

## Cap.10 - Planning the cities of the future

The city takes an ever more strategic role in the European scenario, which focuses itself on the main challenges in the environmental, social and economic context, in terms of potential innovative solutions or risks in terms of sustainability. The urban development model hypothesizes a “city of the future” outside of the administrative borders and seen as a “functional” city at the service of their own territory, favouring a compact structure of establishments with a limited urban proliferation and capable of being the attractive centre for people who gravitate there both for work and study. Scaling down the provinces the metropolitan cities assume more weight; simultaneously, in Veneto there are 5 urban areas (Padua, Treviso, Venice, Verona and Vicenza) and other smaller centres, but with relevant urban functions, deployed across the main routes. The concentration of people in these urban areas could also intensify the risk of social marginalization and determine critical environmental issues which could be solved with innovative solutions. Many cities are already taking part in Smart City projects and in the future, a smart land can be imagined in which opportunities extend to the all regional territory.

### THE ROLE OF URBAN CENTRES

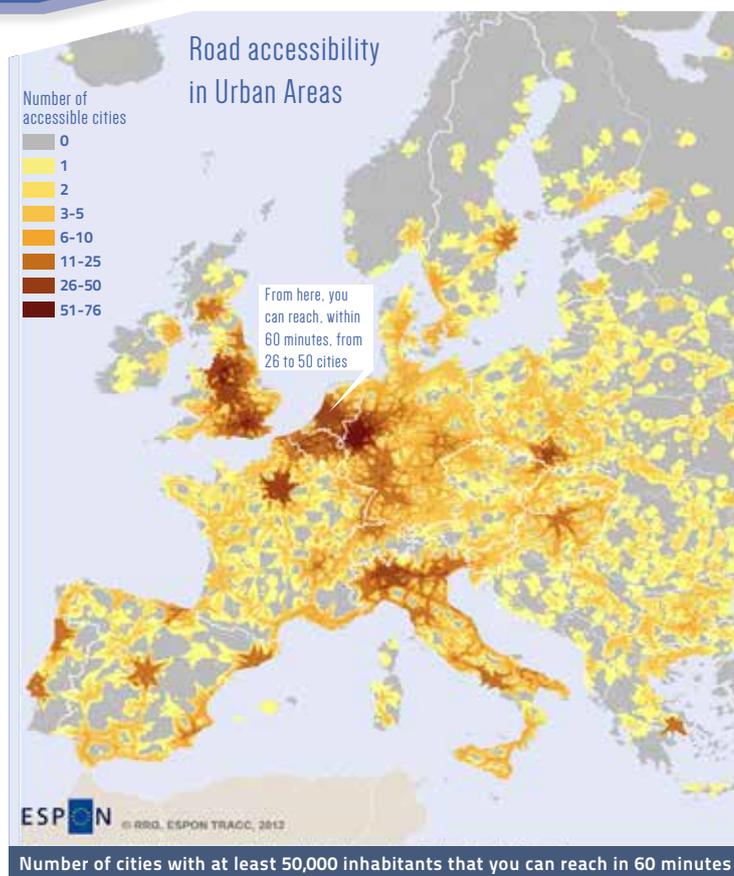
40%

of the population in Veneto reside in urban areas



+26%

Every day 26% more people compared to the residents is present in the capital towns due to study or work reasons





**With the PON Metro, there are more resources for the metropolitan cities**

Whilst the provinces are having a downsizing in their functions, the metropolitan cities are playing an ever more active role

thanks to national laws, as important demographic hubs and as the drivers for development and innovation. To this end in 2014 the National Operational Programme for Metropolitan cities was adopted (PON Metro)<sup>2</sup>: it is an instrument for national programming, co-financed using community funds, for interventions dedicated to the 14 metropolitan areas of Italy. For the seven year period 2014/2020 EUR 892 million have been allocated, of which 588 was funded by the EU (446 from FESR and 142 from FSE) and the rest came from national co-financing. The interested areas covers the territories of the metropolitan cities, with interventions more focused on some portions of these territories and on the territory of the main municipality.

The PON supports the priorities of the national Urban Agenda and focuses on the three main challenges of a metropolitan territory: economic challenges, such as the digital agenda and communication networks; climate and environment challenges, such as sustainable mobility and energy efficiency; social challenges, such as the fight against housing exclusion, the integration of marginalised segments and social innovation. In the medium cities and major urban hubs the Regional Operation Programme EFRD 2014-2020 will be implemented<sup>3</sup>. These cities are densely populated urban areas and represent the major hubs of supply for essential and premium services for vast and significant areas, in first place the capitals of the regions and the provinces.

**With POR-FESR, 77 million euros for Veneto's medium-sized cities**

An axis of the Veneto ROP-ERFD focuses on Sustainable Urban development, with

a financing of 77 million Euros for some strategic objectives. First of all the sustainable urban mobility, also encouraging the use of public transport systems that have a lesser environmental impact.

<sup>2</sup> The Minister for Economic Development – The department for the Development and European cohesion of the National Operational Programme for Metropolitan cities 2014-2020, 22 July 2014.

<sup>3</sup> Veneto region, Operative programme for the objective "Investments in favour of growth and employment" Veneto ROP-ERFD 2015.

The polycentric character of Veneto has represented a great strength for regional development for a long time, specifically economically, but today it has been found to be limited in terms of the consumption of ground, pollution and environmental issues, marginalization of certain areas and segments of the population. The extension of the disseminated city, with the following creation of urbanised continuum, made the transfer flows of people more complicated, creating problems in the organisation of the infrastructure and of transport. To this, we should also add a cultural backwardness, which preserves an obsolete idea of a city designed for cars, far away from the recent European and international tendencies where the sustainable city is built around a public transport network system. Other objectives of the Programme range from the promotion of social inclusion, intended to contain poverty and aiming at reducing the extreme marginalisation of homeless people, consolidating the competitiveness of small and medium-sized businesses and modernising the territorial productive systems, to the strengthening of the e- Government services through the digitalization of administrative procedures and the dissemination of digital services in the interaction among citizens, businesses and the Public Administration.

## Restructuring the local institutions

The definition of the most appropriate forms of government for the territories with the largest urban concentration has been in debate, at the academic and political level, even as far back as the 50's in the previous century. With Law number 142 in 1990, the reformation of the system of the local autonomies, provided for the establishment of metropolitan cities that have been given, then, the status of constitutional bodies with the reform of the Constitution in 2001. 24 years after their first introduction in our legal system, and on the basis of the acknowledgment that in the metropolitan conurbations there coexists the best opportunities and the worst critical situations for the development of the whole country, and Law 56 in 2014 (the so-called Delrio law) redefined them in terms of numbers, and functions and to dictate the rules for their institution. Sacrificing the urbanistic assessments and in order to overcome the foreseeable contrasts related to the boundaries of the metropolitan aggregates, the law made it possible to coincide them with the boundaries of those of the pre-existing Provinces, leaving the possibility wide open for the adhesion

of the municipalities belonging to neighboring provinces.

**Re-sizing the provinces, the Metropolitan city is born**

The same law 56 revised the organisation of the provinces either in terms of their bodies or in terms of their attributes. This one was followed by the Veneto regional law number 19 of 2015 aimed at re-organising the

administrative functions of the Provinces and metropolitan City. We are in presence of a global revision of the organisation of the local autonomies which is not yet completed. In fact, the new constitutional reform, definitely approved by the two Houses of Parliament which will be the subject of the confirming referendum in Autumn, provides for the abolition of the provinces. If the referendum passes, the new constitutional provision will require, at a national level, an adaptation of the Unified text for the local authorities (Legislative Decree n. 267/2000) and, at a regional level, a further rearrangement of the way in which the regional functions are carried out, also in consideration of the absen

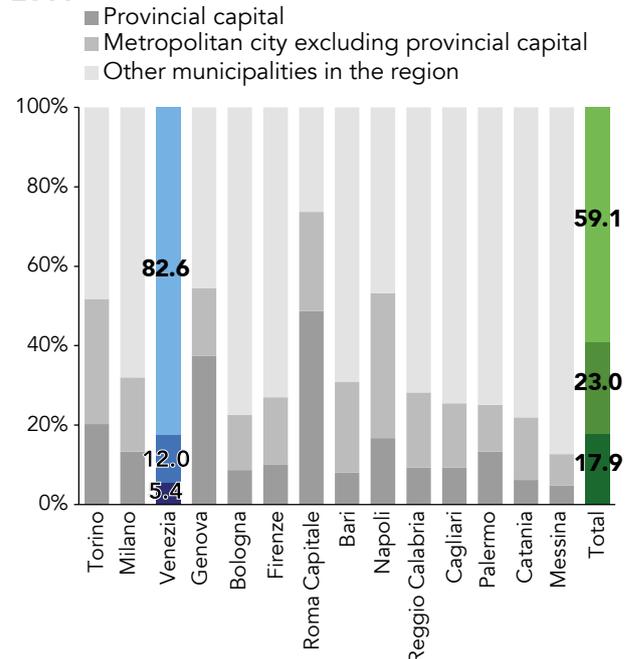
ce of territorial institutions of vast areas operating at the sub-regional level in a homogenous method for the whole regional territory. Focusing the attention on the metropolitan dimension, it is clear that the 14 metropolitan cities, established by the Delrio law, have an important weight on the Italian society, with 36% of the population, 17% of the surface area and 41% of the added value.

**Tab 10.1.1 – The metropolitan cities in Italy – Year 2014**

Region	Metropolitan city	Municipalities	Surface area (km2)	Population	Population density (pop./km2)
Piemonte	Torino	315	6,827,0	2,291,719	335,7
Lombardia	Milano	134	1,575,7	3,196,825	2,028,9
Veneto	Venezia	44	2,472,9	858,198	347,0
Liguria	Genova	67	1,833,8	862,175	470,2
Emilia Romagna	Bologna	55	3,702,3	1,004,287	271,3
Toscana	Firenze	42	3,513,7	1,012,180	288,1
Lazio	Roma Capitale	121	5,363,3	4,342,046	809,6
Puglia	Bari	41	3,862,9	1,266,379	327,8
Campania	Napoli	92	1,178,9	3,118,149	2,644,9
Calabria	Reggio Calabria	97	3,210,4	557,993	173,8
Sardegna	Cagliari	16	1,114,0	423,340	380,0
Sicilia	Palermo	82	5,009,3	1,276,525	254,8
Sicilia	Catania	58	3,573,7	1,116,917	312,5
Sicilia	Messina	108	3,266,1	645,296	197,6
<b>Total</b>		<b>1,272</b>	<b>46,504,0</b>	<b>21,972,029</b>	<b>472,5</b>

Source: Processing by Regione Veneto - Sezione Sistema Statistico. Regionale on Istat data

**Fig. 10.1.1 – Percentage distribution of the population in the metropolitan cities. Italy – Year 2014**



Source: Processing by Regione Veneto - Sezione Sistema Statistico. Regionale on Istat data

Compared to the other territories, Veneto confirms a particularity which consists in the non-predominance of the provincial capital of the region and the metropolitan city of Venice in the regional sphere, where 17.4% of the regional population is concentrated.

