

The impact of 22@ on urban development and real estate: Barcelona's future central business district

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Introduction: 22@ as a necessary condition to increase worldwide competitiveness through the size of the supply and consolidated clusters

At the end of 2000, a major redevelopment operation started with the definitive approval of the Modification of the Metropolitan General Plan to redevelop industrial areas of Poblenou, the 22@ Barcelona district of activities, which covers an area equivalent to 113 blocks of Cerdà's Eixample and has a potential of close to 4 million m² of gross floor space (GFS). This operation was to be carried out in a traditional industrial area that was occupied by around 1.4 million m² of built floor space in varying states of physical and functional obsolescence and with a manufacturing zoning designation (22a). In general, the existing constructions underutilized a very central area that is just 15 minutes from the centre of Barcelona.

Over 4,600 dwellings were also located in the 198-ha area. These dwellings, which were not fully legal, were kept in the new plan. The 22@ development increases the housing stock by around 4,000 dwellings for affordable housing and on ceded land, with a GFS equivalent to 10% of the total development (0.3 FAR - floor space area ratio), which will be transferred to the City Council from the development by law and as its share in the planning gains.

Thus, a potential 3.2 million m² GFS for economic activities was put on the market for building high-density offices

(3 FAR in the blocks¹), as corresponds to a central business district. This is a necessary condition for competing in the global real estate market and attracting new economic activity to the central city, which, without the critical mass of 22@ and the opportunity to create clusters, would have had to mainly locate activities in the outskirts of the metropolitan area in a more dispersed way. This highlights the role of Barcelona as the central server in a system of metropolitan towns and cities, and the focus of directional activities.

The block is the basic unit for planning and for managing private initiatives, if there is agreement among over 50% of the land owners. This unit facilitates the distribution of profits and charges resulting from the development plan, which is in proportion with the land ownership by existing companies. It also provides sufficient flexibility to adapt the supply to the needs of the real estate market. The plan that the City Council began to implement in four predetermined areas and the move of activities to the district are additional incentives for the development of private initiative.

From an economic perspective, the plot ratio incentive (up to 2.7 FAR for @ activities in the new economy and 2.2 FAR for other service sector uses, such as hotels, excluding manufacturing activity and storage) generates planning gains to cover compensation for relocations (around €600 per m² of existing floor space), demolitions, compensation for existing buildings (around €200 per m² of existing floor space), the costs of city and internal infra-

(*) The authors are grateful for the interest of the BSAV. The map was included thanks to Albert Viladomiu Mangrané, Director of Urban Planning of the BSAV, and it was drawn up by: vubeda@barcelonasagrera.com

1. The FAR (floor space area ratio) of 3 m² of gross floor space/m² of land is equivalent to a building area of around 36,000 m² of floor space above

grade in a block of the Eixample (12,000 m² of land). This is almost equivalent, for example, to building a Mapfre Tower (approximately 42,000 m² of gross floor space above grade) or an average-sized Corte Inglés of 7 floors above grade of around 45,000 m² of gross floor space) and explains the type of building in the blocks with new constructions.

structure and the proportional contribution to financing the redevelopment of the entire area, according to the specifications of the Special Infrastructure Plan (PEI) and which accounts for less than €80 per m² of floor space above grade that the corresponding tax ordinance determines per unit of land area.

The concept of PEI is also an innovation in the management and private financing of the redevelopment of the entire area. It determines a high standard of quality for the electricity supply, telecommunications and waste collection. Thus, the planning gains also finance most of the infrastructure of the city, with only a minimum contribution of general investment from the City Council's current revenue. This funding mechanism was subsequently applied to the infrastructure of La Marina del Prat Vermell and is planned for La Verneda. It could be applied in the implementation of urban development plans in the entire municipality, to finance the city infrastructure that cannot be assigned to specific sectors.

Naturally, the blocks that have already been transformed or those that are more likely to be transformed in the future are those that are less dense and close to the average plot ratio for the previous use (around 1 FAR), as less compensation needs to be paid. Therefore, the time it takes to infill the area will depend on the market conditions at each moment to pay the compensation, so the densest blocks are likely to take longer to develop.

The development of the blocks could be delayed if disagreements arise between landowners that are not part of the initial majority initiative. Such disagreements are generally due to compensation, as the financing of the new development could be covered by property developers who buy the land from the current landowners. Although the compensation committees have legal instruments for paying compensation to the minority owner, this does not mean that arguments will not arise that could delay the development of the whole block or sector.

Development in blocks also helps to surpass the minimum standards of general urban planning regulations, as

20% of the block or area is set aside for open spaces and 10% for all kinds of facilities, including newly created ones that are of a 22@ nature.

Free land transfers are neutral in relation to the sale price of the real estate product, as the residual unit value of the plots is the derived demand based on the the sale price of the final product. The business costs, the profit from the promotion, and the absolute price of plots only depends on the plot ratio attributed in the plans and the unit price.

The dimension of the 22@ district can be compared to La Défense in Paris², which is advertised as the biggest international business district in Europe and is centrally situated³. In an area of 564 ha⁴, a total of 3.4 million m² of offices, 0.95 M m² of commercial floor space and 0.95 M m² of dwellings have been constructed in this area since the 1960s. There is a total of 4.4 M m² GFS for economic activity, 185,000 jobs and 20,000 residents. Today, the headquarters of 12 of the 50 biggest multinational companies in the world are located in the Île-de-France area, with 50 million m² of offices.

The 3.2 M m² GFS of 22@ represents 72% of the floor space for economic activity in La Défense and could house 133,000 jobs in the future using an equivalent standard (24 m² GFS per job). Although the total area will only be 35% of that of La Défense and the average plot ratio will be around double, the comparison is appropriate as it highlights the scope and development opportunities of 22@. The dimensions of office space in towns in the Barcelona metropolitan area, with 12.2 M m²⁽⁵⁾ (of which 7.3 M m² GFS corresponds to the municipality of Barcelona), are smaller than the 50 million m² in Île-de-France stated in information on La Défense, given the differences in the level of rent, the degree of tertiarization of the economy, and the effect of its capital status.

All the main urban agglomerations in the world aim to expand their central business districts in locations as close to the centre as possible. This is also the case of Madrid, which in 2009 initially approved a zoning plan

2. <http://www.ladefense-seine-arche.fr/les-lieux-du-projet/la-defense.html>. Document 'Enjoy La Défense Seine Arche'. May 2011.

3. They advertise that the district is 10 minutes from the centre of Paris and 30 minutes from the airports in public transport.

4. With 31 ha of open area and 11 ha of green spaces.

5. Information from the Land Registry Office, Technical Programming Unit, July 2009.

for the extension of La Castellana under the slogan ‘The economic heart of Madrid’⁶. The 312-ha area has a potential 3.05 million m² GFS, 45% of which would be for housing and 55% for economic activity (2.4 M m² GFS). The Madrid model differs from that of Paris and Barcelona basically in the proportions of housing and economic activity, which are almost equivalent. However, this is an issue that could be considered in future plans for Barcelona or in the modification of current plans.

Consequently, 22@ is a plan with a vision for the future. It was drawn up to make more floor space available for the offices the market required, and to encourage the location of the advanced technology activities that the new economy needed and continues to need. It has dimensions, location, quality of city infrastructure and innovative systems of financing and management that are comparable to the best initiatives carried out worldwide.

The recession that began in the second half of 2007 has substantially changed the rate of applications for 22@ building permits. The rate of annual approval of permits for the 2008-2010 period (133,105 m² GFS per year) was 23-27% lower than that in 2002-2007 (122,933 m² GFS per year if 7 years are considered and 143,422 m² GFS from 2002 to 2003). The duration of the low demand will naturally affect the absorption rate, both in 22@ and in the other operations in Barcelona that are currently supplied or in the planning and development stages.

Given that construction in 22@ has taken place in four and a half years of expansion and three and a half years of contraction, we could consider that the medium-term demand is in the order of 100,000 m² GFS per year in approved building permits and around 4,200 new jobs per year, using the average standard of La Défense in Paris.

In this article, we deal successively with the following topics: the forecasts in the initial economic and financial study in relation to the current results (Section 1); the supply in 22@ in the context of competing operations in Barcelona ‘river to river’ (Section 2); the situation of competitive prices and the parameters and opinions in reports by real estate agents, with reference to some internation-

al prices (Section 3); reference to the economic feasibility of the development, according to the influence of the different components of the prices and particularly to the compensation and costs of the city infrastructure (Section 4); the potential building area in 22@ up to 2020 (Section 5); the impact of 22@ on the rest of the construction dynamics in Barcelona, as reflected by the approved building permits above and below grade (Section 6).

The concluding chapter (Section 7) refers to the dimension that will be attained by 22@ and the operations around the La Sagrera station when completed, in the context of floor space for tertiary activities in the various districts of Barcelona and according to the land registry records. This section supports the hypothesis that the floor space for economic activity, and certainly the occupation, will surpass that of the districts of Ciutat Vella and the Eixample, which form the old business centre of Barcelona.

Forecasts and economic hypotheses in the Modified Metropolitan General Plan (MPGM): 20 years, absorption of 135,000 m² GFS per year and economic feasibility of compensation

‘The main aim of this Economic and Financial Study is to ensure that the forecasts in the development plan are met, and to demonstrate that the distribution of charges and profits is feasible, meets the provisions established in planning regulations, and is in line with the situation in the real estate market. In particular, the aim is to highlight that the development of the “zones”, at the current and foreseeable value of the real estate market, and public investment and that from other sources can adequately finance the “systems” (infrastructure, compensations, city infrastructure and facilities for the community) required for the urban development.

This document refers particularly to the following points:

1. Dimension of the new supply of floor space for economic activities resulting from the development plan.

6. <http://www.madrid.es/portales/munimadrid/es>

Plan of stages

Development of a new potential floor space for production activities

	Potential GFS	2000-2004	2005-2009	2010-2014	2015-2019
Predetermined operations	1,150,833	345,251	460,331	345,251	
Optional operations	1,509,021				
Encumbrances = <38,000 pts/ potential m ² of gross floor space	901,626	180,324	360,651	180,325	180,326
Encumbrances = > 38,000 pts/potential m ² of gross floor space	607,395	91,109	121,479	212,588	182,219
TOTAL	2,659,654	616,884	942,464	738,164	362,545
	100%	23%	35%	28%	14%

2. Demand for floor space for economic activities in Barcelona and Poblenou.

3. Feasibility of the new urban development charges, to be financed with the increase in plot ratio.

4. Assessment of the feasibility in real estate terms of the transformation operations (special plans).’ (From the amended text for definitive approval of the Modification of the Metropolitan General Plan, September 2000, pages 1 and 3).

With respect to the first aspect, the study’s summary table gives the following figures for potential: ‘If we add the 509,976 m² GFS of existing housing and local and @ facilities, the total potential is just over 3,500,000 m² GFS. The fulfilment of the potential is foreseen in 20 years in 2019, at an average rate of 133,000 m² of floor space for economic activities per year and the construction of around 4,000 affordable dwellings.’

The following statement was made on the job potential: ‘The new urban planning also provides the opportunity to increase the number of jobs located in Poblenou, which is currently at around 31,000 people, according to the register for 1996. With an optimistic forecast of a density of 25 m² of floor space per job, the new production district will house over 91,000 jobs.’⁷

The following should be highlighted: ‘...given that the annual growth in GDP in these years has been 2.5% on average; a rate that we can reasonably expect to maintain in the next ten years and at least enables us to forecast various economic growth scenarios.’

