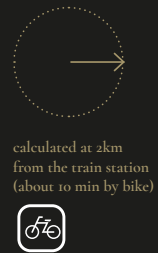


Venice accessibility Scenario

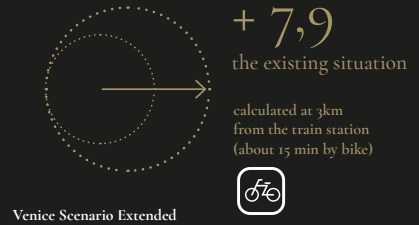
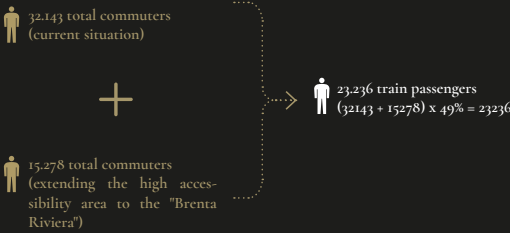
from 2.927 to 15.750 passengers



+ 5,4
the existing situation



Venice accessibility Scenario Extended



Source of data: FS Ferrovie dello Stato 2018, ISTAT Istituto Nazionale di Statistica, 2020.

The scenario explores the possibilities of generalized accessibility by exploiting the existing railway line between Padua and Venice as a metropolitan line that can be associated with a tram along the Brenta Riviera and the waterway as a new water transport system. The measurement exercises carried out in the scenarios show that if we adopted the modal split values of the commuters inferable from the island of Venice (50% train, 30% car, 20% bus) as a benchmark for the other urban centres reached by the stations on the line, we can easily quintuple the number of passengers who leave the car in favour of the train. In fact, on average, we would go from operating quotas equal to about 10% of commuter passengers who choose the train to 50% of the Venetian model, with

stations such as Ponte di Brenta which, if the scenario were to be realized, starting from the current 2%, would undergo an increase from 240 passengers per day (Istat 2001 census) to an estimated 2,890 passengers. If the highly accessible spaces were further extended to reach the urban centres located on the Riviera –approximately 3km away from the station on average– the increase in passengers would be about eight times higher. The scenario highlights the accessibility potential for a metropolis that takes the historic city of Venice as a model of sustainable mobility, based on the absence of cars, pedestrian traffic, and proximity to a widespread public transport system.

Elements / Key concepts

Knowledge-based
economy

Over the centuries Venice has been a model of innovation in administrative, land management, social, public health, and technological terms. Although the situation appears radically different today, the attractiveness of the island can still play a fundamental role in establishing in Venice the foundations of an alternative economy to tourism based on knowledge. Today many scholars, politicians and administrators see a renewed alliance between universities and innovative start-ups as a possible escape route from the depopulation of the city. According to this perspective, the island of Venice could become an international ‘Campus City’ in the future, attracting a larger population of foreign students, teachers, researchers, and innovators to the historic city.



25%
Boston



8%
VENEZIA



16%
Bologna



23%
Padova



12%
Montpellier



15%
Lausanne



19%
Uppsala



21%
Oxford



16%
Heidelberg



31%
Cambridge



18%
Salamanca



21%
Ghent



36%
Leuven



20%
Delft



23%
Tubingen



23%
Pavia



49%
Urbino



41%
St. Andrews

University towns

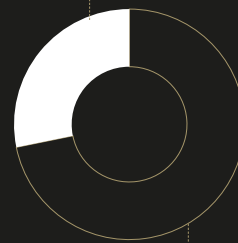
Percentage of students out of the total population.

Source of data: processed from official data of each university institution, 2022.

On the right: ratio of university students enrolled in the University of Padua and Venetian universities

Source of data: MUR, Ministro dell'Università e della Ricerca, 2022.

Venetian universities (Iuav + Ca' Foscari) 28,2%
24692 students



University of Padua 71,8%
62876 students

62,876 students, the two Venetian universities can count on less than 25,000 units overall. Comparison with other university campus cities also shows the extent of the gap to be filled: in the face of the depopulation of the island of Venice, students now represent only 8% of the resident population. To get an idea of the significance of these figures, it should be noted that in Boston – a city which in relation to the subject of university cities is often used as a benchmark – students represent 25% of the resident population, in Delft 20%. This data highlights how the prospect of Venice understood

as a Campus City with an international reach, on the one hand represents a great opportunity to counter the depopulation that today looms over the historic island, while on the other will imply a radical revision of the current local university organizational system, with major repercussions on the regional territory, the city, and the historic island.

Venice calls Boston

If the prospects of a reticular and isotropic Venetian metropolis slowly begin to consolidate in policies, behavioural habits and daily practices that speak to us of an increasingly extensive use of the territory, the future of the historic island remains more uncertain, where environmental and demographic issues that seem to jeopardize its survival have been looming for at least fifty years. To hit the historic centre first of all there is a crisis linked to the social dimension and the loss of residents and, with them, the loss of a manufacturing base in favour of an economy today based almost exclusively on mass tourism. The historic island is today crossed by growing processes of converting houses, shops, theatres, and churches into places destined for consumption and mass tourism (Engramma 2018). The process of touristification with the expulsion of the resident population has its origins far back in time but becomes manifest in a significant way starting from the 1950s, when the number of residents of the historic centre, from 144,000 units, gradually and inexorably begins to decrease with a trend inversely proportional to the number of tourists and to the rise in sea levels, down to almost 50,000 units today. Concurrent phenomena contribute to the progressive loss of residents on the historic island: the progressive shift towards the mainland of the port and of production activities which began in the first half of the 20th century; the impact of extreme climatic phenomena and high waters which have cyclically hit the ground floors of an increasingly fragile and degraded urban fabric since the 1966 flood; the constant growth of real estate values in the historic centre driven by the increase in tourist pressure; the progressive and more recent loss of artisan businesses and neighbourhood businesses; the progressive ageing of the population. ▶⁴

Also, in reference to these interconnected phenomena during the electoral campaign that led Luigi Brugnaro to become mayor of Venice in 2015, the slogan 'Venice like Boston' was used in reference to the university and advanced research vocation that characterizes the North American city. Today, also in light of the exceptional investments made possible by the implementation of the PNRR (National Recovery and Resilience Plan), the idea is taken up by the Minister for Public Administration Renato Brunetta ▶⁵

▶⁴ In this regard, see the surveys and initiatives conducted by O.CIO, *Osservatorio Clivico sulla casa e la residenza (Civic observatory on home and residence)* established in 2018 as the result of a process of meetings and discussions between some Venetian associations, individual citizens, and researchers to analyse the housing issue in insular Venice (historic city + islands). See also: the data on the hospitality sector 1997-2018 (Statistics Office of the Veneto Region); the population data 1997-2018 (Municipality of Venice - Statistics and research service on municipal registry data); the data updated daily on tourist facilities in Venice (GeoIDS portal); the data updated daily on the population in Venice (Daily estimates of the Venice Municipality Registry).

▶⁵ 'We need to bring back to the city an economic base based on human capital. Venice in the 1500s had 40 publishing houses and printed half of the books in the whole world [...]. Thus, Renato Brunetta, Minister of public administration of the Mario Draghi's government and president of the Venice Foundation, the world capital of sustainability in the *Corriere del Veneto* (Zorzi 2022).

and by the Veneto Region through a series of integrated interventions aimed at the sustainable development of the Veneto region, which have as their main objective the nomination of the city of Venice as ‘World capital of sustainability’ (Regione Veneto 2021). Venice today welcomes around 28,000 students, but few reside in the historic centre and few are foreigners, despite the attractiveness of the city worldwide. Out of about 13,000 ‘off-site’ students, it is estimated that only 5,000 reside in the historic centre, for reasons of cost and housing availability. The goal is therefore to reverse the trend towards depopulation and tourist monoculture by making Venice a Campus City at an international level, attracting a larger population of foreign students, teachers, researchers, and innovators to the historic city. The new social fabric as imagined would support a knowledge-based economy where research and development projects, re-startups of traditional businesses, acceleration processes and incubation of new entrepreneurial realities can flourish from research.

Tolerance, pragmatism, and innovation

Over the past centuries Venice has been a bearer of innovation and a place of cultural and commercial openness, so much so as to make it an essential place of exchange for a broad geographical context from Asia to Europe. Innovation therefore not only in terms of land management –both from an administrative and engineering point of view– but also in political, economic, technological, social, and public health terms. Suffice it to recall how the Serenissima developed an avant-garde health organization in the 15th century, which prompted it to establish the practice of quarantine for people and goods in times of pandemics and to ask commercial competitors and political opponents to participate in the notices on health matters, informing the Venetian authorities about suspected diseases and deaths of humans and animals (Cipolla 1976, p. 48; Selmi 1979, p. 31). Or remember how from the beginning of the 13th century there is evidence of credit activity and the existence of banks in the Rialto and San Marco areas, up to the beginning of the 16th century when the banking system of the city was reorganized, reaching the point of turning the Rialto into the centre of the international financial market (Calabi and Morachiello 1987, pp. 63-65). Given the diversity of origins and the multitude of cultures and faiths to which the owners of the

money exchange shops and private banks belonged, the need soon arose to establish a public authority to act as guarantor. Prominent figures such as Senator Tommaso Contarini recalled in fact that ‘essendo adunque dissimile Venetia dall’altre piazze, se quelle esercitan la mercantia con la fede privata, questa ha bisogno per mantener il negotio, dell’autorità publica; se quella senza scritte autentiche fan i suoi pagamenti, a questa per il medesimo effetto è necessario un banco’⁶ (Lattes 1869, p. 122). Thus, the *Banco del Giro* was founded in 1524, a permanent institution of the state and a sort of progenitor of central banks. A few years earlier, in 1516, once again following a mixture of tolerance and pragmatism, the Venetian government decided to formally welcome the Jewish community to the city. Only a few years earlier in 1492, the Jews were persecuted and expelled from Spain, after having suffered the same fate in previous centuries in France and England. The choice was probably also a consequence of the very complex period that followed the defeat of Cambrai in 1509, so that exceptions to previous laws and prohibitions were made to meet extraordinary economic needs. After centuries of alternating fortunes and relationships and despite having to comply with specific restrictive rules, the Jews were then assigned the area of the Ghetto in the *sestiere* of Cannaregio. Thanks to the pledge loan, this soon became the second nucleus –together with the Rialto– of the Venetian banking business. Both managed by public control systems, these replaced the institution of charity elsewhere controlled by the ruling class and mendicant religious orders (Lane and Müller 1985, pp. 76-79), thus introducing a secular form of welfare structure. The same secularism and the consequent relative loosening of censorship controls –in particular when compared to the situation in force at the beginning of the 16th century in many other Italian and European states– is what allowed the rapid spread in Venice of another economic activity that it would have revolutionized the fate of the whole world, that of publishing. The compact size of the historic city combined with the incredible global attractiveness still allows us to imagine the future Venice as the centre of cultural, artistic, and scientific studies at the forefront in the international field, able to attract, train and retain the best minds operating in what seems today the greatest intellectual, technological, and industrial challenge, namely the sustainable transition.

►6 ‘Being therefore Venice dissimilar from other cities where they exercise trade with private faith, this city needs public authority to regulate commerce; if the other cities make their payments without official transactions, here for the same reason a bank is necessary’ (auth.trans.).

Design, entrepreneurship, and culture

Just as humanity has increasingly found itself faced with epochal challenges since the beginning of this millennium, in the same way the passage between the 15th and 16th centuries marked a period of great changes. Changes linked not only to the geopolitical upheavals linked to the colonization of the Americas by some European states, but also to the maturation of the Renaissance cultural revolution which in those decades manifested itself and took place throughout Europe. As in the artistic field, also in the editorial one this revolution in Venice was delayed for a few decades but then established itself with great strength. The figure of Aldus Manutius is exemplary in this sense. Suffice it to recall how in 1516, the same year in which the Venice Ghetto was established, Thomas More published *Utopia* in Leuven: in the ideal society described by the English humanist, the books that were read there were Greek editions printed in Venice by Manutius. This anecdote reveals the extent of the Venetian publisher's production, whose cultural project in those years came to coincide with the very idea of an ideal library (Infelise 2016, p. 157).