The question of the eventual expansion of the boundaries, supported in particular by those who had elaborated the Pa.Tre.Ve concept – the metropolitan central area also consisting of Padua and Treviso – is highly controversial on the political level: this also includes the provision of the Statute of the metropolitan city of Venice which limits to its sole bordering municipalities the possibility of adhesion, introducing thus a limitation in order to preserve the territorial continuity of the new insti-

tution, with respect to Law 56 which contemplates the possibility of adhesion also for non-bordering municipalities, provided that they belong to neighbouring Provinces.

The first problem metropolitan cities have to face is that of filling the content of the planning deeds for which they are competent, from the metropolitan 3 year strategic plan, and to ensure the resources necessary for the urban upgrading operations to be carried out.

In parallel with the rearrangement of the local autonomies system, the recent years have witnessed a clear trend towards the reduction of the number of subjects which assume public functions at the local level and the increase of the dimensions of the reference territorial aggregations.

Facts which are moving in that direction are the launch of the aggregation process between the Chambers of Commerce, the decrease in the number of

land reclamation authorities, the aggregation between the awarding bodies, and also the providers of the integrated water service, and, finally the transformation and reduction in the number of waste management facilities. Similar processes of aggregation are concerning the social-health sector and businesses which provide local public services in various sectors.

**Less public authorities, but with a larger pool**

## 10.2 Cities beyond administrative boundaries

### Some definitions of a "city"

OECD, in accordance with the European Commission and Eurostat, developed in 2012 a harmonized definition for urban areas, called FUA (Functional Urban Areas), which go beyond the administrative

**Tab. 10.1.2 - Aggregation process for public entities operating at the local level**

Entity	Before the reform	After the reform	Notes
Chambers of Commerce, industry, crafts and agriculture	7	6	The decree of the Minister of economic development on 23.10.2014 implemented the incorporation of the CCIAA of Venice and that of Rovigo in the new CCIAA of Venice Rovigo Delta Lagunare
Land reclamation authorities	20	10	Based on the Regional Law N. 12/2009
Awarding bodies for the integrated water service: Municipalities before the reform, then the Optimal Territorial areas (AATO) and, at the moment, the Area Council for the regional Optimal Territorial areas (ATO) and the Area Consult for the interregional ATO	581	9	The reform of the organization of the integrated water service was taken under Law number 36/1994 "Galli Law", implemented at the regional level by Regional Law n. 5/1998, which identified the ATO's and established the relative AATO of reference then replaced, based on Regional Law n. 17/20012, by the Area councils/Area consultation
Integrated water service entities	328	16	Before the reform, 281 municipal entities were operating economically and 47 public businesses or managing consortia; there are now 16 managing companies which operate (14 of which are consortia in the consortia Viveracqua scarl)
Area boards for the integrated management of urban waste	24	11	Based on the Regional Law n.52/2012 and implementing measures

Source: Processing by regione Veneto – Sezione Sistema Statistico Regionale

boundaries. They are characterized by an urban core and by an hinterland, which the work place is strongly integrated with the core<sup>4</sup>. This definition is applied in 29 OECD countries and allows the identification of 1,179 urban areas of different dimensions.

The core comes to be defined through the aggregation of small portions of adjoining territory (1km<sup>2</sup>), with a density of at least 1,500 inhabitants per km squared.<sup>5</sup>The cores may be situated near to each other but not adjoining: although physically separated, they are included in a unique FUA if they are economically integrated, namely if at least 15% of the residents of one of the cores moves for work

<sup>4</sup>OECD, Definition of Functional Urban Areas (FUA) for the OECD metropolitan database; September 2013.

<sup>5</sup> For the European states, the data is taken from the Corine Land Cover Dataset, produced by the Joint Research Centre for the European Environmental Agency (EEA).

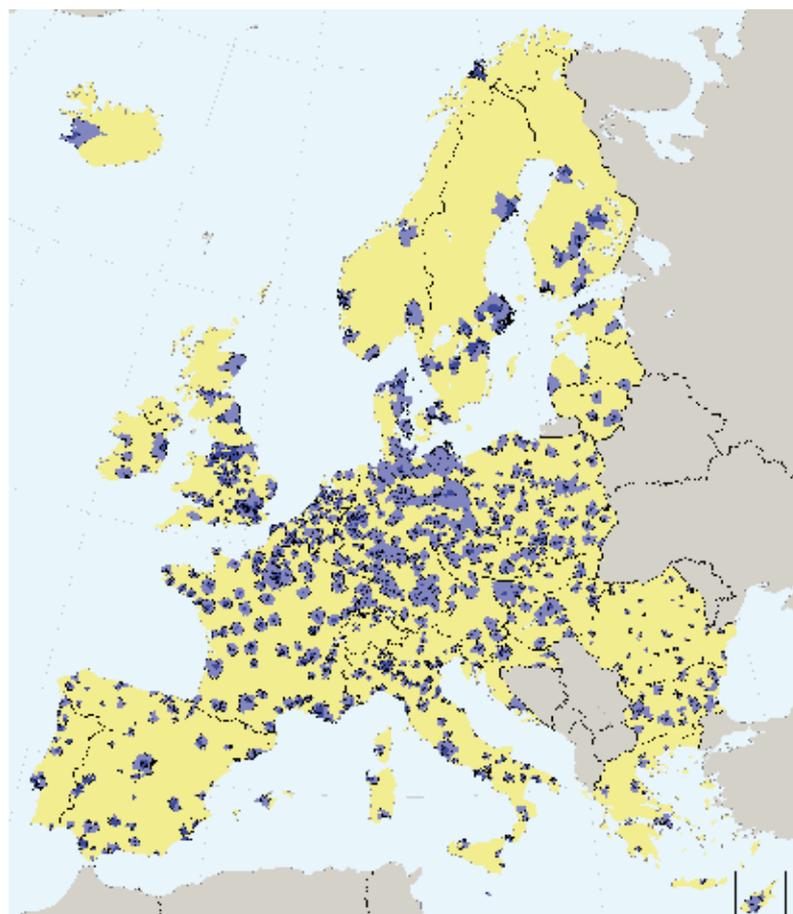
or any other reasons. In this case, we talk about polycentric functional areas.

Around the core, the hinterland municipalities are identified thanks to people commuting for work related reasons, where at least 15% of the residents work in the core. The extension of the hinterland gives an idea of the influence of the city on the surrounding territories.

The FUA's are further classified as: "small urban areas" with an overall population between 50 and 200 thousand inhabitants, "medium-sized urban areas" with a population between 200 and 500 thousand inhabitants, "metropolitan areas" with a population between 500 thousand and 1.5 million inhabitants and "large metropolitan areas" with a population superior to 1.5 million inhabitants.

The European map shows the diversity of the urban functional areas between the EU States. Also, the situation in Italy is especially heterogeneous and the distribution of the cities is not the same for all

**Fig. 10.2.1 - Functional Urban Areas (FUA) in Europe – Year 2012**



Urban core  
Hinterland

eurostat

Administrative boundaries: © Eurostat; Administrative UN-FUA: © Tarkenton; Cartography: Eurostat — GISCO 05/2015

Source: Directorate-General for Regional and Urban Policy

the regions.



**Italian FUA's are very different from the European ones**

According to the OECD tables, Italy has four large metropolitan areas :

Rome, Milan, Naples, Turin. Rome and Milan stands out because of their extortionate surface area and a population exceeding 4 million inhabitants, the core is vast and the hinterland is very diffused. Naples has an extended core along the coast, but a limited hinterland; on the contrary, Turin, Bologna and Florence demonstrate a smaller core but with a rather extended influence on the hinterland.

For Veneto, this definition of functional urban areas includes 5 provincial capitals, with their hinterland: Venice as a "metropolitan area", Verona, Padua and Vicenza as "medium sized urban areas" and Treviso as a "small urban area". For the 5 Veneto cities, the hinterland is made of most of the municipalities bordering with the provincial capital, even if it is not the case for all of them, and some of the neighbouring municipalities.

The FUA's in Veneto are of more modest dimensions and are grouped closely enough: in particular Venice, Padua and Treviso almost seem to create a continuum. Although the three cores are in some ways integrated, the intensity of their relationships is not enough to justify the creation of one polycentric urban area.

The situation is different for many central European cities: for example, the functional urban areas in Germany are numerous and uniformly distributed across the territory, with a concentrated core and an extended hinterland. The presence of concentrated urban centers is synonymous with intensive residential areas and therefore a less important dispersion of these areas, which is the case in many continental European zones. The situation is different for Veneto, where more diffused residential do not allow to create compact residential centers with a limited urban proliferation, which is what the European Commission is hoping for the characteristics of their cities of the future<sup>6</sup>.

In order to describe the reality in Italy in a more detailed way, taking into consideration the peculiarity of our cities which are, for most of them, different from a lot of European cities, Istat provides a definition for urban areas different from the one

provided by OECD, starting with the local systems (SL), which are groups of municipalities identified on the basis of their daily commutes in order to get to their workplace. The functional geography of the local systems, precisely because it is based on the flows and exchanges which characterise the places, gives also an idea of the organisation of the territories that is different from the one established on the basis of the administrative boundaries. It shows how the territory structures itself from the relationships between people and the economic and social subjects, offering an important understanding of the economic-social phenomena, but also for evaluating the environmental impact and quantifying these services.



**Venice, Verona and Padua; 3 big Urban Local systems**

Within the SL tables based on the predominant economic

specialization, Istat identifies 3 large urban local systems (Venice, Verona and Padua), namely where there is a concentrated citizen activity in non-manufacturing areas<sup>7</sup>.

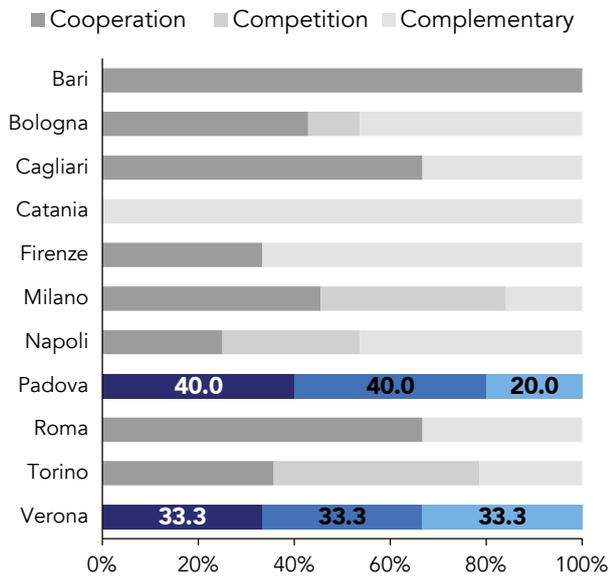
If the Venice local system has a monocentric structure, with one sole attracting centre, the local systems of Verona and Padua present a more complex structure, with more attracting centers which interact between each other. Indeed, the Verona and Padua territories stand out for the high percentage of workplaces in the small centers, thus next to the main centre there is a row of smaller centers which interconnect the territory. In the Padua system, 20% of the relations between the centers are "complementary", namely in a hierarchical way, wherein the intensity of the flows from the small centers towards the main one is significantly greater than that of the opposed orientation. However, most of the relations are established for "cooperation" or "competition" reasons. There is cooperation if the intensity of the flows between the centers is largely the same in both orientations, whilst the competition is present if the exchanges between centers are less or there is at least an inferior intensity compared to the arriving flows from other localities into each of them. In the case of "competition", the centers compete for their hinterland and they come to define a model of dynamic polycentricism, in Padua even more than in Verona.

