 189 BC when the Romans turned it into a colony of Roman law, however the area of Bologna has been inhabited since the ninth century BC at first by the Etruscans (who named it Felsina) and later by the Gauls who fell under the Roman law in 196. The city, which is located in the Po Valley close to the Apennine hills between

the mouth of the Rhine valley and that of the Savena, is home to the oldest university in the Western world (1088).

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to merging of the capital city and the surrounding municipalities of the first belt along the direction of the Via Emilia, defining a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 575,079 in 1951 to 768,093 in 2011 (+33.5%), while at the same time, the Core City's population has grown from 340,526 to

371,337 (+9%); these figures, when compared to the changes in the land use show a clear gap between the numerical and physical growth of the city.

Detailed mapping of the northern area of the city of Bologna clearly shows the extension of urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of manufacturing-production functions along the axis of the A13 motorway and the merging between the town of Castel Maggiore and Bologna.



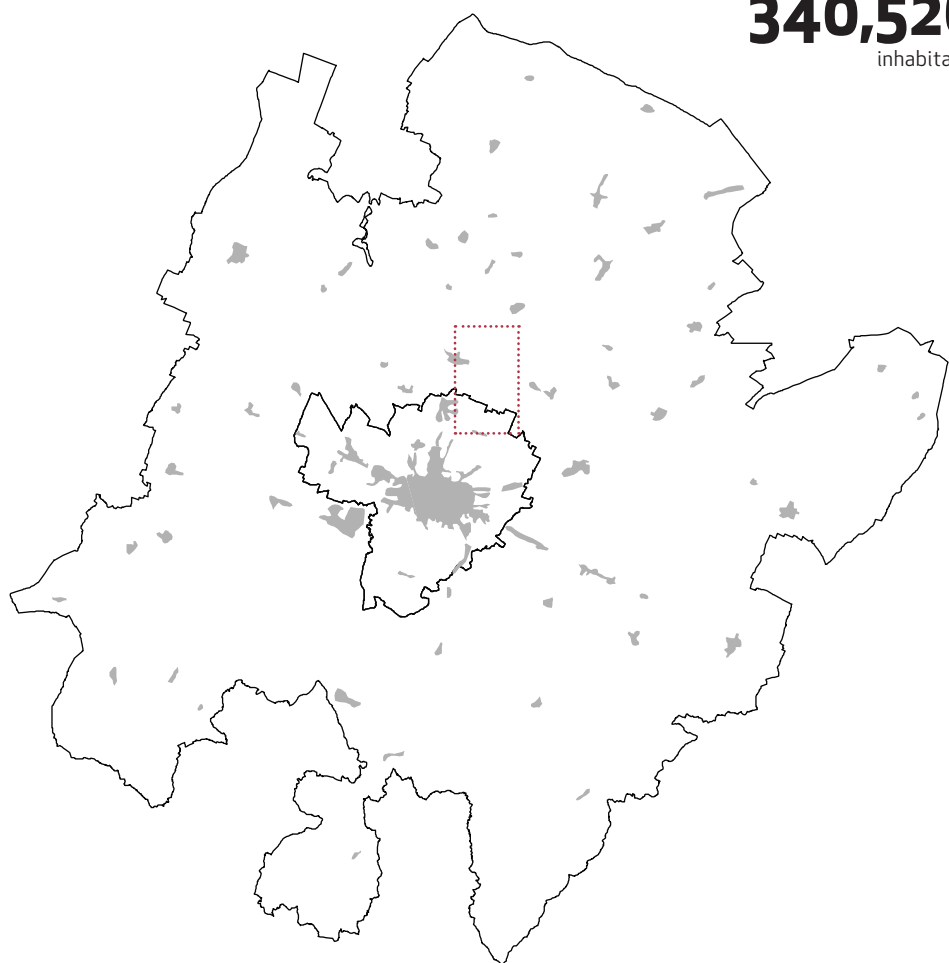
Image by Steffen Brinkmann

Urban Footprint

IGM 1960/Corine Land Cover 2006

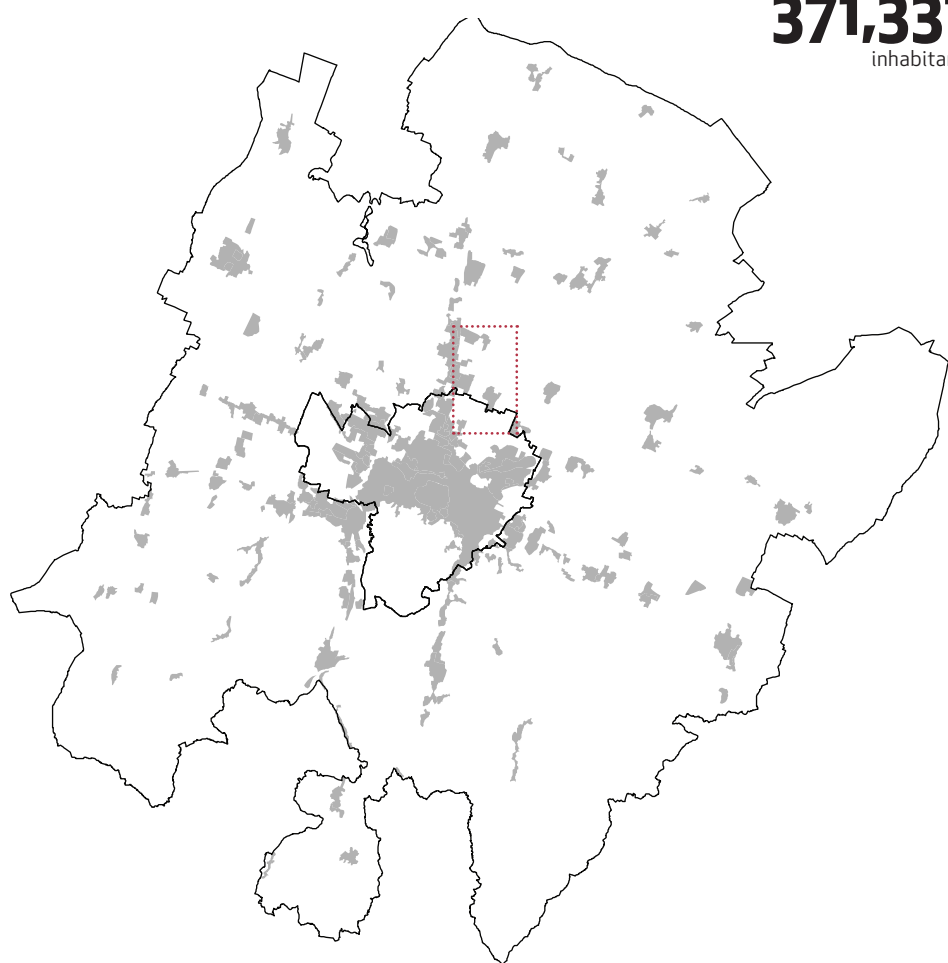
CORE CITY 1951

340,526
inhabitants



CORE CITY 2011

371,337
inhabitants

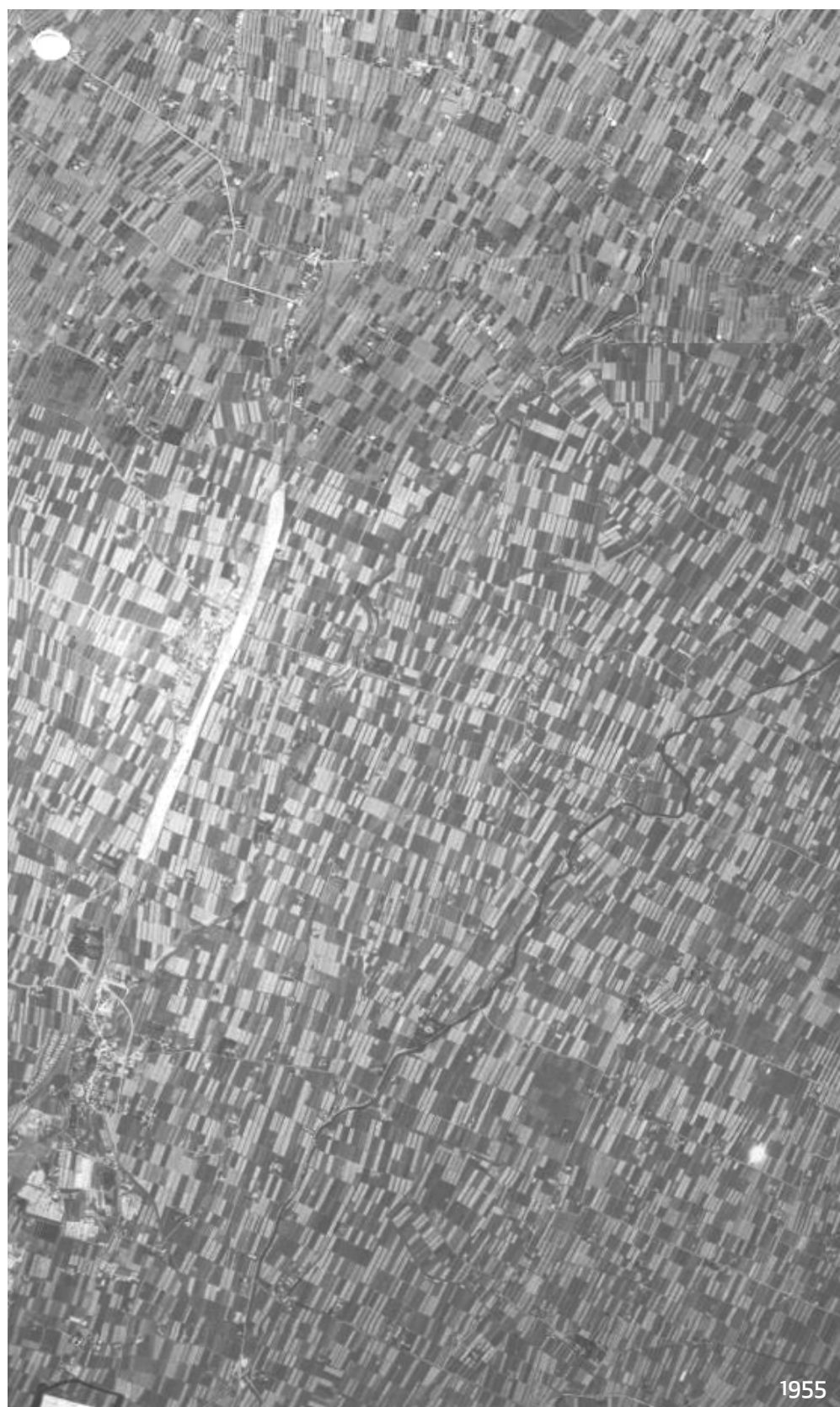


LUZ 1951

575,079
inhabitants

LUZ 2011

768,093
inhabitants



1955

Volo GAI



2006

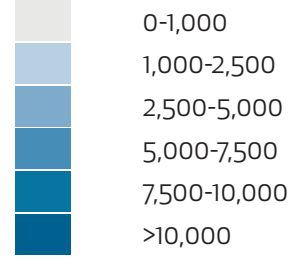
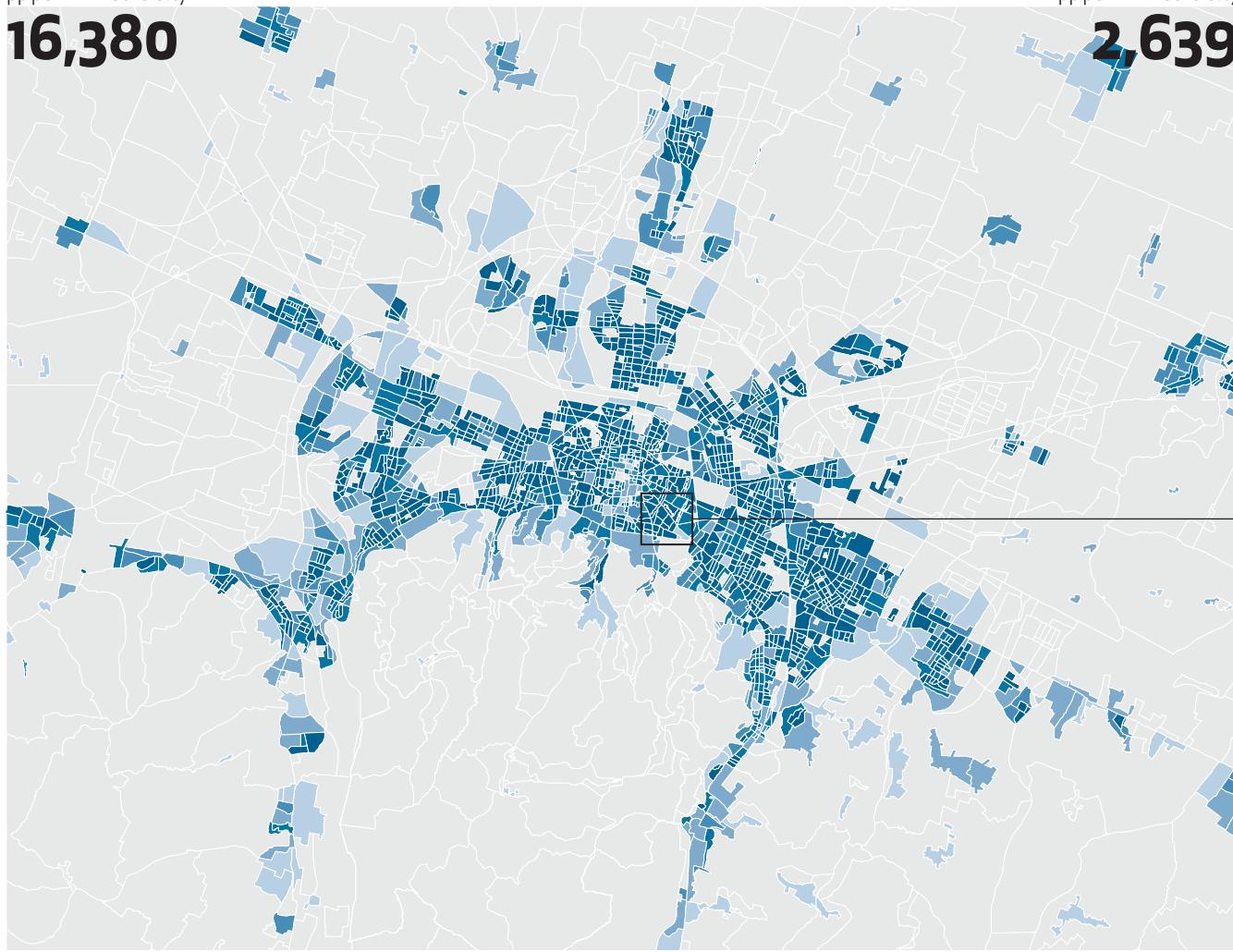
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

16,380

AVERAGE DENSITY
pp per km² - Core City

2,639



Population

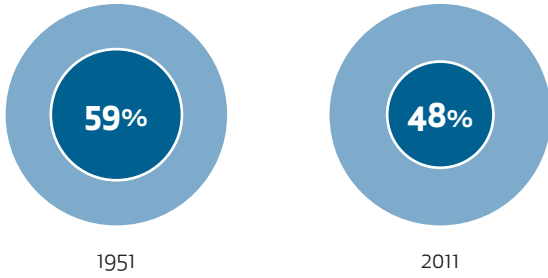


URBAN DENSITY

PEAK DENSITY

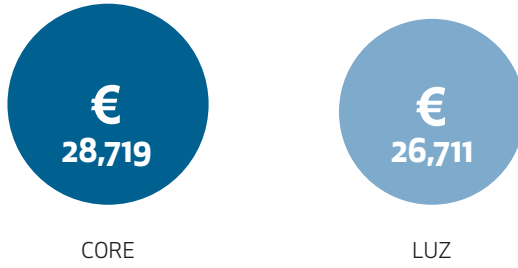
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Bologna, the ratio between the population of the Core City over the population of the LUZ goes from 59% in 1951 to 48% in 2011.

Changes in population within the LUZ, in the three analyzed timeframes highlight a common trend in many Italian cities: a population growth in the Core City from 1951 to 1971 is followed by a progressive reduction during the following two periods (1971-1991 and 1991-2011) when population growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Bologna, the foreign population accounts for 12% of the total population (+208% over the last decade), while in the LUZ it accounts for 10%.

12%

+208%
(2001-2011)

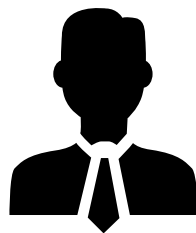


10%

+200%
(2001-2011)

CORE

LUZ



5%

+60%
(2004-2011)

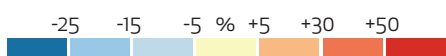
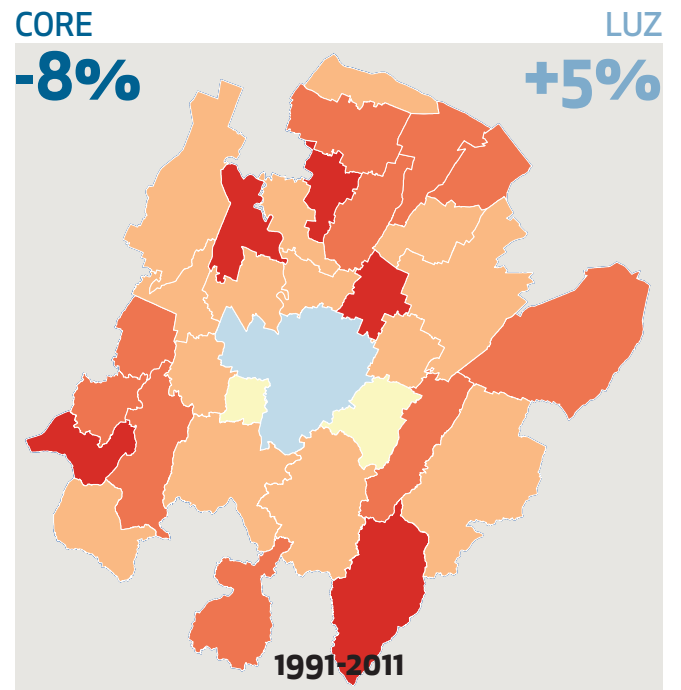
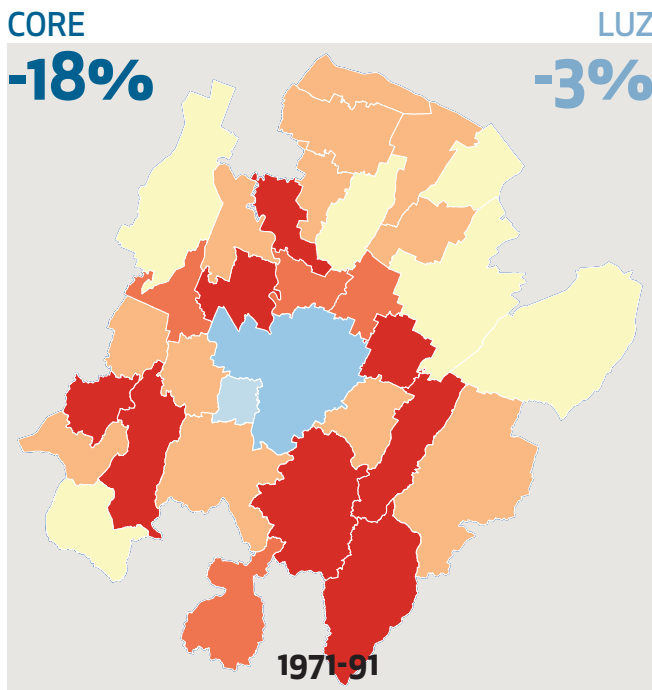
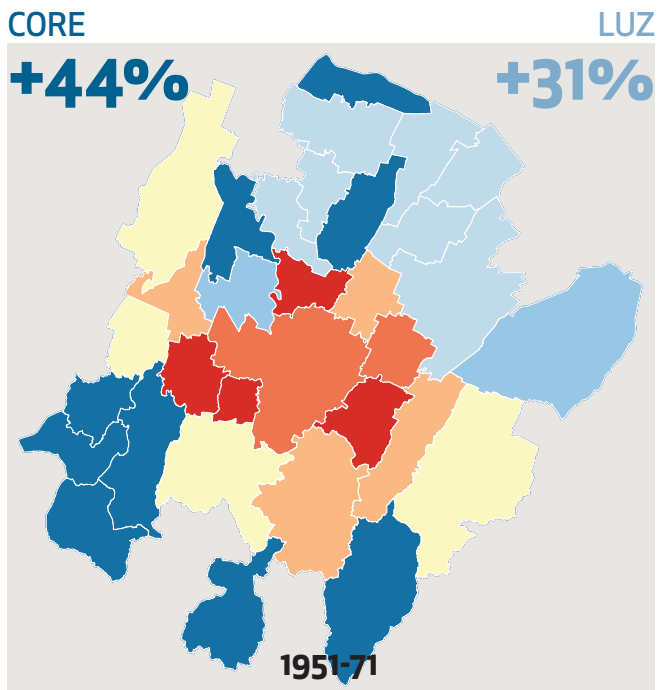
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



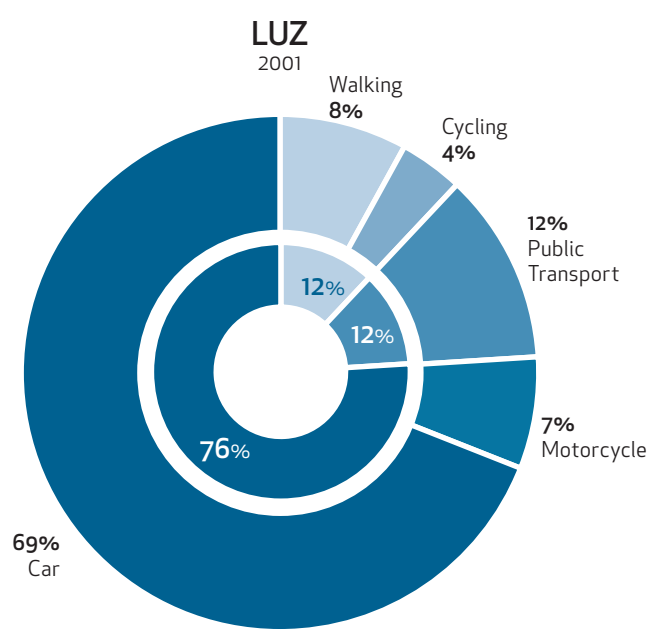
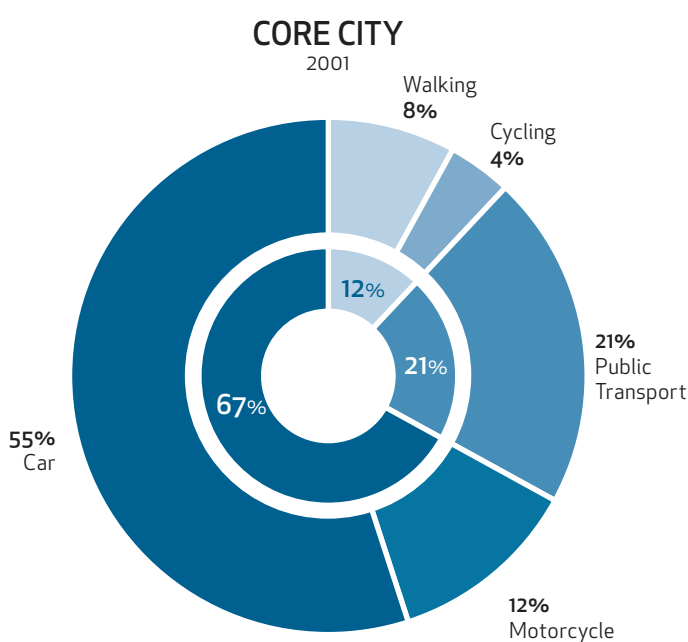
DEMOGRAPHIC CHANGES

Mobility

The metropolitan area of Bologna, as shown in the images below, is served by a good rail and road infrastructure, which connects the city to the rest of the country along the Via Emilia and the Firenze – Padova axis. The modal split chart shows that 76% of travellers use private transport, 12% public transport and 12% walk or cycle within the LUZ; the data for the Core City is different due to the increase in public transport: travellers using private transport are 67%, those using public transport 21% and the remaining 12% walk or cycle.

The data on commuting (for work and study) shows a daily inbound commute of 90,000 people compared to around 35,000 of outbound commuters. The motorization rate is very high, with 579 cars per 1,000 inhabitants in the LUZ and 520 in the Core City.

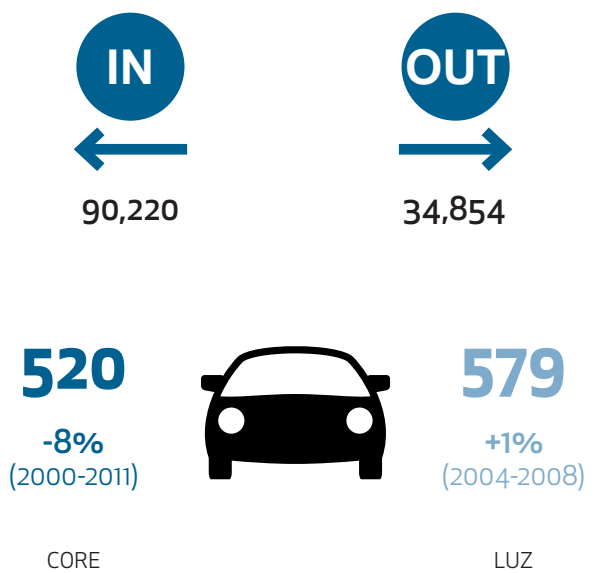
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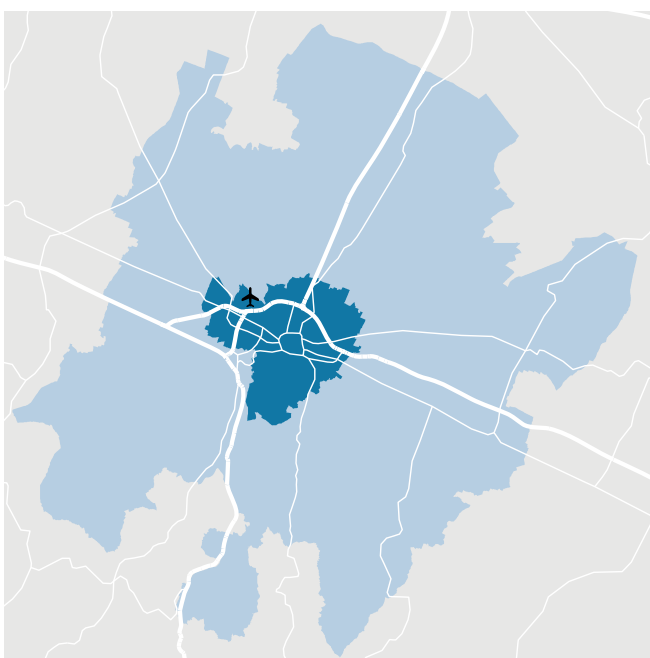
MODAL SPLIT
Eurostat 2001

COMMUTERS

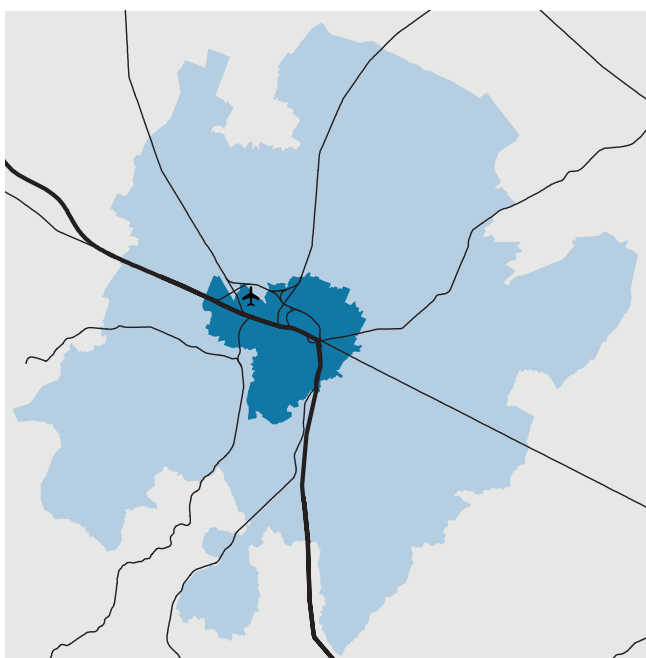
Daily commuters (Core City) - ISTAT 2001



CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



530

kg
-9%
(2000-2011)

WASTE

Annual waste collection per capita (Core City) - Istat 2011



35%

+69%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

2,289

kt

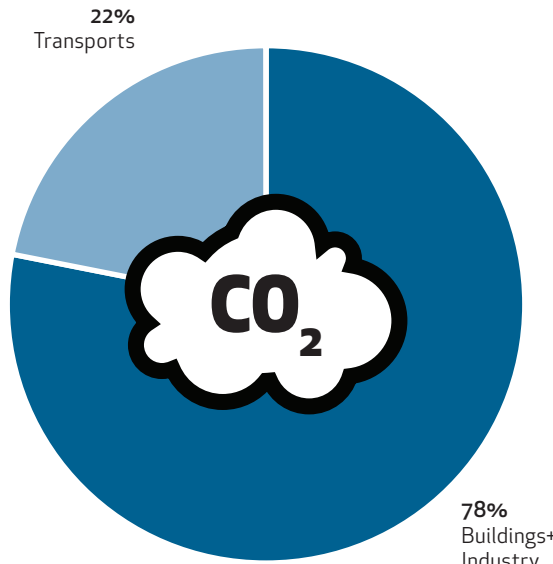


6.1

t per capita

AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2012 (2005)



CO₂ emissions split (Core City) - SEAP 2012 (2005)

43

µg/mc

NO₂

32

µg/mc

Pm10

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,272

kWh per capita



+1%

(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

613

m³ per capita



-4%

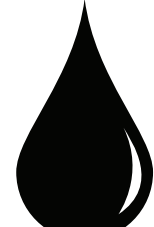
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

160

l per capita

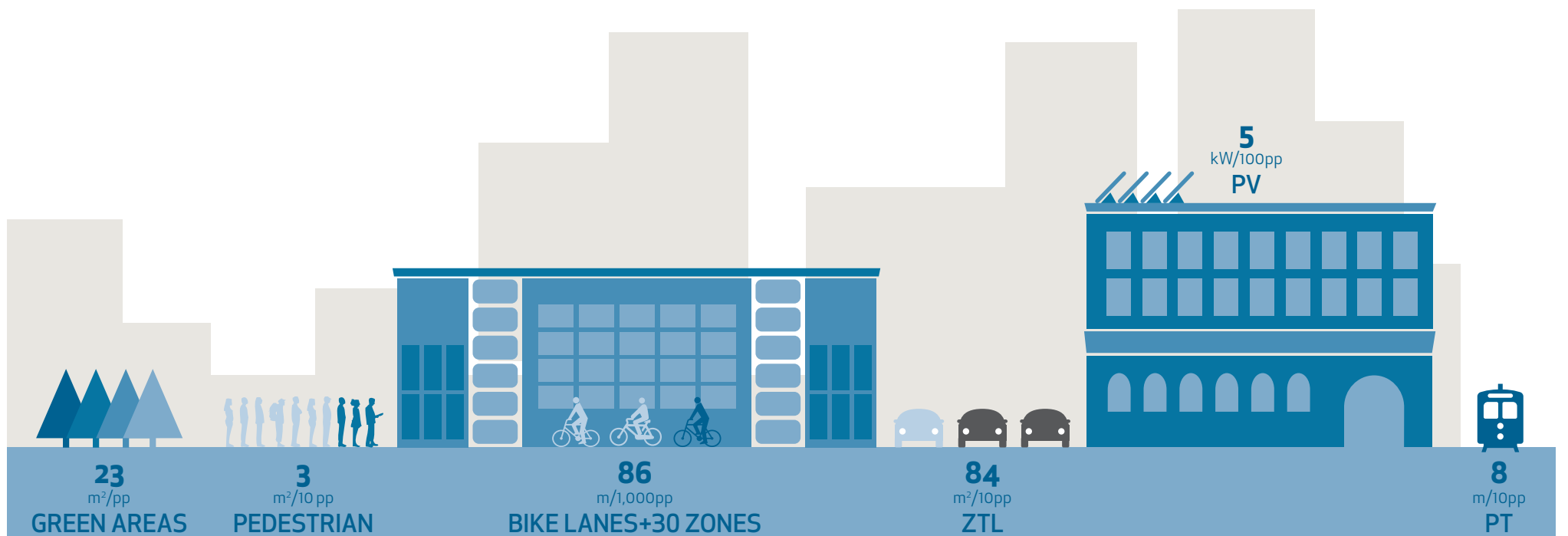


-13%

(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-21%

+

7%

commuting from private to
public transport

private investment for energy
efficiency of residential buildings

424

€ million

+

1,000

bike sharing vehicles

new trees

9,000

-34 l

daily domestic water
consumption per capita

FIRENZE

Region

Toscana

Municipalities

19

Larger Urban Zone area

1,263 km²

Core City area

102 km²



Firenze is the capital city of the Toscana region, the eighth Italian city by population. The metropolitan area, which includes 19 municipalities, covers an area of approximately 1,263 km² and has a population of approximately 694,979 people (2011 Istat survey), of whom 358,079 live in the City of Firenze.

The city is located in a plain crossed by the Arno River and surrounded by rolling hills. The name dates back to 59 BC when a settlement for veteran Roman soldiers was established with the name of Florentia. Following the alternation of Byzantine, Ostrogothic, Lombard and Frankish domination, in the Middle Ages, the city experienced a period of prosperity and it became an independent municipality in 1115.

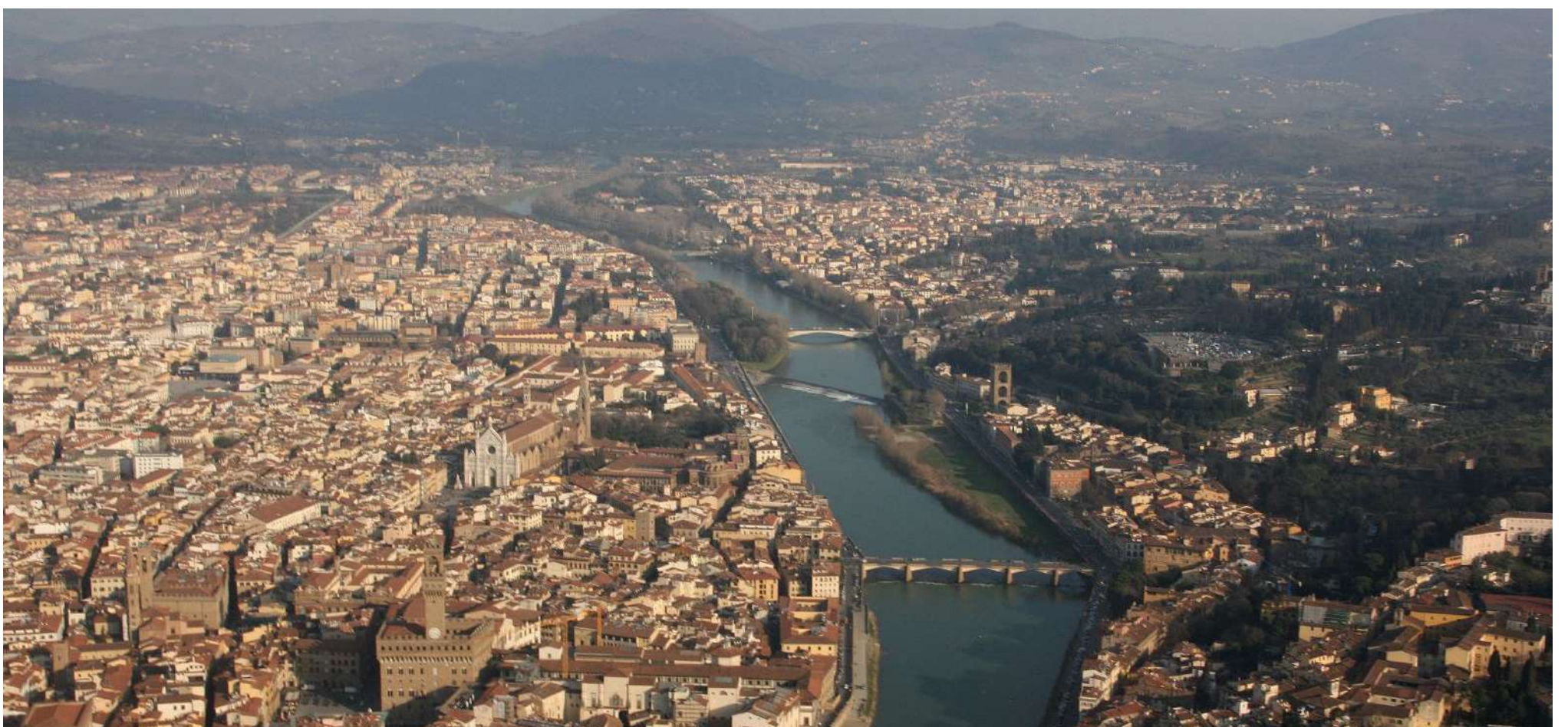
Capital of the Grand Duchy of Toscana under the rule of the Medici and Lorraine families, it is considered to be the cradle of the Renaissance. It was the capital of Italy from 1865 to 1871.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the merging of the city with the municipalities along Prato-Pistoia axis defining a dispersed urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 569,481 people in 1951 to 694,979 people in 2011 (+22%), while at the same time, the Core City's population has grown from 374,625 to 358,079 (-4.4%). These figures, when

compared to the changes in the land use, show a clear difference between the numerical and physical growth of the city.

Detailed mapping of the northern area of the city of Firenze clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of residential settlements on the south bank of the Arno river and the development of productive functions in the areas around the A11 motorway Firenze-mare.