On the assessment of the supply for economic activity in Barcelona in 1999, the study stated: ‘For these reasons, Poblenou’s share in the dynamics of the municipality is between a minimum of 40% and a maximum of 60%. If we apply these percentages to the trend of 387,854 m² GFS per year for all types of tertiary activities, the potential demand in Poblenou is between 155,034 m² and 232,550 m² of new floor space per year, with an average forecast of 194,000 m² of new floor space per year. [...] Barcelona currently has a stock of 4 million m² of offices, which is 56% of the stock of Madrid and 16% that of London. [...] The City Council must ensure the transformation of Poblenou regardless of the economic and real estate cycle. [...] The vision must be for 15-20 years. [...] Currently, 35-45% of the stock of offices is considered obsolete and does not meet the users’ requirements. [...] The estimation of the total absorption of offices of an “international level” in Barcelona and the metropolitan area is estimated [...] to be 197,000 m² per year. The share of Poblenou in the most optimistic forecast would be situated, according to this study, at 69% of the total absorption in the metropolitan area, that is, 135,930 m² per year. [...] The operation in Poblenou is presented as a unique opportunity to re-centralize a Metropolitan process that is excessively decentralised.’

On the economic feasibility of private operations, the document stated that: ‘An operation shall be profitable when the difference between the value of the resulting plots that have to be developed and the total costs of developing them is positive and this difference

7. More recently, the figure of 150,000 potential jobs has been estimated by 22@ (2009), ‘22@Barcelona project. A social, urban and economic urban renewal’, Mimeo, p. 24.

reaches a percentage of the total investment that is equal to or higher than the ordinary returns in the real estate sector.'

The justification of the economic feasibility of private operations was supported by detailed accounts that were submitted for three types of blocks of different densities and with the final conclusion that '...we obtained residual values of land at the start of the operation [...] that in all cases were above the €601/m² of land (€100,000/m² of land) that correspond to a plot ratio of 1 FAR before the expectations of reclassification'.

The considerable innovation in the redevelopment of the sector and its financing was described as follows: 'Barcelona City Council shall draw up a special infrastructure plan to define and specify the standard of the aforementioned urban development services and the characteristics of other required infrastructures and services, both those planned for the public domain and those planned for private land'. In accordance with the suppositions of city infrastructure drawn from the progress in the PEI, the economic feasibility study (EEF) of the MPGM estimated that the unit cost of the investment required in the area of the MPGM is €180/m² of road (30,000 pta/m²) and the total investment is €119 M (19.780 billion pta). The planned financing is 70% from the owners of the land under transformation (1,269,409 m² of land counted) and 30% from the public services providers. The resulting cost to landowners is €24/m² GFS in areas with a plot ratio of 2.2 FAR and €30/m² GFS in those of 2.7 FAR'.

After 10 years of urban development and economic management that is in line with the forecasts both in terms of the rate of transformation, demand, city infrastructure and public-private financing in a cycle of expansion, the development of the innovative 22@ district since 2000 should be adapted to the recession, which increases the length of time needed to attain the proposed objectives.

8. The number of potential jobs is calculated by considering the same plans with approximate standards of 20 m² of gross floor space per job in offices, 40 m² of gross floor space/job in retail, 60 m² of gross floor space/job in facilities, 60-100 m² of gross floor space/job in logistic activities and industries and 2,500 m² of gross floor space/job in car parks.

9. The incorporation of the major supply from the plans for El Prat de Llobregat

Concurrent and competitive operations:

12.4 M m² GFS, a surplus of 207,500 jobs and a short-fall of 198,600 dwellings

Barcelona started this century with a limited supply of offices. However, this changed with the approval of the 22@ project in 2000, with a total floor space of approximately 4 million m², of which around 3.2 M m² GFS are for economic activity. The project represented a major quantitative and qualitative change in supply that put Barcelona in a competitive position in the global market.

This supply for economic activity competes today with the operations in the Plaça d'Europa in Hospitalet (0.2 M m² GFS), the Forum (0.6 M m² GFS) and Fira de Barcelona (0.2 M m² GFS), with a potential of around 26,000 jobs⁸.

In the future, the supply in 22@ will have to compete with that of La Marina del Prat Vermell (0.3 M m² GFS), La Verneda (0.3 M m² GFS), Biopol (0.3 M m² GFS), BZ Barcelona Innovation Zone (1 M m² GFS)⁹, with a potential for approximately 52,700 jobs, and particularly the supply around the future central station of La Sagrera-Prim (0.5 M m² GFS), with an estimated potential for 18,400 jobs, according to the information in the attached tables¹⁰.

The potential floor space above grade in 22@ has been updated with documents and information provided by 22@ Barcelona S.A.U. The below grade figures have been kept as in the MPGM.

Given its significance, we should also refer to the potential supply of the operation in the Centre Direccional de Cerdanyola - Parc de l'Alba, whose plans were approved in 2005. This supply could be considered in a complementary market to the operations in the city centre. It will meet a different demand for economic activity in terms of the characteristics, location and price. It covers an area of 340 ha and has a potential floor space of 1.9 million m², of which 1.5 M m² GFS are for economic activity.

(La Seda, Enkalene, etc.), Gavà, Viladecans (DeltaBCN Aerospace and Mobility Park, etc.), Sant Boi de Llobregat, Badalona and Santa Coloma de Gramanet that should be taken into account are beyond the scope of this article.

10. The city infrastructure operations in La Marina and La Verneda are planned in three phases. In the BZ Barcelona Innovation Zone, a first phase of city infrastructure of 30 ha is already planned.

Major urban operations 2000-2030: 1,182 ha - 11.4 M m² GFS (excluding facilities)



Source: base plan provided by Barcelona Sagrera Alta Velocitat. Data compiled by authors.

Major operations in Barcelona

Operation	Total area ha	Area for housing (m ² GFS)	Area for economic activity (m ² GFS)	Total potential floor space (without facilities) (m ² GFS)	Facilities (m ² GFS)	Total area above grade (m ² GFS)	Floor space below grade/car parks (m ² GFS)	Definitive approval (m ² GFS)
22@ (2000)	198.3	367,382	3,136,095	3,503,478	389,275	3,892,753	940,000	2000
Forum	256.6	260,693	645,374	906,067	228,555	1,134,622	128,452	1999
Prim	21.2	264,726	29,414	294,140	34,431	328,571	90,080	2010
La Sagrera station and surroundings	81.4	752,831	435,972	1,188,803	220,594	1,409,397	395,533	Compiled
BZ Barcelona Innovation Zone (Zona Franca)	50.0	—	1,000,000	1,000,000	—	1,000,000	—	2011
La Verneda	58.2	676,094	289,755	965,849	68,750	1,034,599	286,422	PPA.
La Marina	75.0	869,238	315,420	1,184,658	38,336	1,222,994	383,088	2005
Vallbona	24.4	169,600	18,844	188,444	18,700	207,144	57,711	PDA.
Plaça d'Europa L'Hospitalet	42.0	168,533	195,962	364,495	3,677	368,172	98,056	2001
Biopol L'Hospitalet	30.0	—	300,000	300,000	—	300,000	75,000	Compiled
Ciutat de la Justícia L'Hospitalet	5.3	—	84,379	84,379	147,989	232,368	45,500	2003
Fira de Barcelona (2000) L'Hospitalet	24.0	—	240,000	240,000	—	240,000	125,000	2001
Gran Via L'Hospitalet	—	—	367,618	367,618	—	367,618	72,497	Compiled
Housing Programme Operations 2011	65.2	748,000	62,064	810,064	76,403	886,467	—	—
Total	931.6	4,277,097	7,120,897	11,397,995	1,226,710	12,624,705	2,697,339	—
(22@/Total)	21%	9%	44%	31%	32%	31%	35%	—
(22@ + La Sagrera and surroundings)/Total	32%	32%	51%	44%	53%	45%	53%	—
(22@ + La Sagrera and surroundings)/Total BCN	36%	34%	61%	50%	60%	51%	62%	—

Source: drawn up by authors using the information available in planning documents and reports.

Note: (PDA.: pending definitive approval; PPA.: pending provisional approval)

Major operations in Barcelona

Operation	No. dwellings	No. residents	No. active population	No. jobs	Balance (active population - jobs)
22@ (2000)	4,000	8,800	4,180	150,000	125,820
Forum	6,273	14,766	7,014	14,211	7,197
Prim	3,509	7,720	3,667	884	-2,783
La Sagrera station and surroundings	9,410	20,703	9,834	17,515	7,682
BZ Barcelona Innovation Zone (Zona Franca)	—	—	—	20,000	20,000
La Verneda	8,781	19,088	9,067	9,090	23
La Marina	10,865	23,904	11,354	10,405	-949
Vallbona	2,120	4,876	2,316	818	-1,498
Plaça d'Europa L'Hospitalet	1,684	3,705	1,760	8,477	6,718
Biopol L'Hospitalet	- —	—	—	13,213	13,213
Ciutat de la Justícia L'Hospitalet -	- —	—	—	3,000	3,000
Fira de Barcelona (2000) L'Hospitalet	—	—	—	3,429	3,429
Other Gran Via L'Hospitalet	—	—	—	12,636	12,636
Housing Programme Operations 2011	9,350	20,570	9,771	2,825	-6,946
Total	55,992	124,132	58,963	266,503	207,540
(22@/Total)	7%	7%	7%	56%	61%
(22@ + La Sagrera and surroundings)/Total	30%	30%	30%	63%	63%
(22@ + La Sagrera and surroundings)/Total BCN	31%	31%	31%	75%	78%

Source: drawn up by authors using the information available in planning documents and reports.

To date, urban infrastructure has been carried out, as well as the construction of a synchrotron. As a result, the Barcelona metropolitan area has a quality supply for different types of high-tech industrial activities in an area of approximately 600 km², which is equivalent to the area of the municipality of Madrid.

In the case of 22@, the average standard in the economic feasibility study for the MPGM was 25 m² GFS per job in the district, with an estimated total of 91,000 jobs. However, the number of potential jobs has been updated to an estimated potential figure of 150,000 (22@, op. cit. p. 24).

The major operations considered, together with other operations in the 2011 housing programme¹¹, have a total potential of 11.4 M m² GFS, 7.1 M m² GFS for economic activity, and include a considerable potential supply of new dwellings (56,000 units), with a high percentage reserved for affordable housing. Some of these operations are highly self-sufficient in the ratio of the active population/poten-

tial jobs, as is the case of La Marina del Prat Vermell and La Verneda¹².

Together, all of the operations up to their completion generate a potential of 59,000 active members of the population¹³, with a surplus of 207,500 jobs and at the same time a shortfall of 198,600 dwellings (161,300 in the municipality of Barcelona).

This conclusion is similar to that drawn from a study carried out in 2005¹⁴ on the entire Barcelona metropolitan area and plans for over 200,000 m² GFS. It estimated that there was a surplus of 522,000 jobs in 2011 in comparison to the expected dynamics (op. cit. p. 15).

The total potential figures were estimated at 775,000 jobs and 427,000 new dwellings, and an absorption period of 31 years for floor space for economic activity and 17 years for that of dwellings (op. cit. p. 54), with the expected dynamics at that time. In terms of the argument followed in this article, the metropolitan area plans for 2001-2002

11. 'Municipal commitment to boost the generation of land and promote 20,000 dwellings in the next eight years', by the governing team of Barcelona City Council, April 2011 (excluding La Marina, Prim and Vallbona which are included in the major operations).