<sup>6</sup> The European Commission, The urban dimension of the EU policies – Founding elements of the EU Urban agenda; Brussels 18.07.2014

<sup>7</sup> SL of Venice, Verona and Padua have a much larger catchment area compared to that defined by the OECD in the FUA. According to the Istat figures, Rovigo can also be added to these larger local urban systems.



**Fig. 10.2.2 – Typology of relations between centers. Percentage composition – Year 2011**



Source: Istat

### The ROP-ERDF urban areas in Veneto

In accordance with the Partnership Agreement, the Urban areas in Veneto, where the ERDF investment is intended to go to, are defined based on objective criteria, namely the demographic criterion and the presence of typical urban functions addressed to citizens and the residing businesses in the vast territory areas, with reference to the typology of the premium services in some sectors (health, education, mobility and transport, logistics and infrastructure, research and economic programming...). In this particular case, the funds are intended to be allocated to the five urban areas of the central strip of the region (call for tender underway) and partly to a second typology of areas consisting of minor municipalities, but with relevant urban functions<sup>8</sup>. The five urban areas are identified using the FUA concept of OECD and taking into consideration the results of other documents from the regional programming<sup>9</sup>. The FUA are cross-checked with the

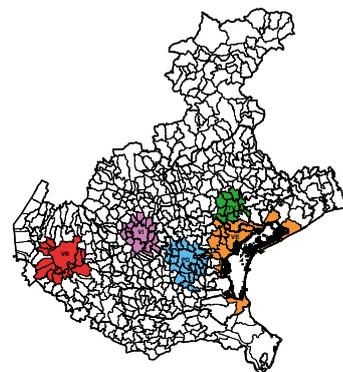
<sup>8</sup> The second typology is made up of minor municipalities, but with relevant urban functions, outlined according to the EAFRD criteria and as centers according to SNAI: Mirano, Montebelluna, Castelfranco Veneto, Camposampiero, Cittadella, Monselice, Este, Isola della Scala, Legnago, Schio, Thiene, Bassano del Grappa.

<sup>9</sup> The Veneto region, Operational programme in the framework of the objective "Investments in favour of the growth and em-

adopted table of municipalities of the document supporting the Rural Development Programme (EAFRD 2014-2020), which categorises municipalities based on their rural and urban nature<sup>10</sup>. The document shows that the most urbanized areas are located in the provincial capitals of the central area of the region, in their urban strips and in the more industrialized areas which were developed along the main roads.

As a result, the 5 FUA territory of OECD is partly modified: we observe the insertion of the municipalities neighbouring the provincial capital not being present in the hinterland declared by the FUA, but resulting in a rural-urbanised situation, or urbanised according to the EAFRD, whilst the neighbouring or bordering municipalities inserted by the OECD have been eliminated, since they do not present urban characteristics, according to the regional documentation. The presence of these premium services is confirmed in the "National Strategy for the Internal Areas (SNAI)" document, which ranks the areas of the territory according to what extent they are located within the periphery. In Belluno and Rovigo, urban characteristics are not accepted, which are already excluded from the OECD definition.

**Fig. 10.2.3 – Urban areas in Veneto according to the ROP-ERDF 2014-2020**



Source: Processing by Regione Veneto - Sezione Sistema Statistico. Regionale on Regione Veneto data

ployment" ROP Veneto ERDF; 2015

<sup>10</sup> EAFRD classifies municipalities in: urban centres (the 5 provincial capitals of the central area), rural areas and specialised intensive agricultural and rural areas, further divided into rural-urbanised municipalities (with a population density <400 inhabitants/km<sup>2</sup>) or urbanised municipalities (>=400 inhabitants/km<sup>2</sup>), intermediate rural areas and rural areas with development problems.

**40% of the Veneto population live in an urban area**

The 5 identified urban areas have a demographic dimension superior to 200,000 inhabitants and a population density much superior to the regional average (268,000 inhabitants per km<sup>2</sup>); covering 16% of the Veneto surface area and containing 40.3% of the regional population. The urban area of Venice is the most territorially expanded, exceeding 1,200 squared kilometers, Paudua demonstrates instead a higher population density whether regarding the provincial capital or the hinterland. The urban area of Treviso is more limited, also because of the less attractive effect the provincial capital has on the hinterland, which limits itself to the neighbouring municipalities and not to the other bordering municipalities. Since Venice is also concerned by the PON Metro, the actions of the ROP should be complementary and demarcated in order to avoid any overlapping of the operations.

**Tab. 10.2.1 - Population, surface area and density of the urban areas. Veneto - Year 2014**

	Residential Population	Surface area (km <sup>2</sup> )	Density (Inhabitants per km <sup>2</sup> )
Padova	484,718	492,7	983,8
Treviso	206,807	266,2	776,9
Venezia	596,021	1,234,9	482,6
Verona	457,444	569,6	803,1
Vicenza	238,491	373,2	639,0
<b>Total urban areas</b>	<b>1,983,481</b>	<b>2,936,6</b>	<b>675,4</b>
% on Veneto	40.3	16.0	-

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

## 10.3 Characteristics of urban areas

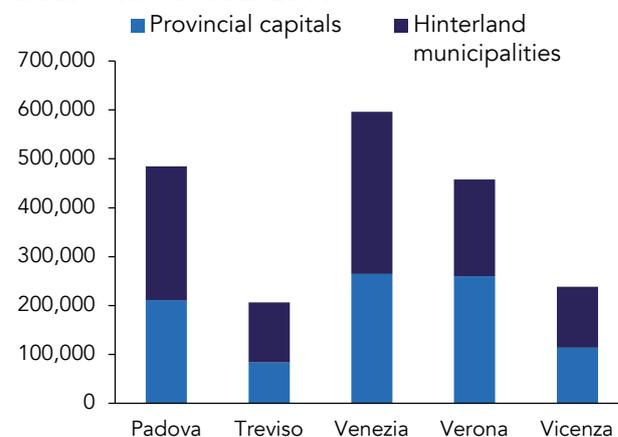
### The population who lives in the city

In the following, we will consider the five urban areas, outlining for them a profile in terms of characteristics of the residing population, the amount of people that use the city, eventual social risks and marginality, as well as the urban decay and land consumption, in these areas the ROP-ERDF will pay particular attention.

Almost half of the regional population resides in ur-

ban areas, and 19% in the 5 provincial capitals

**Fig. 10.3.1 - Residing population in the urban areas. Veneto- Year 2014**



Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

Given the attractiveness of the central cores due to the presence of activities and services, the population who gravitates around the provincial capitals is more numerous: to those who reside there, we should add those who go into the city on a daily basis for work or study reasons, but also those who live (for a long or short periods) – regular commuters or temporarily dwelling residents – who use the city in a stable manner, with evident implications in terms of infrastructure and services, but also impacting the environment and safety. Thus, those who use the city more occasionally and for less time, such as tourists for example, should not be overlooked. Thanks to the Persons&Places project (P&P)<sup>11</sup>, Istat recently gave experimental estimates on the amount of population which uses the city, comprising, besides daily commuters, also regular commuters, who move for residence/work/study for more than a day, such as offsite university students. About 40% of more people, compared to the resi-

<sup>11</sup> The P&P information system falls within the broader ARCHIME-DE project (Integrated register of Economic and Demographic microdata) for Istat, which provides for the evaluation of territorial data, thanks to the integration of different administrative registers, at individual level. In this case, the integration is between the population register and different registers for the location of the person (study, work, university), such as the register office for university and non-university students, Asians-employment, exINPDAP, self-employed workers in Agriculture.

ding population, come into the 5 main provincial capitals; the pressure is particularly intense in the municipality of Padua (60%).

**Tab. 10.3.1 – Pressure indicators for the population of the provincial capitals of urban areas. Veneto. Year 2012**

	% Resident population and incoming commuters (a)	% Daily present population (b)
Padua	159.9	143.8
Treviso	148.4	127.0
Venice	131.3	121.1
Verona	132.4	118.6
Vicenza	137.9	120.2
<b>Total urban areas</b>	<b>140.4</b>	<b>125.9</b>

a) The resident population and incoming commuters represents the population which gravitates in the area of the municipality: residing population + dynamic residents arriving in the municipality (such as: daily and regular commuters)

b) The daily present population represents the individuals who are present in the municipality on a typical day: residing population – outgoing residents and incoming residents from other municipalities.

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

**Every day 26% more people who study or work are present in the urban areas**

It is also true that a part of the residents of the provincial capitals is not present during the day due

to studying or working in other places which lowers the quota of people whom in a standard day (working weekday or daytime hours) are present in the core area: the daily present population is estimated at about 26% more than the residing population in the five provincial capitals considered (Padua 40%). For a deeper analysis on the daily movements for work and study reasons, refer to chapter 1.

**Increasing of residents is more important in the hinterland**

We now consider only the residing population, in the last 10 years, the

urban population has grown by around 5%, a value in line with the regional average; what is worth analysing is the dynamics in these past 10 years within the urban areas. Whilst in the provincial ca-

pitals the population remained on average stable in terms of quantity, with the exception of Venice which has lost inhabitants, the municipalities of the hinterland have registered an average increase of residents superior to 9%.