When Manutius arrived at the turn of the 15th and 16th centuries, Venice was already the largest publishing centre in Europe. The foundations of this primacy had been laid by figures such as Petrarch and Cardinal Bessarione, who had consciously built their collections of codes in order to make Venice the capital of the arts and spirit of modern Europe (De Michelis 2016, p. 20). Although, as is well known, movable type printing in the West –in Asia it had already existed since the year 1000– was introduced by Gutenberg in Mainz around the mid-15th century, Venice was the first city in the world to see the impact of this industry on an urban scale. The great freedom of access to the profession and the ease of purchasing a press meant that in particular the Mercerie area between the Rialto and San Marco was teeming with stalls selling books. There was also the other side of the coin: securing use-resistant and legible typefaces was very complicated, just as the great competition meant that the businesses experienced great economic insecurity and failed very easily, exposed to the risk of unsold copies, plagiarism, and an unpredictable market. This series of risks ended up favouring those who had capital, contacts and experience, and even more people like the Frenchman Jenson, capable of controlling the entire production chain (Lowry 2000,

p. 18). The first printers operating in Italy were foreigners: figures such as the German Johann von Speyer, pioneer of publishing in the Serenissima and the first to obtain a five-year monopoly on the art of printing in Venice in 1469, and Jenson himself, the most important printer in city after von Speyer and before the arrival of Manutius.

There is vague information about the origins and first decades of his life –we know that he was originally from Bassiano in Lazio and that he worked at various courts in northern Italy as an educator– just as the reasons that led him to become a publisher are uncertain, once he had arrived in Venice. What is certain is that Manutius arrived in the city in a period of transition and change –late compared to other Italian realities– between the Gothic and Renaissance periods. A period of particular ferment in Venice, according to Aldo himself ‘a place more like a whole world than a city’ (Infelise 2016, p. 158).

As with other technologies that have revolutionized society, the printing press also initially encountered strong opposition and resistance in Venice. Figures such as Fra Filippo di Strata –sometimes not without foundation, due to the frequent approximate control of the contents and the correctness of the published texts– questioned the authority of culture handed down through manuscripts and its uncontrolled transmission to ever larger groups of society. The quality and innovation introduced by Manutius’ project swept away any form of residual resistance. In fact, the modern book was born with him. An object with attention to every detail, of incomparable structure, clarity, and harmony (Nuvoloni, Parkin, and Sachet 2016, p. 79). The fundamental move of Manutius was the introduction in 1501 of the *octavo* format, lighter and more manageable than all the other volumes on the market at that time. Mindful of Jenson’s lesson, the publisher used a highly legible italic font –using the Bolognese Francesco Griffo, the best punch cutter of the time– which guaranteed revolutionary accuracy and reproducibility. If on the one hand Manutius’ success was linked to precise design choices, on the other it was based on his ambition to produce a catalogue that collected the entire tradition of human knowledge (De Michelis 2016, p. 22), bringing together Greek and Latin classics with more recent works in the vernacular. Also new was the role of the publisher, whose responsibility in his intention was to give stability and provide a point of

►7 Some companies, such as *Fablab Venezia* (www.fablabvenezia.org), interpret the themes of the new digital manufacturing well and are more evidently inspired by the American Maker culture and prototypes (Gershenfeld 2005); others are cooperatives committed to social innovation, such as *Rebiennale* and *MepArt* (www.rebiennale.org) which, through the recycling of waste from the Venice Biennale installations, self-construction and the promotion of collaborative communities, deal with urban regeneration. Others combine new technologies and humanistic culture, such as *Tooteko srl* (www.tooteko.com) which has developed a technological ring that makes museum itineraries accessible to the blind.

reference through culture –Greek and Latin in the first place– to a world that was experiencing continuous revolutions. Manutius' vision produced remarkable results (Infelise 2016, p. 165): the catalogue of texts he published constituted the founding canon of the philosophical and scientific training of Europeans up to the 20th century.

Back to the Future

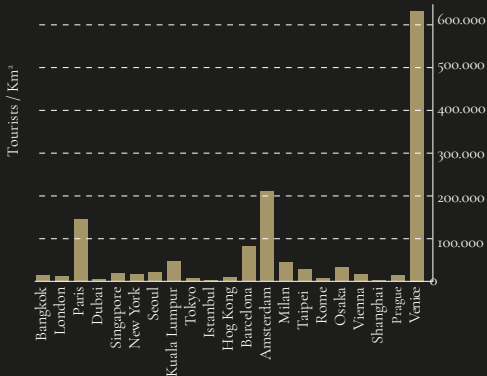
The possible seeds of change in a vision in which Venice returns to being a city inhabited by students, researchers, and innovators, a centre of attraction for the 'new Manutius' can perhaps be grasped in the daily and point-like work of a variegated range of micro-companies, especially innovative start-ups with high technological value, which already operate in the Venetian territory. These individual and small actors are driven by different motivations ranging from a system of values related to environmental issues to specific missions of social responsibility. Some of these realities effectively interpret a dimension that is at the same time urban regeneration, social and technological innovation, revisiting the design disciplines on which the city's universities were originally founded.►7 Overall, they are enterprises straddling the world of research and production, whose incisiveness cannot be judged on the basis of turnover alone. They find their own reason for being in the gaps left by the traditional economy, the long tail that the Internet and new technologies have made possible: they are companies founded on open and collaborative communities; they are part of the Internet generation and know how to exploit it (for the search for suppliers or partners, for the realization of a new project, for the construction of collaborations and consensus). They are entities strongly anchored in the Venetian territory, but which thanks to the web are already connected to a global relationship system from the outset (Anderson 2007; 2014). They are located on an intermediate level between the large international economic entities, universities, public institutions, and the local production system of small and medium-sized enterprises spread across the mainland.

Pressure

Venetian overtourism

Among the causes of depopulation of the historic centre, its progressive specialization as a place dedicated to mass tourism plays a fundamental role: the growth of real estate value derives from overtourism, the consequent conversion of houses, shops, churches and theatres into places specialized in accommodation, catering and trade for tourists, the expulsion of residents with less economic capital and the main neighbourhood activities related to residential care. The process of increasing tourism on the island began slowly between the end of the 19th century and the beginning of the 20th century and underwent a significant acceleration starting from the 1950s. At the same time, also due to these processes, the population of the historic centre is decreasing to almost 50,000 units today.

Venetian touristification



World capitals of tourism

Above: tourist intensity; ratio between the number of tourists (overnight and non-overnight stays) by year and number of residents.

Opposite: tourist density; ratio between number of tourists per year and land area.

Source of data: reworked on data from the Mastercard Global Destination City Index, 2019.

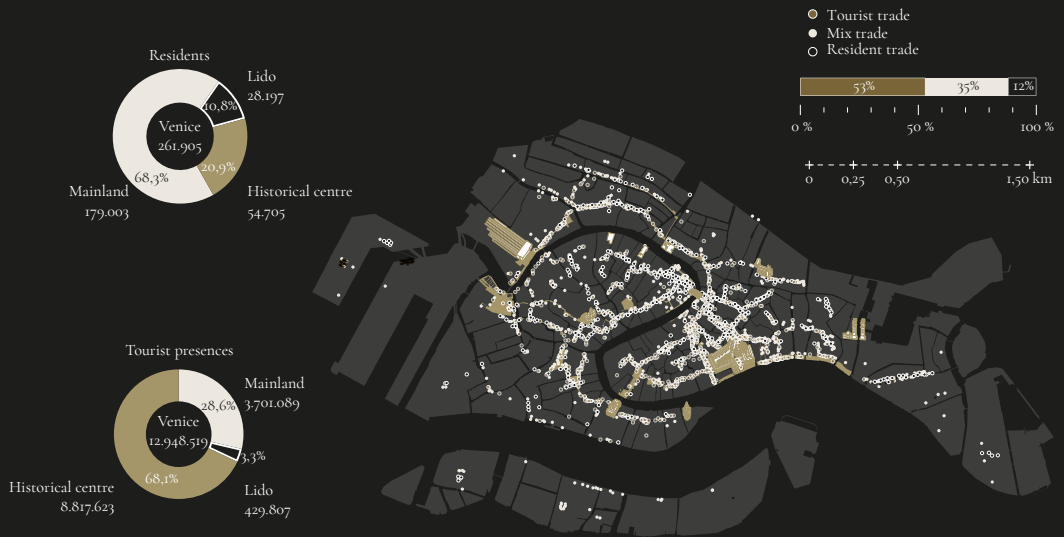
Venice Island

12.948.519 number of tourists (2019)

52.143 number of residents (2019)

The problem of overtourism in Venice is not so much linked to the absolute number of tourists, but to the intensity of the phenomenon, which can be expressed in the actual tourist intensity – a relationship that relates the number of tourists to the residents – and in the tourism density – ratio between the number of tourist presences (the number of nights spent in the city by tourists) and the space on which the phenomenon falls. Up until the pandem-

ic, in 2019, Venice was the first destination in the world in terms of intensity and density of tourism with almost 13 million overnight stays and an estimated value of 20 million visitors (overnight and not) concentrated on an island of little more than 50,000 residents and about five square kilometres of surface. Concurrently with the growth of the tourist population, Venice has undergone important depopulation processes with curves of tourists and residents



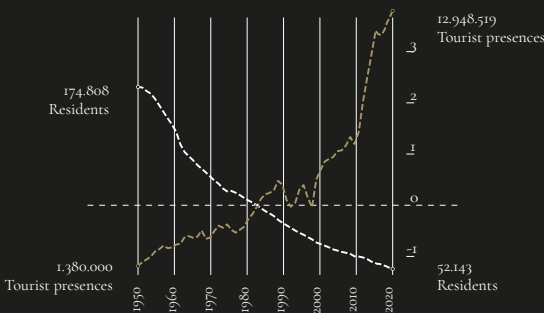
Tourists VS residents

Above left: distribution of residents and tourist presences (overnight stays and not) in the mainland (in white), historic centre (in gold), the Lido (in black).

Reference year: 2019.

Above right: trade distribution along the 'touristic tour'.

Opposite: trend of residents in the historic centre (in white) and tourist numbers (in gold).

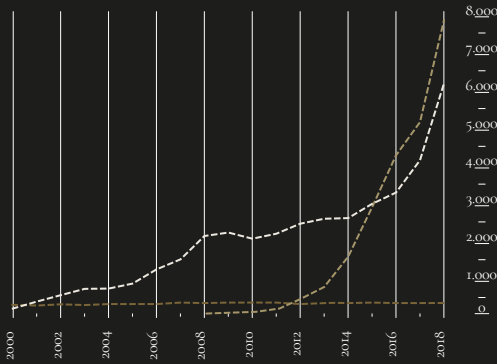


Sources of data: re-elaboration of data from the Venice Project Centre - Shopp Mapp App and from the Statistics and Research Service of the Municipality of Venice, 1950-2019.

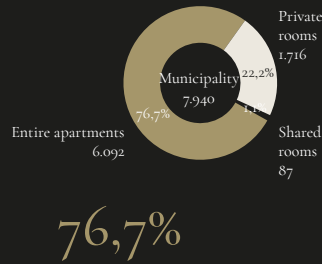
which, from 1950 to today, have had an inversely proportional trend. Processes of gentrification are made evident by the inverse relationship between tourists and residents that exists in the historic city and on the mainland. After the war, services and commerce began to adapt, concentrating on the most attractive points of the city and gradually expelling services and neighbourhood trade. On the *Touristic Tour* –an ideal circuit that includes the most

famous sites of Venice– are concentrated today the commercial activities aimed at a predominantly tourist use. It highlights how tourists are not distributed uniformly in the historic centre and, by being concentrated only in certain places, accentuate even more the effects of congestion derived from the intensity and density of tourism mentioned above.

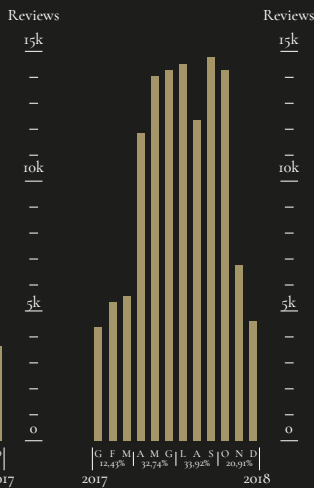
Hypertourism



Evolution of Airbnb in relation to other accommodation facilities



Types of Airbnb existing in the Municipality of Venice



Seasonal trend of bookings

Airbnb mapping

On this page, top left: evolution of Airbnb in relation to other accommodation facilities (years on the abscissa; the number of accommodation facilities on the ordinate); above right: types of Airbnb present in the Municipality of Venice. Reference year: 2000 - 2018. On this page, opposite: seasonal trend of bookings. Reference year: 2017-2018.

