

# 22@ Barcelona: exporting the model

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## I. Introduction

The 22@ Barcelona plan began as a unique opportunity to recover the productive potential of Poblenou and create a major centre for scientific, technological and cultural activity that would make Barcelona into one of the main platforms of innovation and the knowledge economy in the international arena.

With this idea in mind, Barcelona is transforming the industrial district of Poblenou, which was the city's main economic driver for over a hundred years, into a new model of a knowledge area that promotes collaboration and synergies between universities, government and companies to boost the development of a culture of talent and knowledge.

The Poblenou neighbourhood is situated in the Sant Martí district, which houses the past and the future of Barcelona in the same territory. This combination is particularly obvious in the transformation of the old industrial Poblenou into the new technological 22@ district.

Poblenou occupies almost all the eastern quadrant of the Eixample area that was designed by Ildefons Cerdà in 1859. During the second half of the nineteenth century and the first half of the twentieth century, most of the city's industry was located in this area and it became known as the 'Catalan Manchester'; an industrial zone that was based on the textile sector and subsequently diversified into the mechanical, chemistry and food sectors. In the 1960s, the area began to decline as a result of the new dynamics of industrial location resulting from the need for large-scale production and the improvements in mobility systems. Both of these factors led to the creation of spe-

cialized plots in metropolitan corridors and the metropolitan ring, which in turn brought about the relocation of traditional industry out of the city centre. This process became more pronounced in the recessions of the 1970s and 1980s, and led to the physical and economic degradation of the area.

The transformation of the industrial zones of Poblenou began with interventions carried out for the 1992 Olympic Games, including the construction of the Vila Olímpica (Olympic Village) and the ring roads, the restoration of the coastline, as well as actions to open up Avinguda Diagonal.

At the end of the 1990s, this new perspective led to an interesting discussion about the future of the 200 ha of remaining industrial land in Poblenou, whose uses were increasingly precarious and on which there was considerable pressure to bring about transformation for housing. Previous actions had led to a change from industrial to residential use, and the complete transformation of existing structures. In contrast, the approval in 2000 of the 'Modification of the General Metropolitan Plan to redevelop industrial areas of Poblenou, the 22@Barcelona district of activities' made a decisive, unequivocal commitment to maintaining the productive potential of this territory, and to bringing about progressive urban transformation over time. This would be achieved through regeneration of the industrial zone by revaluing its architectural environment and improving the quality of public spaces. However, actions would not follow the conventional method of working by areas that completely changes the urban structure. Instead, a balance would be created between what is kept and what is renovated. This method would enable

new urban images to be created in a context of continuity with the preceding forms.

Therefore, the plan's objectives are the urban and economic renewal of Poblenou through the proposal of a compact, diverse model of a city. Instead of promoting specialization of the territory by (industrial) uses, it opts for a combination that fosters social cohesion and leads to urban and economic development that is more balanced and sustainable. Thus, new economic activities coexist with research, lifelong learning and technology transfer centres, housing, facilities and shops in a high-quality environment in which the density is compatible with balanced provision of open spaces and facilities.

The 22@ Barcelona plan modifies the characteristics of the 22a industrial zoning regulations for Poblenou by introducing a new urban development classification, that of 22@, for land uses and building intensity in the new subzone. The regulations define a new classification for facilities, known as 7@ facilities, creates new standards for the complete redevelopment of the area, establishes the rights and duties of land owners and determines the resulting planning methods and mechanisms for carrying out the transformation. The Special Infrastructures Plan (PEI) for Poblenou, which specifies the provisions in the 22@ Barcelona plan for infrastructure and service networks, was approved on 27 October 2000.

Through a system of incentives that improve the urban development of the area, with a progressive increase in uses and building area from 2 m<sup>2</sup> of gross floor area/m<sup>2</sup> of land to 3 m<sup>2</sup> of gross floor area /m<sup>2</sup> of land, the urban renewal processes contribute to the redevelopment of all of the streets and the renewal of infrastructure, an increase in the quality and capacity of urban services, and the reorganization of mobility. In addition, land is transferred free of charge to the community. This land was initially 100% private, but as a result of the transformation, 30% will be made public for the creation of new green areas, facilities and social housing. The presence in the district of @ activities shall also be promoted. These are activities in which talent is the main productive resource. They are all basically urban activities that are intensive in the use of space and information and communication technologies, and dense in the number of qualified workplaces that are generated.