**Tab. 10.3.2 – Variations in population in the urban areas. Veneto – Variations % 2014/04**

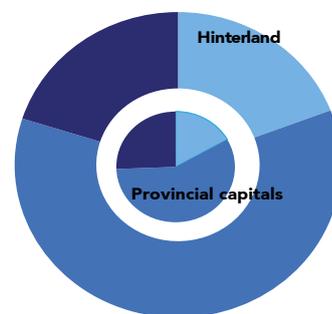
	Provincial capital	Hinterland municipality	Total urban area
Padua	0,2	11,8	6,4
Treviso	1,9	8,9	6,0
Venice	-2,5	6,3	2,2
Verona	0,4	12,5	5,3
Vicenza	0,1	8,3	4,2
<b>Veneto</b>	<b>-0,4</b>	<b>9,4</b>	<b>4,6</b>

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

The hinterlands appear therefore to be the most important attractive area, where families can find houses at a cost which is lower than the houses in urban centres, that are more recent and interconnected with the local transport systems. If it is true that for many of these families, the hinterland represents the opportunity for a better life, with more

**Fig. 10.3.2 – Population per age groups in the urban areas. Veneto – Year 2014**

■ <20 years old ■ 20-64 years old ■ ≥65 years old



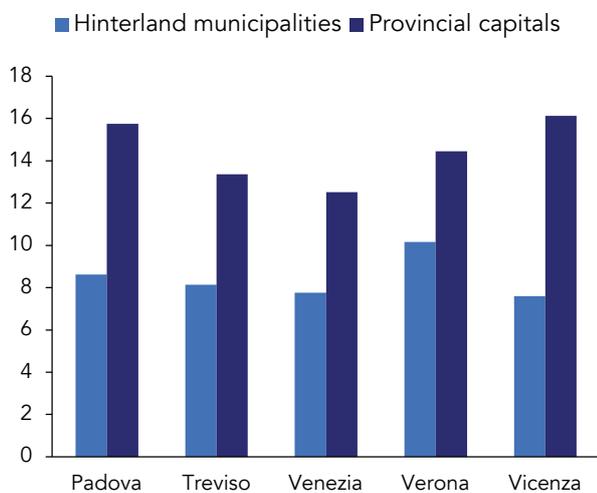
Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

space and more green land, there is also an effect due to the economic-financial crisis, which had severe implications in terms of unemployment and undermined revenues, but it also greatly limited the offer of mortgage loans from the banks.

Also for this reason, within the provincial capitals, the age composition of the residents is unbalanced in favor of the older generations (almost 26% are older than 64), who often have houses where they have resided for a long time, whilst the majority of the younger generation live in the hinterland: where 19.2% are 20 years old or younger, compared to 16.8% in the provincial capitals.

But the most striking thing is the dislocation of foreign residents, whom stabilise themselves in the provincial capitals: because they can find places to rent, often outdated, places to share, in overpopulated or problematic areas due to which the old residents have vacated; in this way, they can save on travel costs. If in the hinterland, the foreign population is, on average, about 8.5%, in the provincial capitals, it is greater than 14% (16.1% in Vicenza).

**Fig. 10.3.3 – Incidence % of the foreign population in urban areas. Veneto. Year 2014**



Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data

### More elderly people in the provincial capitals

In the provincial capitals, the average dimension of the families is smaller because of the high presence of either young people who live on their own or elderly people living alone or as a couple without children. It is the case of the provincial capital of Padua which

has a quota of 11.5% young people living alone, as opposed to a regional average of 2.3%, and elderly people living alone in the capitals are around 30% as opposed to the regional average of 20.9%. Young couples, especially those who have children, prefer on the contrary living away from the provincial capital: their presence here is extremely reduced, especially in the Treviso region. For these cores, the choice of fleeing the city is obviously linked to the cost of living, since these young people are subject to discontinuous careers, have temporary contracts and rather low wages.

### Social Vulnerability

The concentration of thousands of people in urban areas stimulates, on one hand, a modern organisation of urban space and of the services connected to it, but on the other hand it can intensify the risks of vulnerability forms and housing deprivation or social marginalization. These phenomena are caused by the attractiveness of the large cities for people looking for work, often immigrants with social and housing conditions sometimes precarious, or caused by the most recent disparities brought on by the economic crisis, which generated economic difficulties for families and the conditions for a housing deprivation.

The social and material vulnerability index is an indicator elaborated by Istat on the basis of different basic elements which describe the principal material and social dimensions of vulnerability, taking into consideration for example illiteracy, types of families more at risk like single parents, large families or the elderly, the economic and healthcare crises, overpopulation and young people not at school or not working.

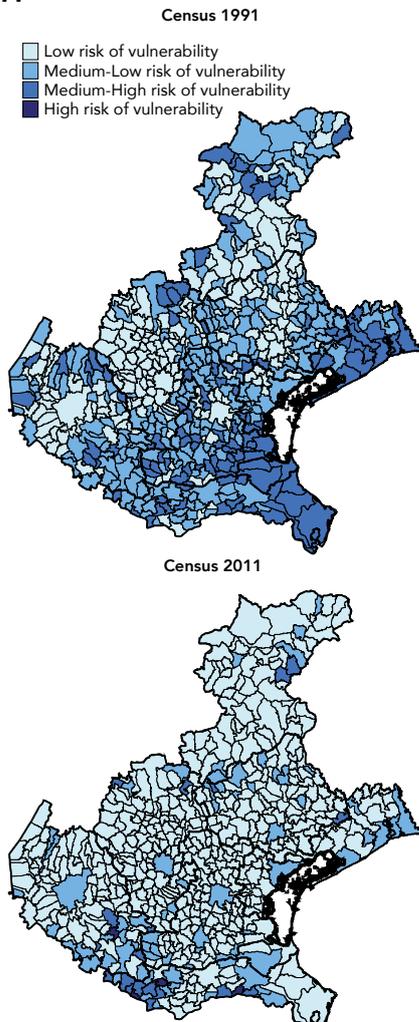
The index is available to the community at various censuses and allows to understand the transformation on the territory, highlighting the most critical areas. Concerning the situation in Italy, in 1991 39% of the municipalities did not show particular problems concerning social inclusion, whilst around 41% showed a medium-high risk of vulnerability, especially in Polesine, in the Venice region and in mountainous areas. None of the areas were in the top of the tables in terms of criticalness<sup>12</sup>.

After 20 years the image of Veneto has been completely transformed and almost all of the municipa-

<sup>12</sup> The municipal distribution of the index, ordered in a decreasing manner, was divided into four categories of vulnerability per quartile of the residing population.

lities are doing well (84%). In the Veneto municipalities, there is a significant improvement over time of the conditions for potential vulnerability, even for the municipalities that were in a more difficult situation. However, the dynamic which draws the most attention concerns the provincial capitals: if in 20 years the index improves in the hinterland municipalities, the provincial capitals register a slight deterioration (from low risk of vulnerability to a medium-low risk). This indicates a situation wherein there is greater social vulnerability in the provincial capitals which should be the catalysts for the modern idea of a city.

**Fig. 10.3.4 - Index of social and material vulnerability per municipality. Veneto - Years 1991 and 2011**



Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data - Population and Inhabitants Census

For the provincial capitals, there is always the weight of elderly families, who are some of the most vulnerable economically speaking and in terms of welfare needs, as well as a certain housing deprivation.

In the past 20 years, both elderly families who are single and who have partners have increased, such as those with the presence of at least one person over the age of 80, that is to say families with higher potential for welfare deprivation.

Venice is the most elderly one, with 31% of the elderly living alone (25% in 1991) and 3.4% of families with a great potential for deprivation (2% in 1991). These situations, given the high risk of the presence of chronic illnesses and limits on the functioning of daily activities due to old age, highlight an implicit need for welfare and therefore a condition for potential social vulnerability.

Particular attention is also paid, to single-parent families, especially those with minor children, which although they represent a small share of families (0.7% on the overall regional level, but a little bit higher in the provincial capitals), they are also a category at risk, because a single parent has to provide for the whole family, either in terms of healthcare, for the house or economically speaking.



### ...and housing deprivation

Besides the social vulnerability situation, the

expanding urban areas show worrying situations also in terms of housing deprivation. In recent years, the repercussion of the economic crisis and therefore the consequences in terms of labour and revenues generated situations of potential housing deprivation, showing clearly the waste between the economic availability of families and the share of revenue intended to be used for the housing.

Among the most serious forms of housing deprivation, there is the risk of losing a lodging due to an eviction: in 2014 in Veneto there was, on average, 1 eviction for every 415 residing families, whilst it was 1 every 611 in 2005. The situation was more critical in the Vicenza province with one eviction every 300 families, whilst it was less critical in Verona.

In the provincial capitals, housing deprivation is more present, so much so that they are referred to as being municipalities with high housing pressure (ATA's)<sup>13</sup>.

<sup>13</sup> With the Regional Authority Decision number 525 on the 28 February 2003, the Veneto region adopted the list of municipalities with high housing pressure, definitively approved by the CIPE

**Tab. 10.3.3 – Percentage incidence of some typologies of families with highest vulnerability levels in urban areas. Veneto – Years 1991 and 2011**

	1991	2011	1991	2011	1991	2011	1991	2011
<b>Padova</b>								
Provincial capital	0,8	0,8	23,1	27,3	9,6	17,7	1,8	3,4
Hinterland (min - max)	(0,2-1,0)	(0,1-1,0)	(9,4-18,4)	(14,9-24,1)	(4,0-7,1)	(8,6-16,0)	(0,7-1,9)	(1,4-2,9)
<b>Treviso</b>								
Provincial capital	0,6	0,8	23,3	26,4	10,3	18,1	2,1	3,6
hinterland (min - max)	(0,3-0,9)	(0,4-0,9)	(16,5-18,6)	(19,4-23,4)	(4,9-7,6)	(9,3-15,5)	(1,0-2,1)	(1,3-3,0)
<b>Venezia</b>								
Provincial capital	0,7	0,8	24,8	30,5	10,6	19,8	2,0	3,4
hinterland (min - max)	(0,4-1,0)	(0,4-1,3)	(11,4-22,6)	(17,0-25,6)	(4,1-7,5)	(11,3-17,6)	(0,5 - 1,4)	(1,4-3,1)
<b>Verona</b>								
Provincial capital	0,9	0,9	26,3	29,3	9,9	17,8	1,9	3,5
hinterland (min - max)	(0,5-1,0)	(0,5-1,2)	(13,9-22,0)	(19,3-23,8)	(5,0-7,6)	(8,9-15,1)	(0,9 - 1,8)	(1,5-2,9)
<b>Vicenza</b>								
Provincial capital	0,9	0,9	25,5	28,3	9,3	16,7	1,7	3,3
hinterland (min - max)	(0,3-1,6)	(0,0-1,3)	(11,6-30,2)	(17,4-28,0)	(4,5-8,7)	(7,4-14,5)	(0,7-1,6)	(1,3-3,1)
<b>Veneto</b>	<b>0,7</b>	<b>0,7</b>	<b>20,9</b>	<b>24,4</b>	<b>7,9</b>	<b>13,7</b>	<b>1,6</b>	<b>2,8</b>

(a) Young single-parent families (mother/father less than 35 years old) / total number of families with only one household \* 100

(b) % of the total of elderly people

(c) Elderly couples who live alone / total number of families with only one household \* 100

(d) % families with at least two components, with all components being at least 65 years old and one being at least 80 years or older

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data – Population and Inhabitants Census

**Tab. 10.3.4 – Eviction orders issued per province. Veneto – Years 2005 and 2014**

	2005 (a)		2014	
	N.	1 eviction every number of families	N.	1 eviction every number of families
Padova	628	545	1,017	379
Treviso (b)	643	541	926	386
Venezia (c)	566	598	n.d.	n.d.
Verona	670	518	1,216	317
Vicenza	705	461	1,312	270
<b>Veneto</b>	<b>3,058</b>	<b>611</b>	<b>4,937</b>	<b>415</b>

(a) Data from 2005 are prior to small adjustments and corrections

(b) For Treviso, the data refer to the years 2009 and 2014

(c) Incomplete data for 2014

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Istat data and Italian Ministry of Interior

with resolution number 87 on the 13/11/2003. The municipalities were identified on the basis of housing deprivation indicators: residing population, incidence of non-EU citizens, evictions per family, number of applications to the Fund for renting support (FSA)

In Veneto there is a total of 29 ATA municipalities, some of which are part of the hinterland of the urban areas considered; more specifically, in the Venice hinterland there are 5 (Chioggia, Jesolo, Mira, Mogliano Veneto and Spinea), 3 in Verona (Bussonengo, San Giovanni Lupatoto, Villafranca di Verona), two in Padua (Abano terme and Selvazzano Dentro) and one in Treviso (Paese).

