

1- A novel university, to support a distinctive project

We are collectively committed to creating a new university of international standing so as to strengthen, develop and disseminate knowledge and cross-disciplinarity on the subjects for which we are a well-established stakeholder.

The distinctive feature of Gustave Eiffel University will be to proceed from its site, its culture, and the particular "chemical reaction" of its components. It will aim to multiply the cross-fertilisation of existing knowledge and skills between the so-called "hard" sciences, earth or environmental sciences, engineering sciences, human sciences and social sciences. This need for cross-fertilisation is now recognised in the approaches around all subjects related to the theme of cities¹. We wish to support this process by breaking down the barriers between universities, schools and research institutions, in order to better respond to research and training challenges.

The I-SITE FUTURE project to support the transformation of cities

The evolution of cities is accelerating on a global scales, quantitatively (densification and sprawl) as well as qualitatively (responding to societal challenges and the expectations of populations who are increasingly educated in these issues). More than half of the world population is now living in urban areas and the continuous transformation of cities is now a given. For such a complex transformation to be sustainable, aimed at the cohesion of the populations concerned, it must systematically rely on the contributions from research. Only an institution of higher education and research specifically designed to answer these questions can be expected to take a leading role.

The economic sectors related to the city (construction, urban services, digital, transport and logistics) and to its anchoring in the territories are growing rapidly worldwide, and these markets are being invested by new, highly innovative players who do not come from the "historical" construction or services sectors, where France has many industrial champions.

The demand for "*smart city*" by local authorities around the world, the unsuitability of current cities for accommodating international migrations, the disruptions caused by new actors in the field of urban services. These examples reflect the need for a profound qualitative and quantitative redesign of the French model in the urban sector, particularly in terms of exports.

In France, local authorities are faced with cross-cutting challenges or situations that are new in scope or nature: urban heat islands, the boom in urban logistics, new solutions for

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The "city" theme must be understood in a broad sense, to include transport, territories and digital technology, among other fields.

active mobility, reputational risks on social networks, increased demand for citizen participation, public health issues, circular economy, etc. Metropolisation leads to changes of scale that require new ways of physically producing the city. It also questions the relationships between authorities and citizens in land-use planning and equal access to resources and opportunities.

In the face of this (r)evolution, the realities and situations that we commonly encompass under the term "city" are numerous, diverse and complex. Each one carries a singular genealogy, a given syntax, with various potentials and features. In order to significantly improve or influence the way these realities develop, the first step is to observe, analyse, understand and, if possible, appreciate them.

Increasing the technical performance of a "city of tomorrow" is a necessary first step to achieve this improvement. However, this is far from sufficient because it leaves out the history of women and men who inhabit and live the city, and it fails to build on a much forgotten resource: the actual and present resilience of long-established cities.

The FUTURE project was selected as an I-SITE by an international jury as part of the *Programme d'investissements d'avenir* (PIA) in February 2017, with a budget of €9 million per year. This initiative contributes to meeting these major challenges in both qualitative and quantitative terms.

On the qualitative level, our research laboratories, our research and development equipment, our partner companies, are all of a very high standard in their respective sub-domains and very much involved in the "Cities" theme. For example, at the Marne-la-Vallée site alone, the Future Urban scientific projects, MMCD (Modélisation et Expérimentation Multi-Échelle des Matériaux pour la Construction Durable), Bézout (Mathématiques - Informatique) and SITES (Sociologie de l'innovation) are qualified as laboratories of excellence (Labex - PIA 1 and 2). The connected mini-city Sense-City and the clean room of ESIEE Paris received the certification "Equipment of excellence" (Equipex). An Institute for Energy Transition, Efficacity, dedicated to energy efficiency in cities, has also been certified by the PIA.

In quantitative terms, the number of employees trained according to the interdisciplinary imperative required by society and business for the city must be significantly increased. This need applies to all levels of initial and vocational training in higher education. With over 15,000 students ranging from DUT to PhD, including bachelor's degrees, professional bachelors degrees, masters degrees, architecture or engineering degrees, and about a quarter of their apprenticeship students, the higher education and research institutions involved in the FUTURE project are in a position to contribute to meeting this challenge.