Thus, the progressive transformation of industrial land shall help to resolve the area's historical shortcomings, and to recover the social and business dynamism that characterized Poblenou in the past.

From the beginning of the project in 2000 to 2011, the 22@ Barcelona municipal company has carried out an urban redevelopment project that involves the creation of a diverse, balanced environment in which the most innovative companies coexist with research, training and technology transfer centres, shops, dwellings and green zones that promote social and business dynamism.

After an initial stage that basically involved urban renewal, from 2004, 22@ Barcelona began a new phase of intense economic and cultural renewal. Around forty projects are being carried out to create areas of European excellence in sectors in which Barcelona could attain international leadership: the audiovisual sector, information and communication technologies (ICT), media technologies, energy and design. This is achieved by creating clusters in the 22@ territory of companies, public organizations and leading science and technology centres in the aforementioned strategic areas of knowledge.

Clusters are one of the most competitive options for development and consist basically in groups of actors (universities, technology and research centres, companies, government, private and public financial resources) that are interested in working together to find synergies in a specific economic sector. 22@ Barcelona gives clusters the opportunity to grow in their natural habitat: the city. As a result, 22@ Barcelona promotes urban modernization and social progress in the district and the city.

These areas of excellence enable the creation of a dynamic model of innovation based on the 'triple helix' concept. The model fosters the convergence of government, universities and companies so that the synergies generated between these strategic agents increase the competitiveness of the productive system and contribute to the creation, growth and consolidation of quality employment.

22@ Barcelona participates actively in the economic promotion of the district, innovation and the international reach of its business, science and teaching activity. It leads a range of projects and provides companies with various support services.



FUTUR PLATAJÓ INTERMODAL  
PLAÇA DE LES GLÒRIES CATALANES

COL·LEGI SORDIU MUNICIPAL LA NAU DEL PORT

UNIVERSITAT DE CATALUNYA

CENTRE DE BARRI ESTRELLA DE GALVÀ

EQUIPAMENT SINDICAL

MUSEU D'HISTÒRIA DE BARCELONA

CENTRE DE BARRI ROSELLÓ

CAMP DE SANT SORDIU POBLET NOU

JARDINS DE JOSEP TRUETA

JARDINS DE GANDHI

PLAÇA DE JULIÀ GAY

PROJECCió S'ESSOL M30A

CEMENTIRI DE L'EST

CAMP DE SANT SORDIU

PLATJA DE LA NOVA ICÀRIA

PLATJA DEL BOGATELL

PLATJA DE LA MAR BELLA

PLATJA DE LA NOVA MAR BELLA

PORT OLIMPIC

CEN·TRES TEORÈTIC



MERCAT DE  
TARIBAGAT

EDIFICI ENI GARRI  
CENTRE DE BARRI  
BARCELONA PERU

CENTRE CIVIC DE BESOS  
BIBLIOTECA RAMON SOR  
L'ESPIONER

MEMÒRIE  
EMERSON

CENTRE DE  
BARCELONA

EDIFICI  
BUICO ME  
RESIDENCIAL  
ESTUDIANTS

PLAÇA DE CAL DE COMERC  
NOU CENTRE NAVEGACIÓ DE  
BARCELONA

CASAL JOAN  
MARABALL

CENTRE COMERCIAL  
TRINIDAD MAR

EDIFICI FORUM  
MUSEU DE CIÈNCIES  
NATURALS DE BARCELONA

EDIFICI DE BELLESGUARD  
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BARCELONA UNGA BARRI

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FUTUR EMPLAÇAMENT  
DE 700 HABITANTS

