UNIVERSITÉ PARIS-EST

vivapolis
La créativité française pour la ville

Les formations et recherches au service de l'innovation pour la ville durable

Le campus de la Cité Descartes accueille l'I-Site FUTURE qui porte sur la ville durable – ville de demain

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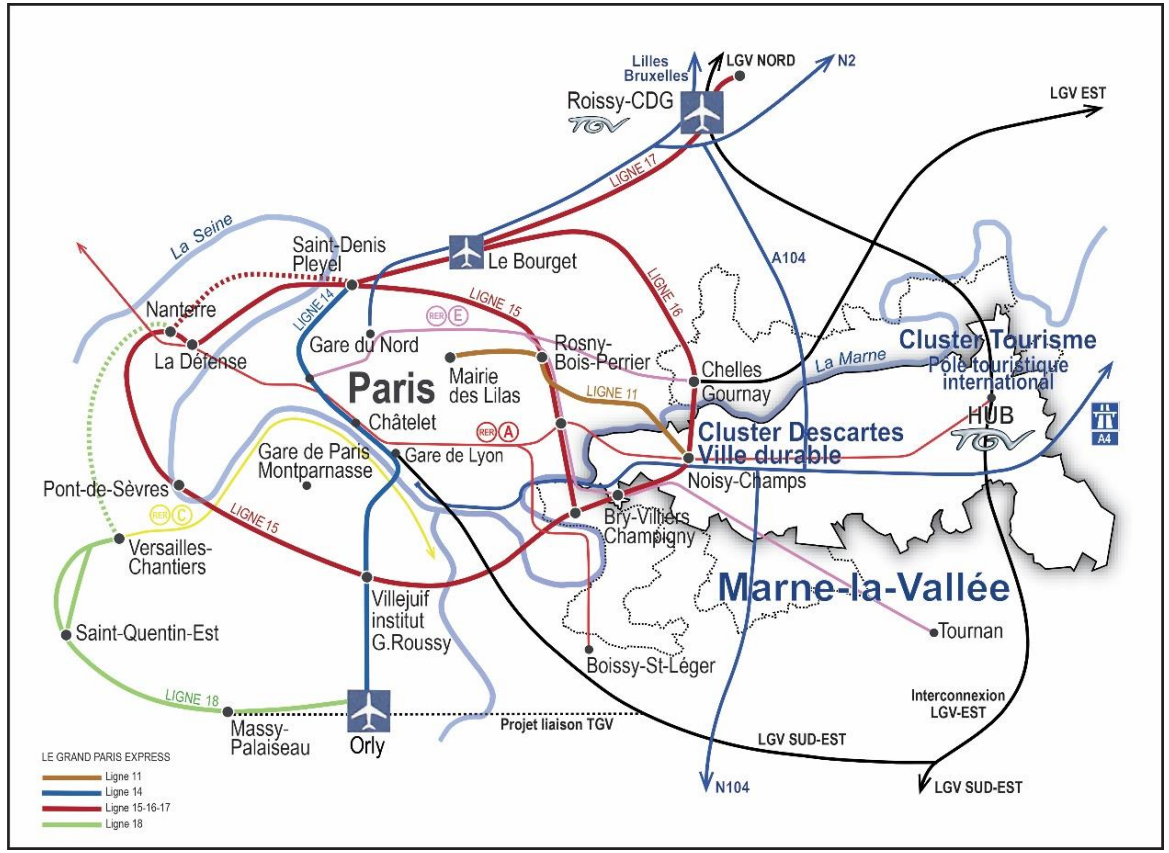
La Cité Descartes, à Champs-sur-Marne, Marne-La-Vallée



- Aujourd'hui, à 20 minutes de Paris en RER A
- Demain, hub du Grand Paris Express, avec les lignes 11, 15 et 16

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Un ensemble unique de compétences académiques sur la ville durable

- 15 000 étudiants
- 700 doctorants
- 1000 Chercheurs et EC
- 30 unités de recherche

- 5 établissements d'enseignement supérieur
- 4 organismes et établissements de recherche

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Le projet I-SITE FUTURE

Construire l'acteur majeur internationalement reconnu sur la ville durable dont la France manque en matière d'enseignement supérieur et de recherche

La plus-value de Paris-Est : le regroupement d'un panel de compétences permettant **une approche systémique de la ville**

▶ Nos partenaires internationaux privilégiés inscrits dans le même positionnement scientifique : AMS (TU Delft – Wageningen - MIT), NTUS Singapour

… avec qui nous construisons un réseau international (*International League* et PIN Ville)

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Construire une communauté scientifique autour des « Sciences Urbaines »

Scientists must have a say in the future of cities

A United Nations conference seeks urban sustainability. But the agenda will fail without input from researchers, warn **Timon McPhearson** and colleagues.