12. Pending provisional approval.

13. Estimates using the standards of 2.2 people per dwelling and 47.5% of the residents actively employed.

14. Roca, J., Clusa, J., Marmolejo, C. (2005), El potencial urbanístic de la Regió Metropolitana de Barcelona. Barcelona City Council, Technical Programming Unit. Collection: Conèixer Barcelona. The study only took into account plans for over 200,000 m² of gross floor space above grade.

would have a surplus of 329,000 jobs or, alternatively, a potential shortfall of 315,000 dwellings.

Therefore, the supply of new floor space for economic activity in 22@ (3.2 M m² GFS), together with the supply in La Sagrera-Prim (0.5 M m²), comprises 51% of the supply of land for economic activities 'from river to river' and would ensure a wide supply for over 20 years according to the past dynamics, which have been temporarily disrupted by the recession. We cannot guarantee the same situation with respect to housing needs, whose forecasts will definitely have to be reconsidered in the current economic situation and the periods required for coverage and completion will have to be lengthened.

Today, the operations of the Forum, Ciutat de la Justícia, Fira de Barcelona and Plaça d'Europa are practically completed, whilst other operations that have been approved more recently, such as La Marina (2005), have not been sufficiently developed.

The potential available in 22@ and La Sagrera-Prim will constitute in coming years the main supply for economic activity (around 2.1 M m² GFS and around 96,600 jobs), but it will have to compete with the supply in the rest of the central city, as it will account for approximately 47% of the total for the major operations considered.

22@ in the market of offices and hotels according to real estate reports: new business district with economical prices

Offices are the most common type of building in 22@. They represent 51% of the floor space above grade in building permits approved from 2000 to 2010 (487,637 m² GFS out of a total of 959,846 m² GFS). The next biggest use is that of affordable housing, which amounts to 18% of the approved floor space above grade. This is followed by hotels, with 13% of the approved floor space above grade. The area for car parks (441,753 m² GFS) increases floor space above grade associated with uses above grade by 46%. Therefore, the three main real estate markets for 22@ are offices, affordable housing and hotels.

The Forcadell report indicates that the average office rent in what are known as the 'new business centres'

(22@, Plaça d'Europa in Hospitalet, Plaça Cerdà-Passeig de la Zona Franca) stood at €13.90 /m² GFS at the end of 2010 and maximum rents of €18.95 /m² GFS, although the closing prices (or 'expert opinion' prices, in the words of the report) are estimated at €7 and €13 /m² GFS. The 'new business centres' have prices lower than those in the prime zones, the business district and the central zone, but above the price of offices in the outskirts of the city.

Rents in 22@ are 22% below those in the prime zone at €17.56/m²/month on average and a closing price of between €15 and €19/m²/month. It is notable that the closing prices are more similar to the asking prices than in other zones.

According to the same report, the sale prices in 22@ are €3,325/m² floor space (with closing prices of €2,200-2,700/m² GFS) and are 37% lower than in the prime zone (€5,250/m² GFS).

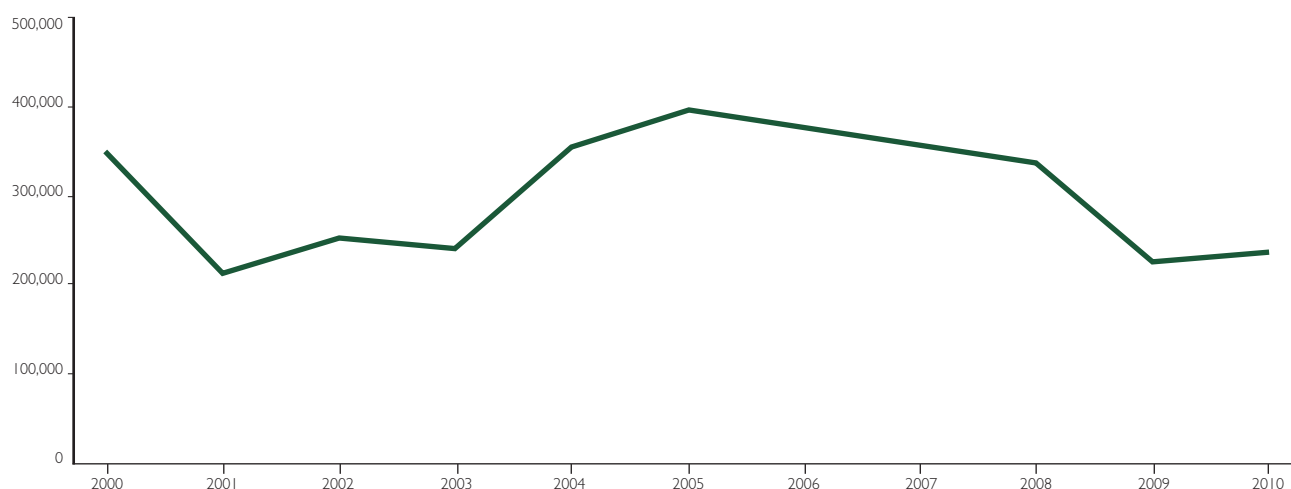
The rates of return (yields) that reflect the risk of investing in each location of the city for new business centres and for the outskirts stand at between 7 and 8% per year, compared to 5.5-6.5% in the prime zones. In addition, the availability rates are higher the further from the centre, compared to the average of 13% for all of Barcelona, which is far from the 7% found in 2007.

The report states that the drop in prices compared to previous years is greater the further from the centre, although '...in 2010 most of the operations were carried out in decentralized zones, unlike in 2009, which was dominated by the prime zone and the business district'.

According to the Forcadell report, office rental in Barcelona amounted to 3.4 million m² from 2000 to 2010, with an average of 305,500 m² GFS per year. The year with the lowest office rental was 2001 (212,000 m², as shown in the first graph), whilst with the recession already underway, a total of 225,300 m² were rented in 2009 and 239,100 m² in 2010. The average for the 8 years of expansion is 320,000 m² and that of the 3 years of recession is 268,000 m², with an average for the 11-year period of 306,000 m².

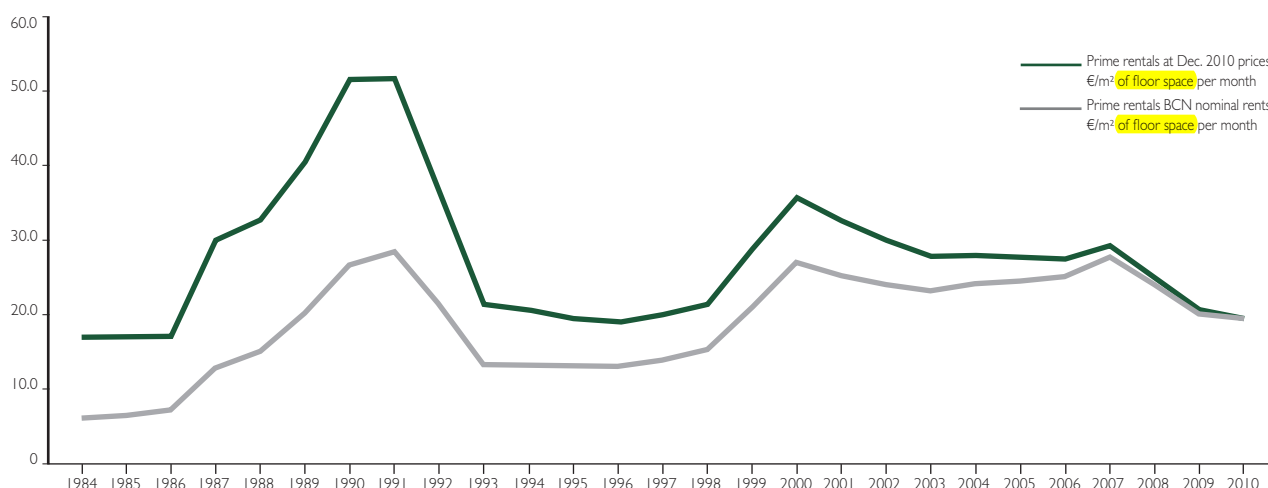
The Savills report of 2010 states that the net absorption of offices in 2010 was 274,000 m² GFS, which coincides almost exactly with the rental figures in the Forcadell report. Although the rental volume cannot be directly related with the number of building permits

Rental (m²) of offices in Barcelona 2000-2010



Source: Forcadell (2011).

'Prime rentals' in Barcelona offices in 3/m² of gross floor space/month 1985-2010. Nominal rents every year and constant rents at December 2010 prices



Source: Savills 2011 (nominal prices) and compiled by authors for the conversion to constant prices.

approved, the share for 22@ can be estimated by relating the area for which permits were granted with the area rented in the period of expansion (122,933 m² GFS, compared to the aforementioned 320,000 m² GFS). This gives a share of 39% of the market of offices built exclusively in Barcelona and L'Hospitalet.

In this context, the 22@ district is in an intermediate position in terms of its attractiveness in Barcelona's real estate market, despite the competitive prices that it offers. The reports by estate agents for offices show that there is a good rate of office rental in Plaça d'Europa and that this can be attributed to the good public transport

connections with the rest of the city, and particularly with the airport.

The evolution of office prices in relation to economic cycles can be clearly illustrated using statistics and graphs from the Savills report¹⁵ for the second half of 2011, from a 26-year perspective beginning in 1984, which was the start of what was known as the bubble of 1986-1991, as shown in the enclosed graph.

The recession of 1991 began with very high rents that were recovered, in nominal values, in 2008. However, the real values have still not surpassed the 1991 levels. Only 57% of the constant rentals of 1991 have been obtained, which illustrates the dimension of the 1986-1991 bubble, particularly in the market of offices¹⁶, and the sensitivity of this market to economic cycles that do not always coincide with the cycle of housing prices.

In terms of hotels as a second real estate open market in 22@, the 2009 report on hotel real estate by CB Richard Ellis is notable. In reference to 2008, the report states:

...there is a considerable increase in new projects in the Sant Martí district, specifically in the 22@ zone and its area of influence. In practice, this relocation highlights the sector's definitive commitment to this zone of business development. Gradually, the major chains have begun to set up this area, which is starting to become one of the city's important business enclaves. Forty per cent of new projects are located in this zone, which also benefits from greater land availability and from the fact that the prices are noticeably lower than in more consolidated and central zones...

This preference for locating hotels in 22@, even though they cannot benefit from the maximum plot ratio for @ activities of 2.7 FAR, can be explained, regardless of the capacity to purchase plots, by the fact that the sector is growing and the @ part of the building area (0.5 FAR) can be transferred to the rest of the development.

As a reference, office rents in Paris, according to information provided by the promotion of La Défense, are as follows:

- Prime rents = €750 per m² GFS and year (€63 /m² GFS/month)

- La Défense = €515 per m² GFS and year (€43 /m² GFS/month)

- Seine Arche = €330 per m² GFS and year (€28 /m² GFS/month)

Rents in La Défense are 32% lower than the prime rents in the centre of Paris, whilst the figure of €14 per m² of gross floor space and month in 22@ is 28% lower than rents for the best locations in the centre of Barcelona. This indicates comparable positions within the city with respect to the central business district (CBD), as would be expected with similar public transport distances.

If we compare the prime rents in Barcelona for the second half of 2011 (€19.50/m² GFS/month), we find that Paris prices are 3.2 times higher than those of Barcelona. Rents in La Défense are 3.1 times those of 22@, whilst those of the Seine Arche, which is in a less central position, are only two times higher. However, in central positions of 22@ the prime rents of Barcelona can be achieved, which indicates the value and real estate interest in this zone, and the different rents within the district.

