ISOCARP
Knowledge for Better Cities

SMART COMMUNITIES

Review 13

NOTE TO OUR READERS

This edition of the ISOCARP Review is designed to provide digital features, such as website and Table of Content (TOC) hot links. For example, to navigate the publication you can chose to scroll through the publication or you can click on a heading in the TOC and that section or article will appear. To return to the Table of contents, click on the letters "TOC" located on the bottom right of most pages. Clicking on highlighted web site references will cause a new window to be opened which will display the content of the page.

To insure that you can use these features, please download Adobe Reader for your computer or Tablet.

On a Mac or a PC, go to:
https://acrobat.adobe.com/us/en/acrobat/pdf-reader.html
for a free copy of this program. Once you have downloaded the program and installed it, simply open the PDF using Reader.

On an iPad, you can download Adobe Reader for free from the iTunes Store. Once installed, open the PDF, which contains the Review, using this application. Reader comes with a PDF file which explains how to do this.

We hope you enjoy this new snazzy version of the Review!

ABOUT ISOCARP

The International Society of City and Regional Planners (ISOCARP) is a global association of experienced professional planners. It was founded in 1965 in a bid to bring together recognised and highly-qualified planners in an international network. The ISOCARP network brings together individual and institutional members from more than 80 countries worldwide. As a non-governmental organisation ISOCARP is recognized by the UN, UNHCS and the Council of Europe. The Society also has a formal consultative status with UNESCO. The wealth and diversity of professional expertise, knowledge, and experience in the ISOCARP membership is unmatched in the planning field.

Although ISOCARP members work in many different fields they share a common interest in the spatial and environmental dimensions of urbanisation. They advise key decision-makers, proposing and supporting projects for intervention in a spatial context through general or specific actions.

The objectives of ISOCARP include the improvement of planning practice through the creation of a global and active network of practitioners. ISOCARP encourages the exchange of professional knowledge between planners, promotes the planning profession in all its forms, stimulates and improves planning research, training and education and enhances public awareness and understanding of major planning issues at a global level.

The association's main event is the annual **ISOCARP Congress**, which focuses on a globally-significant planning theme and which takes place in a different country each year. Since 1965 ISOCARP congresses have taken place in all parts of the world on cutting edge topics and have always promoted knowledge creation and sharing in the planning profession.

Prior to the congress **Young Planning Professional** Workshops are organized. This YPP programme seeks to bring together emerging young planning professionals from all over the world to tackle 'real-world' planning projects.

All ISOCARP activities are covered in **publications** such as the ISOCARP Review, the International Manual of Planning Practice (IMPP), Congress proceedings and special project reports.

ISOCARP recognises excellence through the Society's Awards programme.

ISOCARP **Urban Planning Advisory Teams** (UPATs) assists sponsor organizations by offering the extensive experience and expertise of ISOCARP members to work on important local or international planning projects, programs and policy initiatives.

In response to specific requests for ISOCARP assistance with research and consulting services, ISOCARP forms **Technical Assistance Teams** consisting of members who volunteer their expertise and experience.

In 2016 ISOCARP officially established the **Institute** as a "**Centre of Urban Excellence**" and formal body for generating, documenting and disseminating knowledge for better cities.

The Institute's core function is to design and deliver capacity building and continuing education programs; conduct research and promote knowledge transfer; as well as offer advice and short-term consultancy services to government, non-government and international bodies worldwide.

Photo credit: Travel Portland

![ISOCARP logo] **ISOCARP** Knowledge for Better Cities

Cover image: Portland by air.
Photo credit: Travel Portland

*The City of Portland, Oregon, is the
location for the 53rd ISOCARP Congress.*

TOC

ISOCARP PRESIDENT'S FOREWORD
RIC STEPHENS, ISOCARP PRESIDENT 2015 - 2018

The International Society of City and Regional Planners is a global organization of experienced professionals with the goal of creating and sharing "Knowledge for Better Cities". The ISOCARP network brings together individual and institutional members from more than 80 countries worldwide. Members are planners and other stakeholders involved in the development and maintenance of the built and natural environment. ISOCARP is recognized by the United Nations (UN), the United Nations Human Settlements Programme (UNHCS/UN-HABITAT), and the Council of Europe as a non-governmental organization (NGO). The Society also has a formal consultative status with the United Nations Education, Scientific and Cultural Organization (UNESCO). This year's congress is preceded by an ISOCARP-UNESCO Special Event: "Towards Sustainable Cities We Need: An Obliged Way to Save Life on Our Lovely Planet."

SMART COMMUNITIES
This year's theme, "Smart Communities" is synchronized with the inevitable application of information technology systems for planning, managing and governing communities**. *Smart urbanism*** merges information and communications technologies; energy, resource and infrastructure technologies into networks that create sustainable, resilient, regenerative, urban-rural ecosystems with vibrant communities, thriving economies and biodiverse environments. This is essential for developed countries to transform themselves from service economies into knowledge-based economies. It is also a more sustainable approach for developing countries to transition beyond industrial-based economies. The efforts to plan for smarter communities in Bodo, Norway; Portland, Oregon USA; and, several projects in China and South Africa are highlighted in *Review 13*.

INTEGRATING FOOD SECURITY INTO PLANNING,
AT CITY AND REGIONAL LEVELS
Simultaneous with the integration of technology and analytics into urban development is the adoption of strategies to improve food security in urban and rural areas. Part of this urban ecology movement is the emphasis on 'permaculture,' the development of agricultural ecosystems intended to be sustainable, self-sufficient and respectful of agro-ecology principles. This movement takes a holistic view rather than the historical, dualistic thinking of agriculture as separate from urbanization. This new planning movement includes new multi-stakeholders planning approaches, innovative planning tools and methods, ad hoc policies to strengthen grassroots initiatives, social enterprises as well business oriented firms to grow more nutritious food and make it accessible and affordable to urban consumers. At the same time, these efforts aim to preserve prime agricultural areas, providing urbanized areas with gardens to grow food, such as community gardens and metropolitan green roofs, as well as productive farms, and places to buy local crops such as farmers' markets. It also covers the food infrastructure including the logistics and facility requirements opportunities as well as institutional efforts to introduce locally grown food school and other nutritional and health programs. This year's focus is on City–Region food systems planning as illustrated by articles about Letchworth,

UK; Milan, Italy; Portland, Oregon USA; and Rosario, Argentina, where food planning is moving from a city based approach to a much broader one, embracing metropolitan regions and beyond.

This is the second year the Review has included a Food Planning section. ISOCARP is grateful for the expert assistance of Yves Cabannes and Cecilia Marocchino who are the editors of this important section.

ISOCARP URBAN PLANNING ADVISORY TEAM (UPAT) PROJECTS
And for the first time this year, the Review includes a special section reporting the ISOCARP UPATs accomplished during the past year. I thank Martin Dubbeling for serving as the Editor of this new section.

OTHER ACKNOWLEDGMENTS
The diversity of topics in *Review 13* mirrors the diversity of contributors to this publication who are representative of ISOCARP's global membership. We are greatly indebted all the dedicated authors and section editors for their time and expertise in creating these articles, and proud to have them as contributors to our professional society. In addition, I thank the Review staff who plan the publication, solicit articles, and provide the professional publication and design work to make the *Review* a first-class publication.

Finally, I would like to extend my deepest appreciation to the hosts and organizers of this year's Congress in Portland, especially the Oregon Chapter of the American Planning Association who graciously combined their annual statewide planning conference with our annual world planning congress. It is a unique approach for both organizations, and we will all benefit from the exchange of innovative sessions, workshops and special events.

—

FROM THE EDITORS

There have been several changes to *Review 13* and we wanted to tell you about them.

The most obvious one is that the publication 'went' digital. As a result, the format has been changed to a one column design to allow its legible use on tablets and other devises. The *Review* staff will miss the rich quality one can achieve using modern printing methods (see: *Review 12*) and the satisfaction of placing the publication on a book shelf at the end of the project. At the same time, we embrace the digital format. It enables us to make modification until the last second, greatly reduces the cost to produce the publication, facilitates the sharing of articles, and makes possible the (future) sale of the publication as an E-Book. It also opens new possibilities such as web-enabled links to supplemental information, or even the use of video instead of still photos to illustrate articles. We will be content saving *Review 13* to a flash drive and placing that on our bookshelf.

We continue to publish articles about the Congress theme and are pleased to include the Food Planning section for a second year. However, we continue to change and expand the variety of planning article we publish to provide our readers with broader information about current projects.

In *Review 13* are several Smart Cities articles which demonstrate this concept in a variety of circumstances. First, ICLEI, an international organization focused on Smart Planning, provides an overview of how the term 'smart' has been defined and interpreted into planning efforts by its members. Next, we have an article which report on how this term has been defined in China and which documents that nation's efforts to build new technology cities and retrofit existing cities with smart technology. The Portland, Oregon article records their efforts to find their own way to incorporate technology to better serve their citizens. We then have the story about using on-line database and mapping technology to plan smarter informal villages in Africa and finally one about smart efforts to incorporate public participation into historic renovation planning in Beijing.

The Food Planning section continues to provide examples of places which have integrated food into their city and regional planning. There is a historic perspective article about Letchworth, the first Garden City in England, that explores how food was integrated into its design and planning and how it evolved through time. We also include three on-going city-region food planning efforts: one in Milan Metropolitan Region; another article from Portland, Oregon; and finally, the stunning efforts undertaken in Rosario, Argentina where food planning and urban agriculture were used as a tool to overcome urban poverty and malnutrition and then grew into a full spectrum food systems planning activity embracing both the city and its metropolitan region. Our expert food editors, Yves Cabannes and Cecilia Marocchino, together with Jorge Foncesca (UN FAO), have written a Foreword which provides insightful planning lessons to be learned from the articles and conclude on the need for a human centered food planning.

We have added two new sections, which we hope to continue in subsequent editions of the *Review*. In addition to all the attention which urban planning has gotten as populations continue to migrate to cities, we feel that regional and rural areas also benefit from careful analysis and plans. Therefore, we have created a section to report article about rural and regional planning projects.

Review 13 contains two articles about the creation of large scale linear heritage corridors – one in China and the other in the United States. Coincidentally, both projects focus on corridors created by canals. There is another story from Ningbo, China, which plans to preserve a rural landscape by creating it as a regional park. Last is an article about planning efforts to improve public safety and local economies by provide mailing addresses in informal settlements in South Africa.

Our final new section is devoted to project summaries of recent ISOCARP UPATs. We include articles about reinvigorating the historic district of Hankou in Wuhan, China, and planning efforts to seize the opportunity to relocate and redevelop the combined military and civilian airport site to transform the city of Bodø, Norway, into an attractive, green and high-tech city. We very much appreciate the cooperation and assistance of ISOCARP Vice President Martin Dubbeling who served as the Editor of this Section.

As always, the stars of this publication are the wonderful authors who have contributed their talent and time to create this publication.

The geographic scope of our article continues to increase. We now publish articles from around the world, from the global north and the global south, and from rich and poorer nations. To facilitate this beneficial change, we need to be more informed about planning efforts everywhere. We invite ISOCARP members to volunteer as Review Correspondents, whose job would be to alert the Review editors of new or recently completed planning projects which might be suitable for future publication.

Finally, we note a change in the staff of the Review. Dr. Shi Nan, has completed his term as the ISOCARP VP for Publications and the Editor–in–Chief of the *Review*. Shi Nan had the vision to remake the Review into a magazine-like journal which reports real-world planning projects. Although a very busy man, Shi Nan graciously conducted bi-weekly, Skype-based staff meetings year-round, suggested articles, and if needed, made initial contacts with potential authors. At all times, he was a gentleman, a problem solver, an approachable colleague who was open to new ideas, and a pleasure to work with. We look forward to working with the new VP of publications, and we will have fond memories of our collaboration with Shi Nan.

We hope our readers enjoy *Review 13*.

SMART
COMMUNITIES

TO BECOME SMART, CITIES NEED TO PUT PEOPLE AT THE CENTER OF PLANNING

Michael Woodbridge, Roman Mendle

INTRODUCTION

The origins of the Smart City concept can be traced to experiments by the Los Angeles Community Analysis Bureau in the early 1970s. That experiment began with the creation of a large computer database populated with census, health, crime, environmental, tax assessment and other records from a variety of sources. Eventually, this database contained over 500 data fields; one for each Census tract in the city. Cluster analysis was then conducted, based on a subset of these attributes, to identify and group thirty tracts with similar characteristics. At roughly the same time, the Bureau evaluated color infra-red aerial photography of houses in the city and field-checked the results using windshield surveys in a sample of locations. The Bureau accomplished these tasks by selectively hiring planning experts with programming experience and by augmenting its computer staff with skilled workers from the nearby aerospace industries. Eventually, both the cluster analysis and the aerial analysis were used to identify "blighted" neighborhoods[i]. The idea behind these experiments was simple: cities should harness new technology, utilize emerging

Figure 1: Sitabuldi Market Nagpur, India. Smart city projects need to be tied to the real needs and features of the urban contexts in which they're implemented, starting from the people living them.

