Mass housing estates of the Vallès and the A-road 150
a new territorial articulation

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Abstract

The most habitual practice in renewal projects of mass housing estates has comprised of acting exclusively
within the strict limits of each individual district, thus bypassing the strategic opportunity to tackle broader scale
renewal projects that are linked to their dimension, location and urban characteristics.
In the concrete case of the Vallès, the new context of the mass housing estates and their relationship with
different supramunicipal axes (e.g. that of the Terrassa-Montcada A-road 150) allows us to associate, from a
territorial perspective, groups of residential districts with clear problems of physical, functional and social
segregation; exceeding the current local visions in such a way that determines future renewal strategies.
Furthermore, the A-road 150 axis could become a vertebral axis of activities of urban, social and economic
renewal by way of transforming the old A-road into a new metropolitan street.

Keywords: Renewal projects, Mass Housing Estates, Metropolitan street.

Introduction. Origin of Mass Housing Estates in Barcelona

The mass housing estates in Barcelona, built between the 50s and 70s through several stages with
different legislative frameworks, agencies and action programs, were conceived with the aim of
solving the existing problems of homelessness derived from the massive influx of immigrants, and the
appearance of neighbourhoods of substandard housing and eradicate the existence of shantytowns.

Their appearance entailed a historic period of extensive growth of the city. The mass housing estates,
located mainly on the outskirts of the city, also meant an important change of the structure and shape
of the city and the beginning of the metropolitan area construction. In the city its great impact resulted,
during the period from 1950 to 1975, in the construction of 745,682 houses and a population growth of
almost a million and half people.

Despite being a group of practically simultaneous operations, in terms of timing, with a large
territorial extension based on their dimensions, they were not planned, located nor designed
collectively. Consequently, the result was the city growth via the simple accumulation of housing
districts located in the territory without strategic criteria from an urban perspective and with serious
deficits in structure and continuity with the existing city.
The urban model of the mass housing estates was the direct product of the goal of building the maximum amount of dwellings within the shortest possible time frame and with the least possible financial investment. Therefore, planning, management and execution processes were simplified to the maximum. The result was blocks of flats, precarious both in their typology as well as their construction, and neighbourhoods formed by a series of isolated buildings erected in the territory without any intention of biophysical integration nor respect for the pre-existing matrix, and where the public space was vacant space that had been left by default.

**Context and current status of housing estates**

The contemporary city, "ciutat_mosaic_territorial" raises the need to focus planning activities on efforts to restructure urban sprawl and the concentration and compactness of urban settlements, and the resultant improvement and renewal of the existing urban fabric, against the dynamics of historical development, associated with its growth in terms of land occupation. We therefore aim to identify a period of intensification which can be classified as the "permanent renewal" of the city.

After more than 50 years since the appearance of the first housing estates, with a new social, urban, territorial and economic context, it seems appropriate to diagnose its current state in order to tackle the project of renewal based in new challenges for intervention.

The analysis of different projects studied related to intervention in housing estates, we can identify (without intending to be exhaustive in content) how a set of common aspects regarding the current state of mass housing estates appear repeatedly and somehow allow for the justification and explanation for the need to operate in planning terms in order to improve their urban and social conditions, ultimately improving the living conditions of its inhabitants.

The common factors identified are: habitability and accessibility of housing, social structure and public facilities deficits in public facilities, the residual public spaces, degradation of the urban landscape, environmental issues and the position of the mass housing estates within the city and the territory.

**Habitability and accessibility of housing**

Mass housing estates accumulate several problems that directly affect their living conditions. As a result of the low quality of construction the appearance of constructive pathologies has been a usual occurrence. In the worst cases such pathologies have been structural, as well as the obsolescence of the technical installations, or the breach of regulations in size and environmental comfort of housing, exacerbated by inadequate or non-existent maintenance and upkeep of buildings. On another token, the lack of elevators in high-rise building types seriously affects the conditions of accessibility.

**Social structure and public facilities deficits**

Changes in the social structure of mass housing estates, in recent years, allow us understanding some of the existing urban problems and above all explaining the emergence of new requirements and demands regarding the provision of services and necessary public facilities and the reformulation of the structure and characteristics of urban open spaces.