Although low prices can be considered a positive factor in terms of competitiveness and attraction, the stable prices of real estate products reflect companies' interest in being located in a specific city or place within a city, and at the same time reflects the payment capacity of the companies that move there. Therefore, comparatively high real estate prices that are maintained by stable demand are good news for a city's economy.

Majority private financing for quality re-urbanisation: economic feasibility of the development of blocks with affordable contributions

The construction and renovation of a city requires public and private investment in city infrastructure and construction, financed by the planning gains for building determined in the urban development plan in use by the territory's governing authorities. The recovery of planning gains finances the infrastructure. The trend is for each

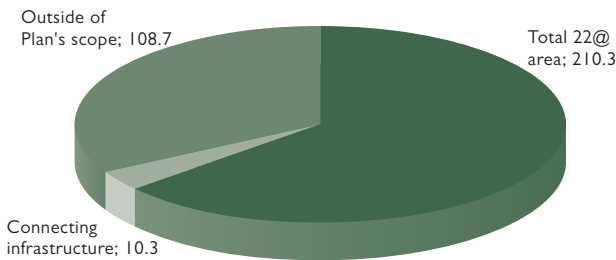
15. The average rents in the 'prime' zone in the Forcadell report (€17.56) only differ by approximately 10% from those in the Savills report.

16. The Mapfre Tower was not fully occupied until 2002, although its construction was completed in 1992.

development to cover all of the direct and indirect costs incurred by the city, and to provide reserves for affordable housing. Here we present the two aspects of financing, analysed from the perspective of the public sector (through the Special Infrastructure Plan (PEI)) and private promotion (through the example of an economic feasibility study (EEF) in the urban planning stage).

The Special Infrastructure Plan (PEI) for Poblenou-22@, which is designed as an urban development instrument that covers the entire area of the MPGM, also includes the connecting infrastructure required for the area to operate and assesses other actions that ‘...are still not located within the area of the Plan and are not works carried out to connect it, but are considered important for the development of the zone’ (EEF of the PEI, 2000).

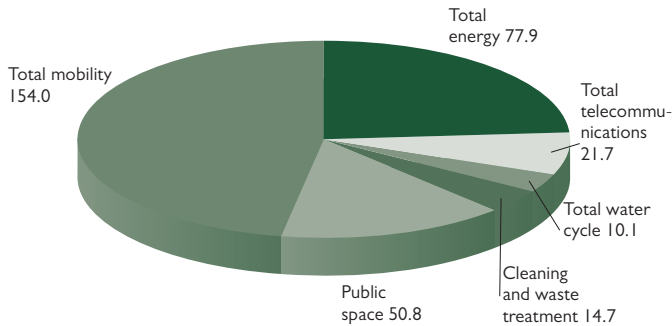
Distribution of investment in the PEI by areas (€M)



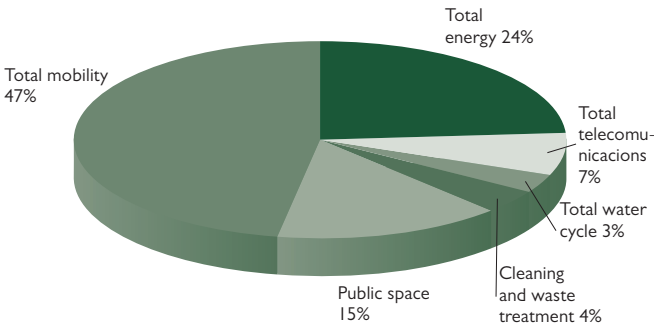
The total investment that was initially expected was 329 million euros,¹⁷ of which €210 M (64%) corresponds to investments in the area of 22@, €10 M (3%) to connection areas and €109 M (33%) to areas outside of the Plan. By type of activity, the main investment is the €154 M in mobility (47% of the entire investment), which is located mainly outside of the area of the Plan (approximately 70%) and involves two important actions: the Avinguda Diagonal tram and the Front Marítim tram. The two next largest systems in terms of investment are: energy (24% of the total) and public space (15% of the total), followed by telecommunications (7%), cleaning and waste treatment (4%) and the water cycle (3%).

The financing of investment in 22@ and connecting infrastructure, which in total is estimated to amount to

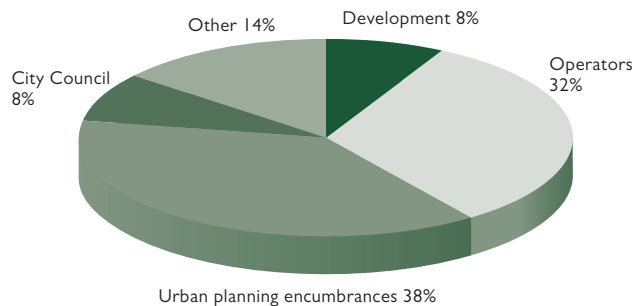
Investment in the PEI by type of actions (€M)



Investment in PEI by type of actions (%)



Financing of the investment in 22@ and connections



17. The updated amount is €376.8 M. The use of information from the document approved in 2000 is justified as it includes details of financing by the public sector, companies and property developers.

€221 M, is expected to be met as follows: 38% from city infrastructure, 32% from service operators, 8% directly from municipal budgets, 8% from property developers (in addition to the charges for city infrastructure) and the remaining 14% from the other financiers who are involved.

The cost forecasts in the PEI that are included as private charges in the corresponding land compensation projects are likely to be lower than current requirements in state and Catalan planning regulations referring to connecting infrastructures and participation to compensate for the shortfall in public transport. The EEF of the MPGM estimated a unit cost of €24 or €30 /m² GFS, for plot ratios of 2.2 and 2.7 FAR, respectively.

Private financing of the urban transformation also includes the costs of compensation for relocation of existing activities and rehousing of those in existing dwellings, demolitions and the infrastructure of the interior of blocks, as well as the construction costs and all spending on the management of city infrastructure and construction processes. The compensation costs may vary considerably depending on the degree of consolidation of the different sectors within the area of the MPGM. However, it is the real estate prices that must make the transformation possible in each case.

A report from 2006 on the financial viability of a private development proposal in the planning stage for two blocks in 22@ clearly illustrates the order of magnitude of private financing and the parameters of the development's financial viability. The operation involved considerable compensation costs for construction, relocation of activities and rehousing as the area was highly consolidated, with a real plot ratio before the transformation of 1.5 FAR, which is far above the average of 1 FAR in the entire MPGM.

The operation was based on an expectation of average real estate prices of €3,000 /m² GFS for economic activity classified as @. It required the relocation of existing activity with considerable compensation costs of around €13 M, which translates to costs for the potential floor space of €189/m² GFS. The entire process was expected to take 6 years, from the purchase of the land to the sale of the built floor space.

18. In 2006, the transfer of 10% of the development to the City Council was not free of encumbrances; this was a precept of State Land Law 8/2007.

The basic data and results were as follows:

Plot ratio: 2.7 FAR and 0.3 FAR transferred to the City Council for affordable housing

Sale price for @ activities = €3,000/m² GFS

Sale price for affordable housing = €1,456/m² GFS

Average sale price = €2,850/m² GFS

Average construction cost: €986/m² GFS

Schedule: 6 years

In relation to the real estate price:

- Average land value: €986/m² GFS (35%)
- Construction and management (includes marketing): €1,228/m² GFS (43%)
- Profit: €635/m² GFS (22%)
- Annual yield rate: 15%

In relation to plot value (€986/m² GFS):

- Plot prior to urban development: €600/m² GFS (61%)
- Compensation: €189/m² GFS (19%)
- City infrastructure (PEI): €32/m² GFS (3%)
- Management (includes 4% of PEI and marketing): €28/m² GFS (3%)
- Profit: €137/m² GFS (14%)
- Annual yield rate: 15%

The price of the built real estate product covers all of the costs and spending in the stages of city infrastructure and construction, with an annual yield rate of 15% in each stage, and total city infrastructure charges of €250/m² of land and payment for the land prior to urban development at €1,620/m² of land. These values are average for plots developed in Barcelona, according to statistics in the Forcadell report for the third quarter of 2006 (€1,315-1,800/m²). This value is equivalent to a cost of €600/m² GFS, which is 61% of the average land cost of €986/m² GFS.

The graph below shows a diagram of the components of the real estate value of the property, the transfer to the City Council of 10% of the development¹⁸, and the complete operation.

The following conclusions can be made about the financial viability of private development:

- The transactions are adapted to the mechanism of derived demand in each case. The market price of the final products 'withstands' high compensation and high

residual values, with expectations, that are required of the property.

- The costs of city infrastructure related to the PEI are only 3% of the value of the plot and do not include the costs of connection or compensation for the shortfall in transport that the state and Catalan law currently require.

- These costs are lower than those of other urban developments in Barcelona. In the MPM for La Marina in the Zona Franca in 2006, for example, the costs of city infrastructure in the infrastructure plan include a metro station. This translates to €92/m² GFS in 2005, which is equivalent to around €75/m² GFS (over double that of 22@) if the figures are updated to 2000, with an annual average rate of 5%.

- In areas with a highly consolidated building area, compensation may be a relevant condition for the transformation. Existing companies expect to cover the costs of the relocation and to have new installations outside of Barcelona with approximately 50% more land and the renewal of some machinery.

- The transfer of 10% of land for green zones and 10% for facilities is neutral in terms of the financial feasibility of the development, as the basic parameters of

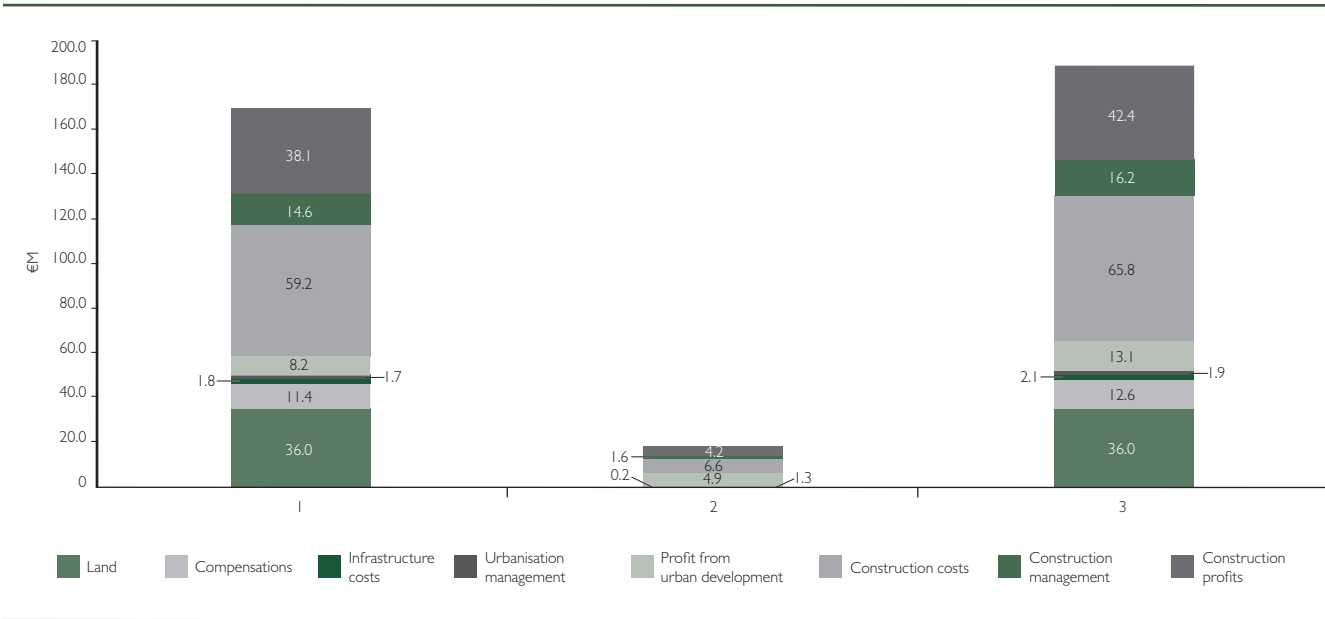
viability are the plot ratio, total income per sale and all the costs and spending on managing the urban transformation and the construction.