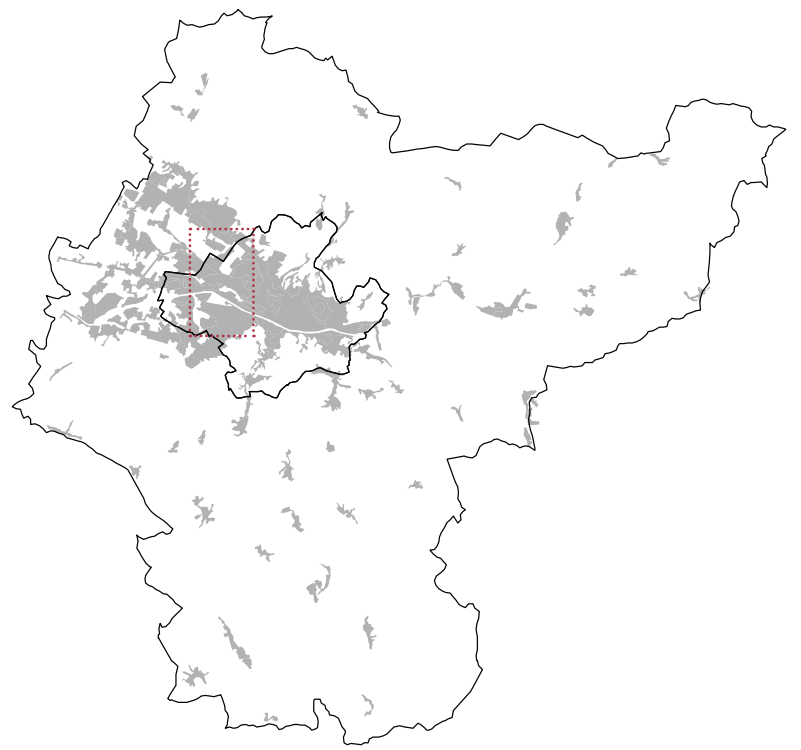
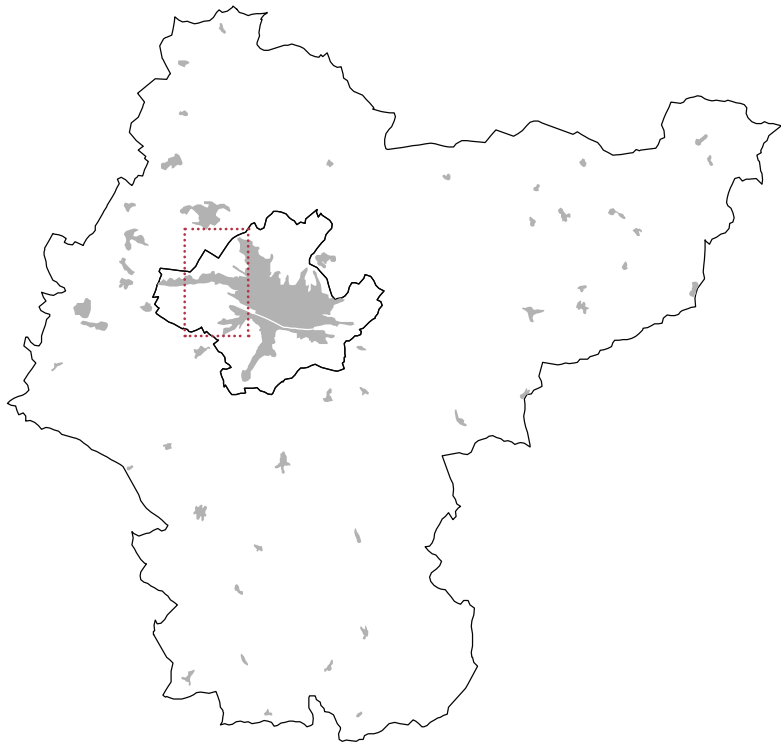


Urban Footprint

IGM 1960/Corine Land Cover 2006

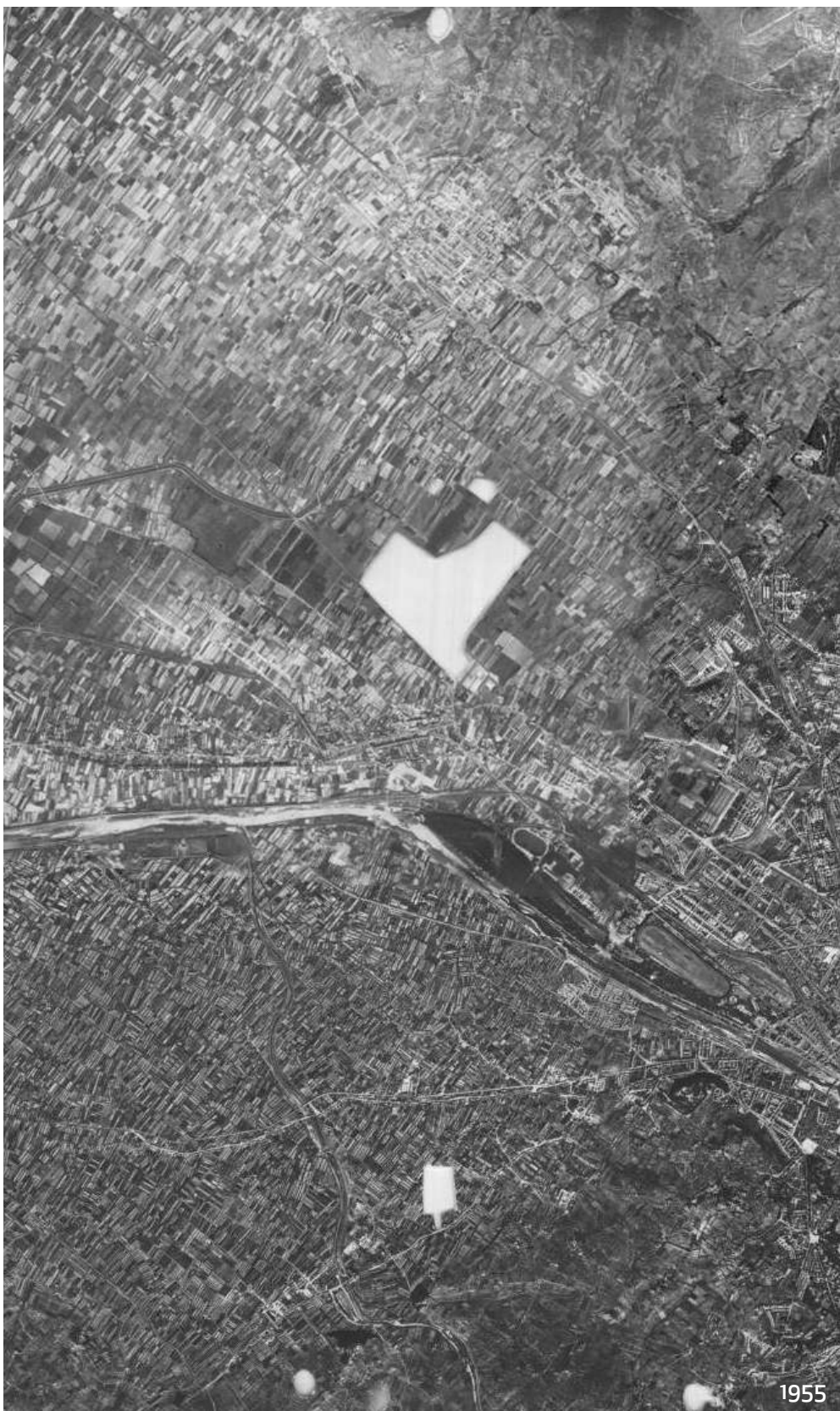
CORE CITY 1951
374,625
inhabitants

CORE CITY 2011
358,079
inhabitants



LUZ 1951
569,481
inhabitants

LUZ 2011
694,979
inhabitants



1955
Volo GAI



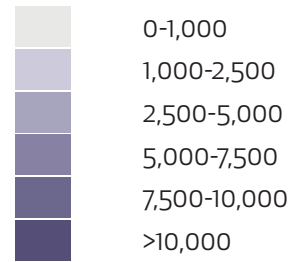
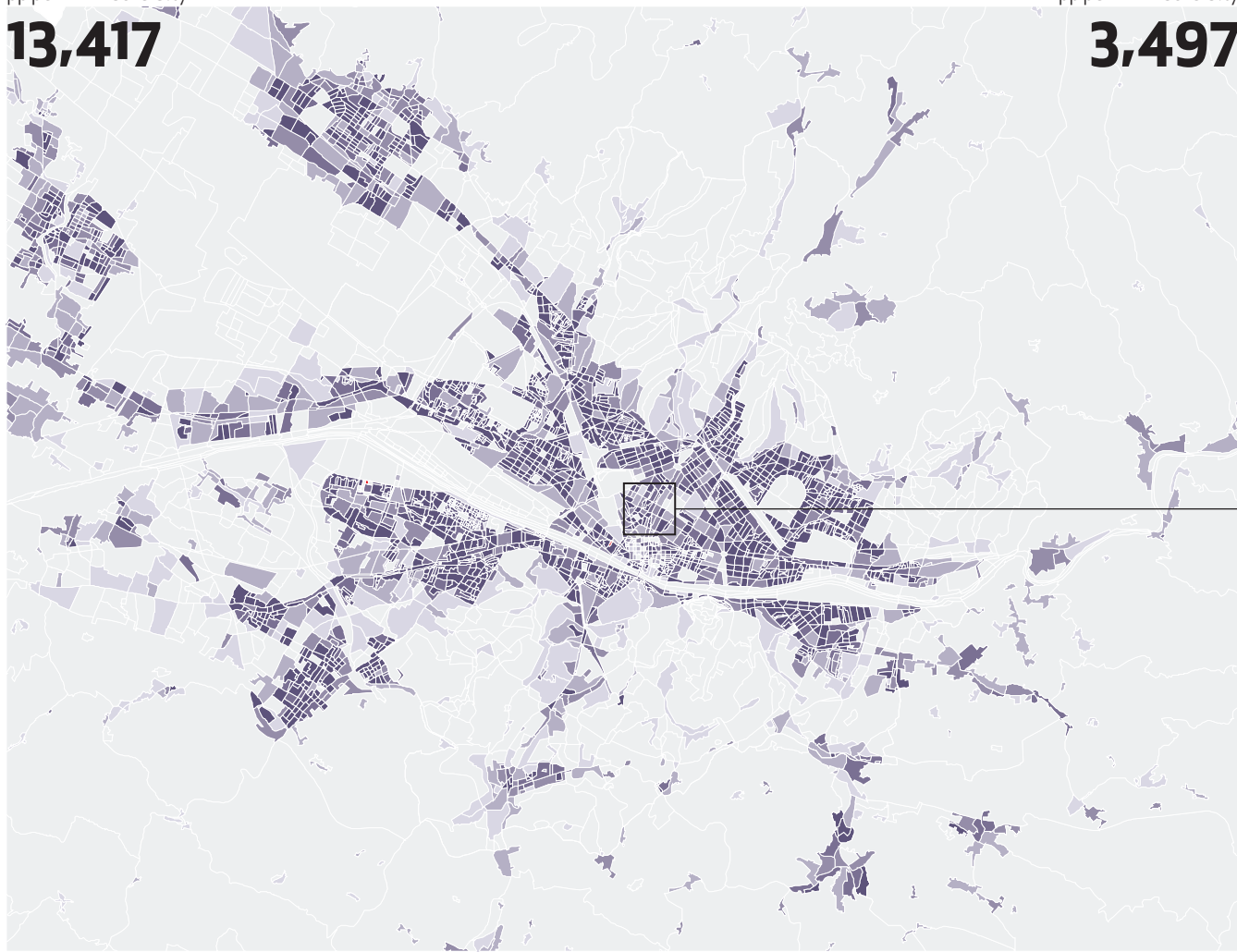
2006
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

13,417

AVERAGE DENSITY
pp per km² - Core City

3,497



Population



URBAN DENSITY

PEAK DENSITY

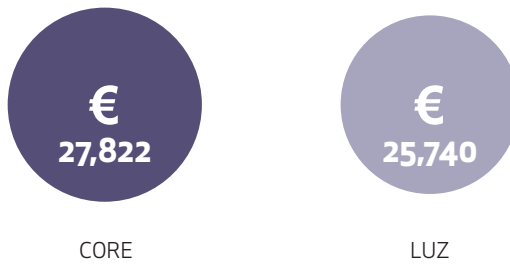
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Firenze, the ratio between the population of the Core City over the population of the LUZ goes from 66% in 1951 to 52% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years period show a growth in the Core City and in those municipalities of the first belt from 1951 to 1971, the following period (1971-1991) shows a decrease in population in the Core City which is extended to the surrounding municipalities in the last period (1991-2011).

In 2011 within the city of Firenze, the foreign population accounts for 12% of the total population (+130% over the last decade), while in the LUZ it accounts for 10%.

12%

+130%
(2001-2011)



10%

+151%
(2001-2011)

CORE

LUZ



5%

-2%
(2004-2011)

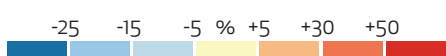
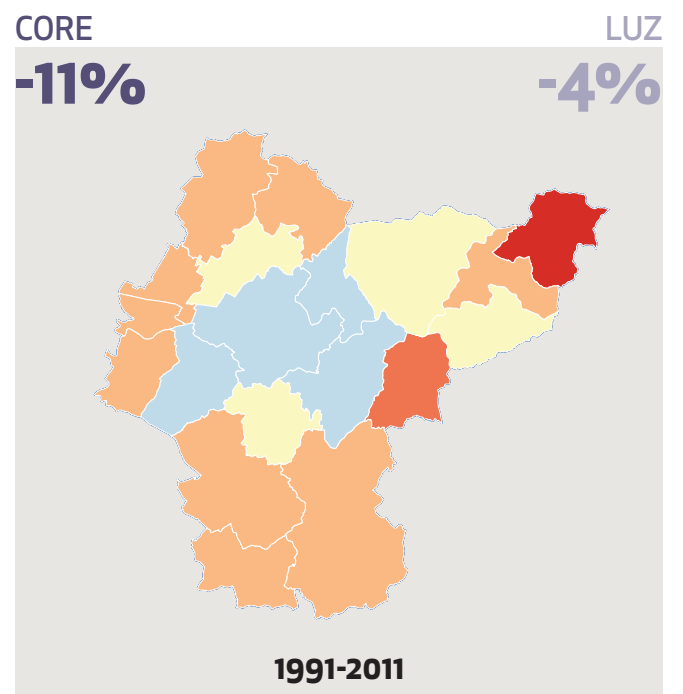
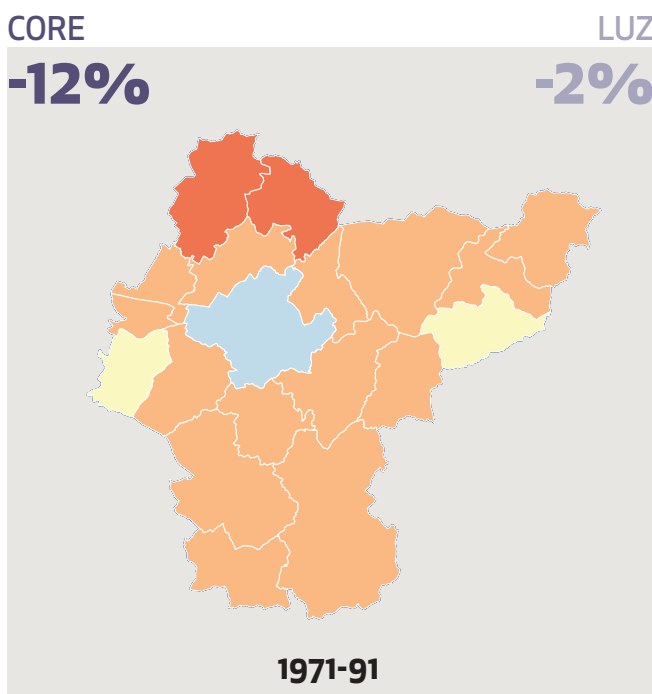
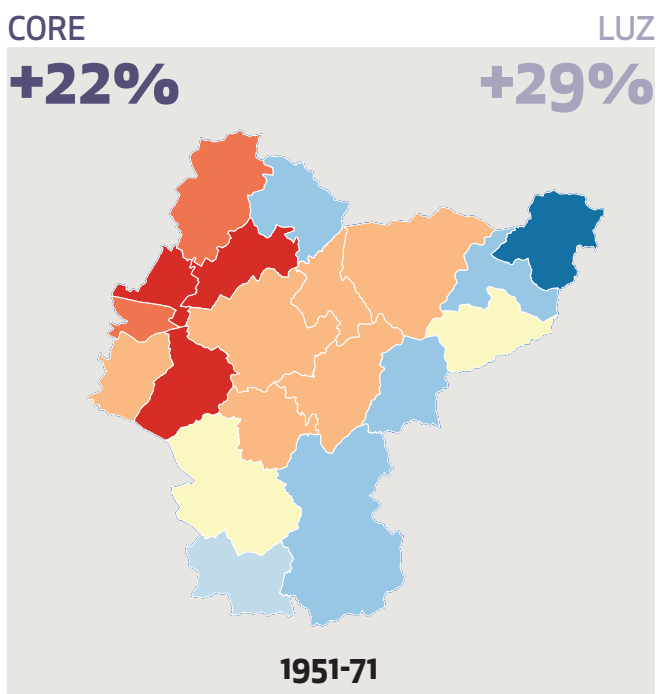
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



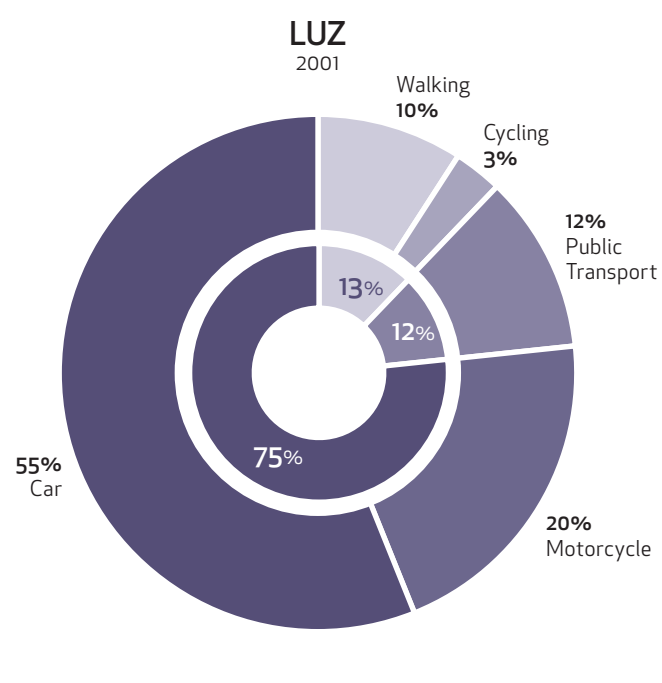
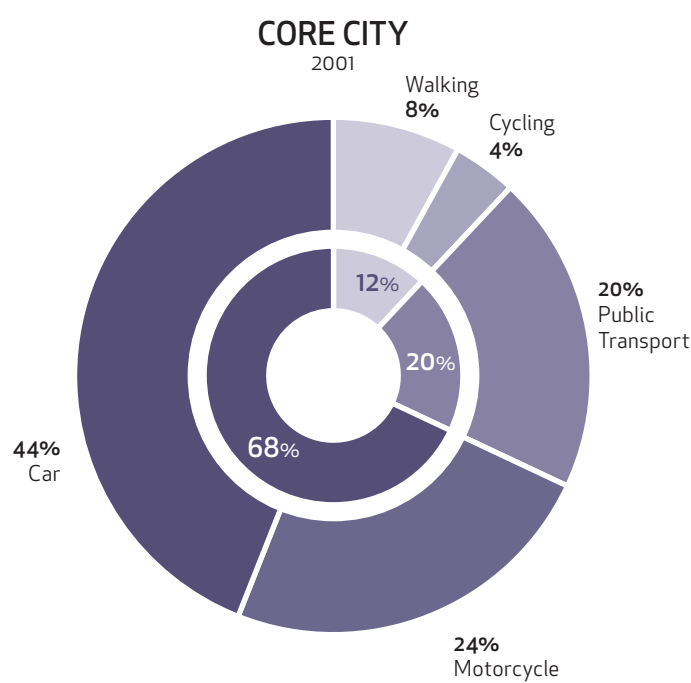
DEMOGRAPHIC CHANGES

Mobility

The metropolitan area of Firenze, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that 75% of travellers use private transport, 12% public transport and 13% walk or cycle within the LUZ; the data for the city core differs slightly

due to the increase in public transport: travellers using private transport are 68%, those using public transport 20% and the remaining 12% walk or cycle.

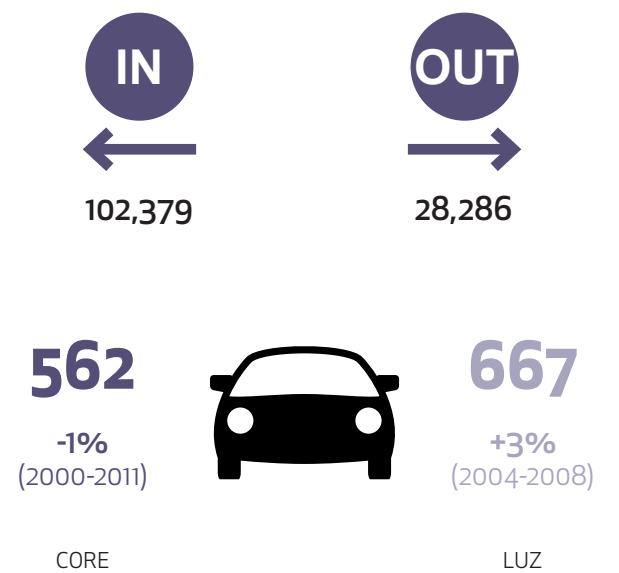
The data on commuting (for work and study) shows the daily inbound commute of more than 102,000 people compared to circa 28,000 of outbound commuters. The motorization rate is very high, with 667 cars per 1,000 inhabitants in the LUZ and 562 in the Core City.



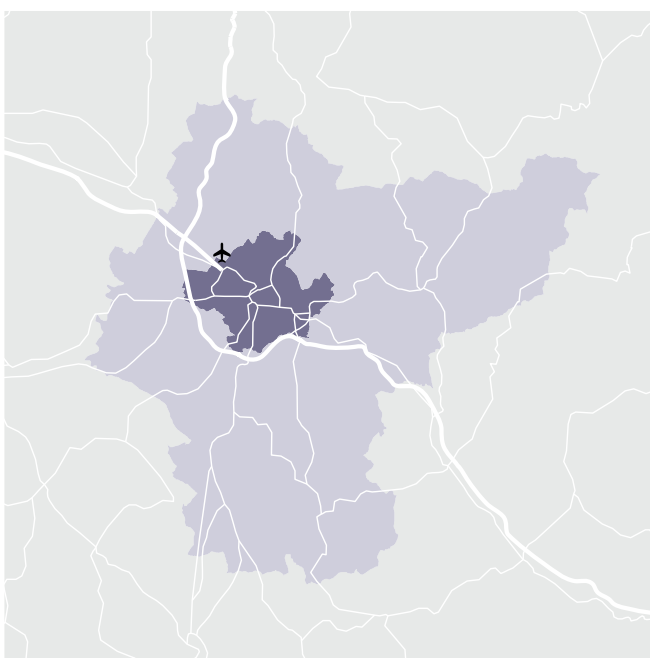
MODAL SPLIT
Eurostat 2001

COMMUTERS

Daily commuters (Core City) - ISTAT 2001



CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



662
kg
-2%
(2000-2011)

WASTE
Annual waste collection per capita (Core City) - Istat 2011



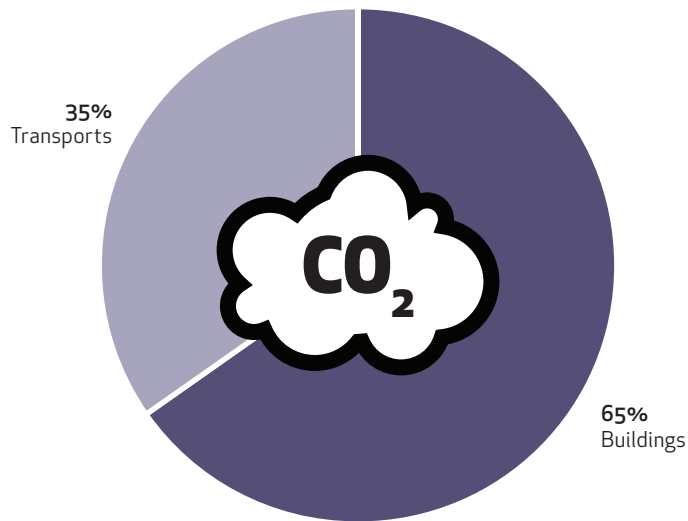
40%
+68%
(2000-2011)

WASTE SORTING
Waste sorting % (Core City) - Istat 2011

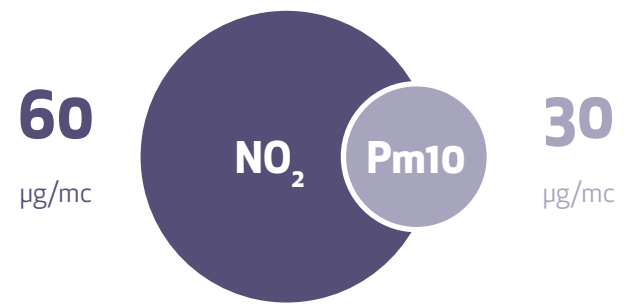


2,547
kt
6.9
t per capita

AIR EMISSIONS
Annual CO₂ emissions (Core City) - SEAP 2011 (2005)

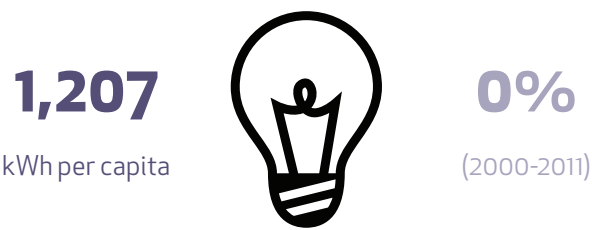


CO₂ emissions split (Core City) - SEAP 2011 (2005)



60
µg/mc
NO₂
30
µg/mc
Pm10

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013



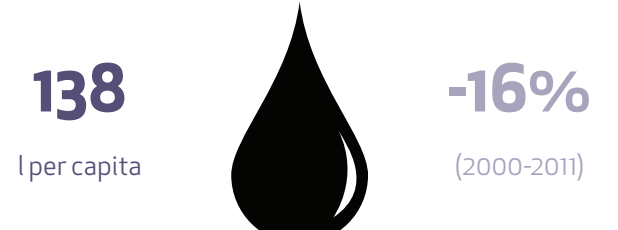
1,207
kWh per capita
0%
(2000-2011)

ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011



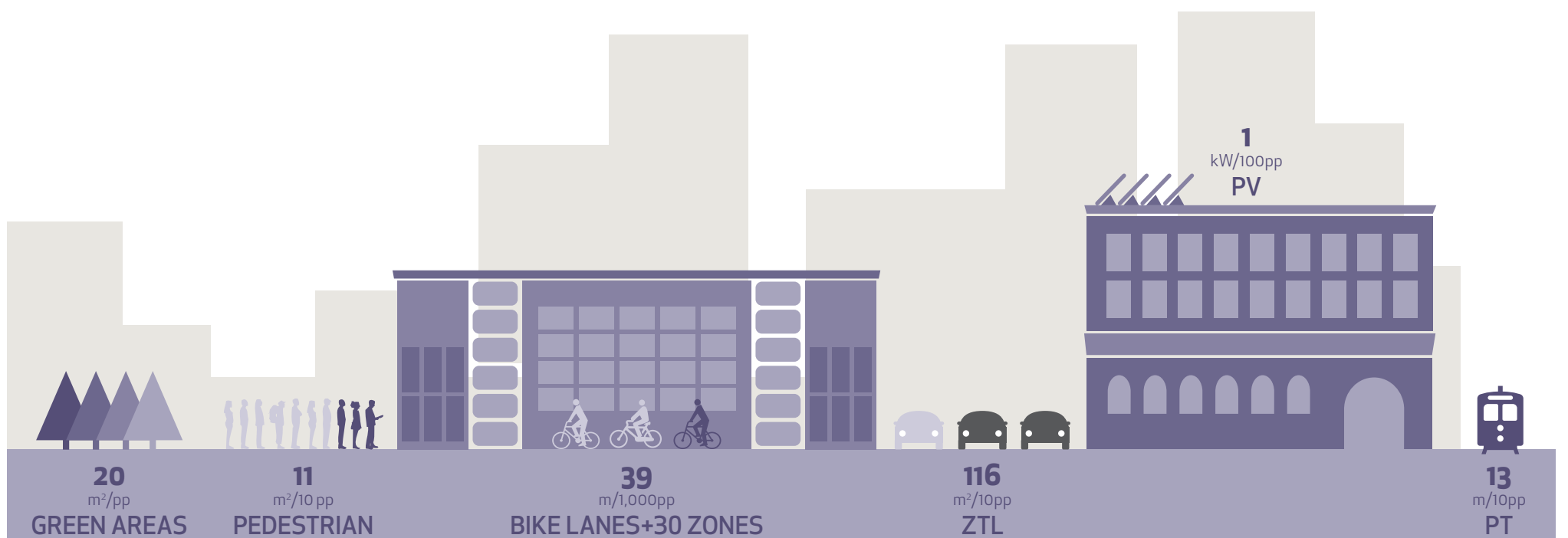
661
m per capita
+37%
(2000-2011)

GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011



138
l per capita
-16%
(2000-2011)

WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-20%

706

€ million of investment
for 3 new tramway lines

+

3,000

private electric vehicles

+

4,000

new cyclists

+

2,750

new trees

15%

street lighting energy saving

ROMA

Region

Lazio

Municipalities

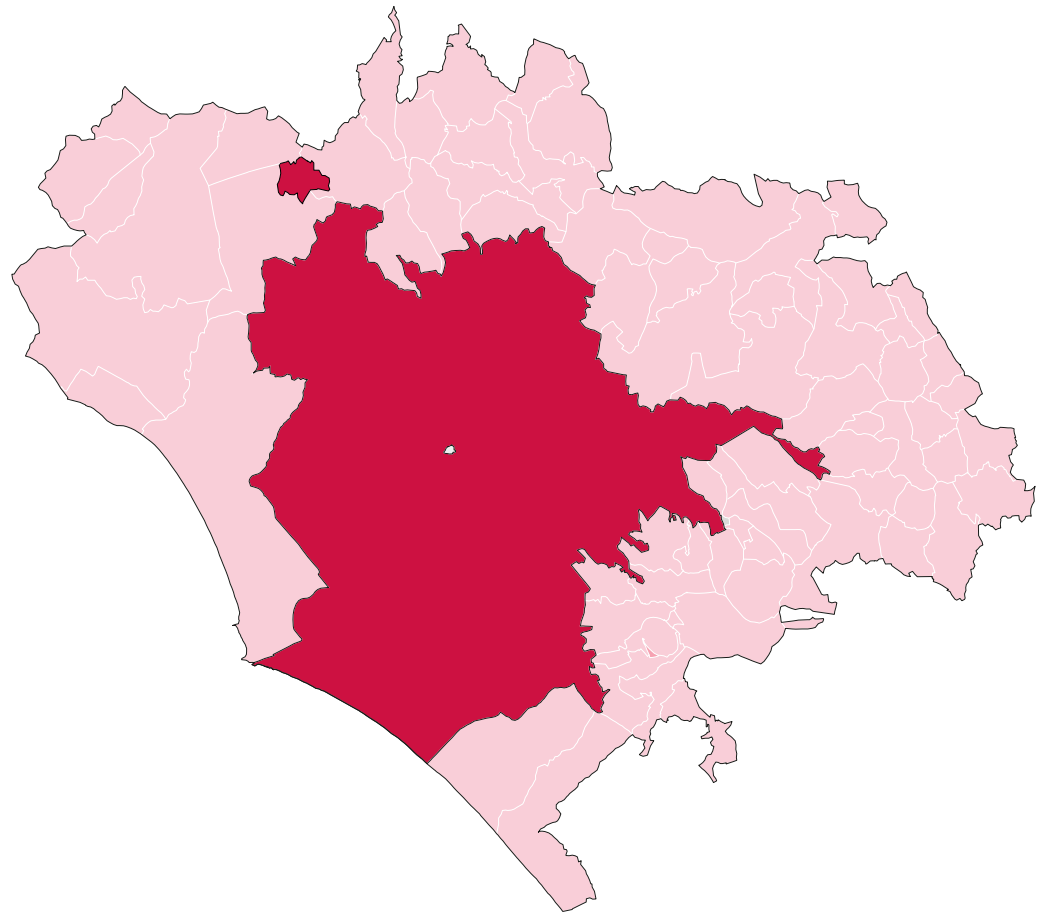
70

Larger Urban Zone area

3,667 km²

Core City area

1,308 km²



Roma is the capital city of the Lazio region and the capital of Italy, the first Italian city by population and extension. The metropolitan city, which includes 70 municipalities, covers an area of approximately 3,667 km² and has a population of approximately 3,626,271 people (2011 Istat survey), of whom 2,617,175 live in the City of Roma.

The city lies on the banks of the Tiber River in a plain surrounded by seven hills. Founded in 753 BC, following the expulsion of the last king in 509 BC, it became the capital of the Roman Empire which extended its dominion over the entire Mediterranean basin. Considered to have been the first great metropolis of humanity it is called

the “eternal city”. With the fall of the Roman Empire the city went through a long period of decline until the establishment of the Carolingian Empire in 800. Capital of the Papal States from the sixteenth century, it became the capital of the Kingdom of Italy in 1871.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development of the city through sprawl, creating a very large urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 1,939,912 people in 1951 to 3,626,271 people in 2011 (+86.9%), while at the

same time, the Core City’s population has grown from 1,626,793 to 2,617,175 (+60.9%). These figures, when compared to the changes in the land use, show a clear gap between the numerical and physical growth of the city.

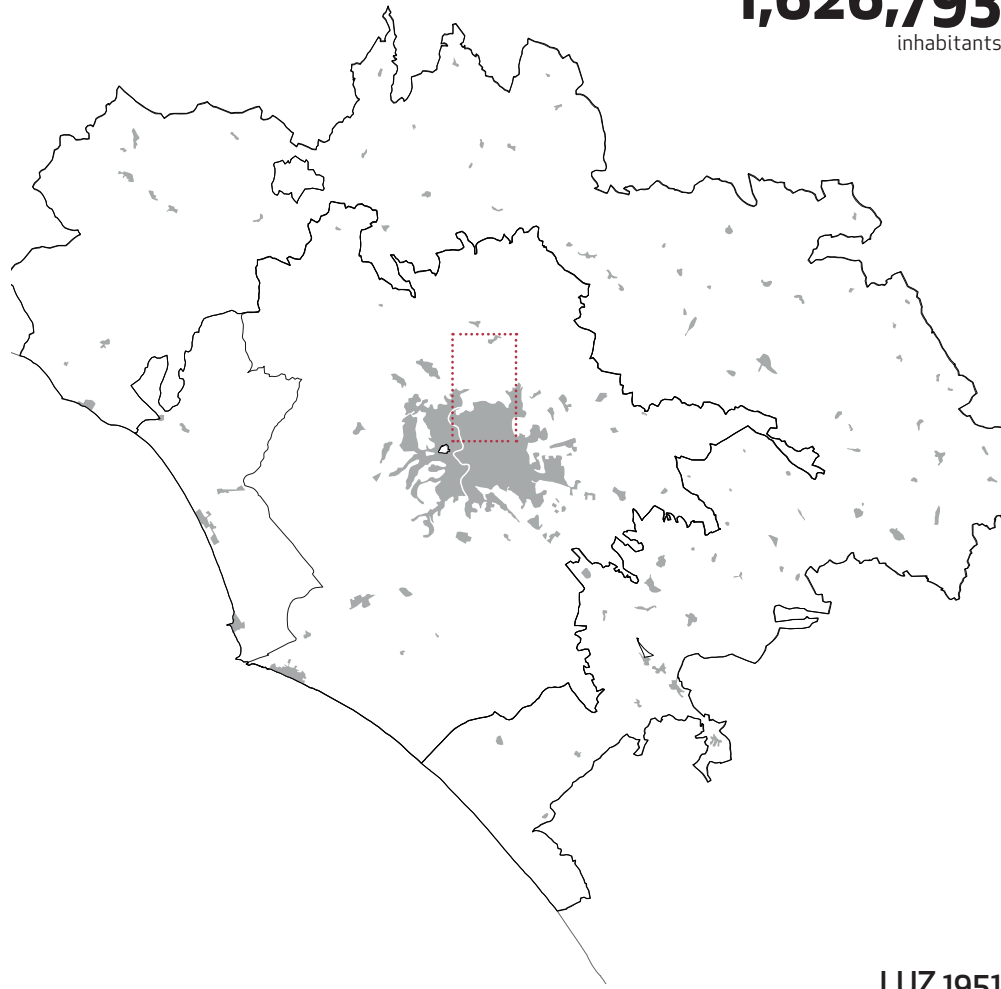
Detailed mapping of the northern area of the city of Roma, the one between Via Salaria and the main ring road, clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: the residential development which started in the 60’ is clearly identified.



Urban Footprint

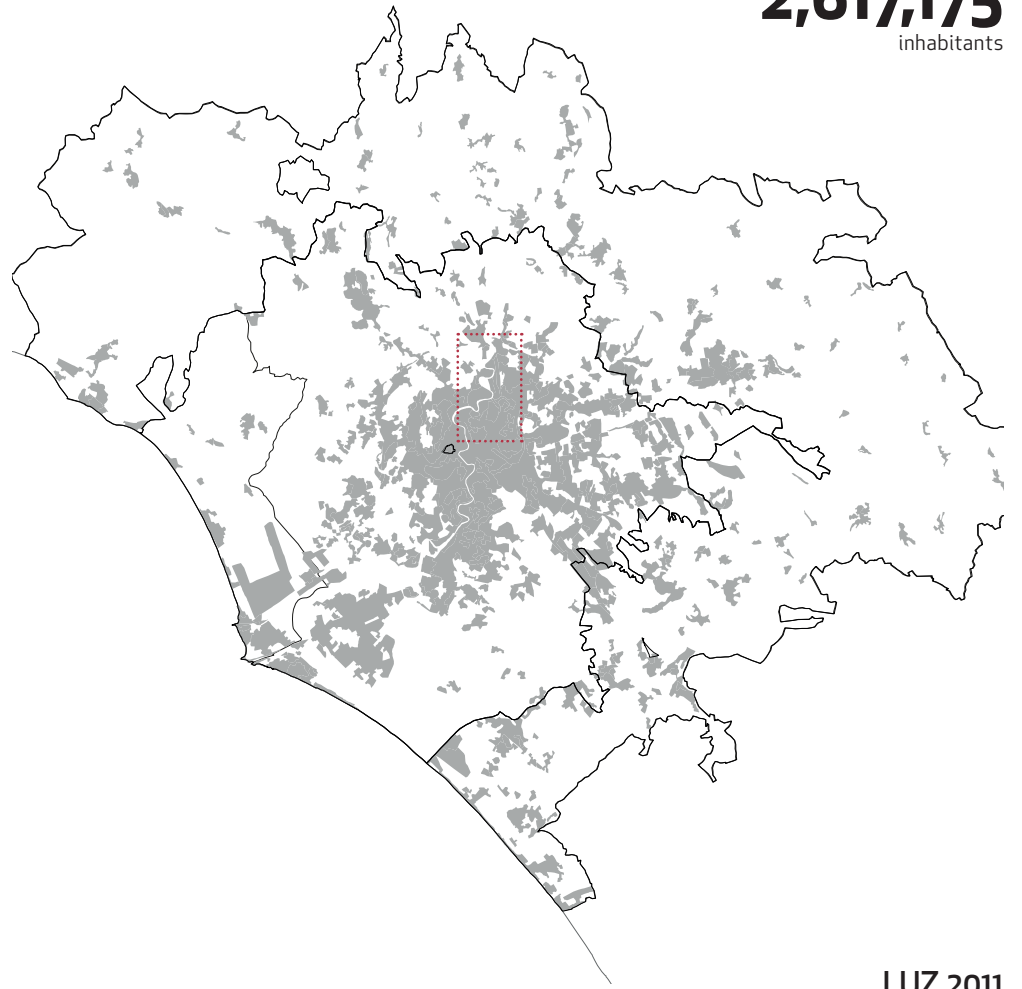
IGM 1960/Corine Land Cover 2006

CORE CITY 1951
1,626,793
inhabitants



LUZ 1951
1,939,912
inhabitants

CORE CITY 2011
2,617,175
inhabitants



LUZ 2011
3,626,271
inhabitants



1955
Volo GAI



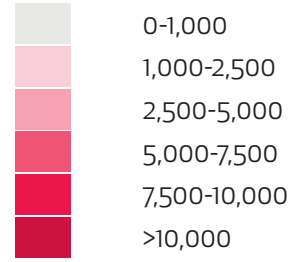
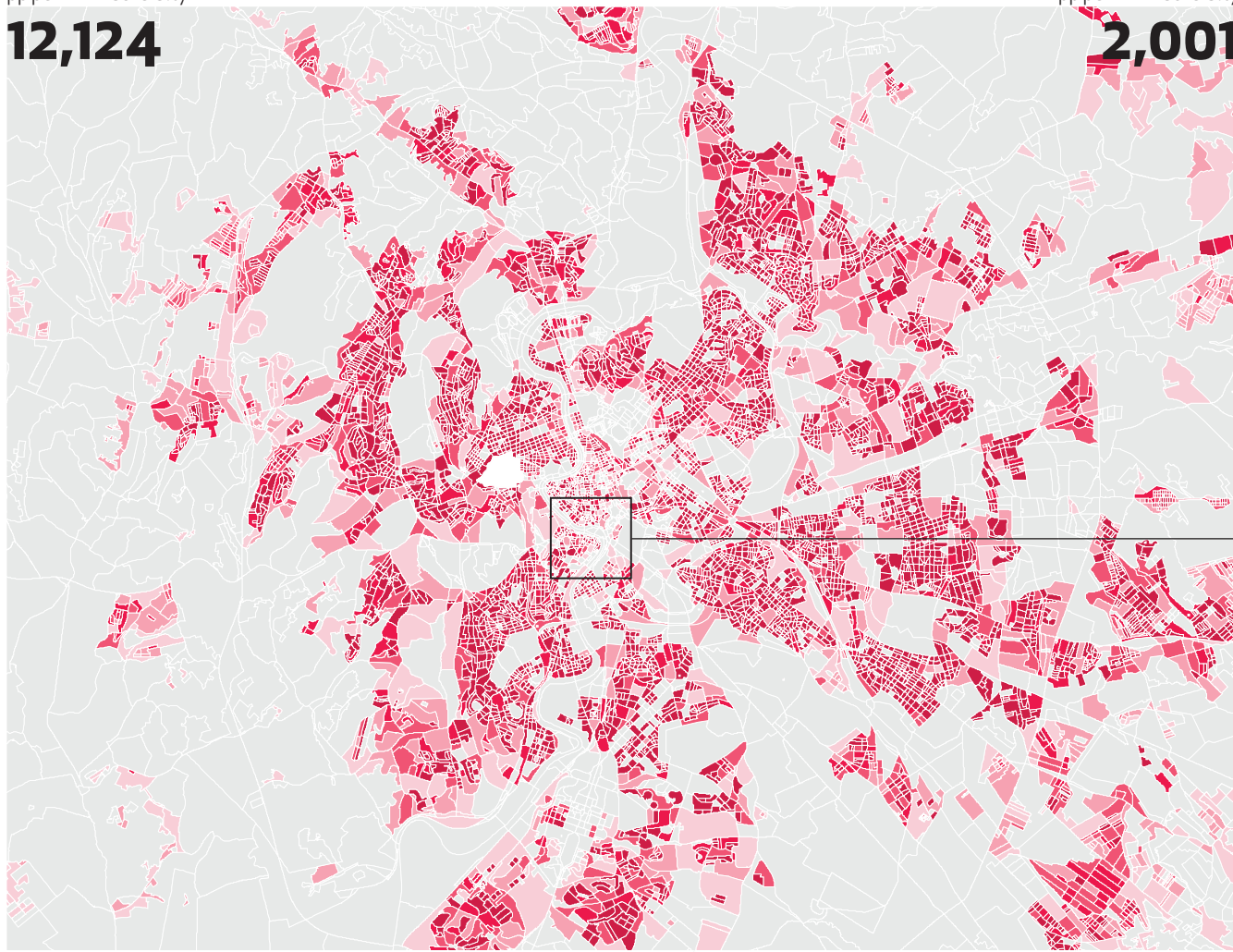
2006
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

12,124

AVERAGE DENSITY
pp per km² - Core City

2,001



Population

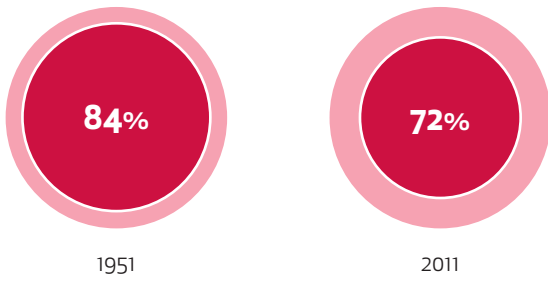


URBAN DENSITY

PEAK DENSITY

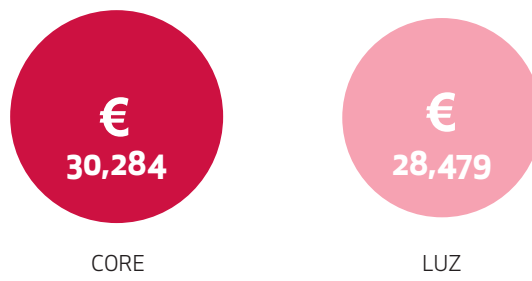
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Roma, the ratio between the population of the Core City over the population of the LUZ goes from 84% in 1951 to 72% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a very atypical trend: a population growth in the Core City from 1951 to 1971, is followed by a progressive decrease in population during the following two periods (1971-1991 and 1991-2011) when growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Roma and in the LUZ, the foreign population accounts for 9% of the total population (+128% over the last decade).

