



## ***Confluência Ivry, um projeto de urbanização sustentável***

*IVRY CONFLUENCE,  
A SUSTAINABLE URBANISATION PROJECT*

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### **Abstract**

At the confluence of the Marne and the Seine, at the gates of Paris and the up-river territory of the Seine, Ivry Confluences is a site where much is at stake as it is the focus of a large-scale project as far-reaching as the metropolis itself. It involves as much as a fifth of the community territory that is currently hemmed in between the Seine and the railway lines of the Austerlitz train station. It is an area that needs to be developed, made denser and linked to the rest of the city of Paris. Up until the 19th century, Ivry-sur-Seine was a small agricultural community but soon took on the scale of an industrial city by multiplying its population thirteen times in 50 years (1806 - 1856).

Immediate access to the Seine, coupled with the arrival of the railway suddenly made Ivry-sur-Seine a strategic sector for development where numerous industries sprang up.

Keywords: sustainable, urban, design, method, indicators, mixed, density

## ***IVRY CONFLUENCE, A SUSTAINABLE URBANISATION PROJECT***



### ***1. The project: its birth, its objectives and main axes***

The city of Ivry, to the east of Paris, started a development process in 2001 for an urban project encompassing the entire Gambetta sector around its structural axis, the rue de Brandebourg, and its main square, the Place Gambetta. This urban project was formalised in the “Schéma d’Aménagement de Référence” (Reference Development Plan Schema) in 2004.

The city’s objective is to convert its various industrial wastelands and available lands into a mixed and animate quarter. Following an important meeting, the city elaborated the Development of the Port of Ivry Schema, which provides a coherent framework for all of the coming interventions in the quarter. The progressive liberation of new parcels necessitated the expansion of the perimeter of the Development of the Port of Ivry Schema, which today covers 145 hectares: the Ivry Confluences Development Operation. This includes the urban orientations of the Development of the Port of Ivry Schema and more generally, the territorial thinking that is being advanced on a regional scale in the context of the “Up-River Seine Development” association.

This project is included in the scope of the National Interest Operation of the, Orly-Rungis - Up-River Seine and constitutes through its importance the leading development operation, which signals the renewal of the entire territory.

As a showcase for the mutations that the Paris region is seeing today, Ivry Confluences adheres first of all to a general dynamic. It benefits from a privileged position and extends the operations that have been undertaken on the Tolbiac site in an immediate manner (the inner Paris site that has undergone the largest urban transformation operation of the past ten



years), but it also belongs in the corridor of mutations that is today federated by the current National Interest Operation of the entire Up-River Seine. Its specificity is also remarkable:

In terms of liaisons, first of all, because Ivry being linked to Paris, integrates into a larger centrality;

But above all, this worksite comprises an extraordinary asset because of an identity of mixed fabrics that are both majestic and fragile.

The Ivry territory today, which is already dense and structured around a fine web of streets devoted to automotive traffic, is located on a strategic point in the confluence of two rivers, the Seine and the Marne; a landscape with a potentially important biodiversity between the Forest of Vincennes, the Park of Cormailles and the Fort of Ivry.

It is a difficult project in terms of urban design, revisiting lifestyles and public access, so the ideas that structured Bruno Fortier, the coordinator architect's project along with the five teams of urban architects - Paul Chemetov, Reichen & Robert, Valode & Pistre, Dusapin and Leclerc and Guérin and Pédrosa – were many.

They have been developed around the broad principles of development, which express themselves along five axes.

### **1.1. A diversified city**

Mixed housing, services and neighbourhood shops rub shoulders with offices, buildings housing social activities and amenities that are integrated into redesigned public spaces.

- 50% of the project is devoted to supporting and developing economic activity
- 570,000 m<sup>2</sup> of offices, shops and social facilities
- 40% of the programming involves the habitat
- 430,000 m<sup>2</sup> are devoted to residential functions for housing (roughly 4,500 units), but are also specific (students, the elderly, researchers, holiday, etc.)
- 10% of the project constitutes large university and cultural facilities, but also neighbourhood amenities with notably 60,000 m<sup>2</sup> dedicated to the construction of scholastic structures, neighbourhood centres, day-care centres, a market, sports and social amenities, etc.