---

i For more information see: http://gizmodo.com/
uncovering-the-early-history-of-big-data-in-1974-los-an-1712551686

analytical methods and employ increasing tech savvy employees to improve the reach, quality and effectiveness of services to citizens.

While the concept of a Smart City has proven durable, there are competing visions on how – and by who - it should be achieved. In the era of the 'Internet of Things', the urban landscape abounds with sensors that can be used for data capture. Accordingly, technology and digital infrastructure have taken center stage in the Smart City discussion, and a new assortment of private actors is becoming increasingly prominent within urban policy discourse. Some researchers have gone so far as to claim that the "future of smart cities is inextricably linked to the internal knowledge organization of a small number of global technology firms" (Mcneil, 2015).

Simultaneously, local and regional governments all over the world are developing Smart City infrastructure and policies, and are positioning themselves to guide, facilitate, and establish data-intensive solutions. Particular attention is being paid to how this new technology may influence the character of municipal governance. While it is clear that advances in ICT (Information and Communication Technologies) can offer solutions, which enable more open governance and efficient service delivery, it must also be recognized that ICT developments can increase the complexity of the challenges. Technology without political understanding and clearly defined goals does not necessarily equate to a Smart City. Far too often, decision-makers look to technological fixes to avoid re-thinking ingrained political and economic paradigms. In other words, if one addresses the conditions which made the pursuit of sustainability as an ideal necessary, ICT can only be part of the solution to achieve sustainability.

An inherent shortcoming of the technology dependent approach to Smart Cities is the belief that efficiency necessarily leads to better quality of life, and can therein serve as an entry point to achieve sustainability in cities. For example, consider a Smart parking app which allows citizens to know in real time where they could find a free parking spot. In theory, this can reduce congestion within the city, but efficiency gains which improve access to a scarce resource (i.e. parking space) are often accompanied by increased demand for that resource. If parking in an urban area is made easier, quality of life might be improved and the emissions from driving around in search of a parking spot might be avoided, but it is unlikely that the modal share for private transport will decrease. The reality is that all sorts of processes and services can be made more efficient without improving urban sustainability, and that urban sustainability does not need to be reliant on technology and ICT.

So, if the implementation of Smart technology should not be the defining principle of a Smart City program, what should? At the Smart Cities 2.0 Session hosted by ICLEI (part of Metropolitan Solutions 2016 Conference), Pietro Elisei, ISOCARP Vice President of Marketing, challenged the audience to consider the inverse: what features or processes would characterize a city that is decidedly not Smart? Amidst the responses, a clear theme emerged from the various local and regional governments present. They argued that what is not Smart is any feature or process that does not produce better outcomes for their citizens.
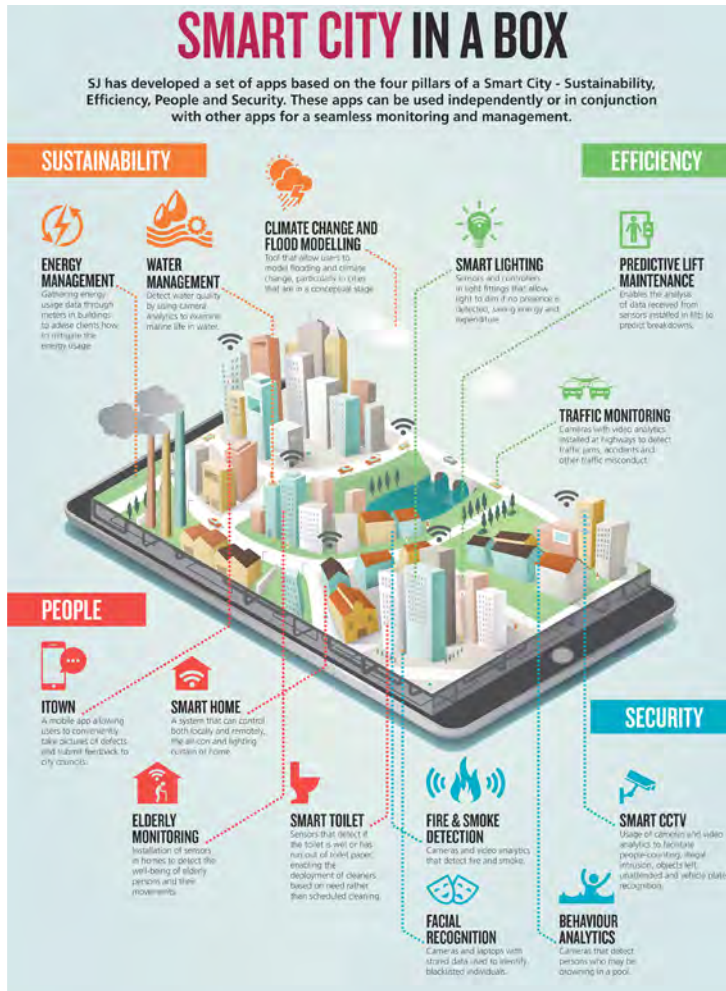
Figure 2: Launched in 2016 from the partnership between Surbana Jurong and Microsoft Smart City in a Box solutions is an integrated set of solutions with a dashboard that allows city officials to load customizable applications (Apps) in four key areas – security, efficiency, sustainability and community [ii]

ACCOUNTING FOR DIVERSITY

One entry point into the Smart Cities discussion is to understand why city officials, and citizens, might want their city to be "smarter". It may mean different things in different regions and might be dependent on the size of the city.

In metropolises all over the world, the most pressing resource shortage often is time. An era might indeed come to pass, as prophesied by John Maynard Keynes in 1930, where our grandchildren work no more than three hours per day. Of course, Mr. Keynes might not have considered that these working hours would be necessary to fulfill multiple-hour commutes. The most obvious culprit for our lost minutes and hours is the transportation system; large cities typically have burgeoning industrial and service sectors, which serve as a major pull factor for employment seekers, but which also create increased competition for commercial and residential spaces, and can increase land expansion and necessitate land use change. Herein, Smart Cities technologies offer solutions: the time required to fulfill tasks- or even the likelihood of cer-

ii Retrieved 28th of August from https://www.wirelessdesignmag.com/data-focus/2016/11/smart-city-box-infographic

tain tasks being fulfilled - can also be reduced or increased through a variety of electronic services (e.g. e-government services to complement formal participation channels).

Smaller and medium-sized cities, on the other hand, are more likely to have relatively controlled pollution levels and less significant challenges relating to traffic congestion. Greenhouse gas emissions can often be reduced through efficient public transportation solutions which do not necessarily inconvenience the end-user. That being said, small and medium-sized cities face the challenge of losing their intellectual capital – not to mention tax base – when their young adults and working population migrate to larger cities for cultural and economic opportunities. Considering these circumstances, openness to new ideas and investment into physical and digital infrastructure can help a small-to-medium sized city stand out. And although it is not an issue that is exclusive to small and medium-sized cities, reduced or non-existent technological knowledge can present a challenge, as can lack of internet connectivity.

But what does Smart mean in the context of an underserved or impoverished city? In those places which have experienced urbanization of poverty, such as Africa, Latin America, and parts of Asia, the Smart City concept needs to consider issues such as access to fundamental rights and the provision of key services (i.e. water, waste management, housing) within an urban area. In these places, the Smart City discussion must focus on governance and inclusivity, and promote policies and regulation which promotes transparent processes, citizen participation, and cooperation. The question of 'who has the power to do what' must always be considered.

SMART CITIES 2.0
ICLEI AND HOW IT PROMOTES SMART CITIES

ICLEI is the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future. We approach sustainability from a wide range of angles, including but not limited to: resilience-building, sustainable transport and eco-mobility, low-carbon solutions, building efficiency and renewable energy, urban biodiversity and urban food systems.

Our approach to promoting Smart Cities is therefore rooted into a holistic vision of urban areas and our core mission of helping cities and regions in our network to walk the path of sustainable urban development, decoupling economic prosperity from pollution and greenhouse gas emissions.

We are also engaged in the process of defining what Smart Cities are by engaging our members in on-going discussions. Using this method, we have found that the local and regional governments, in the ICLEI network, feel that Smart Cities should focus on quality of life for their inhabitants by including urban sustainability as a normative goal of any Smart Cities strategy. Therefore, Smart could be a more open process which enhances the relationship between local administrations and their communities and Smart could be a systems-based approach to optimize the quality of service provision by applying ICT to transportation, energy, public safety, built infrastructure, healthcare, social services, water and waste management, yet doing so without losing sight of the fact that making tangible improvements to these processes requires more than data-capturing and ICT investment.

We at ICLEI also feel that it is time for a "Smart City 2.0" approach, one that acknowledges both existing and future ICT tools and options, and then goes

beyond that to address the roots of the reason why a city might want or need to "get smarter": based on their experiences, the cities in our network, consciously or not, are making sustainable urban development a priority.

In fact, traditional concepts of sustainable urban development such as resource management, livability, mobility, and environmental protection remain at the core of most "Smart City 2.0" projects. The use of technology in and of itself is secondary; it is valuable as a tool that allows cities to achieve the overarching goals of making livable, sustainable, and low-carbon urban areas.

We know that, at least insofar as public authorities are concerned, local and regional governments are often the first to innovate. In large part this is because they are so close to the issues that are important within their communities. As such, many cities around the world have implemented Smart City projects which make citizens the focal point.

What we continue to see from the pioneering Smart Cities within our network is that inclusive and engaged communities are smart communities. That is, in Smart Cities, citizens are better positioned to react to external stressors (i.e. they are more resilient), they are more aware of their impacts on the rest of the city and the environment (i.e. they are more sustainable), and they have better access to resources and opportunities within the city.

A COMMON THREAD

The great potential of the Smart City concept is in its ability to improve quality of life within cities by making sustainable urban development its normative goal. This is at the core of the Smart Cities 2.0 movement.

Underneath every example of the Smart City, regardless of size or level of development, lies the question of data. Data is at the heart of the digital transformation behind Smart Cities, and as technology improves, the capacity for data collection and the total amount of data available increases. In many respects, this is a good thing. If your city is facing a challenge, data will help assess the scale and scope of that problem and inform the demands which must be met.

To this end, many local and regional governments emphasize policies which make large amounts of data 'open'. Open data increases the transparency of government actions and is available for citizens that wish to use it to contribute to policy and service design. There are, however, questions about the privacy and protection of personal data, as well as how effective local and regional governments are in using all the data that is collected, or how easy it is for citizens to navigate and utilize it.

The following Smart Cities 2.0 case stories illustrate how data, along with built infrastructure, is an integral building block of sustainable urban development.

CITY OF GHENT, BELGIUM

The City of Ghent, home to 256,261 inhabitants in the municipal area and 500,000 inhabitants in its greater metropolitan area, is in the vanguard of citizen-focused Smart Cities. Industry plays a prominent role within the local economy, as do innovative companies in bioenergy, biotechnology, and ICT. To promote further growth opportunities for high growth companies, Ghent has allotted over 1,000 acres of municipal land to logistics, the knowledge economy, and services.

Working on the premise that they don't need a Smart City strategy, but rath-

er a city strategy that is smart, Ghent looks to its citizens and various stakeholders to take a lead role in the co-creation of a "future fit" city. To this end, Ghent has introduced initiatives which strike a balance between ICT and non-technological approaches. In addition, the City Council leverages ICT and non-tech approaches, such as living streets, crowd-funding, and the use of temporarily empty public space, to develop a diverse range of successful policy initiatives, including policy participation, assessment frameworks, public-private-partnerships and integrated urban development.

For example, Ghent's open, accessible data policy plays a key role in the innovative 'Apps for Ghent' initiative. Apps for Ghent is a contest which encourages citizens to create apps, websites, or other novel concepts which make use of the open data provided by the City of Ghent and various other partners. The initiative not only provides a space for the co-creation of usable technologies, but also a platform for discussion about the how such technology can be applied.

Figure 3: Apps for Ghent is a contest which encourages citizens to create apps, websites, or other novel concepts which make use of the open data provided by the City of Ghent and various other partners

Ghent has also applied Smart principles to contribute to sustainable urban development. The City was nominated for the 'Belfius Smart City Award 2015' for its ongoing, made-to-measure energy coaching service. Within the initiative, Ghent is looking to recruit a minimum of 110 local companies that are interested in reducing their energy demands and associated CO_2 emissions. Thirty-one local companies participated in 2015 and as a result of the tailored coaching - which included various retrofitting initiatives across lighting, insulation, heating and cooling - many participants achieved emissions reductions upwards of 1,000 CO_2.