9%

+128%
(2001-2011)



9%

+158%
(2001-2011)



9%

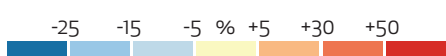
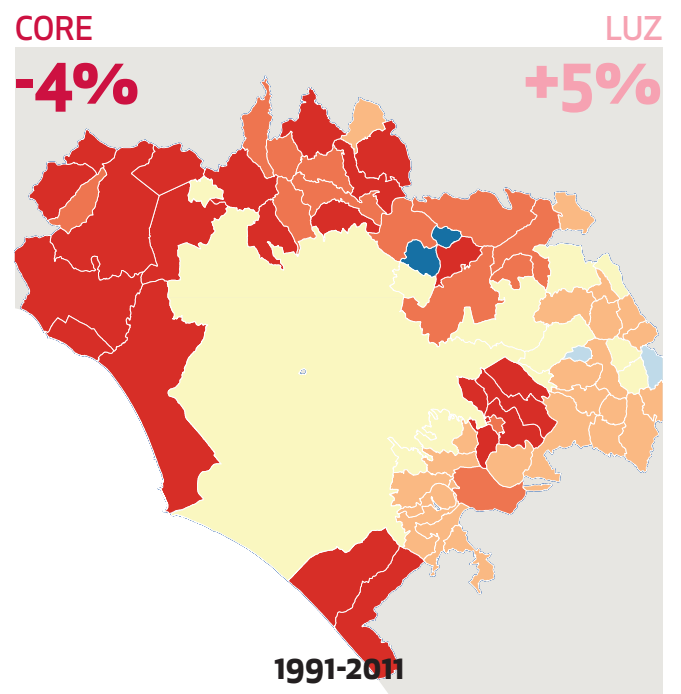
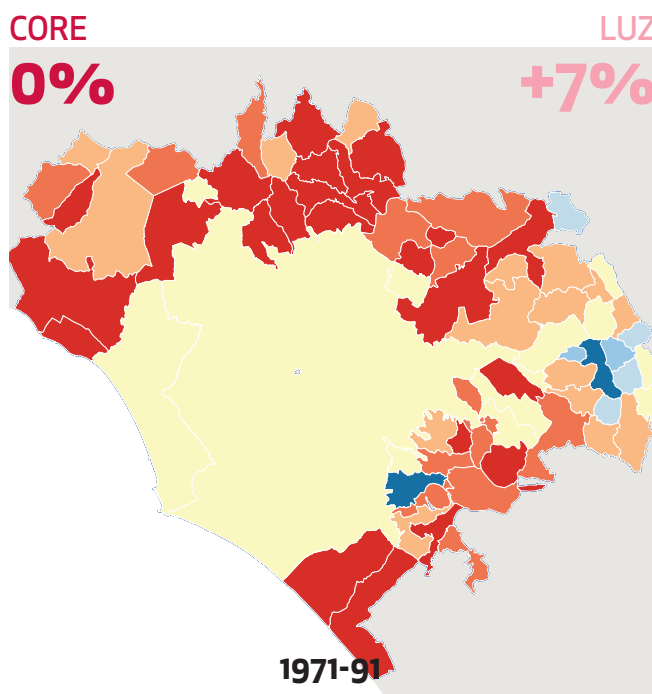
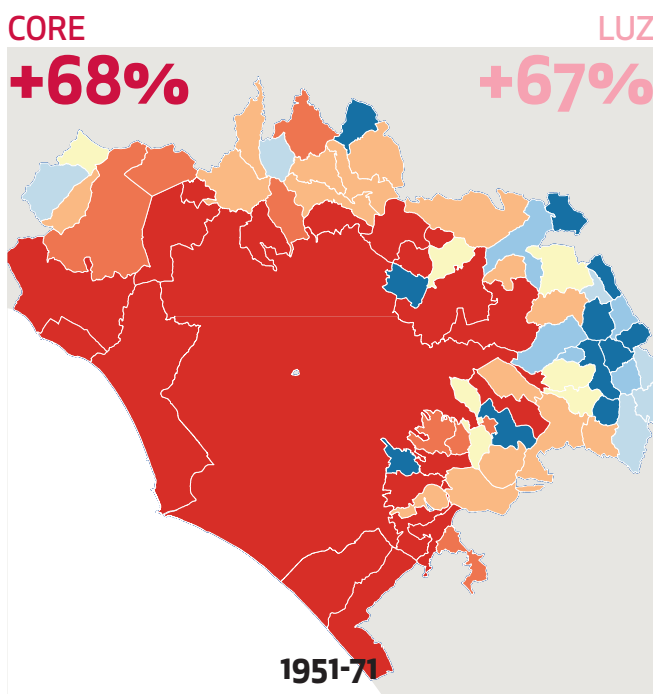
+23%
(2004-2011)

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

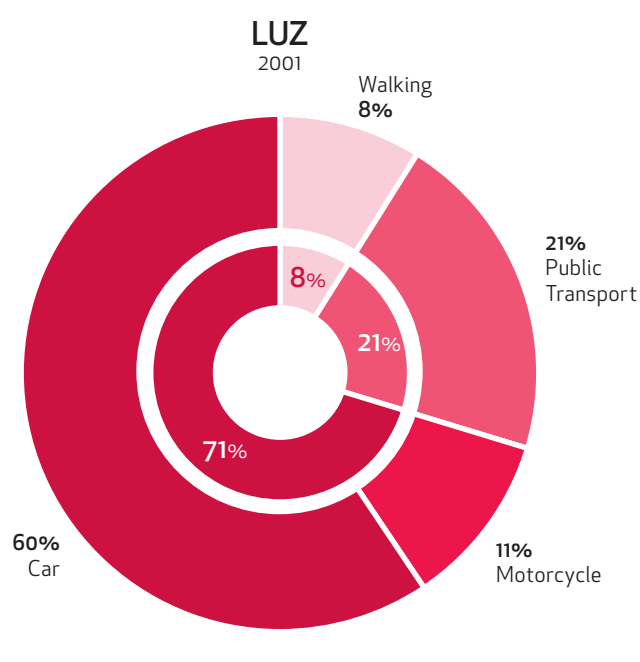
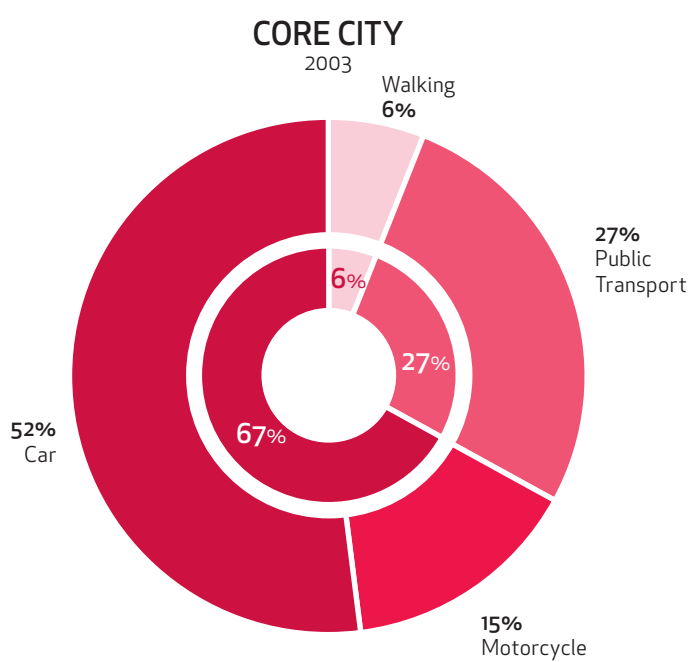
The metropolitan area of Roma, as shown in the images below, is served by a very good rail and road infrastructure. The modal split chart shows that 71% of travellers use private transport, 21% public transport and 8% walk or cycle within the LUZ; the data for the Core City is slightly

different due to the present of a stronger public transport network: travellers using private transport are 67%, those using public transport 27% and the remaining 6% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 214,000 people compared to circa 46,000 of outbound commuters. The motorization rate is one of the highest in Italy, with 700 cars per 1,000 inhabitants in the LUZ and 699 in the Core City.



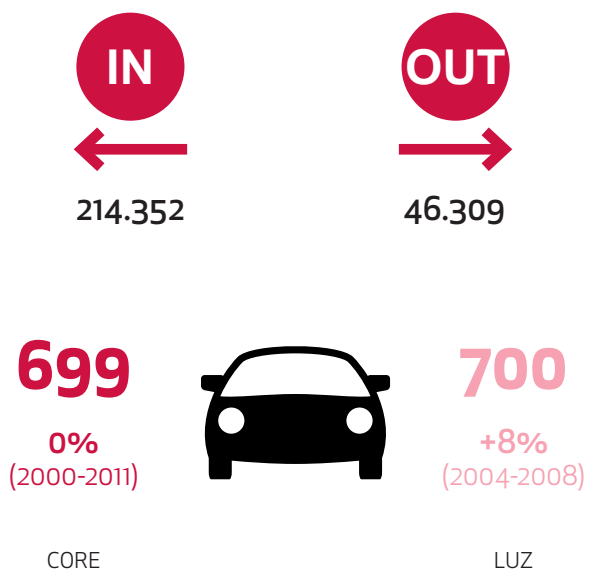
Image by Seier+Seier



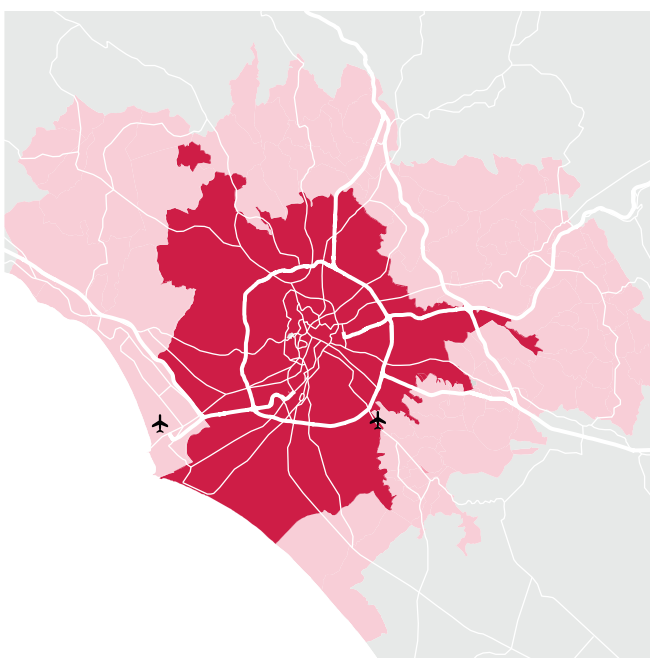
MODAL SPLIT
SEAP 2011/Eurostat 2001

COMMUTERS

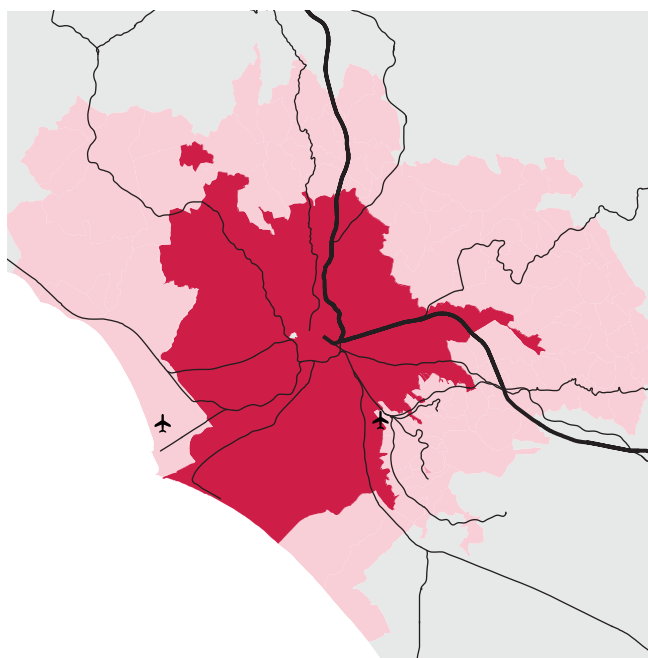
Dailt commuters (Core City) - ISTAT 2001



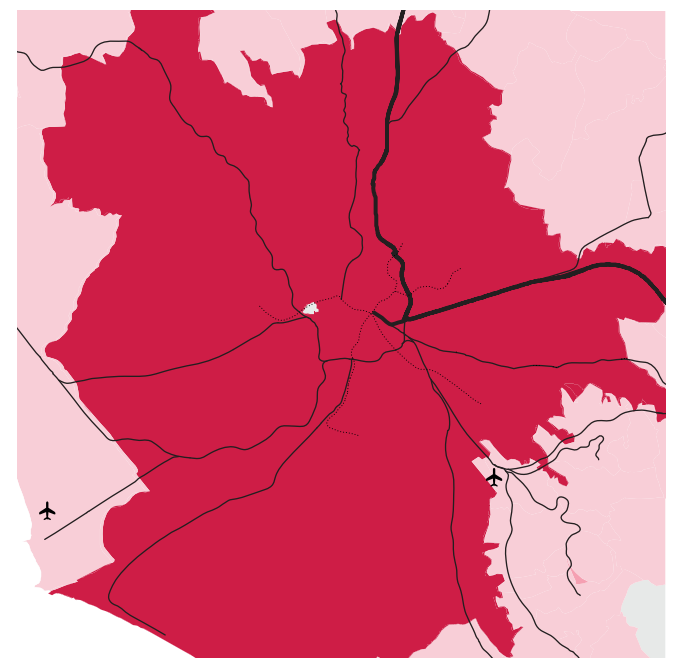
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

ranking in the Italian top 104 main cities - Legambiente 2013



648
kg
+12%
(2000-2011)

WASTE

Annual waste collection per capita (kg - Core City) - Istat 2011



25%
+383%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

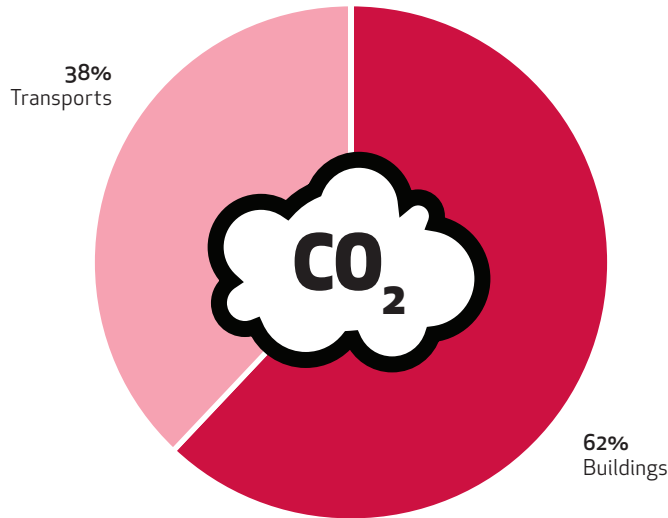
11,000
kt



4.3
t per capita

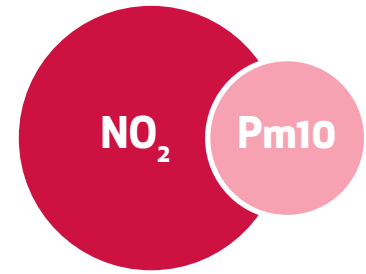
AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2011 (2003)



CO₂ emissions split (Core City) - SEAP 2011 (2003)

54
µg/mc



32
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,459
kWh per capita



+10%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

309
m³ per capita

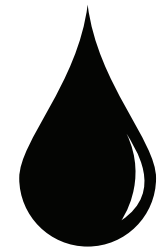


0%
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

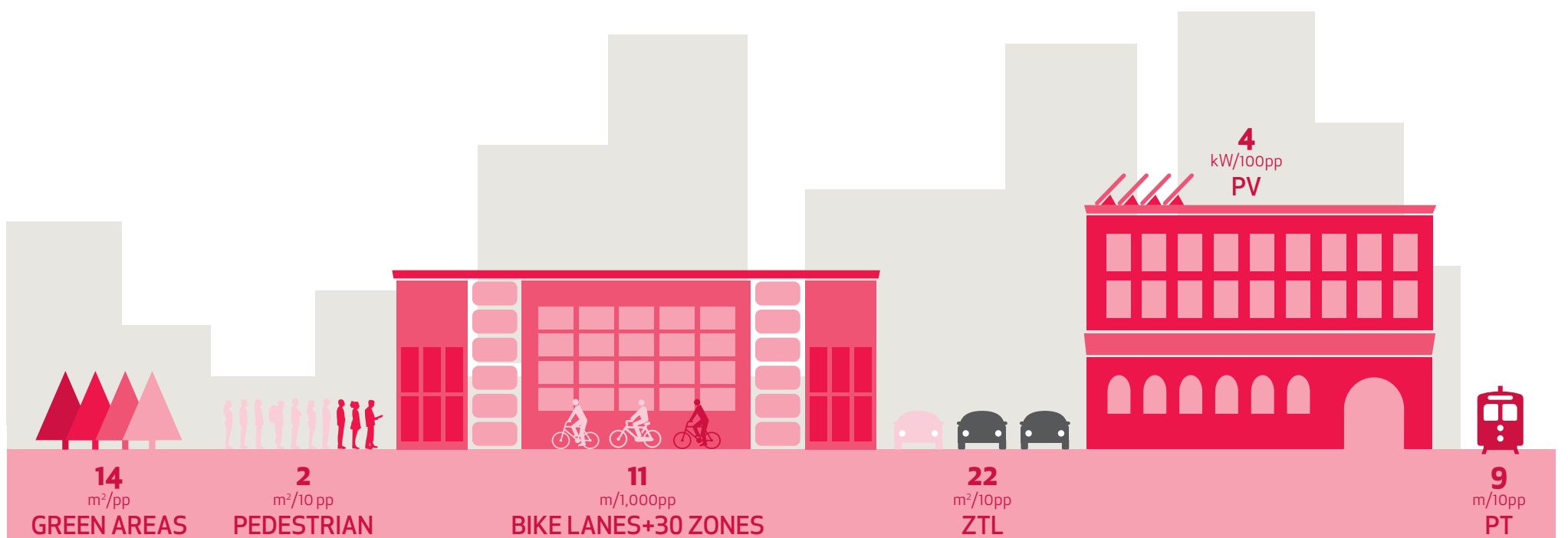
201
l per capita



-25%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2003

-20%

-18,450

daily journeys by private car
in the city centre

5

€ billion of investment
for CO₂ reduction actions

+

20,000

bike sharing vehicles

upgrade of

200,000

street lights

PV installation to produce

600

MWp

NAPOLI

Region

Campania

Municipalities

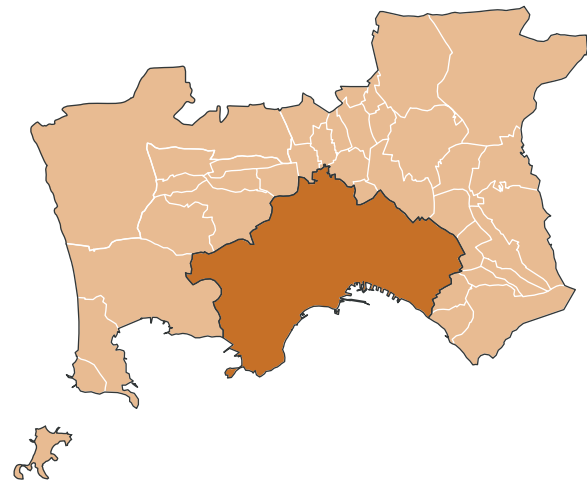
37

Larger Urban Zone area

565 km²

Core City area

117 km²



Napoli is the capital city of the Campania region, the third Italian city by population after Roma and Milano. The metropolitan city, which includes 37 municipalities, covers an area of approximately 565 km² and has a population of approximately 2,212,832 people (2011 Istat survey), of whom 962,003 live in the City of Napoli.

Located in the country's west coast, in the Gulf of Napoli, it lies between two notable volcanic regions, Mount Vesuvius and the Campi Flegrei. It was founded in the eighth century BC, becoming one of the hegemonic city of Magna Graecia. Its name dates back to the sixth century BC and is linked to the fall of the Cumana colony of Parthenope and the founding of a new city,

Neapolis. After the fall of the Roman Empire, during the eighth century the city became an independent duchy from the Byzantine Empire; from the thirteenth century and for about six hundred years, it was the capital of the Kingdom of Napoli. It became the capital of the Kingdom of the Two Sicilies under the Bourbons, and it had a long period of economic and social development which reached its peak just before it became part of the Kingdom of Italy.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to merging of the Core City to the first and second belt municipalities. This led to an almost complete urbanization of the LUZ.

The population of the Larger Urban Zone (LUZ) has grown from 1,521,752 people in 1951 to 2,212,832 people in 2011 (+45.4%), while at the same time, the capital city's population has gone from 1,010,550 to 962,003 (-4.8%). These figures, when compared to the changes in the land use, show a strong difference between the numerical and physical growth of the city.

Detailed mapping of the western area of the city of Napoli clearly shows the extension of the urban expansion which took place in the areas of Secondigliano and the municipality of Casoria between the GAI flight in 1955 and the orthophoto of 2006.

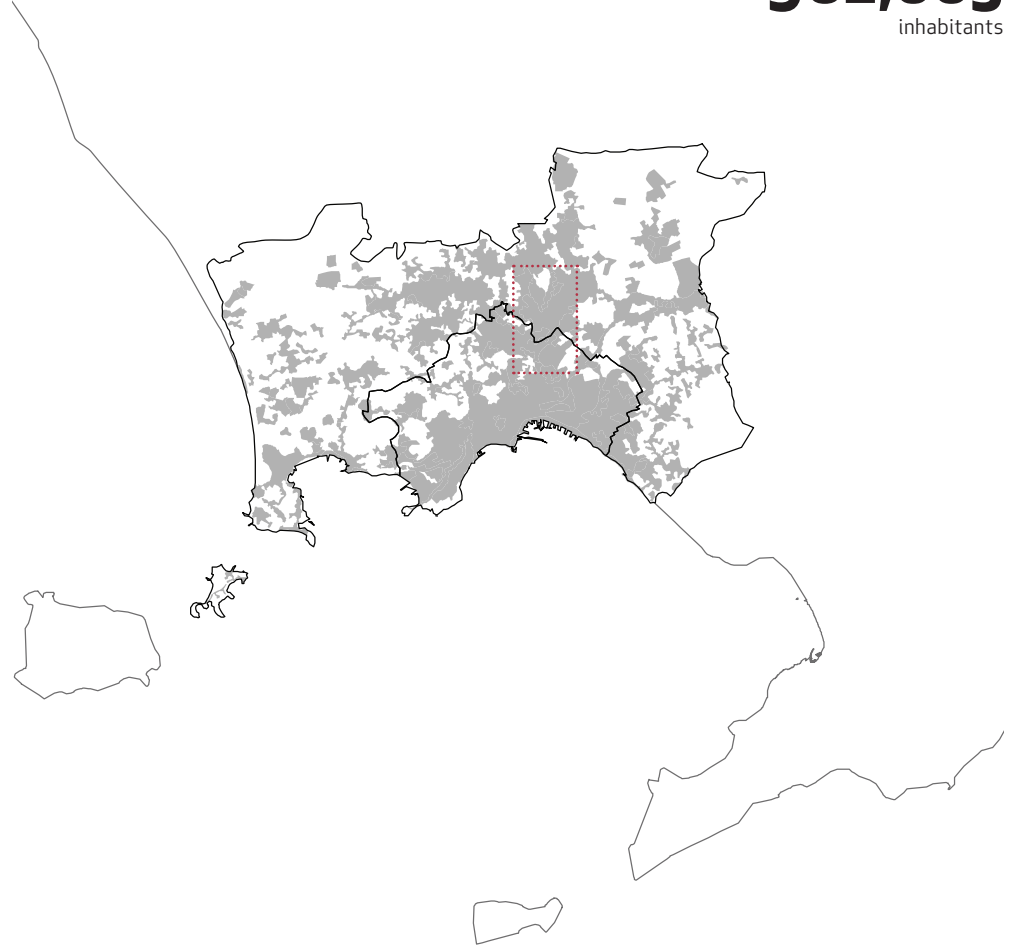
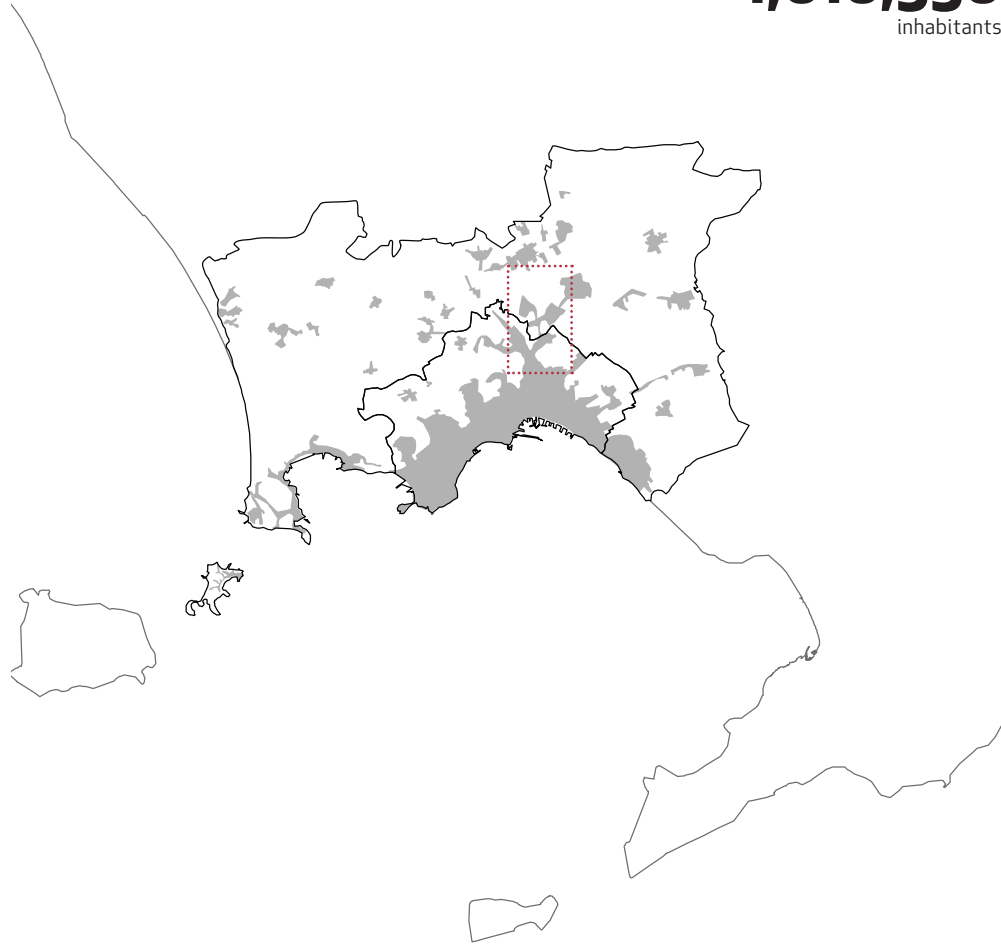


Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951
1,010,550
inhabitants

CORE CITY 2011
962,003
inhabitants



LUZ 1951
1,521,752
inhabitants

LUZ 2011
2,212,832
inhabitants



1955

Volo GAI



2006

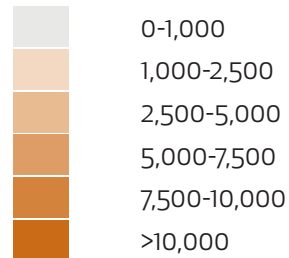
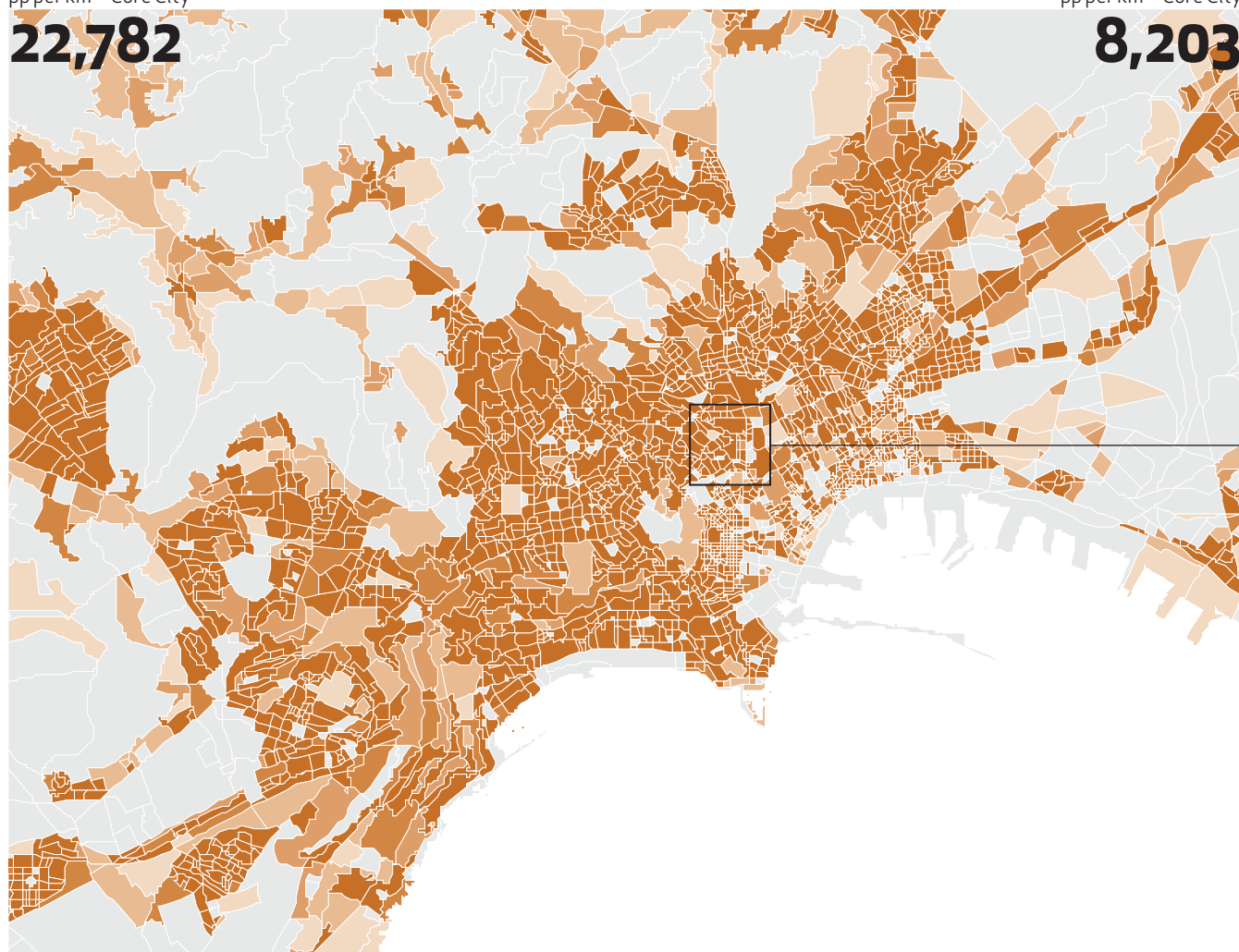
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

22,782

AVERAGE DENSITY
pp per km² - Core City

8,203



Population

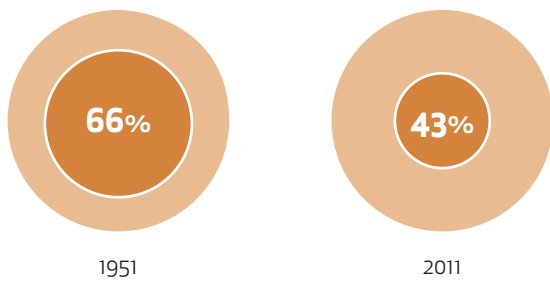


URBAN DENSITY

PEAK DENSITY

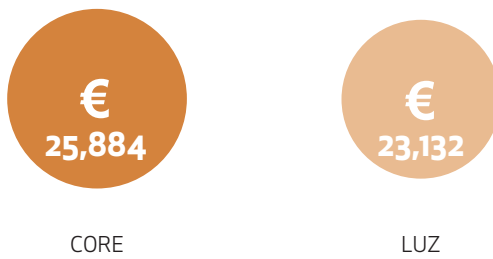
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Napoli, the ratio between the population of the Core City over the population of the LUZ goes from 66% in 1951 to 43% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a trend which is common to other Italian cities: the Core City has a strong population growth from 1951 to 1971, followed by a progressive reduction from 1971-1991 and 1991-2011 when growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Napoli, the foreign population accounts for 3% of the total population (+260% over the last decade) and it accounts for 2% in the LUZ.

3%

+260%
(2001-2011)



2%

+213%
(2001-2011)

CORE

LUZ



17%

-16%
(2004-2011)

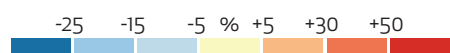
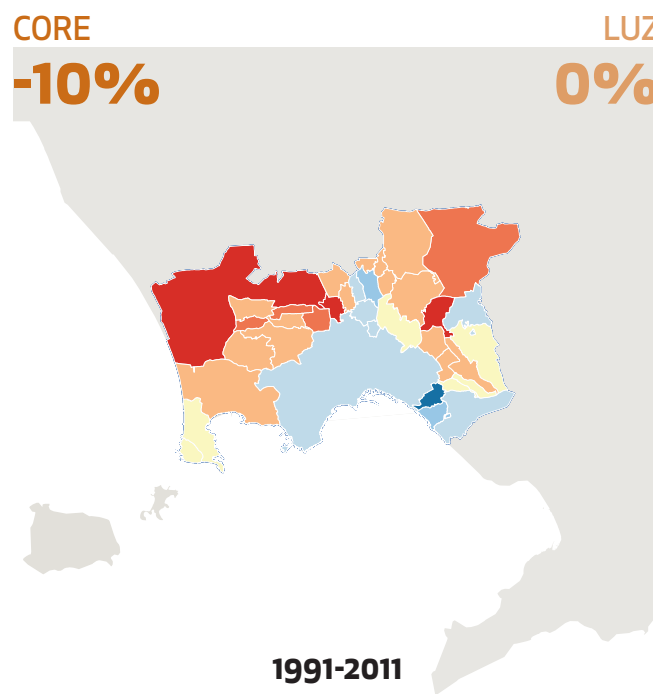
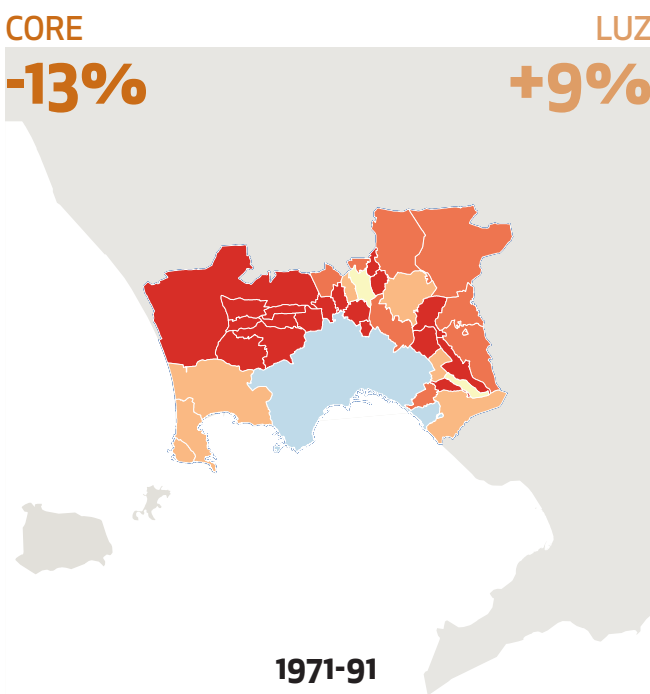
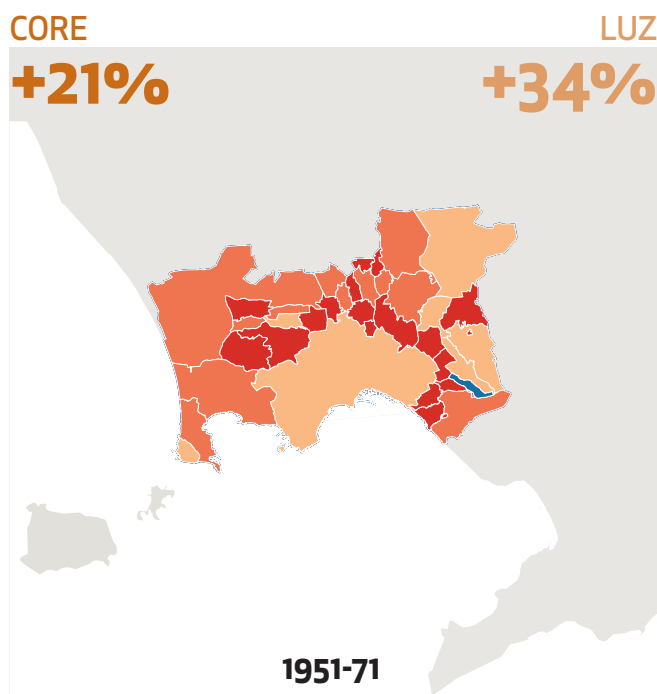
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

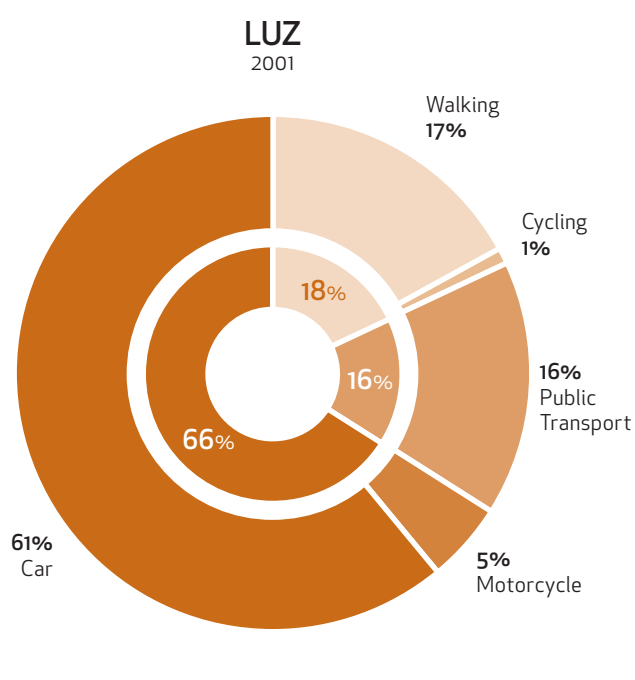
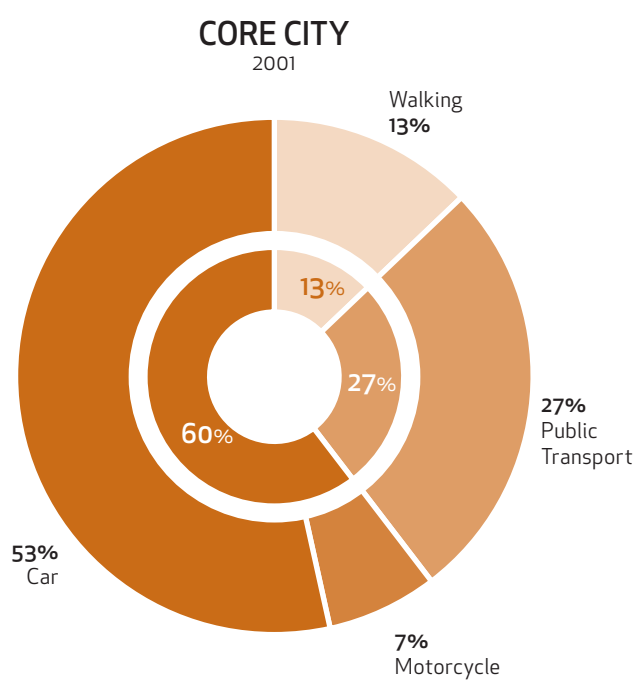
The metropolitan area of Napoli, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that 66% of travellers use private transport, 16% public transport and 18% walk or cycle within the LUZ; the data for the Core City differs slightly due to the stronger presence of public

transport: travellers using private transport are 60%, those using public transport 27% and the remaining 13% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 183,000 people compared to circa 36,000 of outbound commuters. The motorization rate is within the national average, with 582 cars per 1,000 inhabitants in the LUZ and 574 in the Core City.



