

PLANES Y PROYECTOS EN TÉRMINOS DE SOSTENIBILIDAD

El ecodiseño y planeamiento de barrios sostenibles.



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The ecodesign and planning of sustainable neighbourhoods: the Vallbona case study (Barcelona)

El ecodiseño y planeamiento de barrios sostenibles: el caso de estudio de Vallbona (Barcelona)

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SUMMARY

Global sustainability is increasingly an issue of urban sustainability, being essential to encourage more benign trajectories of urbanisation. For this, there is need for a framework that could aid in the process of designing and redesigning (retrofitting) cities. The aim of this paper is to present and describe the methodology of urban ecodesign, which is characterized by a systematic incorporation of environmental life cycle considerations into the design of urban systems. The paper presents a case study of neighbourhood ecodesign from the city of Barcelona (Vallbona neighbourhood). This practical experience shows that the inclusion of sustainability criteria at an early stage of the design and planning of urban systems is the best strategy for environmental protection. In addition, a methodological framework is described in order to provide planners with a structured way of designing urban settlements so as to move towards sustainable urban environments.

113-121

Keywords: ecodesign, urban sustainability, neighbourhood, cities.

RESUMEN

La sostenibilidad global es cada vez más un tema de sostenibilidad urbana. Por este motivo, es necesario un marco de trabajo que pueda ayudar en el proceso de diseño y rediseño (rehabilitación) de nuestras ciudades. El objetivo de este trabajo es presentar y describir la metodología de ecodiseño adaptada a los entornos urbanos, la cual se caracteriza por la incorporación sistemática de las consideraciones ambientales a lo largo de su ciclo de vida. El documento presenta un caso de estudio de ecodiseño del barrio de Vallbona (Barcelona). Esta experiencia demuestra que la inclusión de criterios de sostenibilidad en las etapas iniciales de diseño y planificación de los sistemas urbanos es la mejor estrategia para la prevención ambiental. Además, se presenta un marco metodológico con el fin de proporcionar a los planificadores una forma estructurada de diseño de los asentamientos urbanos que les permita avanzar hacia entornos urbanos más sostenibles.

Palabras clave: ecodiseño, sostenibilidad urbana, barrio, ciudades.

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1. Location and aerial photograph of the Vallbona neighbourhood (12).

other (general systems protection 3.4%) and because it has been faithful to its traditional agricultural uses).

These factors have resulted in the fact that Vallbona presently lacks urban continuity and presents many structural deficiencies as well as isolation from the rest of the city. The area is almost completely surrounded by natural barriers (the Besòs river on one side) and artificial barriers (a dense network of roads, highways and railways). This peripheral and isolated location gives Vallbona an autonomous semi-rural character, which is fostered by its traditional linkage with agriculture.

Next to the area that is going to be urbanized there are some constructions that currently gather about 800 inhabitants, concentrating low income citizenship, with high unemployment rates and relatively high crime rates. The origins of the settlements in the area go back to an urbanization process from the 1950s that was initially characterized by self-construction works. Basic services (water supply and sewage systems, public transportation) came about twenty years later. Later, in 1976, the General Metropolitan Plan of Barcelona was formulated, setting the prescriptions that have shaped the city during last decades, and that laid down the bases for the urbanization, renewal and retrofit of the area of Vallbona (12).

The future neighbourhood will host 2120 dwellings (with a floor area ratio of approximately 0.7) which will represent an important transformation for this area.

ECODESIGN METHODOLOGY AND RESULTS

This section presents the methodology of ecodesign by describing its stages and their application in the case study neighbourhood.