Overall there have been two parallel phenomena that have generated a process of population replacement:
- on one side there has been a shrinking and ageing of the local population (people who originally occupied the estate) due to the outflow of those with more cultural and economic capacity, primarily the case of younger people.
- the increase of immigrants attracted by the existence of housing that is affordable within their means and is made up mainly of young men.

This process, which also could be called negative selection, has generated differing degrees of social tension and conflicts, mainly due to the rapid speed in which it has occurred.

It has also caused the appearance of new specific requirements regarding the facilities and services, especially with social services related to young people (immigrants) and the elderly (native) and also with respect to the need for equipment associated with problems like crime or drug abuse.

Another impact has to do with planning the treatment of urban open spaces, taking into account new safety criteria and gender, as it is in the public space where conflict is staged in coexistence among different social groups and cultures.

**Residual public space**

The perception of public spaces as residual spaces is surely one of the clearest and most obvious symptoms of model errors that gave rise to mass housing estates. While it is true that most of the problems of open spaces in mass housing estates is not quantitative but qualitative and therefore linked to the quality of their laying out and the maintenance of its condition, it seems that there is a prior factor that condemns this situation. The lack of intentionality and the lack definition in the original projects has led these areas to be without order and hierarchy and without any significance.

One consequence of the urban absurdity of the mass housing estates that must be added is that open spaces not only suffer from the lack of internal structure, but also they obviously do not have any relationship or continuity with the whole system of open spaces in the city.

**Degradation of the urban landscape**

The problem of degradation of the urban landscape in mass housing estate developments has to do primarily with the architectural quality of housing units and their state of conservation. The precarious conditions under which they were constructed have led to such rapid degradation and hence the urgency of having to intervene in their rehabilitation.

It also adversely affects the urban landscape, a common fact in the majority of estates such as the existence of a set of streets and urban open spaces that do not meet the conditions of adequate laying out, and where the massive presence of cars in the public spaces predominates.

Lastly, in some cases, interaction with industrial fabrics or excessive proximity to non urban facilities such as cemeteries means a negative impact for the neighbourhoods from physical and psychological standpoints.

**Environmental Issues**

In some cases, the fact that these are situated in close contact with transport infrastructures and industrial fabrics leads to some of the estates suffering major environmental problems, noise pollution, light pollution etc, associated with incompatible adjacent activities and to the intense traffic.

Otherwise, what must be taken into account from an environmental perspective is precarious construction of the existing architectures as well as their low maintenance, thus entailing a very precarious energy efficiency of the apartment buildings in some cases.
Urban estate location

The fact that in its origin the mass housing estates were located, unfortunately, in isolated areas far from urban centres and with an implementation model irrespective of pre-existing and biophysical characteristics of the matrix of the territory, has conditioned relations with the rest of the city and territory and largely explains the current problems and deficits.

However, as a consequence of urban growth during the years of existence of the mass housing estate, they are no longer as they were in their origin; in an isolated position from the existing city, but rather, are mostly found juxtaposed with other urban fabrics. Although they are in a position of contact with other urban areas, most estates are characterized because they maintain a condition of limit or boundary between the established city residential areas and other types of infrastructure, industry, or simply residual spaces:

- road infrastructure, which originally justified in many cases the location of the estates for being of high territorial accessibility, currently serve as urban barriers that prevent the reestablishment of new relational continuity. It is worth mentioning that axes that were regional infrastructure when the mass housing estates were built, with the emergence of new higher-capacity axes, have become obsolete, both functionally and physically. In other cases the barrier effect was accentuated as the initial axis has been strengthened in their existing role, as in the case of Ciutat Meridiana in Barcelona.

- one set of mass housing estates is characterized by being separated from the city by water infrastructure, a factor which accentuates their isolation and hinders conditions for the restoration of physical and functional continuity with the rest of the city. Clear examples of this condition are the estates of Montserrat, Sant Llorenç and Vilardell in Terrassa which are separated from the rest of the city which is divided by the Arenes dry river bed.