PLATJA DE  
LLEVANT

- ÀMBIT 228 - 228 Ares
- LINEA ROJA: PLÀNIA D'INTERVENCIÓ
  - LINEA VERDA: PLÀNIA D'ANÀLISI D'OPORTUNITATS
  - LINEA BLANCA: PLÀNIA DE DETALL
  - Habitatge - Vivienda - New housing
  - Activitats productives - Actividades productivas - New productive activities
  - Equipaments - Equipamientos - New facilities
  - Previsió d'equipaments - Previsión de equipamientos - Planned new facilities
  - Serveis tècnics - Servicios técnicos - Technical services
  - Noves zones verdes - Nuevas zonas verdes - New green areas

## 2. Process instruments

In a short period of time during the second half of 2000, the Modification of the General Metropolitan Plan was approved to redevelop the industrial areas of Poblenuu (MPGM 22@). The Special Infrastructures Plan (PEI) was also approved, and the 22@ Barcelona municipal company was founded. Subsequently, governance decisions were adopted (the Mayor's Office Decree of 19 March 2001 and the agreement of the Plenary Meeting of 22 March 2002) and various committees were formed (the Advisory Committee, Technical Committee and Heritage Committee) to give the company the tools it needed to carry out its task.

These three factors, the MPGM 22@, the PEI and the 22@ Barcelona company, are all singular and innovative. Together they comprise an inseparable unit that is also singular and innovative.

1. Although it is brief, the MPGM 22@ is notable mainly because: a) it establishes specific guidelines and a clear framework of reference, with a wide range of transformation mechanisms adapted to the situation; b) it includes in the urban discourse some structures that go far beyond standard urban development; c) it incorporates economic promotion as a crucial objective, beyond the promotion of a real estate product that has no content; d) it systematizes mechanisms for recovering capital gains to re-balance urban and social aspects (subsidized housing, facilities and open spaces); e) it gives the different operators a leading role; and f) it opts for the recovery of historical heritage and for the maintenance and renovation of housing stock.

2. The PEI is notable because, more than a conventional urban development project, it is a comprehensive plan that focuses on high-quality service networks that incorporate new technologies and meet sustainability criteria. It also takes into account the productive potential of the territory.

3. The 22@ Barcelona company is notable because it was created as a direct management body attached to the City Council. It integrates an overall vision for the entire district of 22@ activities and for all the stages in each transformation as a single, continuous process. This

process ranges from the identification of specific realities in each case to the introduction of new activities, as well as: a) the identification of needs; b) the establishment of objectives; c) urban development planning to regulate not only physical aspects, but also contents; d) management to obtain land and resources to implement plans and infrastructure; e) the execution of infrastructure; f) the support of agents to bring together supply and demand and ensure that the real estate product is filled with content; g) the creation of public facilities and the generation of clusters and business networks that are cornerstones and in which operators interrelate and cooperate in projects at local and global scale (university, company, government, users, etc.); h) the renewal and extension of housing stock, with particular attention paid to those affected; i) the promotion and monitoring of administrative procedures, among others.

The basic organization of the 22@ Barcelona company clearly reflects the objective of carrying out the tasks that it has been given. The company is divided into the following areas: urban development planning, urban management, infrastructures and economic promotion, as well as cross-cutting areas that support the others. All of these are established under their own management, but they are not independent. Instead, they are totally interdependent and interrelated, and have some common objectives.

The company has been present and active in the process of territorial transformation since the beginning, in the stages of drawing up and processing the planning and urban management, in the urban development and redevelopment of roads and public spaces, in the creation and extension of service networks and infrastructures, and in the reception and management of galleries, technical rooms and other spaces, etc.

In parallel to these physical transformation processes, the company collaborates with property developers, companies and institutions to facilitate their establishment in the area and actively incorporate them into clusters and leading business networks. All of these tasks are carried out with a cross-cutting, interdisciplinary approach and are the driving force behind the 22@ Barcelona company.

### 3. Urban development and infrastructures

#### 3.1. Urban planning

The old industrial area of Poblenou is characterised by the superimposition of irregular, diverse urban fabrics, due to the fact that the land has been used over a long period of around 200 years. The construction logic was determined by the industrial production needs, the position of dwellings in relation to workplaces and the connection with the city and infrastructures.