Definition

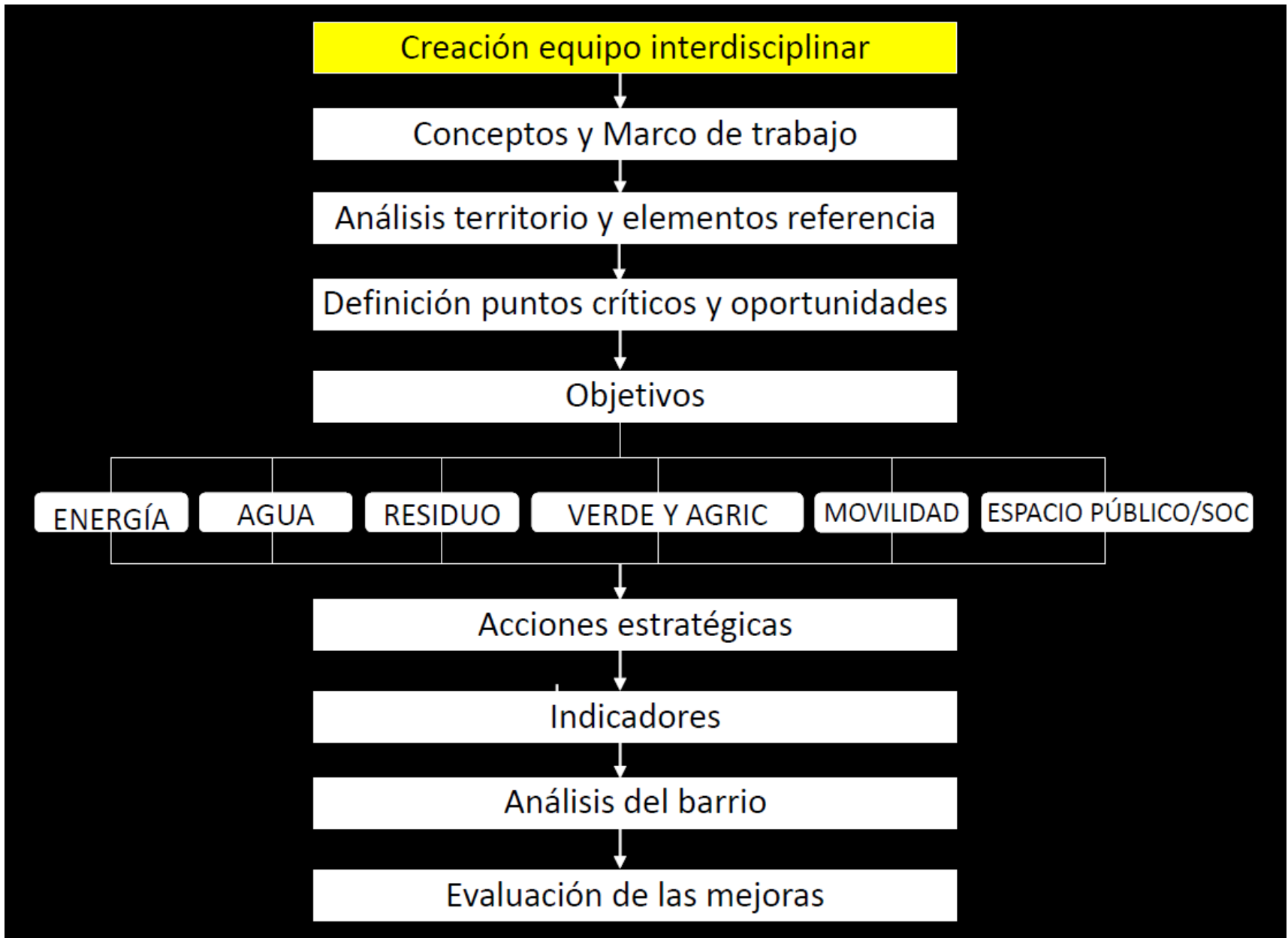
The eco-design consists of the consideration of environmental criteria in the development of a product, without obviating other key aspects of design (costs, functionality, aesthetics, etc.); with the aim of using the minimum amount of resources and generating the minimum emissions along the life cycle of the product. Thus, it can be defined as "the systematic incorporation of life cycle considerations into the design of products, processes or services" (13). Actually, it is one of the most valid tools to reduce the inherent environmental burdens associated to products.