More urban areas will be built in the next 30 years than ever before. Growing settlements will increase demand for infrastructure, food, energy, water and housing. Simply meeting the projected urban expansion will breach the warming limit set by the 2015 Paris climate agreement.

This week, the United Nations' third major global cities conference, Habitat III, convenes in Quito, Ecuador. Held every 20 years, this multilateral meeting will adopt a global framework for making cities more sustainable — the New Urban Agenda (NUA). Sadly, science was largely absent from the drafting process of the NUA. By contrast, expert evidence guided the Paris climate deal, the 2015 Sendai Framework for Disaster Risk Reduction and the UN's 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs).

One reason is that the scientific community was unprepared for Habitat III. The few scientists invited to participate accepted a consultative role, nested among other public voices. Then, in late July, negotiators dropped the proposed multistakeholder panel, which would have formally embedded scientists and other non-state representatives in the implementation process. European Union members and other rich countries were concerned that the panel would be expensive. The final draft of the NUA[1] brokered in New York last month failed to reverse this. It is thus necessary to argue the case once again for the importance of urban science and of establishing a science–policy interface for the NUA.

Urban research is disparate, marginalized and ill-prepared to interact effectively with global policy. The Habitat III agenda requires a global community of urban biophysical and social scientists to assess developments and help direct progress. To achieve the SDGs and the NUA, the global urban research community must come together to develop institutions, funding mechanisms and research agendas.

URBAN ACCELERATION

Rapid urbanization is one of the biggest social transformations in human history[2]. Cities are depleting resources and face new

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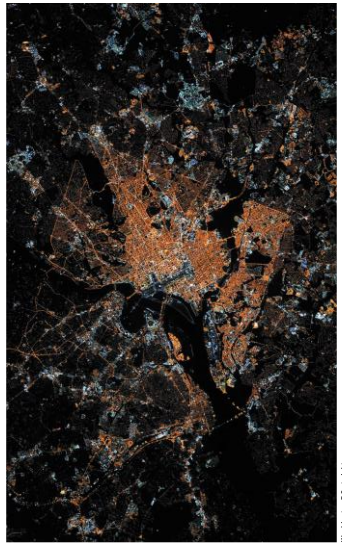

Washington DC at night.

VONNA VITEK LUCOS

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PERSPECTIVE

Meta-principles for developing smart, sustainable, and healthy cities

Anu Ramaswami,[1*] Armistead G. Russell,[2] Patricia J. Culligan,[3] Karnamadakala Rahul Sharma,[1] Emani Kumar[4]

Policy directives in several nations are focusing on the development of smart cities, linking innovations in the data sciences with the goal of advancing human well-being and sustainability on a highly urbanized planet. To achieve this goal, smart initiatives must move beyond city-level data to a higher-order understanding of cities as transboundary, multisectoral, multiscalar, social-ecological-infrastructural systems with diverse actors, priorities, and solutions. We identify five key dimensions of cities and present eight principles to focus attention on the systems-level decisions that society faces to transition toward a smart, sustainable, and healthy urban future.

By the year 2050, the number of people living in cities is expected to increase by about 2.5 billion (1). It is estimated that over 60% of the urban areas that will exist by 2050 have yet to be built, indicating that there will be massive new infrastructure requirements, particularly in Asia and Africa (2). Simultaneously, existing cities worldwide are aging and much in need of infrastructure replacement.

Infrastructures—defined broadly as the systems that provide water, energy, food, shelter, transportation and communication, waste management, and public spaces (3)—are essential to support human well-being and economic development. However, aggregated globally, these seven infrastructure sectors currently place a large burden on the environment and have a considerable impact on human health (Fig. 1). Urban demands dominate these effects; for example, ~70% of global greenhouse gas (GHG) emissions are attributable to cities (1). Because physical infrastructures have life spans of 30 to 50 years, the large imminent global requirement for new urban infrastructure presents a historic opportunity for change. The question is, how can urban infrastructure transformations in the 21st century advance the environmental sustainability and human well-being of our cities by taking advantage of the enormous potential offered by data science and technology?