In these municipalities, there are specific aids for rental, such as eviction contribution for rental termination and the possibility to access the fund for innocent tenants who are in arrears with payments in the case where it becomes impossible for them to pay their rent due to the loss or reduction of the family earning capacity. An indicator about the housing needs of the most vulnerable proportions of the population is the number of applications submitted by the families in response to the competition notice issued by the municipalities in case of Residential Public Housing (e.r.p.) to be assigned. They are addressed to families which suffer evidently from housing and economic deprivation to possess the prerequisites to be able to move

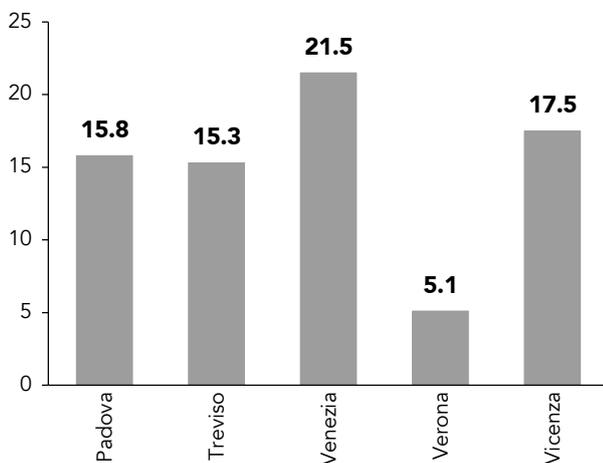
into an e.r.p.<sup>14</sup>



### The demand for Public Housing is increasing

The applications accepted, that is to say those who applied is 5.1 every 1,000 residing families in the city of Verona, up to 17.5 in Vicenza and 21.5 in Venice. However we must note that this figure for Venice is from 2010 because the municipality has not issued any tender since then. In recent years, the demand for public housing especially increased in Vicenza and Treviso.

**Fig. 10.3.5 – Percentage demand for applied public housing per 1,000 families in urban areas. Veneto – Year 2014 (\*)**



(\*) For Venice the data refers to 2010.  
Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Veneto Region and Istat data

The concrete answer in terms of actual provision of housings concerns an even smaller proportion of families: in the city of Padua for example, around 2 applications out of 100 only become accepted, for Vicenza it is 5 and in Verona it's 6. It is clearly important to keep the phenomena monitored, given the enlargement of the less-wealthy portion of the population due to varieties of housing deprivation, in particular in the urban areas<sup>15</sup>.

The availability of public residential housing marginally satisfies to the housing needs of the population which find itself more in difficulty. There are

<sup>14</sup> This data was taken from the regional structure for the Housing Section

<sup>15</sup> Veneto region, Operational Programme in the framework of the objective "Investments in favor of growth and employment" ROP Veneto ERDF; 2015



### Half of the Ater houses are located in urban areas

39,319 Ater managed public lodgings<sup>16</sup>, around 3 housing units per 100 residing families, of which 49.3% are located in the five urban areas (19,385 lodgings). Compared to the hinterland, the provincial capitals have the vast majority of public housings, guaranteeing a higher share of public housing for the families. For example in Padua and Treviso, there are around 5 housing units per 100 families in the provincial capitals and only 1 per 100 families in the respective hinterland. This goes to show however that compared to in the hinterland, the percentage of occupied lodgings is lower in the provincial capitals, allowing therefore a share of vacant lodgings, in some cases

**Tab. 10.3.5 – Housing units managed by Ater in the urban areas. Veneto – Year 2013**

	N° unità immobiliari	% unità immobiliari su famiglie	% unità immobiliari occupate
<i>Padova</i>			
capoluogo	5.274	5,3	90,8
hinterland	1.446	1,3	95,6
<i>Treviso</i>			
capoluogo	1.977	5,2	83,6
hinterland	540	1,1	91,5
<i>Venezia</i>			
capoluogo	3.475	2,7	87,3
hinterland	2.550	1,8	93,6
<i>Verona</i>			
capoluogo	1.803	1,5	81,5
hinterland	915	1,2	87,4
<i>Vicenza</i>			
capoluogo	1.161	2,2	95,3
hinterland	244	0,5	90,6
<i>Totale aree urbane</i>			
capoluogo	13.690	3,1	88,0
hinterland	5.695	1,3	92,8
<b>Veneto</b>	<b>39.319</b>	<b>3,3</b>	<b>88,8</b>

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Veneto Region and Istat data

<sup>16</sup> Data extracted from the Regional Observatory for Public Housing for the Veneto Region

even reaching 20% of lodgings, for lodgings, for different reasons coming from the non-provision due to maintenance works or even the non-availability because it is being sold or being demolished. In the sphere of social and housing inclusion, the concern is finally about the number of homeless people concentrated in the principal urban areas. The second survey on homeless people conducted by Istat, together with the Work and Social Policy Ministry, fio.PSD and Caritas Italiana, estimated that in 2014 homeless people located in the North-east were 9,149, with a high probability of underestimations. If we repropotion this data to the residing population<sup>17</sup>, it is estimated that for Veneto some 3,800 people are homeless, equal to 7.6% of the national total.

## How much was built

Due to its model of a diffused city, Veneto is characterised by a high level of soil consumption, highlighted by the fact that 12.9% of the regional territory is urbanised<sup>18</sup> compared to the national average of 6.7%.



**Padua is the most urbanised urban area**

It goes without saying that in urban areas,

this percentage is higher. Padua is experiencing a strong urban growth, where the soil consumption reaches 80% of the surface area of the provincial capital, one of the highest percentages across all of Italy. Furthermore, the saturation of the provincial capital is accompanied by an intense urbanization even in the hinterland municipalities (31%), which is not equaled in the other Veneto cities. Treviso comes next with 48% of urbanized soil, growing rapidly over the last 10 years (+5 percentage points). In the urban areas of Verona and Vicenza, and even more so in Venice, the soil consumption remains lower, even if on the basis of supported values, both in the provincial capitals and the hinterland.

In the last ten years the number of constructions has increased, even more in the provincial capitals, perhaps going to build in less centralized zones which remained partly free, than in the hinterland. The increase of the buildings in the centre of Treviso, Vicenza and Padua particularly stands out, al-

<sup>17</sup> Istat, caritas Italiana, fio.PSD and the Ministry for Work and Social Policy, Homeless people, Year 2014. December 2015.

<sup>18</sup> The expression urbanized surface area means the surface area of the inhabited centers, the cores and the production locations.

though there is already a large amount built there. The urban area of Venice, very much due to the peculiarity of the presence of the historic centre, has much more buildings in the hinterland rather than in the centre.

**Tab. 10.3.6 – Percentage of urbanized surface area and the number of buildings in the urban area (\*). Veneto – Year 2011**

	% Urbanized surface area	Buildings	Var.% Buildings 2011/01
<b>Padova</b>			
Provincial capital	80,7	39.476	24,8
hinterland	30,6	55.834	13,5
<b>Treviso</b>			
Provincial capital	47,8	17.364	30,3
hinterland	29,4	26.926	16,6
<b>Venezia</b>			
Provincial capital	18,5	40.914	14,0
hinterland	16,3	72.717	19,8
<b>Vicenza</b>			
Provincial capital	36,4	18.145	26,2
hinterland	19,0	27.145	10,9
<b>Verona</b>			
Provincial capital	30,0	30.312	16,1
hinterland	19,6	34.945	10,3
<b>Total urban area</b>			
Provincial capital	31,7	146.211	20,5
hinterland	21,3	217.567	15,0
<b>Veneto</b>	<b>12,9</b>	<b>1.227.490</b>	<b>13,2</b>

(\*18By urbanized surface area we mean the surface area of the inhabited centers, the cores and the production locations.  
Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale su dati Istat – Population and Inhabitants Census

Compared to the hinterlands, in the provincial capitals the percentage of residential buildings is inferior (84% of the buildings in use vs 90%) and also those for productive use (2% vs 3%); 14% of the buildings are used for directional/tertiary or service purposes, or they are tourist buildings or accommodation facilities, a share which falls to 7.3% in the hinterland. The average age of the constructions is obviously more ancient in the provincial capitals: 16% of the residential buildings are historic buildings, that is to say that they were built before 1919, 9.4% were built immediately after WWII, and 43.2%

were built in the 60's and 70's. The building expansion in the municipalities of the hinterland took place from the start of the 60's up until the end of the 80's (around 60% of the buildings). 11% of buildings were built post 2001 (5% in the provincial capitals).

**3% of buildings are not used in urban areas**

About 3% of the buildings are not used, which indicates a potential for these buildings that is not fully exploited, of which 58% are so because they are dilapidated, and the rest because they are under construction or because they are still not ready for productive or residential purposes. The phenomena concerns the provincial capitals but also the hinterlands: indeed, the quota of non-used buildings generally increases as we move away from the provincial capitals, concerning mainly in the municipalities outside of the urban area, not only for the presence of structures under construction, but also due to a greater number of buildings which are not being repaired or are in ruins (2.8% of buildings aren't in use in the 5 provincial capitals as opposed to 4.5% in the municipalities lying outside of the urban area). Padua and Treviso are once again the exceptions, wherein the percentage of non-used buildings is higher than in their hinterland. A positive signal may be the reduction of the incidence of the non-used buildings compared to 10 years ago, not only for the completion of the construction works, but also for the restoration of buildings and the urban requalification works.

**Less building deprivation in Veneto than in Italy**

Overall, the 5 urban areas do not demonstrate obvious signs of building deprivation compared to the national average, given that the percentage of residential buildings which are in a very poor or mediocre state of conservation is inferior: for the provincial capitals, this percentage is equal to 12%, for the relative hinterlands it is 9.7% compared to the national value of 16.8%. This is an average, it is clear that within the internal part of the municipal territory, there may be areas more degraded in terms of buildings that require a greater attention and requalification works. The centre of Vicenza has a slightly worse index, whilst Treviso stands out for a better conservation state of its residential buildings, and also due to the fact the buildings were built more recently. The phenomena, albeit contained, concerns about 166 thousand

people who live in buildings in poor conditions, of whom 90 thousand are residents in the provincial capitals, equal to 10.3% of the respective population.