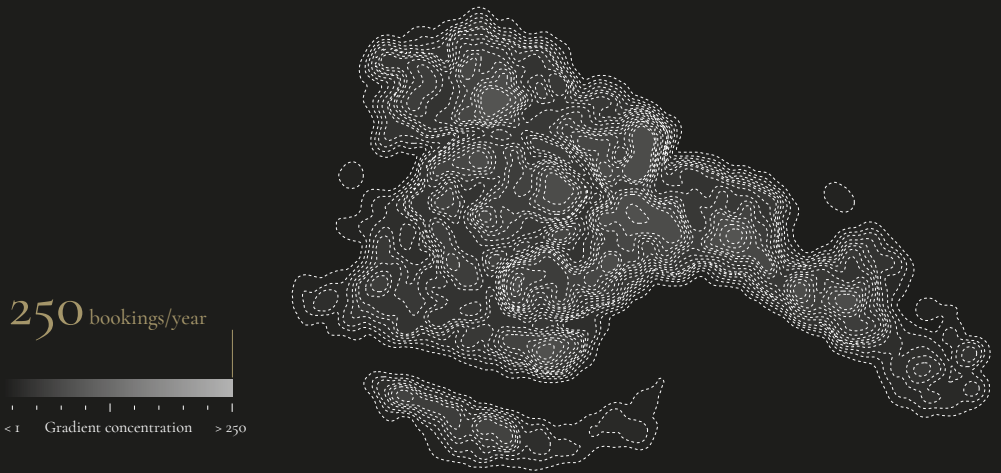
Opposite page, above: distribution of bookings (the contour lines are classified with increasing colours according to the growth in the number of bookings for overnight stays).

Opposite page, below: Airbnb hotel size (the circles are proportional to the number of beds for a single ad).

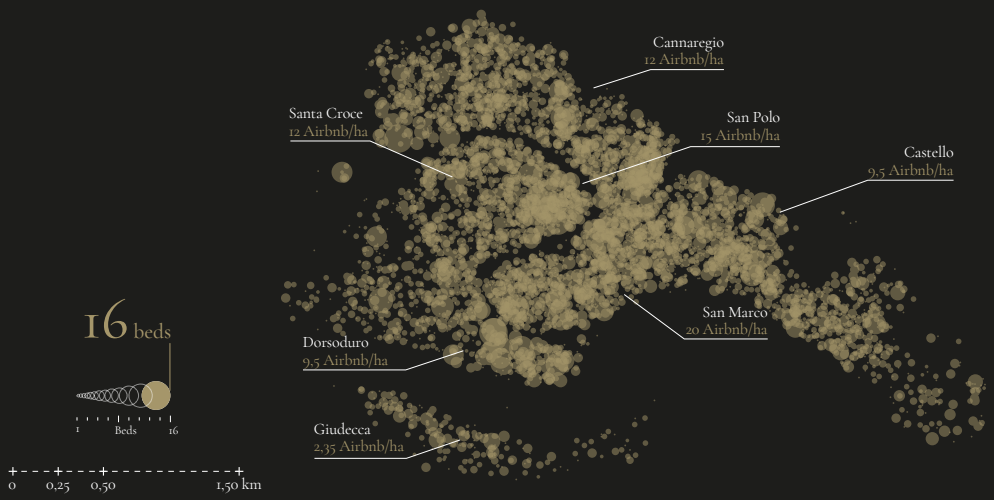
Sources of data: reworking of data from Inside Airbnb (2018), from the Statistics and Research Service of the Municipality of Venice and Airbnb Report, 2018.

Since its appearance, the Airbnb home sharing portal has quickly become one of the main players in the hospitality sector in the global and Venetian tourism scene. The analysis of the data of its trend over time and its distribution in space today allows us to develop some reflections and provisional hypotheses on the new geographies and modes of operation of tourism

in Venice. The images show in particular the very rapid growth of the service over the years in relation to traditional accommodation facilities, the cyclical seasonal trend, with tourist concentrations in the months from May-September and the distribution in the municipality of private rooms and apartments. In 2018, bookings for overnight stays in Airbnb rooms



Distribution of bookings



Number of beds

or apartments amounted to over 8,000, compared to 6,000 bookings in complementary accommodation facilities and approximately 500 bookings in traditional hotels. The maps show the size and territorial impact of the phenomenon starting from the dimensional characteristics of the accommodation (number of beds for each individual ad). The spatial distribu-

tion and size of many lodgings offering up to 16 beds per ad, shows that larger lodgings are now comparable to small hotels with little or no contact with residents.

Destination Venice

Live like a local, spend like a tourist

According to the *Healthy Travel and Healthy Destinations* report published by Airbnb in 2018, Venice is the world capital of mass tourism. A record that in the main historical islands is cyclically the cause of queues, congestion of some places and public transport, increase in prices for access to primary services with important and often uncontrolled negative consequences on the quality of life of residents and for the experience of tourists themselves. The analysis of data shows that the problem of mass tourism in Venice is in particular linked to the density of tourism, which can be expressed in a relatively small number of tourists (Venice has a quarter of the number of visitors to Bangkok, less than a third of visitors to Paris, and less than half of visitors to New York) concentrated in an excessively small space (Venice historic centre has a tourist intensity 130 times higher than Bangkok, 250 times higher than New York).

As already mentioned in conjunction with the growth of the tourist population, Venice has undergone depopulation processes that have distant roots in time (Mencini *et al.* 2013). Over-tourism and the gentrification processes deriving from mass tourism have led from 1950 to today to a radical transformation of the Venetian social fabric: on the one hand, over the years, as is well known, we have witnessed an inversely proportional trend of the growth curves between tourists and residents in some parts of the municipal area; on the other hand and as a consequence of this same phenomenon, there is a progressive but ever increasing specialization of entire parts of the conurbation. Also, on the island of Venice we are witnessing the specialization of some parts, with itineraries and areas on which tourist pressure is concentrated. Especially in these parts of the city, from the second half of the 20th century and well before the arrival of the Internet, services and commerce have progressively begun to adapt to user demand, concentrating on the most attractive points and gradually expelling people, services and neighbourhood trade from these areas. Even within the historic centre, tourists are not distributed uniformly but are concentrated in certain spots, accentuating even more the effects of congestion resulting from the intensity of tourism involved. Over the years, on the *Touristic Tour* –an ideal circuit that touches the

most famous points of Venice— churches and public buildings of great historical and cultural value have been converted into shops, supermarkets, and shopping centres. The original Airbnb slogan, ‘Live like a Local’, today has to deal with a city where residents are increasingly rare and where tourism itself is often the primary source of gentrification phenomena that afflict the city. If tourism today represents a monoculture that can threaten the future of the historic city, it is nevertheless possible to observe how even in this field Venice has been a place of innovation throughout history.

A global magnet

Through its publishers, first of all Manutius, Venice has contributed to forming the European culture and science of the last centuries. The city also played this role on another level, that of education through travel.

The Italian peninsula –and Venice within it– has a long history as a travel destination. Documented travel practices related to religion, culture, or leisure date back at least to Medieval times with Christian pilgrimages, followed by the educational journey, thermalism and the Grand Tour. Starting in the 19th century tourism emerged as a new phenomenon that only in formal aspects can be compared to the previous practices, since it originated from a new relationship with the world. The maturation and evolution of bourgeois society led to a radical transformation of travel, and not simply to a transition from the Grand Tour to organized tourism (Berrino 2011, p. 11). Italy played a fundamental part in this process, actually being a leading destination for longer than it has been a modern state (Hom 2015, p. 3).

Within Italy, and globally as well, Venice assumed –and still assumes– a paradigmatic role. The maturation and evolution of bourgeois society in the 19th century led to the transformation of the act of travelling: the economic expansion allowed increasingly large parts of the population to travel for pleasure. The aristocracy’s private networks of relationships on which the Grand Tour was based were no longer effective and a demand for new services emerged. This demand was met by new entrepreneurs who gave shape to organized form of tourism. Venice was no exception. The development of tourist and leisure facilities in the historic city and the Lido perfectly exemplifies the evolution of tourism between the 18th and 20th century: from trips and stays system-

atically configured as cognitive explorations of the natural space to sensory explorations led by emotionality in the Romantic age; from the search of confirmation of scientific and industrial progress in the second half of the 19th century to a more playful attitude at the beginning of the 20th. What indeed remains constant is the search for points of reference for the construction of a new Western cultural identity, through trips and pilgrimages to the vestiges of its own history (Berrino 2011, p. 11).

In this continuous coming and going between universalization on the one hand and differentiation on the other, Venice increasingly embodied the tension between the search for antiquity and the desire for modernization. If this tension pertains to a cultural dimension, another issue that proved to be crucial in the complicated relationship between the city and tourism is the scale of interventions and their effect on the evolution of the morphology and character of the metropolitan area.

Glamour and industrialization

The political and intellectual crisis that emerged in Venice in the 16th century, following the shift from a maritime to an agricultural economy, pushed the government of the Serenissima to proceed in the renewal of the urban fabric of the city (Tafuri 1980, p. 16). A similar dynamic was put in motion in the mid-19th century by the increasingly relevant role of tourism in the local economy. The apex of this hype for urban renewal was touched in 1853, when entrepreneur Giovanni Busetto 'Fisola' presented to the Venice Municipality a proposal for a monumental building with the function of a bathing establishment on Riva degli Schiavoni. Prior to this proposal, which foresaw the construction of a brand-new facility explicitly conceived for touristic and leisure needs, all new hotels in Venice –a pattern still recurrent today– were located in pre-existing palaces and residential buildings. The complex designed by architect Lodovico Cadorin would have stretched for 600 metres and be 46 metres deep, with an average height of five floors above ground (Romanelli 1977, p. 319). Surprisingly the project did not find any opposition in the Municipal Commission and was blocked only by the Provincial Delegate in 1854 (Romanelli 1977, p. 323), adducing issues of environmental compatibility as well as military ones. The failure of Fisola's project for Riva degli Schiavoni finally pushed the entrepreneur to realize the first mod-



A.



B.



C.

A. Luigi Querena, Veduta di Venezia: Riva degli Schiavoni da San Biagio, 1852 Museo Correr, Cl. I n. 2044. View of the monumental building with the function of bathing establishment on Riva degli Schiavoni proposed by Giovanni Busetto 'Fisola'.

B. Osvaldo Boehm, First bathing establishment at the Lido, around 1890 Archivio Naya-Boehm.

C. Giovanni Sardi, Hotel Excelsior, the Lido, 1908 For kind concession of IPAV Venezia, © Fondo Fotografico Tomaso Filippi.



Francesco Marsich, *Hotel des Bains, the Lido*, 1908
For kind concession of IPAV Venezia, © Fondo Fotografico Tomaso Filippi.

ern bathing establishment in the Lido in 1857 (Plant 2002, p. 151). It became increasingly clear that this demand for advanced services and new facilities could not be satisfied by the historic city and that investments and business operations should have been redirected towards peripheral areas. The Lido stood at the forefront of this process (Savorra 2002), with private and public operators that gave shape to a brand-new urbanization constellated by private villas and punctuated by grand hotels –such as The Excelsi-



or— that set a global standard during the *Nouvelle Epoque*. Hotels that were at large owned by the *Compagnia Italiana Grandi Alberghi* that saw between its associates many of the same investors –such as Giuseppe Volpi di Misurata– that developed Porto Marghera starting from 1917. Fifteen years later, under the initiative of the same Volpi di Misurata, the first edition of the Venice Film Festival at the Lido would be inaugurated. The future of the Venetian Metropolitan area seemed defined: the largest industrial and energy production hub of North-Eastern Italy in the mainland, the glamorous touristic development on the coast, Venice and its monuments at the centre of the lagoon.

From over- to hyper-tourism

After World War II the trend seemed to continue with artists flocking to Venice attracted by patrons such as Peggy Guggenheim; Ernest Hemingway sojourned in Hotel Gritti –acquired by CIGA in 1947– where he wrote a large part of the novel *Across the river and into the trees*. In the meantime, Italy experienced the economic boom that brought with it increasing wealth and new lifestyles. As in other Western countries, the development of modern society was accompanied by the exponential growth of modern mass leisure and international tourism (MacCannell 2013). In those same years the historic centre of Venice reached the peak of inhabitants –nearly 175,000 in 1951– prior to the beginning of a depopulation process that seems to have no end, to the point that today just 50,000 people live in it. If in other contexts the development of modern tourism often brought with it environmental and urban imbalances, in Venice the main outcomes have been over-tourism and gentrification processes that led to a transformation of the social fabric from the 1950s to today. While the urban fabric remained mainly untouched, its use has radically changed and witnessed the specialization of some parts following the emergence of touristic itineraries and areas. Commerce and services have progressively begun to adapt to tourist pressure since the end of the 20th century and prior to the boom of the Internet, concentrating in strategic locations and gradually eradicating from these areas any form of traditional neighbourhood life. This phenomenon resulted in the accentuation of the effects of tourist congestion. The advent of Airbnb acted as a detonator of this process that was already underway and resulted in the further

relocation of local residents, students, and neighbourhood retail in peripheral areas of the historic city. The exponential growth of Internet-related practices since the beginning of the 21st century led to a shift from over-tourism to hyper-tourism, intended as a translation of the concept of hyper-capitalism as introduced by Jeremy Rifkin (Rifkin 2001). The experience of tourism in Venice thus becomes a manifest expression of that path that led from the commodification of space –the first resource of proto-capitalism– to the total commodification of experience, made possible by new communication technologies. In this sense, Venice seems to be a perfect territory for the conquest of hyper-tourism, a historicized space in which, with the ‘economy of experience, goods are not produced but memories’ (Rifkin 2001, p. 194).