The result of this process was the coexistence of a rich diversity of urban fabrics. Despite the regular grid of the Eixample, Poblenou is clearly distinguished by considerable variations in a series of alignments, traces of agriculture, old industrial premises, narrow streets, as well as buildings with a range of dimensions, uses and styles that form the urban fabrics. Cerdà's grid takes on very different hues in each part of Poblenou and in comparison with the rest of the city.

With this complex reality as a starting point, the general planning regulations do not determine the final result of the transformation, unlike traditional urban development plans. In other words, they do not establish detailed, precise urban planning for the territory. Instead they promote its gradual redevelopment over a twenty-year period. The redevelopment is adapted to the existing structures, so that the industrial and residential buildings that are maintained are integrated with the new buildings, to create fabrics with combined functions and complex forms, in an environment of great cultural value that brings together tradition and innovation, and fosters continuity in the process of urban evolution.

To promote this transformation of the territory and attain a balance between replacement and the permanence of fabrics and representative elements of the neighbourhood's industrial past, a flexible system of transformation mechanisms has been established. Various types of derived plans are adapted to the different situations and requirements, and enable projects of different dimensions to be promoted, including direct interventions on existing plots or buildings, plans that cover an entire block, promoted by the private sector, and the six public initiative plans for predetermined areas that transform axes or strategic areas, act as benchmarks, condense the urban fabric, and are drivers of

transformation in the project. The predetermined areas are: Perú-Pere IV, Parc Central, Llull-Pujades-Llevant, Llacuna, Llull-Pujades-Ponent and the Audiovisual Campus. They have a combined surface area of 925,482 m<sup>2</sup> of land and represent 47% of the total area of transformation.

The development of the plan through derived planning instruments has enabled the transformation to be adapted to the real characteristics of each territory, through a detailed study of the fabrics, buildings and uses. Thus, the range of elements to maintain has been increased from those initially included in the general planning (heritage buildings of interest, residential facades and industrial buildings above grade). Additionally, land divisions, buildings and, in short, urban fabrics shall also be kept.

#### 3.2. Urban development management

In terms of implementation of the planning, 22@ Barcelona is responsible for promoting, drawing up, processing and monitoring the urban development management instruments envisaged for the areas of action outlined in the planning. In the first few years of the 22@ project, many of the plans that were approved were the result of public initiative and related to management in areas of action also through public initiative. Most of these plans were approved and are either completed or in very advanced stages of implementation. In recent years, the number of private initiative developments has increased. Private planning and management proposals have been submitted and processed and are now in various stages of implementation.

In any case, one immediate, essential consequence of the drive to implement urban planning is the description of the transformations in physical, legal, economic and social orders. These generate and impose expectations and obligations, benefits and charges, rights and duties. The most specific task in urban development management is compliance with various urban development obligations, charges and duties, including: the payment of charges and compensation for those affected; the relocation of activities; the rehousing of residents; demolitions of buildings; soil remediation; compulsory cession of land for facilities, open spaces and public uses and subsidized housing; payment of the costs of urban development; and the provision of infrastructure, among others.

In the first ten years since the launch of the 22@ plan, urban development management, an activity with a high legal content, has been affected by considerable changes in the legal framework and a series of rulings on the few disputes that have arisen, which not only questioned the initial model but also strengthened and consolidated it.

### 3.3. Infrastructures

In addition, the 'Modification of the General Metropolitan Plan' envisages the provision in the district of new infrastructures that meet the current urban development, social, economic and environmental needs, and fulfil criteria of sustainability, and competitive service provision. A new standard of urban development is determined that goes far beyond the traditional model. Through the Special Infrastructure Plan for Poblenou, the new standard specifies the basic elements and main characteristics that must be included in plans for the surface area and the service networks.

The Special Infrastructure Plan details the urban development of the district (including 37 km of roads), and specifies the urban development charges and the needs for each service. It provides a comprehensive solution that reconsiders the role of public spaces and private community spaces to support the infrastructures that coexist with the current networks.