The benefits of ecodesign are many: reducing environmental impact, reducing costs, innovating, satisfying legal environmental requirements, increasing the quality of the product and improving the image of the neighbourhood and the whole municipality (14).

The life cycle approach

Ecodesign means that environmental aspects have been taken into account for decision-making along the neighbourhood design process, as an additional factor to the ones which have traditionally been considered (financial, social, political... aspects). The goal of ecodesign is to reduce the environmental impact of the neighbourhood along its whole life cycle. The life cycle of a neighbourhood (or a city) is here understood as all the stages for which it evolves, which includes (a) the planning stage, (b) the architectural design and construction stage, (c) the neighbourhood management stage and eventually (d) urban transformation (rebuilding the city) and revision of planning schemes (figure 2). By being able to act from the planning stage (a), there is large room for the achievement of high environmental standards in the eventual neighbourhood. However, in case

Metodología de trabajo.



Selección de un equipo multidisciplinar

3 Ingenieros de caminos, canales y puertos

4 Ingenieros industriales

5 Ingeniero de ciencias ambientales

Ingeniero agrónomo

Ingeniero ambiental

Ingeniero químico

4 Arquitectos

Biotecnólogo

Sociólogo

Economista

Geógrafo

Biólogo



Rol clave: Ambientólogo

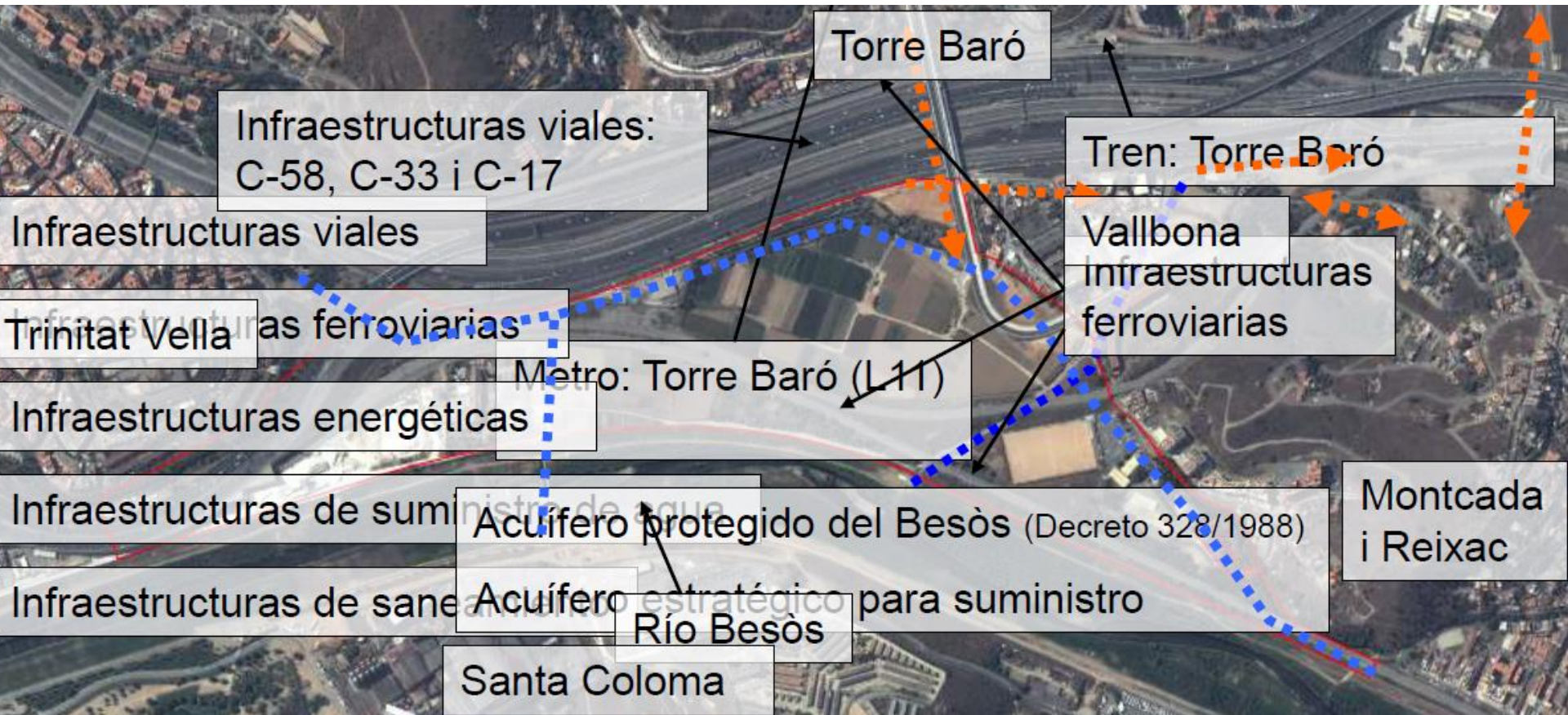
Conceptos y estructura

- Flujos circulatorios metabólicos y tendencia a la autosuficiencia
- Vecindad para personas
- Diversidad de los usos
- Biodiversidad



Análisis del territorio y elementos de referencia

- Definición de puntos críticos y oportunidades.
- Realizar un análisis y diagnóstico ambiental, social y financiero del territorio
- Análisis de algunos elementos de referencia (otros barrios del área metropolitana y de otras regiones)
- Detectar sus puntos críticos, pero también sus fortalezas y oportunidades.



Establecimiento de metas.

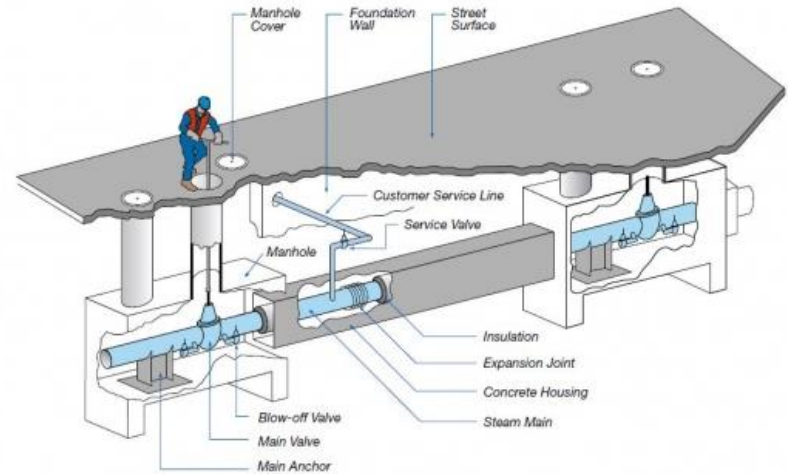
- Energía
- Agua
- Residuos
- Áreas verdes y agrícolas
- Movilidad y transporte
- Espacio público y entorno social



Acciones estratégicas

- Minimizar la demanda de energía de los edificios
- Utilizar fuentes locales de energía renovable y una red de calefacción urbana
- Mantener lo más posible el mosaico agrícola de la zona ya que tiene un gran valor paisajístico y representa un elemento distintivo de la misma
- Diversificar las fuentes de agua, adaptando la calidad del agua a sus usos debiendo ser gestionadas y asignadas de forma eficiente para el uso más adecuado
- Gerente de recursos locales. Necesidad de un administrador de recursos que pueda manejar los recursos locales y gestionar las instalaciones medioambientales de los barrios