## 1.2. *Recapturing the river*

The Seine will once again become the centre of life, animated by the emergence of new housing, shops and formative public amenities to the detriment of the current motorised traffic routes. Slow forms of circulation such as the opening of pedestrian walkways and bicycle paths will be favoured in order to preserve the quality of life of the residents and to reconnect directly with the river. The river / the confluence: the veritable heart of the project will see the creation of a vast park around which a tertiary pole, a university, housing and neighbourhood shops will be organised. The area overlooking the Seine will also welcome housing and public amenities. As for the two kilometres of riverbank, they will be re-developed to constitute a place for preserving life where fauna and flora will be protected.

## 1.3. *A re-designed neighbourhood*

The architects have imagined a quarter hinging on new settings for an attractive and animate lifestyle.

The Place Gambetta: the opening point onto the Confluence Park, will be brought back to life and become animate again. The Brandebourg axis: this nerve centre of the quarter will flourish with new shops at the foot of buildings in order to encourage people to go to what will be an animated thoroughfare, pleasant residential area and focus for leisure activities. The train station zone: its central location close to the Park of Cormailles and numerous town centre housing projects calls out for active development because of its attractiveness potential, notably for businesses.



#### 1.4. *Varied and effective transportation*

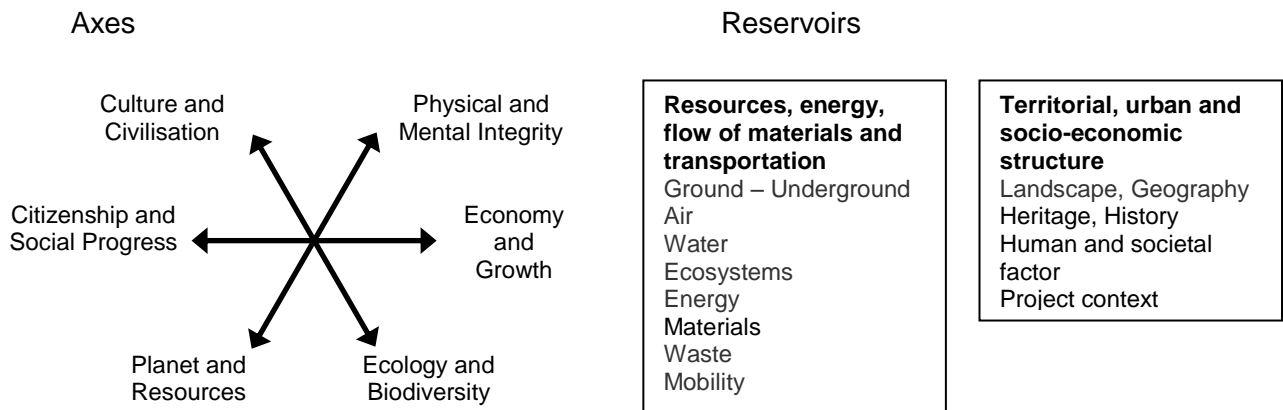
New lines will be added to the existing network: an increase in the rhythm of the RER added to the creation of public transport on the sites themselves will allow for more fluid access to the quarter. The extension of the line 10 Metro as far as Place Gambetta is also being studied. New routes combining slow traffic and automobiles will be implemented in order to complete the existing network.

#### 1.5. *Nature at the heart of the Project*

Squares, gardens, landscaped links and slow traffic will all provide newly developed spaces in the heart of the city. A future park, Confluence Park, will provide a view of the Seine from the Place Gambetta. These actions ascribe with others to a sustainable development approach that conciliates the wellbeing of the inhabitants with urban density.

### 2. *The methodology for applying and following up on the principles tied to sustainable development*

Programmatic analysis began by a diagnosis of sustainable development that made it possible to bring forth the issues tied to the specificity of the site. This systematic process was done following a methodology that crosses the axes of sustainable development and the “reservoirs” representing the themes to be examined.