- the location of certain estates areas of inadequate topography due to their steep slopes, is another inherited factor that, in cases such as Ciutat Meridiana, forces the project intervention to be tackled to with the need for incorporating solutions related to the elimination of barriers architectural and general improvement of accessibility.

- railway infrastructures also contribute to the physical and functional discontinuities of some neighbourhoods such as Ca n’Anglada or Ciutat Meridiana.

Despite the factors mentioned previously, it is necessary to make a positive assessment of the proximity of some estates to certain infrastructural axes. This factor make them to be in metropolitan positions of high regional accessibility and thereby facilitating their potential for regeneration.

Alternatively, one element that characterizes the position of mass housing estates is the condition of rather accentuated discontinuity with respect to the rest of the city. The land occupation of the city has reached them without the willingness or the project to integrate them structurally throughout the city. In this respect, and paradoxically, despite evidence indicating problems with internal and external structure between estates and the city, intervention projects in housing from a global city or at least from a perspective broader than the perimeter of the polygonal area has rarely been addressed. This has perpetuated the original perimeter of polygons and an impermeable boundary.

Renewal projects. Background

A several number of renewal operations, in the mass housing estates, have been in recent decades, carried out in order to improve precarious living conditions. These have been analysed in order to draw some conclusions for new projects of intervention in this type of neighbourhood.

In this observation, many individual works, of all types and scales of redevelopment, rehabilitation, construction of new facilities or others, carried out in mass housing estates from its origin, have been...
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ignored. Interest has been focused on those activities relating to broader renovation projects, i.e. actions with a programmed framework.

From a strictly urban perspective, the set of interventions analysed can be synthetically identified in four different groups, depending on the type of actions employed: actions of replacement of residential buildings, rehabilitation activities, integral projects, and transformation operations. Of course, all actions admit different variables nuances and degrees of interpretation. For this reason the fact that they are included in only one group seeks to identify the type of intervention in accordance with the fundamental objectives set for it and does not exclude the fact that other objectives or actions of another nature have also been integrated.

In addition, within each group those actions that have been jointly promoted, managed and/or funded through several specific programs have been identified.

Replacement projects

The actions of replacement of residential buildings, have been carried out under two programs, known locally as "programes de remodelació"; developed by the "Institut Català del Sòl" (INCASOL), a regional organization which has intervened in a total of 17 districts in different areas of Catalonia, and the other by the "Patronat Municipal de l'Habitatge" (PMH) of the city of Barcelona, which has acted in three districts of the city.

In the case of Incasol, the neighbourhood redevelopment programs have operated in districts originally promoted by the initiative of public organizations that currently have a social structure of low income. The objective was to simultaneously solve two major problems of housing buildings in these neighbourhoods; the existence of constructive and structural pathologies (the restoration of which was economically unviable, and therefore advised to be demolished), and the second, of typological nature, linked to the existence of substandard housing types.

In short, in this program actions have been centred mainly on the management efficiency and economic feasibility of the operations and in the typological and architectural design of new buildings. In this sense, actions are framed within a context of general reflection about how they had to be new residential typologies. In contrast to those that were replaced, the new have been designed with the aim of improving the quality of their construction and their functional adequacy and typological diversity.

Furthermore, the planning documents entitled, "Plans Especial de Reforma Interior" (PERI) are instruments that have enabled the process building replacement using the sequential shift from their original position to adjacent open spaces in accordance with management criteria based on the speed of re-housing. However, although improvements have led to the improvement of the laying out of some of the public spaces affected and have introduced new non-residential uses on lower floors, the morphological changes resulting from the relocation of buildings have generally not addressed a planning criteria which deals in depth with issues related to the structural conditions or morphology of the neighbourhood and their physical and functional relationship of continuity with the rest of the city. This has meant that issues such as mobility management, strategic functional diversity of the neighbourhood or hierarchy and definition of the set of existing public spaces have been ignored.

Rehabilitation projects

A set of interventions related to various programs have been established with the basic objective of rehabilitating the existing buildings, and thus brought forth in order to resolve structural and constructive deficiencies and pathologies.
Within the scope of the neighbourhoods rehabilitation program, the PMH has been involved in several housing projects that have led to actions of restoring buildings with structural problems and construction issues of different natures such as “carbonatosi”, water and electrical installations, heat insulation of facades, or damp, floor pavements and woodwork. It has also dealt with aspects of landscaping. There have been plans in order to define colour proposals of actions linked to elements of facades. Otherwise, there have been several jobs defined in order to remove barriers and improve accessibility in homes through the installation of lifts.