Notable aspects of the Special Infrastructure Plan are the creation of a district heating and cooling system that reuses heat from the waste recovery plant in the Forum and has considerable environmental advantages; the development of a pneumatic waste collection system for selective collection; and the installation of fibre optic networks that reach all buildings. The urban development's finishing will be sober, in line with what is already found in the Eixample, and the pavement at crossroads between blocks have been widened to gain space for pedestrians.

With respect to the planning of works, and to ensure the availability of services in the new urban developments, the PEI specifies the construction of proximity and coverage networks for the entire area. These activities represent 30% of the total budget for the planned actions.

## 4. Economic development

### 4.1. Promotion of urban clusters

In 2004, to strengthen and highlight the physical transformation (urban development and infrastructures) of the 22@ Barcelona district, economic activity promotion policies were implemented that focused on emerging sectors in which a competitive position could be obtained at international level, including the audiovisual, information and communication technologies (ICT), medical technologies and energy sectors. In 2008, a new line of action was launched in a fifth strategic, relevant sector for Barcelona: the design sector.

The aim of promoting urban clusters in the 22@ territory was to increase the innovative capacity of companies through the creation of productive environments that bring together leading companies, institutions, public agencies, universities and research, development and innovation centres in each sector. The clusters promote innovation value chains for each sector, through science-technology-company-market projects. Companies in the district benefit from an innovation ecology that increases their capacity to compete internationally.

Each of the five clusters in 22@ is at a different point of development depending on its characteristics and level of maturity. In 2010, projects that had started in the previous years continued, and some new projects began. In all cases, the method followed in 22@ Barcelona has been based on establishing close relationships with an entity that manages the cluster and draws together the sector. This entity has the mission, shared with 22@ Barcelona, of boosting companies' competitiveness.

In 2007 and early 2008, strategic plans were drawn up for the following sectors: ICT, audiovisual, energy and media technologies. In 2008, operational plans were drawn up to implement the strategic plans and a model of governance and management was designed for each cluster. The strategic plan for the design cluster, which is jointly led by the Barcelona Design Centre (BCD), was drawn up in 2009 and the cluster was recognized by the Spanish Ministry of Industry (MITYC) as an Innovative Business Cluster (AEI).

In the past, 22@ Barcelona collaborated on the creation of sector-based centres for technology transfer (CTs).

These centres act as instruments to connect research (universities) and companies. 22@ Barcelona helps to consolidate these centres, which include the Barcelona Media Foundation in the audiovisual sector, and the Barcelona Digital Foundation in the ICT sector. In 2009, 22@ Barcelona supported the creation of a technology centre for medical technologies and helped to consolidate the Catalonia Institute for Energy Research (IREC), which together with b\_TEC is leading the energy cluster.

#### 4.2. Business establishment and support

In 2008, the 22@PLUS initiative was launched to meet the strategic objective of strengthening support for companies seeking to move to 22@. Work on this initiative continued in 2009 and 2010. 22@PLUS is conceived as a value proposal for companies that are studying the option of moving to the district. It is comprised of a catalogue of services in which the added value elements of 22@ are presented: technology infrastructure, knowledge infrastructure, business cooperation networks, clusters strategy, access to public and private funding, access to talent, access to the market, facilities and innovative spaces for companies and entrepreneurs, platforms for companies landing and taking off, among others. Part of this service is Business One Door, by which a company that wants to move to the district is supported throughout the process. It is given the information required to join a cluster and to access the services and tools available in 22@ Barcelona.

The programme of actions of the 22@Network, which is the association of 22@ companies, aims to facilitate the integration of companies, institutions and their employees into the area, and to strengthen relationships between them and the Poblenou neighbourhood and its rich fabric of associations. One very effective instrument has been the monthly 22@Update Breakfasts, which are organized in conjunction with the 22@Network to discuss current business issues and to bring together and connect companies located in the 22@ district.

To support and adapt spaces offered in the district to ensure that they meet company needs, marketing tasks have been coordinated with property developers and real estate consultants.