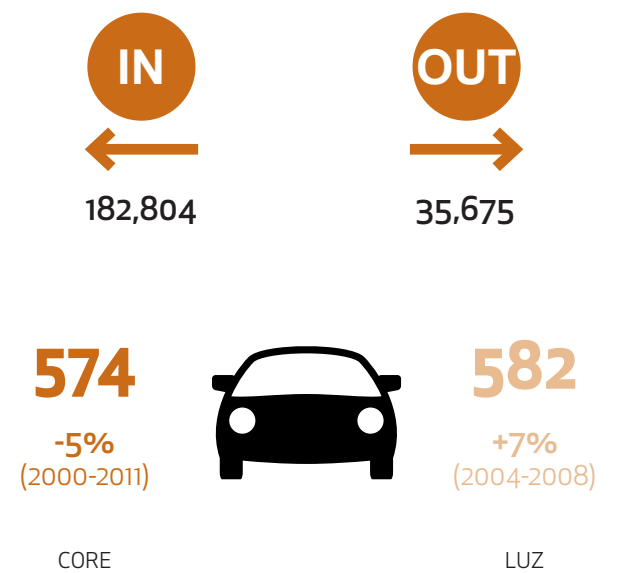
Image by Claudio Morelli



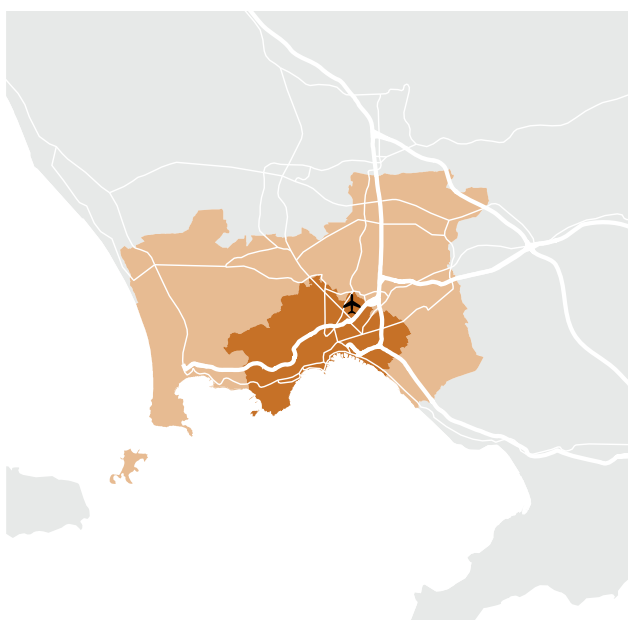
MODAL SPLIT
Eurostat 2001

COMMUTERS

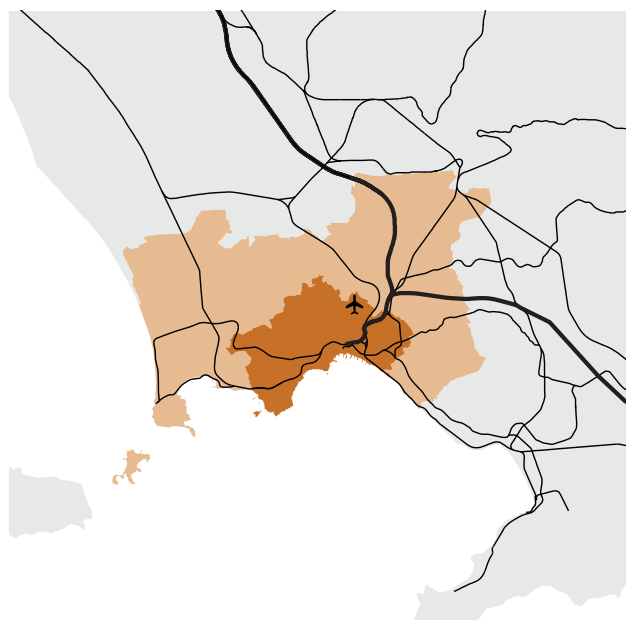
Daily commuters (Core City) - ISTAT 2001



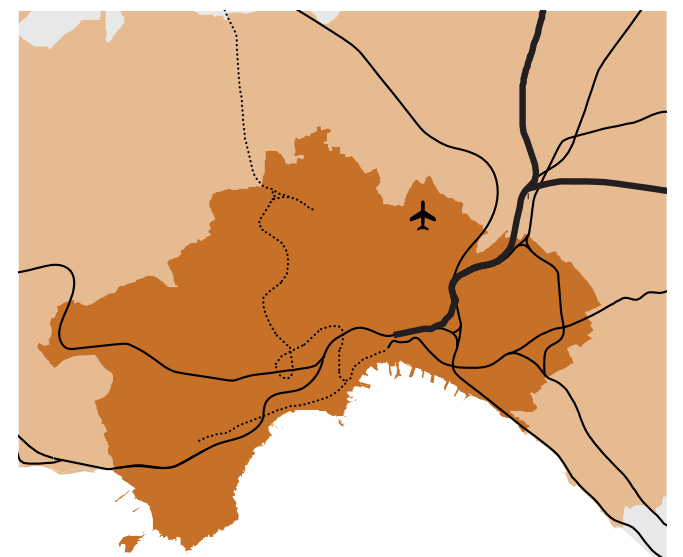
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



WASTE

Annual waste collection per capita (Core City) - Istat 2011

541
kg
-10%
(2000-2011)



WASTE SORTING

Waste sorting % (Core City) - Istat 2011

18%
+90%
(2000-2011)

2,913
kt

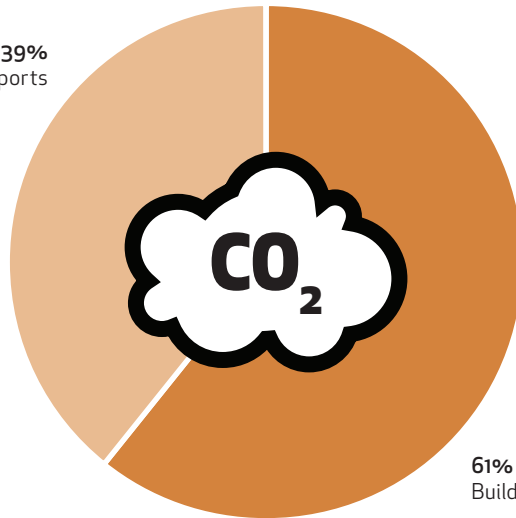


3.0
t per capita

AIR EMISSIONS

Annual CO₂ emissions (Core City) - SEAP 2012 (2005)

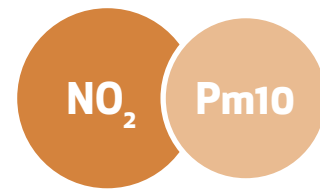
39%
Transports



61%
Buildings

CO₂ emissions split (Core City) - SEAP 2012 (2005)

37
µg/mc



33
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,065
kWh per capita



+2%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

168
m³ per capita



+5%
(2000-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

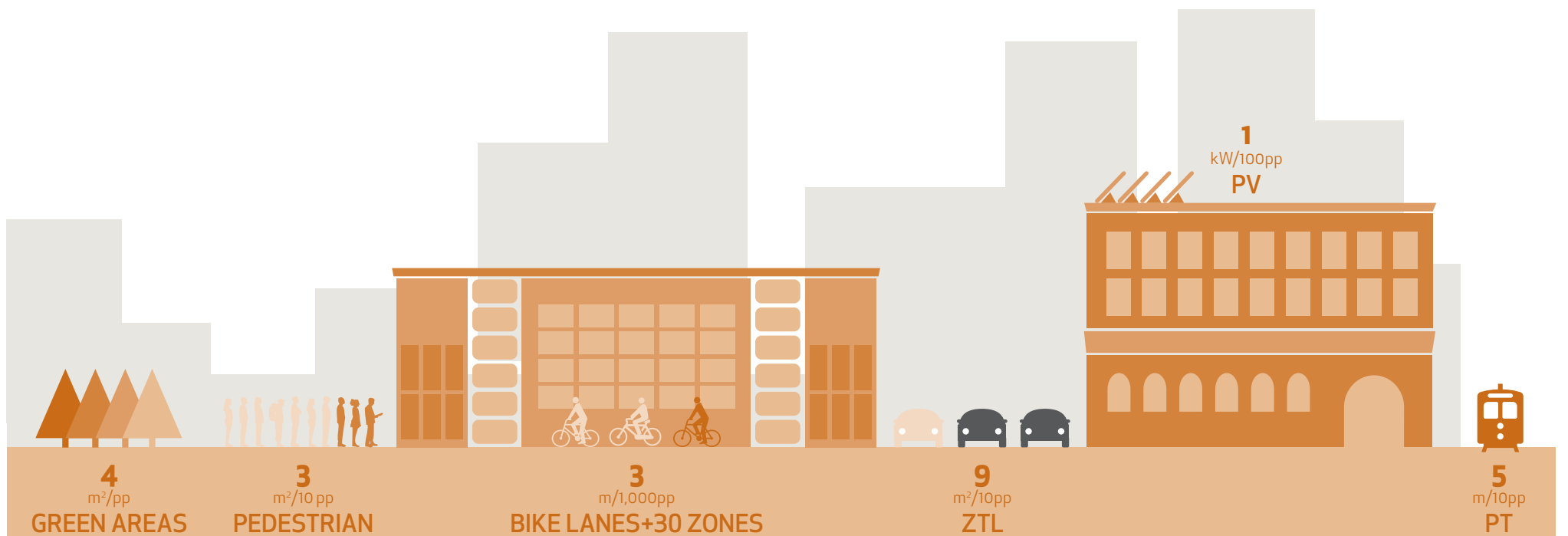
160
l per capita



-22%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2005

-25%

15%

upgrade of
public transport vehicles

3

€ billion of investment
for CO₂ reduction actions

**+
40 km**

bike lanes

-253 kt

CO₂ emissions
in transport sector

energy audit for

70%

of public buildings

BARI

Region

Puglia

Municipalities

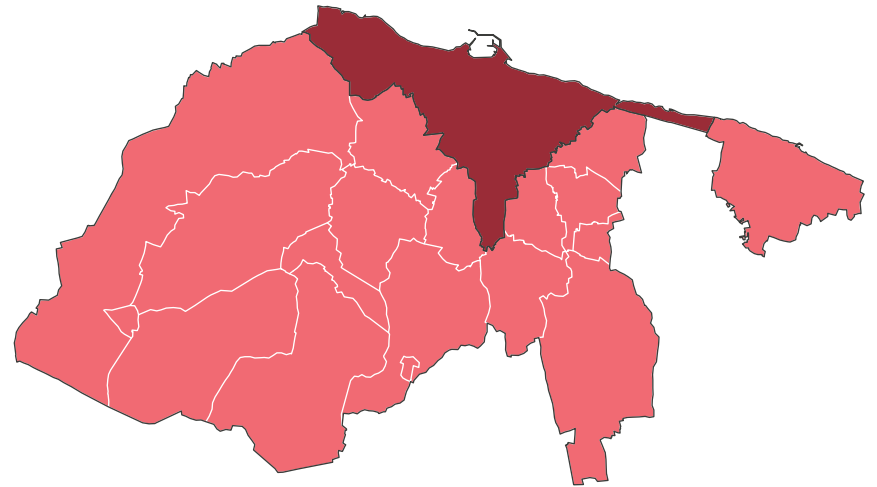
17

Larger Urban Zone area

894 km²

Core City area

116 km²



Bari is the capital city of the Puglia region, the ninth Italian city by population and the largest and most economically relevant city overlooking the Adriatic Sea. The metropolitan area, which includes 17 municipalities, covers an area of approximately 894 km² and has a population of approximately 1,744,000 people (2011 Istat survey), of whom 615,026 live in the City of Bari.

The origins of the city of Bari are not clear, although it seems that the first nucleus dates back to the Bronze Age. In Greek times it was named Barion and, after falling under Roman rule in the third century BC, it began to develop around the axis of the Via Traiana. After the fall of the Roman Empire the Lombards and

Byzantines fought over it and it was later dominated by the Normans, Swabians, Angevins, Aragonese and the Spanish.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development of the city along the lines that radiate from the city center to the inland, defining a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 447,451 people in 1951 to 615,026 people in 2011 (+37.4%), while at the same time, the Core City's population has grown from 268,183 to 315,933 (+17.8%). These figures, when

compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

Detailed mapping of the western area of the City of Bari clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of residential settlements along the coast while, and the development of the productive functions in the areas between the airport and the A14 motorway.



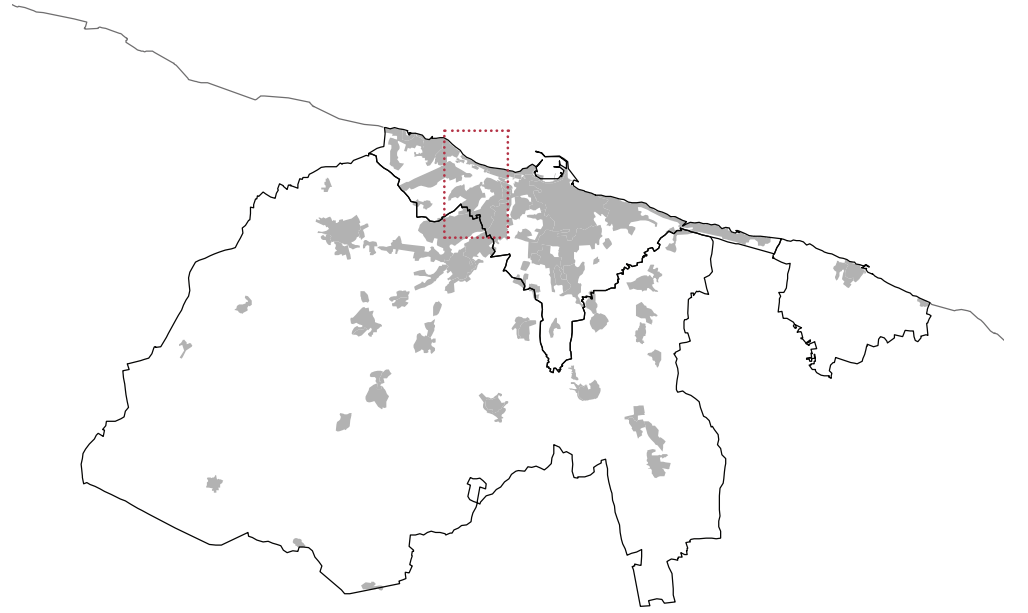
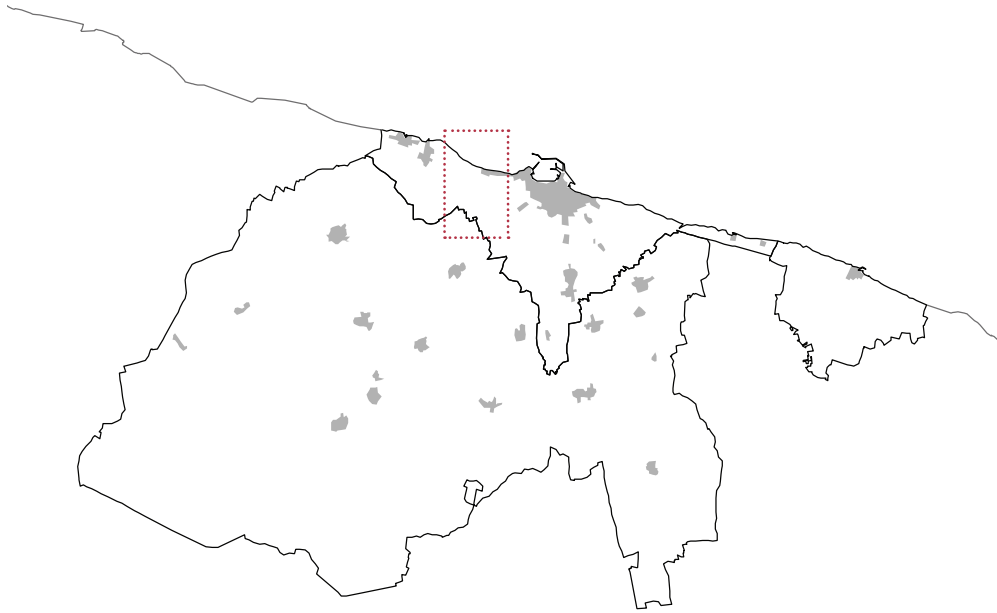
Image by Saverio De Giglio

Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951
268,183
inhabitants

CORE CITY 2011
315,933
inhabitants



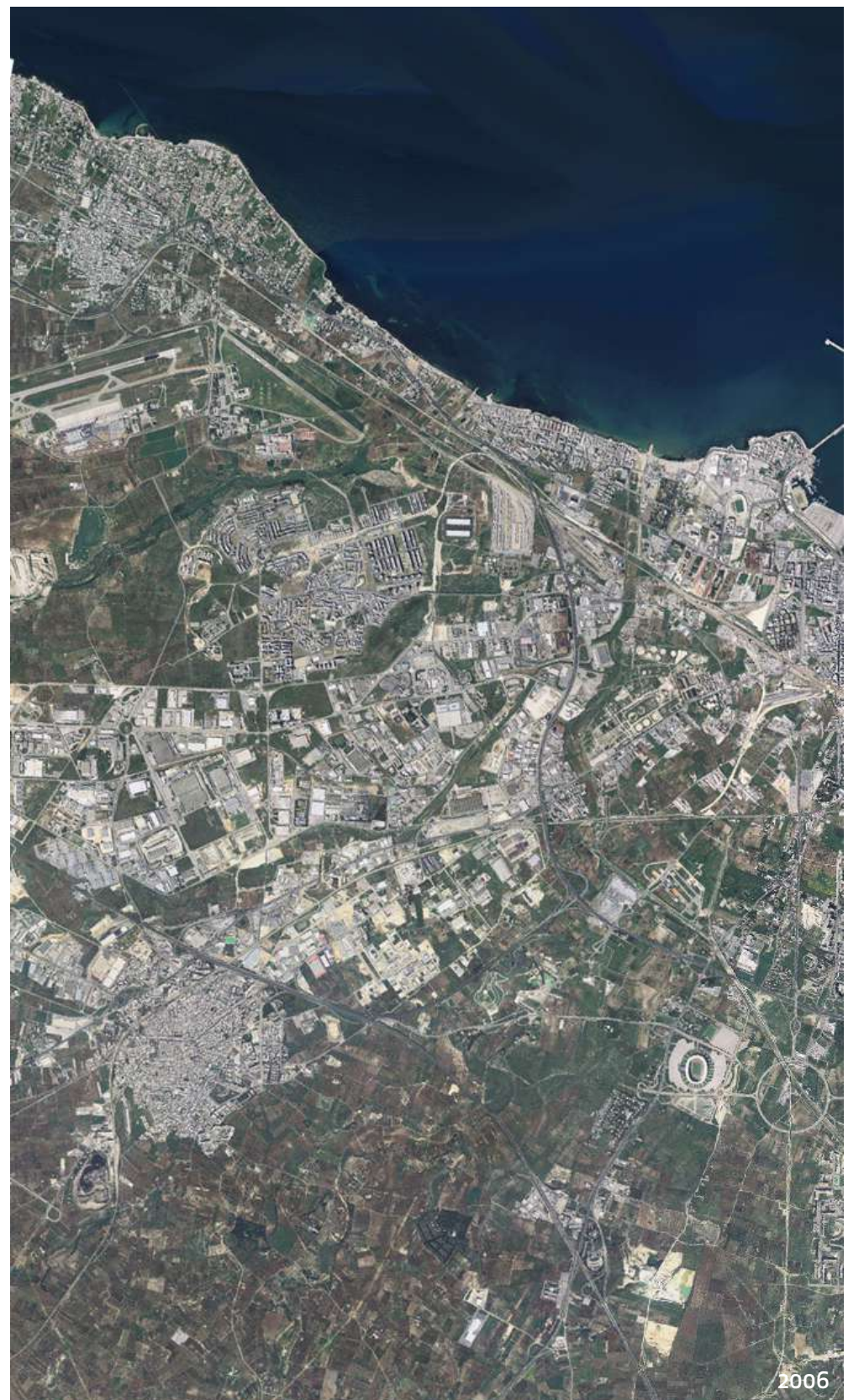
LUZ 1951
447,451
inhabitants

LUZ 2011
615,026
inhabitants



1955

Volo GAI



2006

Geoportale Nazionale

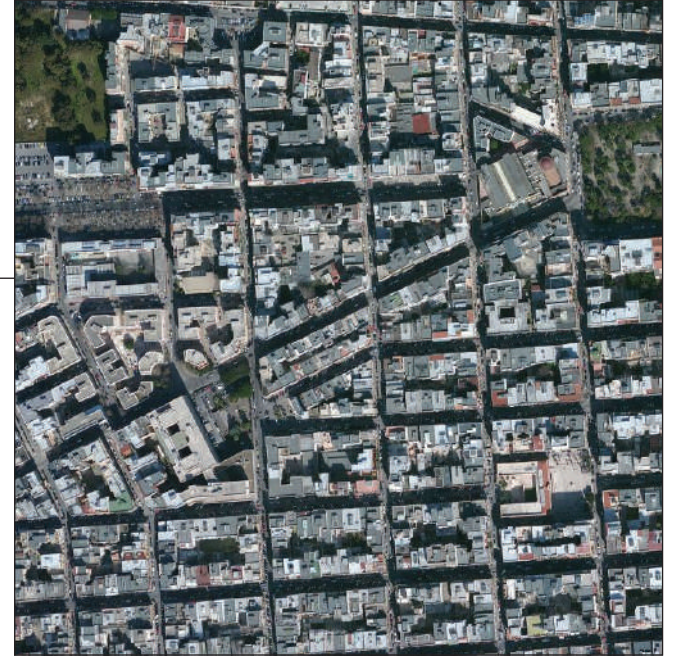
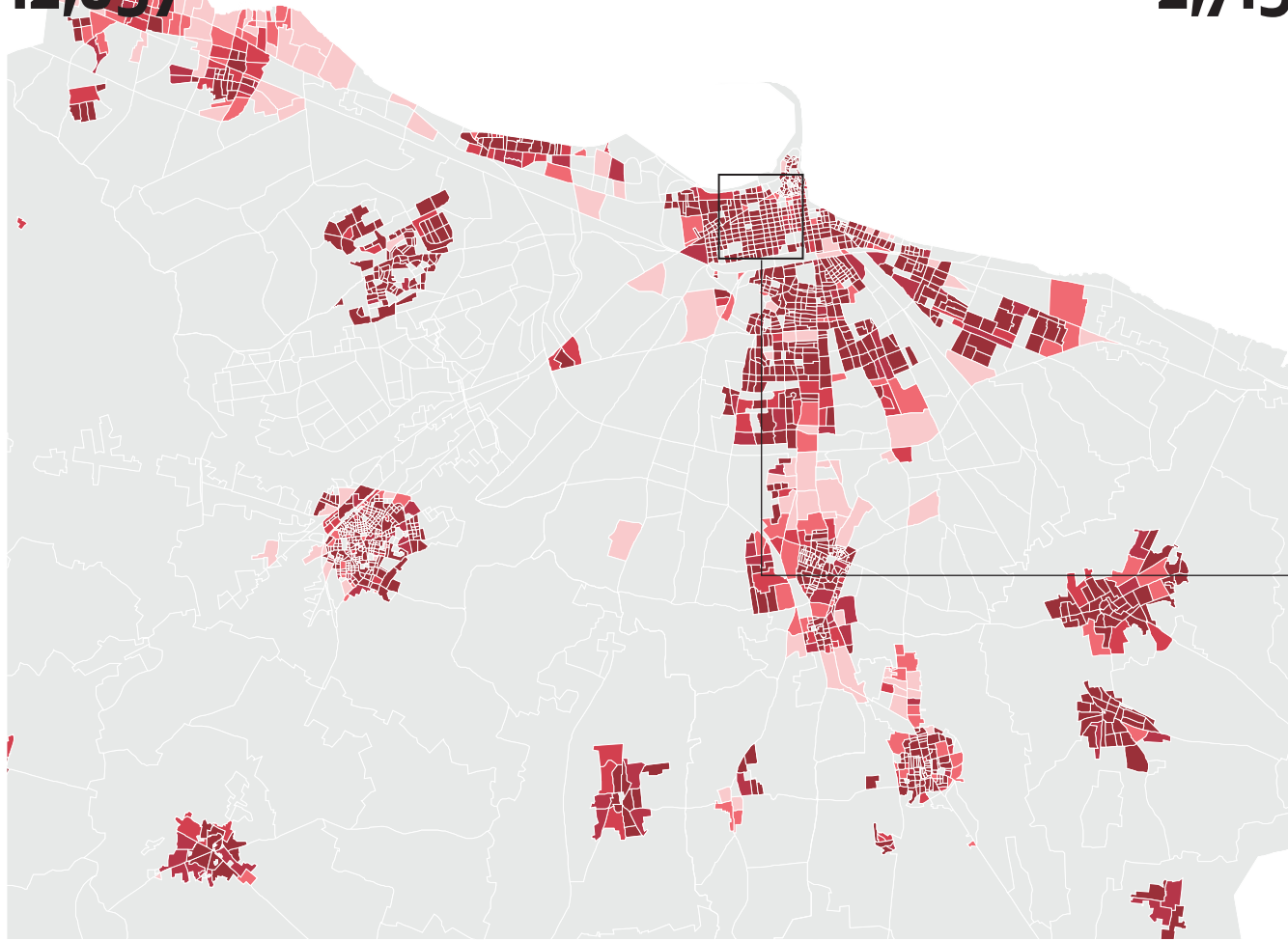
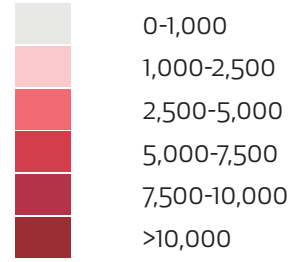
PEAK DENSITY
pp per km² - Core City

12,097

AVERAGE DENSITY
pp per km² - Core City

2,719

Population

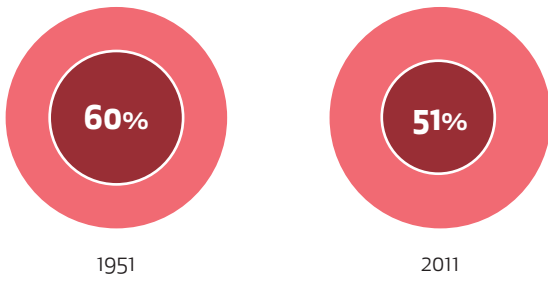


URBAN DENSITY

PEAK DENSITY

CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Bari, the ratio between the population of the Core City over the population of the LUZ goes from 60% in 1951 to 48% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a growth in the Core City and in those municipalities of the first belt from 1951 to 1971, in the following two periods (1971-1991 and 1991-2011) population growth is concentrated in the municipalities of the first and second belts while the Core City faces a steady decrease in population.

In 2011 within the city of Bari and in the LUZ, the foreign population accounts for 2% of the total population (+168% over the last decade).

2%

+168%
(2001-2011)

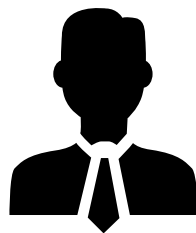


2%

+158%
(2001-2011)

CORE

LUZ



12%

-20%
(2004-2011)

LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011

CORE
+33%

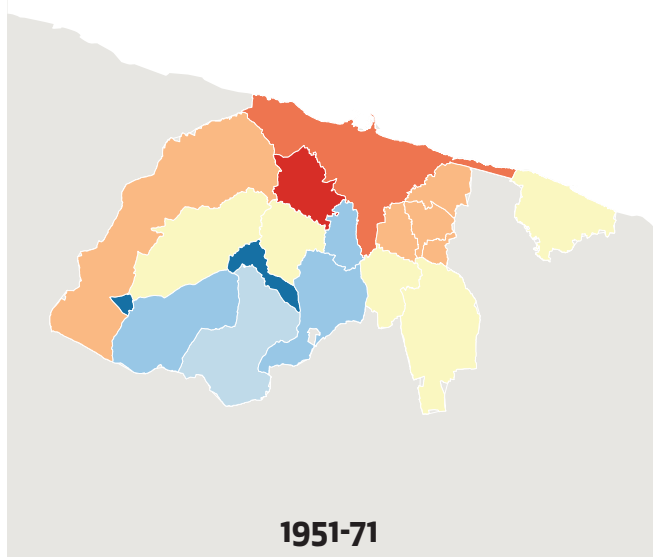
LUZ
+23%

CORE
-4%

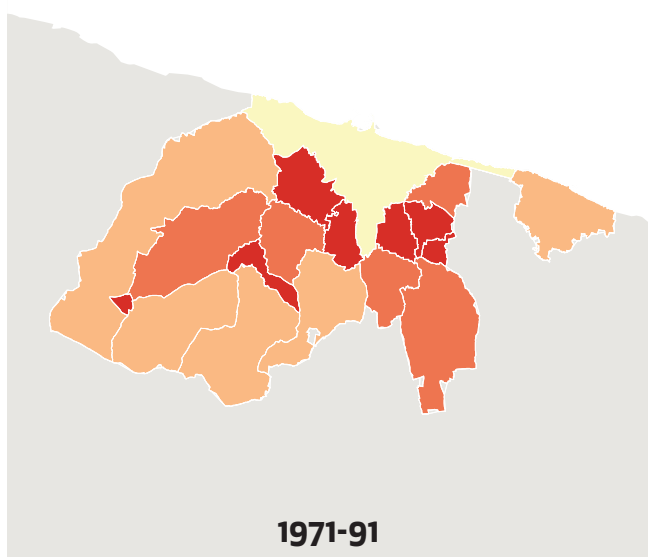
LUZ
+11%

CORE
-8%

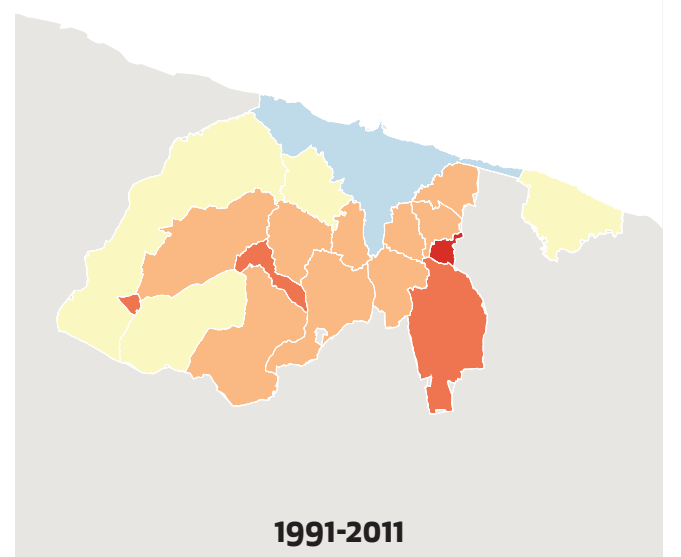
LUZ
+1%



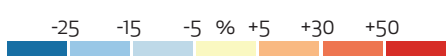
1951-71



1971-91



1991-2011



DEMOGRAPHIC CHANGES

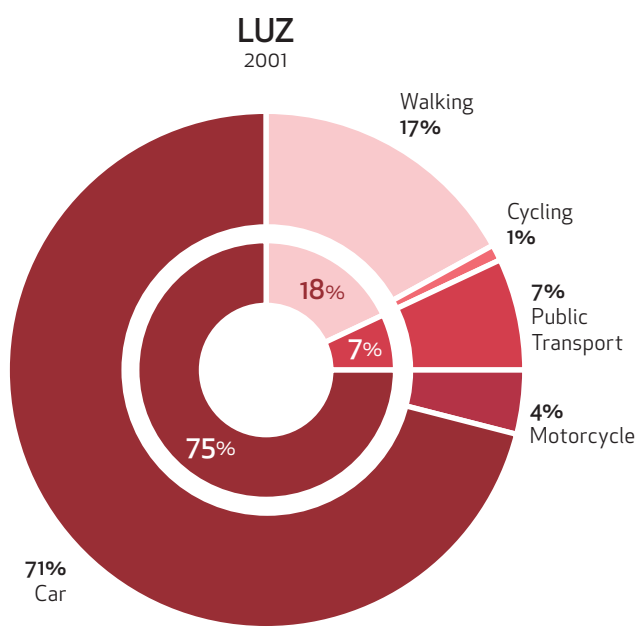
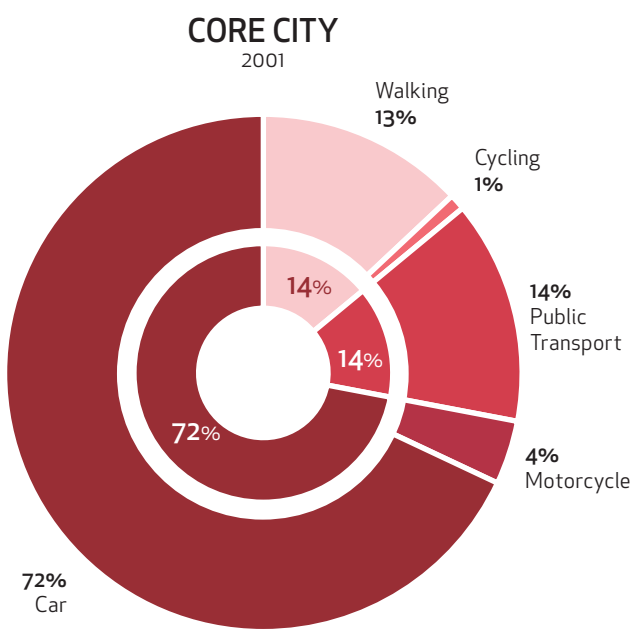
Mobility

The metropolitan area of Bari, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that 75% of travellers use private transport, 7% public transport and 18% walk or cycle within the LUZ; the data for the Core City is quite similar:

travellers using private transport are 72%, those using public transport 14% and the remaining 14% walk or cycle.

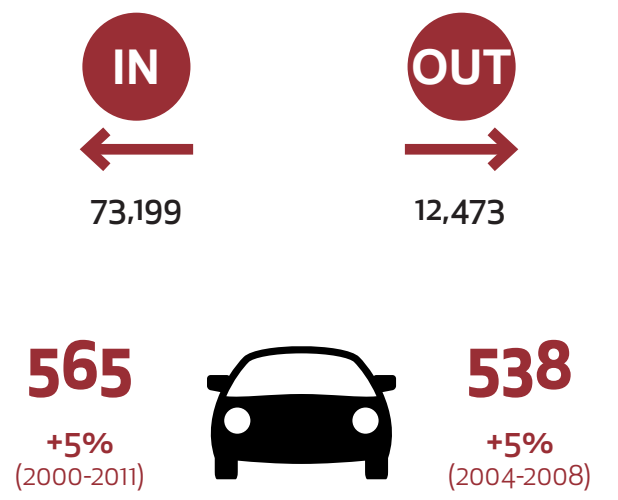
The data on commuting (for work and study) shows the daily inbound commute of more than

73,000 people compared to circa 12,000 of outbound commuters. The motorization rate is within the national average, with 538 cars per 1,000 inhabitants in the LUZ and 565 in the Core City.



COMMUTERS

Daily commuters (Core City) - ISTAT 2001

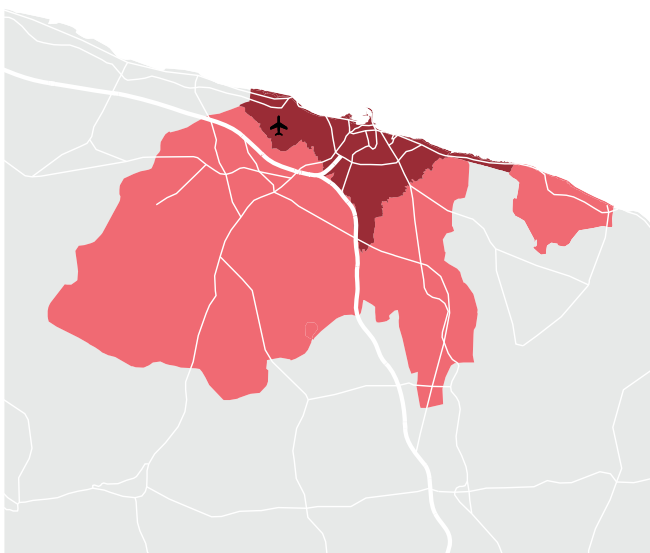


MODAL SPLIT

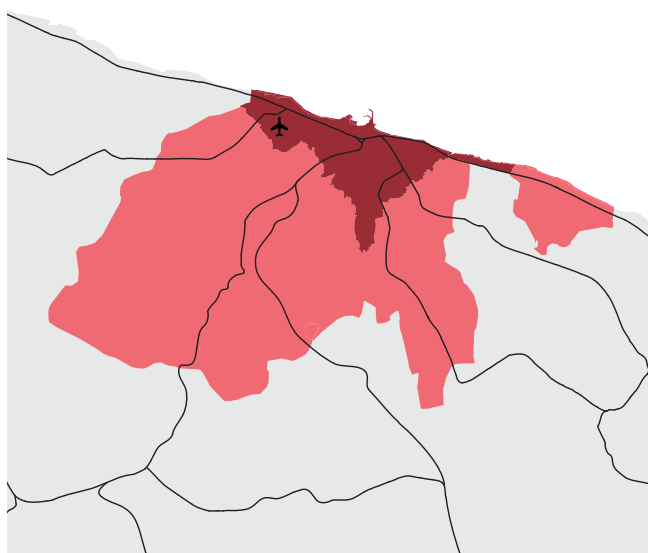
Eurostat 2001

CAR OWNERSHIP

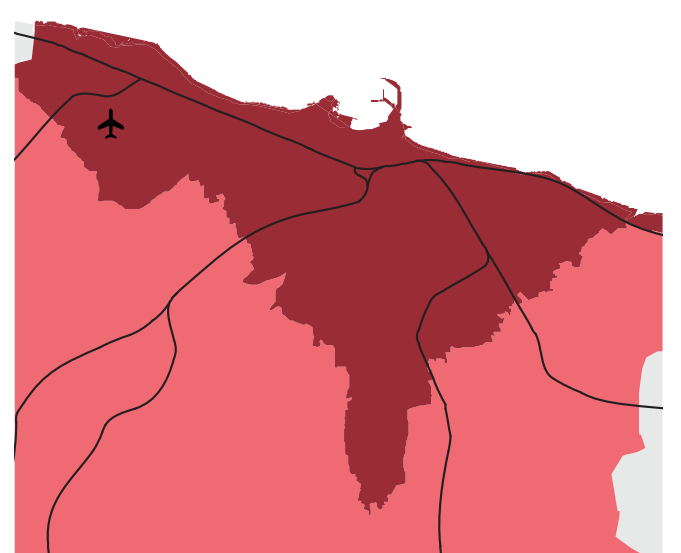
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



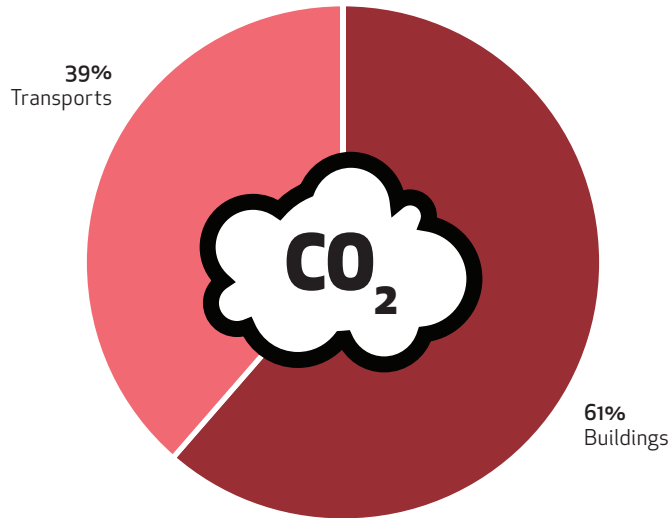
610
kg
+9%
(2000-2011)
WASTE
Annual waste collection per capita (Core City) - Istat 2011



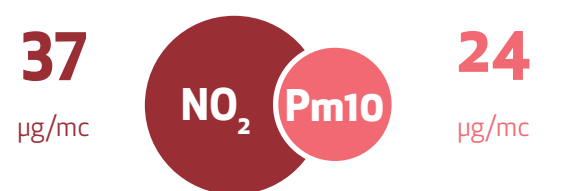
21%
+197%
(2000-2011)
WASTE SORTING
Waste sorting % (Core City) - Istat 2011



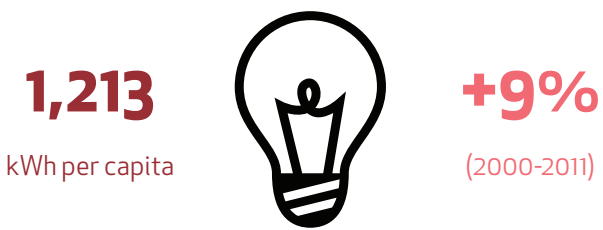
1,096
kt
3.5
t per capita
AIR EMISSIONS
Annual CO₂ emissions (Core City) - SEAP 2011 (2002)



CO₂ emissions split (Core City) - SEAP 2011 (2002)



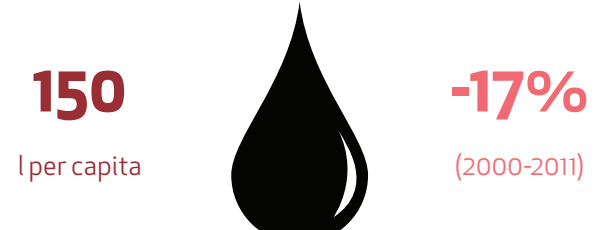
Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013



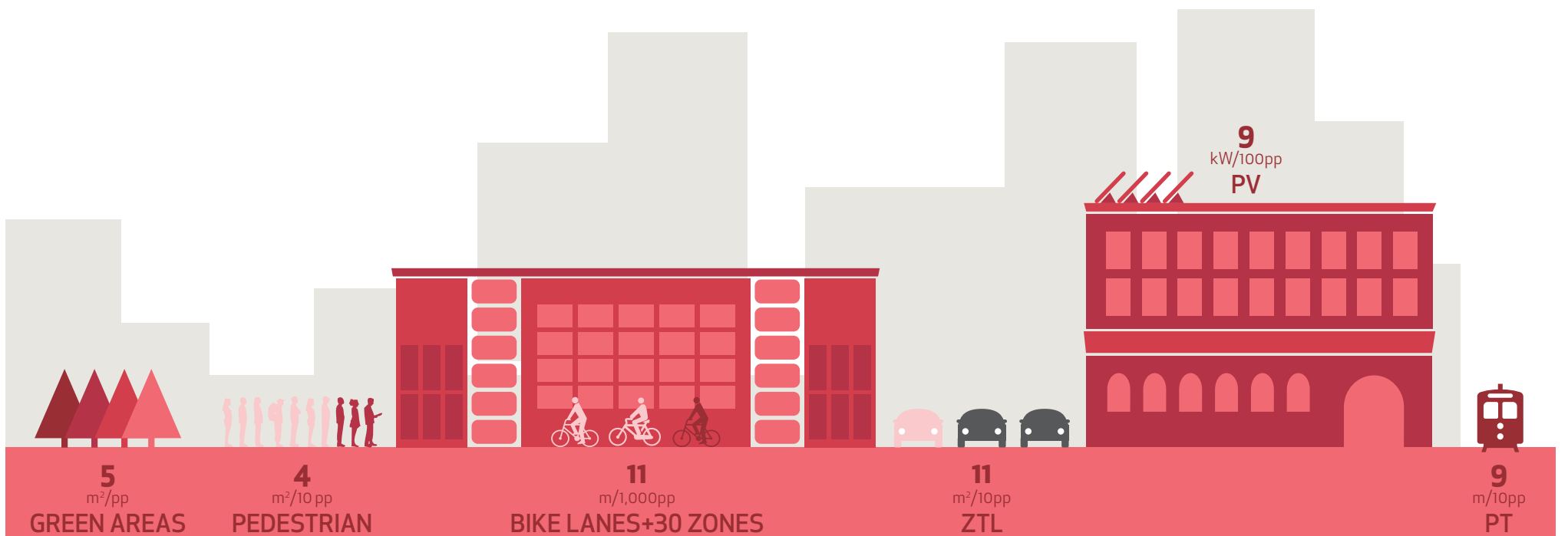
1,213
kWh per capita
+9%
(2000-2011)
ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011



233
m³ per capita
+21%
(2000-2011)
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011



150
l per capita
-17%
(2000-2011)
WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
2002

-35%

1.8

billion € of investments

energy efficiency measures for

3,000

existing buildings

**+
90 km**

bike lanes

**+
1,300**

bike sharing vehicles

**+
100**

car sharing electric vehicles

REGGIO CALABRIA

Region

Calabria

Municipalities

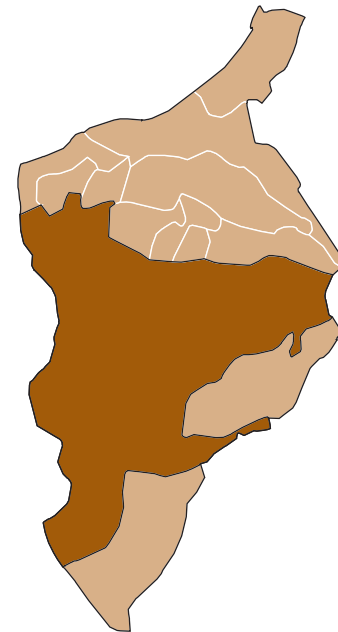
13

Larger Urban Zone area

489 km²

Core City area

236 km²



Reggio Calabria is the capital city of the Calabria region, part of the vast Sicilian and Calabrian conurbation known as Etna Arc. The metropolitan city, which includes 13 municipalities, covers an area of approximately 489 km² and has a population of approximately 228,118 people (2011 Istat survey), of whom 180,817 live in the Municipality of Reggio Calabria.

Important and flourishing colony of Magna Graecia and one of the oldest cities in Europe, Region was founded in the eighth century BC on the site of a former settlement dating back to the third millennium BC. Despite its ancient history the city of Reggio Calabria has a modern urban structure, due to the

catastrophic earthquake which destroyed the city in December 1908. Its urban system, forced to the east by the Strait of Messina and crowned from behind by the foothills of the Apennines is crossed by four rivers which divide the territory into horizontal sections.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development towards the southern area of the city, defining an urban structure which extends for 30 km between the Aspromonte and the sea.

The population of the Larger Urban Zone (LUZ) has grown from 197,383 people in 1951 to 228,118 people in 2011 (+15.6%), while at the same time,

the Core City's population has grown from 140,734 to 180,817 (+28.58%). These figures, when compared to the changes in the land use, show a difference between the numerical and physical growth of the city.

Detailed mapping of the southern area of the City of Reggio Calabria clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006, and which has led to a saturation of the land south of the municipality between the "fumare" of Calopinace, Sant'Agata and Valanidi and an irregular development of logistic, productive and residential functions.