In the context of the Revitasud Interreg project, ADIGSA, a Catalan public company and partner in the project, has been involved in various mass housing estates renewal projects with the aim of achieving full integration of these neighbourhoods in the urban environment itself. This has been done, through a diagnosis made according to criteria of environmental sustainability while promoting public participation during the period of 2003-2007. These are primarily rehabilitation intervention-based projects with the aim of improving the energy efficiency of the architecture through rehabilitation, improvement or replacement of technical installations or construction elements.

ReHabitat 2010, is a project of the European Union to improve social cohesion and eco-efficiency through rehabilitation and maintenance of social housing. It began in 2009 and is scheduled for completion in June 2012. The project stems from the results of the needs identified in the Revitasud program, and in detected needs: urban revitalization, with sustainability criteria, and integration and social inclusion.

The European projects E3SoHo, Reshape and Ciclope, aim to subsidize and promote energy efficiency and renewable energy sources, promoting the production and use of energy in a more intelligent way and increasing the use of renewable energy, in operations of building rehabilitation.

In addition there have been a series of projects and programs that have established goals indirectly linked to the improvement of the efficiency of the rehabilitation project instruments: the Impact Project aims to improve the quality of energy audits and certification systems for existing buildings. The purpose of Project Rehab in BCF was developing a tool, complete with examples of innovative projects, on CD-ROM geared towards technicians, building foremen, social groups and users to raise awareness about the need to rehabilitate in an environmentally correct way.

Lastly, we have included in this group the "Projecte Ecobarri", made up of work teams of the Institute of Science and Technology (ICTA) and ADIGSA. Its objectives are: to develop and apply new tools for environmental analysis and diagnosis in a pilot district, to define proposals for environmental improvement and savings of resources in urban systems in Catalonia which can be applied by ADIGSA. The pilot project has allowed for a complete diagnosis of the environmental vectors of water, energy, waste and urban open areas as well as the establishment of a set of monitoring indicators of the neighbourhood. After, a set of intervention strategies have been defined for each of the vectors, regarding criteria of building rehabilitation projects, refurbishment of the open space and mobility management.

Comprehensive projects

This group first of all identified those projects related to the "Llei de Barris" and that under this project have been outlined in a project of comprehensive intervention.

The “Llei de Barris, àrees urbanes i viles que requereixen una atenció especial” was approved by the Government of Catalonia in 2004 with the aim of giving local authorities the necessary tools to carry out social and urban interventions in those neighbourhoods that should require it. The main objectives of the "Llei de Barris" are to create an instrument of social redistribution, to promote the rehabilitation of neighbourhoods, encouraging actions to improve social cohesion and integration to improve environmental sustainability and promote economic revitalization. Since 2004 more than 100
comprehensive action projects have been carried out, of which 22 were related to mass housing neighbourhoods.

In fact, we can consider that the "Llei de Barris" program has entailed establishing a new framework on how to tackle renovation projects in two fundamental aspects:

The first, of an analytical nature, is the proposal of objectively evaluate and define the areas that need intervention, by the definition of indicators grouped into four generic situations: processes of urban decline, demographic problems, economic problems, social or environmental and social deficits and local development, which can identify which areas are eligible for the program.

The second, strategic-planning, is aimed at tackling the renewal project of the neighbourhood via a comprehensive intervention project, that exceeds the sector interventions and actions, allowing them to take comprehensive action intended both for physical rehabilitation as well as environmental sustainability, social welfare and economic revitalization. This goal entails the definition of the following eight areas of intervention developed by urban development, social, economic and environmental initiatives: improving public space and the provision of green spaces, rehabilitation and equipping of the collective elements of buildings, provision of facilities for collective use, the incorporation of information technologies in buildings, promotion of sustainable urban development especially regarding energy efficiency, savings in water consumption and waste recycling, gender equality in the use of urban space and facilities, development of programs that involve improving social and economic planning of the neighbourhood and the accessibility and the removal of architectural barriers.