NAGPUR, INDIA

Like Ghent, Nagpur, a metropolis of over 2.4 million inhabitants, has involved citizens from the outset in its Smart City planning. To create its Smart City Strategy, the Nagpur Municipal Corporation (the local government administrative body for Nagpur) launched an intensive citizen engagement initiative which attempted to reach out to as many households and potentially underrepresented demographic groups as possible in order to inform its strategic priorities. This process was supported by the Nagpur Smart City Council, a large, diverse group of stakeholders incorporating thematic experts, urban planners, NGOs, and private partners.

As a result, six key principles were identified that now inform Nagpur's Smart City agenda: a well-planned city; safety and livability; future-proof infrastructure; sustainable habitat; digital governance; and economic prosperity. However, over the course of the stakeholder engagement process, local gov-

ernment officials identified a typology of three distinct neighborhood within Nagpur: a dense city core with significant heritage areas; planned residential neighborhoods; and informal settlements along the fringes of the urban area. Thirty-six percent of the population in Nagpur reside in informal settlements.
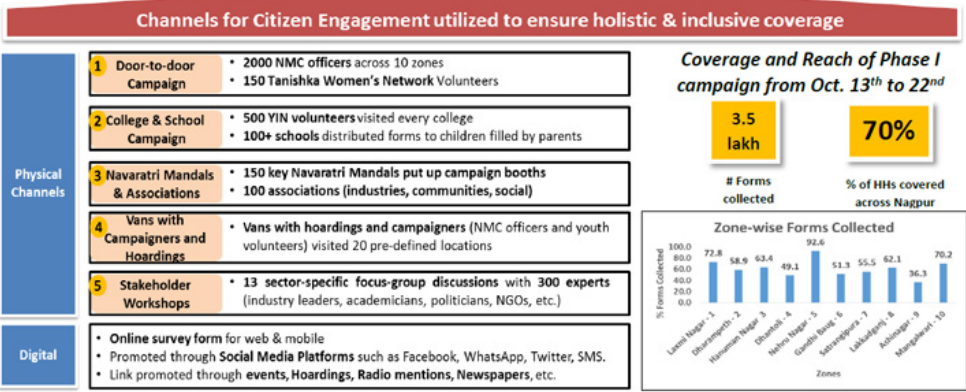
This typology, along with inputs from the Nagpur Smart City Council, was helpful in identifying the need to develop two metro-line corridors as a key smart city intervention to alleviate Nagpur sub-optimal public transportation infrastructure. The plans, composed 17 stations dispersed across a 21.8 km north-south corridor and 18.3 km east-west corridor, encourage the redevelopment of core city areas, mixed-use development along the metro, and affordable movement options for those living in informal settlements.

The Nagpur Municipal Corporation is using the Smart City concept to become a truly inclusive city by 2025. This will mean ensuring that key services are provided to the underserved population in the eastern periphery, as well as developing more accessible and green open spaces, and emphasizing compact, mixed-use planning through the strategic use of publicly owned land, and making Nagpur an open defecation free city.

Figure 4: Nagpur launched an intensive citizen engagement initiative which attempted to reach out to as many households and potentially underrepresented demographics as possible in order to inform its strategic priorities. Source: Delivering Change Foundation

CITY OF VIENNA, AUSTRIA

Home to 1.8 million residents and projected to expand to 2.2 million by 2050, the City of Vienna is Austria's largest city. While some cities focus on the use of innovative technology, Vienna Smart City prioritizes social inclusion. In 2011, Vienna launched a participatory process through numerous thematic workshops and expert consultations in order to formulate concrete objectives. The resulting strategy, the Smart City Wien framework, is directed at a wide range of groups: citizens, enterprises, nonprofit institutions, and the public sector. The project aims to improve the city's performance in three areas: resource preservation, quality of living, and innovation.

Driven by these goals, the city has implemented numerous specialized smart city projects in different sectors and have identified objectives such as the reduction of CO_2 emissions from 3.1 to 1 ton per capita; increasing renewable sources to 50% energy consumption by 2050; and decreasing motorized individual traffic from 28% to 15% by 2030.
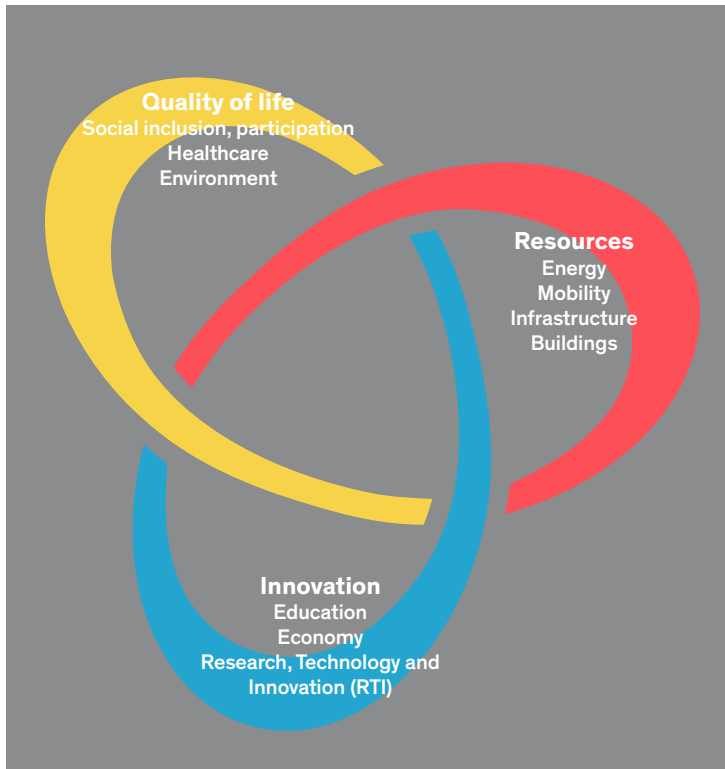
Figure 5: The Smart City Wien framework was developed through an extensive participatory process, and it will continue to serve as a long-term umbrella strategy until 2050

"The MA48 Waste App" is one good example of Vienna's approach to smartness. The app provides information regarding waste disposal, including the next collection dates, the nearest waste disposal sites, and updates to the system. Vienna uses the app to motivate citizens to participate in waste separation. This is characteristic of its smart city project, which focuses not so much on new technology but on the use of existing technologies to change processes and mindsets.

The Smart City Wien framework will continue to serve as a long-term umbrella strategy until 2050, and encompasses all areas of municipal administration and urban policy. It has been designed to interact with existing and future plans in order to provide a consistent and productive strategic framework.

THE SEVEN QUALITIES OF A SMART CITY

With these examples of how cities all over the globe are approaching the "smart city" idea in mind, ICLEI has identified some of the key traits that constitute a "smart city":

1. A smart city puts people at the center. Tapping the potential of new technologies and data management is useful, if it is a means to an end. ICT and other technologies should be considered only in relation to how rapidly, how easily and how effectively they allow the city to move towards sustainable, inclusive and engaged communities.

2. A smart city is less about innovation per se, than it is about removing roadblocks to local human capital. A smart city should act as an incubator for innovation and a catalyzer for solutions, refraining from expecting to have all the solutions and relying on the existing local human capital.

3. Before engaging into technology-intensive revolutions of administrative action, a smart city aims to better integrate existing projects and plans, find synergies among previously disconnected streams of work and areas of responsibility.

4. A smart city fosters citizens' engagement. Decades of top-down approaches have shown that crafting policies in city hall and imposing them on the community is not an effective way to achieve the intended goals. When citizens are given a chance to participate in policy crafting and subsequent implementation, projects yield faster and better results. Citizens' engagement is also crucial in strengthening local democratic institutions and build a stronger sense of community.

5. A smart city has a central goal or set of goals that it intends to achieve within a given timeframe. All the rest is built around those goals. The questions a city should ask itself when considering a Smart City plan or project are: What do we want to achieve? How do we believe we can achieve it? Why do we think this is going to improve the lives of our citizens?

6. Smart cities don't act in a void. Local businesses, academia and other research organizations, civil society and, of course, relevant regional and national administrations are all going to play a crucial part in delivering change at the local level. Building partnerships is crucial to implement policies that aim to make the city more livable, more sustainable and more inclusive. Many successful cities have been able to leverage the potential within the local community or partnering with interested organizations to better monitor air quality, organize waste management in a more effective and sustainable way, provide the context for a low-carbon transition to take place within the city.

7. Smart cities ask themselves not what is smart but rather what is not, what doesn't work, what creates a loss for the community and how to transform that into a net gain. Becoming smart means then identifying criticalities and addressing them.

Figure 6: Energy efficient building in Copenhagen, Denmark.
Source: The City of Copenhagen website www.kk.dk

CONCLUSION

The Smart City debate offers cities a dynamic environment for rethinking the approaches and methodologies to foster sustainable urban development. It is cities themselves who will continue to decide on the values that are appropriate to their sustainable development path.

It is increasingly clear that there is no single blueprint for Smart Cities that works for small and large, poor and rich cities. Each local community has its own pre-existing geographic, social, political and economic conditions which may limit or enhance the process of sustainable urban development. And with that in mind, every local and regional government must maintain and exercise the right to dictate what Smart City means for them. ICT innovation, systems integration, and efficiency gains must be deployed in the service of sustainable and people-centered local development.

That being said - and to follow in the footsteps of Mr. Elisei by considering the inverse - just because there is no blueprint for what cities should do, it does not mean that there are not traps and pitfalls which should be avoided by civic practitioners developing Smart City strategies and frameworks. The biggest pitfall of all is to consider methodological approaches - such as innovation, efficiency, systems integration - or practical requirements for implementation - such as data, technology, governance models, and digitalization - in the absence of a goal. Even a Smart City needs to set a strong foundation.

—

SMART CITY CONCEPTUAL DEVELOPMENT IN CHINA

Anrong Dang, Danming Zhang, Jian Xu, Juan Li

ANRONG DANG
DANMING ZHANG
JIAN XU
JUAN LI

NATIONAL ACTIVITY OF SMART CITY DEVELOPMENT

Figure 1: Zhongguancun Science Park
Source: http://www.zgc.gov.cn/

Smart City, as a new concept for Research and Development, was first discussed at the Chinese National level on August 2009 at the seminar titled "Summit of Information Technology Development Strategy", hosted by the China National Ministry of Science and Technology in Xiangshan. In June 2010, experts from Smart City related field, such as information science, remote sensing, and the modern service industry, organized a symposium to discussing the research and development of Beijing as a Smart City. The most important achievements of the symposium were: that Smart City will be part of strategic emerging industries of China; that Smart Citiy was defined as the comprehensive application of the new generation of information technology; and that Smart Citiy will promote the depth fusion of informatization and industrialization in China.

In October 2010, Wuhan (Capital city of Hubei Province) and Shenzhen (Located between HongKang and Guangzhou, Guangdong Province) were selected by the China National Ministry of Science and Technology as pilot cities to be planned and developed as Smart Cities. While Wuhan and Shenzhen were working on their Smart City planning and development, some other cities, such as Beijing, Shanghai, and Ningbo, also launched their Smart City development strategies. Taking Shanghai and Beijing as examples, Shanghai produced their Three-year Actions to Promote Smart Shanghai Development in September 2011, and Beijing published The Outline of Smart Beijing Activity in March 2012.

In November 2012, the Ministry of Housing and Urban-Rural Development of China released the following three documents: Notification of the Pilot Work for China National Smart Cities; Provisional Regulations of the Pilot Work for China National Smart Cities; and, The Index System of the Pilot Work for

ANRONG DANG
DANMING ZHANG
JIAN XU
JUAN LI

Figure 2: Zhongguancun Science Park, Haidian District, Beijing
Source: http://www.zgc.gov.cn/

China National Smart City and District and Town. Then the evaluation and selection process and work of the pilot smart city program was started all over main land China based on the voluntary application by city government (www.mohurd.gov.cn).

In January 2013, the list of first group of pilot cities was announced which includes 37 prefecture-level cities, 50 districts and county-level cities, and 3 towns, a total of 90 Smart City projects. In August 2013, the second group of pilot cities was announced which includes 80 districts, 23 county-level cities and towns, and 9 expanded towns – a total of 112 projects. And in April 2015, the third group of pilot cities was announced which includes 84 districts and counties and towns, 13 expanded districts and towns, and 41 special districts and towns for a total of 138 projects[i].