- The transfer of 10% of the development to the City Council provides plots that are equivalent to 0.3 FAR for affordable housing. Without subsidies, this provides the equivalent to the impact of a subsidized plot. The 10% transfer is not a charge for the property owner, but a way of recovering the planning gains or profits conferred on the land by the planning, given that private initiative obtains a profit equivalent to 27% of the sale value of the real estate, which is equivalent to returns of 15% per year cash of flow during the six years of management.

Impact of building permits for 22@ on all of Barcelona since 2003: 61% of offices and 38% of hotels

Barcelona City Council granted 158 building permits for new construction or major renovation in the 22@ district between 1998 and 2010, for an area of 959,846 m² GFS above grade (planning potential) and 441,753 m² of floor space below grade (an additional 46%), according to the database of the Technical Unit of 22@.

Components of the final real estate price



Most permits were approved between 2003 and 2007 (72% of the total area). The evolution of the figures over time reflects the need in the early years (1998-2002) to carry out the land planning and management (18% of the total) and, from 2007 onwards, the general slow-down in the real estate market (10% of the total). In comparison to the whole of Barcelona, we can consider that the activity in 22@ took off in 2003, when previous permits were accumulated. There were two peaks in 2005 and 2007, with 39% of the total floor space.

From 2001 to 2007, the average built area per year was 172,106 m² GFS, whilst in the following three years it was only 33,105 m² GFS. Between 2003 (accumulated) and 2010, on average 120,000 m² of floor space above grade were approved per year. This trend could be taken as an optimistic forecast of growth in the next few years, as the period includes four and a half years of expansion and three and a half years of recession. However, a pessimistic trend could be situated at 100,000 m² GFS per year.

The main building type is offices, which represent 51% of the floor space above grade in the approved permits (488,000 m² GFS out of a total of 960,000 m² GFS). This is followed by affordable housing (173,000 m² GFS

and around 2,200 dwellings) at 18%, and then by hotels (150,000 m² GFS and around 2,300 rooms) at 13%.

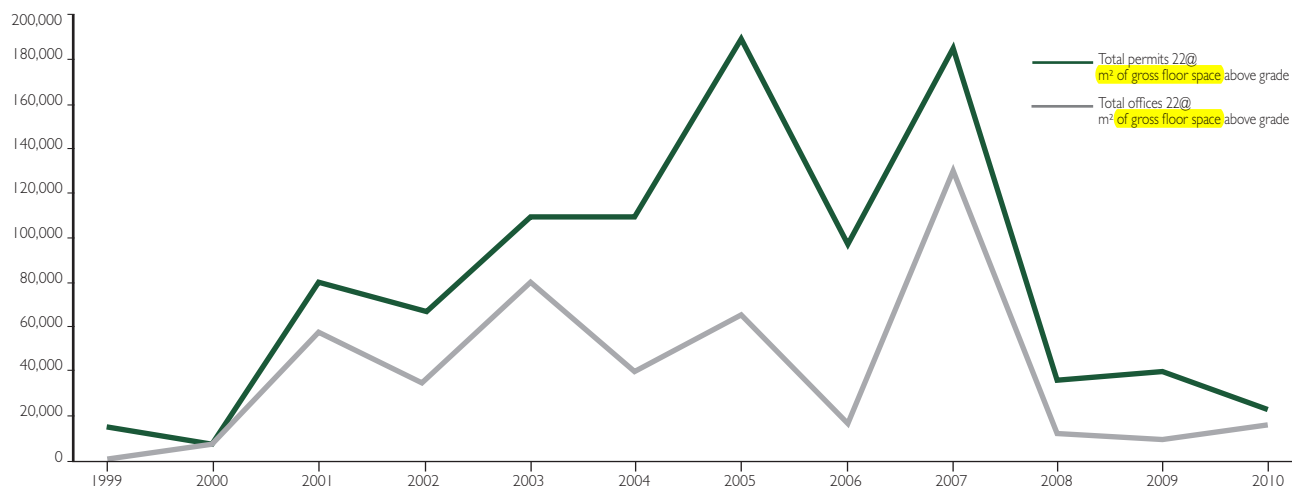
The average area in permits for offices, dwellings, hotels and facilities is between 5000 and 7000 m² GFS above grade, with the exceptions of manufacturing (2,100 m² GFS) and two permits for independent car parks (18,000 m² and around 720 parking spaces). A total of 46% of permits are for under 3,600 m² GFS, which is equivalent to approximately a tenth of the potential of a block. Only 20 permits (13%) are for over a quarter of the potential of a block. The average permit is for 6,050 m² GFS above grade.

The estimate of jobs that the approved permits could represent was calculated on the basis of the standards that result from combining Barcelona's land registry information with information on jobs from the magazine *Barcelona Economia*, which presents information on employment in 32 subsectors, as well as the authors' own hypotheses¹⁹.

The average standards are as follows:

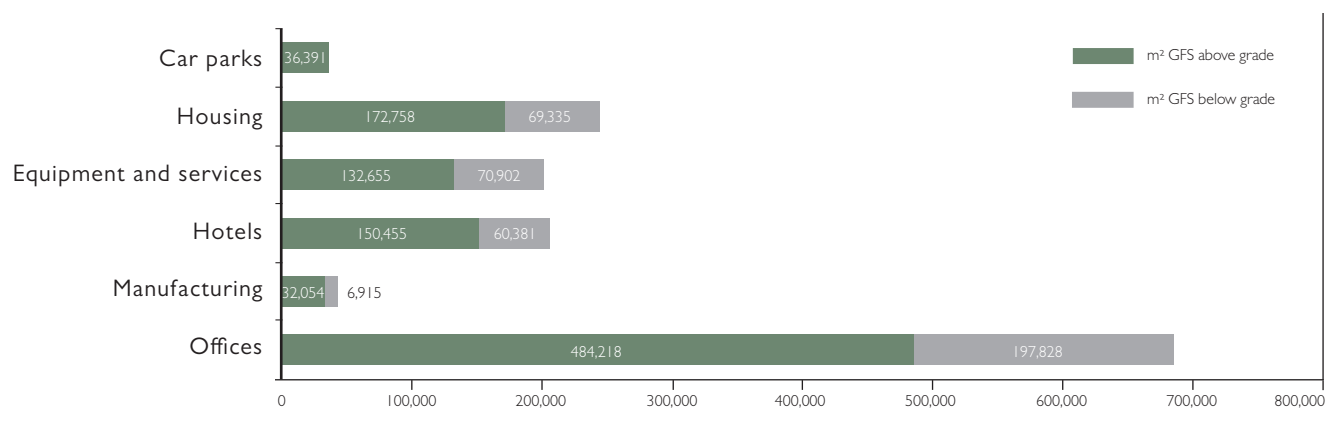
- Storage: 74 m² per job
- Retail trade: 86 m² per job
- Personal services (excluding health) and education: 45 m² per job

22@ building permits. In m² of floor space above grade, 2001-2010

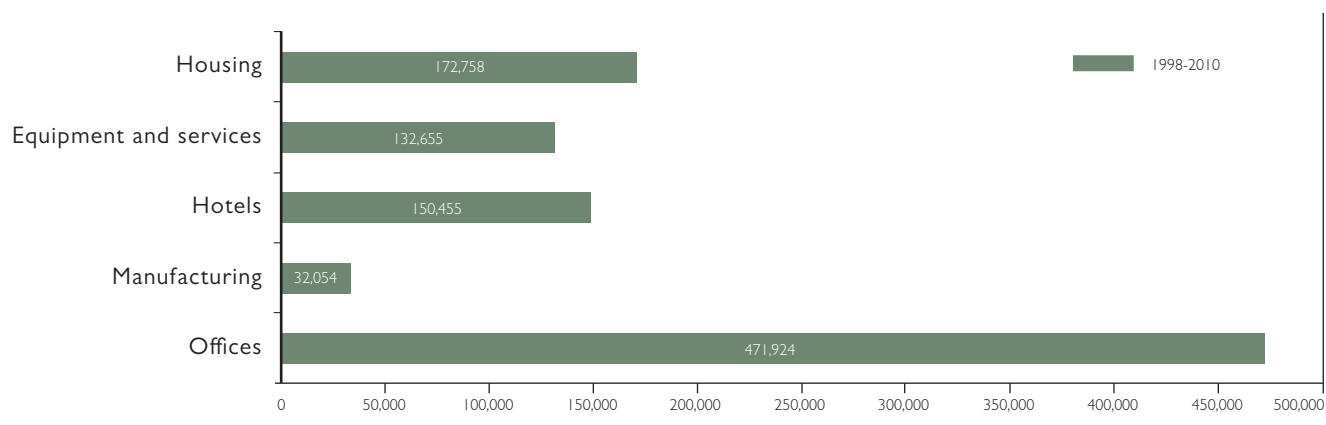


19. This is part of a wider study underway on the urban and real estate impact of 22@.

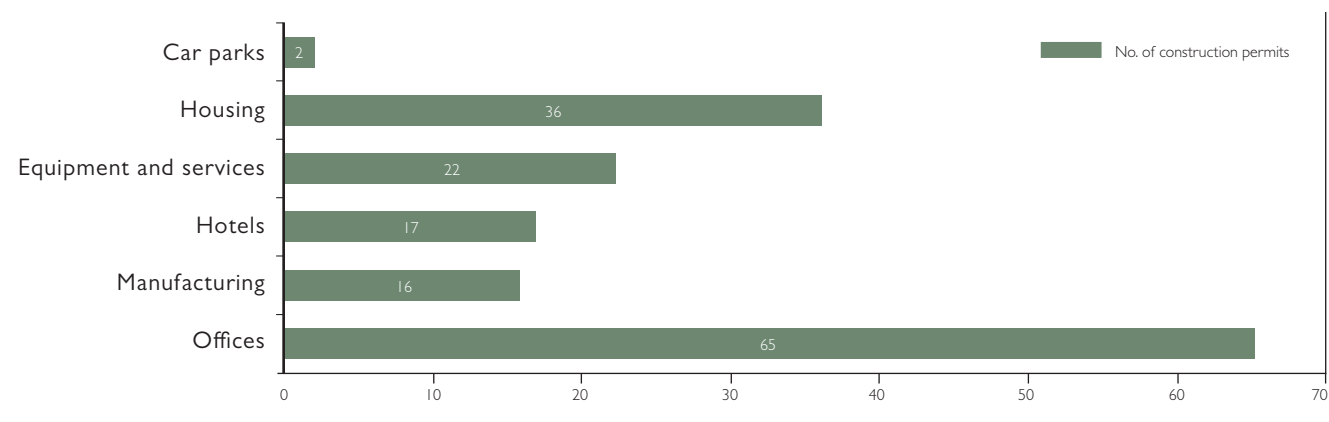
22@ building permits. floor space above and below grade by use. In m² of floor space, 2001-2010