## 5. 22@: 2000-2010

### 5.1. Urban planning

Planning is the first phase in the urban development process. The next stage is urban development management and the final stage is new building or renovation projects.

The process of transforming Poblenou's industrial areas has been carried out through a series of actions that have been implemented over the ten years of the project. In the middle term, these actions ensure substantial changes in the physical environment, in the presence and type of companies and institutions in the territory and, consequently, in the types of relationships established between the people who coexist there.

The total surface area of 22@ covers almost 200 hectares. Of these, the area for redevelopment (land that is not classified as roads) is 1,323,357 m<sup>2</sup>, that is, over 130 hectares. The final aim of the plan is to create almost 4,000,000 m<sup>2</sup> of gross floor area above grade for production spaces, dwellings, technical services and facilities.

A total of 47% of the 200 hectares corresponds to six areas that will be developed through predetermined, public initiative plans that have already been definitively approved, although some still require work on certain areas through specific plans.

The planning stage has been completed for more than 68% of the redevelopment area. This represents 2,975,161 m<sup>2</sup> of floor area and 909,332 m<sup>2</sup> of land. Of this area, 123,678 m<sup>2</sup> of land is classified for facilities and 148,388 m<sup>2</sup> for green zones. In addition, the planning that has been carried out defines conditions for the development of over 3,000 dwellings as part of a public subsidized housing scheme.

In terms of the number of planning instruments, in the ten years since its launch, 127 plans have been approved definitively for the 22@ district, of which 80 have been promoted by private initiative. In private initiatives, the plans that are being processed have been monitored and advice and guidance given to the teams responsible for drawing them up. Information has also been provided for the interested parties during the process. The plans define the position of land for private use and land to be transferred to the

municipality for social housing, facilities and green zones, the characteristics of the new buildings and all of the urban development parameters that, after the processes of urban development management, enable the implementation of building projects and the marketing of the resulting real estate products.

The 'Modification of the Special Plan for the Protection of Architectural Heritage in the District of Sant Martí. Industrial Heritage of Poblenou' was approved in 2006. It incorporates urban planning for existing structures in the area. The Special Protection Plan includes 68 elements and industrial buildings, in addition to the 46 that were already protected. This demonstrates even more clearly that the Poblenou extension area has its own urban structure that differs from that of the central Eixample district.

In addition to planning for the 22@ district, plans have also been developed for outside the boundaries of the urban development area, notably the 'Diagonal-Besòs Interuniversity Campus', which covers almost 8 hectares. The uses envisaged for the future Campus are focused on university activity, including teaching, research, technology transfer and services for the university community, as well as other research and innovation activities associated with the core areas of the new Campus: energy, mobility, water and sustainability.

In addition, the Modification of the General Metropolitan Plan for the historical centre of Poblenou, which covers around 43 hectares of the district, has been modified and the Heritage Catalogue has been expanded. This Catalogue has the following main objectives: a) maintain the general character of Poblenou as a neighbourhood with urban streets (old streets, narrow streets and urban extension area streets); b) identify and protect the buildings and groups of buildings that are most relevant in terms of architectural and urban development heritage in the defined area (currently there are 12 elements catalogued; this number will rise to 65 elements that have some kinds of heritage protection and 492 buildings with urban development protection); and c) promote actions to redevelop instead of replace.

Up to the end of 2010, eleven green areas had been developed covering a total of 26,226 m<sup>2</sup>; a total of 14,224 m<sup>2</sup> are under construction; and 33,073 are being

designed. Up to 31 December 2010, a total of 101,132 m<sup>2</sup> of gross floor area above grade had been built for facilities. In the first half of 2011, another 7,000 m<sup>2</sup> had been completed. Examples of the completed facilities include: Ca l'Aranyó/Pompeu Fabra University, the Media-complex building, Can Jaumandreu, CEIP Llacuna, the MediaTIC building and the Audiovisual Council of Catalonia (CAC).