In August 2014, approved by the State Council, the Guidance for Promoting Healthy Development of Smart Cities was worked out by eight ministries, including the National development and reform commission, Ministry of industry and information technology, Ministry of science and technology, Ministry of public security, Minister of finance, Ministry of land and resources, Ministry of housing and urban-rural development, and Ministry of transport[ii]. Four important principles of Smart City development were defined in the Guidance. Smart Cities were to be people oriented, to be local condition based, to be collaborative innovation, and to ensure safety. Five objectives of Smart City development were also enumerated as follows, convenience of public service,

---

i http://www.mohurd.gov.cn/
ii ibid

ANRONG DANG
DANMING ZHANG
JIAN XU
JUAN LI

refinement of urban management, livable of living environment, intelligent of city infrastructure and long-lasting network security.

In October 2014, based on the main ideas of the Guidance for Promoting Healthy Development of Smart Cities, an Inter-ministerial coordination working group was established by 24 ministries to enhance the cooperation among ministries. In November 2014, the working group published Inter-Ministerial Coordination Working System and Working Program for Promoting Healthy Development of Smart Cities (2014-2015).

Approved by the State Council, In December 2015, the working group extended to 25 ministries and changed their title to "Inter-ministerial coordination working group for new Smart City development". The main tasks of the working group consisted of four items: to coordinate the inter-ministerial policy of new Smart City development; to guide and monitor the new Smart City development; to evaluate the new Smart City development; and, to organize foreign exchange activity. Compared to the Smart City, the new Smart City meant new objectives, new ideas, new principles, new contents, new methods, and new requirements.

In April 2016, the working group published Inter-Ministerial Coordination Working Program for new Smart Cities development (2016-2018). In December 2016, The Evaluation Index of New Smart City (2016) was published by the State Standard Committee Office, which includes 8 first class indicators, such as service people, precision governance, ecological livable, Intelligent facilities, information resources, network security, and citizen experience. Meanwhile, the Evaluation Index includes 21 second class indicators and 54 third class indicators (see: http://www.ndrc.gov.cn for more information). Based on the Evaluation Index system, most of the pilot smart cities were to be evaluated and 100 of them will be selected as the Models of New Smart City development.

ANRONG DANG
DANMING ZHANG
JIAN XU
JUAN LI

CONCEPT MODEL AND FRAMEWORK OF SMART CITY

According to the Guidance for Promoting Healthy Development of Smart Cities, the concept of Smart Cities was described as a new idea and model to promote urban planning, urban construction, urban management, and urban service. Being "smart" was achieved by means of integrated application of information technology, such as internet of things (IOT), cloud computing(CC), big data(BD), and geo-informatics (RS, GIS, GNSS, VR). Developing Smart City was seen to be of great importance to speed up the 'informationization'[iii], new industrialization, agricultural modernization, and new urbanization, as well as to enhance the sustainable development of the city. Based on the concept above, the concept model of smart city can be graphical expressed by Graph 1.
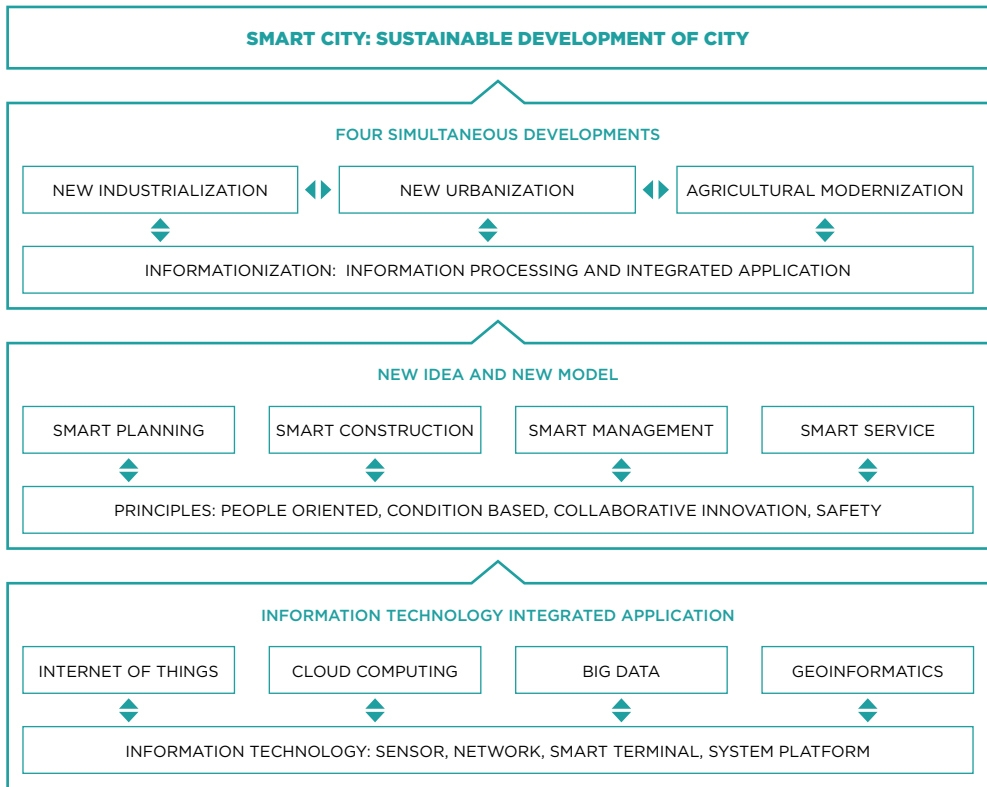
The preceding diagram of Smart City is helpful to understand the main ideas of the smart city concept. However, we should transfer the concept model to a built framework according to the demands of people, the process of urban planning, construction, management, and service, and the characteristics of information technology as expressed by Graph 2. This diagram includes three infrastructure platforms, two classes of application systems, and one guarantee systems, such as Information sensing and transmission platform, infor-

Graph 1: The Concept Model of Smart City

---

iii Informatization or informatisation refers to the extent by which a geographical area, an economy or a society is becoming information-based, i.e., increase in size of its information labor force. Usage of the term was inspired by Marc Porat's categories of ages of human civilization: The Agricultural Age, the Industrial Age and the Information Age (1978). Informatization is to the Information Age what industrialization was to the Industrial Age (Wikipedia Definition see: https://en.wikipedia.org/wiki/Informatization).

mation management and computing platform, resource sharing and service platform, management and service systems, decision support and service systems, and maintenance and guarantee systems.

INFORMATION SENSING AND TRANSMISSION PLATFORM

The information sensing and transmission platform is the information infrastructure of smart city, which includes information sensing facilities and information transmission facilities. Information sensing facilities refer to information gathering technology and equipment such as remote sensing technology, radio frequency identification (RFID), GNSS terminal, natural environment sensor, urban social sensor, and camera video capture terminal, which are located in the urban informatization system.

SERVICE OBJECTS OF SMART CITY

| Government | Business | Community | Public |

DECISION SUPPORT AND SERVICE SYSTEM

| Expert Knowledge | Data Mining | Scenario Analysis | Decision-making Model |

MANAGEMENT AND SERVICE SYSTEM

| Smart Government | Smart Business | Smart Community | Smart Public Service |

INFORMATION MANAGEMENT AND COMPUTING PLATFORM

| OGC: WFS | OGC: WMS | OGC: WCS | OGC: WTS |
| Cloud Computing | SOA | Geoinformatics |

INFORMATION SHARING AND SERVICE PLATFORM

| Spatial Database | Attributes Database | Video Database | Metadata Database |
Data Warehouse: Integration of management and service

INFORMATION SENSING AND TRANSMISSION PLATFORM

| Sensor Network | Fiber Network | Wireless Network | Cyber Security |

MAINTENANCE AND GUARANTEE SYSTEM

MANAGEMENT POLICY

MANAGEMENT DEPARTMENT

OPERATING MECHANISM

CAPITAL INVESTMENT

TECHNICAL SUPPORT

SPECIAL TALENT

INFORMATION SECURITY

Graph 2: The Framework of Smart City

—

Information transmission facilities refers to the wired and wireless network transmission facilities, including communication fiber network, 4G/5G wireless communication network, micro-sensor network, related storages and servers, and network terminals. The various components integrate to build a universal urban Internet of Things.

INFORMATION MANAGEMENT AND COMPUTING PLATFORM

The information management and computing platform is the spatial data infrastructure of smart city, which includes two aspects: data integration management system and information computing service platform. Data integration management system is mainly supported by the data warehouse technology, to manage the smart city databases, such as city basic geodatabase, resource and environment database, socio-economic database, population database, legal database, urban and rural planning database, remote sensing image database, video database, and application-oriented subject database. To better manage data, cloud computing technology should be applied to provide data computing services, through resource sharing and service platform, for smart city management and service system and decision support and service systems.

INFORMATION SHARING AND SERVICE PLATFORM

The information sharing and service platform is the service infrastructure smart city, which is to sharing information and service based on SOA and cloud computing. The platform integrates remote sensing (RS), geographic information system (GIS), global navigation satellite system (GNSS), virtual reality (VR) to provide all the service to management and service system and decision support system and service system by means of OGC standards, such as WFS, WPS, WMS, WCS, and WTS. The platform could not only provide software service, platform service, facility service and other resource services, but also realize the smart city resource management, process management, application request response, application service provision, and so on.

SMART CITY MANAGEMENT AND SERVICE SYSTEM

The management and service system is the main body of smart city, including four aspects, such as the smart government affairs, smart business service, smart community service, and smart public service. The smart government affairs is the further development of former e-government, mainly covering the government management informatization and networking, involving urban resource management, planning and construction management, environmental protection, tourism management, and other functions. Similarly, smart business service is intelligence development of former e-commerce, to achieve the informatization and networking of enterprise production management and business activities. The smart community service is the deepen development of the digital community, to support the citizen's daily life and behavioral decision-making informatization and networking. And the smart public service is for the public people to acquire smart services related to the science education, the daily life, and leisure activity at anytime and anywhere.

The smart city decision support and service system works like the brain of the smart city. It supports both government or business decision-making related to major city events. Based on the smart city management and service system, smart city decision support and service system is mainly the integration of expert knowledge, data mining, knowledge discovery, scenario analysis, and decision-making modeling. To enable comprehensive decision-making, the system to provide technical and information to meet the smart city needs and to achieve sustainable urban development.

SMART CITY MAINTENANCE AND GUARANTEE SYSTEM

The Planning and developing of a Smart city is a long-term systematic project, which relates all aspects of urban planning, urban management, citizen life, and public demands. It is impossible to be achieved overnight. To ensure the orderly development of smart city, the maintenance and guarantee system had to be defined early on, including issues such as relevant policies, operating mechanism, capital investment, technical support, special talent, information security, and other aspects. At the same time, the life cycle operation and maintenance of the systems are also very important considerations which must be considered.

EXAMPLES AND CHARACTERISTICS OF SMART CITY

Figure 3: Zhongguancun Science Park, Haidian District, Beijing
Source: http://www.zgc.gov.cn/

Guided by the Guidance for Promoting Healthy Development of Smart Cities (2014), there are more than 300 cities practiced the planning and developing of smart city and obtained lots of achievements. Each of them has their own characteristics, and the following are three of them.

SMART ZHONGGUANCUN SCIENCE PARK, BEIJING

Located in northwest of Beijing, Zhongguancun Science Park is very famous for its high tech and innovation development. Zhongguancun Science Park consists of 41 universities, 206 science institutes, 68 national laboratories, 27 national engineering research centers, 28 national technology research centers, and 34 overseas students pioneer parks. More than 3000 high tech and innovative companies are registered at Zhongguancun Science Park. Therefore, planning and developing Smart concepts at Zhongguancun Science Park is the most important element of Smart Beijing.

Investment Service System	Planning & land System	Building Management System

INFORMATION SERVICE PLATFORM

Sensing	Databased	Service

Business Analysis System

Human Resources System

Project Management Systemv	Financial Analysis System	Business Management System

Graph 3: Components of Smart Zhongguancun Science Park

Followed the concept idea and general framework of Smart Beijing, the components of Smart Zhongguancun Science Park were worked out as shown in Graph 3. One information service platform and eight application systems are the main components. There are three important aspects of the service platform, such as information sensing, database management, and information service. While the eight-application system includes: an Investment Service System, a Planning and Land system, a Building Management System, a Human Resources System, a Business Management System, a Financial Analysis System, a Project Management System, and a Business Analysis System.

Figure 4: Smart Yishanwan Community, Wuhan

SMART YISHANWAN COMMUNITY, WUHAN

Yishanwan community is in Jiangxia District, Wuhan, Hubei province. It plans the community space, industrial and agricultural layout required in new comprehensive planning. It also calls for the rapid development of community informatization. It believes that the integration of urban and rural overall development can only be achieved by embedding information technology in all aspects of new community development. Therefore, under the background of the synchronous development of informatization, new industrialization, agricultural moderniza-

ANRONG DANG
DANMING ZHANG
JIAN XU
JUAN LI

tion, new urbanization, the development of smart Yishanwan community to-wards new urbanization is to follow both the trend of the era and the approach which conforms best to the developing local vision. Based on the experience of the development of Smart Wuhan, the demand of building Smart Yishanwan Community is embodied in four aspects: the informatization infrastructure, management, service, and mechanism.