Urban Footprint

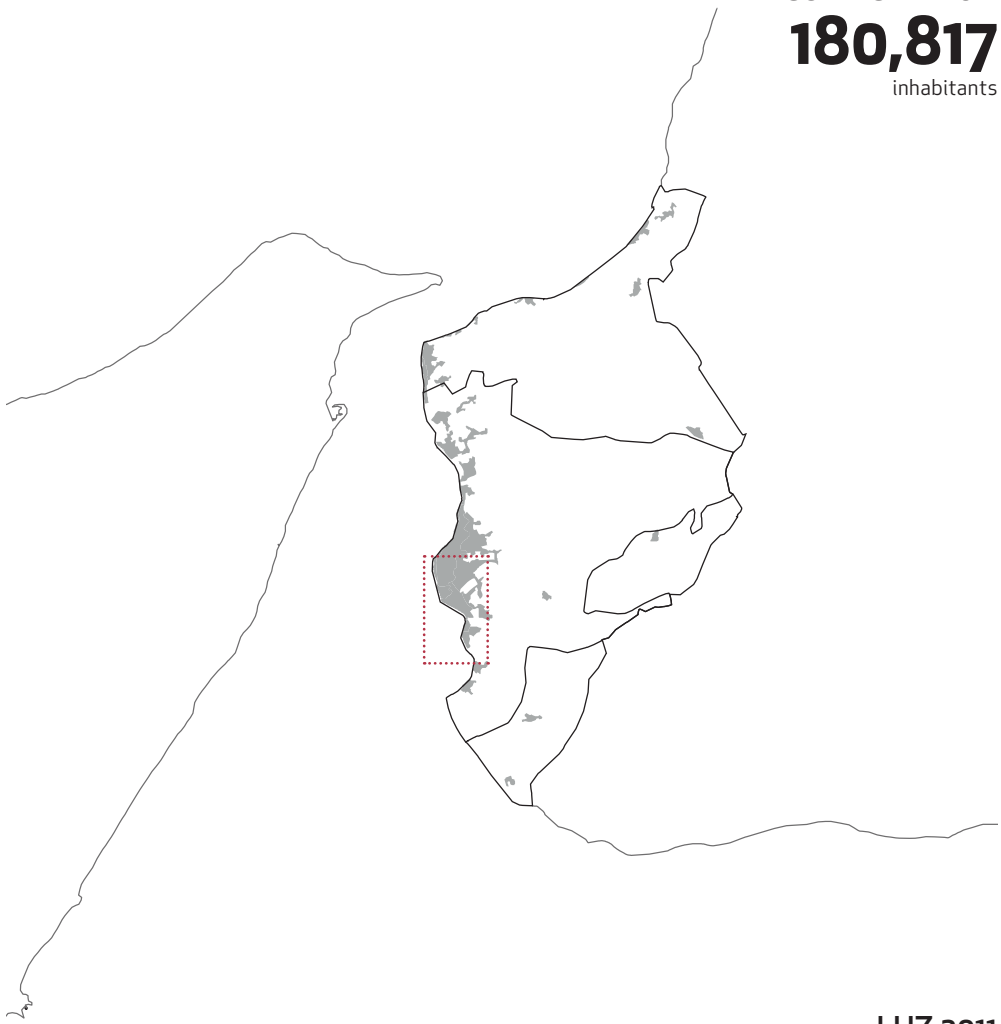
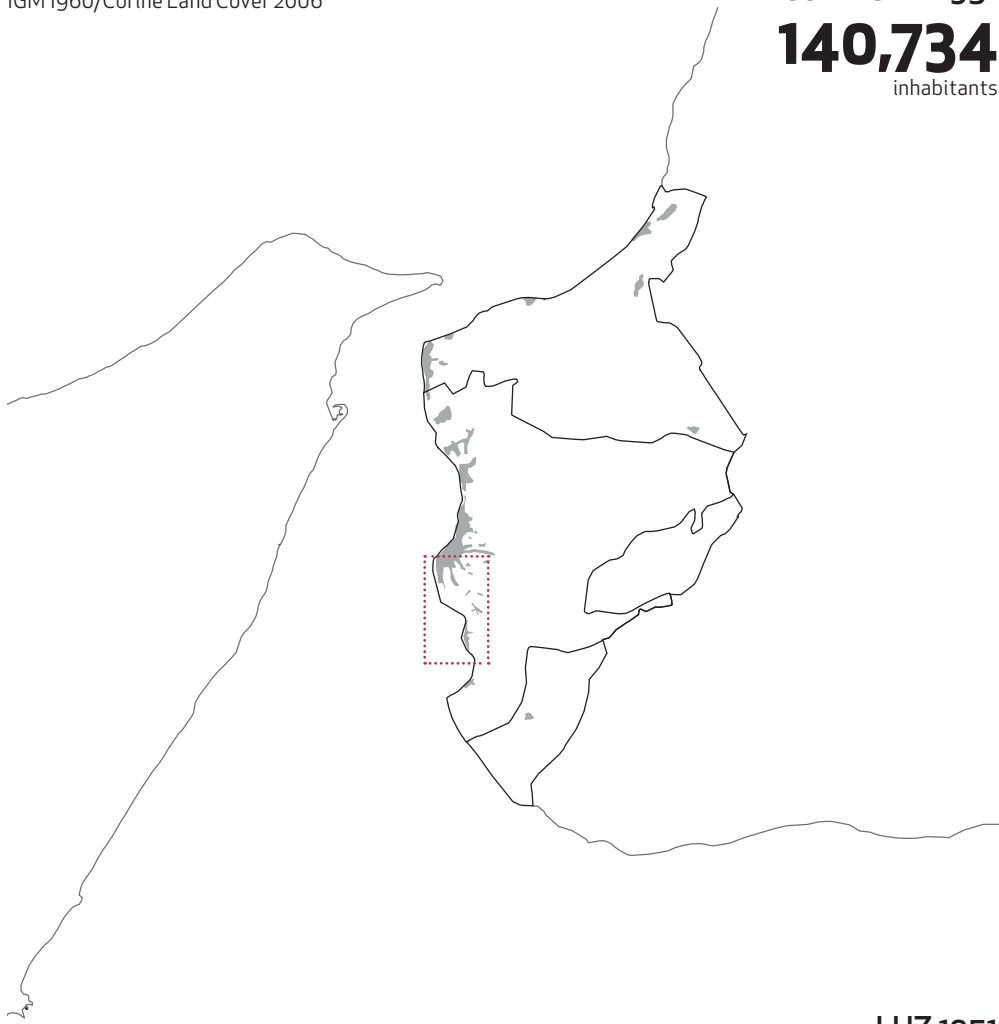
IGM 1960/Corine Land Cover 2006

CORE CITY 1951

140,734
inhabitants

CORE CITY 2011

180,817
inhabitants



LUZ 1951

197,383
inhabitants

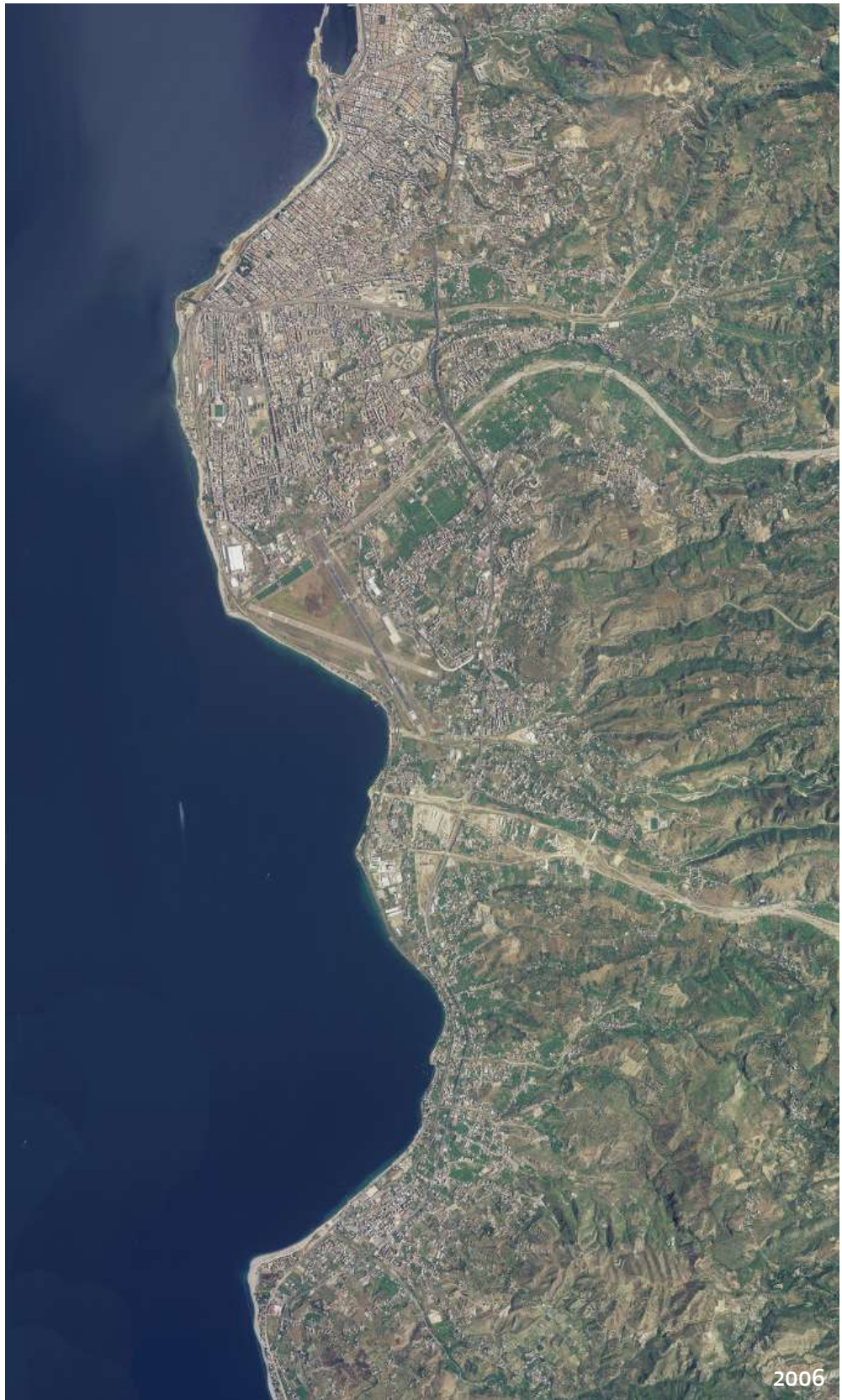
LUZ 2011

228,118
inhabitants



1955

Volo GAI



2006

Geoportale Nazionale

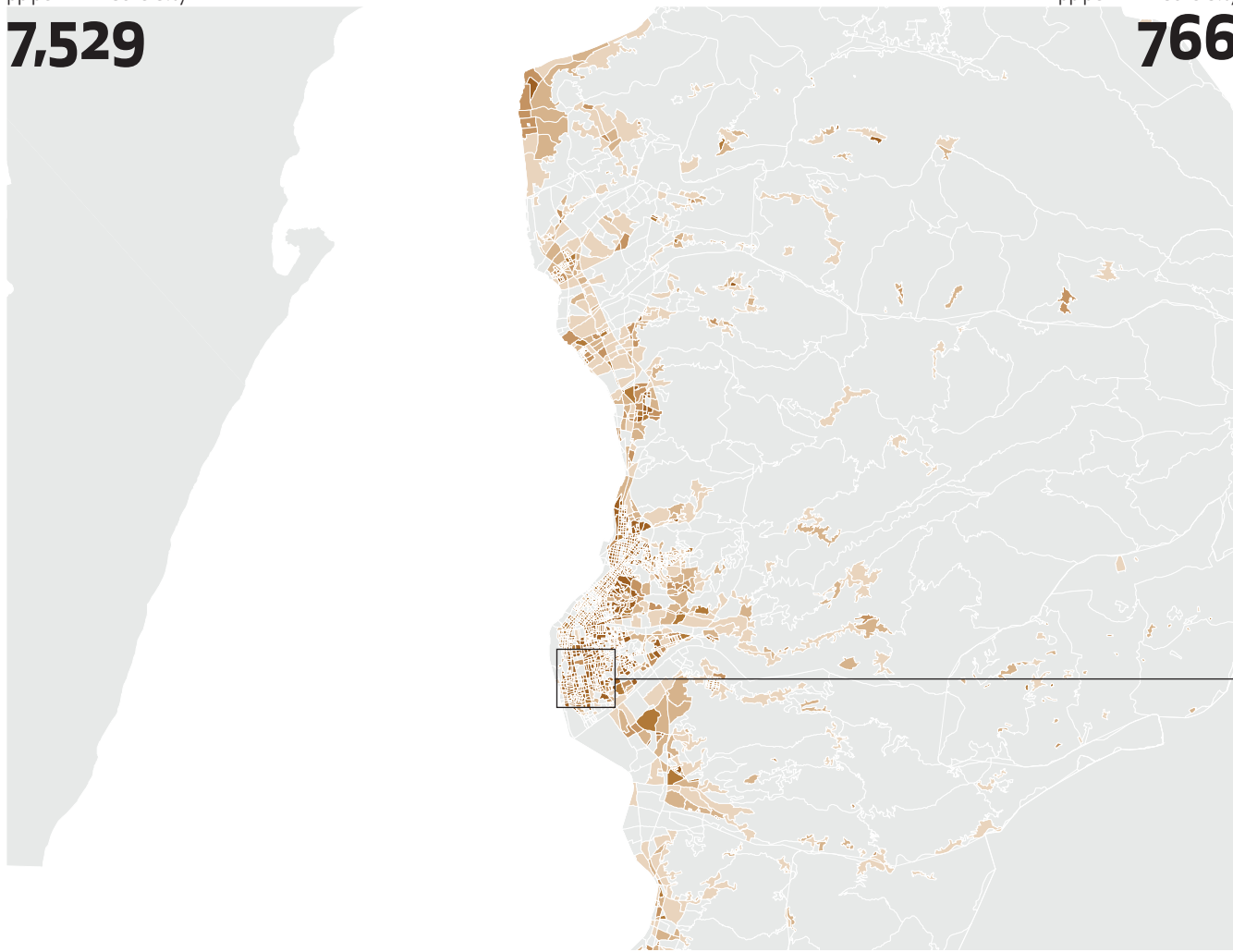
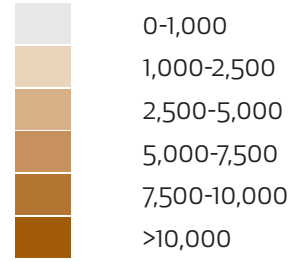
PEAK DENSITY
pp per km² - Core City

7,529

AVERAGE DENSITY
pp per km² - Core City

766

Population



URBAN DENSITY

PEAK DENSITY

CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Reggio Calabria, the ratio between the population of the Core City over the population of the LUZ goes from 71% in 1951 to 79% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a constant growth in the Core City and a continuous decrease in population in the municipalities of the first and second belts.

In 2011 within the city of Reggio Calabria and in the LUZ, the foreign population accounts for 4% of the total population (+146% over the last decade).

4%

+146%
(2001-2011)



4%

+158%
(2001-2011)

CORE

LUZ



10%

-57%
(2004-2011)

LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011

CORE
+18%

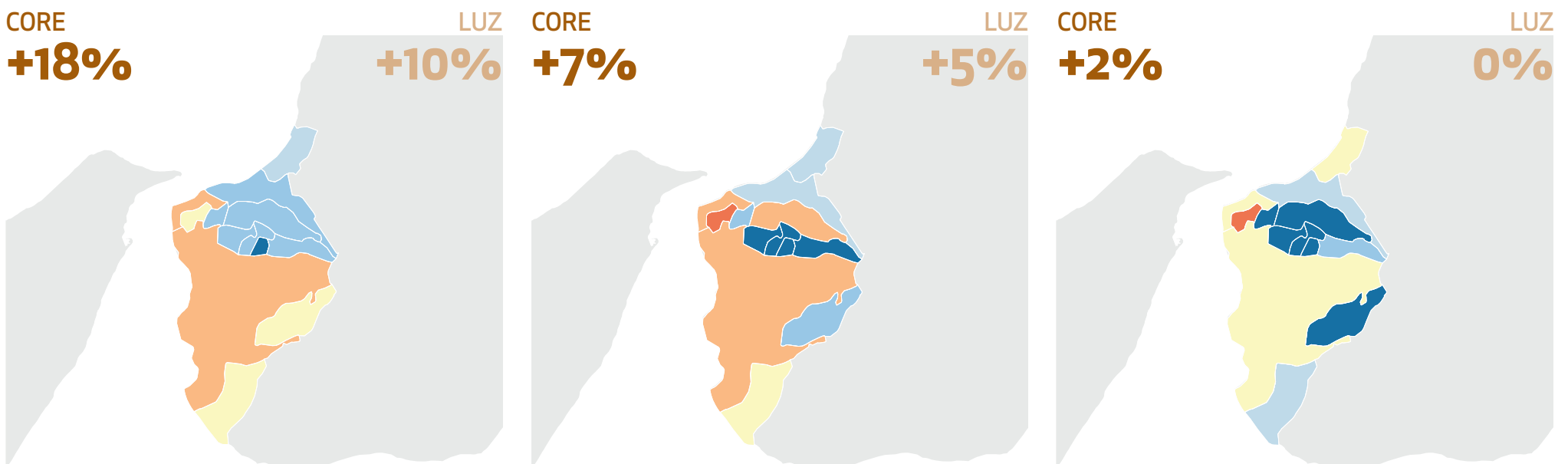
LUZ
+10%

CORE
+7%

LUZ
+5%

CORE
+2%

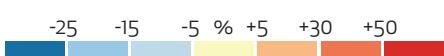
LUZ
0%



1951-71

1971-91

1991-2011



DEMOGRAPHIC CHANGES

Mobility

The metropolitan area of Reggio Calabria, as shown in the images below, is served by a poor rail and road infrastructure. The modal split chart shows that 79% of travellers use private transport, 6% public transport and 15% walk or cycle within the LUZ; in the Core City, travellers

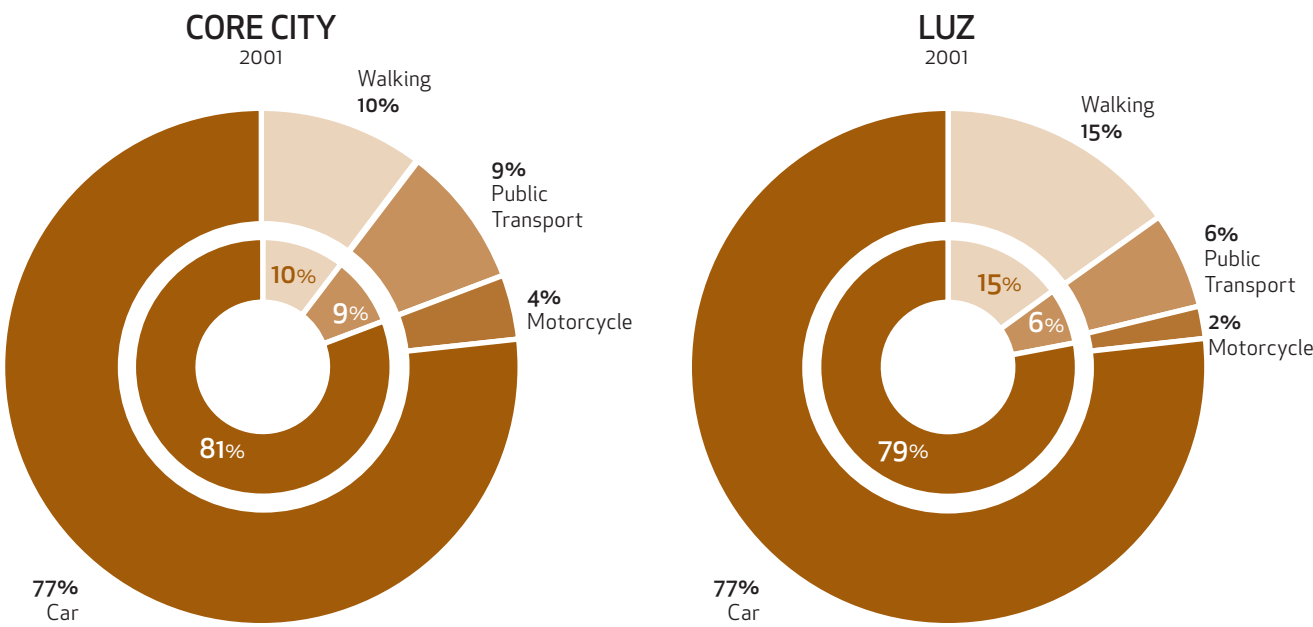
using private transport are 81%, those using public transport 9% and the remaining 10% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more

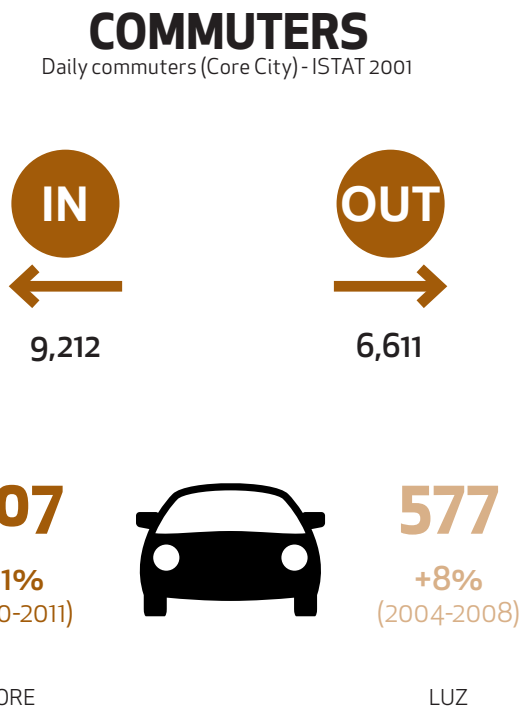
than 9,000 people compared to circa 7,000 of outbound commuters. The motorization rate is within the national average, with 577 cars per 1,000 inhabitants in the LUZ and 607 in the Core City.



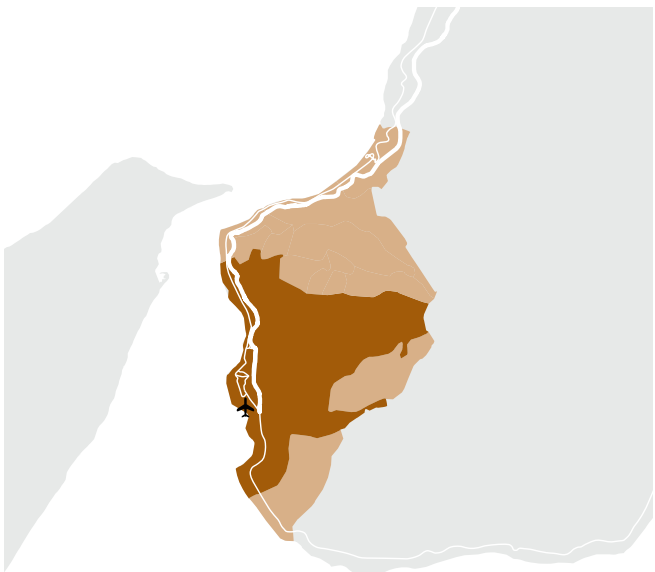
Image by Antonio Regolo



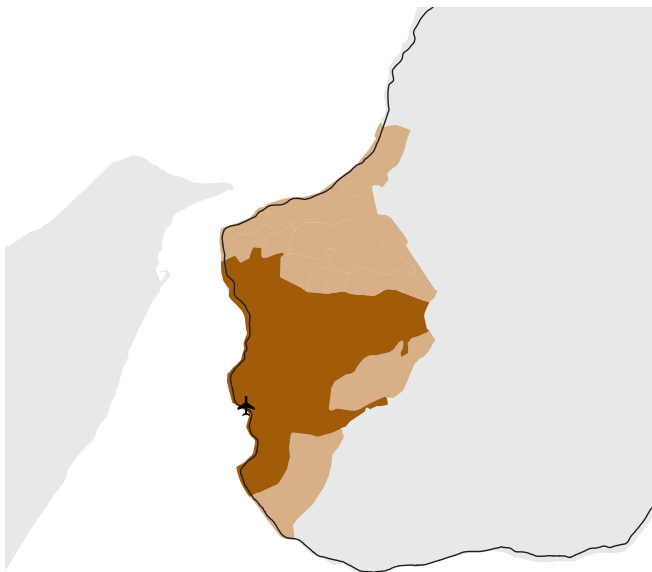
MODAL SPLIT
Eurostat 2001



CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE

Italian top 104 main cities - Legambiente 2013



474
kg
+2%
(2000-2011)

WASTE

Annual waste collection per capita (Core City) - Istat 2011



11%
+807%
(2000-2011)

WASTE SORTING

Waste sorting % (Core City) - Istat 2011

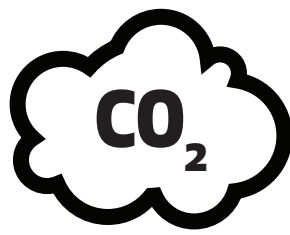
N/D
kt



N/D
t per capita

AIR EMISSIONS

Annual CO₂ emissions (Core City)



CO₂ emissions split (Core City)

12
µg/mc



Pm10

N/D
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,294
kWh per capita



+3%
(2000-2011)

ELECTRICITY

Annual domestic electricity consumption (Core City) - Istat 2011

62
m³ per capita



+227%
(2006-2011)

GAS

Annual domestic Natural Gas consumption (Core City) - Istat 2011

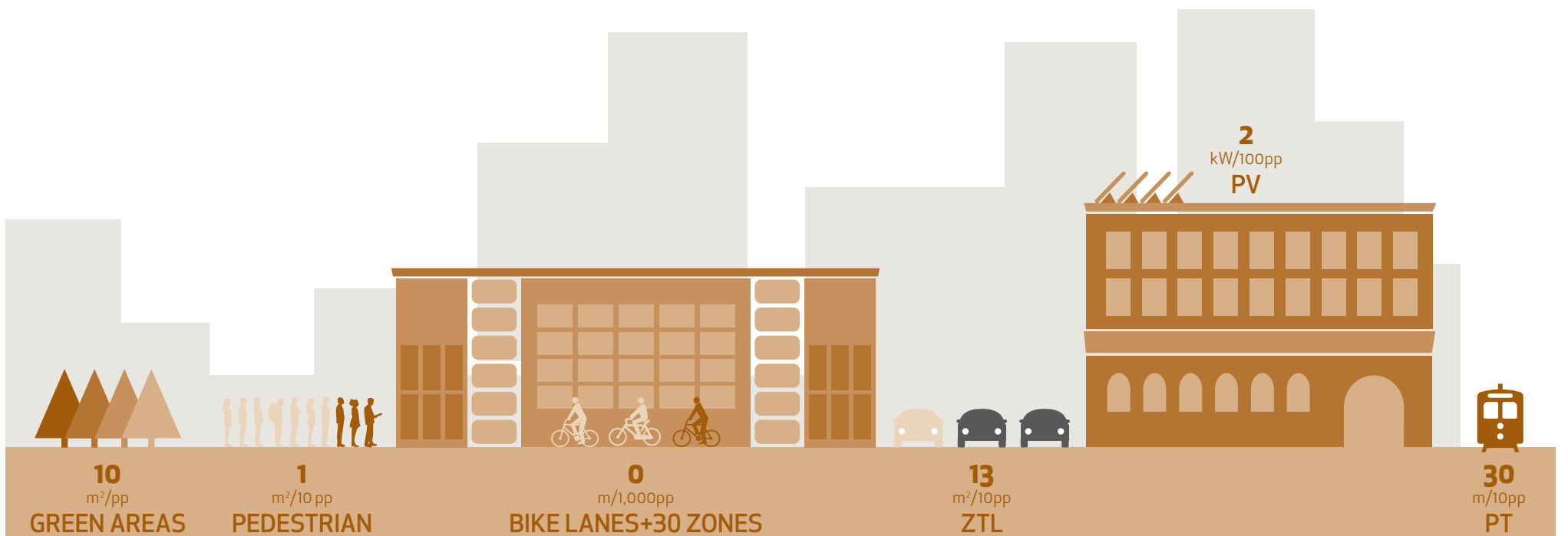
194
l per capita



+9%
(2000-2011)

WATER

Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

Actions in place

MESSINA

Region

Sicilia

Municipalities

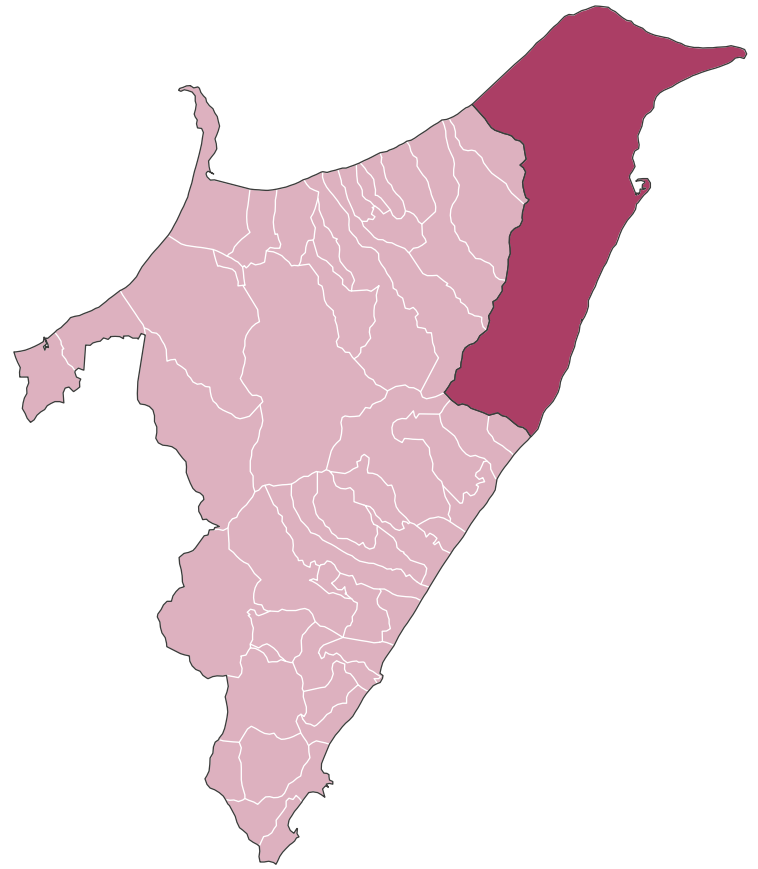
51

Larger Urban Zone area*

1,130 km²

Core City area

211 km²



* the perimeter indicated by the Sicily Regional Law 9/1986 was considered for the city of Messina

Messina is the capital city of the province, located near the northeast corner of Sicilia (Capo Peloro), on the Strait of Messina. The metropolitan city, which includes 51 municipalities, covers an area of approximately 1,130 km² and has a population of approximately 478,309 people (2011 Istat survey), of whom 243,262 live in the City of Messina.

Second Greek colony of Italy and the first of Sicily, Messina was founded by the Greeks around 756 BC with the name of Zancle, (which in Greek means sickle, from the peninsula of San Raineri resembling a crescent which forms the natural harbor). Conquered by the Romans in 264 BC, after the fall of the Roman Empire it was

ruled by the Byzantines, and later by the Arabs and then the Normans. Under the Swabian-Angevin-Aragonese law, Messina became the capital of the Kingdom of Sicily with Palermo. It becomes part of the Kingdom of Italy after the expedition of the Garibaldines in 1860.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the complete urbanization of the coastline of the LUZ.

The population of the Larger Urban Zone (LUZ) has grown from 426.204 people in 1951 to 478,309 people in 2011 (+12.2%), while at the

same time, the Core City's population has grown from 220,668 to 243,262 (+10.2%). These figures, when compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

Detailed mapping of the central area of the city of Messina clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of settlements along the coastline on one side, and the development towards the valleys of the mainland on the other one.



Image by Alessandro Grusso

Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951
220,668
inhabitants

CORE CITY 2011
243,262
inhabitants

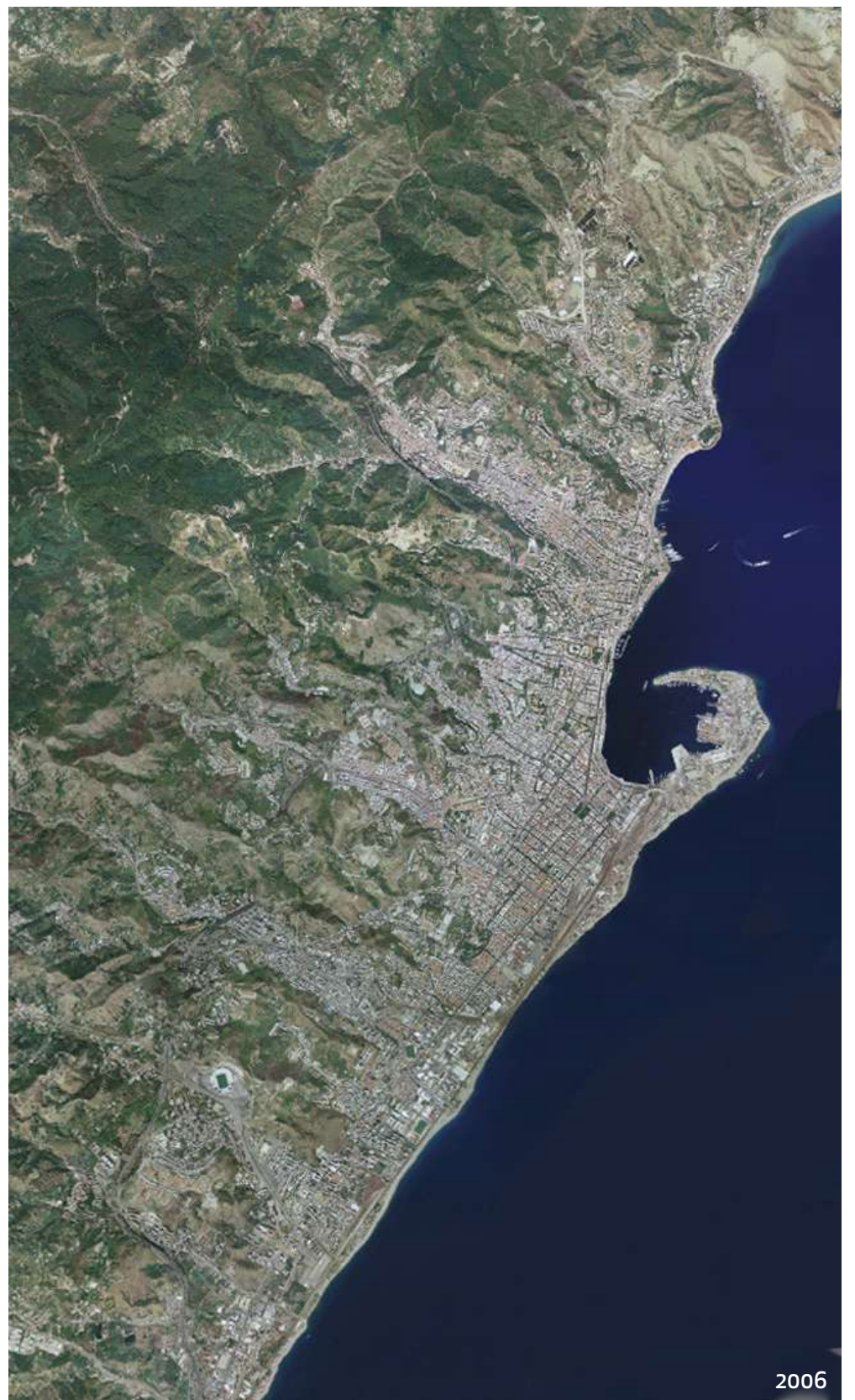


LUZ 1951
426,204
inhabitants

LUZ 2011
478,309
inhabitants



1955
Volo GAI

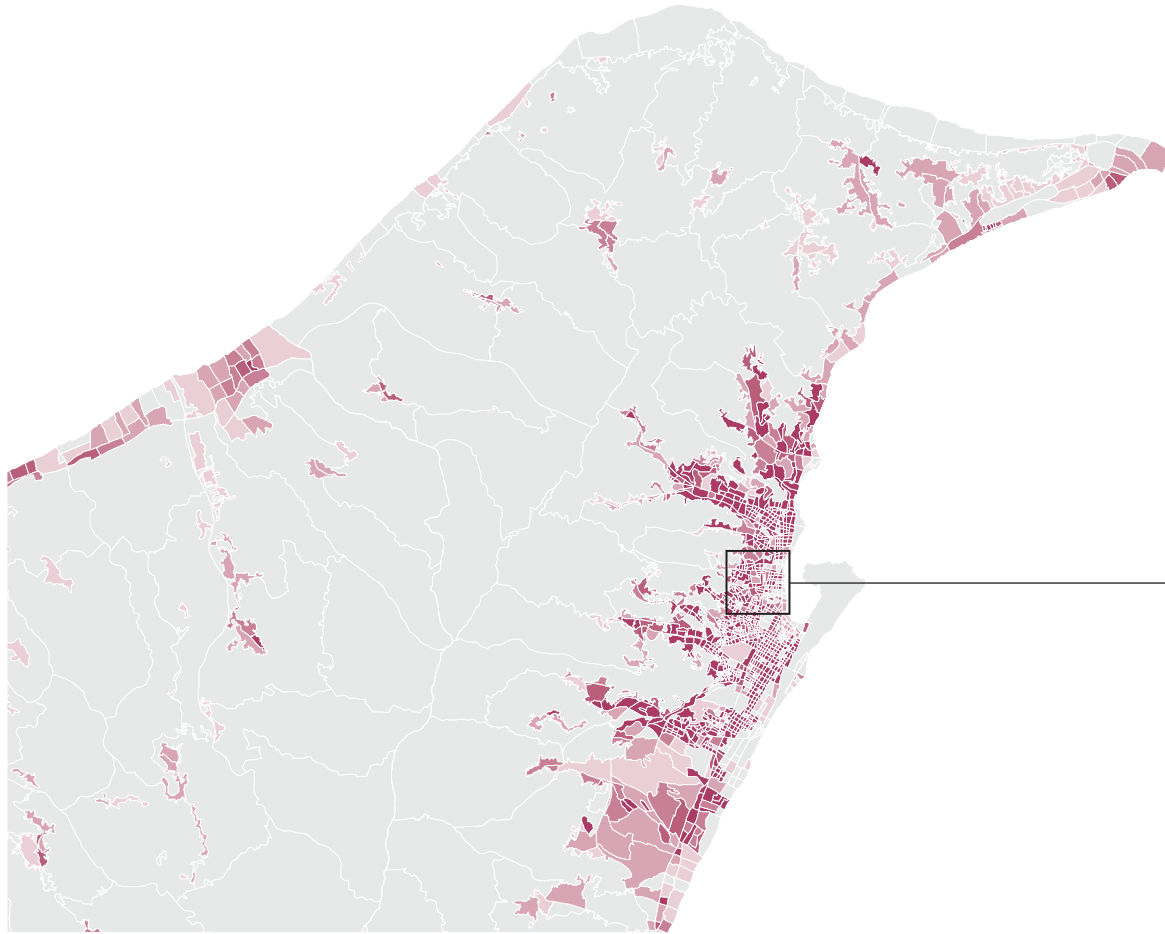
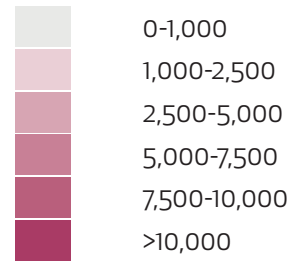


2006
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City
8,539

AVERAGE DENSITY
pp per km² - Core City
1,152

Population

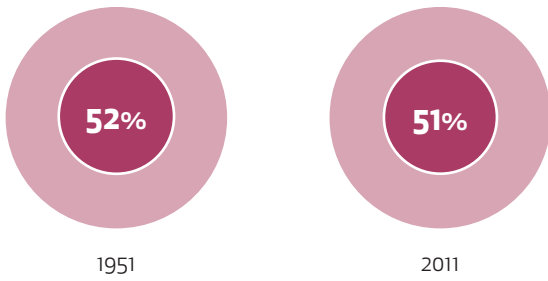


URBAN DENSITY

PEAK DENSITY

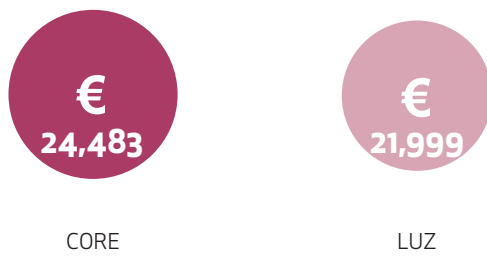
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Messina, the ratio between the population of the Core City over the population of the LUZ goes from 52% in 1951 to 51% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a growth in the Core City and a reduction in population in neighboring municipalities from 1951 to 1971, in the following two periods (1971-1991 and 1991-2011) there is a diffused reduction in population both in the Core City and the neighboring municipalities with the exception of the municipalities on the coastline.

In 2011 within the city of Messina, the foreign population accounts for 5% of the total population (+132% over the last decade) and for 4% in the LUZ.

5%
+132%
(2001-2011)



4%
+150%
(2001-2011)

CORE

LUZ



14%
-16%
(2004-2010)

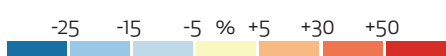
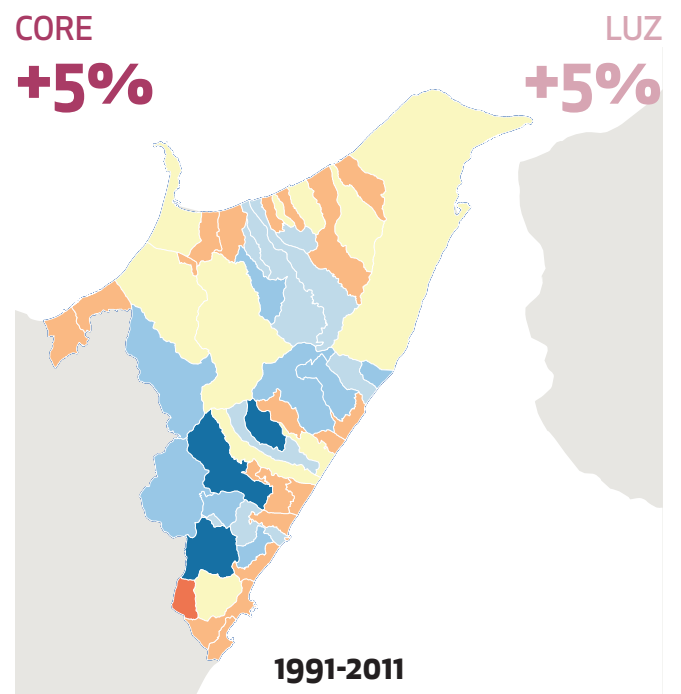
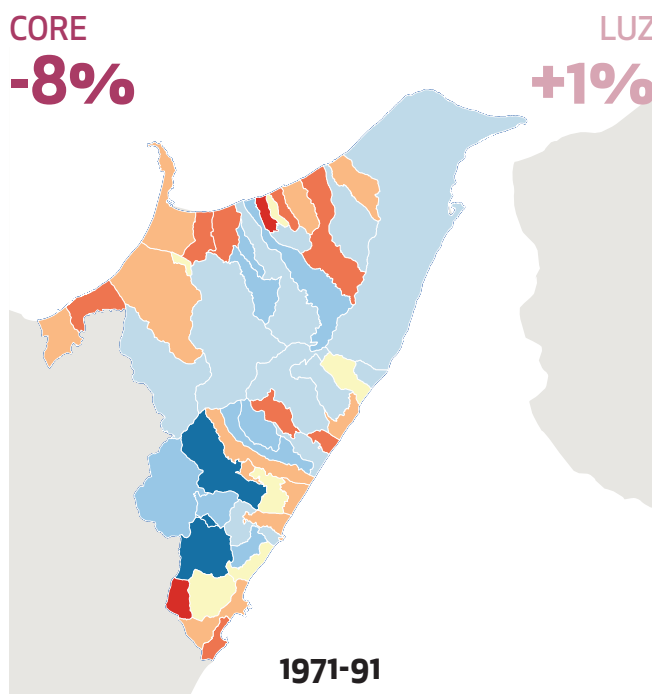
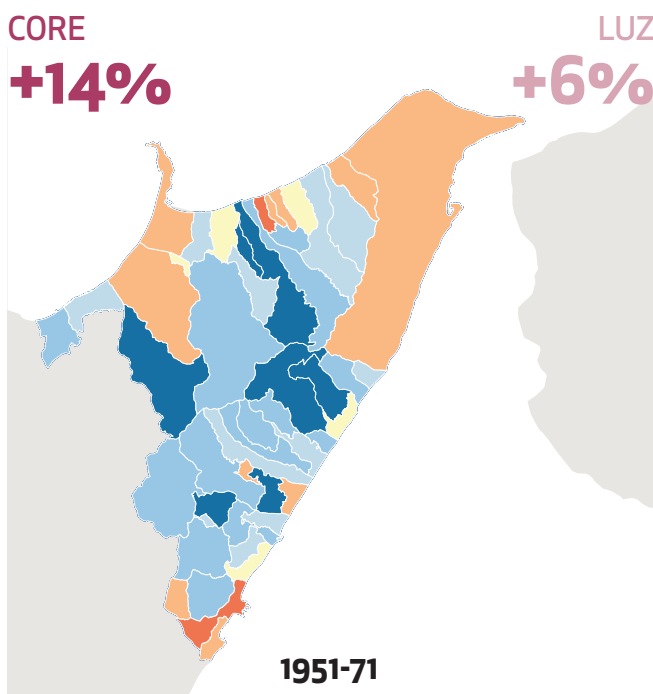
PROVINCE (NUTS3)

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Istat 2010



DEMOGRAPHIC CHANGES

Mobility

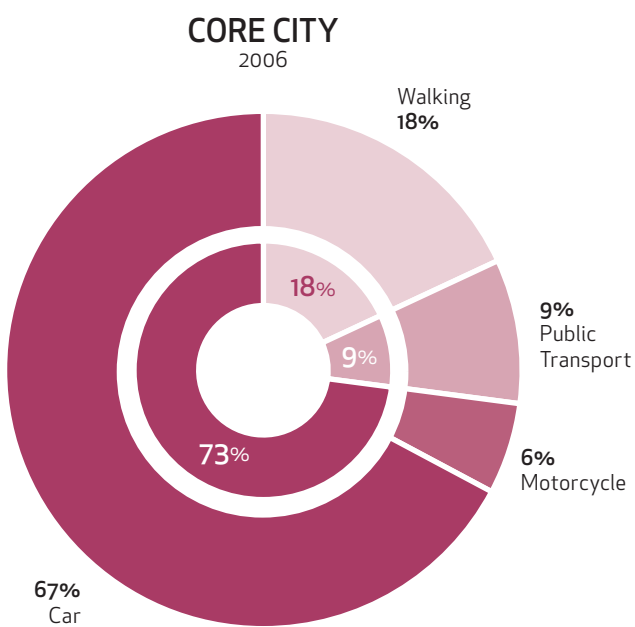
The metropolitan area of Messina, as shown in the images below, is served by a poor rail and road infrastructure. The modal split chart is available for the Core City only and it shows that 73% of travellers use private transport, 9% public transport and 18% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than 17,000 people compared to circa 4,000 of outbound commuters. The motorization rate is within the national average, with 596 cars per 1,000 inhabitants in the core city.