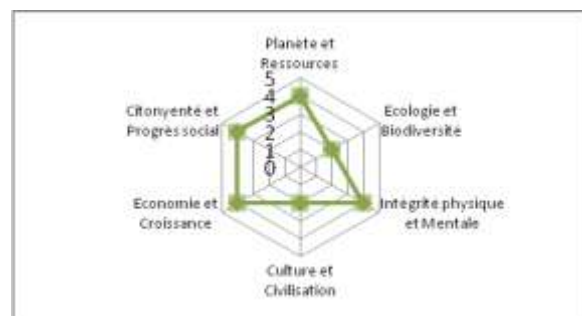
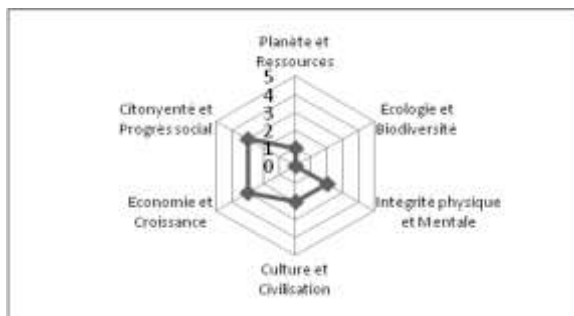




- **The analysis method** (developed by S'pace Sa), is based on an approach that aims at constituting sustainable cities; an approach that lays out six axes and twelve reservoirs: it involves systematically considering each reservoir in function with each axis for understanding how a territory functions. The imaginary mental process is to “plunge” the six axes into each thematic reservoir and see which vectors light up according to the context.
- **The Six Axes:** Planet and Resources, Ecology and Biodiversity, Physical and Mental Integrity, Culture and Civilisation, Economy and Growth and Citizenship and Social Progress. The axes thus enable a complete and pragmatic approach of the aspects of Sustainable Development. They assure a global vision, and reveal the interdependencies inherent in projects.
- **The Twelve Reservoirs:** Ground - Underground, Air, Water, Ecosystems, Energy, Waste, Mobility, Landscape and Geography, History and Heritage, Materials, Human and Society Factor and the Specific Context of the Project.

These reservoirs represent the essential components of the territory, the constituent elements of a complex system: space, time, societal organisation and eco-systemic organisation. These reservoirs are the raw materials for analysis and reflection, of possibility and mutation that involve evaluating and measuring in the scope of what is possible. Each of these reservoirs will be systematically subjected to an analytical and interpretive reasoning with respect to the six axes that have been determined.

- This **methodical and rigorous analysis** can then enable one to make a certain number of interpretations, in terms of assets, weaknesses, opportunities and threats; interpretations that comprise the main issues of the project being studied.



A crossed, multi-criteria analysis makes it possible with the help of radar to measure the profile of the actual state against the profile in the projected state of the treated themes according to the results obtained.

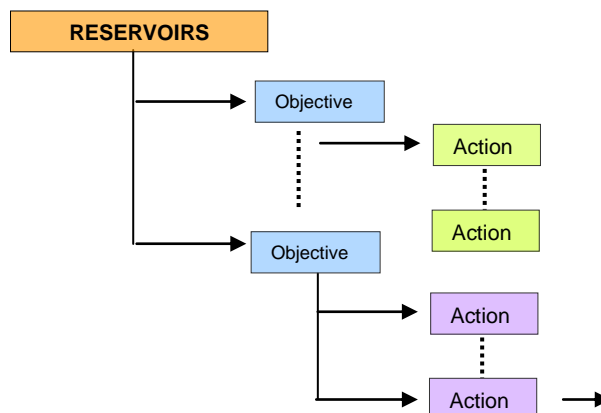
Several themes of action in relation with the issues have then been defined.

The different themes have been broken down into objectives, themselves illustrated by concrete actions to be implemented. Several actions can be foreseen and studied for the same objective in order to establish a scenario in the end that does not necessarily include all of them.

A “General Plan of Action” brings out the themes, objectives and actions that have been broken down.

For each objective, indicators are proposed for each action and a table presents the questions and foreseeable stages, the actors involved and the studies and documents available or that need to be produced.

Several priorities emerge from this methodological analysis bearing on the choice of the principal themes to be treated.



### 3. *The project objectives by theme*

The plan of action carried over to defining a charter of objectives to be followed in the evolutionary process of conception.

The key elements are the following.