According to the demand of informatization development of smart commun-ity, the general framework (Graph 4) of Smart Yishanwan consists of four-layer components, such as base layer, sharing layer, service layer, and portal layer. And

an information center and a security system is working on the integration of the five layers. The framework can be summarized as a project of "Six Ones", that is organizing one information center, building one base layer (a set of infra-structure), one sharing platform, one application and service system, one infor-mation portal, and one security system.
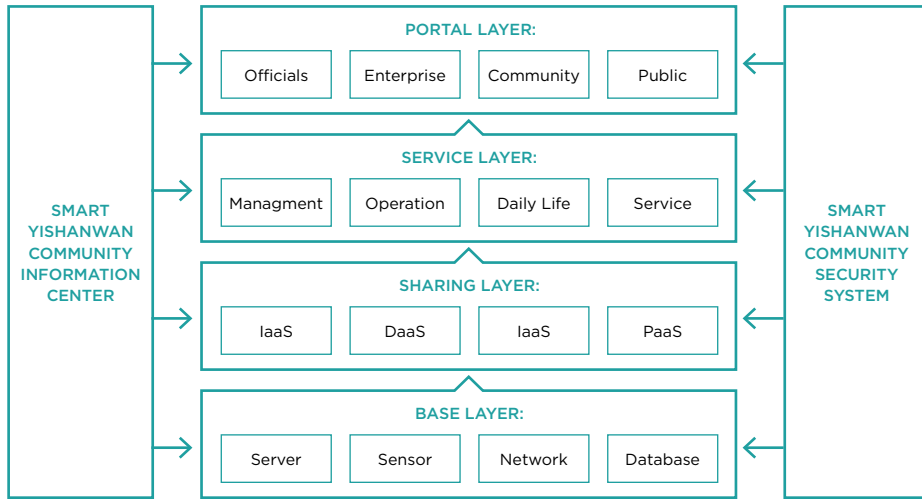
Graph 4: Components of Smart Yishanwan Community

CONCLUSION AND DISCUSSION

After eight years study and practice of Smart City in China, most of the govern-ment officials and IT experts realized that Smart City development is an impor-tant way for new urbanization development in China. The advantages are not only for government management, but also for public service. With the devel-opment of the smart city, new types of shared economy are developing very well. More and more industries are changing their developing mode, while more and more people are becoming familiar with various aspects of smart daily life. However, some related issues must be considered, such as the personal privacy, the information security, the technical standard, the social regulation, and so on.

—

PORTLAND'S SMART CITIES EVOLUTION

Christine Kendrick, Kevin Martin

Eastbound bridgehead connecting the Tilikum Crossing, Bridge of the People, to greenways and bike routes. Portland's newest bridge carries pedestrians, cyclists, TriMet's Max Orange line trains, buses, and streetcars over the Willamette River but not passenger vehicles

INTRODUCTION

Smart Cities is not a term that was coined by the City of Portland or any other city or community. Rumor is the origin lies in the private sector. It's been criticized as a marketing term created by companies anticipating a billion-dollar market in civic technology. Perhaps because of its cloudy provenance, there is no standard Smart Cities definition despite lots of discussions about standards. Generally, people may know it has something to do with data and technology, perhaps they have heard of the Internet of Things (IoT) or have read popular media articles about the rise of the autonomous vehicle. It is not always a beloved term by cities (we are not "dumb" now), nor is it necessarily seen as a term that identifies strategies or goals that many communities were not already pursuing.

The City of Portland's understanding of Smart Cities has been evolving through our experiences of the past few years. Today, Portland defines Smart Cities as the efficient use of existing and innovative technologies, data collection and management tools to enhance community engagement and bring public benefits through improved services. Central in any smart city project should be the attainment of at least one of our City goals: to achieve digital equity; improve mobility; have greater affordability; facilitate climate change mitigation and adaptation; improve community health and safety; encourage workforce development; or improve disaster preparedness and resiliency. We also want to enhance the ability of the City and our wider community to transform data into knowledge to inform our decision-making. We also seek new economic and civic technology opportunities. But the fundamental goal of City of Portland Smart Cities projects is simply to make people's lives better.

The City of Portland has invested in a regional approach to Smart Cities planning, working closely with Portland State University, our local transit agency (TriMet), our regional metropolitan planning organization (Metro), and the State Oregon Department of Transportation (ODOT). We have also built out an internal Smart Cities governance structure to facilitate projects across the City's bureaus and ensure collaborative work with university researchers, the local technology community, and the public. The City has been able to leverage the collection of ideas under the Smart Cities umbrella to develop an integrative and comprehensive approach to innovation, one that successfully navigates Portland's unique commission form of government[i].

INITIAL SMART CITIES EFFORTS

PRE US DOT SMART CITY CHALLENGE

Beginning in 2014, a small group of City staff, Portland State University (PSU) faculty and researchers, staff from the Technology Association of Oregon (TAO), and representatives from the private sector began meeting to identify potential efforts that fell under the Smart Cities umbrella. These project ideas were rooted in how data and technology could be used to improve quality of life.

This initial Portland Smart Cities working group was made up of City representatives with expertise in transportation, planning and sustainability, TAO and other private sector representatives specializing in regional technology businesses and transportation infrastructure, and PSU researchers from computer science, urban planning, environmental science and transportation engineering. Opportunities to join several emerging national Smart Cities initiatives were seized. Portland formed a team to work on a Smart City technology project, referred to as Action Clusters in the Global Cities Team Challenge (GCTC) program led by the National Institute of Standards and Technology (NIST) and the non-profit US Ignite. PSU and the City of Portland were also founding members of the MetroLab Network, a group of city/university partnerships around technology and data. These initiatives were key to helping Portland build our understanding of Smart Cities, develop initial project ideas, connect to other cities and communities, and advance our vision for what Smart Cities means in our community. Portland's participation in these national programs continues today.

UB MOBILE PDX

Then in December 2015 the US Department of Transportation (US DOT) Smart City Challenge was announced. It invited proposals from mid-sized cities in a winner-takes-all competition, with the winner getting a $50 million grant to implement a smart transportation system. Emails flew, meetings and phone calls were scheduled, webinars watched, and a team was assembled to craft a pre-proposal in two months' time. The effort was led by the Portland Bureau of Transportation (PBOT). The City of Portland, like other cities, was able to base

---

i   The commission form of government in the City of Portland means that its members have legislative, administrative, and quasi-judicial powers which differs from most other municipal governments among large cities in the United States. The City has six elected officials comprised of the Mayor, four Commissioners, and the Auditor. The City Council is made up of the Mayor and the Commissioners who also serve as administrators of City departments. See this article for more details: https://www.portlandoregon.gov/auditor/article/9178

its proposal on existing long-term and short-term plans for our transportation vision, plans that were rooted in many months of community engagement. Because the City was participating in several Smart Cities groups and national networks, we also had a list of potential pilot ideas and partnerships that had been discussed, ideas that were in search of funding. These were projects that we knew we could run with.

Becoming a finalist US DOT Smart City Challenge was announced in an exciting fashion in March 2016, with Portland's Mayor attending the South by Southwest conference in Austin with the other finalist Mayors and US DOT leaders. We thought there would only be five other cities to compete with, but the pool was increased to seven because of the quality of the proposals and the difficulty in narrowing it down further. With funding to dedicate to the full proposal and exciting partnerships to explore, the challenge began. The next four months were full of writing, draft deadlines, vendor meetings, teleconferences, searches for matching funds, and ensuring time for community and stakeholder engagement.

Our "UB Mobile PDX" proposal ultimately focused on increasing access to transportation choices and connecting mobility and infrastructure investments across the City, therefore bringing better, cheaper and more accessible mobility options to our underserved communities. A key objective was to connect the close-in "Portlandia" neighborhoods with East Portland, an area home to some of Portland's most diverse and economically-vulnerable communities, which had not had the same level of attention and investment over the past several decades.
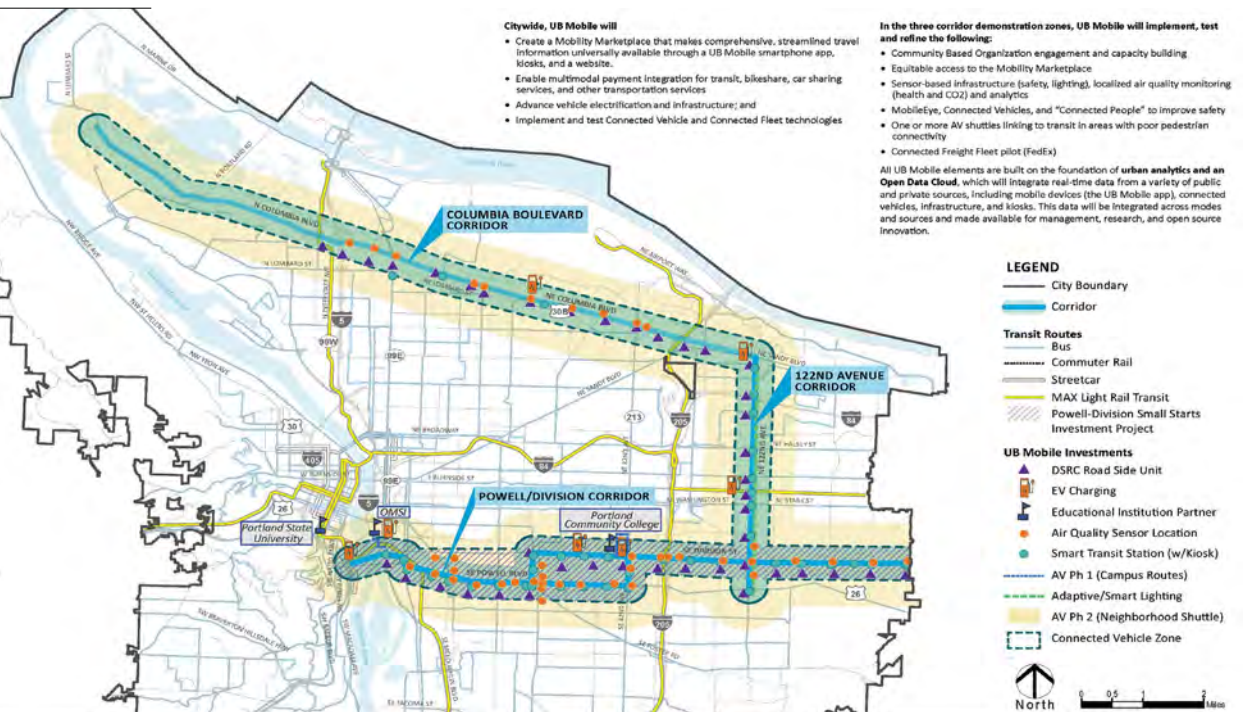

Figure 1: Annotated site map from the City of Portland's US DOT Smart City Challenge proposal, UB Mobile PDX, focused on increasing access to, connectivity, and equity in mobility across the City in three key corridors

UB Mobile PDX included both citywide components as well as the research and testing of Smart Cities technologies in three Portland corridors: Powell/Division in Southeast/East Portland, 122nd Avenue in East Portland, and Columbia Boulevard in North Portland (see Figure 1). The initiative is built on the foundation of a centralized data management and analytics structure, the "Open Data Cloud" (see Figure 2).

UB Mobile PDX

Citywide Elements
> Mobility Marketplace
> Multimodal Payment Integration
> Vehicle Electrification and Infrastructure
> Connected Fleets and Vehicles

Demonstration Corridors
> Community-based Organization Engagement
> Equitable Access to the Mobility Marketplace
> Sensor-based Infrastructure (Safety, Lighting, Air Quality)
> MobileEye, Connected Vehicles, and "Connected People" to Improve Safety
> One or more AV Shuttles Linking to Transit in Areas with Poor Pedestrian Connectivity
> Air Quality Monitoring (Health and CO2)
> Connected Freight Fleet Pilot (FedEx)

Open Data Cloud and Urban Analytics
All UB Mobile PDX elements are built on the foundation of urban analytics and an Open Data Cloud, which will integrate real-time data from a variety of public and private sources, including mobile devices (the UB Mobile PDX app), CVs, infrastructure, and kiosks. This data will be integrated across modes and sources and made available for use for management, research, and open source innovation.