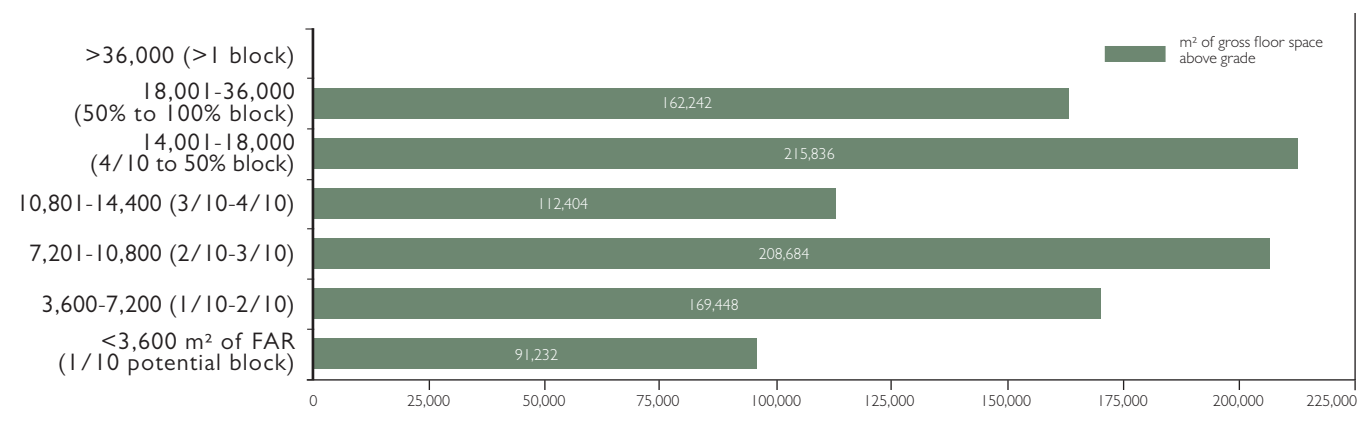
22@ building permits. By uses, in m² of floor space above grade, 2001-2010



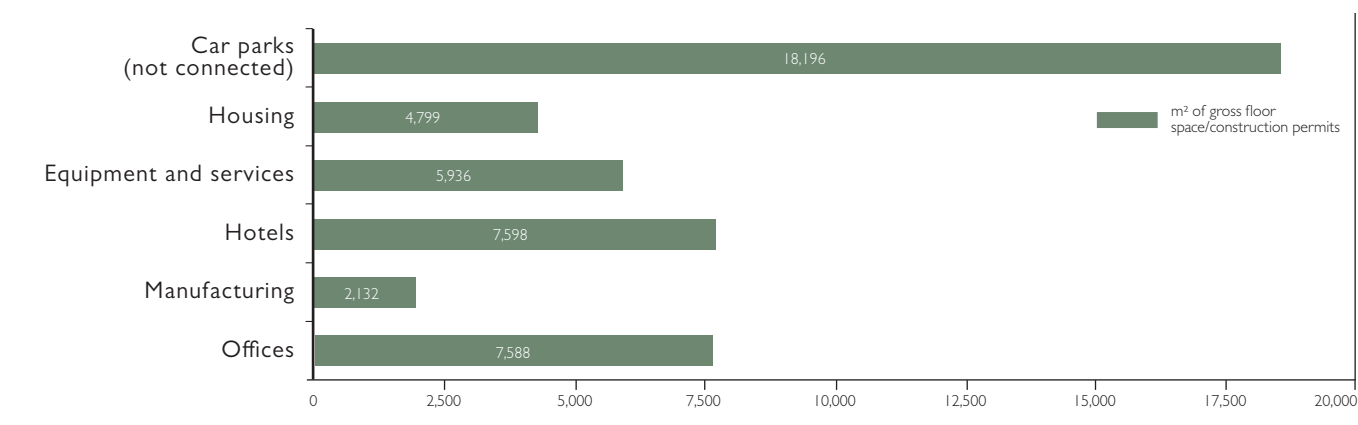
22@ building permits. Number of permits per use, 2001-2010



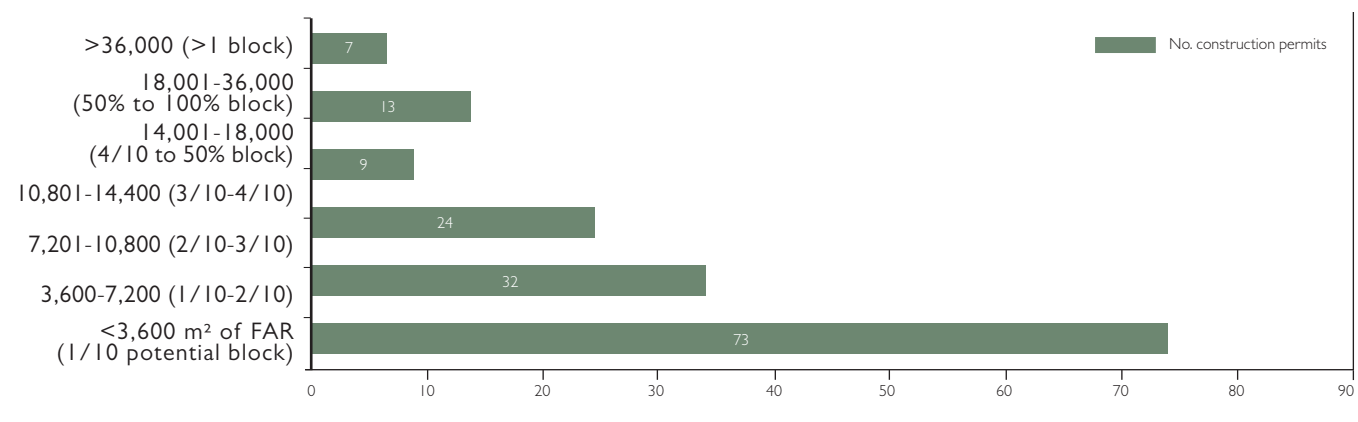
22@ building permits by size. In m² of floor space above grade, 2001-2010



22@ building permits. Average size by use in m² of gross floor space/permit



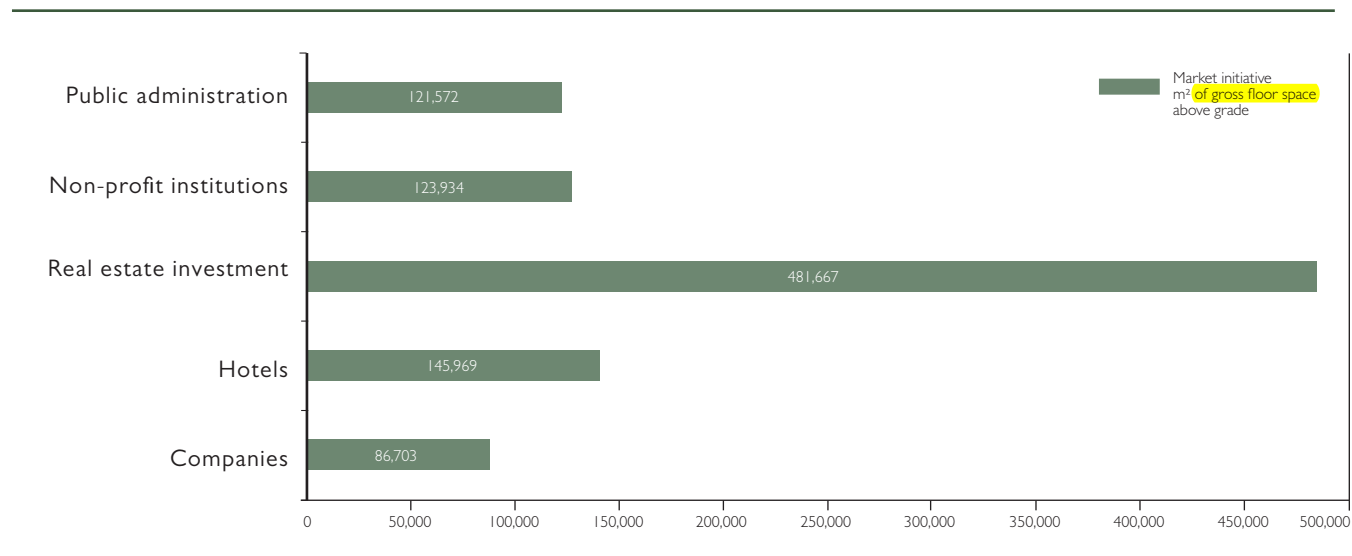
22@ building permits by size. Number by intervals of m² floor space above grade, 2001-2010



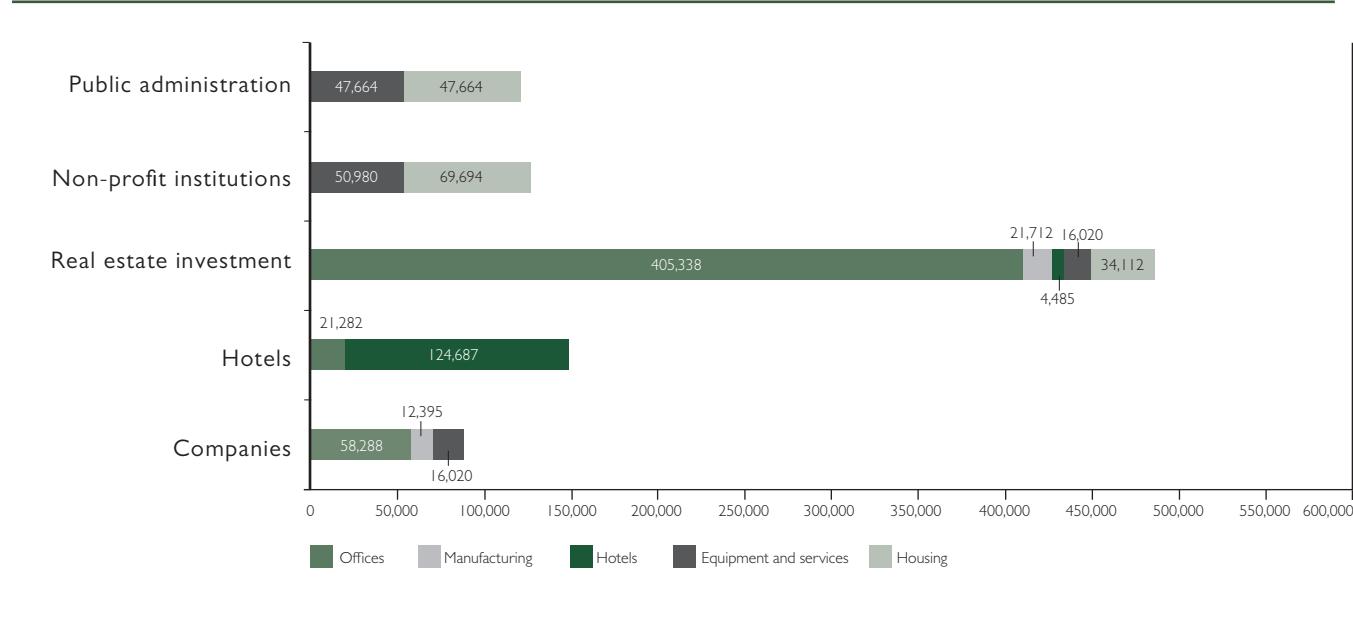
- Leisure, hotel and catering²⁰: 39 m² per job
- Manufacturing: 90 m² per job
- Health: 26 m² per job
- Offices: 18 m² per job

Therefore, 32,149 jobs will have been created when all of the approved permits have been built, if we apply the average standards for the municipality up to 2010.