►8 The data elaborations we refer to were developed as part of the research *Veneto Sustainable Smart Tourism 2030* supported by the Veneto Region with funding from the European Social Fund. Working group: Lorenzo Fabian (scientific director) Giacomo Mantelli and Camilla Cangio-tti and as part of the Master’s Thesis in Architecture and Arts *Tourist at home: Tourism as a phenomenon that restores the community of Venice* (student: G. Mantelli; supervisor: L. Fabian; Università Iuav di Venezia).

Governing the digital

The economic model that began to consolidate downstream of the 2008 crisis and the possibilities offered by digital technologies are generating important and profound repercussions not only on productive spaces but on the entire system of functioning and organization of cities and territories (Rifkin and Canton 2018; Anderson 2014). Digital technologies have superimposed an intangible infrastructure that has enormously amplified the potential for customizing the tourist offer for territories, citizens and consumers who express increasingly articulated demands. At the same time, the technological revolution when applied without regulation to mass tourism destinations has often been a harbinger of processes of gentrification and increase of the cost of living. The analysis of data relating to Airbnb in Venice shows the rapid growth of the phenomenon. ►8 In 2018, the rooms and apartments registered on the Airbnb platform numbered over 8,000, compared to the 6,000 complementary accommodation facilities and approximately 500 traditional hotels. The distribution in space and the size of much accommodation (which offer up to 16 beds for each single ad) shows how the various brokerage companies for tourist rentals active in the Venetian territory increasingly resemble actual new generation diffused hotels. In recent years European cities such as Paris and Barcelona have tried to tackle these phenomena. They respectively introduced measures such as a temporal limit of 90 days per year by which an apartment can be rented through Airbnb (ALUR 2014) or approved an urban

tool (Ajuntament Barcelona 2017) that governs the establishment of tourist accommodation, trying to find a balance between the pursuit of a relevant source of income and access to the city for residents.

Back to Venice, it seems appropriate to highlight how since late 2019 the combined effects of the exceptional high water and of the pandemic have temporarily suspended hyper-tourism with heavy economic consequences that have suddenly highlighted the extreme fragility of the model adopted. In reality, digital tools, and ancillary services, if accompanied by a clear vision and sound urban policies, could become very useful tools to support the desire for residentiality, which over time has seen its power to access the market eroded. Digital tourism, if limited to a single room and organized through brokerage companies –property managers– managed by resident cooperatives, could activate effective synergies between housing and tourism. On the one hand, it could be a useful tool for the community in the daily management of apartments that are often too large and old, providing assistance to elderly population and residents who often do not have the tools (cultural, economic, and technological) to take advantage of the opportunities offered by the digital revolution. On the other hand, it could, in concert with the municipal administration, become an engine for the recovery of an important part of the public housing stock today in a state of underutilization. Thanks to an accurate reading of seasonal and weekly flows, it could also help to manage the rhythms of a possible alternation between tourists and students. Finally, digital tourism, recovering the diffused hotel model extended to the territory, could support alternative forms of tourism in the smaller islands and in the innermost areas of the lagoon, diluting and redistributing at least in part the tourist pressure –and the resulting wealth– now exclusively concentrated in the historic centre.

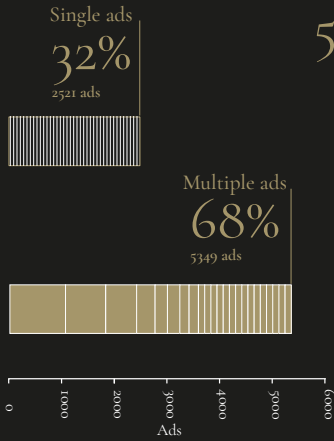
What-If

A synergy between
tourists, students, and
residents?

Venice seems to be the perfect territory for the conquest of hyper-tourism, a historicized space in which, with the 'economy of experience, goods are not produced but memories' (Rifkin 2001, p. 194). Co-hosting companies accelerate the phenomenon where they are configured as diffuse hotels that 'sell the experience' of living as a resident, without however the need to own a single property.

What would happen if digital tourism became a tool to support the Venetian residentiality of elderly and fragile populations currently excluded from the opportunities of the sharing economy? What if co-hosting companies were run by resident cooperatives forced to reinvest in community real estate?

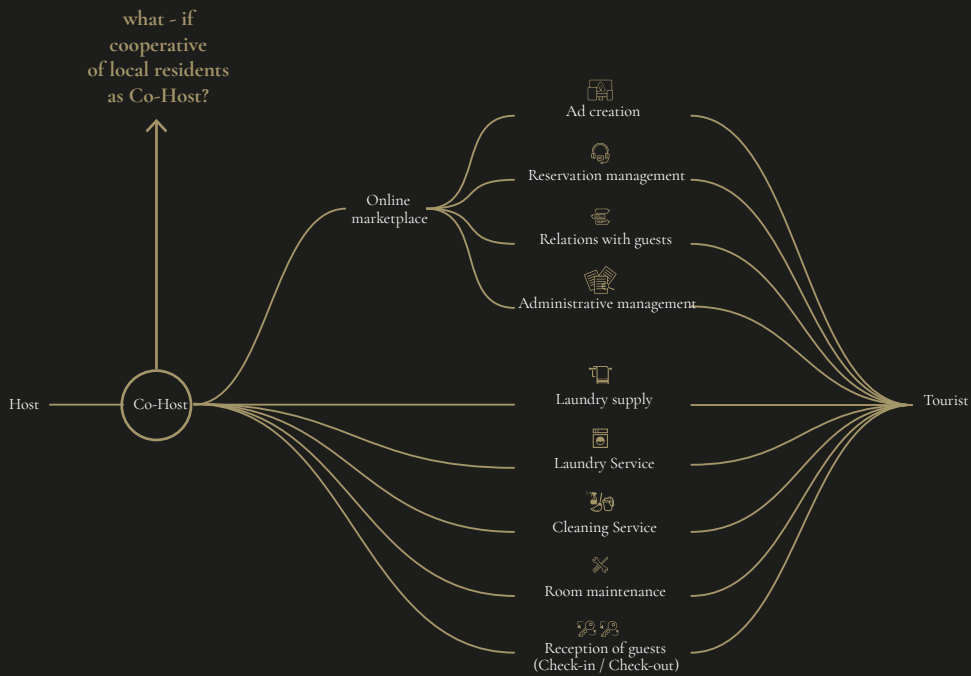
A synergy between tourists, students, and residents



5% of hosts manage
33% of ads



Sources of data: reworking of data from Inside Airbnb (2018), from the Statistics and Research Service of the Municipality of Venice and Airbnb Report, 2018.



As already mentioned in the previous pages, in Venice the short-term rentals of Airbnb have shown to be more profitable than traditional rentals in the face of a more complex management derived from the necessary and frequent reception services, cleaning, supply of linen, and ordinary maintenance. For these reasons,

many owners of second homes, in the face of a deduction on the costs of the lease, prefer to entrust the management of their Venetian properties to co-hosting companies which, taking advantage of online services, act as intermediaries between the owner and the tourist. Analysis of the data relating to Venice shows

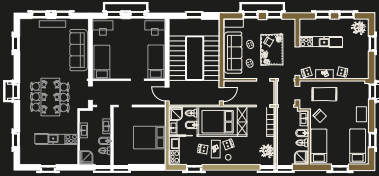
THIRD FLOOR

⑨

Living room for yoga sessions



SECOND FLOOR



FIRST FLOOR

②

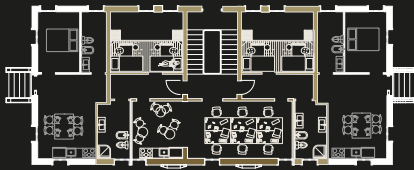
New coworking spaces for residents and students



GROUND FLOOR

⑤

Shared kitchen



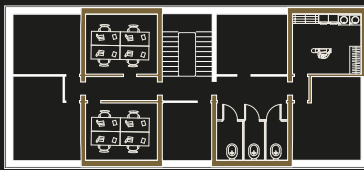
PIANO INTERRATO

③

Shared spaces for waste collection

④

Shared repairs workshop

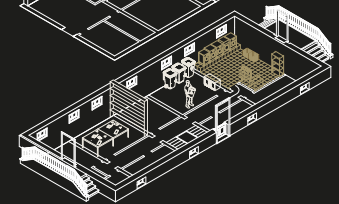
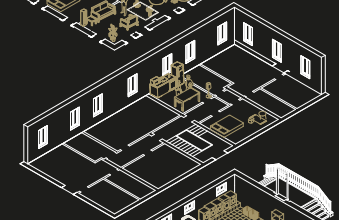
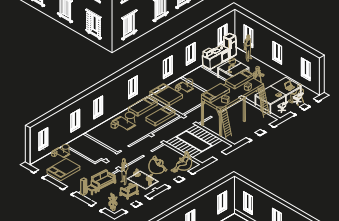
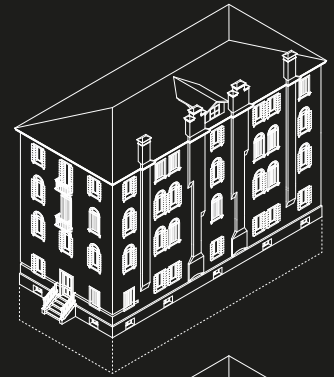


⑧

Shared laundry in the Airbnb flat storage room

⑦

Splitting the large flat into a mini-apartment for tourist rental



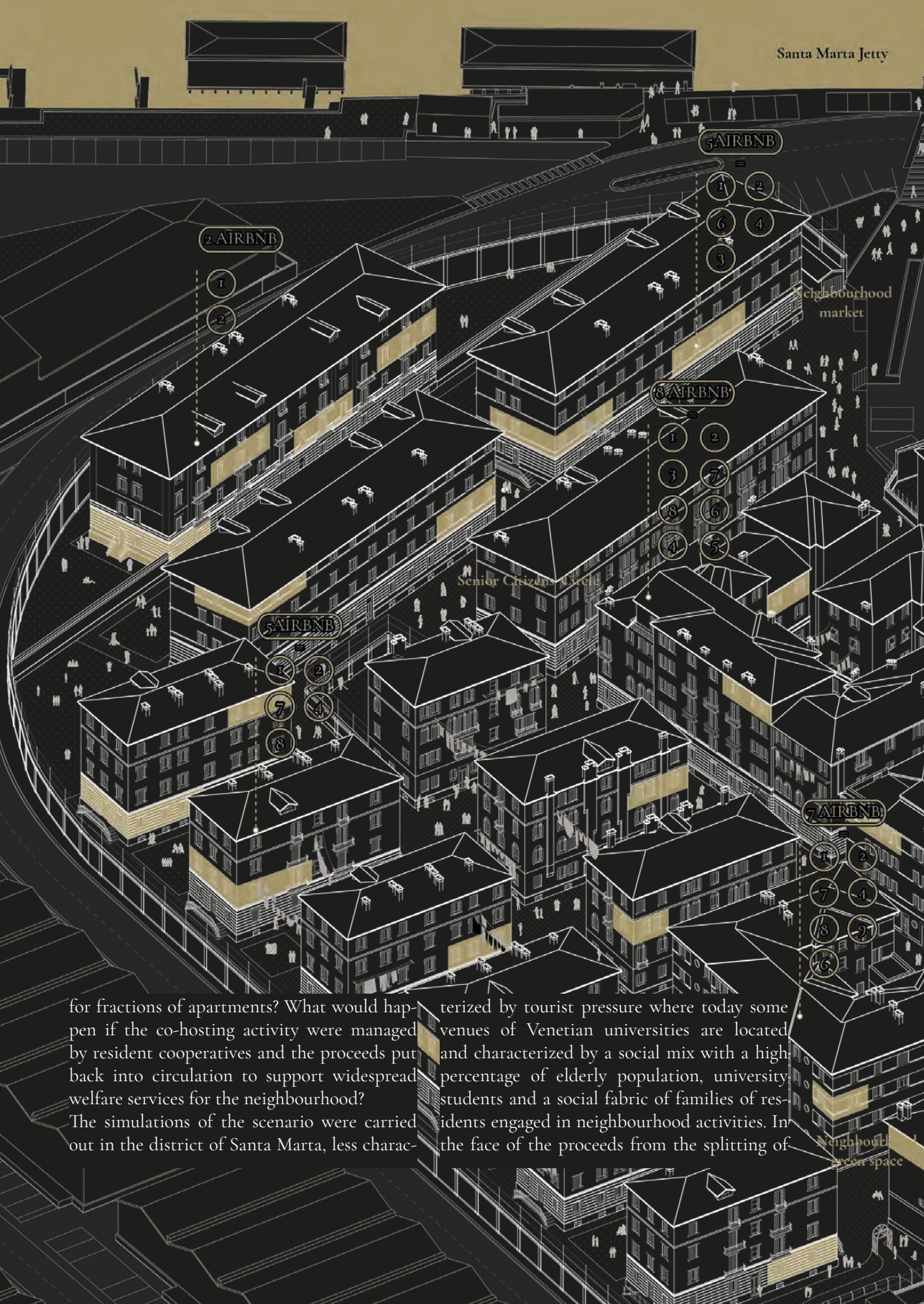
①

Shared laundry in the Airbnb flat storage room

Residential care spaces

that one in five hosts on Airbnb is actually a co-host company that manages multiple listings, with 5% of co-host companies managing 33% of the total listings. In the face of these phenomena and ever-increasing house prices, many owners are excluded from access to the possible advantages of home sharing and dig-