Figure 2: Elements of the City of Portland's US DOT Smart City Challenge proposal, UB Mobile PDX

We headed into June 2016 with lots of excitement in the air and confidence in the UB Mobile PDX proposal. Then at the end of the month we learned that Columbus, Ohio was selected as the final city and US DOT Smart City Challenge winner. Columbus put together a fantastic presentation and innovative approach to their transportation and community health challenges. Our initial reaction of course included disappointment, but there was also a recognition of the great collaborations and coordination that had been built through the proposal process. The US DOT Challenge and UB Mobile PDX proposal built an incredible team that brought a variety of public agencies, universities, private-sector companies and community-based organizations together at the same table. We decided to dust ourselves off and build on this momentum.

POST US DOT SMART CITY CHALLENGE

The ending of the US DOT Smart City Challenge did not mean the end of moving forward with Smart City projects and plans at the City of Portland. The intensity and pace of meetings with potential project partners, vendors, and the pitches from various technology providers also did not wane. As we continued to evaluate projects over the next eight months, it became clear that we were in a reactive state, allowing vendors to lead the conversation. We needed to become proactive and coordinated to lead with our goals as a City. We needed to ensure that public benefits are the foundation for all of our Smart Cities efforts.

Additionally, there was some scratching of heads regarding how we could broaden our Smart Cities projects beyond transportation. We had an established strong pillar in transportation, but also recognized the potential for public benefits in emergency management, addressing the digital divide, improved community engagement and government performance evaluation. We also knew we needed to learn how these improved data management and smart technologies could be used to help improve access to housing and address issues for those that are houseless; one of our largest challenges and a challenge that many other cities are facing.
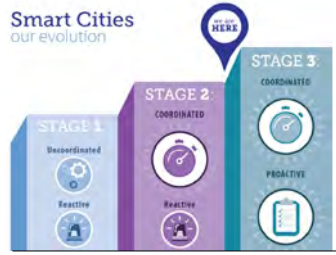
Figure 3: City of Portland's Smart Cities evolution as of June 2017

SHAPING OUR SMART CITIES PROGRAM

SMART CITIES GOVERNANCE STRUCTURE

To address the hurdles discussed above, the City of Portland designed and adopted a new Smart Cities governance structure, beginning with the formation of a Smart Cities Steering Committee (SCSC) (see Figure 4). The SCSC is led by the Bureau of Planning and Sustainability (BPS) on behalf of the Mayor's Office, and coordinated by BPS, PBOT, Bureau of Technology Services (BTS), and the Office for Community Technology (OCT). Formalizing a citywide structure around our Smart Cities work created mechanisms for improved internal and external collaboration, clarifies roles among City leadership and bureaus, and helps us to identify priority focus areas and goals. Coordination also allows us to better leverage resources between bureaus and projects and gain additional help to make projects or funding applications more successful.
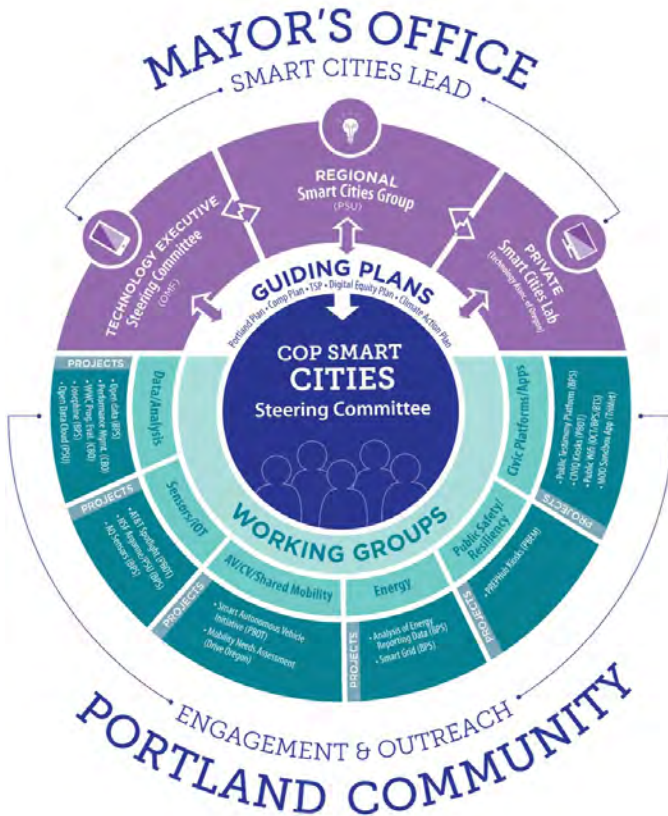
Figure 4: City of Portland's Smart Cities Governance Structure showing a formalized citywide structure for Smart Cities work with mechanisms for internal and external collaboration and identification of priority focus areas and goals

The design and adoption of this structure took several months of work and strategic development and culminated with the formal Resolution No. 37290 adopted by Portland City Council in June 2017. Working through the SCSC allows us to speak with one voice and make sure our central priorities of equity, resiliency, and affordability are evident in Portland's Smart Cities projects. In our upcoming fiscal year budget, we also have dedicated staffing in BPS for Smart Cities priorities which combined with this governance structure builds a foundation for a prudent, proactive and sustainable approach to Smart Cities opportunities.

REGIONAL ACTION PLAN

In parallvel to the City of Portland Smart Cities governance structure is an active Portland Regional Smart Cities Committee led by Portland State University. This committee is working to build a comprehensive, long-term vision for the entire region. The committee includes representatives from the City, Metro, TriMet, ODOT, Port of Portland, and non-profit mobility and community-focused organizations like Forth[ii] and OPAL[iii]. This group was able to capitalize on the momentum created in the US DOT Smart City Challenge to get organized and bring together funding to develop a Regional Smart Cities Action Plan to advance Smart Cities in the Portland Metro region.

The Regional Action Plan currently being drafted, incorporates interviews from all participating agencies, assesses existing regional projects and creates guiding principles and criteria for evaluating the desirability and feasibility of future projects. The plan will include three 2-year actions based on identified early wins, current resources available, and an assessment of most urgent needs in the Portland region. Expected outcomes also include the creation of a foundation for the expansion of Smart Cities initiatives to benefit needs beyond mobility and transportation, an important issue identified by City of Portland. The Action Plan and regional group will work together on priority initiatives related to carbon-emissions reduction through transportation-related improvements and look at other sectors to address climate change and resiliency through data and technology.

OPEN DATA POLICY AND PROGRAM

In May 2017, Portland City Council enthusiastically adopted an Open Data Ordinance (No. 1883562) to establish an Open Data Policy and Open Data Program for the City of Portland. This action built upon earlier efforts from a 2009 Resolution (No. 367353), led by the City's Bureau of Technology Services (BTS), when Portland became the first city in the United States to declare its commitment to Open Data and to develop an Open Data portal, CivicApps[iv]. Establishing an Open Data Policy and Program is a critical step to support our Smart Cities efforts to create shared, standardized systems for collecting, managing, analyzing, and distributing data. Below are the five summary goals for City of Portland's Open Data Policy and Program:

1. Increase transparency and improve public trust;
2. Build civic participation and engagement;

---

ii Forth is a non-profit organization with a mission to advance electric, smart, and shared transportation through innovation, demonstration projects, advocacy, and engagement.

iii OPAL Environmental Justice Oregon is a non-profit organization with a mission to build power for environmental justice and civil rights in communities. OPAL stands for Organizing People/Activating Leaders.

iv http://civicapps.org/

3. Improve access to data to inform and improve decision making;

4. Reduce staff time devoted to responding to requests for City data;

5. Grow the likelihood of data-driven innovations in the private sector that increase the social and commercial value of City assets and improve the delivery of City services.

Developing and passing the Open Data Ordinance was a collaborative partnership between BPS, the City Budget Office (CBO), and technical experts from the Center for Government Excellence at Johns Hopkins University and the Sunlight Foundation. These technical partners were a result of the City's partnership with Bloomberg Philanthropies' What Works Cities (WWC) initiative[v]. Over the next year, the City of Portland will continue to work in these collaborative partnerships to coordinate a data governance committee across all bureaus and build the implementation plan for a data governance system and Open Data Policy.

ATTACHMENTS AND USE OF CITY-OWNED INFRASTRUCTURE IN THE RIGHT OF WAY

The number of applications for attachments to, and uses of, city-owned infrastructure in the public right of way (ROW) is growing rapidly with no slow-down in sight. For example, the deployment of autonomous and connected vehicle communication will necessitate the installation of new hardware along roadways. In addition, the City and community have a growing interest in distributed, connected sensors for higher density, real-time measurements of infrastructure utilization and environmental variables to help aid data driven decision making. These devices – plus the ones individuals carry around in their pockets or use in their vehicles – largely communicate through the same cellular, wireless networks. To support this growing usage and increase cellular network capacity beyond what can be supplied by traditional cell towers, mobile carriers need to deploy small cell sites[vi] in high densities across urban areas.

A working group with representatives from PBOT, BPS, OCT, and the City Attorney's Office was assembled quickly in the spring of 2017 to develop a strategic framework for how to manage attachments and city-owned poles in the ROW. Opportunities, issues, and key considerations for the current technology applications were identified along with key steps for a policy review, physical systems review, and needs assessment. We also looked at similar efforts by other cities. This information was used to shape the development of protocols with specifications and requirements and to create an equitable strategic framework that can meet these fast-growing technology demands of public infrastructure while continuing to manage the right-of-way for the greatest public benefit.

SMART AUTONOMOUS VEHICLES INITIATIVE

Autonomous vehicles (AVs) is another example of a coming technology that requires a new look at city policies, so that cities can be participating partners in their deployment while also ensuring the technology applications meets the goals and vision informed by the public. AVs have the potential to bring positive impacts, such as more flexible transportation options that address some

---

v See "Finding Out What's Working in America and Beyond", Simone Brody, ISOCARP Review 12, pages 109 – 115, September 2013.

vi Note that the name "small cells" can be deceiving as it does not describe the size of the hardware that needs to be attached to poles, street lights, or signal lights, which can be significant. "Small" describes the shorter range of these stations.

of the issues related to unequal access to affordable transportation outside of Portland's inner core. But there is also a high risk for negative impacts if cities are not proactive in our response to AVs, such as increased vehicle miles travelled (VMT), worsening congestion, reduced transit ridership, and privatization of public transit.

REGIONAL AVERAGE OF 19%
ABOVE
BELOW
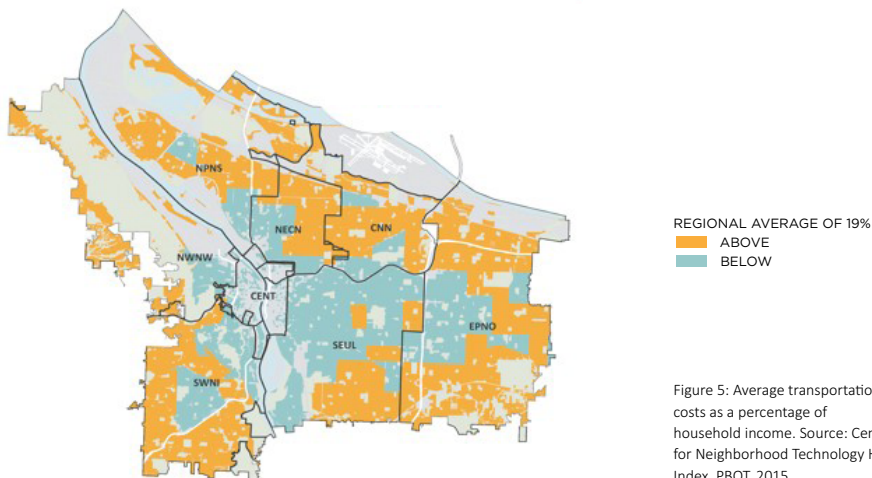
Figure 5: Average transportation costs as a percentage of household income. Source: Center for Neighborhood Technology H-T Index, PBOT, 2015

In April of 2017, the Portland Bureau of Transportation launched a Smart Autonomous Vehicles Initiative (SAVI) through City of Portland Resolution No. 372964. The purpose of SAVI is to develop best practices for the testing of AVs, and to create AV policies that spur innovation, advance the City's Vision Zero goals to eliminate traffics deaths by 2025, reduce congestion, significantly decrease CO_2 and other transportation pollutants, and make travel more affordable for Portland's low and moderate-income residents. The ultimate goal of SAVI is to maximize the public benefits of AVs to Portland residents and businesses, and to minimize the risks and potentially negative outcomes of this new technology.

There are three main components to SAVI. The first component is an adopted Autonomous Vehicle Policy. With SAVI, the City introduced the concept of "FAVES" – fleet-owned fully-autonomous vehicles that are electric and shared. Prioritizing FAVES will be the foundation of the City's draft policy. Tools such as congestion pricing and road use fees are also being considered as part of the AV policy.

The second component is a Request for Information (RFI) to gather information from AV and other technology providers regarding a potential pilot of AVs in the City of Portland. The pilot would be informed by and operate within the framework of our draft Autonomous Vehicle Policy.