With respect to subsidised housing, up to the first quarter of 2011, the 22@ plan had already drawn up planning for the urban development of over 75% of the subsidised housing envisaged. A total of 1,160 dwellings have already been built and a further 410 are under construction, which brings the total to 1,570. In addition, a permit has been granted for a further 96 dwellings, whose construction should begin in the near future. The 1,666 dwellings, plus the 445 whose management has been approved, amounts to over 50% of the 4,000 envisaged in the 'Modification of the General Metropolitan Plan'.

Up to the end of 2010, permits had been granted for a total of 1,401,789 m<sup>2</sup> of gross floor area, of which 959,847 m<sup>2</sup> are above grade and 441,942 m<sup>2</sup> are below grade. The distribution of this floor area by use is 70% for financial activities, 17% for dwellings and 13% for facilities.

## 5.2. Urban development management

From the start of the 22@ plan to the end of 2010, a total of 190 management instruments were promoted, including agreements. These directly involved over 900 people, including individuals and legal entities, and affected around 270 activities, most with 2 or 3 employees, which required compensation and relocation, and around 80 dwellings whose inhabitants had to be rehoused.

The land managed throughout this period amounts to around 625,000 m<sup>2</sup> (approximately 47% of that envisaged in the 22@ plan), of which around 200,000 m<sup>2</sup> will be transferred to municipal ownership for open spaces, facilities, roads, subsidised housing and economic activity. This land will have a managed area of 1,920,000 m<sup>2</sup> of gross floor area, of which 120,000 m<sup>2</sup> of gross floor area will be transferred to public ownership for subsidised housing and a further 30,000 m<sup>2</sup> of gross floor area will be transferred to public ownership for economic activity.

Finally, private property developers have participated in urban development management, with 45.26 million euros of funding for the Special Infrastructure Plan, and the City Council has taken in 24.55 million euros in compensation for the value of compulsory transfers that cannot be carried out physically.

### 5.3. Infrastructures

The Special Infrastructure Plan (PEI) envisages the redevelopment of 37 kilometres of roads, determines the urban development charges and the needs for each service, and offers a comprehensive solution that reconsiders the role of public spaces and private community spaces as an infrastructure support.

The redevelopment of 98 stretches of roads has been completed, and a total of fifty projects have been carried out. Consequently, about 40% of the PEI has been executed, with around 14,400 lm (linear metres) of roads resurfaced out of a total of 37 km and an urban development area of almost 310,000 m<sup>2</sup>. All of the corresponding infrastructures have been transformed, including the over 5,100 ml of new sewers and the 34,820 ml of ductbanks (for electric and telecommunications cables), as well as 44 galleries constructed and three more underway.

To strengthen these new infrastructures, two new pneumatic waste collection centres have been built as well as an electrical substation. A district heating and cooling system is being constructed in Carrer Tànger, whose expected completion date is 2011.

One singular project is the extension and adaptation of the historical chimney at Ca l'Aranyó for use as an exhaust for fumes from the future heating and cooling system substation.

The introduction and continuity of renting dark cable has also been important. A total of 41 km of fibre have already been installed to serve the companies in the district.

To sum up, the main indicators in the first ten years are as follows: 98 stretches of road completed; 44 public galleries; 880 lm of public galleries; 2,200 lm of private galleries; 13,100 lm of cooling and heating network; 59 clients connected to the heating and cooling network; 11,050 lm of pneumatic waste collection network for municipal waste and 65,112 lm of ductbanks.

### 5.4. Economic development

The transformation of the district has enabled the installation of ten university centres with over 25,000 students, and 12 research and development and technology transfer centres. The latest business census carried out within the geographic area of 22@ Barcelona has shown a continuous increase in companies established in the area since 2000.

This census, which was drawn up several years ago, excludes individuals (freelancers) and companies in the sectors of trade, hotels and catering, construction, real estate activities, travel agencies and bank offices. If we take these exclusions into account, on 31 December 2009, the number of companies established in 22@ Barcelona since 2000 was 1,502, which is 4.2% more than in the 2008 census. Thus, in terms of evolution and despite being in the most severe recession in the last 70 years, 22@ Barcelona continues to grow in the number of companies. This fact has a direct influence on the financial activity of all the shops, hotels and offices in the area.