Steam Distribution System



Indicadores

- Establecer un conjunto de indicadores que se propone como marco para el seguimiento y la evaluación (siguiendo los pasos de la metodología).
- Monitoreo y evaluación como herramientas que nos ayudan a saber cuando algo no funciona y cuando las circunstancias han cambiado.
- Los indicadores se definen para la etapa de gestión, ya que la mayoría de los costos ambientales y financieros están relacionados con la operación del vecindario.
- Producción alimentaria local: La agricultura urbana está emergiendo como una estrategia de sostenibilidad urbana, ya que presenta muchos beneficios: crea ocupación, reduce las demandas y costos de transporte, mejora los vínculos de las personas con la naturaleza, mejora la calidad de los entornos urbanos

Table 1
Summary of goals, strategic actions and indicators for the Vallbona neighbourhood

TOPIC	GOALS	STRATEGIC ACTIONS	INDICATORS
ENERGY	<ul style="list-style-type: none"> • To minimize energy demand per inhabitant in buildings • To use local renewable energies 	<ul style="list-style-type: none"> • Passive saving measures: Orientation optimization (minimum 4 hours direct insolation/day in winter) • Natural ventilation • District heating • Efficient architecture 	<ul style="list-style-type: none"> • Primary energy consumption • Renewables production • Equivalent CO2 emissions
WATER	<ul style="list-style-type: none"> • To diversify water sources, adequate water quality to its uses and use local water sources • To reduce consumption 	<ul style="list-style-type: none"> • Separative sewer • Rainwater harvesting from roofs and non-trafficked areas • Irrigation with local river sources • Groundwater use • Greywater reuse 	<ul style="list-style-type: none"> • Total pipe water consumption/inhabitant • Water self-sufficiency
WASTES	<ul style="list-style-type: none"> • To maximize selective waste collection • To cover the manure demand of agricultural areas with local compost 	<ul style="list-style-type: none"> • To compost organic waste within the neighbourhood • Waste collection at street level (not pneumatic) 	<ul style="list-style-type: none"> • Urban solid wastes production • Selective collection of wastes
GREEN & AGRICULTURAL SPACES	<ul style="list-style-type: none"> • To preserve and foster local biodiversity • To maintain the agricultural mosaic as a distinctive landscape element • To foster the local river as a structural element • To design new green areas with environmentally-friendly criteria • Participative management of non-professional vegetable gardens 	<ul style="list-style-type: none"> • Preservation of an irrigated agricultural plot of 2,3 Ha • To make compatible professional agriculture and social vegetable gardens • Xerogardening • Promoting green areas with sustainable criteria and aimed at preserving local biodiversity within the urban fabric 	<ul style="list-style-type: none"> • Local food production • Bird biodiversity in green areas
MOBILITY	<ul style="list-style-type: none"> • To improve the connectivity with the surrounding areas • To rationalize the mobility flows • To recover the public space for people • To reduce private mobility 	<ul style="list-style-type: none"> • New connections with the surrounding areas • To keep 75% of the road network for pedestrians • To foster bicycle use • To minimize public space devoted to parking • Improvement of the bus network 	<ul style="list-style-type: none"> • Transportation modal split • Car sharing clients • Average time for several trips
PUBLIC SPACE AND SOCIAL ENVIRONMENT	<ul style="list-style-type: none"> • To minimize acoustic pollution • To assure the permeability of public spaces • To design public space in order to foster social relationships 	<ul style="list-style-type: none"> • Installation of noise-reduction elements • To facilitate access to public transportation systems and to services through new accesses • New equipments so as to serve people's needs and to integrate the neighbourhood in the whole city 	<ul style="list-style-type: none"> • Proximity to basic urban services • Ecodesigned urban furniture • Social participation

Análisis de vecindario y evaluación de mejoras

- La propuesta de planificación es sometida a evaluación política y procesos de audiencia pública y debate.
- Definición de una propuesta de planificación de vecindad sostenible evaluada por el ayuntamiento.
- Retroalimentación y adaptación de la propuesta.
- Audiencia pública y debate.
- Aprobación inicial de la propuesta de planificación.
- Análisis del producto ecodiseñado, con el fin de obtener un diagnóstico ambiental del barrio.
- Recolección sistemática y el análisis de información a lo largo de la etapa de uso del vecindario



De la teoría a la práctica. Vallbona como modelo.