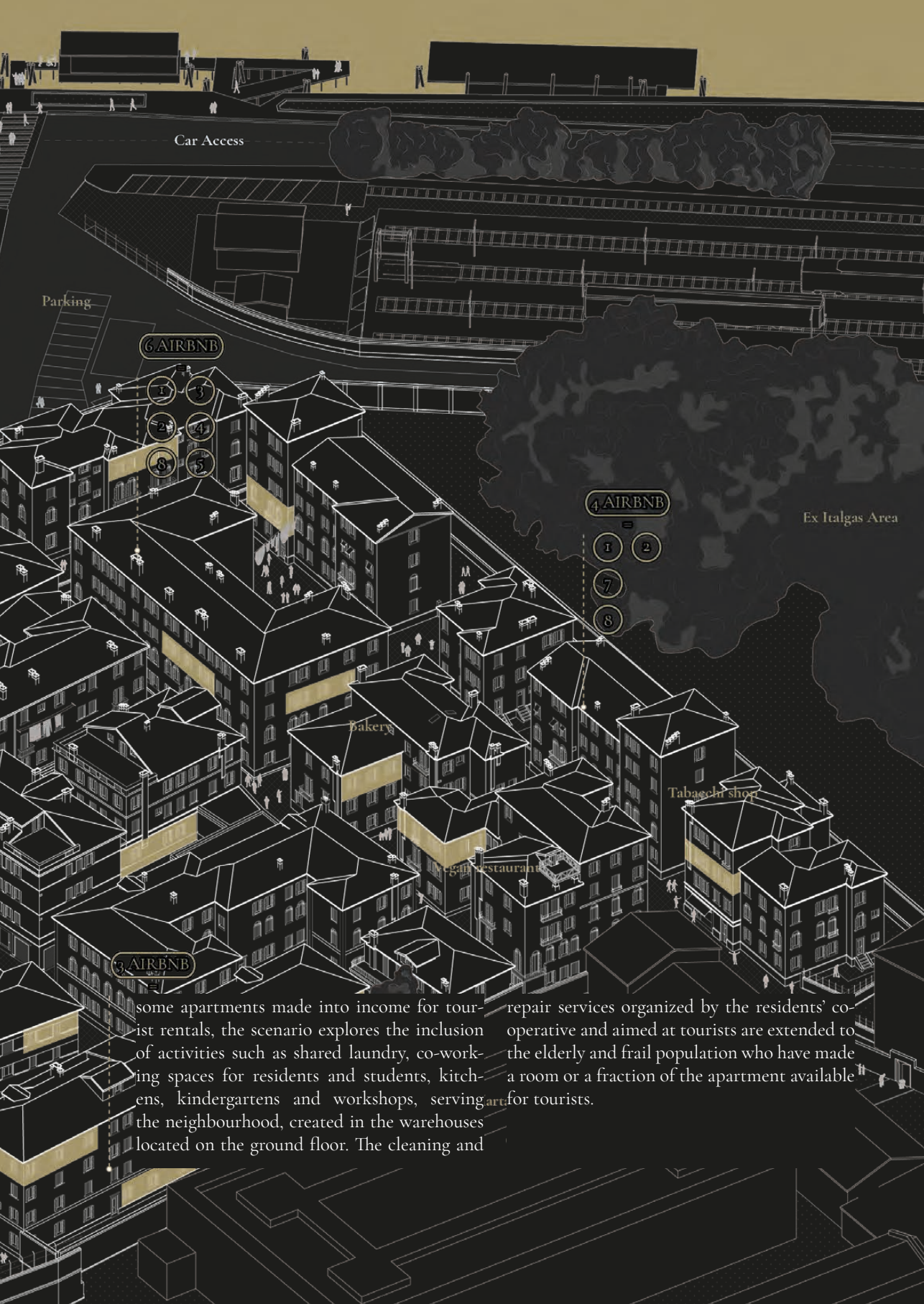
ital tourism. These are mainly a fragile population, often lonely elderly people with little digital knowledge and little economic capital, however, in possession of very large houses that would need renovation. What would happen if in the historic centre of Venice short online rentals were granted only to residents and only



for fractions of apartments? What would happen if the co-hosting activity were managed by resident cooperatives and the proceeds put back into circulation to support widespread welfare services for the neighbourhood?

The simulations of the scenario were carried out in the district of Santa Marta, less charac-

terized by tourist pressure where today some venues of Venetian universities are located and characterized by a social mix with a high percentage of elderly population, university students and a social fabric of families of residents engaged in neighbourhood activities. In the face of the proceeds from the splitting of



Car Access

Parking

6 AIRBNB

4 AIRBNB

Ex Italgas Area

3 AIRBNB

some apartments made into income for tourist rentals, the scenario explores the inclusion of activities such as shared laundry, co-working spaces for residents and students, kitchens, kindergartens and workshops, serving the neighbourhood, created in the warehouses located on the ground floor. The cleaning and

repair services organized by the residents' cooperative and aimed at tourists are extended to the elderly and frail population who have made a room or a fraction of the apartment available for tourists.

Fishing and Hydrogen Valleys

The territory of the Venice lagoon has been dotted for hundreds of years by only one type of valley, that of fishing. A spatial and productive model that has slowly evolved and given shape to large areas of the northern and southern lagoon, providing jobs for the inhabitants of these areas and food for the city. A model that in the face of a globalized market economy has presented some critical issues, but which in view of climate change represents one of the possible strengths in an essential redesign and rethinking of these territories.

In addition to the fishing valleys, the Venetian metropolitan area in the near future could be crossed by a new valley, that of hydrogen. A technology still in its infancy in Italy but with great potential in environmental and economic terms (Confindustria 2020). The scope in terms of innovation of the Venetian Hydrogen Valley should contribute to the decarbonisation of transport, heating systems, waste, and the circular economy for the Veneto Region and potentially for the entire North-East of the country. If today this represents only a gamble –the first steps for its establishment were taken by some pioneers a decade ago—⁹ it is very likely that the considerable investments (between 2.5 and 4 billion euros) that will be allocated to start the sustainable development plan of the Veneto area as part of the PNRR (National Recovery and Resilience Plan) will translate it into an essential reality in the coming decades. The Venetian metropolitan area will thus be able to become one of the world capitals of sustainability not only in terms of ecology, lifestyle and cultural models but also in a crucial aspect such as energy.

To counter the industrial and employment decline in Porto Marghera and given the need to conclude the recovery of the site from an environmental point of view –through containment of toxic materials, cleaning up of areas and aquifers, new administrative procedures– the Veneto Region has identified the Hydrogen Valley as the main engine of industrial and environmental regeneration of Porto Marghera (Regione Veneto 2021). A vast industrial area of 2,000 hectares which, as underlined in the Deliberation of the Regional Council of Veneto n. 278 of 12 March 2021, has lost two thirds of the employed compared to the peak of over 30,000

⁹ See for example the project by Veneto Nanotech S.c.p.A. for the development of storage systems of hydrogen in cylinders, of storage systems for solid state absorption and development of sensors for hydrogen, approved by resolution of the Regional Council of the Veneto Region no. 2611 of 18.12.2012.

in the 1960s, and where 40% of the entire surface is in a state of neglect. The benefits related to hydrogen would extend to the regional –with the creation of another three or four districts, potentially up to twenty, starting from an estimated investment of between 300 million and 1 billion euros over 5 years (2022-2027)– and national dimension, with an impact forecast on GDP in the order of 5-10 billion euros.

The Hydrogen Valley finally seems like a realistic and convincing prospect –despite the great challenges and unknowns in terms of reclamation of the areas that the project brings with it– for the regeneration of Porto Marghera, after several decades of political and industrial stalemate and a lack of clear vision regarding the productive destiny of a crucial actuality of the Italian industrial and energy system located in a nerve centre of the Venetian metropolitan area.

Cinema and progress in the lagoon

In the aftermath of the Second World War, the two main economies in the Venetian metropolitan area seemed clear: that of tourism in the historic centre and islands, and that of industry in the lagoon eaves. In 1959 Enrico Mattei –president of ENI, one of the main players in the development of Porto Marghera– asked Joris Ivens to produce a film relating to the key role that hydrocarbons were playing in the Italian economic boom after World War II. The result of the Dutch director's work was a three-episode documentary released in 1960 entitled *L'Italia Non è un Paese Povero (Italy is not a poor country)*. The narrative intertwined state-of-the-art oil infrastructures with scenes of daily life in the poorest Italian regions, provoking strong opposition and censorship from both the government and the national media. The second part of the documentary, entitled *Due Città (Two Cities)*, told of the crossed destinies of Venice and Ravenna. Cities united by the boom in the oil and natural gas industry in the 20th century, but even earlier by a millenary history of settlements founded in an unstable lagoon environment, strenuously defended by the Serenissima in the first case and instead slowly disappearing over the centuries in the second. Although originating from a specific assignment by a large corporation, *Due Città* can be framed within the ideological battle between tradition and progress that marked the second half of the 20th century in Venice. In those same years, other films

were in fact produced that touched on this crucial question (F. Zucconi 2021, p. 242), including *Quattro passi per Venezia* (A stroll around Venice) (1954) by Francesco De Feo, *Venezia città moderna* (Venice modern city) (1957) by Ermanno Olmi and *L'altra faccia di Venezia* (The other side of Venice) (1962) by Emilio Marsili.

The initial scenes of *Due Città* are a manifesto of the role that the Venetian Porto Marghera –founded in 1917 in the *barene* of Bot-tenigo as a new industrial area and expansion of the commercial port built in 1870 in Santa Marta– in those years at the height of its productivity carried out as the fulcrum of energy and industrial



Frames from the initial scenes of *Due Città*, the second episode of the documentary *L'Italia non è un Paese povero* by Joris Ivens, 1960

►¹⁰ It is worth mentioning the conference *Il porto di Venezia nel problema adriatico* (*The port of Venice in the frame of the Adriatic problem*) held by Foscari in 1904 at the Ateneo Veneto and dedicated to the proposal to establish a new port in Marghera.

production in north-eastern Italy: an oil tanker carrying crude oil from Egypt crosses the San Marco basin before reaching the refineries located on the mainland via the lagoon. A highly symbolic passage that recalled the new role imagined for Venice at the beginning of the century by figures such as Piero Foscari,^{►¹⁰} Luciano Petit, Ruggero Revedin, Achille Gaggia and Nicolò Papadopoli, and then concretized by Count Giuseppe Volpi (Dorigo 1973, p. 165).

If on the one hand the project led by the latter originated ‘from the hatching of an idea of port development, and from its skilful transformation into a national plan of industrial exploitation’ (Mancuso 1990, 186), on the other it was based on a vision of a ‘Great Venice’ conceived as early as the second half of the 19th century (Zucconi 2002) in which the historic centre would have ‘expelled’ the productive functions to concentrate on cultural, touristic, and commercial activities.