**Tab. 10.3.7 – Indicators of the state of buildings in urban areas. Veneto. Year 2011**

	% of non-used buildings	% of buildings under construction	% of dilapidated buildings	% of residential buildings in a poor state of conservation
<b>Padua</b>				
Provincial capital	3.6	1.6	2.0	11.6
Hinterland	2.9	1.3	1.5	10.3
<b>Treviso</b>				
Provincial capital	3.7	1.4	2.2	6.5
Hinterland	2.8	1.3	1.5	11.7
<b>Venice</b>				
Provincial capital	1.7	0.8	0.9	13.1
Hinterland	2.9	1.2	1.7	7.5
<b>Vicenza</b>				
Provincial capital	2.8	1.0	1.8	14.2
Hinterland	2.9	1.4	1.6	11.4
<b>Verona</b>				
Provincial capital	2.5	1.0	1.5	12.8
Hinterland	3.3	1.0	2.3	10.2
<b>Total urban area</b>				
Provincial capital	2.8	1.2	1.6	12.0
Hinterland	2.9	1.2	1.7	9.7
Veneto	3.7	1.4	2.3	12.6

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale su dati Istat – Population and Inhabitants Census

## Fast connections

The cities act as catalysts for innovation and rese-

arch, technological and scientific know-how, also thanks to the concentration of universities, centers for research, start-up and business incubators. The city of the future needs investment in innovation for the development of public and private services, with the aim to improve the quality of life for those who live in and use the city.

The digital infrastructures represent the “roads” of the future, the new ways of communication, necessary for the development of services capable of responding to the renewed needs of the citizens and businesses: it is in this area that the efforts are being intensified in order to enhance the connectivity services, in particular broadband and ultra-wideband, in line with the European and national objectives from the Digital agenda.

**Complete broadband coverage for almost all of the provincial capitals...**

In Veneto, there is currently on average 29% of housing units which are covered by FTTN architecture, that is to say services with a speed greater than 30Mbps and usually inferior to 100Mbps. In the provincial capitals, the coverage is almost complete, except for Venice and Vicenza which are a little bit behind with percentages between 70% and 80%. In the hinterland, the coverage is lower than the one in the provincial capitals (on average, from 9% in Treviso to 24% in Vicenza), even though there are municipalities which are almost completely covered. For example Dolo,

which has a 98% coverage of its buildings with FTTN infrastructure, exceeding by 30 percentage points the average coverage for Venice.

**...and already working on the ultra-wideband**

Almost all of the provincial capitals are more advanced, also in the infrastructuring

of services with speeds greater than 100Mbps: if Veneto has currently an average of 4% of housing units which are covered by a FTTH, FTTB-FTTDP architecture, in Verona, this percentage equals to 25%, Padua 24% and Venice 15%. The municipalities of Vicenza and Treviso are still almost uncovered, even though according to the coverage provisions of the last consultation with Infratel, as a consequence of the private plans and the public investments already implemented or underway in 2015, a considerable acceleration is to be expected, and may guarantee, in some cases, a 60% coverage to ultrafast services. For example, Venice and Padua are in the top ten pilot cities selected by Enel for the experimentation of the laying down of optic fibre from house to house, to bring the ultra-wideband at a speed of 100Mbps. The project will involve a total of 224 municipalities across the country.

The following paragraphs give some material to analyse the digital development in terms of smart cities for the various provincial capitals.

**Tab. 10.3.8 - Percentage of housing units covered by FTTN architecture in urban areas. Veneto – Year 2015 (\*)**

Provincial capital		Hinterland	
		media	(min - max)
Average	(min-max)	17,3	(0,0 - 98,0)
Treviso	97,1	8,7	(0,0 - 50,7)
Venezia	70,1	23,1	(0,0 - 98,0)
Verona	90,5	23,0	(0,0 - 98,0)
Vicenza	78,1	23,6	(0,0 - 98,0)
<b>Veneto</b>	<b>28,7</b>	-	-

(\*) L'architettura FTTN garantisce servizi con velocità maggiore  
 (\*) The FTTN architecture guarantees service speeds greater than 30 Mbps but less than 100 Mbps: the fibre terminates at an intermediate node of the access network on an existing physical carrier (copper), or at a node of access systems on a radio carrier.

Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Infratel and Ministry of Economic Development data

**Tab. 10.3.9 – Percentage of housing units fitted with FTTH, FTTB-FTTDP architecture in the capital communes of the urban areas. Veneto. Year 2015 and forecasts for 2018 based on private and public pland underway and or in planning in 2015 (\*)**

	2015	2016
Padua	23.6	59.4
Treviso	0.3	47.2
Venice	14.6	48.9
Verona	25.0	60.0
Vicenza	0.0	45.0
<b>Veneto</b>	<b>3.8</b>	<b>16.0</b>

(\*) FTTH/FTTB/FTTDP architecture guarantees services with a speed superior to 100Mbps: the fibre terminates at an optical distribution point at no more than 50 metres from the housing unit. The expected coverage data refers to the results obtained from the last public consultation carried out by Infratel in 2015. Source: Processing by Regione Veneto - Sezione Sistema Statistico Regionale on Infratel and Ministry of Economic Development data



## 10.4 The quality of the urban environment

The climate changes were at the hearth of the international debate in the framework of COP 21, the Conference of the Parties on climate change held on 30th November 2015 in Paris. At the end of the conference, the 196 participating countries agreed on a global pact called Paris Agreement aimed at limiting greenhouse gas emissions, with the purpose to contribute in mitigating the effects of climate change and, in particular, keeping global warming to below 2 °C above pre-industrial levels.

In particular the cities and the large urban agglomerates play a strategic role in reducing greenhouse gas emissions. From 2008 many European mayors had already joined the Covenant of Mayors (which has involved more than 3,100 Italian municipalities), with the aim to reduce CO<sub>2</sub> emissions in their cities by 20% by 2020. To this, for each city a plan of action for sustainable energy has been drawn up.

At the same time many cities have also undertaken Smart City projects, focusing on programmes to increase the energy efficiency, to reduce emissions and fine particles and to promote sustainable mobility. It is worth emphasizing that the urbanisation model upon which a city was developed strongly impacts on the quality of the urban environment. The knowledge of the different types of urbanisation and of the types of settlements is the fundamental basis in order to be able to face the challenges related to sustainability and urban resilience: the urbanisation forms are one of the driving factors of environmental sustainability, because of their impact on the functional features of the city itself. For example a widespread and dispersed urbanisation leads to loss of landscapes and increase of land use, thus generating an increased energy need and encouraging private mobility systems, which would surely have a greater impact on the environment compared to collective mobility services. In the cities of Veneto some differences can be seen concerning the urbanisation model<sup>19</sup>. Padua is subject to an urbanisation which covers and surpasses the borders of its municipality, resulting in a saturated urban environment. This characteristic makes the city particularly exposed to the environmental risks caused by fragmentation which, in turn, increase energetic consumption and the use of pri-

vate transport whilst hampering collective mobility. In the municipalities of Treviso, Verona and Vicenza a central nucleus may be observed, surrounded by several smaller centers, which have arisen over the time for social-economic reasons, and which tend to contribute to increase fragmentation. Finally, the specific morphology of Venice over time has led to the creation of several decentralised nodes of significant size such as Mestre and Marghera.

These remarks on the dispersion and fragmentation of the urban centers, together with the strong industrial development of the region and the typical climatic factors of the Po valley, help to better understand the environmental framework of the cities of Veneto.

The problems related to fine dust particles are always under debate – the Po valley is particularly concerned. However, beyond the actual emission sources, the climatic factor, which greatly impacts on the retention of these particles on the lower layers of the atmosphere, needs to be taken into account (See chapter 13 for a more in depth analysis on greenhouse gases and fine dust particles). Thus, it becomes vital to understand how the environmental issue is managed within the cities in order to cope with these critical situations. Unfortunately the environmental data available is for the most part limited to the municipalities enjoying status of provincial capital and to the metropolitan city of Venice. This is a limitation given the fragmented nature of the Venetian urban areas. It would thus be useful to analyze the urban areas in their actual extensions, which means including the municipality enjoying status of provincial capital and all of the neighbouring municipalities which are an integral part of the capital, or at least, are strongly linked to it for economic and demographic reasons. It is however possible to make some remarks on the environmental management of the cities, also by means of this analysis which only focuses on the municipalities enjoying status of provincial capital. (Please note that hereinafter the analyses will refer not just to the capitals of the urban areas defined in the Regional Operation Programme EFRD 2014-2020, but also to all the municipalities enjoying status of provincial capitals.) The presence existence and density of public green areas plays an important role in protecting the environment, in as far as they represent true and real natural absorbers for polluting substances, as well as for greenhouse gases. In Veneto the situation is quite heterogeneous, with some differences among the single provincial

<sup>19</sup> ISPRA, Quality of the urban environment – XI report, edition 2015

capitals, due to their specific location.

**Venice and Belluno: the cities richest in green areas**

The municipality of Venice stands out with "outsized" values compared to the other municipalities of Veneto: more than 270 million m<sup>2</sup>, equal to 65% of the territory, with more than 1,000 m<sup>2</sup> of green areas per inhabitant. The specific geographical configuration of Venice shall be taken into account, as well as the fact that nature protection areas are considered as green areas. In the case of Venice, the lagoon is considered as a protected area, from which we get a higher value.

Belluno follows, located close to the Dolomites and surrounded by mountains, with 22% of the municipal territory allocated to nature protection areas and urban green areas. The capitals of the central portion of Veneto present green areas impacting for less than 10%, with the exception of Treviso (12.6%).

Veneto is a highly industrialised region, characterised by a considerably high GDP and by a notable tourist presence throughout the whole year.

**Less waste in Veneto compared to Italy as a whole...**

The high density of inhabitants in the capitals means that the

per capita values are higher than the regional figures: Venice, Padua and Vicenza produce 600kg of urban waste per inhabitant per year.

One of the strengths of the Veneto region is the waste sorting system.

**...and over 65% of the waste collected separately!**

In 2014, separately collected waste accounted for 65.3% of the total waste, exceeding the target of 65% expected for 2012 as per Legislative Decree N. 152/2006. In terms of cities, Belluno reported the highest percentage of separately collected waste with a quota of 74.4%, followed by Treviso with 69.3%. As far as the collection systems are concerned, in all of the capitals people must separate organic fractions

**Tab. 10.4.1 - Green area surface in the municipalities enjoying status of provincial capitals (\*). Veneto - Year 2013**

	m <sup>2</sup>	% of the total surface area	m <sup>2</sup> /inhabitant
Belluno	32,450,666	22.0	901.6
Padova	8,220,786	8.8	39.2
Rovigo	1,411,279	1.3	27.1
Treviso	6,993,353	12.6	84.1
Venezia	270,510,566	65.0	1.022.6
Verona	17,451,097	8.8	67.1
Vicenza	3,803,651	4.7	33.5
<b>Veneto (a)</b>	<b>340,841,398</b>	<b>31.0</b>	<b>334.5</b>
<b>Italy (a)</b>	<b>3,755,012,406</b>	<b>18.2</b>	<b>206.0</b>

((a) For Italy and Veneto the figures represent respectively the sum of the surface areas and the impact of the green areas of the municipalities enjoying status of provincial capitals.