The data is not available for the LUZ.



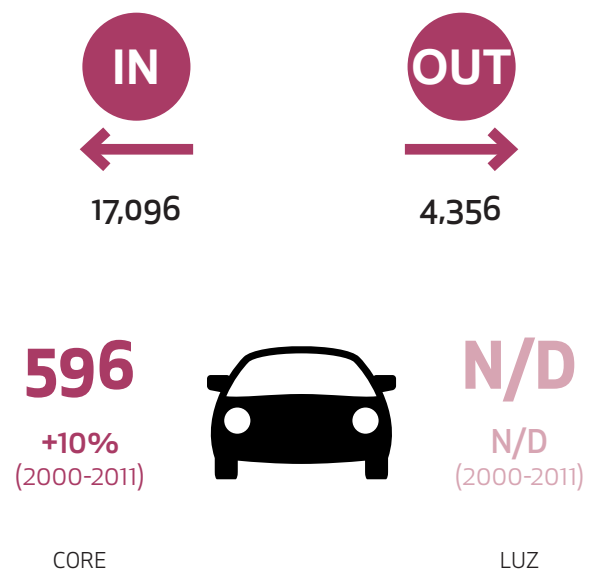
Image by Stefano Barilla



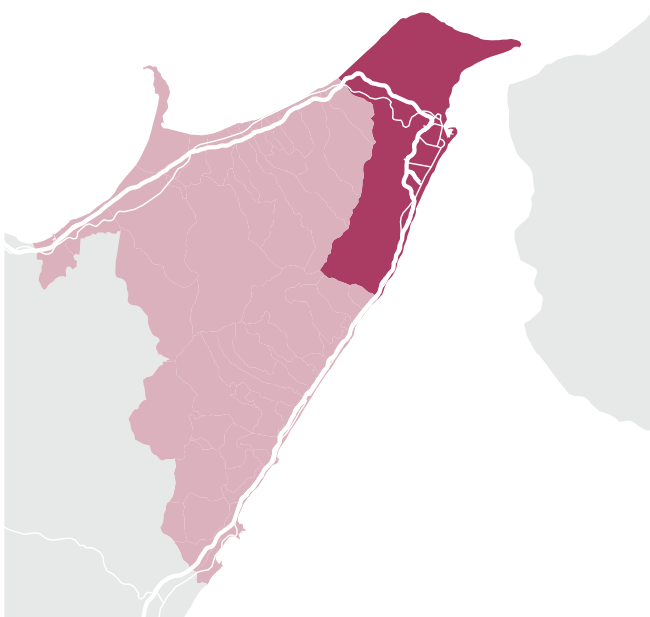
MODAL SPLIT
PUM 2006

COMMUTERS

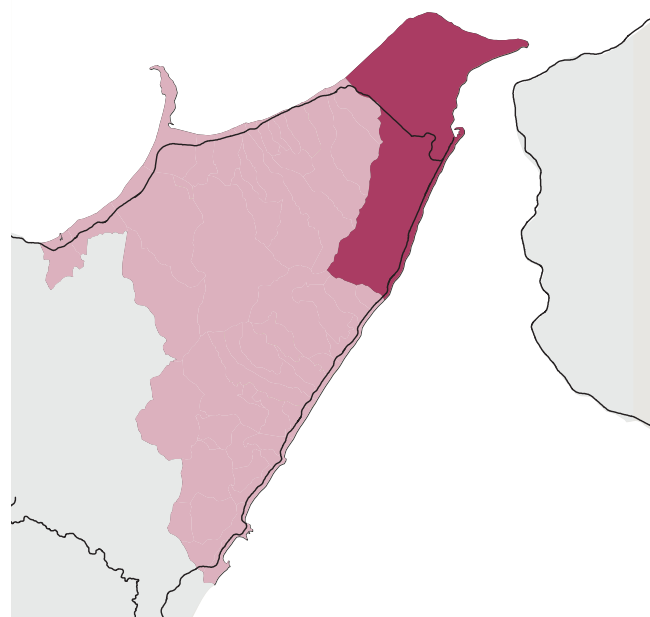
Daily commuters (Core City) - ISTAT 2001



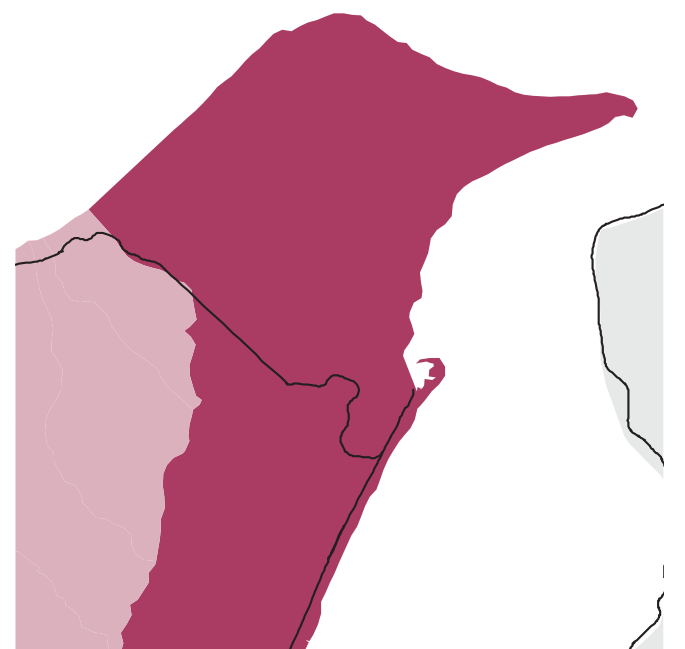
CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



WASTE
Annual waste collection per capita (kg - Core City) - Istat 2011

535
kg
+14%
(2000-2011)



WASTE SORTING
Waste sorting % (Core City) - Istat 2011

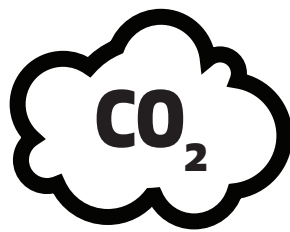
6%
+341%
(2000-2011)

N/D
kt



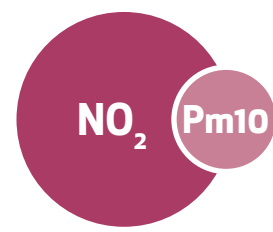
N/D
t per capita

AIR EMISSIONS
Annual CO₂ emissions (Core City)



CO₂ emissions split (Core City)

44
µg/mc



20
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,161
kWh per capita



+9%
(2000-2011)

ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011

109
m³ per capita



+12%
(2000-2011)

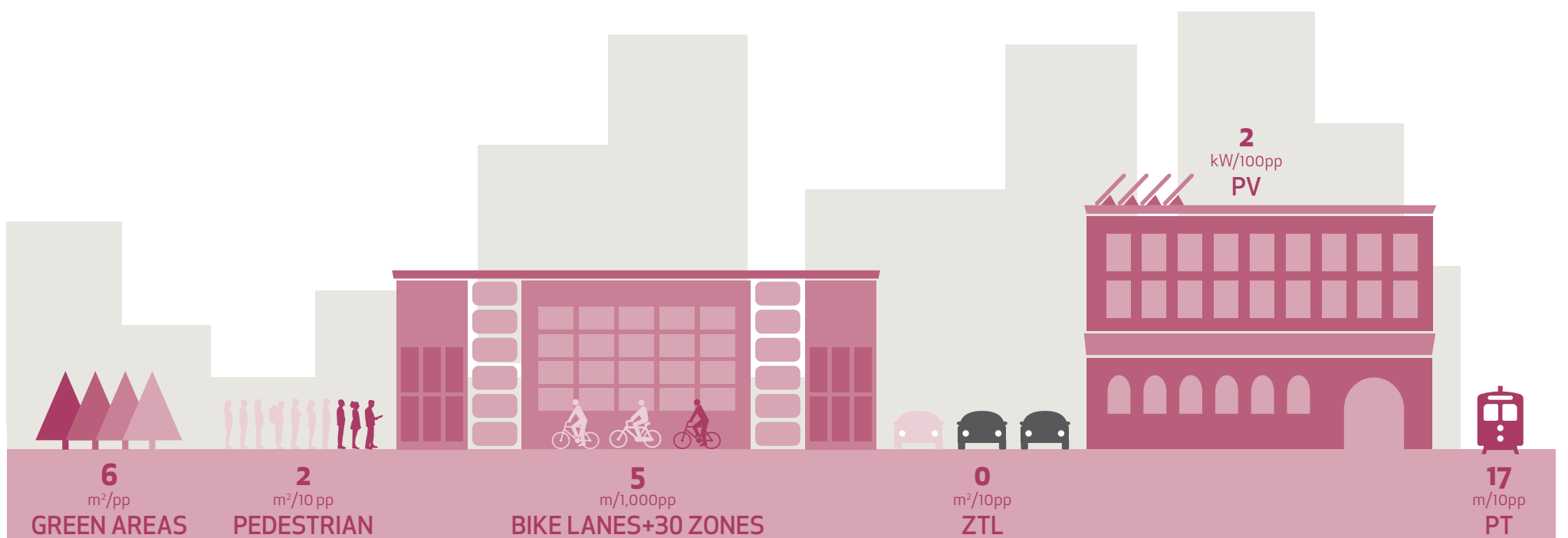
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011

212
l per capita



+18%
(2000-2011)

WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

-15%
use of private car
for commuting

+
71%
use of public transport
for commuting

150
new vehicles
for public transport

CATANIA

Region

Sicilia

Municipalities

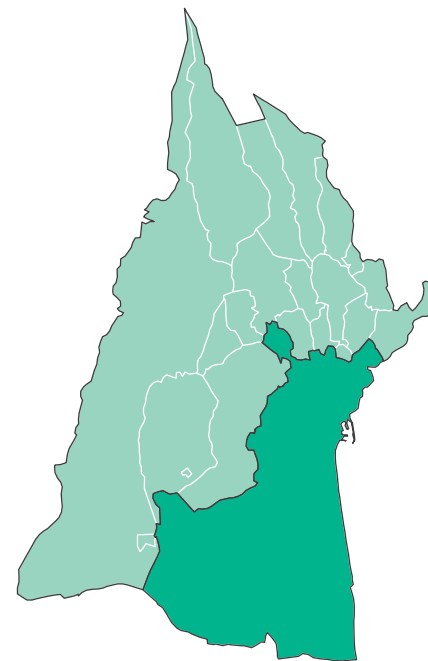
19

Larger Urban Zone area

585 km²

Core City area

181 km²



Catania is the capital city of the Catania province, the tenth Italian city by population. The metropolitan city, which includes 19 municipalities, covers an area of approximately 585 km² and has a population of approximately 579,267 people (2011 Istat survey), of whom 293,902 live in the City of Catania.

Founded by the Chalcis Greeks in 729 BC it was conquered by the Romans in 263 BC. The city of Catania has a long history of dominations (Byzantines, Normans, Swabians, Angevins, Aragonese, Spanish, Savoy, Bourbon), the remains of which characterize today's artistic, architectural and cultural features. Damaged several times over the centuries by volcanic

eruptions and earthquakes, its baroque city centre has been inscribed on the World Heritage list by UNESCO.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which is characterized by an urban explosion in all directions which has gradually led to merging of the Core City to the municipalities of the first belt, creating a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 370,936 people in 1951 to 579,267 people in 2011 (+56.1%), while at the same time, the Core City's population has grown

from 299,629 to 293,902 (-1.9%); these figures, when compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

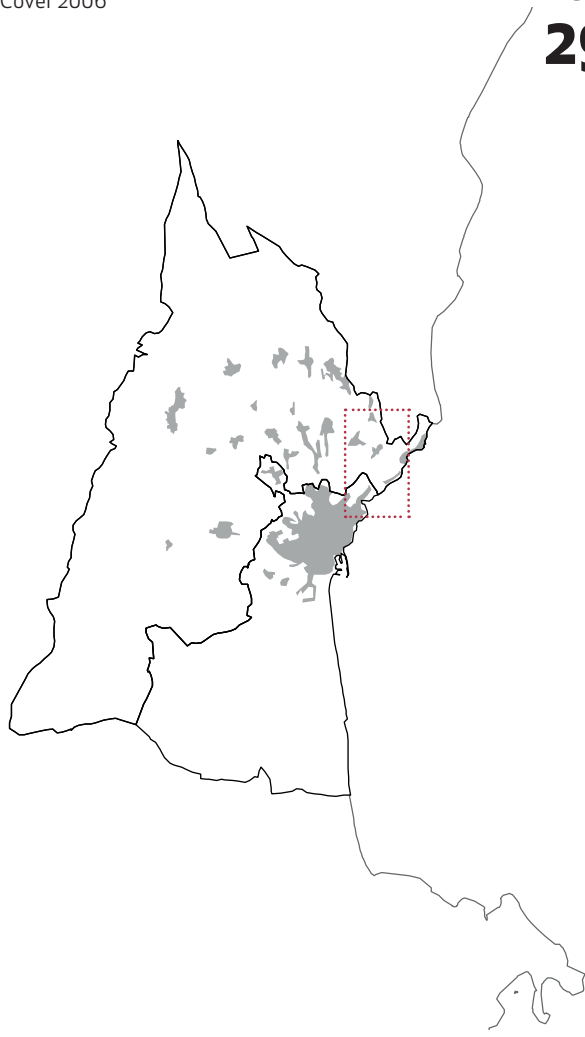
Detailed mapping of the northern area of the city of Catania clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: the development of the mixed functions in the areas in proximity of the A18 motorway.



Urban Footprint

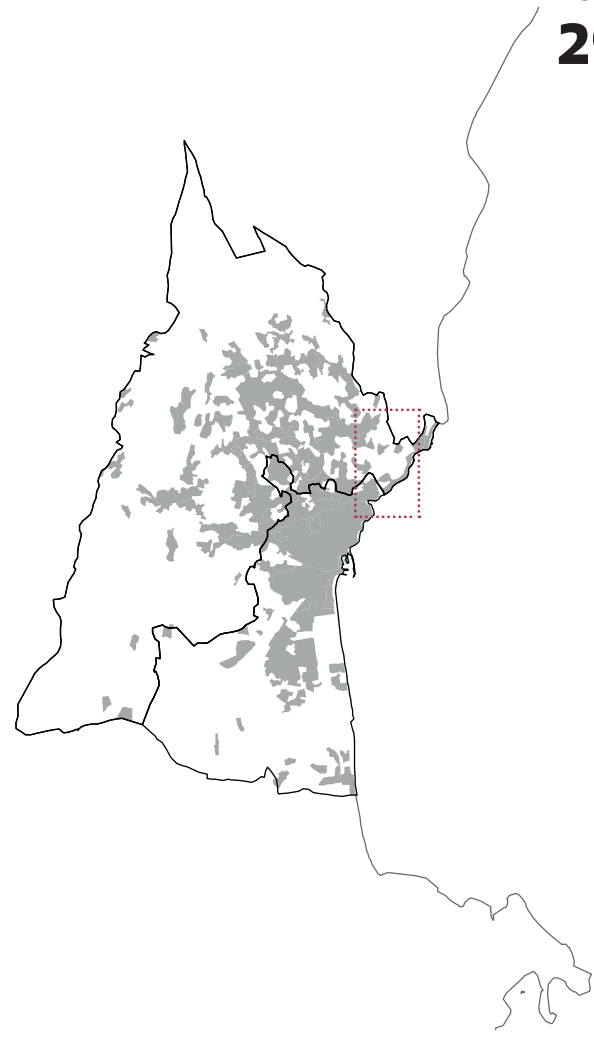
IGM 1960/Corine Land Cover 2006

CORE CITY 1951
299,629
inhabitants

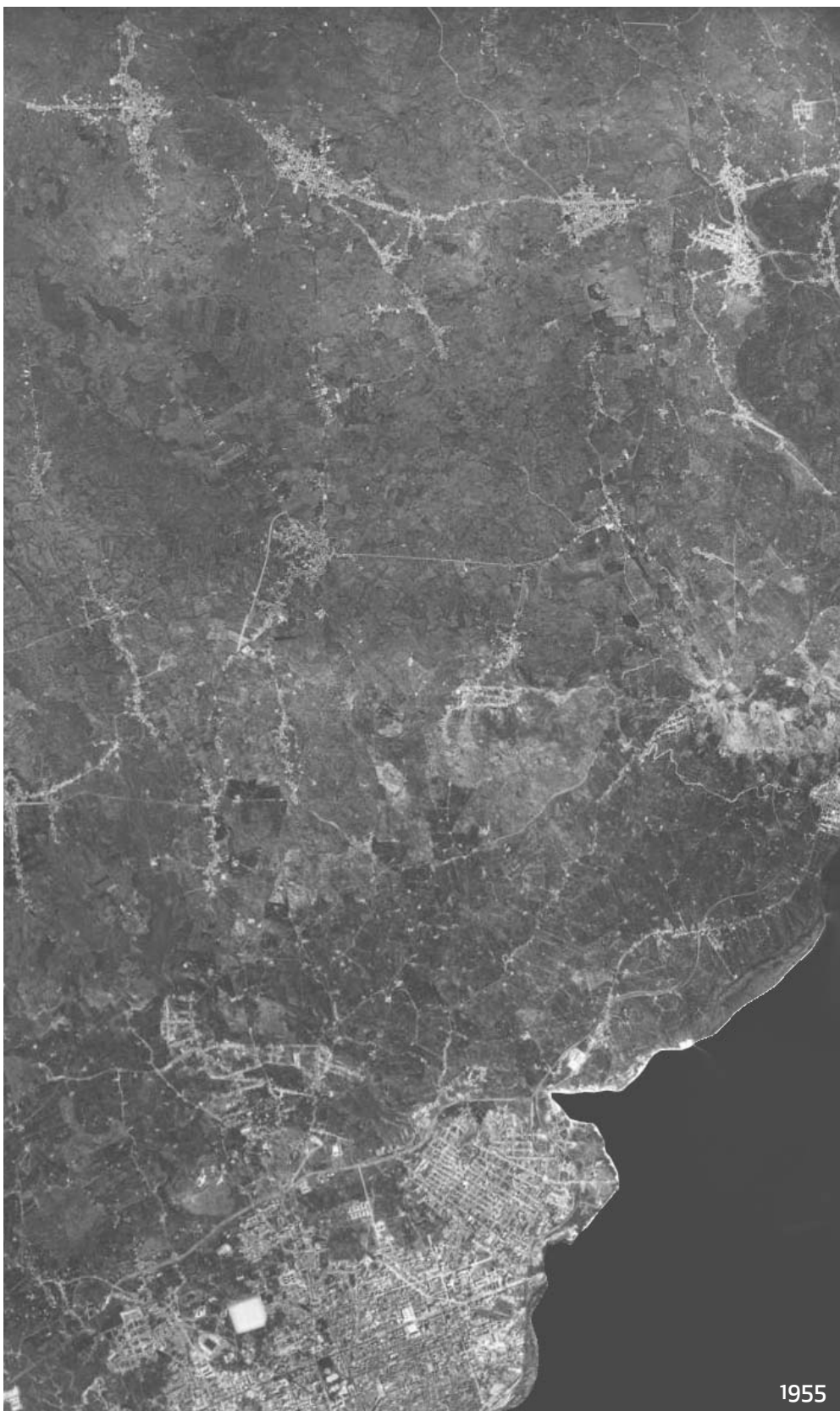


LUZ 1951
370,936
inhabitants

CORE CITY 2011
293,902
inhabitants



LUZ 2011
579,267
inhabitants



1955

Volo GAI



2006

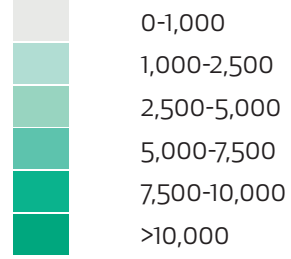
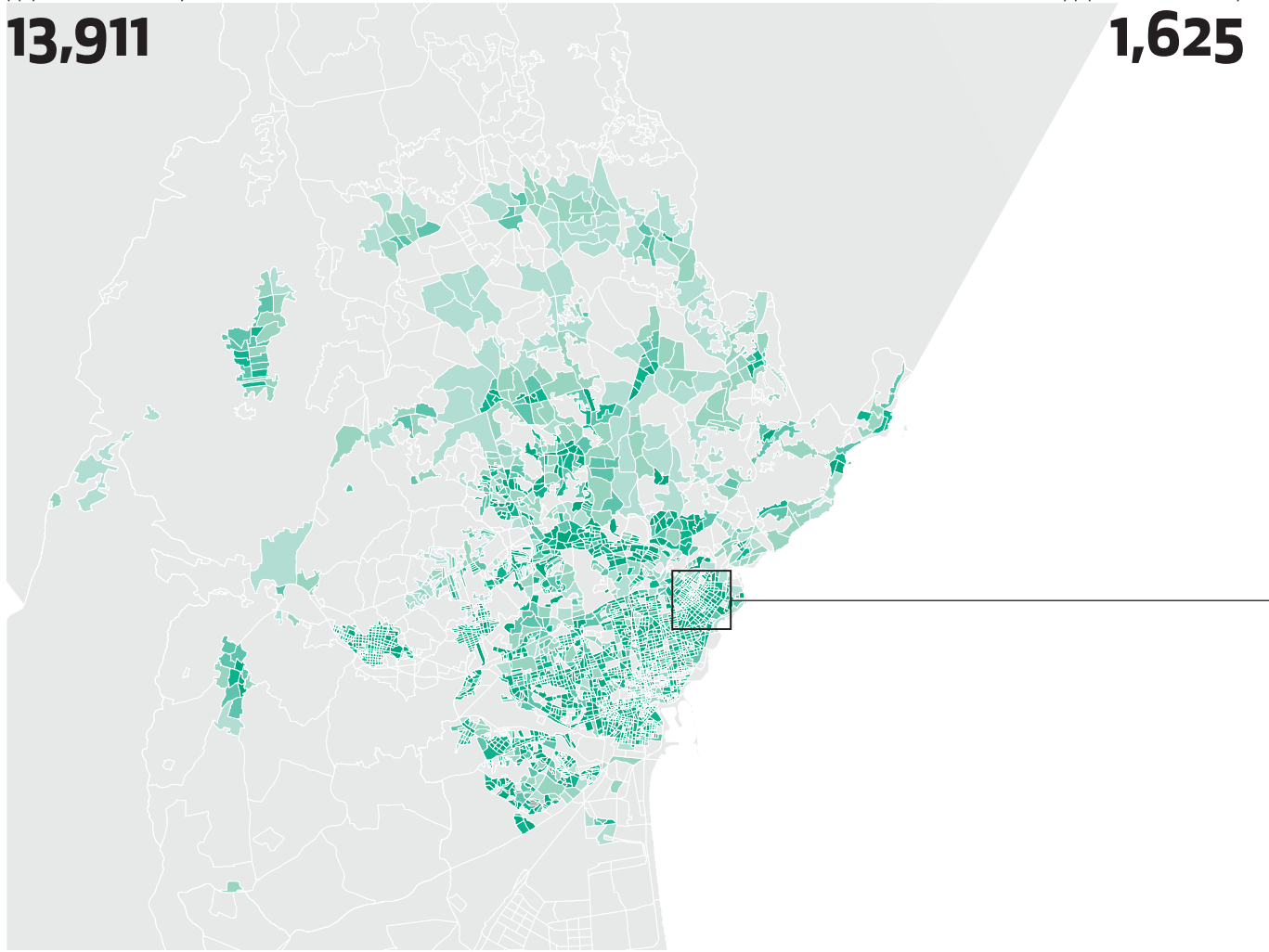
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

13,911

AVERAGE DENSITY
pp per km² - Core City

1,625



Population



URBAN DENSITY

PEAK DENSITY

CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Catania, the ratio between the population of the Core City over the population of the LUZ goes from 81% in 1951 to 51% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a trend which is common to other Italian cities: a strong growth in population the Core City from 1951 to 1971, is followed by a progressive decrease in population during the following two periods (1971-1991 and 1991-2011) when growth is concentrated in the municipalities of the first and second belts.

In 2011 within the city of Catania and in the LUZ, the foreign population accounts for 2% of the total population (+69% over the last decade).

2%

+69%
(2001-2011)

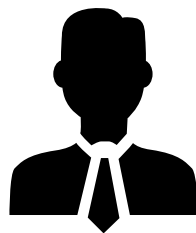


2%

+60%
(2001-2011)

CORE

LUZ



12%

-8%
(2004-2011)

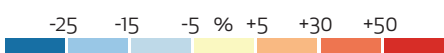
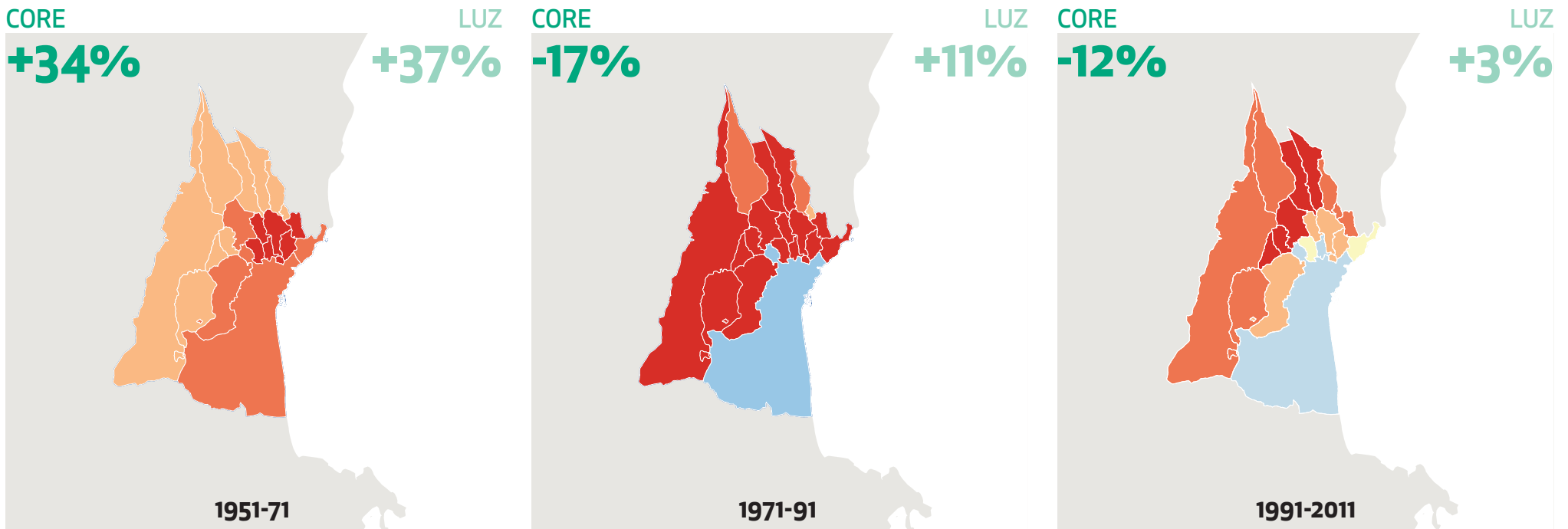
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

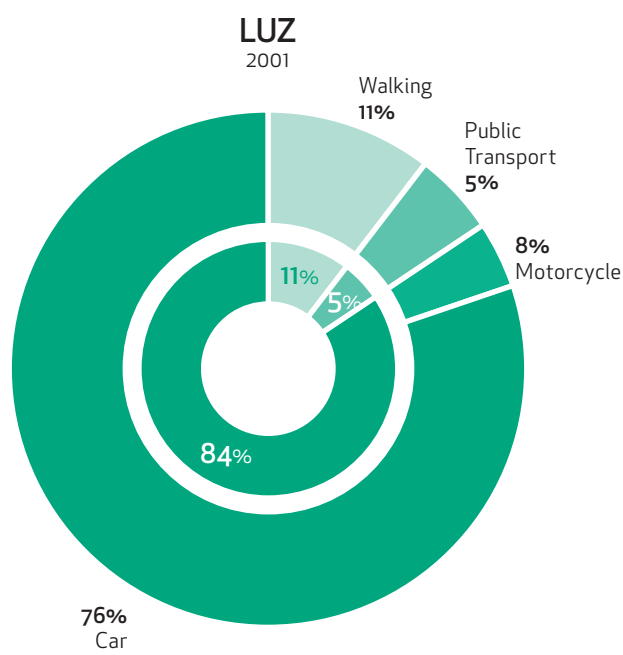
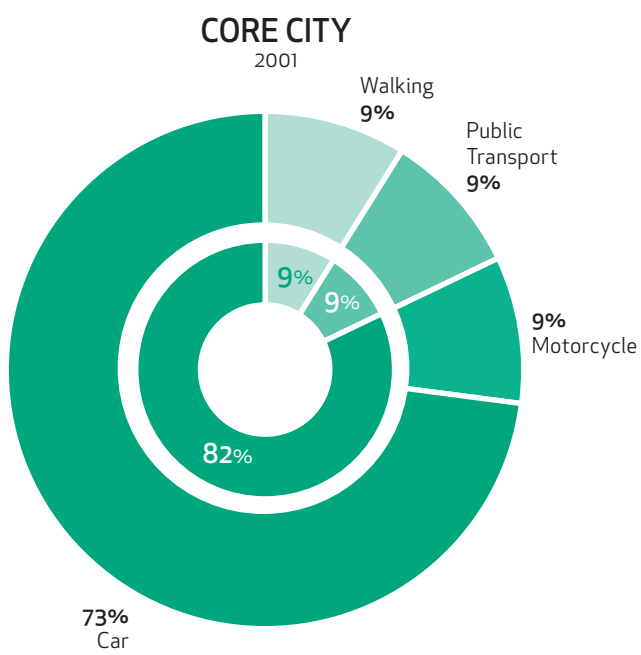
Mobility

The metropolitan area of Catania, as shown in the images below, is served by a good rail and road infrastructure. The modal split chart shows that, 84% of travellers use private transport, 5% public transport and 11% walk or cycle within the LUZ; the data for the Core City is quite

similar, travellers using private transport are 82%, those using public transport 9% and the remaining 9% walk or cycle.

The data on commuting (for work and study) shows the daily inbound commute of more than

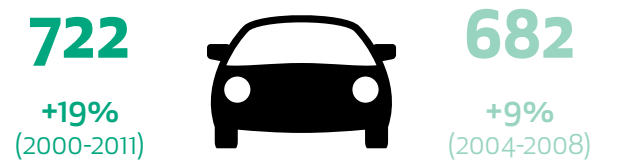
75,000 people compared to circa 10,000 of outbound commuters. The motorization rate is one of the highest in Italy, with 682 cars per 1,000 inhabitants in the LUZ and 722 in the Core City.



MODAL SPLIT
Eurostat 2001

COMMUTERS

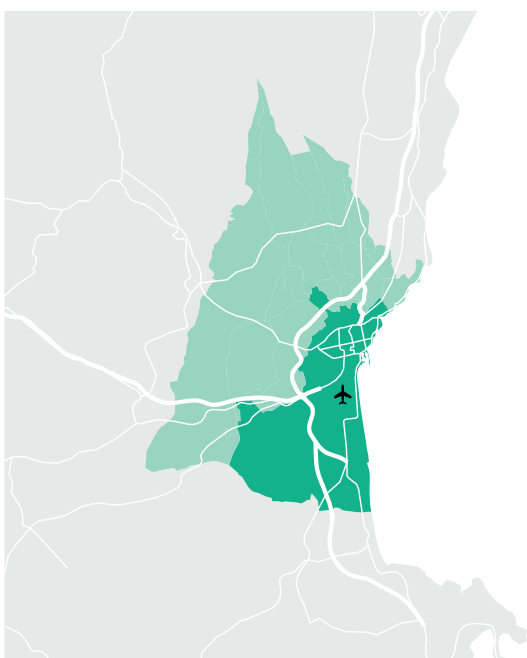
Daily commuters (Core City) - ISTAT 2001



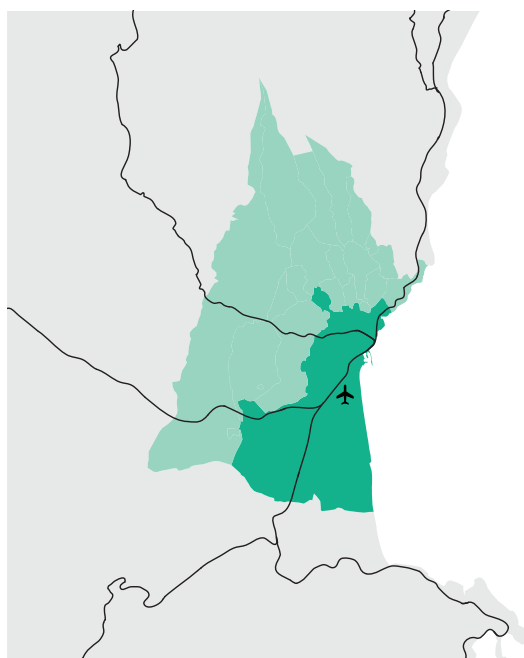
CORE LUZ

CAR OWNERSHIP

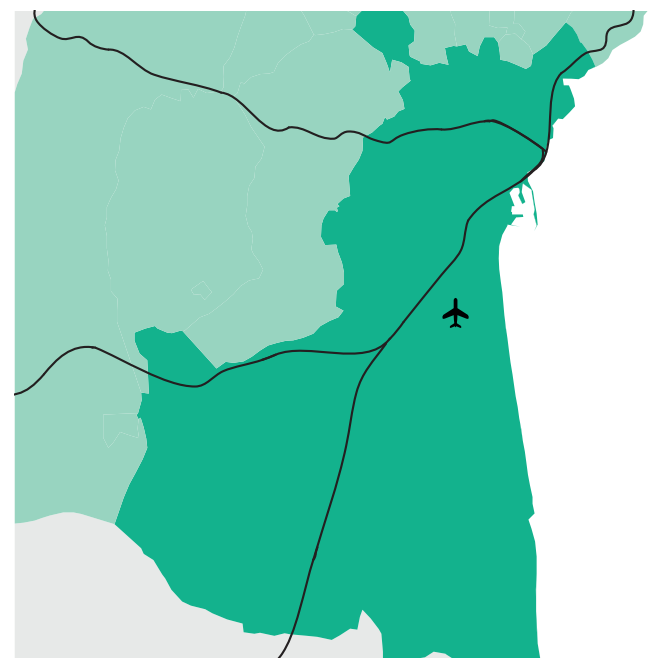
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



775
kg
+15%
(2000-2011)

WASTE
Annual waste collection per capita (Core City) - Istat 2011



8%
+1,064%
(2000-2011)

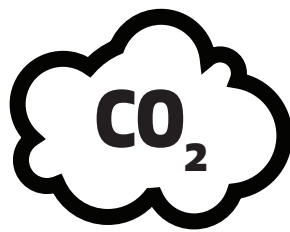
WASTE SORTING
Waste sorting % (Core City) - Istat 2011

N/D
kt



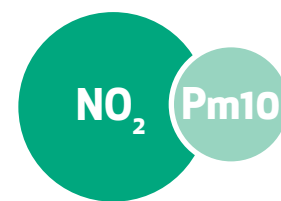
N/D
t per capita

AIR EMISSIONS
Annual CO₂ emissions (Core City)



CO₂ emissions split (Core City)

39
µg/mc



24
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,328
kWh per capita



+19%
(2000-2011)

ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011

56
m³ per capita



+42%
(2000-2011)

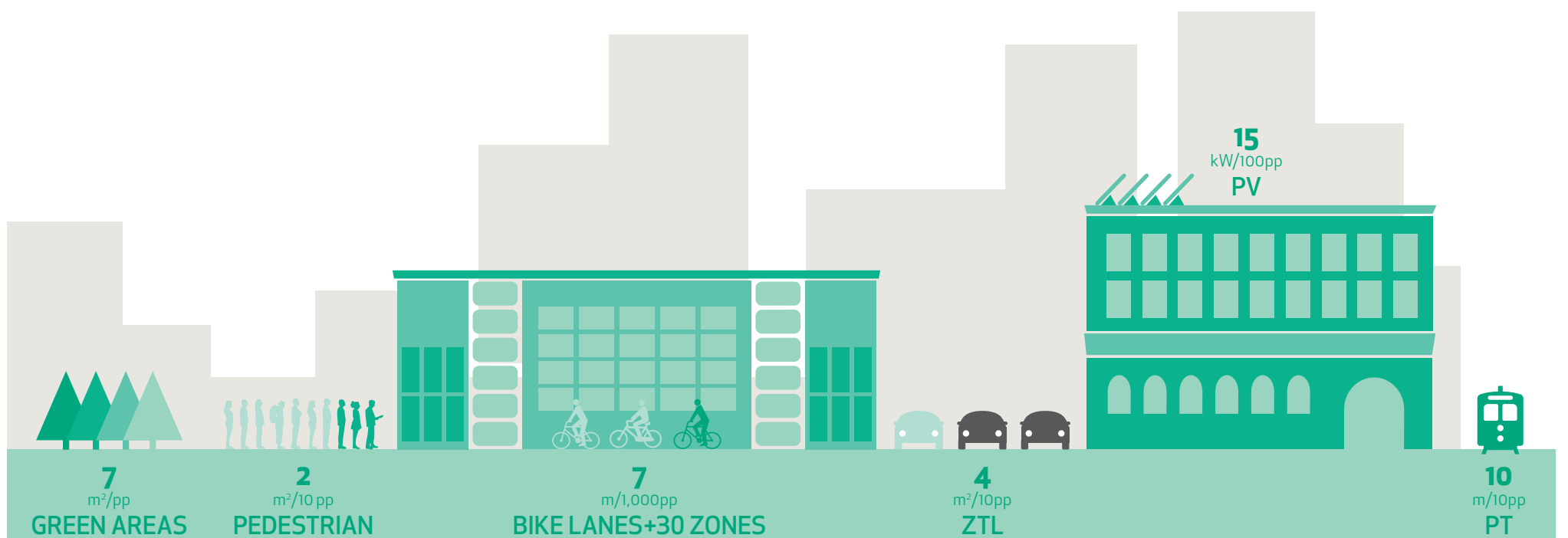
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011

230
l per capita



+2%
(2000-2011)

WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

3

**new Bus Rapid Transit lines
by 2020**

50

**new vehicles
for public transport**

+

41%

**dedicated lanes for
public transport**

PALERMO

Region

Sicilia

Municipalities

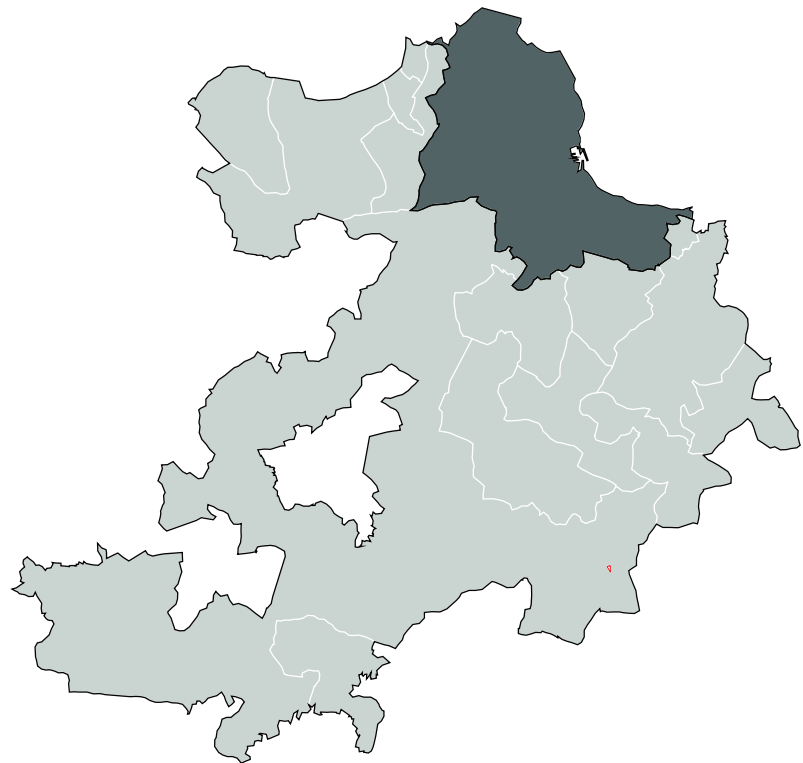
17

Larger Urban Zone area

1,176 km²

Core City area

159 km²



Palermo is the capital city of the Sicilia region, the fifth Italian city by population after Roma, Milano, Napoli and Torino. The metropolitan city, which includes 17 municipalities, covers an area of approximately 1,176 km² and has a population of approximately 854,861 people (2011 Istat survey), of whom 657,561 live in the City of Palermo.