Although information and communication technologies are important for developing smart, sustainable, healthy cities (4), we argue that a larger understanding of urban infrastructure systems is necessary to move from data to information to knowledge and, ultimately, to action for urban sustainability and human well-being. With infrastructure as the focus, we identify five key dimensions of cities and present eight principles to help guide urban transformations toward sustainability and health, drawing on examples from the United States, China, and India.

Key dimensions

Economic opportunity is a key driver for urbanization, and infrastructure is a prime enabler. Multi-city data sets are emerging that describe scaling relationships among urban population growth, gross domestic product (GDP), household incomes, and infrastructure-related parameters such as financial investments, energy and water use, and land and road expansions (5). Cities with different economic structures (e.g., highly industrial, highly commercial, or mixed economy) are known to exhibit different socio-spatial patterns of development (i.e., urban form) that affect infrastructure design. Yet basic city-level data on urban GDP, sectoral employment, and household incomes are sparse in many developing nations and in smaller cities and towns, where much urban growth is projected to occur.

Urban form or morphology describes the evolving interaction between physical space and human activity in cities. Numerous data sets, from census data to aerial and satellite photographs and remote sensing information, are being integrated to enable planners to characterize urban form. Urban complexity science is advancing new measures (4) that focus not only on population density, connectivity, proximity to jobs and services, and diversity and intensity of urban activities but also on understanding self-similarity across scales (from blocks to neighborhoods to cities) and patterns of social segregation (e.g., of migrant and informal populations in a city). Urban form represents the foundation upon which infrastructure develops, shaping energy and material use; access to and contiguity of water bodies, green space, and other critical ecosystems; and urban equity and well-being.

Infrastructure design and socio-spatial disparities within cities are emerging as critical determinants of human health and well-being.

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Downloaded from http://science.sciencemag.org/ on May 19, 2016

Un positionnement scientifique construit sur 3 défis majeurs afin de répondre aux enjeux d'Habitat III et des ODD

▶ Fournir une compréhension systémique des interactions entre les infrastructures ou les différents espaces bâtis, les services associés, les usages et l'utilisation des ressources (eau, sol, air, matériaux, énergie) à différentes échelles territoriales

▶ Repenser les formes et l'organisation urbaine qui permettront la mise en place de nouvelles infrastructures et services associés les plus performants et satisfaisants pour les ressources et la santé

▶ Étudier et développer la ville numérique et en faire un levier de performance sociale, environnementale et économique : réseaux de capteurs urbains, méthodes de data analyse innovantes, nouveaux services associés

▶ Comprendre et gérer le « risque urbain » dans ses interactions et interdépendances

▶ Outils de mesure et modélisation

▶ Proposer des modes d'organisations adaptés à des territoires et un ensemble de solutions techniques, organisationnelles ou méthodologiques innovantes

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Pour porter notre stratégie, la constitution d'un nouvel établissement pour 2019

IFSTTAR

UPEM UNIVERSITÉ PARIS-EST MARNE-LA-VALLÉE

ESIEE PARIS

EIVP ÉCOLE DES INGÉNIEURS DE LA VILLE DE PARIS ÉCOLE SUPÉRIEURE DU GÉNIE URBAIN

Éa v&t

- **Une forme institutionnelle originale et unique**
- **3 missions :**

-Excellence en recherche : Soutien aux talents et politique RH de haut niveau, renforcement du doctorat, mobilité
-Excellence dans la formation : politique de sélection, formation continue et forte spécificité dans l'apprentissage
-Expertise, appui aux politiques publiques et à la normalisation