Out of the new companies set up in the 22@ Barcelona district in 2009, 50.7% provide business services, 21.9% manufacturing industry services, and 9.6% personal services and other social activities.

The pace of economic renewal in the district is clear and, despite the current economic climate, the rate of installation is obviously positive. Thus, between 2000 and 2003, a total of 489 companies set up in 22@ Barcelona; between 2004 and 2006 the number was 552; and during 2007 and 2009, it was 461.

The latest data on the number of workers, which were drawn from the business census, indicate that the number of workplaces within the geographic area of 22@ Barcelona has risen to reach 44,600.

The rise in the total wage bill for the district is due to the increase in the number of companies and in the workforce of companies that are already present in the zone.

In 2009, half of the companies (51%) had not experienced any changes in the number of employees, 24% employed less people and 21% employed more. The large companies and those dedicated to ICT are those that, in proportion, experienced the most growth in the creation of workplaces. The proportion of knowledge- and tech-

nology-intensive activities was considerable. Thus, 74.2% of the 1,500 companies (1,114) were dedicated to activities considered @, which highlights the relevance of the new economy in the district.

In fact, many of the companies that have folded in recent years were involved in the manufacturing industry, whilst the 'new economy' has been able to attract more companies and workers and has helped 22@ Barcelona to grow and create quality employment for the city. In comparison, in Catalonia as a whole, @ activities account for 58% of the total economic activities.

A study of companies who carry out their activity within the geographic region of 22@ Barcelona estimated that their turnover was approximately 6 billion euros, which is 300 million more than in 2008; that is, 5.4% more than in the previous census.

At total of 8.1% of companies with headquarters in 22@ Barcelona have a turnover of over 15 million euros; 12.2% have a turnover between 3 and 15 million euros; 20.3% between 600,000 and 3 million euros; and almost 60% have a turnover of up to 600,000 euros.

Almost 7 out of every 10 companies (68%) that have work centres in the 22@ Barcelona district are 'micro-companies' that have no more than 10 employees. Of these microcompanies, most (9 out of every 10) have their entire workforce in 22@ Barcelona.

In terms of the activity carried out by companies, 1 out of every 2 companies (54%) forms part of, or is associated with, one of the five clusters in the 22@ Barcelona district (ICT, audiovisual, medical technologies, energy and design).

- 26% of companies carry out ICT activities.
- 24% of the companies carry out design activities.
- 11% of the companies carry out audiovisual activities.
- 5% of the companies carry out activities linked to medical technologies.
- 4.5% of companies carry out activities associated with the energy sector.

One in four companies carry out research and development activities. ICT and medical technologies are the two strategic sectors in which research and development is carried out by the highest proportion of companies (4 out of 10).

A total of 23.5% of companies in the 22@ Barcelona district export goods and services. Among medium-sized and large companies, this percentage stands at 38%. By clusters, the companies dedicated to medical technologies export the most (4 out of every 10 or 39%), followed by design companies (31%).

The data obtained from the study indicate that human capital is a differentiating factor in the district, due to the high degree of training of the people who work there.

On average, 72.5% of employees of @ companies in the district are university graduates. In fact, one out of every two companies in 22@ Barcelona has more than 50% of staff with a university qualification. In Catalonia as a whole, according to the results of the labour force survey (EPA), only 37% of the employed, salary-earning population has reached higher education level.

## 6. 22@ Barcelona: exporting the model

Today, 22@ Barcelona is an international benchmark for urban, economic and social transformation for cities such as Rio de Janeiro, Boston, Istanbul and Cape Town. It is a model that is studied and followed by universities and science and technology parks worldwide.

The experience in the Innovation District is being made available to other districts in the city through the accumulated know-how. Thus, the model is being extended to the rest of the city of Barcelona.

The model of urban clusters promoted by 22@ has established the bases for a dialogue on territory-economy-society by bringing together universities, companies and government in an economic transformation that goes beyond the borders of the 22@ innovation district.

22@ Barcelona is one of the benchmarks for the International Association of Science Parks and the Competitiveness Institute, in terms of the number of companies and number of professionals established in the district.