Founded by the Phoenicians in 734 BC and conquered by the Romans in 254 BC, the city and seaport of Palermo has always been a strategic trading center for commercial and cultural exchanges between the western world and Asia. With the fall of the Roman Empire, the town fell under a long series of rulers (the Byzantines,

Arabs, Normans, Swabians, Angevins to the Aragonese) who left their mark on the artistic and architectural heritage of Palermo.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development of the city along coast line and inland.

The population of the Larger Urban Zone (LUZ) has grown from 602,661 people in 1951 to 854,861 people in 2011 (+41.8%), while at the same time, the Core City's population has grown from 490,692 to 657,561 (+34%). These figures, when compared to the changes in the land use,

show a gap between the numerical and physical growth of the city.

Detailed mapping of the western area of the city of Palermo clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: on one side the development of mixed settlements between the area of the old city and Mondello and along the A19 motorway and the coast.



Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951

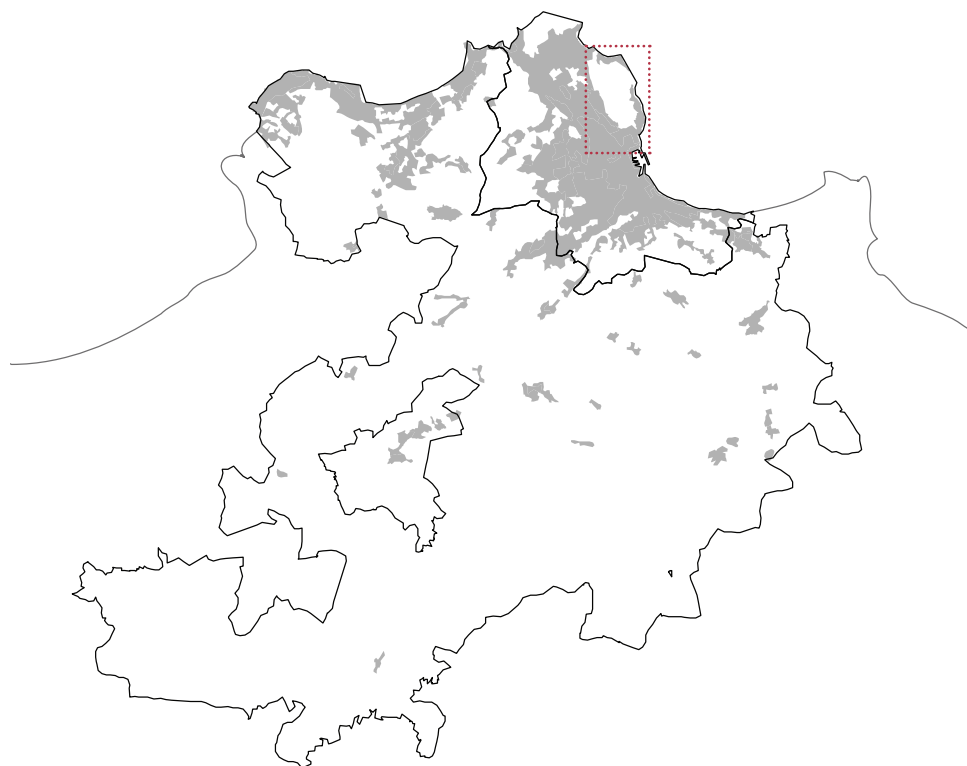
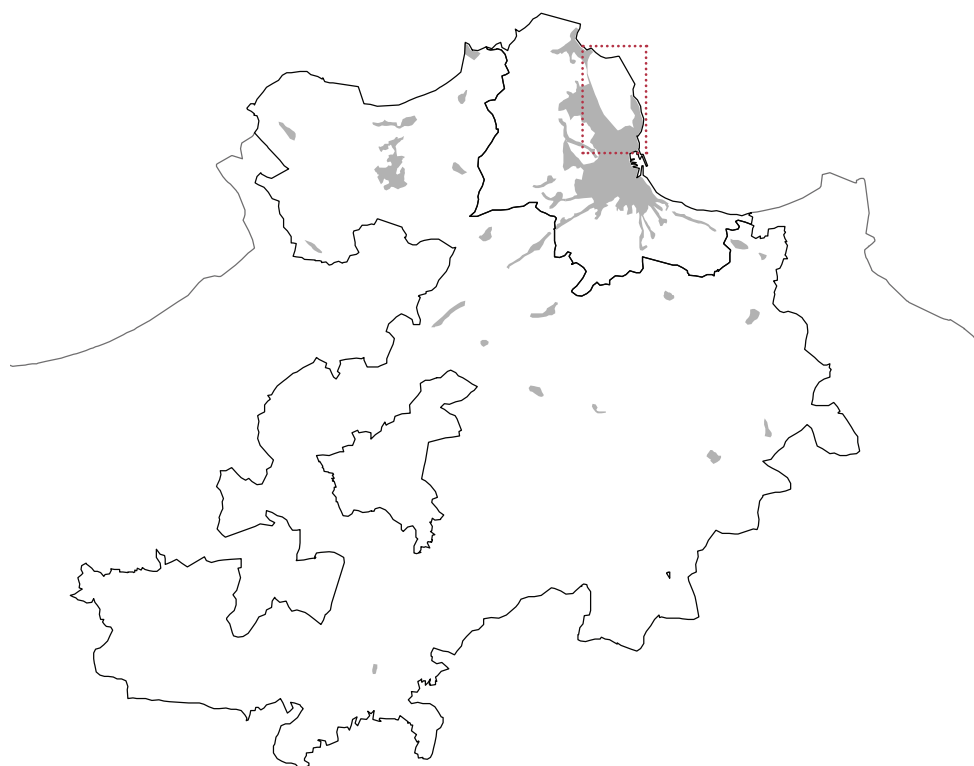
490,692

inhabitants

CORE CITY 2011

657,561

inhabitants



LUZ 1951

602,661

inhabitants

LUZ 2011

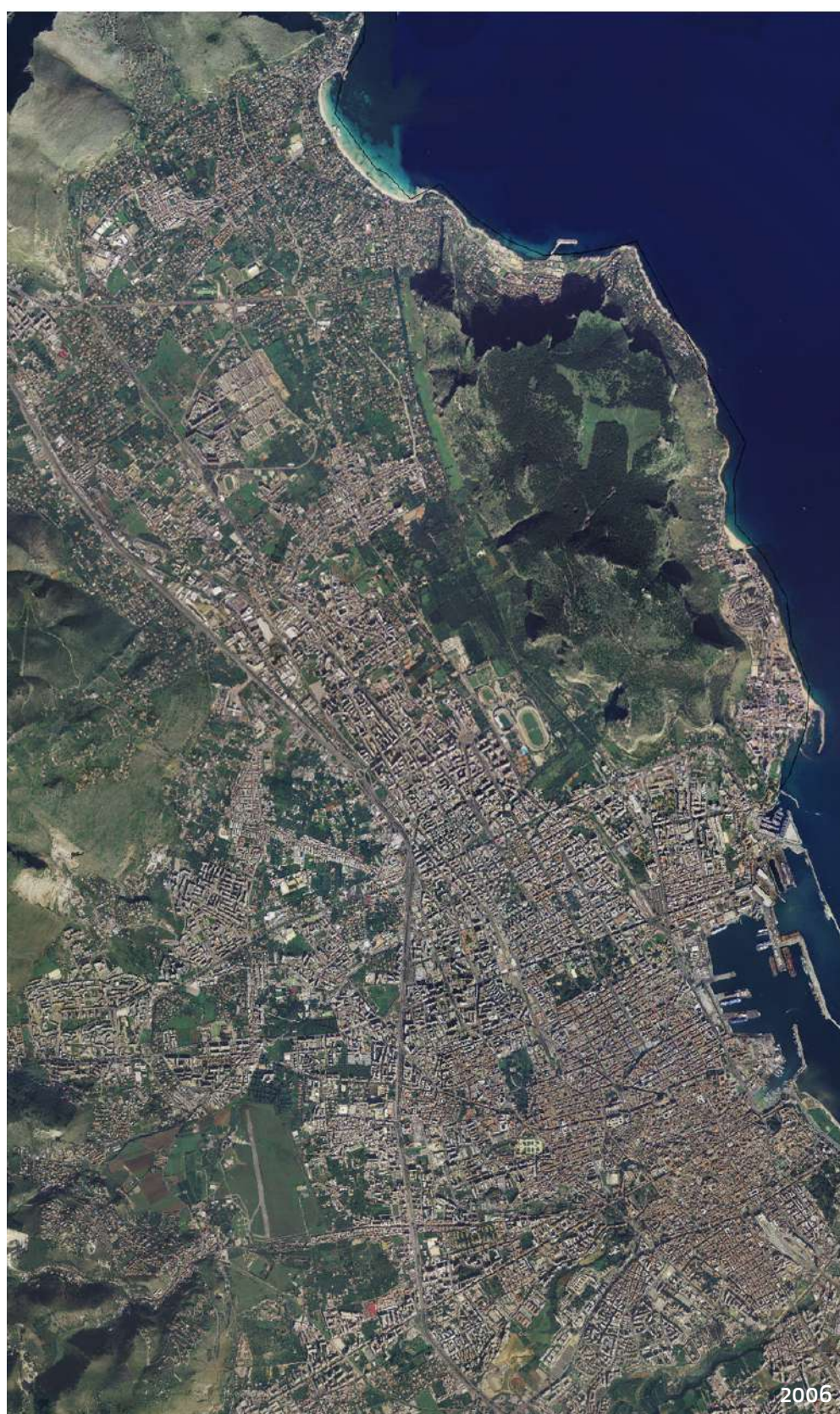
854,861

inhabitants



1955

Volo GAI



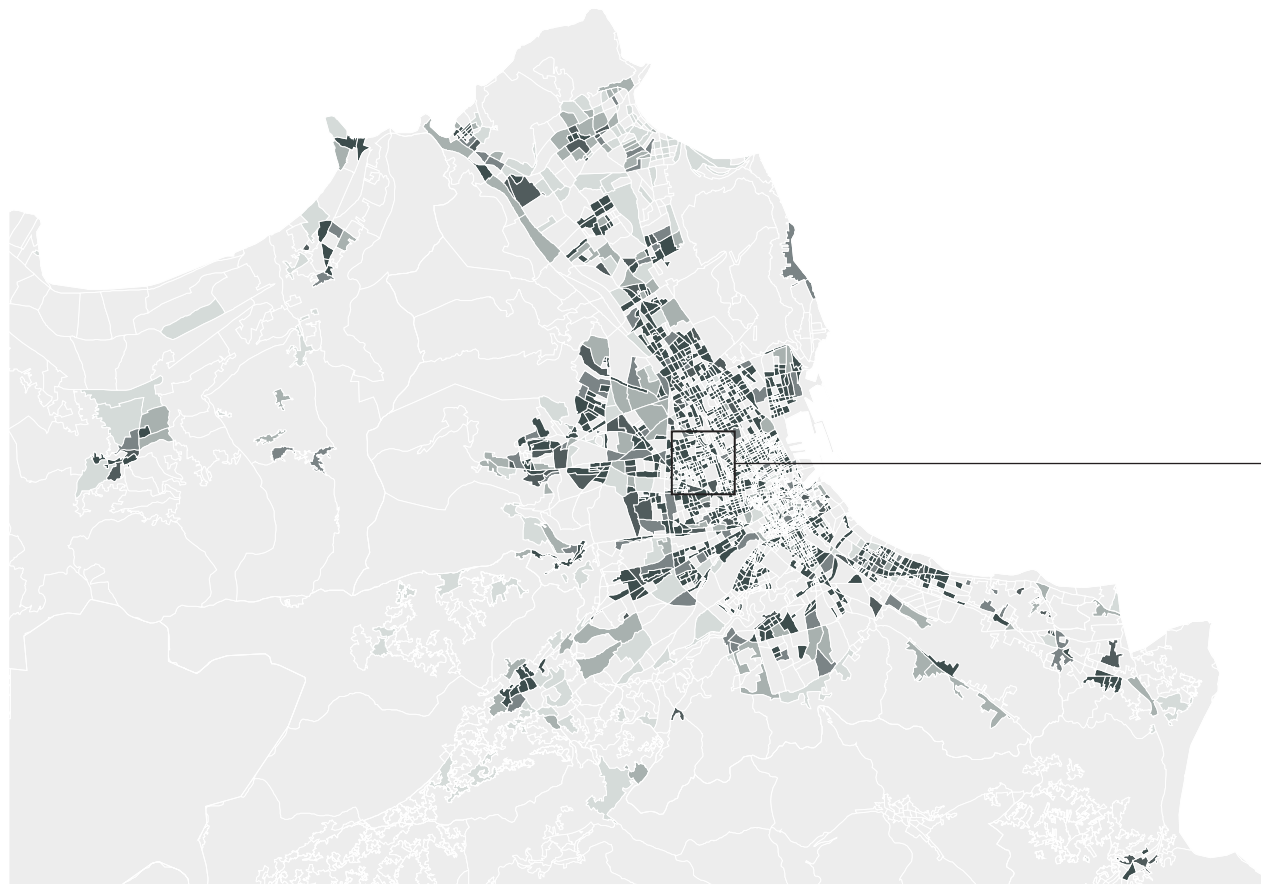
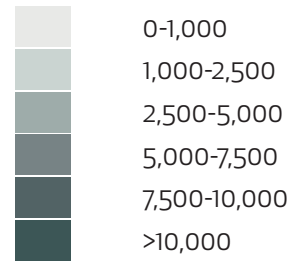
2006

Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City
15,617

AVERAGE DENSITY
pp per km² - Core City
4,139

Population

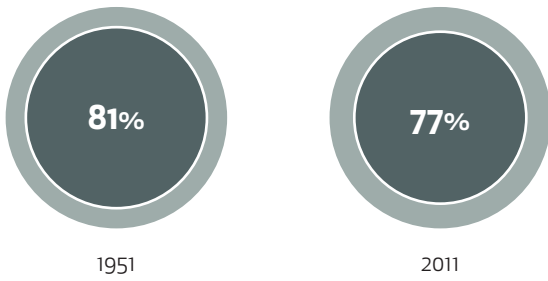


URBAN DENSITY

PEAK DENSITY

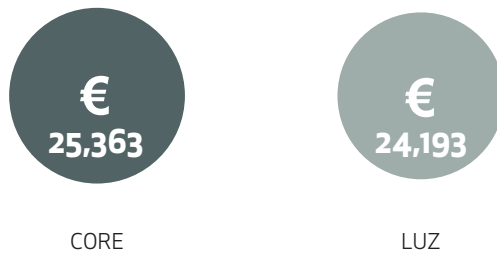
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Palermo, the ratio between the population of the Core City over the population of the LUZ goes from 81% in 1951 to 77% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a uniform growth: from 1951 to 1991 there is a population growth in the Core City and the municipalities of the first belt, while from 1991 - 2011 there is a decrease in population in the Core City which is balanced by a growth in the municipalities of the LUZ.

In 2011 within the city of Palermo and in the LUZ, the foreign population accounts for 3% of the total population (+103% over the last decade).

3%
+103%
(2001-2011)



3%
+104%
(2001-2011)

CORE

LUZ



19%
-8%
(2004-2011)

LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

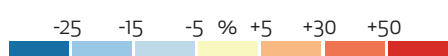
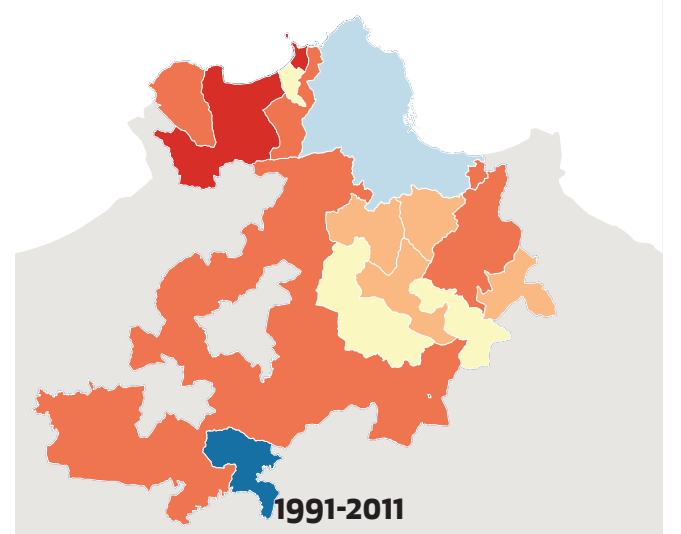
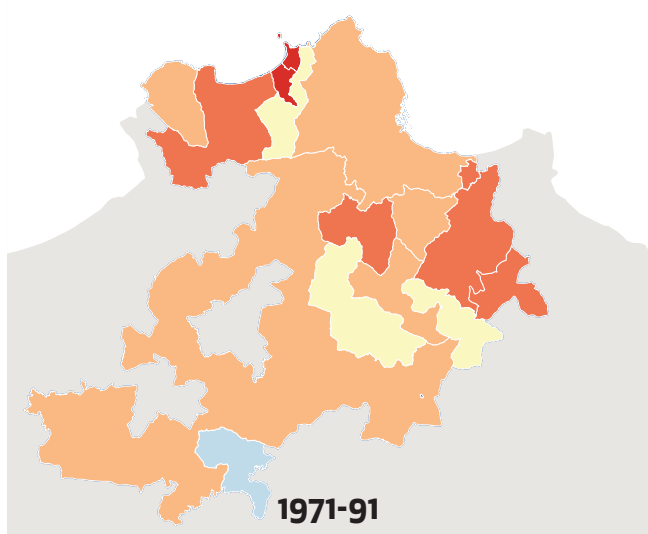
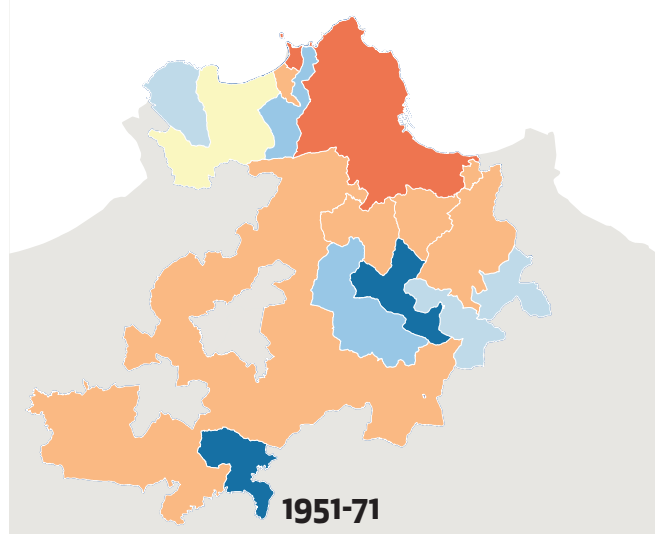
Eurostat 2011

CORE
+31%

LUZ
+26% CORE
+9%

LUZ
+12% CORE
-6%

LUZ
+1%



DEMOGRAPHIC CHANGES

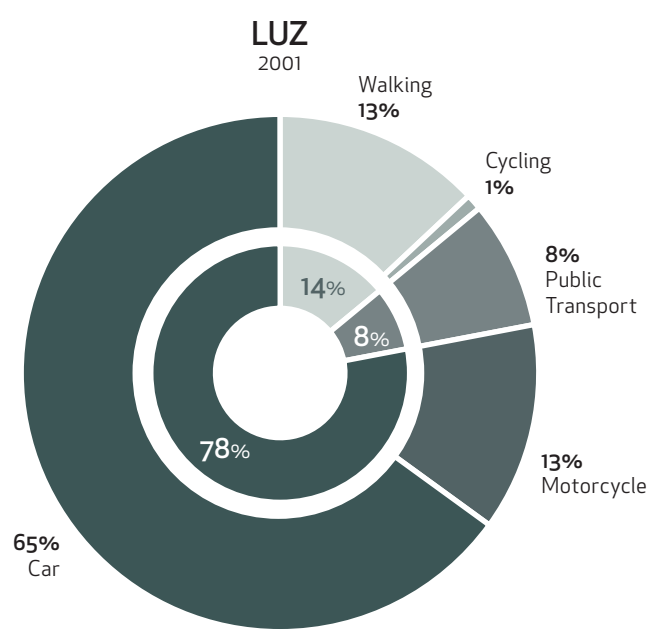
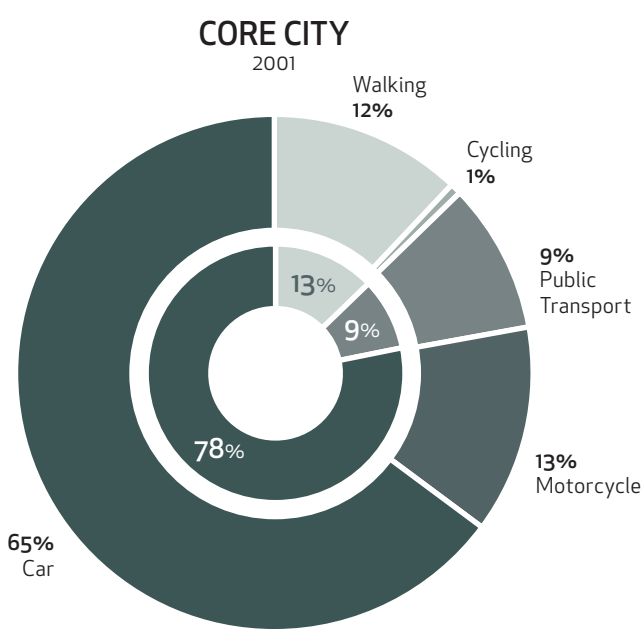
Mobility

The metropolitan area of Palermo, as shown in the images below, is characterized by a good rail and road infrastructure. The modal split chart shows that 78% of travellers use private transport, 8% public transport and 14% walk or cycle within the LUZ; the data for the Core City

is quite similar: travellers using private transport are 78%, those using public transport 9% and the remaining 13% walk or cycle.

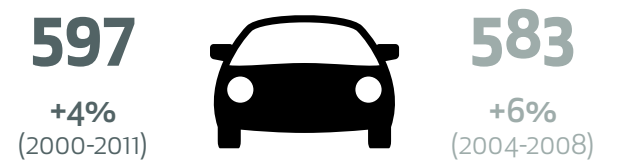
The data on commuting (for work and study) shows the daily inbound commute of more

than 45,000 people compared to circa 8,000 of outbound commuters. The motorization rate is within the national average, with 583 cars per 1,000 inhabitants in the LUZ and 597 in the Core City.



COMMUTERS

Daily commuters (Core City - ISTAT 2001)

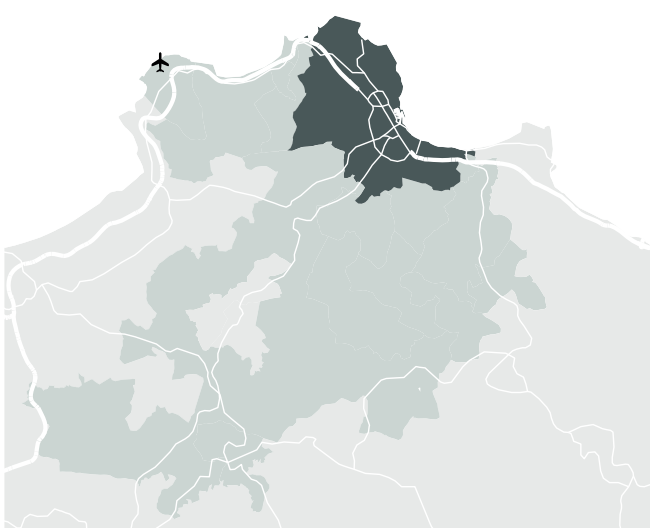


MODAL SPLIT

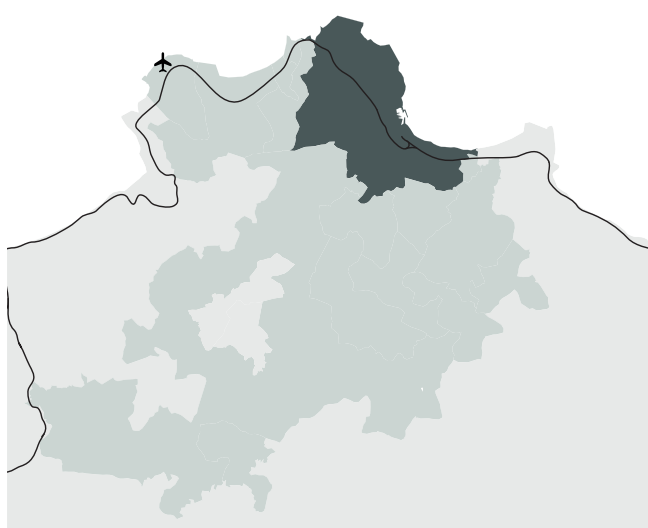
Eurostat 2001

CAR OWNERSHIP

per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



WASTE
Annual waste collection per capita (Core City) - Istat 2011

575
kg
-8%
(2000-2011)



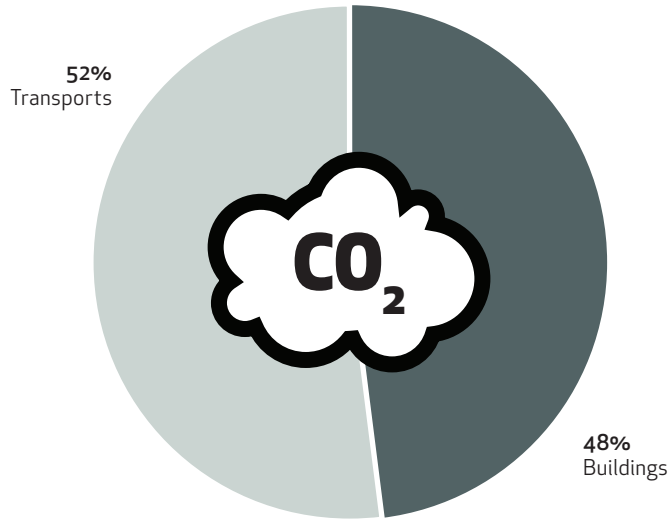
WASTE SORTING
Waste sorting % (Core City) - Istat 2011

10%
+92%
(2000-2011)

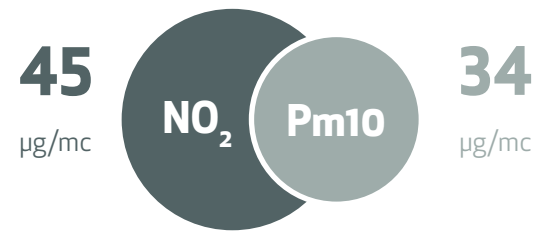


AIR EMISSIONS
Annual CO₂ emissions (Core City) - SEAP 2013 (2001)

1,859
kt
2.8
t per capita

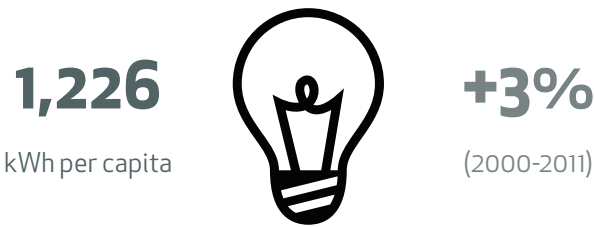


CO₂ emissions split (Core City) - SEAP 2013 (2001)



Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

45
µg/mc
NO₂
34
µg/mc
Pm10



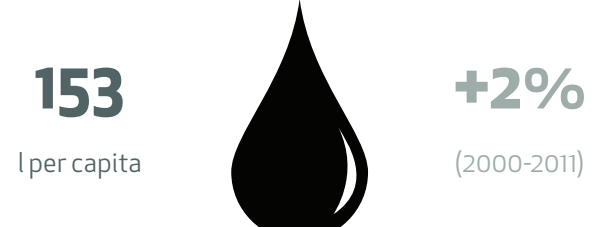
ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011

1,226
kWh per capita
+3%
(2000-2011)



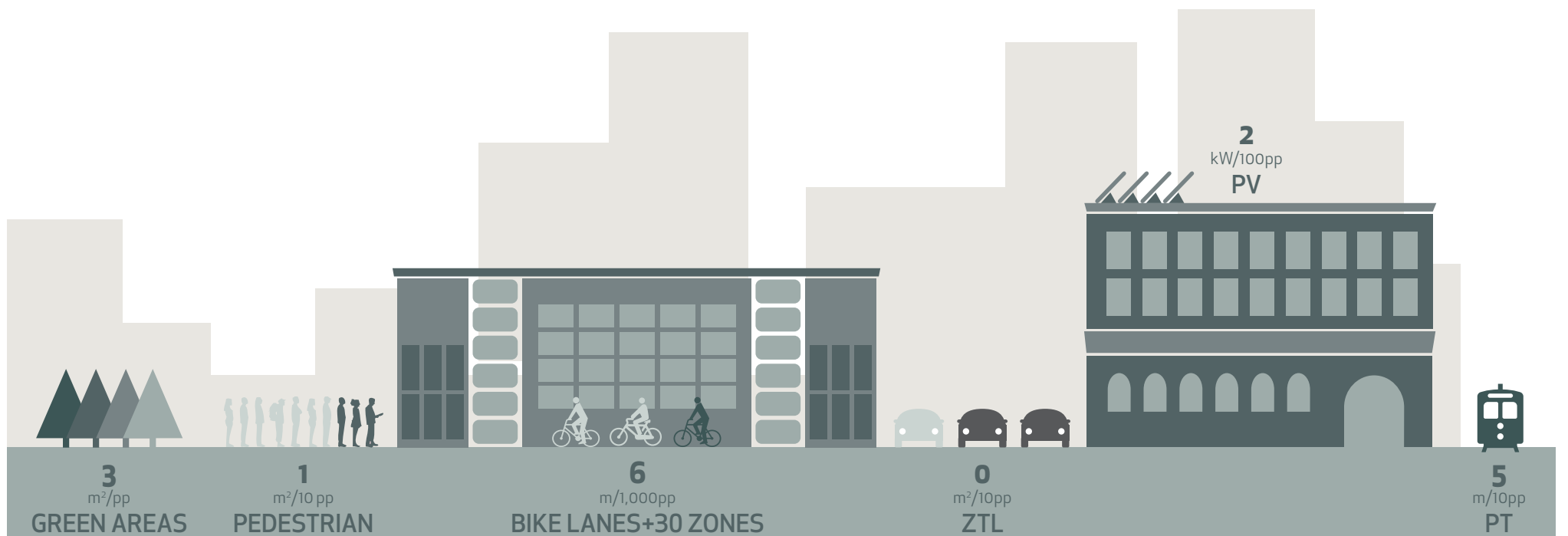
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011

88
m³ per capita
+65%
(2000-2011)



WATER
Daily domestic water consumption (Core City) - Istat 2011

153
l per capita
+2%
(2000-2011)



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

CO₂ emissions compared to
1990

-21%

1.2

billion € of investments

energy efficiency measures for

80,000

existing buildings

+

15 km

new tramways

m² of new pedestrian areas

36,500

-60%

street lighting
energy consumption

CAGLIARI

Region

Sardegna

Municipalities

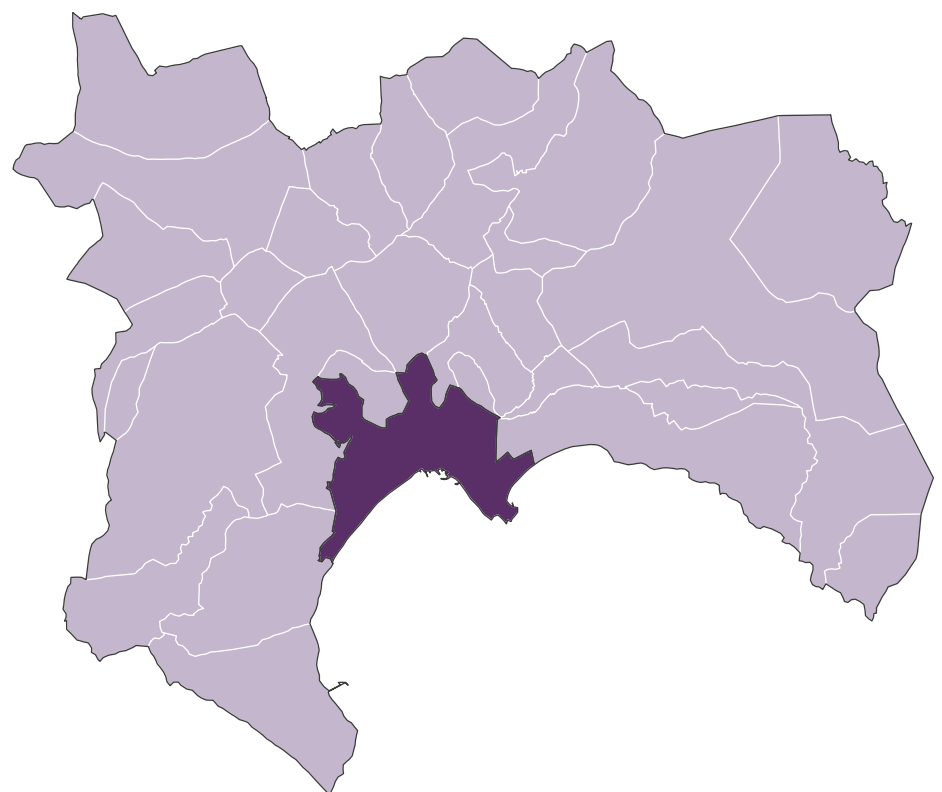
27

Larger Urban Zone area

1,686 km²

Core City area

86 km²



Cagliari is the capital city of the Sardegna region, located in the southern area of the island in the Golfo degli Angeli. The metropolitan city, which includes 27 municipalities, covers an area of approximately 1,686 km² and has a population of approximately 470,024 people (2011 Istat survey), of whom 149,883 live in the City of Cagliari.

There are archaeological findings which show that the area of the modern city of Cagliari has been inhabited since Neolithic times. Ruled by the Carthaginians in the fifth century BC the city experienced a rapid socio-economic growth which continued after the first Punic War, when it became an important Roman colony (238 BC). With the fall of the Roman Empire the city went

through a period of recession that lasted until the Aragonese conquest, when Cagliari became the capital of the Kingdom of Sardinia (1325), a role that it held almost continuously during the House of Savoy until 1814.

The comparative analysis on land use carried out in 1960 (IGM) and in 2006 (Corine Land Cover), shows a trend which has gradually led to the development of the city along the radial axis, creating a star-like shape urban structure.

The population of the Larger Urban Zone (LUZ) has grown from 237,055 people in 1951 to 470,024 people in 2011 (+98.3%), while at the same time, the Core City's population has grown from 117,361 to 149,883 (+27.7%). These figures, when

compared to the changes in the land use, show a gap between the numerical and physical growth of the city.

Detailed mapping of the northern area of the city of Cagliari clearly shows the extension of the urban expansion which took place between the GAI flight in 1955 and the orthophoto of 2006: in particular with regards to the development of mixed functions between the coastline and the ring road around the Molentargius lake.



Urban Footprint

IGM 1960/Corine Land Cover 2006

CORE CITY 1951

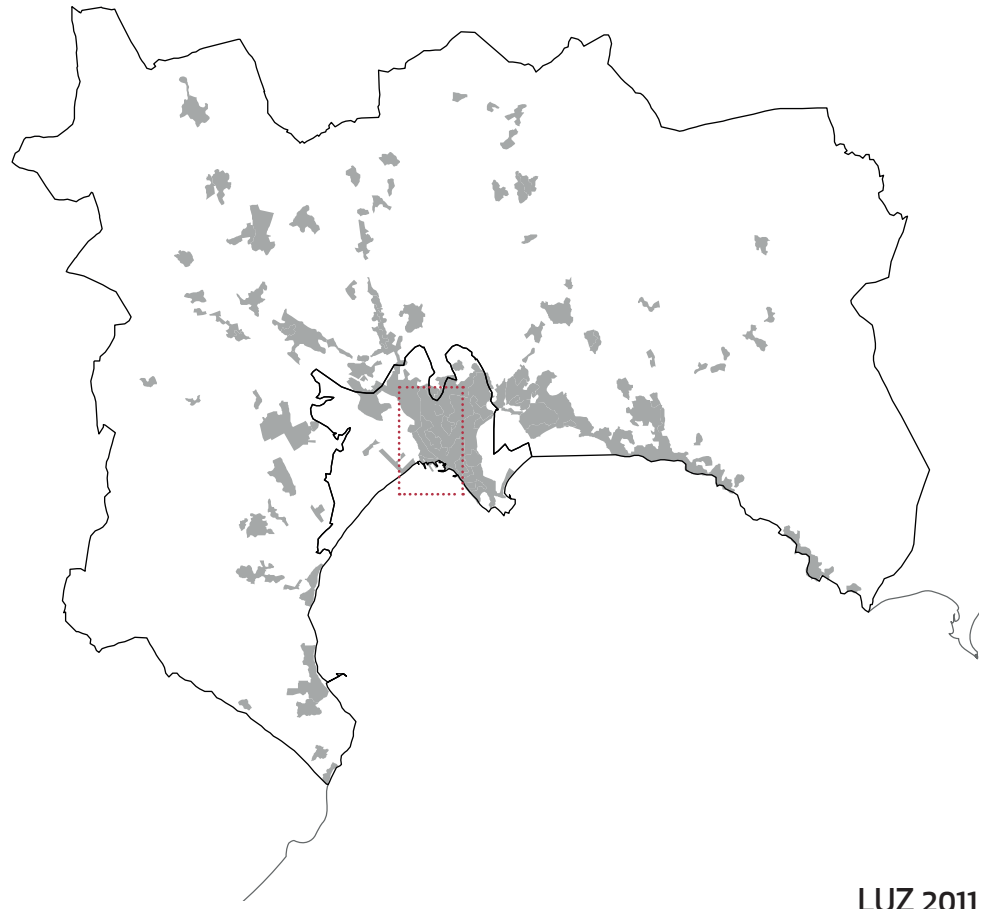
117,361

inhabitants

CORE CITY 2011

149,883

inhabitants



LUZ 1951

237,055

inhabitants

LUZ 2011

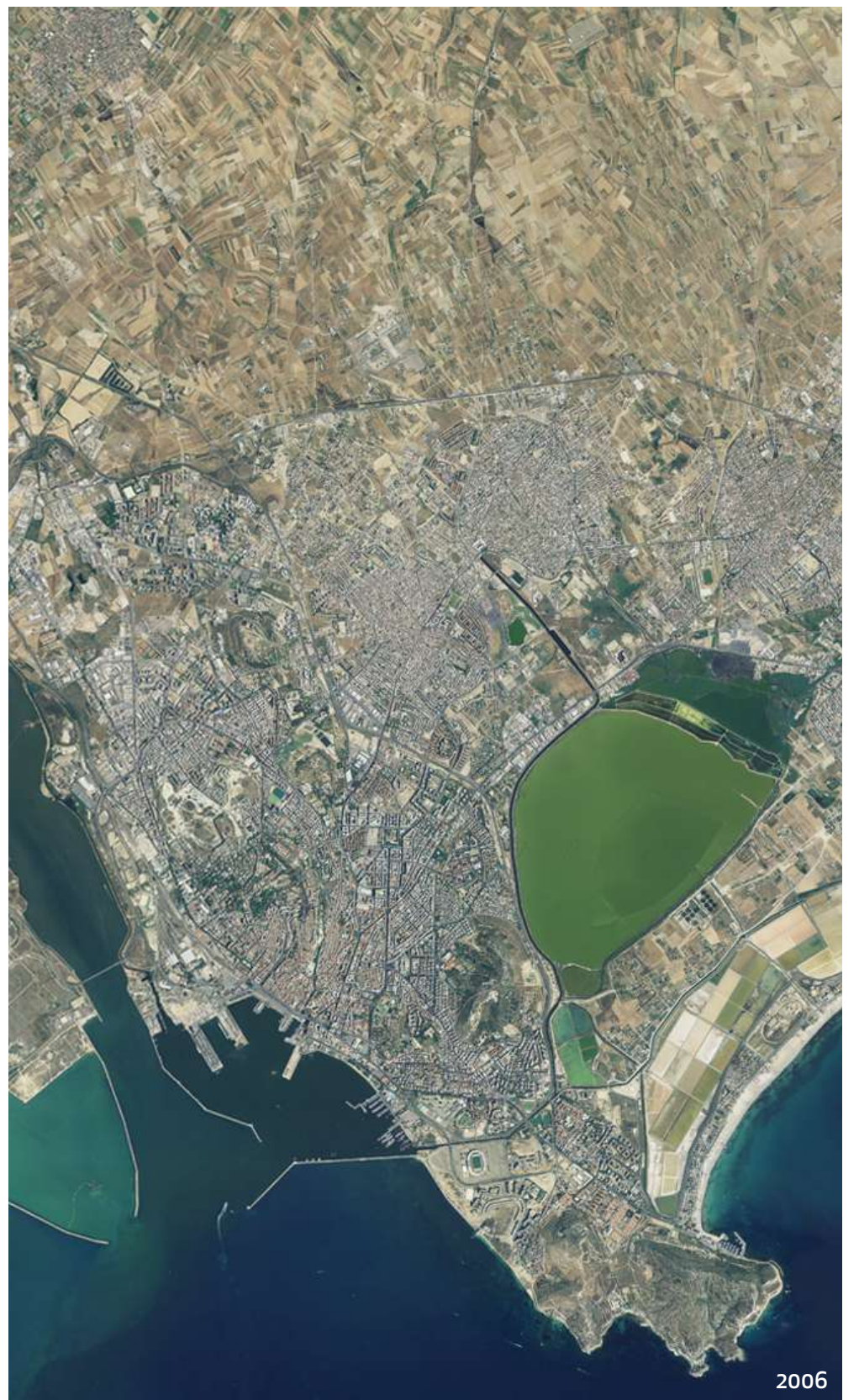
470,024

inhabitants



1955

Volo GAI



2006

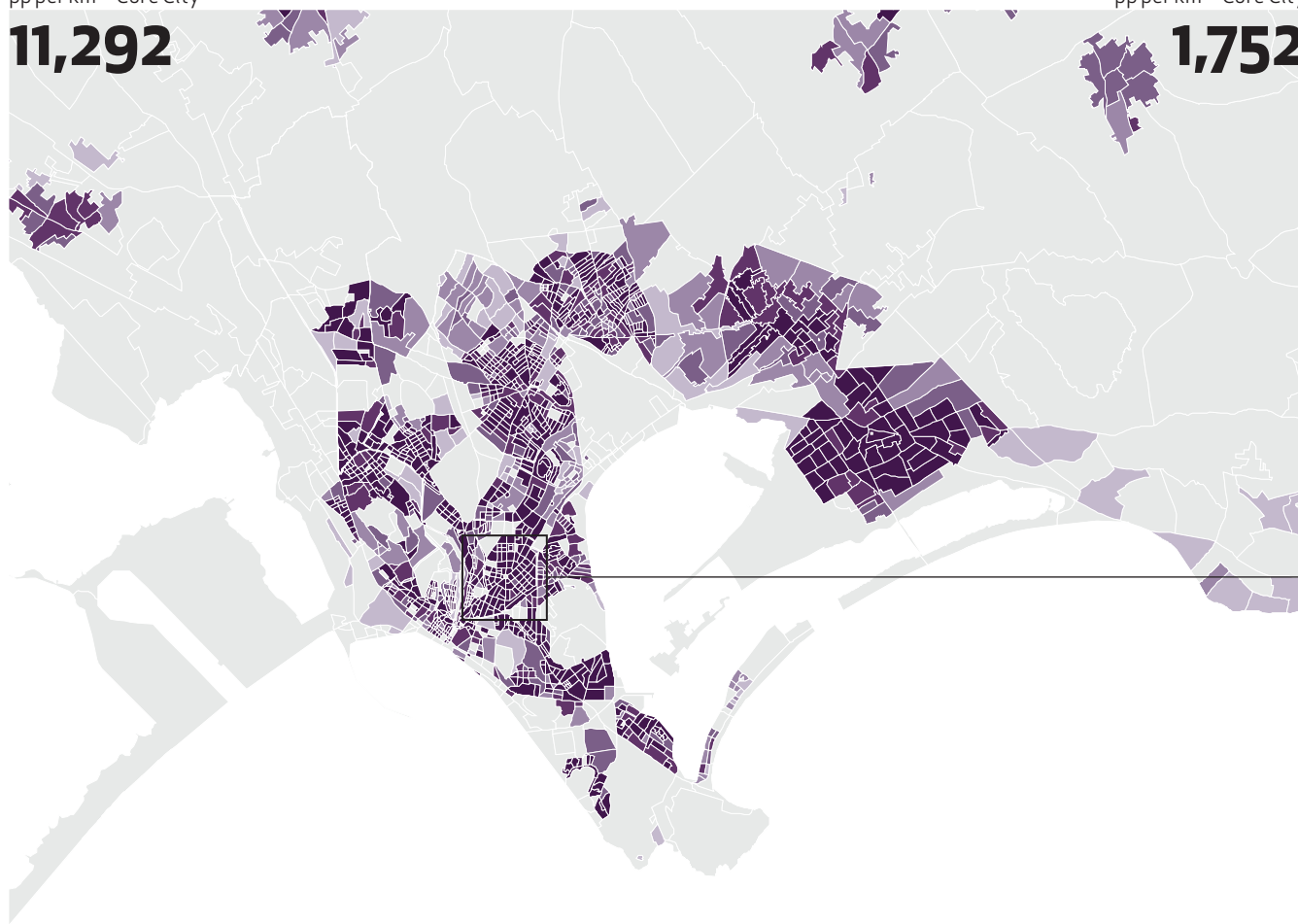
Geoportale Nazionale

PEAK DENSITY
pp per km² - Core City

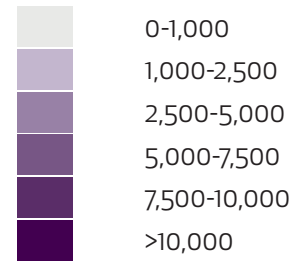
11,292

MEDIUM DENSITY
pp per km² - Core City

1,752



Population



URBAN DENSITY

PEAK DENSITY

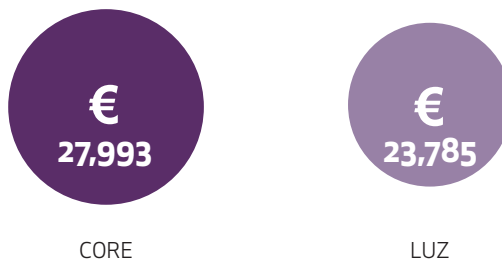
CORE CITY POPULATION

as % of LUZ population - Istat



INCOME

Ministry of Economy and Finance 2010



In the metropolitan area of Cagliari, the ratio between the population of the Core City over the population of the LUZ goes from 50% in 1951 to 32% in 2011.