After seven convocations the program proved its efficiency in the management and implementation of the activities planned. However, the figures show that the most important effort was devoted to public space laying out and public facilities buildings, corresponding to 50% and 25% of investments, while the remaining 25% were distributed among the social and economic activities.

Transformations projects

Of the different intervention projects linked to housing developments not affiliated with any of the specific programs mentioned above, it seems appropriate to highlight and discuss the "Pla de transformation del barri de La Mina a Sant Adrià de Besòs". The purpose of the document was to begin a process of intervention in the district of la Mina, a mass housing estate built in 1974 and stigmatized by their history of social problems and conflicts, with the objective of improving their social and economic conditions of the population.

The origin of the action lies within the framework of the urban transformation of the area east of Barcelona., begun at the beginning of the century and outlined by four strategic actions: the activities district of Poblenou, the area Sagrera, the recovery of the Besòs river basin and the works carried out in Diagonal Mar and the surrounding areas of the Forum 2004. All four, positioned the neighbourhood on an attractive site, and this was seen as an opportunity for the "la Mina" to be linked to this new and great urban transformation.

The plan to transform the neighbourhood of La Mina in Sant Adrià de Besos, meant to overcome the mere urban rehabilitation, and embracing a much broader perspective and from different scales in which the social, economic, cultural and urban aspects integrate a holistic project that aims to set a new stage for occupancy in the neighbourhood and also, by extension, the city of Sant Adrià de Besòs.

The transformation strategy involves a radical intervention, an action on the central area of the neighbourhood that will both break and suture at the same time. It entails a recycling in order to create new habitat conditions and determines a new flexible and open stage on which to build the necessary strategy for renewal and revitalization. The content of the planning proposal is based on the
construction of a new central vertebra, central space and reference for the new district to support and feed into new and existing buildings, a place for to the new civic social economic and cultural activities. The introduction of this urban benchmark condenses the three basic principles of the proposal:

1. Centrality. The central locations give the cities identity. They are places of collective demonstrations, the space with the strongest presence of public buildings, by far the place of the collectivity, space relationship entertainment, commerce, culture, the space where the city ultimately most greatly expressed.

2. Diversity. The principle of diversity which so evident in the richest assessment of the natural ecosystems, enables the city to take on greater value, as it is the principle which should ensure a greater wealth of relations between the components of the neighbourhood. Diversity to be given at all levels; social, in the composition of people and neighbours; physics, by the definition of spaces, architectures and types of housing; and economic by way of the diversification of productive activities.

3. Exchange. Understood as a basic principle of relationships, essential in the prevention of atrophy, decay and social breakdown as a consequence that may result by the isolation of any human collective. Again, environmental sciences emphasize the need for the exchange between different areas and ecosystems, so it will be necessary in some cases, increased and improved interconnectivity with the outside world, and elsewhere, the provision of urban flows generators that promote precisely this exchange.

In addition, the comprehensive plan, was accompanied by the social action plan and was divided into seven main sections: education and social integration, reconciliation of work and family life, economic development, participation and community development, improving relationships and community spirit, social and educational support, the sharing of public space and civism, with those that have already been carried out making up a total of more than seventy actions and programs.

Conclusions

Of the programs, projects and actions analysed we can establish a series of reflections or lessons learned that in a sense also allow us to highlight their evolutionary process.

Chronologically, the first actions carried out were mainly centred on solving the most urgent problems of the estates; those linked to structural and / or construction problems that seriously affected the living conditions of housing and in some cases posed some type of risk for their occupants. Whenever technically and economically possible, there have been rehabilitation operations. When these have been considered unviable, a decision was made for the demolition of buildings and their replacement by new ones. Replacement operations have improved the residential typologies of existing buildings and have also introduced, reluctantly, new non-residential uses in new ground floors.