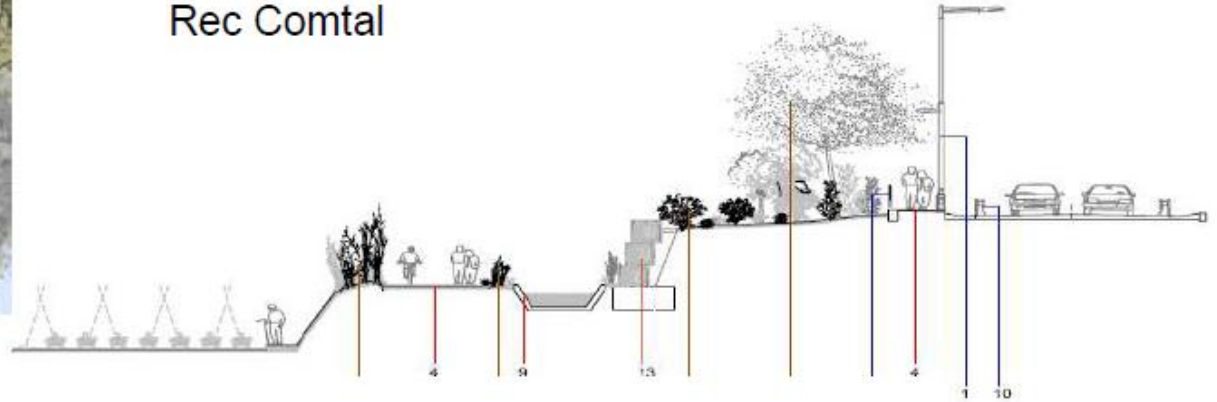
Propuesta de ordenación



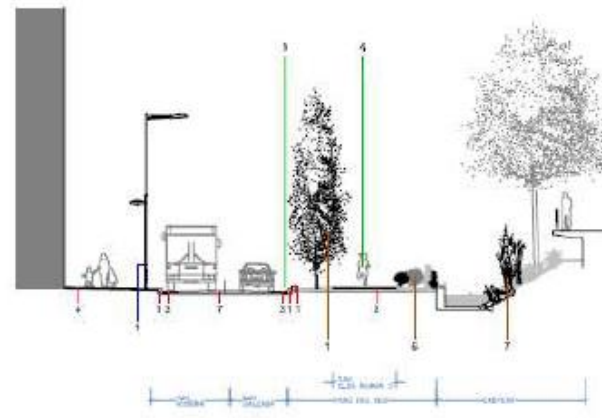
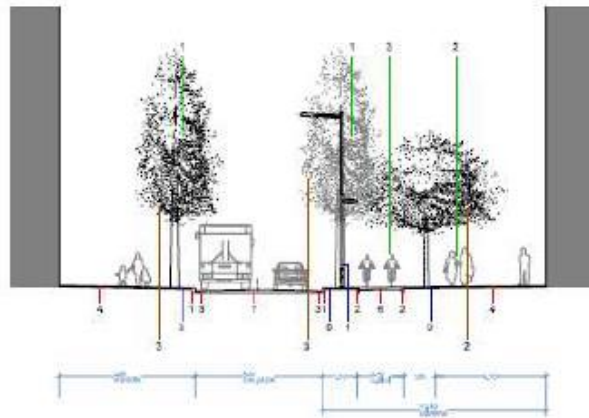
Secciones urbanas



Rec Comtal



Viario principal



Vista general del proyecto