(\* Green areas include nature protection areas and urban green areas.

Source: Regione Veneto Processing - Sezione Sistema Statistico Regionale on Istat data

The production and management of urban waste also contribute in defining the quality of the environment of the cities. In Veneto the total waste production in 2014 was equal to 2,241 million tonnes with a 1% increase compared to the previous year. The production of waste per capita is 455 kg per inhabitant a year, which is lower compared to the national average (488kg/inhabitant), even though

**Tab. 10.4.2 - Urban waste production and separate collection in the capital communes. Veneto - Year 2014**

	Production of Urban waste (kg/year)	Production of urban waste per capita (kg/inhabitant/year)	% separately collected waste
Belluno	14,139,887	394	74.4
Padua	128,577,224	609	47.2
Rovigo	31,228,041	601	54.5
Treviso	39,715,464	475	69.3
Venice	161,669,301	611	49.6
Verona	134,620,565	517	46.2
Vicenza	68,665,012	604	60.6
<b>Veneto</b>	<b>2,240,464,148</b>	<b>455</b>	<b>65.3</b>

Source: Regione Veneto Processing -Sistema Statistico Regionale Section on Arpav data

(wet and dry collection). The only exception remains Venice, where this separation is only active on the mainland, whilst the historical centre and on the principal island waste is not being collected se-

parately yet. In the field of waste sorting the municipality of Treviso has always been at the forefront: where door-to-door waste collection (for all waste types) is now widespread is across all the territory. Water management is also relevant, from its withdrawal to feed-in, as well as from the supply to the final users to the treatment of wastewater. The situation in Italy is different from city to city, either as far as the exploitation of water resources is concerned or the quality of the networks (which translates into the level of dispersion). The data collected over the last 3 years have been showing how the per-capita water fed into the networks of Italian capitals has decreased, going from 415 liters per inhabitant a day in 2012 to 389 in 2014. As far as the dispersion of the networks is concerned, namely the percentage of water fed which isn't actually supplied (the dispersion is due to inefficiencies in the distribution networks), the national average value in capitals is increasing, thus revealing a critical situation and reaching 36.9% in 2014. In the cities of Veneto, the same applies for past 3-year trends. In all of the capitals in Veneto the average pro capita use of water was less than the national average, both in terms of fed and supplied water to the final user, and also in terms of dispersion with the only exceptions in this last aspect being Treviso and Venice, which show respective percentages of 41% and 38%.

**Tab. 10.4.3 – Water management in the capital cities. Veneto. Year 2014 and variations. 2014/12**

Commune	Water fed (litre/ inhab./ day)	Water supplied (litre/ inhab./ day)	Dispersions (%)	Water fed (var. %)	Water supplied (var. %)	Dispersions (Diff. %)
Belluno	293.6	229.0	22.0	-7.9	-9.1	1.0
Padua	273.9	223.5	18.4	-24.4	-7.1	-15.2
Rovigo	294.3	189.2	35.7	-8.4	-9.9	1.1
Treviso	342.8	202.4	41.1	-0.7	-10.1	6.2
Venice	503.0	312.2	38.0	-3.9	-7.5	2.4
Verona	387.7	259.1	33.2	-7.6	-12.1	3.4
Vicenza	265.2	214.5	19.1	-7.3	-8.7	1.2
Veneto (a)	2361.5	1629.7	31.0	-8.4	-9.2	0.6
Italy (a)	388.9	245.5	36.9	-6.3	-9.8	2.4

(a) For Italy and Veneto the figures include all the cities enjoying status of provincial capital  
 Source: Regione Veneto Processing –Sistema Statistico Regionale Section on Istat data

The issue of urban mobility is closely linked to the environment. It may be analysed taking into account either the pressure on the environment, which means by studying the qualitative/quantitative composition of the cities vehicle fleet, or the response, namely the management of sustainable mobility services by the municipalities trying to reduce their environmental impact.

**Less cars driving on public roads per inhabitant...**

As far as the number of circulating cars

is concerned, in 2014 the cities of Veneto reflected entirely positive results, with the lowest average in Italy, which translated as 600 cars per 1,000 inhabitants. Turning to the details of the type of cars in terms of emission classes, in Italian cities for every 1,000 inhabitants circulate on average: 266 Euro 3 cars, 200 Euro 4 cars and 135 for Euro 5 or superior cars. . In the cities of Veneto, the situation is heterogeneous, even though by nature Euro 3 class cars are less present compared to the rest of Italian cities, while Euro 4 and 5 class cars are more widespread.

**...And greater use of ecological cars**

The figures concerning electric and

gas-powered cars circulating in the cities are interesting. They show how the use of these environmentally friendly cars is more widespread in Veneto than across the rest of Italy. Also for the 5 cities in the central part of Veneto, with a higher density of traffic, there are four electric cars per 1,000 circulating cars (the national average is 2.8) and the presence of gas-powered cars is 90 per 1,000, whilst in Italy the average is 77, peaking in Verona which has over 130.

Sustainable mobility services include the car/bike sharing, the management of the traffic light systems and also the presence of "zona 30"20 in the cities, cycling lanes and the adoption of urban mobility plans on the part of the municipal administration. At the moment, car sharing is not popular across Italian cities, with 5.5 vehicles available, on average, per 100,000 inhabitants in 2013; the offer is still not very high and the service is not widespread. In fact, there are only 1.4 subscribers per 100,000 inhabitants. In Veneto, the service is only active in Venice and Rovigo, more developed in the first with 18.3 vehicles per 100,000 inhabitants and an average of 14.5 subscribers per 1,000 inhabitants. Cities focus more on bike sharing: the service is available in 5 out of 7 cities and the number of available bikes is

**Sempre più diffusi i servizi di infomobilità**

greater than national average of 5.2 every 10,000 inhabitants: in Padua the figure is 12.7 and in Treviso and Verona around 10. The optimization of the mobility is also down to correct traffic control management in terms of reducing traffic congestion and promoting the ecological transport. For this reason, many municipalities have introduced an Urban Plan for Mobility (PUM), active in zones where the speed is limited to 30 km/h, trying to increase the attractiveness of walking and cycling, and building new cycling lanes. In 2013 in Veneto the PUM was adopted by, Vicenza, Venice and Padua, whilst Verona, Vicenza, Belluno and Venice all implemented the "zona 30".

**174 km per 100km<sup>2</sup> of cycling lanes in Padua**

Concerning cycling lanes, the situation in Padua is quite heterogeneous, with over 174 km of cycling lanes per

100km<sup>2</sup> of municipality surface area. The data for Vicenza, Verona and Treviso is also significant, which alongside Padua represent the medium-large cities of the Po valley, demonstrating the awareness of local administrations as far as sustainable mobility is concerned.

The municipality of Venice is a stand-alone case. The city is not located on the mainland and presents therefore a unique scenario: it is one large pedestrian zone, in which bicycles cannot circulate. Naturally, this leads to a strong decrease in the amount of cycling lanes, however this figure is not in the form of a negative.

This discussion on mobility includes infomobility services. For the cities, Istat has analysed the presence of certain services, 4 relative to private mobility and 5 to public mobility<sup>20</sup>.

In the graphic, there is a coloured bar attributed to the city if the service is present: the best performing cities are represented by a longer cumulative bar (Treviso, Venice and Vicenza)

**Infomobility services are becoming ever more widespread**

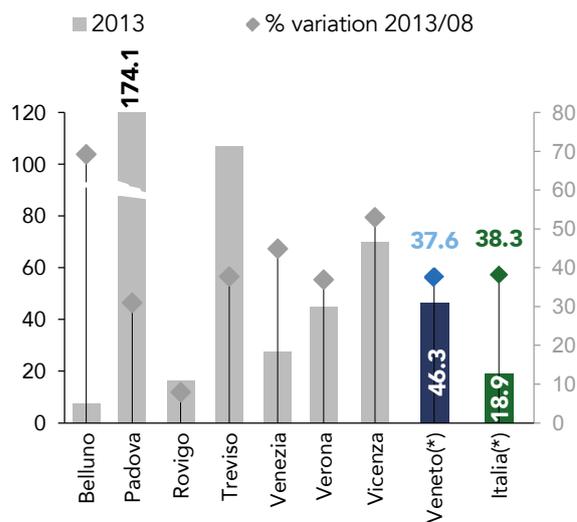
The data at detailed level show that road panels with changeable messages are largely in use, as well as electronic

ranging rods at public transport stops and internet

<sup>20</sup> The "zona 30" is a form of urban intervention aimed at traffic control for the urban road system, where the speed limit is set to 30 kilometres an hour

sites for information of routes and timetables. There are also electronic payment systems for private parking, electronic payment systems for public

**Fig. 10.4.1 – Cycling lanes in the capital cities (kilometres per 100km<sup>2</sup> of municipality surface area). Veneto – Year 2013 and variations % 2013/08**



(\*) For Veneto and Italy the figures refer to all the cities enjoying status of provincial capital. Source: Regione Veneto Processing – Sistema Statistico Regionale Section on Istat data

transport tickets and internet sites selling tickets online.