As the most basic and evident problems have been corrected, there has been a need to improve methods of diagnosis of neighbourhoods in order to establish criteria and mechanisms of comparison between them and with other typologically distinct neighbourhoods. The activities have been gradually incorporating new qualitative parameters to the strategies:

- social, incorporating participation strategies in order to involve the residents affected in projects, as a means of more efficient performance and also ensuring the maintenance. Alternatively, the projects have been complemented by activities linked to social services and education.

- economic, promoting the revitalization of economic activities in the districts as key factor to their urban and social improvements.
- environmental, progressively integrating analytical and intervention criteria with the objective of making the buildings more efficient in terms of resource consumption and enhancing their public spaces with better environmental quality.

- methodology: generating networks of different organizations, or government administrations with the objective of exchanging and cooperating.

In general, we can conclude that the actions of rehabilitation and refurbishment have meant significant improvements in the architectural quality of buildings and, consequently, of their living conditions. It also entailed an improvement in the quality and accessibility to public spaces in neighbourhoods without altering their structure or morphology.

The replacement projects, however, have altered the position of some existing buildings in order to facilitate the management of the operation and the required rehousing. In almost no case did this lead to substantial changes to the structure of the urban fabric, and when there were changes, they did not seem to be a response to strategic criteria concerning the relationship between the neighbourhoods and their surrounding area.

The projects of "Llei de Barris" have, from a planning standpoint, allowed for the introduction of a new project parameter which complements the rehabilitation and redevelopment, which is the case of the public facilities. The works related to the reformulation of existing facilities or new programming have, in some cases, enabled the internal structure of the estate to be reoriented while at the same time generating new polarities in order to improve the integration of neighbourhoods throughout the city.

It is probable that the plan for transforming the "la Mina" neighbourhood is the only one which has been able to integrate simultaneously, in terms of both time and space, actions of different degrees and thus achieve a level of intensity and transversality can aspire to becoming a true urban and social transformation and improvement of the neighbourhood. Emphasis has also been placed on key strategic planning issues such as the quality of public space over quantity, the capacity of urban facilities as generators of flows and exchanges, or the concept of "physical compactness" as a condition for the restoration of spatial continuity in a residential estate.

In most renewal projects, the works carried out have merely addressed the problems of internal organization of the neighbourhoods and have acted in both an independent as well as isolated manner. Only in some cases have these been integrated into broader considerations associated with the urban context of the neighbourhood. In some projects linked to the "llei de barris", other aspects related to the construction of new facilities have been added which that to a certain extent can redirect certain structural aspects of estates and their functional relationships with the city, or in the case of “la Mina”, where the renewal project was part of a wider process of urban transformation.

**A new context for mass housing estates**

This paper raises the hypothesis that with the accumulated knowledge and experience of different projects and renewal programs for mass housing estates and within a the new urban, territorial and social context, (completely different from those that originally gave rise to the neighbourhoods), it is possible and desirable to overcome the isolated nature of such actions. This thus affirms that the renewal of urban housing estates cannot only be produced piece by piece but also by way of their articulation.

In a sense, this series of programs and activities have allowed for certain more urgent aspects to be solved or improved, but have not incorporated the territorial aspect required to deal with those defects arising from the original location and urban model of the neighbourhoods and heterogeneous and fragmented city that they derived from. However, the new metropolitan context, together with the social changes occurring, provides a framework for new mass housing renewal projects by reading and
interpreting it in a positive sense should enable us to establish programs, intervention strategies and instruments to employ in the definition of a new renovated project. Understanding that the goal should not be solely the internal improvement of the district, but rather, to take advantage of their structuring potential for a comprehensive renovation project of the city and territory.

**The Mass Housing Estates of the Vallès and the A-road 150**

In observing the location map of the housing estates of the Metropolitan Region of Barcelona we can identify a set of mass housing estates linked to intermediate cities such as Cerdanyola del Vallès, Badia del Vallès, Sabadell and Terrassa.

Unlike the mass housing estates that are situated in the urban continuum of the city of Barcelona, these estates are located within a territorial structure that is clearly polarized by the urban centres of the cities. This means that, in general, several border positions will still remain; between areas of different nature, between city and regional infrastructures, between city and countryside, etc.