Changes in population within the LUZ, in the three analyzed twenty years periods, show a peculiar trend: uniform population growth occurs in the LUZ from 1951-1971 and from 1971-1991. During the period from 1991-2001 there is a population decrease in the Core City and a population growth in the neighboring municipalities.

In 2011 within the city of Cagliari, the foreign population accounts for 3% of the total population (+180% over the last decade) and 2% in the LUZ.

3%

+180%
(2001-2011)



2%

+161%
(2001-2011)

CORE

LUZ



12%

-24%
(2004-2011)

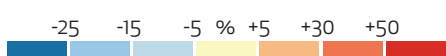
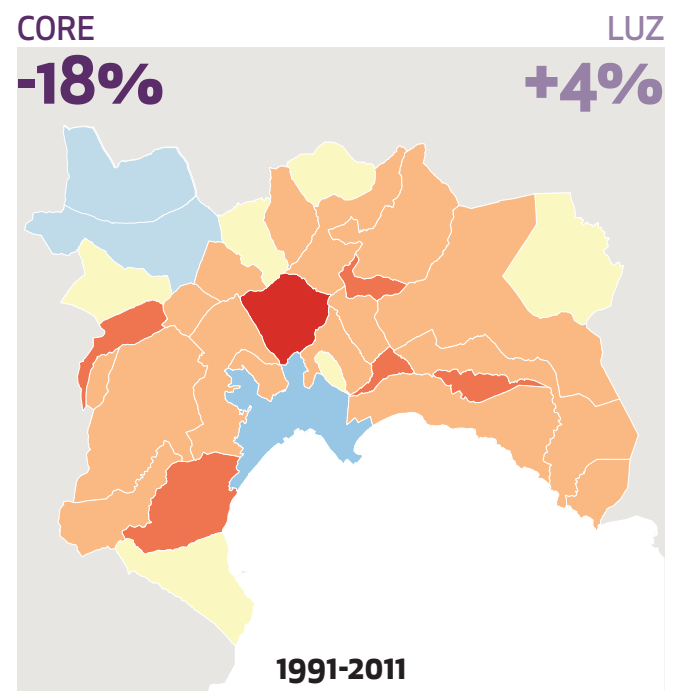
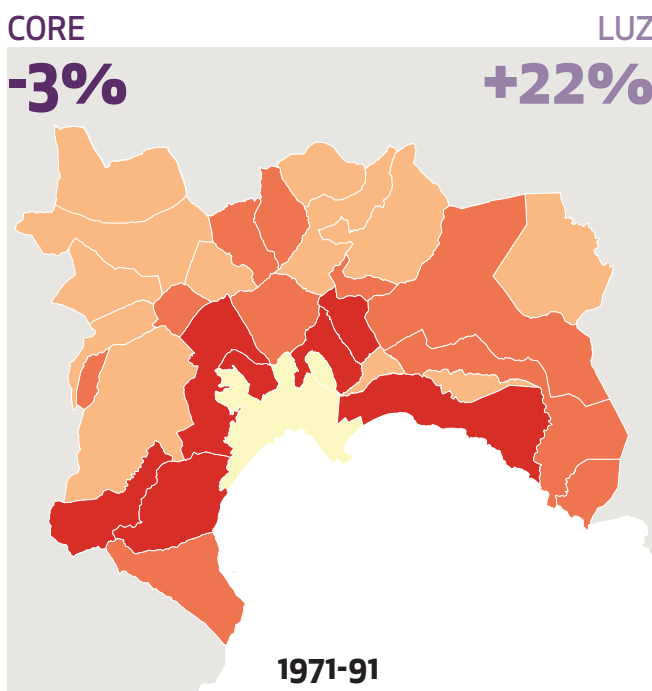
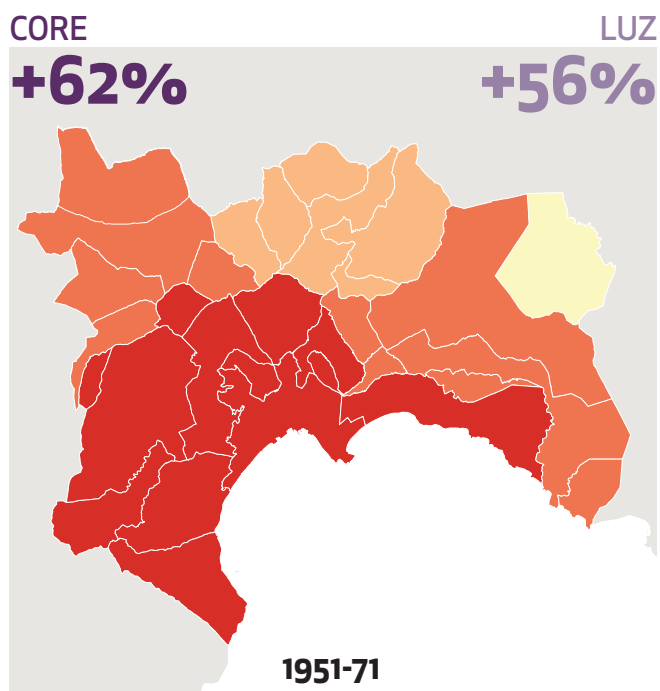
LUZ

FOREIGN POPULATION

Istat 2011

UNEMPLOYMENT

Eurostat 2011



DEMOGRAPHIC CHANGES

Mobility

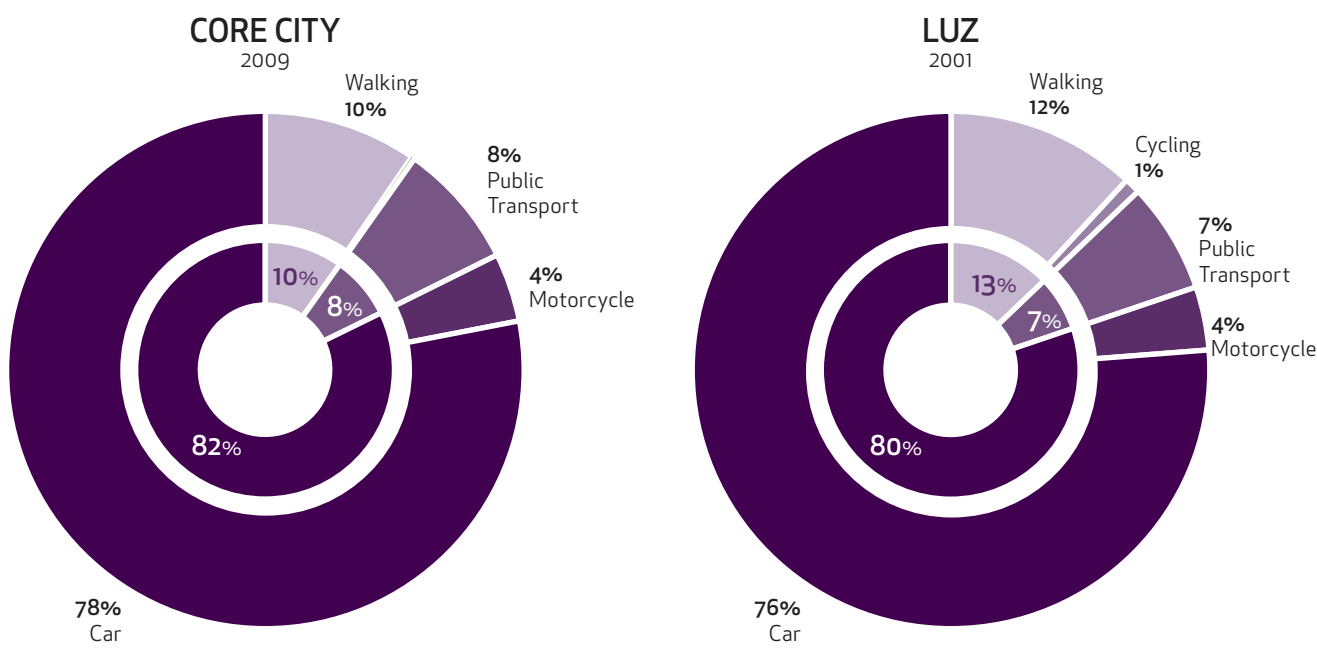
The metropolitan area of Cagliari, as shown in the images below, is served by a poor rail and road infrastructure. The modal split chart shows that 80% of travellers use private transport, 7% public transport and 13% walk or cycle within the LUZ; the data for the Core City is quite similar,

travellers using private transport are 82%, those using public transport 8% and the remaining 10% walk or cycle.

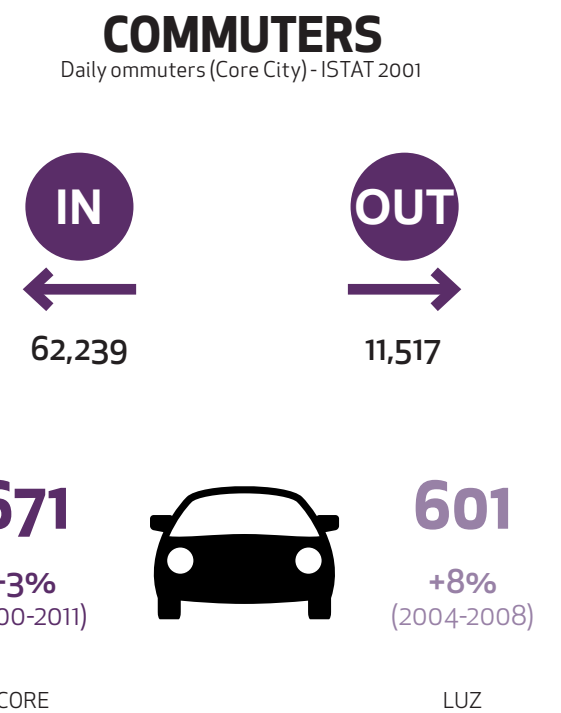
The data on commuting (for work and study) shows the daily inbound commute of more than 62,000 people compared to circa 11,000 of out-bound commuters. The motorization rate is very high, with 601 cars per 1,000 inhabitants in the LUZ and 671 in the Core City.



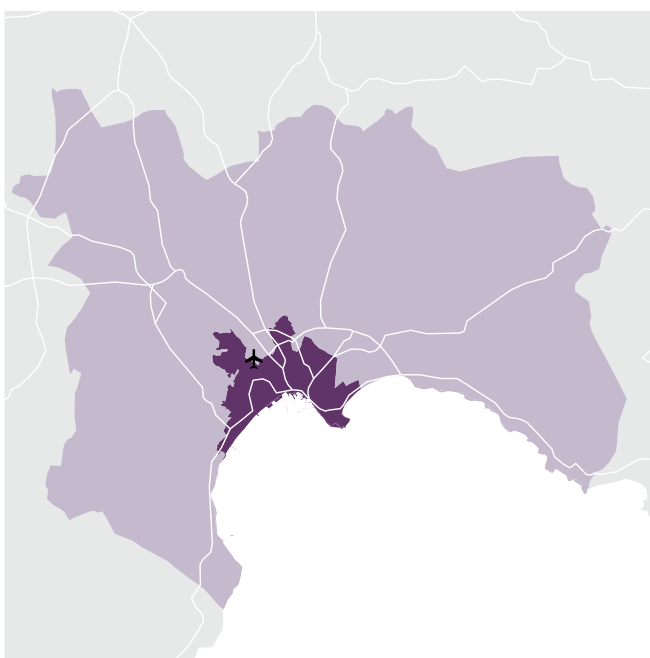
Image by Antonio Romano Liscia



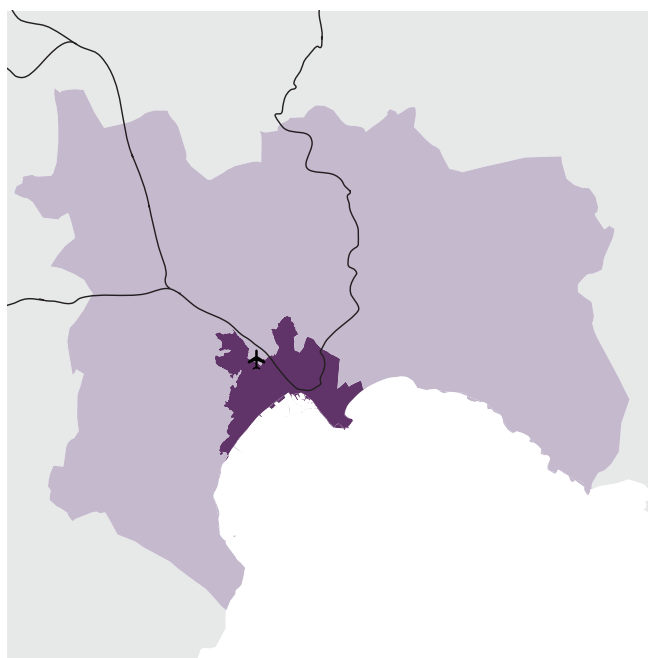
MODAL SPLIT
PUM 2009/Eurostat 2001



CAR OWNERSHIP
per 1,000 inhabitants - Istat 2011/Eurostat 2008



ROADS



RAILWAYS



RAILWAYS AND SUBWAYS

Environment



QUALITY OF LIFE
Italian top 104 main cities - Legambiente 2013



605
kg
+1%
(2000-2011)

WASTE
Annual waste collection per capita (Core City) - Istat 2011



34%
+7.816%
(2000-2011)

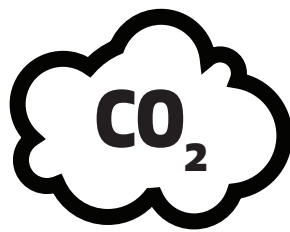
WASTE SORTING
Waste sorting % (Core City) - Istat 2011

N/D
kt



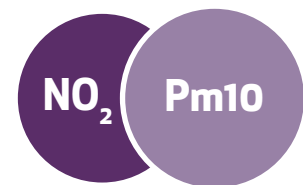
N/D
t per capita

AIR EMISSIONS
Annual CO₂ emissions (Core City)



CO₂ emissions split (Core City)

35
µg/mc



37
µg/mc

Annual NO₂ and Pm 10 emissions (Core City) - Legambiente 2013

1,583
kWh per capita



+7%
(2000-2011)

ELECTRICITY
Annual domestic electricity consumption (Core City) - Istat 2011

25
m³ per capita



+56%
(2000-2011)

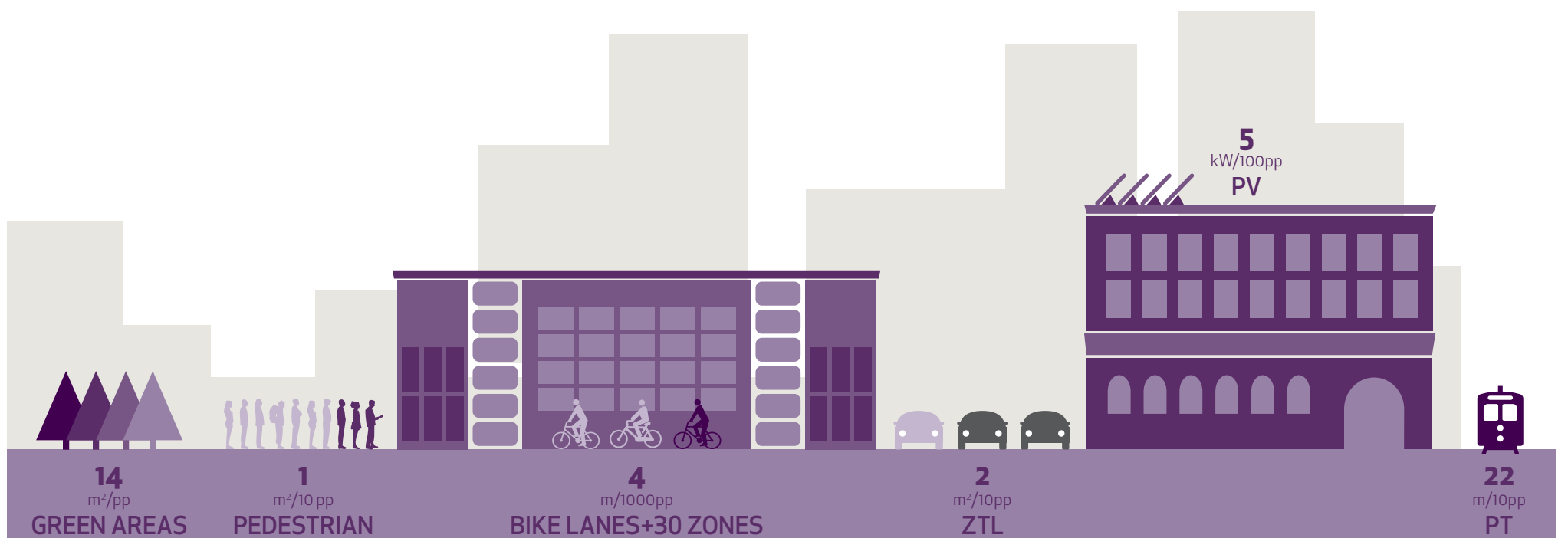
GAS
Annual domestic Natural Gas consumption (Core City) - Istat 2011

181
l per capita



-7%
(2000-2011)

WATER
Daily domestic water consumption (Core City) - Istat 2011



URBAN ENVIRONMENT

CORE CITY
Legambiente 2013, Istat 2011, Atlasole 2013

Actions in place

14 km

new subway

91,200

m² of limited traffic areas

111 km

bike lanes

new bikes for bike sharing

300

50

new cars for car sharing

Benchmarks

CORE CITIES



AREA
CORE CITY



POPULATION
CURRENT



DENSITY
AVERAGE



FOREIGN
POPULATION



PUBLIC
TRANSPORT



NON MOTORIZED
TRANSPORT



PRIVATE
TRANSPORT

TORINO	130	872,367 2011	6,702 2011	13% 2011	27% 2004	12% 2004	61% 2004
GENOVA	244	586,180 2011	2,406 2011	8% 2011	30% 2001	12% 2001	58% 2001
MILANO	182	1,242,123 2011	6,822 2011	14% 2011	31% 2005	13% 2005	56% 2005
VENEZIA	416	261,362 2011	628 2011	10% 2011	37% 2001	21% 2001	42% 2001
TRIESTE	84	202,123 2011	2,392 2011	8% 2011	22% 2001	13% 2001	65% 2001
BOLOGNA	141	371,337 2011	2,639 2011	12% 2011	21% 2001	12% 2001	67% 2001
FIRENZE	102	358,079 2011	3,497 2011	12% 2011	20% 2001	12% 2001	68% 2001
ROMA	1.308	2.617,175 2011	2,001 2011	9% 2011	27% 2003	6% 2003	67% 2003
NAPOLI	117	962,003 2011	8,203 2011	3% 2011	27% 2001	13% 2001	60% 2001
BARI	116	315,933 2011	2,719 2011	2% 2011	14% 2001	14% 2001	72% 2001
REGGIO C.	236	180,817 2011	766 2011	4% 2011	9% 2001	10% 2001	81% 2001
MESSINA	211	243,262 2011	1,152 2011	5% 2011	9% 2006	18% 2006	73% 2006
CATANIA	181	293,902 2011	1,625 2011	2% 2011	9% 2001	9% 2001	82% 2001
PALERMO	159	657,561 2011	4,139 2011	3% 2011	9% 2001	13% 2001	78% 2001
CAGLIARI	86	149,883 2011	1,752 2011	3% 2011	8% 2001	10% 2001	82% 2001
AMSTERDAM	166	779,808 2011	4,700 2011	12% 2008	30% 2003	26% 2003	44% 2003
BARCELONA	98	1,615,908 2008	16,455 2008	17% 2008	43% 2008	26% 2008	31% 2008
COPENHAGEN	89	549,050 2012	6,162 2004	11% 2004	31% 2003	42% 2003	27% 2003
FREIBURG	153	224,191 2011	1,464 2011	14% 2008	25% 2008	41% 2008	34% 2008
GRONINGEN	78	189,991 2011	2,433 2011	4% 2008	8% 2003	40% 2003	52% 2003
MUNICH	310	1,353,186 2011	4,359 2011	23% 2008	45% 2008	17% 2008	37% 2008
STOCKHOLM	188	847,073 2011	4,503 2011	9% 2008	43% 2005	23% 2005	34% 2005

AREA
CORE CITY
km²

POPULATION
CURRENT
inhabitants







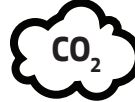






















DENSITY
AVERAGE
pp per km²

FOREIGN
POPULATION
% of total population

PUBLIC
TRANSPORT
% of daily commuting

NON MOTORIZED
TRANSPORT
% of daily commuting

PRIVATE
TRANSPORT
% of daily commuting

 CAR OWNERSHIP	 BIKE LANES NETWORK	 PUBLIC TRANSPORT NETWORK	 WASTE COLLECTED	 AIR POLLUTION PM10 CONCENTRATION	 COVENANT OF MAYORS	 CO ₂ EMISSIONS REDUCTION TARGET	
601 2011	1 2008	9 2008	531 2011	43 2012	 SEAP	-29% 2005-2020	TORINO
465 2011	0 2008	13 2008	552 2011	22 2012	 SEAP	-24% 2005-2020	GENOVA
543 2011	1 2008	5 2008	528 2011	43 2012	 SEAP	-20% 2005-2020	MILANO
412 2011	3 2008	14 2008	673 2011	36 2012	 SEAP	-23% 2005-2020	VENEZIA
526 2011	1 2008	17 2008	482 2011	26 2012	 SIGNED	N/D	TRIESTE
520 2011	2 2008	8 2008	530 2011	32 2012	 SEAP	-21% 2005-2020	BOLOGNA
562 2011	2 2008	13 2008	662 2011	30 2012	 SEAP	-20% 2005-2020	FIRENZE
699 2011	0 2008	9 2008	648 2011	32 2012	 SEAP	-20% 2003-2020	ROMA
574 2011	0 2008	5 2008	541 2011	33 2012	 SEAP	-25% 2005-2020	NAPOLI
565 2011	0 2008	9 2008	610 2011	24 2012	 SEAP	-35% 2002-2020	BARI
607 2011	0 2008	30 2008	474 2011	N/D -	 SIGNED	N/D	REGGIO C.
596 2011	0 2008	17 2008	535 2011	20 2012	 SIGNED	N/D	MESSINA
722 2011	0 2008	10 2008	775 2011	24 2012	 SIGNED	N/D	CATANIA
597 2011	0 2008	5 2008	575 2011	34 2012	 SEAP	-21% 1990-2020	PALERMO
671 2011	0 2008	22 2008	605 2011	37 2012	 SIGNED	N/D	CAGLIARI
253 2008	12 2004	32 2004	507 2008	25 2008	 SEAP	-40% 1990-2025	AMSTERDAM
381 2008	1 2008	61 2008	546 2008	39 2005	 SEAP	-23% 2008-2020	BARCELONA
218 2003	7 2004	N/D	N/D	21 2008	 SEAP	-20% 2005-2020	COPENHAGEN
307 2011	9 2008	12 2008	377 2008	16 2008	 SEAP	-29% 1992-2020	FREIBURG
298 2008	8 2004	N/D	509 2004	N/D	 NONE	N/D	GRONINGEN
354 2011	7 2004	20 2008	556 2008	22 2008	 SEAP	-47% 1990-2020	MUNICH
370 2008	10 2004	120 2008	453 2008	17 2008	 SEAP	-45% 2009-2020	STOCKHOLM

CAR OWNERSHIP
per 1,000 inhab.

BIKE LANES NETWORK
km per 10,000 inhab.

PUBLIC TRANSPORT NETWORK
km per 10,000 inhab.

SOLID WASTE COLLECTED
annual kg per capita

AIR POLLUTION PM10 CONCENTRATION
µg/mc - annual average

COVENANT OF MAYORS
status

CO₂ EMISSIONS REDUCTION TARGET
by 2020

DATA SOURCES:
Istat, Eurostat, Legambiente, SEAP

LARGER URBAN ZONES



AREA
LUZ



POPULATION
CURRENT



DENSITY
AVERAGE



FOREIGN
POPULATION



PUBLIC
TRANSPORT



NON MOTORIZED
TRANSPORT



PRIVATE
TRANSPORT

	AREA LUZ	POPULATION CURRENT	DENSITY AVERAGE	FOREIGN POPULATION	PUBLIC TRANSPORT	NON MOTORIZED TRANSPORT	PRIVATE TRANSPORT
TORINO	1,879	1,744,555 2011	928 2011	9% 2011	15% 2001	13% 2001	72% 2001
GENOVA	930	700,705 2011	753 2011	7% 2011	25% 2001	15% 2001	60% 2001
MILANO	1,348	3,068,424 2011	2,276 2011	11% 2011	20% 2001	14% 2001	66% 2001
VENEZIA	1,212	621,099 2011	512 2011	8% 2011	20% 2001	18% 2001	62% 2001
TRIESTE	212	232,601 2011	1,098 2011	7% 2011	20% 2001	12% 2001	68% 2001
BOLOGNA	2,047	768,093 2011	375 2011	10% 2011	12% 2001	12% 2001	76% 2001
FIRENZE	1,263	694,979 2011	550 2011	10% 2011	12% 2001	13% 2001	75% 2001
ROMA	3,667	3,626,271 2011	989 2011	9% 2011	21% 2001	8% 2001	71% 2001
NAPOLI	565	2,212,832 2011	3,917 2011	2% 2011	16% 2001	18% 2001	66% 2001
BARI	894	615,026 2011	688 2011	2% 2011	7% 2001	18% 2001	75% 2001
REGGIO C.	489	228,118 2011	467 2011	4% 2011	6% 2001	15% 2001	79% 2001
MESSINA	1,130	478,309 2011	423 2011	4% 2011	N/D	N/D	N/D
CATANIA	585	579,267 2011	990 2011	2% 2011	5% 2001	11% 2001	84% 2001
PALERMO	1,176	854,861 2011	727 2011	3% 2011	8% 2001	14% 2001	78% 2001
CAGLIARI	1,686	470,024 2011	279 2011	2% 2011	7% 2001	13% 2001	80% 2001
AMSTERDAM	859	1,482,287 2008	1,725 2008	8% 2008	23% 2003	23% 2003	54% 2003
BARCELONA	1,795	4,440,629 2008	2,475 2008	14% 2008	20% 2008	29% 2008	51% 2008
COPENHAGEN	2,782	1,822,569 2004	655 2004	7% 2004	24% 2003	24% 2003	52% 2003
FREIBURG	2,211	633,799 2011	287 2011	9% 2008	18% 2008	26% 2008	56% 2008
GRONINGEN	913	344,049 2008	377 2008	3% 2008	7% 2003	37% 2003	56% 2003
MUNICH	5,504	2,686,780 2011	488 2011	17% 2008	33% 2008	17% 2008	50% 2008
STOCKHOLM *	1,329	1,489,127 2008	1,121 2008	9% 2008	34% 2005	17% 2005	49% 2005

*KERNEL

AREA
LUZ
km²

POPULATION
CURRENT
inhabitants








DENSITY
AVERAGE
pp per km²

FOREIGN
POPULATION
% of total population

PUBLIC
TRANSPORT
% of daily commuting

NON MOTORIZED
TRANSPORT
% of daily commuting

PRIVATE
TRANSPORT
% of daily commuting

 CAR OWNERSHIP	 CYCLING TRANSPORT	 TIME JOURNEYS TO WORK	 DEPENDENCY DEMOGRAPHIC	 POPULATION GROWTH	 COVENANT OF MAYORS	 UNITS ADMINISTRATIVE	
623 2008	2% 2001	24 2001	63 2008	-1%	28% 2013	88	TORINO
479 2008	1% 2001	25 2001	72 2008	-12%	44% 2013	32	GENOVA
576 2008	4% 2001	27 2001	62 2008	+1%	76% 2013	116	MILANO
496 2008	7% 2001	25 2001	62 2008	+1%	71% 2013	21	VENEZIA
540 2008	0% 2001	18 2001	74 2008	-11%	33% 2013	6	TRIESTE
579 2008	4% 2001	21 2001	66 2008	+5%	81% 2013	32	BOLOGNA
667 2008	3% 2001	22 2001	68 2008	-4%	5% 2013	19	FIRENZE
700 2008	0% 2001	32 2001	63 2008	+5%	46% 2013	70	ROMA
582 2008	1% 2001	25 2001	64 2008	+0%	27% 2013	37	NAPOLI
538 2008	1% 2001	18 2001	61 2008	+1%	18% 2013	17	BARI
577 2008	0% 2001	19 2001	65 2008	+0%	46% 2013	13	REGGIO C.
N/D	N/D	N/D	N/D	+5%	10% 2013	51	MESSINA
682 2008	0% 2001	21 2001	64 2008	+3%	63% 2013	19	CATANIA
583 2008	1% 2001	21 2001	65 2008	+1%	47% 2013	17	PALERMO
601 2008	1% 2001	19 2001	52 2008	+4%	48% 2013	27	CAGLIARI
317 2008	19% 2003	31 2003	54 2008	N/D	N/D	17	AMSTERDAM
416 2008	1% 2008	28 2008	55 2008	N/D	N/D	89	BARCELONA
321 2003	22% 2003	24 2000	59 2004	+6%	N/D	48	COPENHAGEN
429 2011	17% 2008	21 2008	61 2011	+13%	N/D	78	FREIBURG
369 2008	33% 2003	25 2003	58 2008	N/D	N/D	10	GRONINGEN
425 2011	9% 2008	27 2008	58 2011	+13%	N/D	188	MUNICH
389 2008	6% 2005	35 2005	60 2008	N/D	N/D	N/D	* STOCKHOLM

CAR OWNERSHIP
per 1,000 inhab.

CYCLING TRANSPORT
% of daily commuting

TIME JOURNEYS TO WORK
average minutes

DEPENDENCY DEMOGRAPHIC
(<20 + >65)/20-64 years

POPULATION GROWTH
1991-2011

COVENANT OF MAYORS
% of signatories

UNITS ADMINISTRATIVE
number of

DATA SOURCES:
Istat, Eurostat, Covenant of Mayors

Where to improve?

1 URBAN PLANNING

- 1.1 MINIMIZING GREENFIELD CONSUMPTION TO PROMOTE BROWNFIELD TRANSFORMATION
- 1.2 IDENTIFYING DENSITY BONUSES LINKED TO THE ENERGY EFFICIENCY STANDARDS OF NEW BUILDINGS
- 1.3 RAISING STANDARDS FOR SOCIAL HOUSING, GREEN AREAS AND PUBLIC SPACES

2 TRANSPORT

- 2.1 DISCOURAGING USE OF PRIVATE TRANSPORT WITHIN THE CITY CENTRE
- 2.2 INCREASING THE MODES AND FREQUENCIES OF PUBLIC TRANSPORT TO CUT COMMUTING TIME
- 2.3 ENCOURAGING USE OF NON MOTORIZED TRANSPORT

3 EXISTING BUILDINGS

- 3.1 IMPROVING ENERGY EFFICIENCY OF PUBLIC AND PRIVATE EXISTING BUILDING ASSETS
- 3.2 ENCOURAGING REUSE OR REFURBISHMENT OF VACANT BUILDING ASSETS

4 WASTE MANAGEMENT

- 4.1 PROVIDING SELECTIVE WASTE COLLECTION SERVICES AND WASTE MANAGEMENT FACILITIES DEDICATED FOR RECYCLING AND DISPOSAL
- 4.2 IMPLEMENTING INFORMATION CAMPAIGNS ON REDUCTION OF WASTE PRODUCTION

5 WATER SUPPLY

- 5.1 REDUCING LEAKAGES IN WATER PIPES NETWORKS
- 5.2 PROMOTING RAIN WATER HARVESTING AND GREY WATER REUSE

6 ENERGY SUPPLY

- 6.1 ENCOURAGING LOCAL PRODUCTION OF RENEWABLE ENERGY
- 6.2 DEPLOYING SMART GRIDS TO DELIVER SIGNIFICANT ENERGY EFFICIENCIES AT THE CITY SCALE

7 STREET LIGHTING

- 7.1 INTRODUCING SMART TECHNOLOGIES FOR THE MANAGEMENT OF STREET LIGHTING
- 7.2 INTRODUCING LED AND CFL ENERGY SAVING DEVICES

8 LOCAL FOOD PRODUCTION

- 8.1 ENCOURAGING THE IMPLEMENTATION OF CITY FARMS AND COMMUNITY GARDENS
- 8.2 INCREASING THE PRESENCE OF LOCALLY PRODUCED FOOD MARKETS

9 ICT

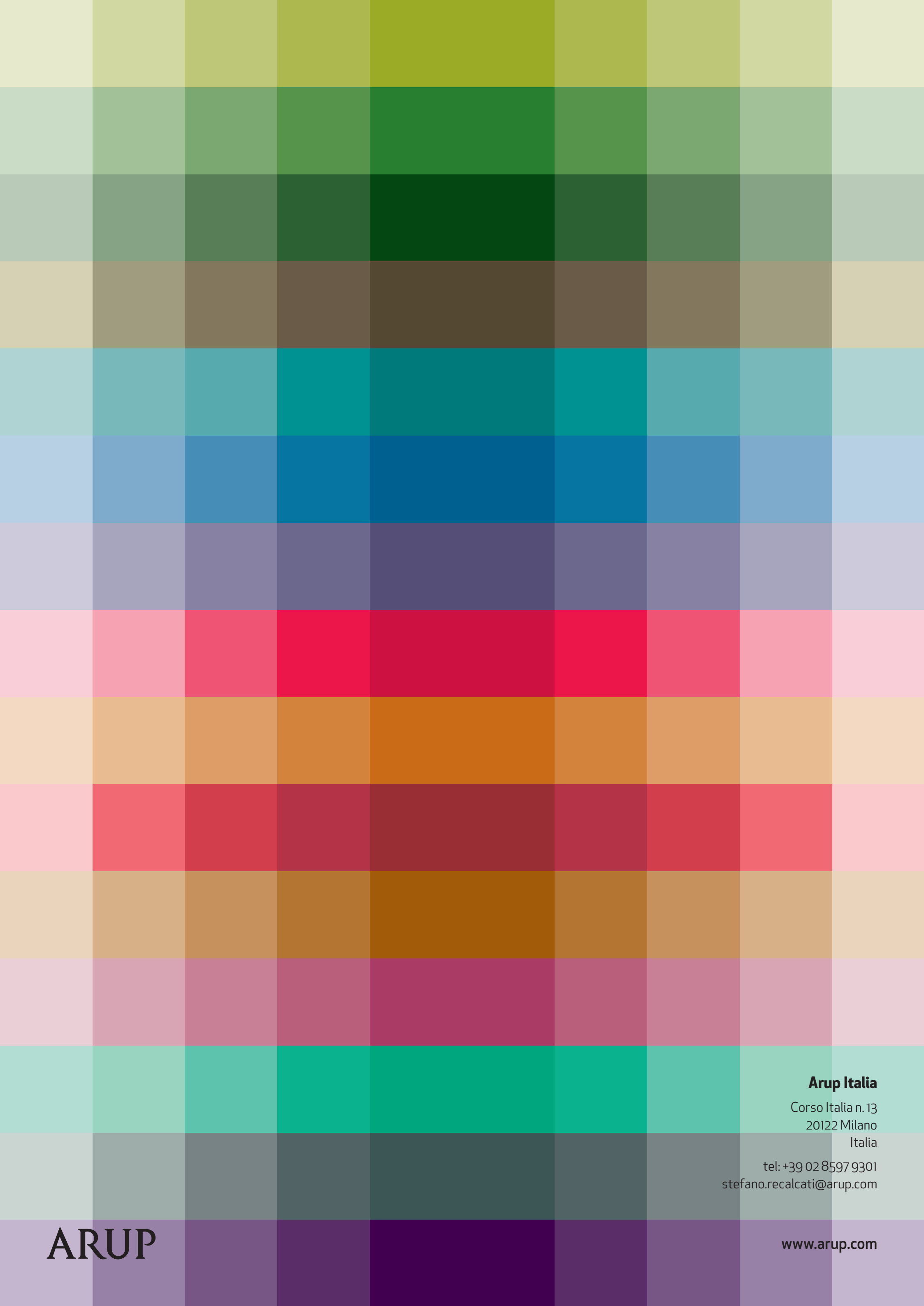
- 9.1 INCREASING FREE WIFI POINTS IN THE CITY TO IMPROVE CONNECTIVITY AND ACCESSIBILITY TO INFORMATION
- 9.2 INTRODUCING REAL TIME PUBLIC TRANSPORT INFORMATION SYSTEMS

10 ECONOMY AND FINANCE

- 10.1 INTRODUCING INCENTIVES, LOANS AND TAX REDUCTIONS FOR BUILDING REFURBISHMENT AND RETROFITTING
- 10.2 INTRODUCING ECONOMIC BONUSES ON SUSTAINABLE PERFORMANCES OF INDIVIDUAL CITIZENS

Glossary and Sources

NUTS 3	The Nomenclature of Units for Territorial Statistics (NUTS) is a set of geographical boundaries set and regulated by the European Union. The NUTS levels 3 in Italy corresponds to the administrative boundaries of Provinces.
LUZ	The Larger Urban Zone is an approximation of the metropolitan functional urban area extending beyond the Core City defined by Eurostat.
Core City	The Core City is the main centre of a Larger Urban Zone, defined by the administrative boundaries of the Municipality.
PT	Public transport
PV	Photovoltaics
Sustainable transport	Public transport, car sharing, walking, cycling, electric, hybrid and biodiesel cars.
ZTL	The Limited Traffic Zone (ZTL) is an urban area where the movement of motor vehicles is restricted.
30 ZONES	A form of urban measure where an area is designated with a 30 kilometres per hour (km/h) limit, or 20 miles per hour (mph) limit.
N/D	No Data
Atlasole	Geographic information system provided by Gestore Servizi Energetici, which contains data and information on photovoltaic systems.
Corine Land Cover	Coordination of Information on the Environment (Corine) is a European programme initiated in 1985 by the European Commission aimed at gathering information relating to the environment on certain priority topics for the European Union. The Corine databases and several of its programmes have been taken over by the European Environment Agency.
Covenant of Mayors	The Covenant of Mayors is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO ₂ reduction objective by 2020.
Eurostat	Eurostat is a Directorate-General of the European Commission located in Luxembourg. Its main responsibilities are to provide statistical information to the institutions of the European Union (EU) and to promote the harmonization of statistical methods across its member states and candidates for accession as well as EFTA countries.
IGM	The Istituto Geografico Militare (IGM), or Military Geographic Institute is an Italian public organization, dependent on the Italian Army. It is the national mapping agency.
Istat	Istituto Nazionale di Statistica (Istat) is the Italian National Institute of statistic. Its activities include the census of population, economic censuses and a number of social, economic and environmental surveys and analyses.
Legambiente	Legambiente is an Italian environmentalist association. It is part of the European Environment Bureau, the organization that brings together all the major environmental groups in Europe and of the International Union for Conservation of Nature.
Ministry of Economic and Finance	The Ministry of Economic and Finance is the executive body responsible for economic, financial and budget policy, planning of public investment, coordinating public expenditure and verifying its trends, revenue policies and tax system.
SEAP	A Sustainable Energy Action Plan (SEAP) is the key document in which the Covenant signatory outlines how it intends to reach its CO ₂ reduction target by 2020. It defines the activities and measures set up to achieve the targets, together with time frames and assigned responsibilities.
World Bank	The World Bank is an international financial institution that provides loans to developing countries for capital programs.



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