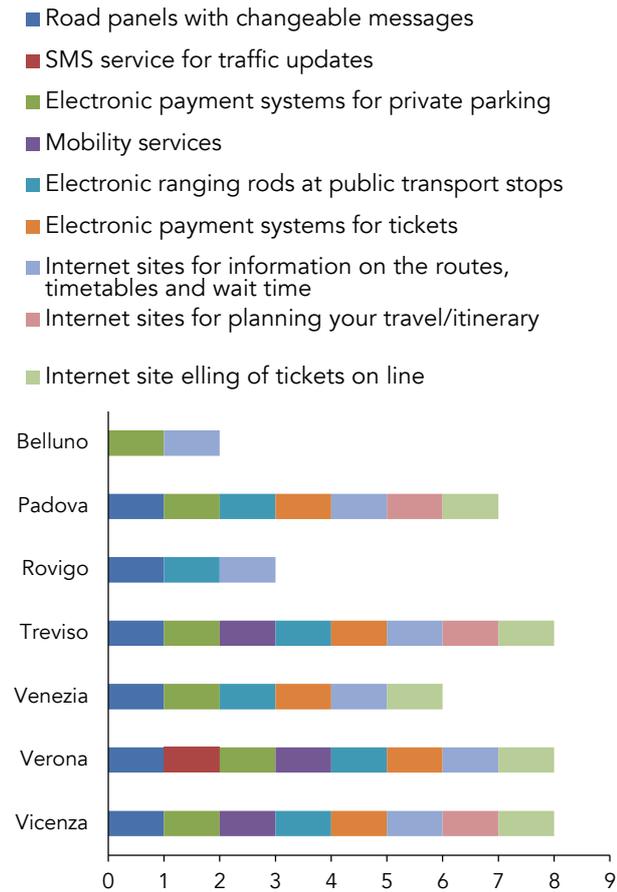
**Almost all of the capital cities have adhered to the Covenant of Mayors**

Energy saving is another key theme which is strongly inter-

connected with the environment. Almost all of the capital cities of Veneto have adhered to the Covenant of Mayors that was approved by the Plan for Action for Sustainable Energy (PAES). Padua, Venice, Verona, Vicenza and Belluno have activated district heating systems, in all of the capital cities there are photovoltaic panels for the production of energy, located in municipal plants or on other structures owned by the administration. So far now we have observed the urban environment taking into account the environmental pressure (production of waste, use of water resources, vehicle fleet) and the responses (the management of green areas and waste water systems, infomobility services and energy saving). However, we still

need to analyse the actual state of the environment within the cities. Perhaps the most representative element of this is the quality of the air and the si

**Fig. 10.4.2 – Infomobility services present in the capital cities (\*). Veneto – Year 2013 Road panels with changeable messages**



(\* ) A coloured bar is attributed to a city where the service is present.  
Source: Regione Veneto Processing –Sistema Statistico Regionale Section on Istat data

tuation concerning fine particles (PM10). To this, the concentration of PM10 in the air within the capitals cities of Veneto using monitoring systems from Arpav located in the Urban background (BU) and urban traffic (TU) zones, which, that is to say, are the representative of the typical atmosphere in our cities, has been analysed. Now the concentration thresholds of PM10 are established under Legislative Decree number 155/2010 and are the limit annual value (calculated as an annual average for the concentration detected) which must not exceed 40  $\mu\text{g}/\text{m}^3$  and the daily limit is 50  $\mu\text{g}/\text{m}^3$ , which cannot

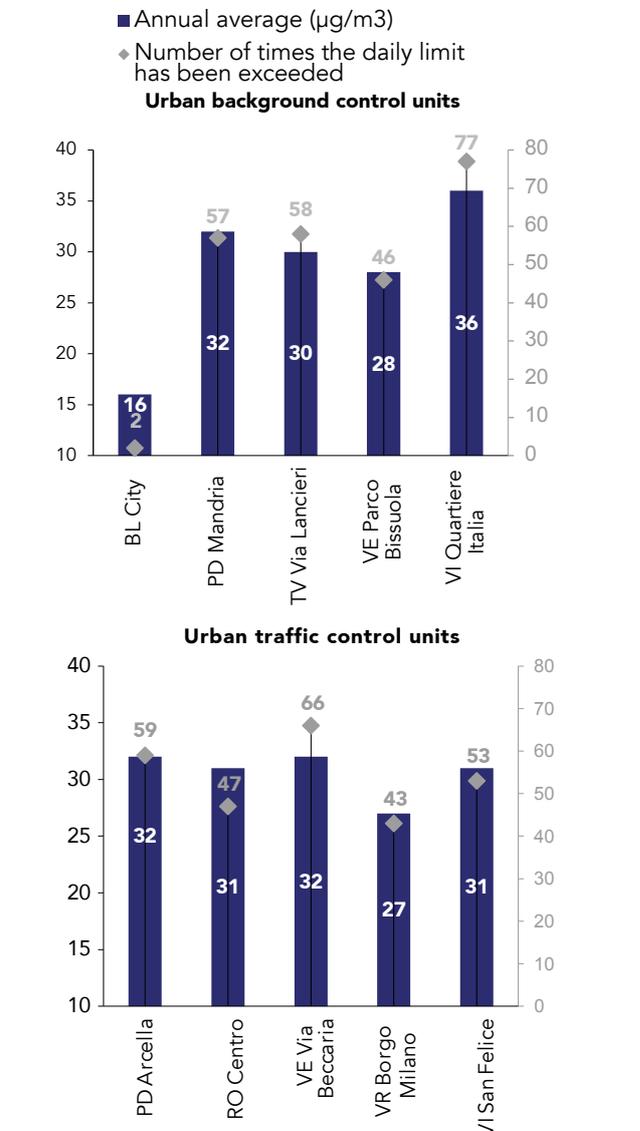
be exceeded more than 35 times a year.

**PM10 pollution remains a challenge...**

The situation in 2014 was quite critical concerning

the number of times the daily limit was exceeded, given that in almost all of the control units – both in the urban background zones and in the urban traffic zones – the limit was exceeded more than 35 times.

**Fig. 10.4.3 – Quality of the air: number of times the daily limit for the concentration of PM10 has been exceeded and the annual average. Veneto – Year 2014**



Source: Regione Veneto Processing –Sistema Statistico Regionale Section on Arpav data

**... But a slight improvement is in sight!**

However, considering the trend in the last ten years,

a progressive decreasing in the number of times the daily limit of 50 µg/m<sup>3</sup> is exceeded may be observed, indicating an improvement of the general situation. As far as the other legal limit is concerned, (the annual average concentration equal to 40 µg/m<sup>3</sup>), the conditions seem to be positive, given that all of the control units concerned have recorded values below the limit.

In general, as already stated above, the air in the cities of Veneto presents critical issues related on the one hand, to pollution sources and on the other hand, to the climate of the Po Valley which does not favour the recirculation of the air and therefore the dispersion of fine particles.

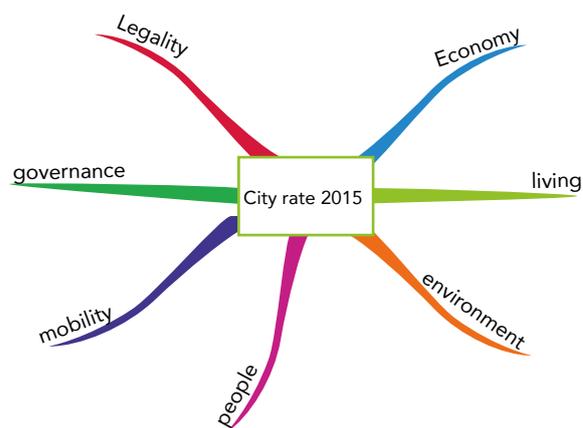
## 10.5 Veneto as a smart land

In the field of urban development, policies covering the cities and the innovation they may produce are becoming more and more relevant. Based on this knowledge coming from studies carried out in the 90's of last century, the concept of smart city was created, covering many different meanings. At the beginning, it was used to qualify a digital city, and then it evolved into a concept covering social inclusion, environmental sustainability and quality of life aspects. Compared to the original classification of the dimensions for smart cities proposed by Rudolf Giffinger in 2007, linked to the neoclassical theory for urban and regional development, the following models have added new dimensions for smartness and have amplified the number of factors and indicators we use to assess these dimensions. There were proposals for sector indexes and comparison synthetic indexes, which were found to be learning indexes, namely indexes which change and expand in relation to the changed or new dimensions being analysed. Also at the European level, over the years ever more importance was given to the policies of smart cities, both in terms of endowments for digital infrastructure and in terms of actions for environmental sustainability. In the Italian experience, there is a dichotomy between the importance of smartness recognised in the research world and law provisions. For the latter, the aspect of smart cities or better "smart communities" was mentioned in Art. 19 and 20 of law 221, 2012, but this acknowle-

dgment was not followed by any integrated operational programme, aimed at implementing the concept, which leads to believe that even the best ideas need suitable financial support.

In this context, it is useful to look the positioning of the cities of Veneto in the national panorama. To this end, several Istat studies and data (that, however, do not aim at providing any actual benchmark), are available, as well as two analyses already developed and updated years ago by Forum PA, in collaboration with the National Association for Italian Municipalities (ANCI), and Ernst&Young. The approach chosen by Forum PA identifies 7 dimensions for analysis, each one with the help of several indicators<sup>21</sup>.

**Fig. 10.5.1 – The 7 dimensions of analysis according to the Forum PA / ANCI**



Source: Forum PA, ICity Rate report 2015

The approach adopted in 2016 by Ernst&Young was more effective than the one of the analysis based exclusively on these dimensions, used up until the latest edition. The 2016 analysis based on 4 layers (applications and services, service delivery platform, sensors and infrastructure) and on 2 analysis fields (smart citizens and livability of the city, and vision and strategy)<sup>22</sup>.

Comparisons between classifications based on different methods entails some conceptual limitations. Nevertheless, it could be interesting to observe the national positioning of the 7 capital cities of Veneto in order to at least have an idea of the situation

<sup>21</sup> Forum PA, ICity Rate, the classification for smart Italian cities, 2015.

<sup>22</sup> Ernst&Young, Smart city index report 2016, 2016



in our region. The capitals of Veneto deliver good performances on average, particularly for the larger cities, generally consolidating or improving upon results achieved in the previous two reports.

The approaches adopted in the two analyses refer to the municipalities enjoying state of capital. This approach obviously presents limits: it does not consider the smartness of a larger or more urbanised territory, as is the case in Veneto. In fact, the administrative borders for the municipalities are strongly inappropriate for assessing the characteristics of the urban system, which shall be assessed on a much wider scale.

To this end, various actions have been put in place over the course of the years, including the funding for drafting the Lighting Plans for the Lighting Pollution Control (PICIL), the plans for Sustainable Energy Action (PAES) and the drafting of the preliminary projects for the works they provided for; as well as the financing for the fablab; these aids were used by dozens of municipalities in Veneto and helped to successfully disseminate best practices across the whole region.

**Tab. 10.5.1 – Positioning of the capital cities in the national rankings carried out by Forum PA and Ernst&Young (\*). Veneto – Years 2015 and 2016**

Municipality	ForumPA- 2015	Ernst&Young- 2016
Belluno	52	44
Padua	9	13
Rovigo	65	83
Treviso	33	39
Venice	5	15
Verona	15	18
Vicenza	30	30

(\*). The ranking by Forum PA covers 106 Italian capital cities, whilst Ernst&Young's covers 116  
 Source: Regione Veneto Processing –Sistema Statistico Regionale Section on ForumPA, Ernst&Young data



**From smart cities to the smart land**

This consideration is even truer for our region, where

the polycentricism not only has represented a factual situation, deriving from the past, but also a model of development. Based on production districts and having experienced urban sprawling, it has evolved into a network system for cities and businesses, as we know it today, rich in connections and understood as an extended “unconscious smart city”. Thus comes the necessity to consider the entire regional territory in order to analyse it in terms of smart land, based on the fact that most “minor” centres have developed their own innovative and interesting experiences and best practices, and because the regional policies for smartness not only impacts on the capital cities but the whole territory.