#### 3.1. *Energy*

A real policy of diminishing needs by improving the envelope

Coefficient of loss U in W/m<sup>2</sup>.K

Roof	< 0,15
Outer wall	< 0,15
Floor	< 0,15
Windows	< 0,70

BBC (Low Energy Consumption Building): The absolute reference 65 KWh/m<sup>2</sup>/annum, BBC -10%, BBC – 20%

Implement an energy improvement policy for the existing park with significant reductions in consumption

Come down to at least Factor 2 and where possible, Factor 4

Heat network policy by the CPCU (Parisian Urban Heating Company)

Use of renewable energy

#### 3.2. *Water*

Reduce the consumption of drinking water to 80 litres/day/person by setting up hydro-economy systems.

Optimise rainwater management by assuring a rate of seepage flow for surfaces: less than 1 hectare to 1 litre / second / hectare

Retain and regulate rainwater beforehand by minimising the RW (rainwater) management networks via landscaping.





### **3.3. Waste**

Reduce production and optimise waste recovery

Optimise collection circuits between places of production, storage and pick-up.

Favour the set up of spaces that allow for waste recovery and housing block composting.

Study the feasibility of the possibility of implementing a selective pneumatic collection system in association with the Sycatom waste treatment factory.

Integrate construction worksite waste recovery at the level of 50% (70% of preliminary deconstruction) and material recovery of 50%.

### **3.4. Mobility**

- Reduce the place of the car in the project
- Create a web of bicycle paths
- Make provisions for numerous vélib stations (cheap, broad-scale city bicycle rentals)
- Encourage the extension of Metro line 10
- Encourage the improvement of the RER service
- Make provisions for ground level electrical and car-pooling car parks
- Make provisions for shared parking with entrances in public spaces
- Make provisions for walking path circuits for schools
- Move the flow of vehicles to within the territory instead of along the riverbanks

### **3.5. Biodiversity**

- Guarantee ecological continuity on a regional and local scale: functional biodiversity
- Existence of a linear expanded green framework between the 3 grand functional unities
- Existence of a “secondary” green space within the framework of the current green space
- The river is taken into account as a corridor for birds nesting in the aquatic milieu as well as for migrating birds
- Guarantee the diversity of biotopes: eco systemic biodiversity
- Existence of micro-corridors within the urban framework



#### **4. An integrated concept of sustainable development**

On the scale of the project, the question of sustainable development is asked in terms of the translation of these issues. The programmatic choices have been determined by the key concepts of proximity and social mix in order to produce a quarter that takes up the challenge of succeeding as an “intense city”.

##### **4.1. Recycling the city and its materials**

- *Recycling the city on itself*

The project has to accommodate a large park of existing real estate and the production of new buildings. Recycling being the sustainable action ‘par excellence’, the project intends to apply as much thought to re-use and what already exists as to conceiving the construction that is to come.

- *Recycling waste and materials*

On the other hand, managing waste is an obvious problem for a project of this size. The objectives of the project are many:

- Reducing the quantity of waste collected by developing recovery channels,
- Reducing to a minimum the noise linked to the collection of household waste.

##### **4.2. Confronting the scarcity of resources**

Energy is the major vector in the evolution of the way we build and use buildings. Reducing energy and water needs in new buildings but also existing buildings is a way of also avoiding the energy gap. The bioclimatic approach has made it possible to consider the overall plan in order to optimise the energy efficiency of the urban structure. It means taking into account orientation for solar contribution, protection against over-heating in summer and wind management (protection and natural ventilation on a neighbourhood scale). The conception of the overall plan and landscape development place sunshine, runoff and wind in a synergistic relationship to create a micro-climatic regulating system.



Wind direction for an outside temperature of > 25° C

The housing block itself is well open to summer breezes, but is partly sheltered by housing block 4C.

#### **4.3. Return nature to the city and provide a new urban landscape**

The project is inscribed in a very urbanised territory with a low density of green spaces and very far from the currently known main sources of biodiversity (ZNIEFF, ZICO, RN, etc). Nevertheless, it is located right next to the Seine and the Marne, which are both important ecological corridors, as well as being close to several large areas planted with vegetation. The site also presents potential in terms of fallow treed and grasslands among the industrial and public spaces that are already laid out, such as the Charles Foix Hospital.

- **Favouring local biodiversity**

- Functional biodiversity: this involves assuring an ecological continuity at a regional and local level.