Between 1924 and 1928 the excavation of the West canal and the consequent availability of new areas –to which was added the new Regulatory Plan approved in 1926, that authorized the expansion of the original nucleus of Porto Marghera towards the south– favoured the settlement of new industries, including SAVA-Società Alluminio Veneto Anonima (Veneto Aluminium Anonymous Society). The result of a mixed partnership between Venetian industrialists in the electricity sector and the Swiss company Aiag-Alusuisse, together with Montecatini was the largest producer of alumina and aluminium in Porto Marghera and assumed a strategic role in particular during the years of the Second World War (Bianchi 1985).

Aluminium and ferries

Between 1962 and 1964, a few years after the release of Ivens’ documentary, the new second SAVA factory was built in Fusina, one of the largest and most iconic in Porto Marghera. This included two groups of works. The first directly concerned the production of aluminium and included the alumina silo, the furnace shed, the foundry and other buildings comprising a shed with electrolysis furnaces –450 m long, 23 m wide and 22.5 m high– built along the lines of a similar building at the Alusuisse in Zurich. The second was linked to the thermoelectric plant that operated the entire plant and consisted of the plant itself, the fuel oil tanks, and the water intake and drainage works (Colombo and Failla 1965, p. 45).



IROM refinery in Porto Marghera, 1954
ENI Historical Archive.

►II Specifically, in *Annex A* of the legislation implementing the PAT regarding the transformation of the industrial area of Porto Marghera it is emphasized that 'the residual areas of the second industrial zone, currently disused or underused, need, in particular, a priority industrial reconversion, addressed to environmentally sustainable types of production and the expansion of port functions as well as the productive ones integrated with these'. For the area of the former SAVA, through a Programme Agreement between the Veneto Region, the Municipality of Venice and the Port Authority of Venice, a variant was approved to the PRG - *Piano Regolatore Generale (General Zoning Plan)* for Porto Marghera, which now identifies it as a future commercial port. Not surprisingly, following the expulsion of large ships from the San Marco basin starting in 2021, the Fusina terminal



IROM refinery in Porto Marghera, 1954
ENI Historical Archive.

has become the docking point for cruise ships, pending a definitive solution to the problem.

►12 Ro-ro is an abbreviation of the English term roll-on/roll-off and indicates a horizontal or rolling loading ferry-ship designed for the transport of road vehicles that embark and disembark on their own wheels.



Following financial difficulties in 1973, SAVA was acquired by the state finance company EFIM and in 1988 it was renamed Alumix. The constant economic losses, covered by the Italian state over the years, led to the gradual disposal of most of the Porto Marghera plants until its definitive closure in 1991. The only plants still active in Fusina were sold in 1996 by EFIM to the multinational Alcoa, which subsequently discontinued the production of the primary plant.

Since 1997, the production of aluminium, one of the most polluting and expensive in terms of energy and water consumption, has been definitively stopped. Given its strategic position, overlooking the lagoon, and located in the southernmost part of Porto Marghera, the area was therefore acquired by the Port Authority of Venice, which developed a programme and a project for its transformation between 2004 and 2014, now being implemented. This design, in line with the functions contemplated by the current PAT-Piano di Assetto del Territorio (Long-term territorial plan) of the Municipality of Venice, which envisages the strengthening of the port functions and the possible location of a new cruise offer^{►11} for the Porto Marghera area, supports the main redevelopment interventions of an urban nature already implemented in the first industrial area –such as the Venice VEGA (Venice Gateway) Scientific and Technological Park– and prefigures for the former SAVA area of Fusina a new role as a strategic intermodal centre for the Upper Adriatic.

The relevance of this transformation, which is still underway, is not so much based on the design of new office and logistics buildings –which include cutting-edge solutions in terms of energy production and consumption reduction– but on breakthroughs in terms of development vision, long-term economics and new standards in the reduction of fossil fuel consumption that it recommends. The former plant for the manufacture of alumina and aluminium, in fact, is involved in the Fusina Logistics Platform project which is transforming it into a ro-ro terminal^{►12} for ferries of European significance and inserted in the network of the Motorways of the Sea (MoS). Introduced by the 2001 White Paper on Transport–European Transport Policy (European Commission 2001), the MoS are designed as new intermodal sea-based logistics chains which will decongest roads and make better use of the rail network and mainland waterways.

The transformation of the former SAVA area, which today partly falls within the area protected by the landscape regulation of the Naviglio Brenta (D.M. February 18, 1964), and the stretch of water in front of it, which is also protected (D.M. August 1, 1985), is part of a global process that sees as its objective a more equitable use and consumption of resources and the recovery of so-called brownfields –polluted areas where transformation interventions produce both environmental and economic benefits for the community– in order to rethink economic and ecological chains, imagining new development paradigms.

Epochal challenges

The territory of the Venetian metropolitan area is now facing three major challenges, different in nature but closely linked to each other from a political, economic, and environmental point of view. Challenges to be addressed through a wide range of tools: embankments, reclamation, demolition and reconstruction of buildings and entire areas, administrative acts and laws, digital applications, and tools.

The first is not only a Venetian challenge but a global one, namely climate change and the rise in the average sea level. A first response in the local area was the creation and commissioning of the MoSE, including ancillary and compensation works. This is an experimental project, conceived and completed over decades, which hopefully will guarantee the salvation of Venice, the historic island centres and the lagoon until at least 2100.

The second is the conversion of large areas of Porto Marghera. Areas that have been abandoned for a long time, almost always heavily polluted, or areas still in operation, which for logistical reasons or respect for environmental parameters require a radical adjustment or rethinking. The case of the ex-SAVA plant is just one of these, with many others besides waiting for a new future.

The third is the rethinking of the tourism model that focuses on Venice and its metropolitan area. Compared to the other two challenges, this possibly requires less effort –and imagination– in physical terms, territorial projects, and new infrastructures, but more effort in intangible terms, as well as new cultural, economic and housing policies.

It is the opinion of many observers that the economic model that began to consolidate downstream of the 2008 crisis and the pos-

sibilities offered by digital technologies is generating important and profound repercussions not only on production spaces but on the entire system of functioning and organization of cities and territories (Rifkin 2015; Anderson 2014c). As is known, the new production matrix is made possible and operational thanks to the pervasiveness of the Internet: an enabling platform for ubiquitous communication of anything and everything. With the progressive diffusion of the Internet of things, most objects, buildings, machines, energy infrastructures and cities will become 'smart' because they are globally interconnected by thousands of data-producing sensors.

In this case too, a global dynamic intersects with complex Venetian themes. Issues such as mobility and the functioning of an 'amphibious' public transport service which can ensure that even the most remote places in the lagoon are served and reached by both residents and visitors who aspire to alternative rather than mass tourism experiences. Or like the redesign of the borders: the cyclical recurrence of the municipal referendum to divide the historic centre and the lagoon area from the mainland; the expansion of administrative borders –from Padua-Treviso-Venice to the metropolitan city that follows the perimeter of the pre-existing province– in order to better govern environmental processes, adaptation of the buffer zone edges and other areas of monumental and environmental protection in order to respect the dictates of UNESCO. Or even themes such as the strong demographic decline suffered by the historic centre in the last seventy years and the need to support forms of residential care, both in the long term and for students and professionals who in the short-medium term bring new vitality and stimuli, fully establishing Venice as a global place of innovation in terms of sustainability, economy, and culture.

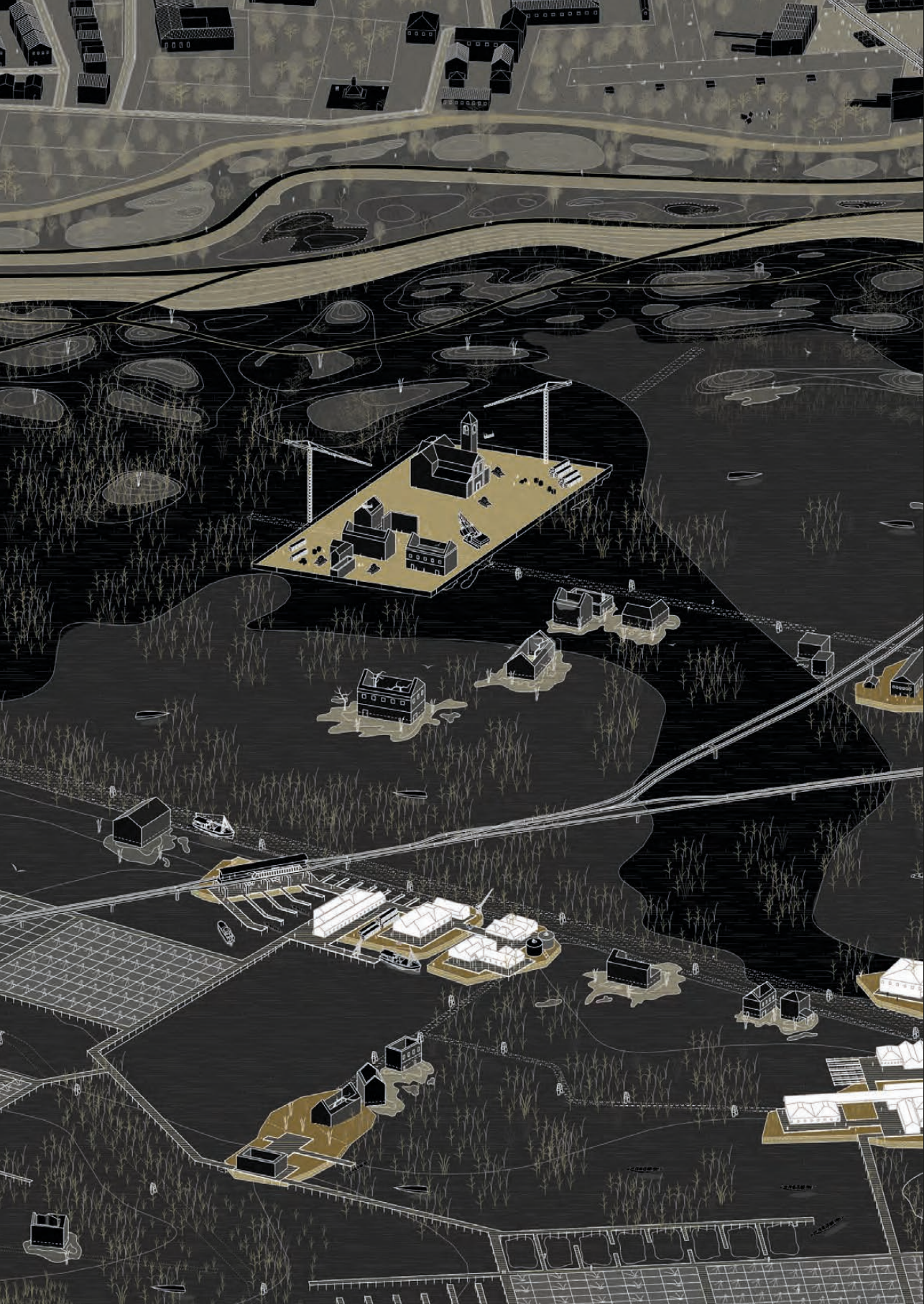
Chapter 4

On the amphibious space

Venice, year 2100.

Like every morning, Cristoforo walks along the canal that takes him to work from the Eraclea pier at 7:15 am. From the *vaporetto* window, he sleepily contemplates the tired awakening of men, machines and construction sites that dot the large lagoon east of the Piave. A little to pass the time, a little out of professional habit, every day he mentally measures the progress of work compared to the day before: another new construction site for the recycling of an old house; the rapid progress of the consolidation works of the lands necessary for the construction of the small polders that will host the fish market; the continuous maintenance of the protective embankments of the new island of Eraclea. And then on one side he observes the maintenance works of the photovoltaic fields in the middle of the water, while on the other the stratification of the stilts for the hydroponic cultivation of the ancient agricultural products of this land, as well as the floating infrastructures that extend as far as the eye can see for the aquaculture of microalgae, fish and mussels, where he himself works. Cris measures the number and progress of the works, thinks about how much this landscape has changed in the last twenty years, when he was among the few to inhabit these territories.