The third component of SAVI is community outreach and engagement around AVs to identify where and what type of potential pilot systems would deliver the most benefits to the community. A goal from the outset is to focus on underserved communities in Portland and to use AVs to address to the issue of mobility choice inequity, which has resulted from a focus on the private vehicle as the primary means of transportation. AVs are likely to be a disruptive technology that could give cities the opportunity to correct past mistakes, to move away from privately-owned, single-occupancy vehicles, and

to develop a system of mobility that better meets the needs of all Portlanders, including the most vulnerable. The City of Portland seeks to fully engage our community in shaping the next generation of our transportation system.

Portland recognizes that AVs alone are not a Smart City technology. It is the opportunity that AVs present for cities to change and improve our transportation systems and to better meet the mobility needs of our residents – to help us meet our transportation, land use, equity and other city goals – that makes AVs a Smart Cities technology. The critical need is for proactive policies to steer this coming technology to address our City goals and the needs of our residents.

LIVING LABORATORY

The City of Portland is currently developing a portfolio of projects with diverse partners to pilot new technology applications and Internet of Things (IoT) systems. To truly create a living laboratory, we will need to create understanding and trust with the public to enable some technologies to be tested out through responsible pilots. The overall goal of these projects is to improve the available data for informed decision making by City engineers, planners, and the public. The uses for such collected data are currently focused on informing traffic safety, improving emergency management and communication, enabling assessments of public health and equity, advancing Portland's Climate Action Plan goals, and creating economic and civic engagement opportunities.

OPEN DATA CLOUD

Using new data sets from distributed sensors to meet City goals will require

Figure 6: The pillars of data management, documented and standardized data access, and urban analytics for the City of Portland and Portland State University Open Data Cloud and Analytics Pilot

efficient data integration, analysis, and improved management. A collaboration between the Bureau of Planning and Sustainability and Portland State University has produced the concept of an "Open Data Cloud", which recently received funding for an initial pilot.

The Open Data Cloud Pilot project will collect, store, and integrate Smart Cities related data from a variety of sources including new sensor deployments, autonomous and connected vehicle pilots, and existing City internal
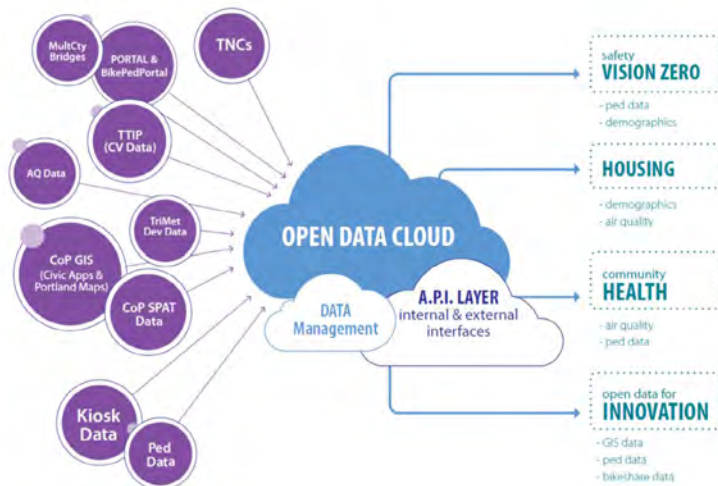
Figure 7: Conceptual Open Data Cloud architecture

data sets and regional data sources. The integrated data platform will provide standardized access to these data sources for public sector agencies and local innovators, while respecting privacy and security needs and developing data user agreements. A key step in this process is documentation of the metadata for each data set including quality control/quality assurance methods, any other data cleaning methods, other notes about aggregation, etc. The documentation step combined with standardized access is key to helping make the data useable by a variety of end users. Additionally, the pilot will focus on developing data standards and an automated data integration process.

ROADWAY URBAN INSTRUMENTATION

Two urban instrumentation projects will begin deployment in the next 6 months. The first is a multi-vendor, low-cost, climate and air quality sensor pilot funded by a Replicable Smart Cities Technologies Cooperative (RSCT) grant from the National Institute of Standards and Technology (NIST). This project will deploy 9 sensors total: 3 Argonne National Laboratory/University of Chicago Array of Things nodes; 3 SenSevere RAMP devices; and, 3 Apis SensorCell nodes. Each device will take 5-minute mean measurements of carbon monoxide (CO), nitric oxide (NO), nitrogen dioxide (NO_2), and ozone (O_3) gas concentrations, temperature, and relative humidity. The RAMP devices will also measure carbon dioxide (CO_2) and the Array of Things nodes will also measure particulate matter with diameters < 2.5µm ($PM_{2.5}$).

Figure 8: Images of the three climate and air quality sensor devices to be deployed in the City of Portland. From left to right, Argonne National Laboratory/ University of Chicago's Array of Things node, Apis SensorCell node, SenSevere RAMP device

The air quality devices will be deployed in three phases beginning with a laboratory deployment at PSU to compare the sensor measurements with known concentrations of pollutants. Next, the devices will be deployed at the Oregon's Department of Environmental Quality (DEQ) urban background monitoring site to co-locate the sensors with each other, and with reference instruments used for regulatory purposes, to assess their accuracy. During the final deployment, the validated sensors will be placed on the roadway at three different signalized intersections where one sensor device from each vendor will be deployed (3 unique sensors per intersection) and co-located with City operated Curbside Labs for Emissions and Atmospheric Research (CLEAR) cabinets for two of the intersections. The CLEAR cabinets house some reference air quality instruments in repurposed traffic signal cabinets with special air sampling inlets and reference meteorological instruments deployed to the traffic signal pole and mast. This sensor project also involves the development of sensor recycling guidelines with the Green Electronics Council (GEC). We are working to draft guidelines for how to improve the ability to recycle IoT electronics, minimize electronics waste and maximize the ability to repurpose

Figure 9: The City of Portland Curbside Lab for Emissions and Atmospheric Research cabinet on the right at the intersection of SE 122nd Ave and SE Division St. The traffic signal cabinet operating the signals and decorated with community art is on the left

Figure 10: The traffic signal pole and mast arm equipped with a 3D sonic anemometer for wind speed and direction, temperature and relative humidity probe, and cameras and radar for traffic counts on the SW corner of the intersection of SE 122nd Ave and SE Division St.

—

or upgrade electronics through city and community procurement guidelines.

The second potential sensor deployment, coming online over the next year, is a pilot collaboration with AT&T, GE, and Intel to install approximately 200 CityIQ Nodes on street light fixtures along high crash corridors. This pilot will test computer vision algorithms in the nodes to collect pedestrian counts and direction as well as traffic counts, speed, direction, and lane use. Pedestrian counts are rarely collected in real-time or across the length of major corridors. Such data have been identified by planners, engineers, and researchers as key to addressing both the City of Portland's Vision Zero traffic safety goals and to identify locations of where pedestrian infrastructure investments are needed. This project will also rely on collaborations with PSU and cross-bureau partnerships between PBOT and BPS to help design node orientations and deployment setups, validate data collected, manage data collected and develop methods to aggregate and query data across the corridors. Research partnerships will allow for further use case exploration, such as building pedestrian activity models, so that we can potentially apply what we learn in this pilot to other non-instrumented intersections.

SMART RESILIENCY

BPS and the Portland Bureau of Emergency Management (PBEM) are also partnering with the Massachusetts Institute of Technology (MIT), Portland State University and Portland General Electric (PGE) to pilot an innovative kiosk-based infrastructure designed to increase disaster resilience. PREPHub, the name for this technology, was developed by the Urban Risk Lab at MIT as part of an ongoing research project exploring ways to integrate disaster preparedness and response technologies into public infrastructure to facilitate community resilience. PREPHubs, which are able to operate without power for several days during and after a disaster, are strategically placed in visible, public gathering spaces, and will include free public WiFi. Because of their locations they both serve a function during a disaster and act as a reminder for the Portland community to build preparedness into their everyday lives. PREPHubs are designed to engage the community during normal times, so residents are familiar with the PREPHub and its location if there is a disaster.

Figure 11: An example of the PREPHub disaster resiliency kiosk

This pilot project will deploy PREPHubs in several designated post-disaster gathering sites[vii] that exist in Portland. Community engagement is core to the PREPHub project, so various Portland communities will be involved with the development and design of the pilot units, including what functionality and information is provided. PREPHub is still a research project, so we are helping develop and pilot the prototypes.

WHERE TO NEXT

Smart Cities projects provide a framework to help the City of Portland implement technology and data-related projects on our continued pathway to enhance Portland's livability and be a sustainable, equitable, and resilient City. Organizing and managing our data is key to looking at the city as an integrated system as well as being transparent. Comprehensive, coordinated policies and projects will be necessary to meet our goals to provide public benefits and leverage resources efficiently. Data analysis and analytics will help us continually evaluate our policies and projects to help us make better decisions and thus maximize public benefits.

Broadening the scope of Smart City projects beyond transportation is an important need identified by the City and region. The collaborative smart cities governance structure will be key in coordinating new projects and conducting a use case inventory across all City Bureaus. Access to affordable housing, emergency management infrastructure and communications, energy efficiency, and green infrastructure are future Smart City project topic areas identified from initial meetings. For any type of project, improved community engagement such as using online tools or technology in the roadway to submit public feedback or learn about City services is an important direction as we move forward. Bridging the digital divide with increased access to technology is also another target area we hope to transform with future Smart Cities projects.

Taking the time to assess the achievements and the challenges related to our recent Smart Cities efforts allowed us to re-focus and formalize a centralized approach that is applicable for Portland. Sharing with our community and making sure Portland's Smart Cities project are understandable by our public and incorporating feedback are essential next steps as we move forward and aim for our planned trajectories on City goals around digital equity, improved mobility, greater affordability, sustainability, community health and safety, workforce development and resiliency.

—

vii   A post-disaster gathering place, also called BEECN sites, are designated locations in Portland to go to after a major earthquake to seek emergency assistance and report severe damage or injuries if phone services are down. BEECN sites will be staffed with pre-designated City employees, Neighborhood Emergency Team (NET) members or other volunteers trained to operate emergency radio equipment and provide information on food, water, shelter and other supplies. To learn more about the BEECN program run by the Portland Bureau of Emergency Management, see: https://www.portlandoregon.gov/pbem/59630?

References

City of Portland 2017 Smart Cities Steering Committee & Citywide governance structure Resolution No. 37290, June 7, 2017 Portland City Council https://www.portlandoregon.gov/auditor/56674

City of Portland 2017 Open Data Policy and Program Ordinance No. 188356 https://www.portlandoregon.gov/cbo/article/636448?

City of Portland 2009 Open Data Resolution No. 36735 https://www.portlandonline.com/shared/cfm/image.cfm?id=275696

City of Portland 2017 Smart Autonomous Vehicle Initiative Resolution No. 37296, June 14, 2017 Portland City Council https://www.portlandoregon.gov/auditor/56674

MAKING SMALL CITIES SMART IN SOUTH AFRICA

Verna Nel, Darren Nel, Stephanus Minnie

INTRODUCTION

The concept of a 'smart city' has several definitions. Some authors emphasise the human component, where a smart city contains highly qualified and innovative people who can develop new ideas, products and services and thus promote economic growth (Shapiro, 2006). For others, it means that social inclusion and participatory governance are very important (Albino et al., 2015; Goodspeed, 2014; Söderström 2014). Finally, the more widely held definition associates a city's smartness with the use of information and communications technology (ICT) to improve governance – including planning functions – and thereby improving the quality of life for its citizens. Other versions of this high-tech definition include human capital, such as people who can develop or exploit information and technology to the benefit of the urban economy.

Where smart technologies are adopted they range widely and include various sensors and feedback systems linked to services such as water and electricity, various modes of public transport, and public safety. Some people, including the ICT industry, see the urban fabric of future cities embedded with these technologies and communicating through Internet of Things (IoT) linkages to homes and smart phones (Angelidou, 2014; Kitchin, 2014; Harrison and Donnelly, 2011; Lazaroiu and Roscia 2012). This perspective focuses on technology enabling people to improve their quality of life and supporting city governments to provide more efficient, effective, and economical services.

Harrison and Donnelly (2011) suggest that a smart city comprises several layers such as the natural environment, infrastructure, resources, services, and social systems. We might best see smart technologies and systems as methods to address the issues within these layers by using: a data layer that contains the

information produced and used in the area, an infrastructure layer containing physical and information systems to manage it, an e-services layer (offered by government and business), and a user layer that includes relationships with stakeholders and citizens (Anthropoulos and Vakali, 2012). Since planning addresses all of a city's layers, planners need modern tools to facilitate their work in light of the ICT revolution.