It involves taking into account the capacity of species requiring large living spaces to be able to occupy the sector and circulate between the biotopes favourable to them. It also means developing natural or semi-natural milieu that can welcome specific biotopes, which can be linked the one with the other to assure their ecological functioning. This then implies there would be a sufficiently broad mix of the genes of these vegetal and animal populations.

- Specific biodiversity: this involves assuring a diversity of species.



These milieu host very common (banal) flora and fauna most of the time. It is very important to insure this diversity, in particular at the flora level so as to attract a maximum of animal species and thus aspire to an eco-systemic functionality.

The mixing of genes is dependent on the functionality between these milieus, but it is also primordial to preserve the diversity of the ancient varieties created by man, which are often rustic and tolerant species. This biodiversity passes through research on essences planted in private as well as public spaces.

- **Integrating the specificities of the confluence**

The project site is marked by the confluence of the Seine and the Marne, through its hydrological and geographical constraints, but also through its landscape potential. In effect, the unknown quantity of flooding is a determining factor for the conception of the project on the scale of quarters, housing blocks and even buildings.

In this context, the issue of water management is marked by a double constraint: the management of the resource and the management of the flood via the rules of the PPRI (Prevention Planning for Inundation Risk). A need to reduce water consumption to a minimum and to differentiate between the different uses of water in terms of required quality needs to be acknowledged. Water sources can be diverse: rainwater recovery, cleaning used water, etc. The management of used water is also a major issue of the project and should be optimal in order not to generate an overload on the existing networks of the city.

The technical approach of managing rainwater has been to encourage holding techniques along with recycling to generate urban and landscaped area recovery, favouring those coming from what is referred to as an “alternative” approach that aims at conceiving an integrated urbanisation, in its very constitution, with mechanisms for slowing and holding rainwater under the open sky. Setting these practices up makes it possible to adapt rainwater runoff to the constraints imposed downstream. They offer enhancement potential for the landscaped and environmental areas of the site as well as greater security and economic advantages.

In order to anticipate the risks of flooding from the Seine overflowing, restrictive measures have been taken in the context of the Plan de Prévention du Risque d’Inondation (Prevention Planning for Inundation Risk) of the Seine and the Marne (PPRI), that result in constructability rules on the scale of the sector under study. These regulation measures are

reinforced by a system of low protection walls that correspond to the floods that were lower or equal to those of a period of the past 50 years – walls that have been built all the way along the banks of the Seine.

The redevelopment of the Ivry Confluences sector provides the opportunity of enhancing the proximity to the Seine by:

- the amendment of the river's expropriation and its main bed;
- the conception of a city turned towards the river that develops its landscaping, waterworks and environmental heritage;
- the organisation of special propagation axes and flood expansion fields.

### ***5. The role of the key players and project management***

There are numerous actors taking part in the Ivry Confluence project: the City of Ivry, which is behind the transformation of this area to give its inhabitants more pleasant living spaces; the Sadev, a development company that has been hired by the city to follow the evolution of the project's progress; a large team of contractors comprised of several architects with experts in the environment, mobility, biodiversity and hydrology, to name a few, and of course the inhabitants of the quarter themselves. This city transformation will of course extend over a very long period and could take as much as 40 years from the time it starts till its completion.

The management and exchange of information between all the players is a procedure that does not always allow for the questions of economics and management to be fluid, or for communications to be exact between the different participants. It is of course through speaking that the strongest opinions and convictions are heard, but unfortunately this is only ever partially successful. French regulations today require a process of dialogue with the inhabitants, but this often takes place when decisions have already been taken or are well advanced.

#### ***5.1. Conclusion***

Ivry Confluence is a development project in and on a city with a strong environmental ambition of including numerous principles for limiting our impact on the environment. This project opens up questions on the place of the sustainable city, its space, the treatment of its roofs that must at the same time be able to receive solar panels, photovoltaic panels, thermal

treatment, green cover and air treatment units while also being liable to flooding in order to limit runoff into the drainage system, etc. It raises questions about the ground itself, which we want to be permeable, good for cycling, for pedestrians, able to be flooded while also leaving room for electrical car parks, deliveries, car sharing spaces and of course, green spaces. Does the city of tomorrow require more space? What are the right proportions between density, renovating what already exists, waste management and energy and water management? Only the completion of construction and renovation of this quarter (2050) will allow us to note what range of choices, techniques and technologies work and so enable us to properly measure their environmental performance.

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