Figure 1. The mass housing estates of the Vallès. Territorial context

Nevertheless, these mass housing estates not only have in common the fact that they were originally located in peripheral areas (with respect to the historic centres of the respective cities), but also, were spatially linked to specific territorial roads. In the case of the Vallès, the mass housing estates are directly related to the axis of the A-road 150, a historic communication axis, known as the road from Barcelona to Terrassa. This axis that connected Terrace with Barcelona in 1852, served as a main route connecting the various municipalities of the Vallès and Barcelona until the construction in the
70s of the current C-58 highway, which improved the existing axis by way of a new route of much greater capacity.

Figure 2. The mass housing estates of the Vallès and the A-road 150

Since the construction of the highway, the road has followed a process of progressive obsolescence, although it still is an important axis of communication between cities and regional accessibility to certain facilities polarized in its path. The road has had several projects of urban integration, through works of refurbishment, but it has not been subject to an overall revision as far as its overall layout is concerned. Even today, it remains an old road that has been improved by fragmented renovation projects while others stretches are still almost with the characteristics of the original road.

In the case of the Vallès, the regional context of the mass housing estates and its relationship with the axis of the A-road 150 enables us to relate a series of residential neighbourhoods with clear physical, functional and social problems related to the urban centres and act from a regional perspective that exceeds the current local and individual vision.
Developing territorial planning

The recently adopted Metropolitan Territorial Plan of Barcelona (April 2010) proposes a series of actions with respect to mobility networks in the area of Valles, with a direct impact on the neighbourhoods of housing estates and the axis of the A-road 150.

Regarding the railway network plan proposes to grant a more important role in mobility in the RMB, and, among other things, proposes measures to improve access to Barcelona, cross territorial coverage and connectivity. One of the specific proposals is the creation of a new light rail network of and / or platforms reserved for buses. In the case of the area of the Vallès which is being studied the definition of two connections is reflected: the first between the Autonomous University of Barcelona, Badia del Vallès and Sabadell, and second, the internal connection in Terrassa. This proposal have been established in a schematic manner, thus, the specification of the types of line, their layout and their technical and economic viability, will have to be defined in further studies.

Figure 3. Pla Territorial Metropolità de Barcelona. Railway network proposals
It also incorporates the proposal for the connection with the new line of the "Ferrocarrils de la Generalitat de Catalunya" (FGC) Barcelona and Terrassa with a new stretch connecting Sabadell with Terrassa.

Regarding the road network, the axis of the A-road 150 has different considerations. There are some stretches that have been defined as integrated urban roads, but in some sections, such as that between Terrassa and Sabadell, they remain as structural roads.

Figure 3. Pla Territorial Metropolità de Barcelona. Road system proposals

**Intervention strategies and criteria of the projects**

The strategies and criteria outlined below are part of the evolution process in which the renovation projects described above have been developed. The goal is to offer a new outlook and new criteria for intervention in housing developments based on an accumulation of sound practices.
The proposed intervention arises from the general strategy to plan, coordinate and manage renovation projects in mass housing estates in a way which complements the proposed conversion of the A-road 150 road into a "metropolitan street".

As far as the regional scale is concerned, the development and precision of the proposed actions in the PTMB must view and understand housing estates as an opportunity to articulate in a more balanced sense, the construction of the metropolitan area. As a result this will assume that the need of renovation of the mass housing estate is not just a matter of social justice but can also activate areas of opportunity in integrating and adding value to some of the proposals.

The new road proposed by PTMB structural scheme should reduce traffic flow intensity along the A-road 150. In this sense, the proposal to convert the axis of the A-road 150 into a new metropolitan street, with all of its potential as a linear vertebra of the territory, can become an operation with multiple effects through the by way of the program principles:

- an axis capable of favouring the coexistence of mobility, enhancing light mobility (i.e. bike lanes and pedestrian areas) at the expense of the available spaces for car use.
- an authentic veritable backbone of mobility and modal exchange transport, through the integration of the new tram network into the zone proposed.
- a path of territorial scale which integrates elements and areas of natural and environmental value of the local geography.
- a layout that gives structure to the areas of political borders, incorporating them as new project areas.
- a key project that allows for the identification of strategic areas of action that articulate and synchronize projects in the city council pertaining to the mass housing estates.
- a high quality axis of urbanization providing a structural support network of supramunicipal services

Furthermore, from the specific scale of housing estates, the propose starts, a priori and in general, with the need to clarify in each case via from two complementary assessments: the capacity for the permanency of the urban fabric and its transformative potential. The first as a fundamental criterion of urban renewal that gives priority to refreshing the cities appearance as opposed to the massive replacement of buildings; and the second reading as some of the positive features of the urban model of mass housing estate developments.