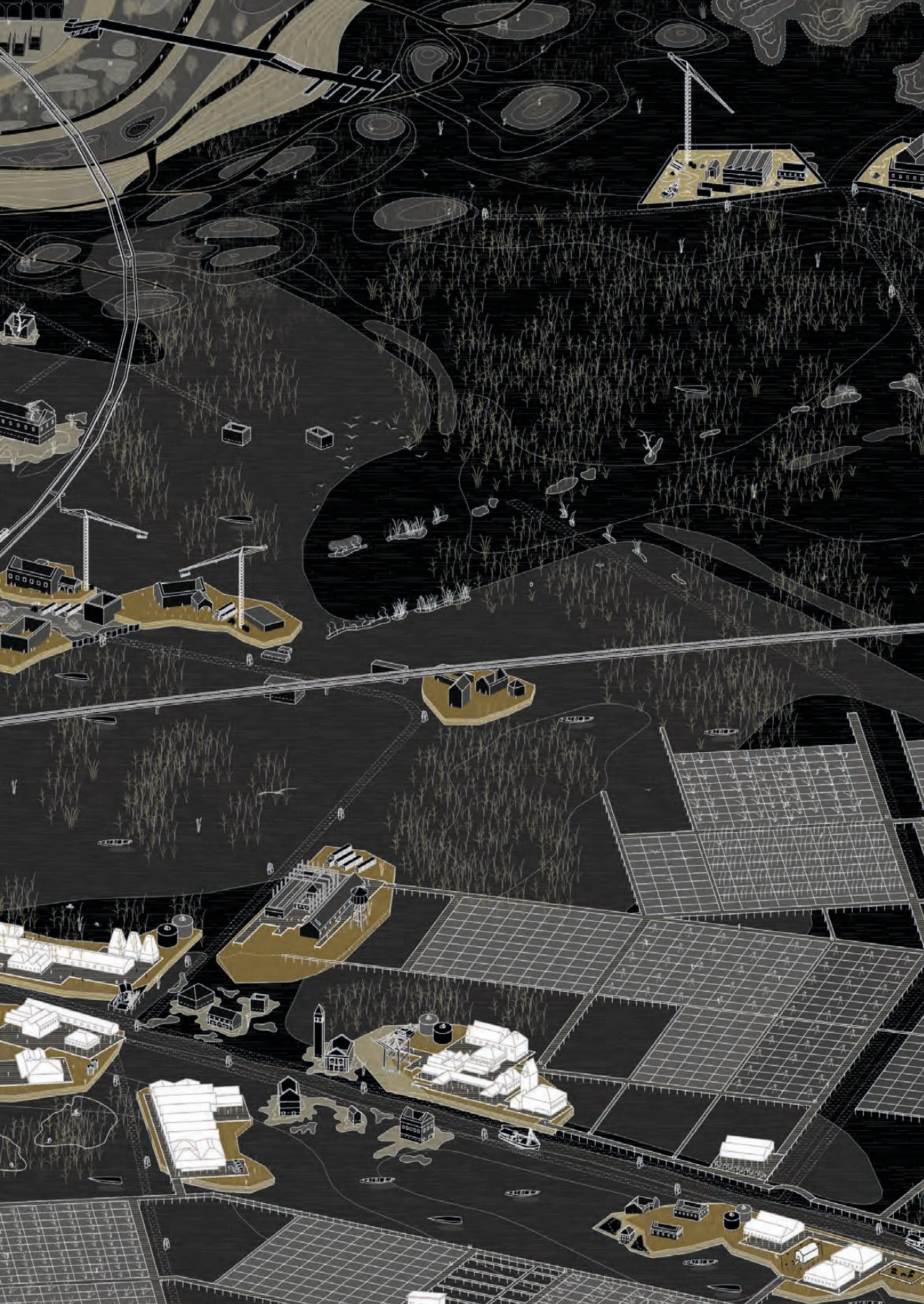
Cris is an engineer specialized in terraforming and cultivating humid environments, one of the many

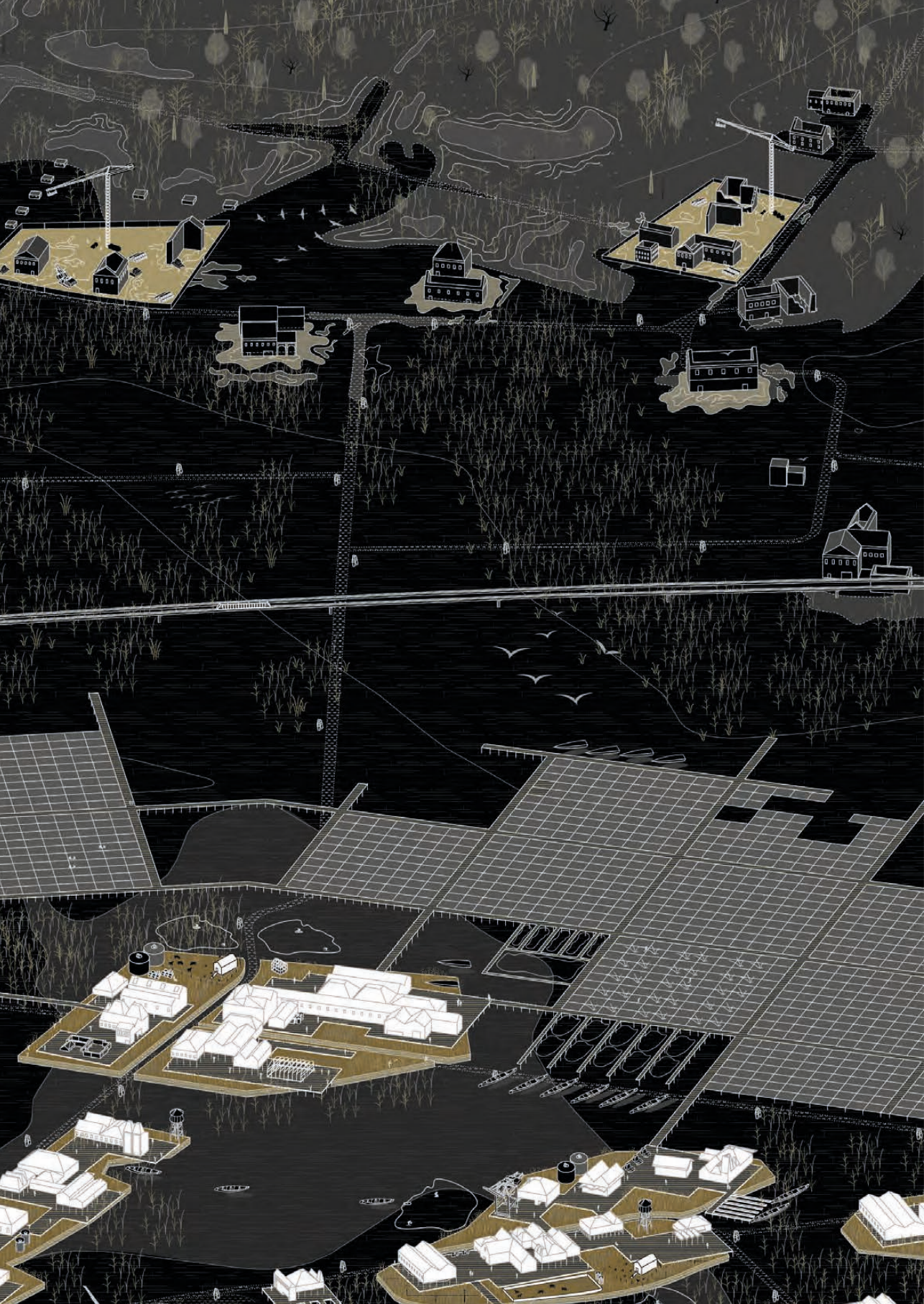


professions that came about as a result of the transition at the beginning of the millennium. Today he works as a freelancer at Venetian Aquaculture, a cooperative of which he himself is a member and which, for at least, ten years has been one of the largest outdoor fish farms in the Mediterranean. Cris deals in particular with the preparation of the land necessary to host the cultivation of oysters, which today represent the flagship product of the cooperative. Cris' oysters are of the native variety *Ostrea edulis* (flat oyster), historical inhabitant of the Venice lagoon at least until the end of the 19th century. The native oyster was reintroduced in 2021 by Professor Bertolini, a marine biologist who founded the research centre where Cris himself worked for a short period of time. There, under the teachings of the elderly teacher, he acquired the soil preparation methods that were already used by the Venetians at the end of the Republic. The technique still involves the dispersion of crushed mussel shells in the lagoon bottoms to increase the calcium content in the soil. It was originally tested in the 19th century by Professor Molin, a member of the Reale Istituto Veneto di Scienze (Royal Veneto Institute of Sciences) and reintroduced in 2020 in an aquaculture area of the southern lagoon. Here, with the collaboration of local aquaculturists, the first 2,200 'mother' oysters imported from Croatia were sown, becoming founders of the new colony lagoon.

The Venetian large aquaculture fields extend into agricultural lands that had been farmed for over a century and a half by Cris' family. He knows very well that the fields on which his lifelong ancestors broke their backs were only countryside for a short period of time. His great-grandfather worked in the lands that before the 20th century were marshes; during the 17th century they had become *il lago della Piave* (the lake of the Piave), but even earlier, around the year 1000, they were part of a system of lagoons that extended over the whole upper Adriatic Sea from Ravenna to Grado. The family lands were made arable and kept dry only after the First World War with the reclamations that set a precedent throughout Italy. A huge operation which, thanks to the creation of embankments, ditches, drains and, finally, the decisive installation of dozens of water pumps capable of pumping thousands of litres of water per second, has made an amphibious territory habitable. The large pump motors then created the impression of an earthly world for decades, until they were finally shut down. The last pump was turned off in 2050, when it was now clear that the cost of energy was higher than the benefits of a harvest made increasingly scarce due to the worsening of the saline wedge, the repeated flooding of the Piave and the rising sea.

Before the decision to reconvert, it took years to out-





line a clear destiny for these lands. At the two extremes of the debate stood those who argued that these places should have been abandoned and given back to water to take on the role of large reserves of biodiversity, and those who explored the possibilities of building ever larger embankments and ever more powerful engines. It was then that first in a targeted way, then more and more widely, the ancient land reclamation consortia slowly reorganized to explore the habitability of an amphibious territory. The process took place gradually and was not linear: once the mechanical drainage was interrupted, the depressions of the ditches at the edges of the fields slowly transformed into the canals on which today we move into the reconquered lagoon, the farmhouses became new amphibious villas, the old, inhabited centres became new islands protected by embankments. The territory has been kept productive by hundreds of families organized in aquaculture cooperatives, to transform themselves from farmers of the land into farmers of the sea. Cris' ancestors have always been pioneers who stubbornly decided to inhabit territories that nature had deemed uninhabitable. Cris thinks of them and the long day that awaits him when the *vaporetto* reaches his place of work.





A large lagoon

Designing an amphibious territory

In relation to the adaptation challenges posed by climate change, wetlands can play a very important role. On the one hand, in fact, they are fragile environments whose survival is directly threatened by the effects induced by the rise in sea level, on the other hand they play a decisive role in the absorption of global climate-altering emissions.^{►1} Despite their small surface area –wetlands occupy only 6% of the earth’s surface– they contribute in proportion more than woods and forests to the global absorption of CO₂ and to the mitigation of the effects of climate change. In addition to this, wetlands are very important reserves of biodiversity, essential for the purification and oxygenation of surface waters, for the regulation of the hydrodynamic balances of the tides, for the control of soil erosion and for the protection of the coast from storm surges. Among the wetlands, lagoons are also natural nurseries for fish and molluscs, and for this reason they can make an important contribution to human nutrition on a global scale. Wetlands are naturally adaptive and resilient territories, in transition by vocation and amphibious by necessity. Despite these aspects and, more generally, the high value in terms of ecosystem services that can be attributed to wetlands, their existence is increasingly threatened by a series of concomitant causes.^{►2}

Today, when we think about the project for the wet areas of the Venetian metropolis and its amphibious environments, we must think above all about the project for water spaces of the so-called dead lagoon and the territories on the edge along the coast and the waterways of the drainage basin. The first are the endo-lagoon territories where the currents and hydraulic exchanges between fresh water and sea water are less intense and the life and the ‘lungs of the lagoon’ will be guaranteed by the strengthening and maintenance of the dense halophilic vegetation of the salt marshes that populate these territories (Bonometto 2014). The second are the reclaimed territories with mechanical drainage kept artificially dry by embankments and water pumps, which extend from Ravenna to Grado along the entire edge of the Upper Adriatic and which will require a radical rethinking depending on the average sea rise, on the necessary energy transition and the consequent de-polderization of parts of the soil. To these territories are add-

►1 ‘Undisturbed coastal wetlands are a powerful carbon sink, with long-term carbon sequestration rates up to 55-times faster than tropical rainforests [...]. Coastal wetlands store significant amounts of atmospheric carbon – on average 512 tonnes carbon per hectare for seagrass, 917 tonnes carbon per hectare for salt marshes and 1,028 tonnes carbon per hectare for mangroves [...]. This blue carbon is stable and can remain for hundreds or thousands of years’ (Ramsar Convention on Wetlands 2021, pp. 37-38).