22@ building permits classified by real estate initiative. In m² floor space above grade

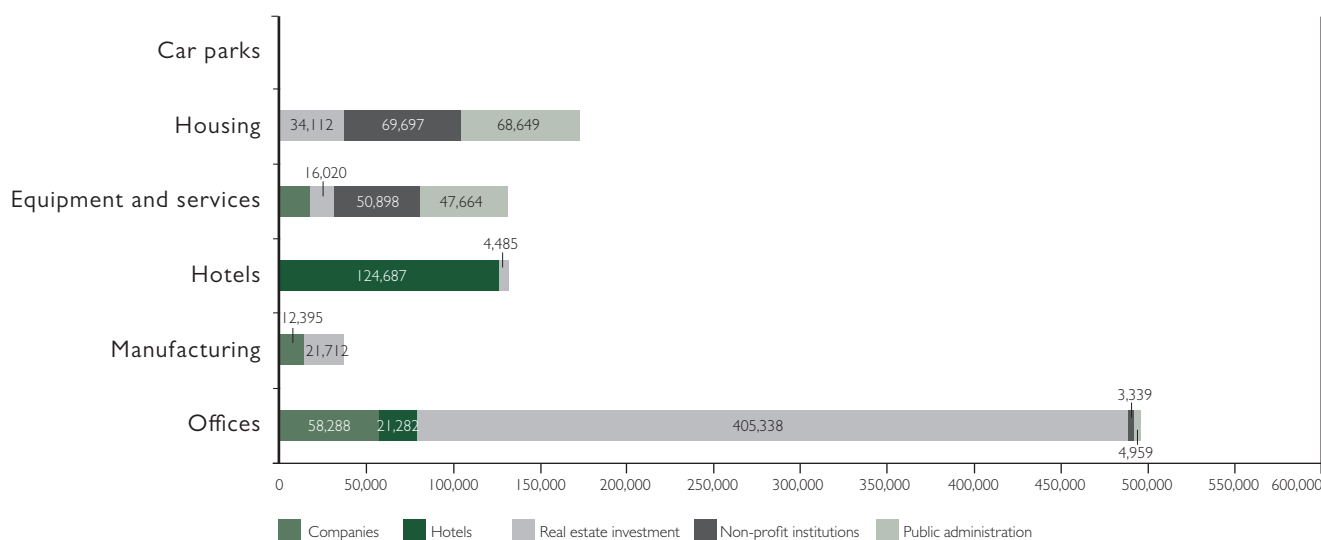


22@ building permits classified by real estate initiative and uses in m² floor space above grade



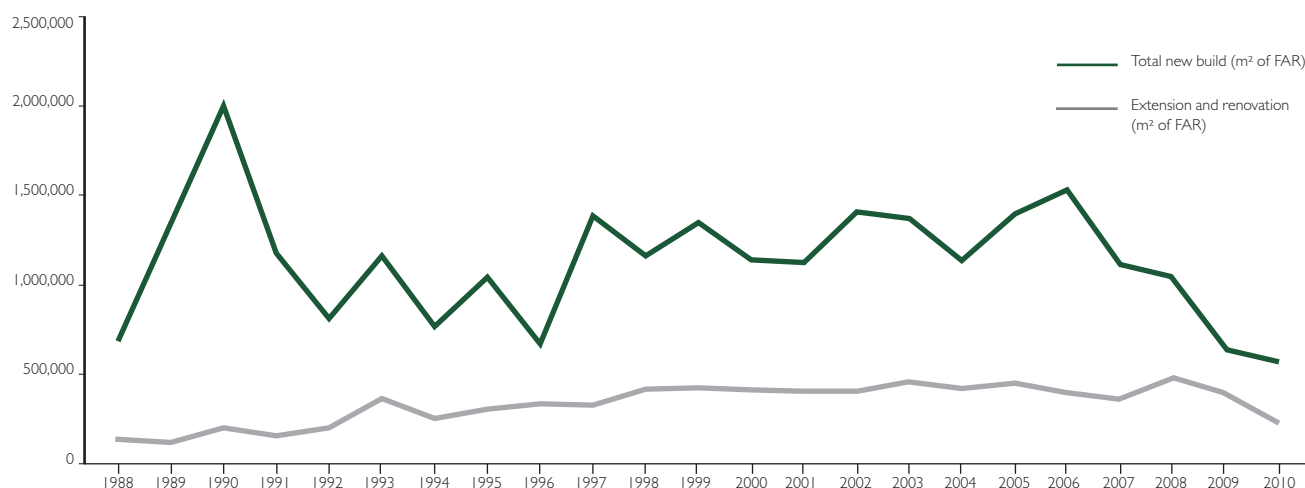
20. It is not clear whether this should be applied exclusively to hotels. Double the standard of 79 m² of floor space per job will be considered.

22@ building permits. Uses and real estate initiative. In m² above grade



New floor space and floor space of extensions and renovations (m²) in Barcelona 1988-2010

(Source: *Barcelona Economia*)



In the real estate market²¹, most applications for permits have been for investment and rental (50.2% of the approved area), mainly for the development of offices.

Specific hotel initiatives, which are also considered a private real estate investment, represent 15% of the approved floor space. Government buildings, together with the

21. This has been classified according to the name of the permit holder. In addition, the 22@ technical services were questioned to ascertain the distinction between 'real estate investment for rent' or 'specific company', which were the concepts that were most difficult to assign. The distinction between 'non-profit institutions' corresponds mainly to trade union estate agents in the case of housing and institutions in the case of facilities. 'Lofts' are assigned to 'real estate investment' in dwellings.

investment of non-profit institutions in affordable housing in particular, comprise 26% of the total, and are in similar proportions. Direct investment by specific companies accounts for only 9% of the approved floor space.

To determine the impact of the approved building permits in 22@, we examined Barcelona's real estate output, using the same source of information, *Barcelona Economia*²². The year with the greatest real estate output in the municipality of Barcelona in the last 23 years was 1991, just before the Olympic Games of 1992, when 2.0 M m² GFS in new constructions was built. This figure was not even surpassed during the peak years of the recent cycle of expansion, in which 1.62 million m² GFS was constructed in 2006.

The average annual output in the last ten years (1.13 M m² GFS) almost coincides with the average output in the last 23 years (1.13 M m² GFS) since 1988, as do the areas for renovation or extensions (0.39 M m² GFS compared to 0.33 M m² GFS). The results highlight the compensation between the levels of output in cycles of expansion (1988-1991 and 1997-2007) and cycles of contraction (1992-1996 and 2007 and 2010), in a consolidated territory that is mainly completed, as is the case of the municipality of Barcelona.

After 1991, there was a clear drop that lasted two years, followed by a slight recovery up to 1996, which was the worst year in the previous recession, although the figures were close to the low output of 1992 and 1994. From 2007 and 2008, the current cycle of contraction began with the lowest point in 2008 and sharp drops in 2009 and 2010, in which the lowest outputs in the last 23 years were reached.

A comparison of the total area approved in 22@ and the total for Barcelona made using the available statistics should take into account the additional assumption that the City Council's statistics include 15% of permits that have been modified or re-issued that may be counted in different years, and that the output in the first few years of 22@ is accumulated in 2003.

As a result of the compilation of data, the estimated impact of 22@ for different uses between 2003 and 2010 is as follows:

- Offices.....	61%
- Hotels.....	32%
- Facilities.....	13%
- Car parks.....	17%
- Housing.....	6%
- Manufacturing.....	5%
- All uses (excluding commercial):.....	17%

The results indicate that 22@ is the most important singular operation in Barcelona in terms of offices (61% of the total since 2003) and that, at the same time, it has played an essential role in the location of new hotels (38%), to address the growing demand resulting from the constant increase in visitors to the city.

The results also highlight that 22@ combines and competes with other areas of the city that have considerable dynamism in the years of expansion, one of which is the important area of the Forum, which is adjacent to the district of Sant Martí. In addition, the synergic effects of clusters should be considered as a single operation, to which La Sagrera central station and the surrounding area shall soon be added.

Building potentials for 22@ and the expected time it will take to infill the area: up to 2014, with 100,000 m² GFS absorbed annually and potential for 85,000 jobs.

The figures are based on data available for 22@, today, which are (in m² GFS above grade) as follows:

- Listed buildings for which no permit has been requested.....	108,163
- Other buildings that remain	198,193
- Consolidated façades for housing	137,085

22. In relation to the comparison with information on 22@ building permits by uses, the problem in the new-build statistics in *Barcelona Economia* is that hotels are classified with facilities. The comparison could also be biased by years, because there is a time lag between the date of the City Council's approval and the favourable information provided by the 22@ technical services. Therefore, we can assume that the proportion of the two uses is the same as that in the statistics on total major building works.

- Consolidated industrial buildings pending transformation.....	438,955
- Permits granted.....	959,847
Total 1 (Consolidated).....	1,842,243
Areas with planning and management that have not been built.....	480,137
Àreas pending planning and/or management	1,570,373
Total 2 (Potential pending development).....	2,050,510
Total 1+2 (Total potential).....	3,892,753
Total 1+Total 2 (Total potential, rounded up).....	4,000,000

In terms of the total 198.3 ha of land, this represents a total plot ratio of 1.96 FAR. In terms of the 116.0 ha of land to be transformed (42% of land in roads, green zones and other systems), this represents a net plot ratio of 3.3 FAR.

A total of 1,842,243 (47% of the total floor space) can be considered consolidated floor space, and only 959,847 m² GFS (57% of the consolidated floor space) in granted permits is still pending construction. A plausible hypothesis is that building has not yet begun on only approximately 95,000 m² GFS in building permits granted between 2008 and 2009.

The considerable planning and management effort in 22@ is clearly revealed by the building potential with completed planning and management, which stands at 60% of the total potential (2.3 million m² GFS compared to the total of 3.9 M m² GFS).

We could consider that the areas that are pending planning and management (480,137 m² GFS) will be developed in the short- to medium-term when the market conditions are suitable, and that this will be the first potential area for which construction permits shall be sought.

The main issue is to determine which part of the 1,570,373 m² GFS with no planning or management, equivalent to 40% of the total potential, will be put on the market due to demand, after excluding the industrial plots that have a high ratio of m² of gross floor space/m² of land and thus

involve high transformation costs. These plots cannot be considered as potential supply to be transformed in the medium term.

Due to a lack of further information, we have used the proportion indicated in the economic and financial study of 2000 for blocks with built areas of less than 38,000 m² GFS in the 'optional development' category (59.7%). The development potential will probably be 1,417,650 m² GFS (937.513 m² GFS added to the 480,137 m² GFS with planning and management).

Consequently, the infill of the area will be completed in 12 years (2022), with an optimistic forecast of permits being granted for 120,000 m² GFS per year, or in 14 years (2024), with the pessimistic forecast of permits for 100.000 m² GFS per year, according to past trends.

If we make combined forecasts for occupation, taking into account that part of the new developments will be allocated to dwellings and also assuming the average standard of 30 m² GFS per new job (including housing), the pending potential development is likely to house 52,446 jobs, in addition to those estimated from the permits that have already been granted (32,149²³). This gives an approximate total of 85,000 jobs²⁴ derived from new development in 22@, which can be added to the existing jobs for activities that will not be transformed.