Excess land intended for public use as roads, open space or equipment, should enable actions to be implemented which, through the optimization of these spaces and the complementary nature to other types of actions, resolutely tackle the structural, morphological and functional problems of the mass housing estates areas as well as their articulation with the remaining territory.

In accordance with these strategies and with the dual purpose of renovating in order to improve the habitability of the neighbourhoods, the following intervention criteria are proposed:

*The permeability of the estates: dealing with perimeters and urban transition spaces*

The original perimeter of mass housing estates has often become a really impermeable border, preventing inside-out continuity and thus making the mass housing estates to become practically blocked off, both physically and psychologically, from the rest of the city. A fundamental strategy to combat this level of isolation is to act on the urban conditions of this perimeter so that it could function as relational space.

There is also proposed a second criterion, which is geared towards improving permeability of the mass housing estate through the detection of "weak-points" in the perimeter to enable the creation of transitional spaces between the estate and its surroundings, in the reinforcement of certain continuities.
**The integration of infrastructures**

The coexistence of territorial estates and infrastructures of a different natures is constant and therefore the need to define strategies that permit their integration into projects of urban redevelopment is essential.

**Internal restructuring**

The trivialization of modern requirements, as well as excessively speculative intentions defined the model of urban housing developments, and generated conditions in which urban space was the result of simple block aggregation and thus lack of structure, hierarchy and specific use. This is a fundamental and complex factor as it affects other existing problems. Therefore, the actions leading to the internal restructuring of estates must be addressed by integrating a set of effective strategies that enable new structures to be effective, by the definition of, public spaces of reference that are typologically recognizable, which may play as a unifying civic areas, from mobility and urban activities.

**Spaces of identity**

The need to strengthen the sense of identity and belonging to the neighbourhood is a fundamental step required in order for other strategies to be efficient. The principle of identity can be specified in three steps: defining a central space or reference, the quality of public space and the integration of landscape and heritage.

**The systematization and hierarchy of public spaces**

In general, all projects of comprehensive intervention incorporate actions aimed at improving public spaces. Of this set of actions it is worth highlighting those that, in addition to the redevelopment and improvement of public spaces, represent a structural intervention in the whole neighbourhood, and thus promote the systematization of the whole hierarchy of such areas:

**Public facilities: deficits and structure**

Despite having have overcome the precarious public services in the mass housing estates in recent years, there are still deficits. If we added the value of the public facilities based on their ability to generate urbanity and give meaning to the city, the proposed actions related to facilities have a fundamental value when it comes to suggesting redevelopment projects of urban housing estates.

Therefore, the public facilities proposals have the primary objective of eradicating the quantitative deficits of services provided. In these sense, must be considered that the social transformation that has occurred in these areas (i.e. those linked to social factors such as cultural evolution, ageing population, the arrival of immigrants or outbreaks of marginality), define a set of new requirements and specific demands.

The second goal is strategic and has to do with the location of neighbourhood facilities which operate on a municipal scale and enable functional relationships to be established between the estate and the rest of the municipality. The construction of iconic buildings is not a sufficient condition if they are not situated in a position of good accessibility to the rest of the city or they are not real engines of collective urban activities.
The diversity of activities

The lack of diversity of uses in existing housing estates is a factor that characterizes them. Indeed, exclusively residential building types have hindered the emergence of new uses and activities on the ground floors, as these areas do not meet the appropriate characteristics. This fact has a very negative impact on the character of the district and contributes decisively to their lack of use and, as a result, their degradation.

Actions need to be encouraged that, without out direct urban planning, promote the remodelling of the ground floors of residential buildings for commercial or non residential uses as a mechanism for inducing a process of regeneration and improvement of public space.

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