►2 ‘Among these are: the erosion of the coasts and the rising of the sea due to climate change; the introduction of alien species; uncontrolled population growth and urbanization; the eutrophication of water linked to the excessive release of nutrients; settlement or tourism activities that threaten the precariousness of natural ecosystems; the production systems that cause water and soil pollution; economic activities that challenge the traditional production systems linked to these fragile areas’ (Tosi, De Marchi, and Pace 2021). See also in this regard Ramsar Convention on Wetlands (2021).

ed the spaces on the edges of the rivers of the drainage basin of the lagoon, which will increasingly assume the role of integrated infrastructures, amphibious places to give more space to the lamination of the waters in the event of a flood, ecological corridors, biodiversity deposits, buffer strips for the purification of surface water, and linear parks for leisure time. It is in these places at the extremes between land and water, when the environment becomes wilder and the presence of man apparently more discreet, that it is easier to understand the true essence that characterizes the construction and maintenance project of an amphibious territory.



Map by Antonio Vestri depicting the *status quo* after all the main rivers have been deviated from the lagoon. 1709.

Archivio di Stato di Venezia, Savi ed Esecutori alle Acque, Disegni, Diversi 109

The water spaces of the dead lagoon are most evident through the project for permanent construction and maintenance of a liquid world that is only apparently natural and in reality is defined and preserved in all its parts by man. An environment whose water depth varies from twenty centimetres to one metre, regulated by the daily oscillation of the tides and which owes its ecological health to its amphibious conditions, and for this reason is kept in perennial suspension between the ancient risk of landfill and the opposite and more current risk of the deepening of waters. It is here that it is still most evident today that the space of the entire lagoon was (and will always be) the result of a centuries-old project of modelling the soil and corrugations of the earth, aimed at the diversion of water and the definition of limits and equilibria that are hydraulic and biological but also political, social and legal. The result of this 'training' project for the current and permanent micro-modelling of surfaces are the territories that were initially marshes and then became stable emerged lands, portions of the mainland that became *ghebi* and *barene*, wetlands gradually transformed into fishing valleys and then salt marshes, sometimes natural, sometimes trained by man, to whom we owe the healthiness and oxygenation of the shallow lagoon beds. Naturally unstable territories modified in the long term by a society and a culture, that of Venice, which has gradually refined to the point of remodelling not only the natural elements but also its own history, its very origins.

Foundation myths, remodelling stories

The history of Venice is full of myths. The origin of Venice as a republic born free and founded in wild uninhabited lagoon territories by the people of Altino fleeing from Attila's army has been dismantled by authoritative studies (Dorigo, Codato, and Venchierutti 2002) (Calaon 2014) which have shown how some portions of the lagoon were centuriated in Roman times. Not only that: historians such as Cassiodorus and Procopius tell how these territories were already shaped at that time by water infrastructures such as canals and *fossae transversum* that guaranteed the intra-lagoon passage (Canal 2015, p. 24). A sea level on average between 2 and 2.5 metres lower than that of the present, in fact, from the 1st century AD onwards allowed for a massive colonisation of the territory; where there were still areas covered by water, such as

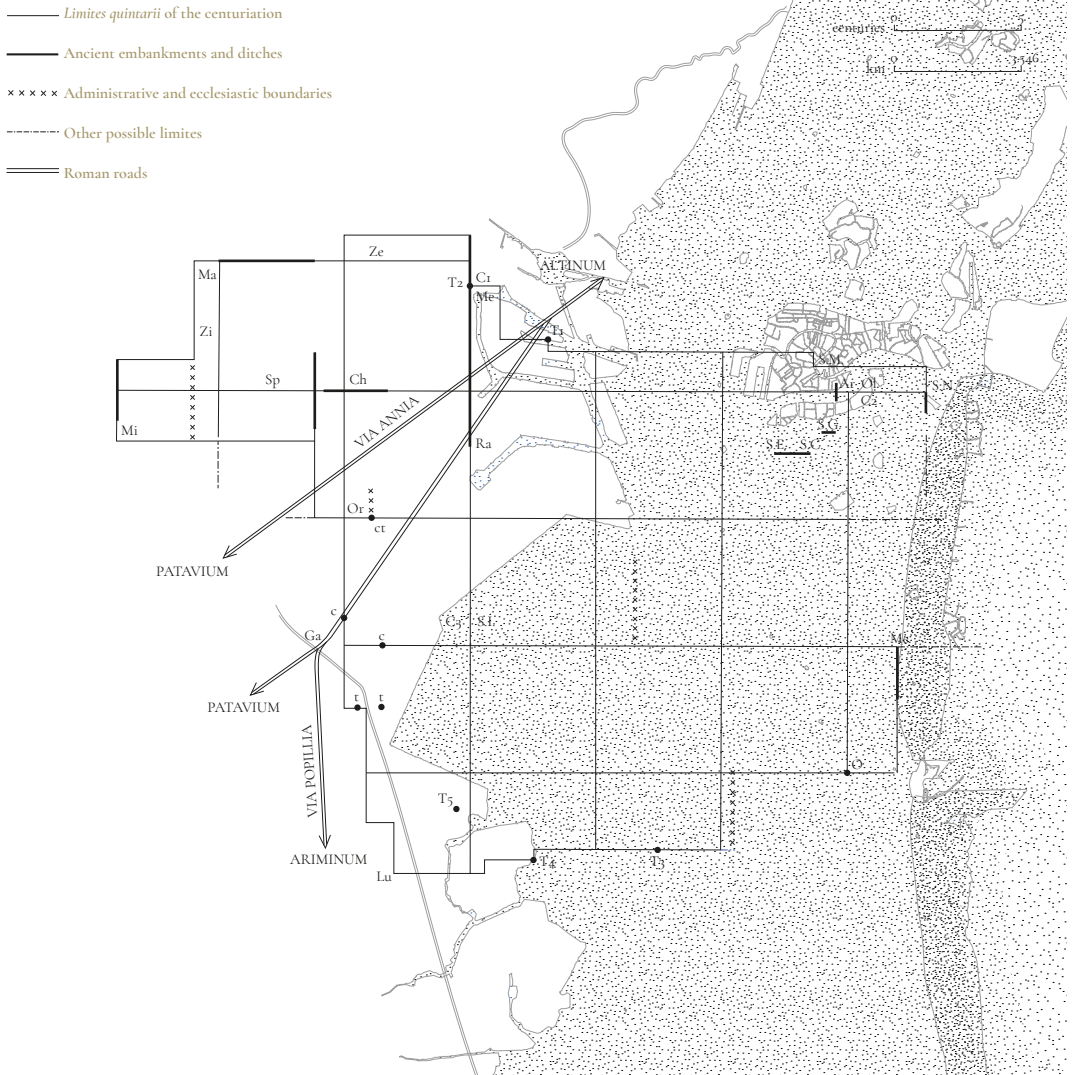


Diagram of the Roman centuriation *Patavium III* (“mestrina”) superimposed on the Venice lagoon contours.

Drawing by the authors after the original diagram published in Wladimiro Dorigo, *Venezia Origini*, Vol. 1, 83.

Localization of sites: Ma: Maerne; Zi: Zigarago; Mi: Mirano; Sp: Spinea;
 Ze: Zelarino; Ch: Chirignago; Or: Oriago; Ga: Gambarane; Lu: Lugo;
 Me: Mestre; Ra: Rana/Ponte di Bottenigo; S.I.: S. Ilario; S.E.: S. Eufemia;
 S.M.: S. Michele; S.C.: S. Croce; S.G.: S. Giorgio; Ar: Arsenale; Ol: Olivolo; O: Otragono; Me: Metamaucio; S.N.: S. Nicolo di Lido;
 Cl: Castello di Mestre;
 C2: Castel Olivolo; C3: Castel S. Ilario; Tr: Torre di Marghera; T2: Torre di Mestre; T3: Torson di Sotto; T4: Torson di Sopra; TS: Torre di Curan;
 c: confine; t: termine.

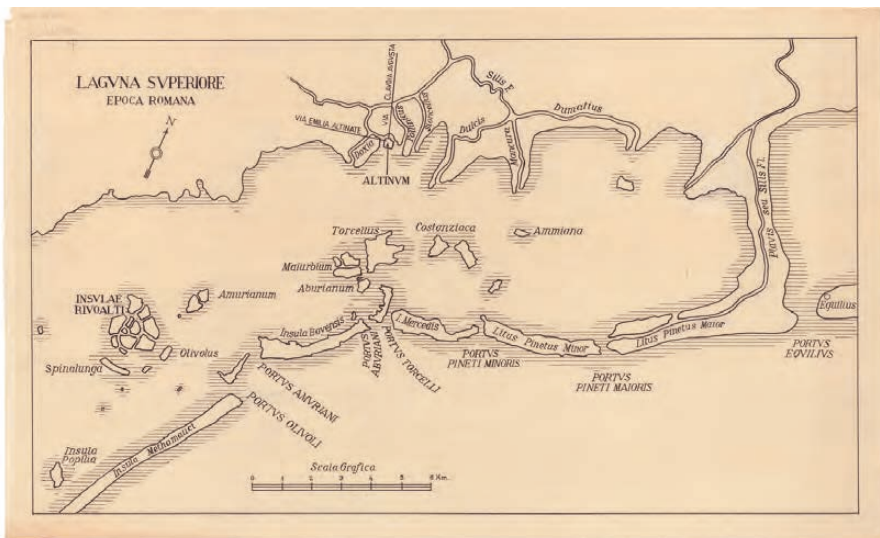
the marshes near the Lido and Pellestrina, salt pans were later located (Canal 2015, pp. 11, 51–52, 64). Starting from the 4th century, the increase in the salinity of the water and the rise in sea levels pushed the inhabitants of these areas to the construction of works to raise and refill lagoon land. As a consequence of the repetition of these events over the centuries, every significant increase in sea level corresponded to a real ‘break’ from the settlement point of view (Canal 2015, pp. 24, 28, 65).

Between the 9th and 12th centuries the archaic territory was radically remodelled by the action of rivers and the sea. Incessant human action tried to oppose it through a capillary series of small interventions to cope with the degradation of habitability conditions and the construction of embankments-roads that today signal climate and sea level changes (Canal 2015, p. 206). This action made it possible to save some fragments of land that emerged, passing from a widespread ancient colonisation to targeted settlements of a monastic and military character in the early medieval period. Venice was morphologically formed in parallel with the evolution of the lagoon, with the abandonment in 810 AD of the ancient dogal seat of Malamocco hit by a fearful environmental crisis and its transfer to today’s Rialto. A process of ‘islands which, through desperate synechism, become cities’ (Dorigo 1995, p. 164). In that period, in fact, ‘two destinies of conservation (of the city and of the lagoon) were indissolubly welded in the face of two destinies of death, implying aspects of ecological policy and public works that can be united in a defensive strategy (mythical element of resistance to Pepin) and of integrality of the environmental-urban nexus, which tended to re-signify the ancient extensive and polycentric conception of the Duchy, from archaic communities of *populi* (Torcello, Chioggia, Rivoalto, Murano) to Rivoalto’s hegemony. The lagoon was conceived and manipulated for the life of Venice’ (Dorigo 1995, p. 181).

This infinite process of stratification and remodelling of the territory has left indelible traces, both on the surface and below it. A process confirmed by the discovery in the area of the Venice lagoon of remains from the Neolithic age at about 6 metres lower than the current ground level and at about two to three metres lower compared to the Roman age (Leonardi 1960, pp. 85–86). Geological, archaeological and historical studies testify how the coastal strip of the upper Adriatic and its system of coastal

lagoons –of which that of Venice is a part– constitute a fragile and unstable system, once punctuated by numerous river mouths that have now disappeared. The interdependence of physical and biological factors has given rise to phenomena that in the past millennia have had a strong impact on human activity and settlements in the area. Settlements but also mobility infrastructures, as evidenced for example by the traces found in a double system of road and water transport in Roman times between present day Chioggia and Jesolo (Dorigo 1995, p. 151).

It is evident how archeology –suitably combined with and supported by morphological and environmental data– in the lagoon context can prove extremely relevant not only in producing knowledge about the past, but also in defining scenarios for the future concerning the cyclic repetition of phenomena such as sea level rise. Hand in hand with archaeology, a long-term geographical reading of what is the ‘support line’ (Febvre 1980) on which Venice is built is fundamental. That is the upper Adriatic, and even more specifically, the water space of the lagoon. A non-homogeneous space, defined by two main complementary environments, with mobile and porous borders: the living lagoon and the dead lagoon.



Reconstruction of the the central and northern Venice lagoon morphology in Roman times by Eugenio Miozzi
 Università Iuav di Venezia, Archivio Progetti, Fondo Eugenio Miozzi, pro/023.

Elements / Key concepts

The lagoon as a
transition space