The 22@ district, the central station of La Sagrera and the Forum: Barcelona's central business district in 2025-2030

The central business district (CBD) of a metropolitan urban area is the part of the territory, generally in a very central position, where there is the highest concentration of directional activities providing services to companies, with maximum added value per job. For simplicity, the boundaries of the CBD in Barcelona are considered to be the Eixample and Ciutat Vella districts, although a more precise delimitation would be more linear along Passeig de Gràcia and Avinguda Diagonal,

23. However, in another study based on a census of companies, the number of new workers in 22@ economic area (extended) was estimated at 44,600 in December 2009.

24. Using the standards of La Défense (24 m² per job in offices and retail) this would be 99,062 jobs.

as shown on the maps in reports by the main real estate agents.

The urban development proposed in the transformation of industrial Poblenou into the 22@ district has a potential of around 3.2 million m² GFS above grade (and approximately 1.3 M m² GFS below grade, based on proportions derived from approved permits) and will alter the concentration of current tertiary activities and the metropolitan centres.

The municipality of Barcelona had 118.99 million m² of registered floor space in February 2005, both above grade and below grade in car parks, according to the City Council's Institute for Fiscal Studies. In December 2009, it had 121.29 M m², according to information from the Land Registry Office of Catalonia. Therefore, there was an increment of 1.93%, and the breakdown of uses did not coincide exactly with the initial information.

The Sant Martí district represented 12% of the total registered floor space of Barcelona (14.6 M m² GFS) in 2005. However, it housed 20% of manufacturing (2.7 M m² GFS) and 6% of offices (0.4 M m² GFS) and government buildings. In contrast, the Eixample district represented 27% of the total registered floor space (23.9 M m² GFS) and housed 45% of the offices and public administration buildings (2.5 M m² GFS) and 14% of the manufacturing

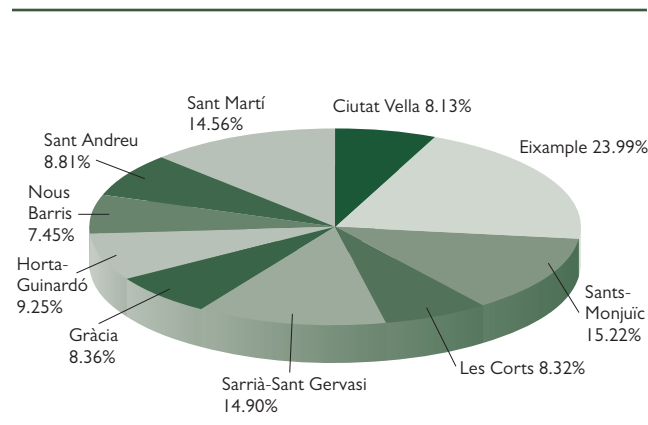
of Barcelona (1.7 M m² GFS). Although the increase in the number of offices would have been very different in other districts, we do not have enough land registry information to document it accurately²⁵.

The combined districts of Eixample and Ciutat Vella that are considered the current CBD account for 45% of the floor space of offices and government buildings in Barcelona, with 3.5 million m² GFS in 2005.

To the dimensions of 22@ (3.2 M m² GFS above grade for activity and an allocation below grade -assuming that industrial activities can coexist that are progressively transformed within the same sector of activity into activities that are more compatible with other uses - and around 1.2 M m² GFS below grade), we should add the potential economic activity in the operation of the Forum (0.6 M m² GFS above grade and around 0.1 M m² GFS below grade) and in the area surrounding the central station of La Sagrera (0.4 M m² GFS above grade and 0.1 M m² GFS below grade). The total activity in the three operations together would be 4.2 M m² GFS of activity above grade and 1.4 M m² GFS below grade, compared to 3.5 M m² GFS in the districts of Ciutat Vella and the Eixample, in 2005.

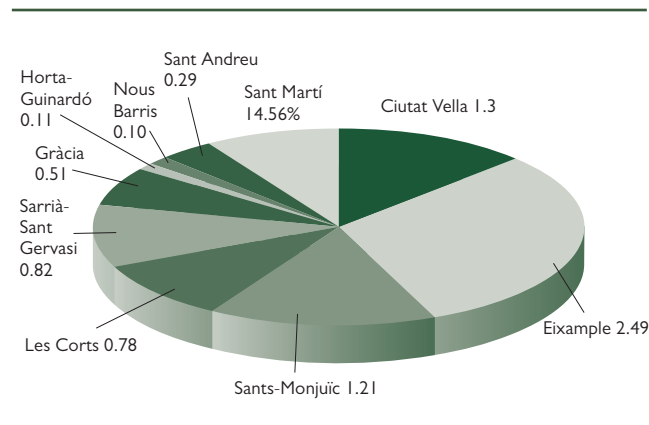
We can conclude, therefore, that the completion of the major economic activity operations in the districts of Sant Martí and Sant Andreu (4.2 M m² GFS above grade), which

Land Register BCN (above and below grade) 2005.
In millions of m² GFS



Source: Institute for Fiscal Studies, Barcelona City Council, Ciutat Vella

Land Register BCN, Offices-Public Administration, 2005.
In millions of m² GFS



Source: Institute for Fiscal Studies, Barcelona City Council, Ciutat Vella

25. This is a serious statistical problem that affects the assessment of the physical and economic dimensions of cities, that is probably caused by the centralized management of the land register.

are close together and will therefore facilitate clustering and synergies when economic conditions allow, will surpass or at least equal in size and in knowledge-based and new technology activities the dimensions of the districts of Eixample and Ciutat Vella (3.5 M m² GFS, in 2005), and will modify in any case the central areas in the city.

However, there is still the question of whether more dwellings are needed than those envisaged in the plans for these major operations in the east of Barcelona, to create the balance of a compact and complex city and meet the additional needs of accessibility and public transport that modern CBD require. In any case, the main commercial centre of the city will continue to be the traditional, historic CBD.

Summary and conclusions

1. The 22@ district, which has a potential of almost 4 million m² of buildable area (GFS), boosts the knowledge economy by providing companies with externalities to compete better. It also offers an additional plot ratio of 0.5 FAR, which acts as an implicit subsidy in comparison with other zones with lower plot ratios. The location in the 22@ district of universities and technology centres and a commitment to clustering means that those who move to the district do so not only for the prices, but also for the position in innovation, the 'current critical mass' and because it is the largest central supply. One of the advantages in terms of real estate is that construction can begin immediately, unlike in other competing operations that are still in the planning stage.

2. The 22@ district competes with operations around the world of a similar scale that are in central locations, such as La Défense in Paris or the extension of La Castellana in Madrid. Its advantage is that it is a knowledge economy cluster, and its disadvantage is that it has a lower critical mass and regional and international rail networks are not highly accessible from the district today. Furthermore, the prices and rents are higher than those of Barcelona, which reflects the greater attractiveness of world cities. The district benefits from the iconic Agbar Tower, the Biomedical Research Park and the new Telefónica tower on Avinguda Diagonal, which is outside its urban area.

3. The MPGM predicts that it will take 20 years to complete the development. The annual absorption rate will be 135,000 m² GFS. The compensation for relocation of industrial activities is economically feasible and 70% of the infrastructure plan will be covered. The development was well in line with expectations up to the change in economic and real estate cycle that began in 2007, and permits have been granted for only 33,000 m² GFS on average per year.

4. Concurrent and competing current and future operations have a total building area of 11.4 mm² GFS for activities and housing, generate a surplus of 207,500 jobs and a shortfall of 198,600 dwellings in the city 'from river to river', and their development shall increase metropolitan mobility.

5. The potential area available in 22@ combined with the future potential of La Sagrera-Prim shall continue to be the main supply for economic activities in the coming years. However, it will only represent 47% approximately of the potential. The supply that shall be in most competition with 22@ will be the Innovation Zone in Zona Franca in the former SEAT factory, which will provide around 1 million m² GFS with a plot ratio similar to that of 22@, and with very competitive rental prices. The city infrastructure of this area has just begun. To differentiate the supply, it is essential to ensure specialization by sectors in each territory.

6. The second main metropolitan supply for economic activity, in terms of size and quality of the city infrastructure, is that of the Centre Direccional de Cerdanyola-Parc de l'Alba, which is currently available. We can consider that this supply complements that of 22@, as it meets a different demand for activity, in terms of characteristics, location and price. The two areas strengthen each other to attract international demand. They cover an area of 340 ha and have a potential floor space of 1.9 million m² GFS, of which 1.5 M m² GFS are for economic activity.

7. The 22@ district has been a successful operation because 61% of the total new office buildings in Barcelona have been located there since 2003, and 38% GFS of new hotels, for which there is increasing demand due to the constant rise in the number of visitors to the city. Without the 22@ district, these activities would have had to be located in the wider metropolitan area, which would have

presented fewer opportunities to create urban economic clusters.

8. The permits approved up to the end of 2010 would lead to the creation of 32,000 jobs, using the city's average standards of density by use. However, in the wider economic area of 22@, around 44,000 new jobs shall have been created in 2010.

9. The development of 22@ has been driven by the location of public facilities, universities and non-profit institutions, given the supply of land for affordable housing that represents 26% of the total floor space in the approved permits. The real estate interest is clear: 50.25% of the approved areas are for buildings for investment and rent, mainly for offices. Specific hotel initiatives, which should also be considered private real estate investment, represent 15% of the approved floor space. Direct investment by start-ups or existing companies only accounts for 9% of the approved floor space to date; consequently this area should be promoted in the future.

10. From 2001 to 2007, the average area constructed per year was 172,106 m² GFS, whilst in the three last years it has been only 33,105 m² GFS. Between 2003 (accumulated) and 2010, an average of 120,000 m² GFS above grade was approved per year. This trend could be taken as an optimistic forecast for the coming years, as it includes four and a half years of expansion and three and a half years of recession. A pessimistic forecast would be 100,000 m² GFS absorbed per year.

11. The forecast costs of the Special Infrastructure Plan that are to be financed by the developments are too low in comparison to what is currently required in the Spanish and Catalan planning regulations on connecting infrastructure and on participation to redress the shortfall in public transport. The economic accounts for the operations could include higher city infrastructure costs.

12. The 22@ district is an operation that enables planning gains to be recovered through the financing of city infrastructures and through the transfer of land for affordable housing, which is compatible with private returns on the operations, due to the plot ratio. Private real estate initiative has provided profits of approximately 27% of the real estate sale value and returns of 15%

per year in cash flow for an average management period of six years from planning to sale.

13. The potential area that is pending development in 22@ (1.4 million m² GFS) shall be completed in 12 years (2022) in the optimistic forecast of permits being granted for 120,000 m² GFS or in 16 years (2026) in the pessimistic forecast of 100,000 m² GFS per year, according to past trends.

14. The total potential number of jobs is estimated at 85,000 (99,000 using the standards of La Défense, Paris), with current standards of density. These jobs will be added to those of activities that will not be transformed.

15. The completion of major economic activity operations in the districts of Sant Martí and Sant Andreu (4.2 M m² GFS above grade) will facilitate the formation of clusters and synergies when economic conditions are right, due to their proximity. Combined, these operations will surpass in size and in knowledge- and technology-based activity the dimensions of offices for directional activities in the current CBDs of the Eixample and Ciutat Vella (3.5 M m² GFS, in 2005), and shall become the new CBD of Barcelona by 2025-2030.

16. From the perspective of urban development and real estate, we can consider whether more dwellings are needed than those envisaged in the plans for for these major operations in the east of Barcelona. This would help to create the balance of a complex and compact city, and to meet the additional needs for internal accessibility through public transport of the most contemporary CBD, which could be funded by the new development. Nevertheless, the main commercial centre continues to be the traditional, historic CBD.