- **Caractère national du nouvel établissement**

En association avec

IGN INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

École des Ponts ParisTech

Approche projet

anses

cnrs

FCBA INSTITUT TECHNOLOGIQUE

CSTB le futur en construction

LRMH Laboratoire Recherche Monuments Historiques

ESTP PARIS L'ÉCOLE DES GRANDES PROJETS

paris-belleville école nationale supérieure d'architecture

malaquais

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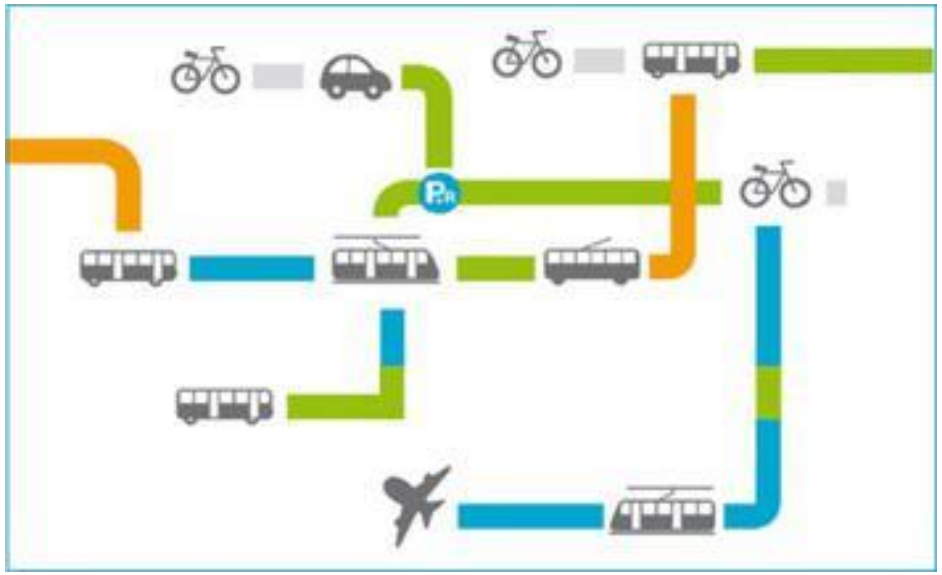
Une politique scientifique fondée sur :

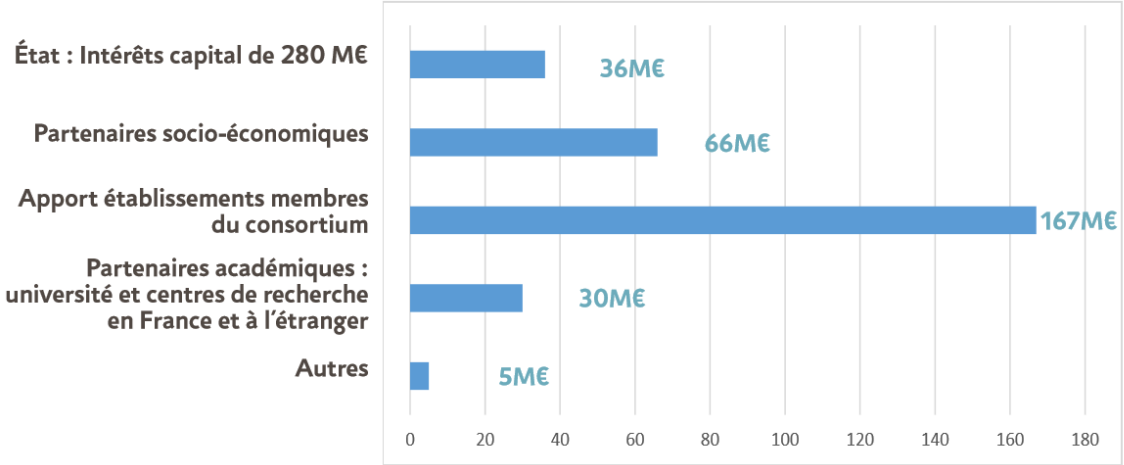
- Un niveau très élevé d'**interdisciplinarité** pour contribuer à la création de connaissances et méthodes en rupture. Exemple : Appel à projet tremplin, pouvant accompagner des projets à hauteur d'1 million d'euros
- L'exploration d'une **large gamme d'échelles** : du laboratoire aux territoires
- Un **réseau d'équipements/plateformes expérimentales et de données** de rang mondial
- **La co-innovation** entre académiques et acteurs opérationnels



Focus sur la co-innovation avec les partenaires socio économiques

- Pour 1€ du PIA, les entreprises apportent 1,5€ de cash

BUDGET DE L'INITIATIVE SUR 4 ANS



- Pour :

- Des programmes de recherche conjoints
- Des plateformes et des démonstrateurs pour tester la mise en société de nouveaux dispositifs
- Des programmes de formation jusqu'au doctorat
- Des laboratoires conjoints et des dispositifs de mobilité RH

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Un projet de campus durable démonstrateur

- Un lieu de **formation, recherche et de dispositifs expérimentaux** (Equipex Sense-City, pédagogie par projet, « village expérimental »)
- Un lieu de **démonstration** (Descartes 21)
- Un **lieu de vie, de démocratie et de responsabilité** (gestion durable de campus)

➔ *Enjeu pour le développement du projet : trouver des **formes de gouvernance** qui permettent d'associer les acteurs du territoire de manière effective*

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Merci pour votre attention

Contact

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