Pooling existing forces to strengthen these assets

To protect and strengthen the production of cutting-edge and innovative knowledge in the field of the city, it is necessary to foster a rich scientific activity within laboratories that broadly cross disciplines; it is also necessary to support the increase in our international visibility. It is indeed a principle of excellence that prevails in this respect: scientific cooperation will be developed, as it is now, regardless of geographical criteria.

It is also necessary to build training curriculum that reflect the new interdisciplinary

challenges of cities, and are both academically demanding and professionally oriented. Students can be recruited on several criteria: territorial, performance, consistency of the professional project, in accordance with the curriculum. It is of course essential that the increase in numbers of people trained in the field of cities is obtained by a more sustained attention to individual training curriculum and employment prospects, and not through a downward negotiation on requirements. Establishing a close association between the socio-economic world and research in the definition of training curriculum is another guarantee of effectiveness.

The FUTURE project combines the qualitative and quantitative advantages of the institutions it brings together. It plays an important transformative and leveraging role to meet the challenges identified. However, it has a major flaw in the long run: it is not sustainable, since it stops no later than ten years after its launch, even if the funding remains.

The creation of a new university, a carrier of the long-term vision

The institutions supporting the project have been in contact with each other for a long time, twenty-five to seventy years; a majority are located in Marne-la-Vallée as a result of a government policy pursued over the years.

Since the 1960s, the Ministry of Public Works and subsequently the Ministry of Environment has established its technical and scientific component in eastern Paris. The creation of the new university of Marne-la-Vallée and the school of architecture, as well as the installation of ESIEE Paris, have been part of this regional planning policy. It has naturally developed primarily on topics related to civil engineering, cities and transport, as well as digital technology. However, focusing on these themes would be to forget that institutions embrace a great diversity of academic fields, which is the very foundation of a university.

Six of the seven institutions in the FUTURE consortium intend to merge in order to create a new university, more intensive on research visible at the international level, open to very diverse, reactive and prospective training curriculum.

The intention is not to merge skills and resources or to forget the specialisations that make up the strength of the project. The aim is to strengthen high-level teams, and organise curriculum between the different types of trainings that will be maintained and developed. Maintaining and strengthening the links built with Ifsttar's institutions outside Marne-la-Vallée is also a crucial point for developing a national vision on "city and transport" topics and an opportunity for other topics.

It is also a question of continuing and crowning a continuous evolution of the past twenty years and the first contacts that have taken place between the institutions: a Descartes Polytechnicum, then a "Carnot", then a PRES and now a COMUE, which have gradually encouraged collaboration between researchers, teachers and managerial teams who have come to know and trust each other.

Finally, it can be observed that, while each institution is well positioned in its particular area of work, their development opportunities and international visibility remain limited; together, they will have the size and influence to tackle, among other things, integrated urban and transport issues through complementary approaches while respecting their respective subject matter. All these topics will also benefit from the increased

collaboration between institutions.

A university model that is new in France (but not elsewhere)

Several features make this project distinctive :

- creation of a nationwide university (sites in Lille, Nantes, Lyon, Versailles, Marseille-EPST are maintained) ;
- merger of several engineering schools under different supervisory authorities (City of Paris, CCIR, IGN), an architecture school (Ministry of Culture), an EPST (Ministry of Ecological and Solidarity Transition, Ministry of Higher Education, Research and Innovation) and a university (Ministry of Higher Education, Research and Innovation);
- governance, inspired by international models, will be hybrid between the French models of universities, research organisations and grandes écoles (collegiality and freedom of research and teaching, public service missions and advice to public authorities, mainly external governing boards, academic councils with prerogatives, presidents appointed by the Government, possibility of delegation of authority,..);
- maintaining strong links with the original supervisory authorities, who are all major stakeholders in the main themes of the new university.

The project proposed by the institutions is that of a complete merger, with a highly integrated partnership for those who wish to retain a legal personality. This model allows progress to be made year after year on the various integration works, without the prospect of having to undo the work at the end of an experiment, or if one institution should leave. This type of integrated university exists, for example, in the Netherlands and China, with great success.