Smart cities also use a variety of emerging specialized software programs to support specific planning tasks, of which geographic information systems (GIS) are perhaps the best known. In this article, we refer to such specialized programs as Planning Support Systems (PSS). PSS applications include software that can improve analysis and support decision-making and include hardware, such as high speed computers capable of rapid data processing, or touch screens in the form of a 'map table', that can spatially represent information in a user-friendly manner (Pelzer et al., 2014).

However, to become smart, cities must acquire technology and secure the skilled labor to install, maintain and use it. Further, their citizens need to be able to access information, planning and services through smart phones and computers.

Cities in developed countries often have the resources to invest in technology and people, thus moving towards greater 'smartness'. In Africa, only the most developed parts of the largest cities can dream of being smart, while most smaller cities and towns lack the financial and technological capacity, and their residents the access to the internet to invest in smart systems. What happens, however, when a place does not meet these smart perquisites? Can it still be smart? Can it use smart planning technology?

We argue that there are opportunities for smaller cities and towns to use technology in planning processes, and in this way, earn the epithet of 'smart planning' cities and towns. In the following sections, we describe tools available to cities and towns to improve their service delivery, their relationships with stakeholders and hence, the quality of life for their citizens. We also describe the context of South African towns and the nature of the challenges that they face in adopting smart city technologies.

CONTEXT: SOUTH AFRICA'S CITIES AND TOWNS

It is essential to understand the context in which planning is taking place to appreciate the challenges and potential for the application of smart technologies and systems, including planning support systems (Biermann, 2011). This section describes some key features of the municipal planning milieu in smaller cities and towns in South Africa to provide a foundation for the discussion on smart city opportunities in later sections.

South Africa has three dominant city regions centred on growing metropolitan municipalities such as Johannesburg, Ekurhuleni and Tshwane (Gauteng), Cape Town, eThekwini (Van Huyssteen et al, 2009). Although there are other municipalities (such as Nelson Mandela Bay, Buffalo City or Mangaung) with a metropolitan status, they are smaller with less diverse economies. These cities, along with secondary cities such as Polokwane, Rustenburg, and Kimberly play an important function in their regions (Turok and Borel-Saladin, 2014; Marais, 2014; Marais and Cloete, 2016). Furthermore, there are several large towns with important service functions (Harrison, 2014).

Figure 2: Bloemfontein- an intermediate city.
Photo by Emmy van Dyk

While the metropolitan regions have generally outperformed the rest of the country in terms of population and economic growth, most intermediate cities have performed poorly in comparison to the metropolitan regions (metros). Measured in terms of both economic output (GVA) and employment, they have shown slow growth, accounting for only 10% of all new employment growth between from 1996 to 2012 (Turok and Borel-Saladin, 2013). While the metros have the most diversified economies, the intermediate cities and rural areas are far more dependent on one or two sectors (Marais, 2014, Marais and Cloete, 2016), and increasingly, this is the community services sector that is funded by taxes (Turok and Borel-Saladin, 2013). Notwithstanding high levels of poverty and unemployment within the city regions, their average household incomes and employment opportunities are higher than the remainder of the country (Harrison, 2014).

Despite their differing fiscal capacities, all South African municipalities have the constitutional responsibility to provide inclusive, democratic, and account-able government that promotes social and economic development as well as a healthy, safe environment. Other functions derived from the constitution are access to housing and the provision of basic services. The primary plan-ning instrument to achieve these goals is the integrated development plan, a five-year strategic plan to guide all municipal activities and spending. that includes a spatial development framework (South Africa, 2000). These plans also form part of the municipal spatial planning system and along with a land use management component (South Africa, 2013) form the core of municipal planners' functions.

The Fiscal and Finance Commission (FFC, 2013; 2016) has expressed concern over the financial viability of less urban municipalities that have a limited econ-omy and hence, tax base and municipal revenue, but must still provide a suite of social services and infrastructure to their residents. With lower revenues, these non-metropolitan municipalities generally have less capacity, with fewer qualified technical staff such as engineers and planners (Municipal Demarcation Board, 2012). Limited revenues also preclude the use of expensive planning and infrastructure technology. Such problems are not restricted to small towns, but are evident in intermediate cities as well (Campbell et al., 2016).

In the context of resource constraints and limited capacity, smaller munici-palities, cities, and towns are unable to invest in the high technology ICT servi-

ces associated with smart cities. However, there are options available to them, especially around planning support services, that can contribute to becoming 'smart planning' cities.

SMART PLANNING SUPPORT SYSTEMS

This section discusses several options for PPS that have low financial and human resource requirements and may be more suitable for cities of the Global South than the elaborate systems proposed for wealthy cities in developed countries[i]. Thus, complex data gathering and sensing applications, intricate urban simulations and models that require expertise seldom available in small cities, have been ignored. Rather, we discuss simpler systems, designed to work with and enhance existing local capacity. Several of the systems are already operational, while some are options that could be considered. The discussion considers solutions which are applied to three key components of planning work: spatial planning; land use management; and, collaborative development. We looked at applications that are supported by government, provided by the private sector or locally initiated by the city or used by its planners.

PSS ENABLED BY GOVERNMENT

The National Department of Rural Development and Land Reform (DRDLR) in the Free State and Northern Cape provinces of South Africa, has led the way in providing PSS to assist municipalities who have limited resources in the province.

SPATIAL PLANNING INFORMATION SYSTEM (SPISYS)

One of the first initiatives was the **Spatial Planning Information System** (**SPISYS**), that serves several functions. Firstly, the DRDLR initiated a process to provide access to as much planning relevant data from other government departments as possible. Although the source departments retain ownership and responsibility for the data and access to sensitive information is limited, the open component of the data was made available to persons who register on the website. Secondly, this data is also made available to municipalities, or planning consultants, for the purposes of spatial planning. This reduces the time needed to source base-line information for planning purposes. In return for access to the data, the planners who have prepared the spatial plan must provide the DRDLR and municipality with the data and information that they have acquired or generated, so that the DRDLR data base can be enhanced. This system has worked so well, that the DRDLR is now developing these concepts into a much more extensive system for the entire country. The extended system will be called The National Spatial Planning Data Repository (NSPDR) Ecosystem.

The following key objectives were presented at the Geomatics Indaba 2016 for the NSPDR project include:
· Promote integrated planning by creating a system for real-time sharing of spatial information
· Remove subjectivity from the planning function, and move towards an evidence-based approach
· Develop approach for content search and discovery
· Record land development initiatives

(http://www.ee.co.za/wp-content/uploads/2016/09/Mfanafuthi-Gama-and-Paul-Strydom.pdf)

---

i   For example see Harrison and Donnelly, 2011; Söderström 2014; Happich, 2016

Not only does the SPISYS concept provide planning support, it can also be used by the private sector and individuals. This system could thus promote inclusionary governance, and be used to improve municipal governance: important components of a smart city (Albino et al., 2015; Goodspeed, 2014; Söderström 2014).

Figure 3: SPISYS website.
Source: http://www.spisys.co.za

E-LODGEMENT

A second initiative by the Free State office of the DRDLR is the **e-Lodgement** process, developed to guide municipalities and consultants through the process of submitting and approving development applications. This is an on-line **application processing system** and is linked to the municipal by-laws, (particularly those municipalities in the Free State province which require the electronic lodging of applications).

This system step-by-step process guides the submission of applications, from the documents that are required, to the relevant departments that must provide comments on the application. Similar support is provided to municipalities: each step in clearly indicated and unless a step is completed, the following action is blocked. The broad process has two stages, namely, *Pre-Lodgement* and *Lodgement* for applicants. The stages that are the responsibility of the municipal planning and administration function are: *Administration; Assessment; Municipal Planning Tribunal Management; and, Appeals Authority*. Finally, to comply with the legislation, a Monitoring module has been included that allows all information required for Provincial and National monitoring to be gathered from the electronic submission forms, to ensure support is give at a focused level, where and when it is needed. This system is easy to use, and facilitates rapid processing of applications and decision-making (A Kotze: personal communication, February 2017). It avoids the situation that has existed in the province where applications – worth millions in potential investments – lie unattended due to the lack of capacity (staff and knowledge) in municipal offices (L van Biljon: personal communication, July 2016).

Figure 4: SPISYS- E-Lodgement screen.
Source: http://www.spisys.co.za

These systems, developed and made available by government, enable small cities and towns to access smart planning support systems, at little to no cost to them, yet with the same functionality as far more costly systems used by large city governments.

PRIVATE SECTOR SERVICES

Planners in small towns in rural municipalities often struggle with spatial planning as they frequently do not have access to sophisticated geo-intelligence software, the skills to use the software, or the relevant spatial data. As a result, any mapping or spatial analysis required by a planner or decision maker needs to be sent to the GIS department (if they have one) or must be outsourced to a private consultant. This adds time constraints on the planning process and increases the its cost. Additionally, the spatial planner is deprived of the ability to do spatial analysis.

Recognising the lack of resources – human and financial – in many municipalities, towns and small cities, the private sector has also developed products and services provide smart PSS. One such company is MapAble®.

Figure 5: MapAble website.
Source: http://www.mapable.co.za

MapAble® is a web-based geo-intelligence system that aims to bridge the three main gaps, namely, access to software, the skills to use the software and lack of data. MapAble® does it in such a way that the entry skill and costs barriers are low enough to allow non-GIS professionals the benefit of spatial analysis and map visualization. In addition, MapAble® can create dynamic reports for profiling any area of the planner's choice. MapAble® enables smart planning by facilitating collaboration within teams (including GIS professionals, partners, and clients) through shared web-based workspaces. In other words, collaborators can work together on the same project from their respective offices or homes.

MapAble® responds to the general lack of easily available data, which that can significantly hamper fact-based planning endeavours. This is specifically relevant to small towns and cities where data is often lacking, incomplete or not centralised. MapAble® provides users access to its information catalogue which currently comes pre-packaged with roughly 1,300 national (South African) layers that are already visualised and ready to use.
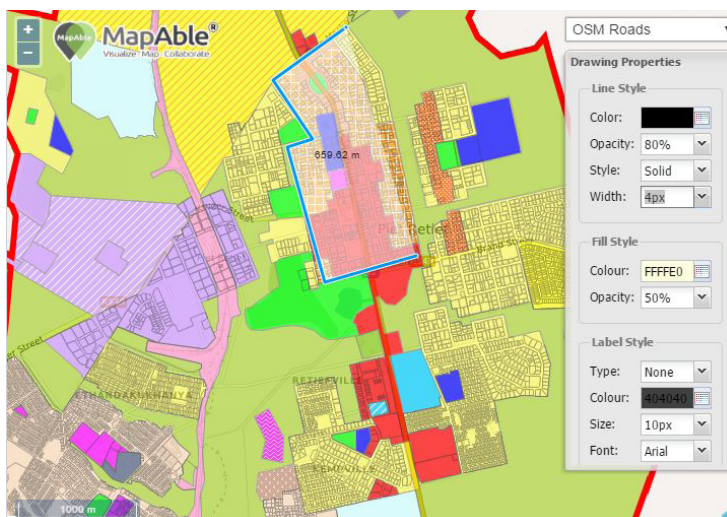
Figure 6: Mapable drawing tool- Makhondo SDF.
Source: Mapable ™
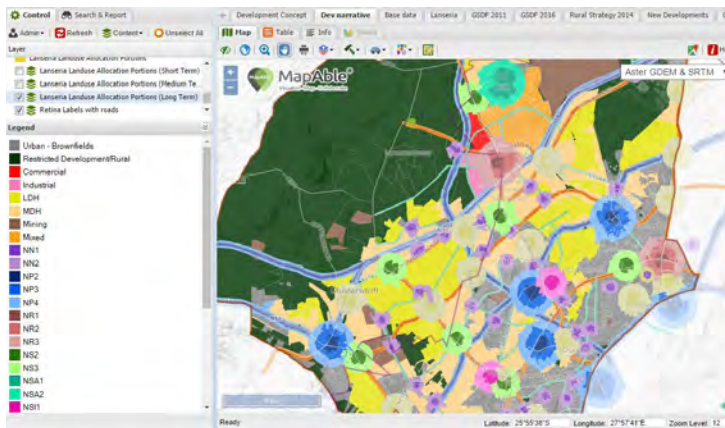
Figure 7: Mapable - Land allocation: Lanseria are, Johanesburg. Source MapAble ™

MUNICIPAL, INDIVIDUAL PLANNER'S OR COMMUNITY INITIATIVES

In addition to support systems provided by government, or services provided by the private sector, there are initiatives that planners themselves can consider including less costly forms of GIS, the use of mobile and smart phones and crowd-sourcing of ideas.

Although most **GIS applications** – required for spatial analysis and planning - are relatively expensive and require expertise to operate, there are alternatives, such as *Quantum GIS* (QGIS) that is free and thus affordable for a cash-strapped municipality. More powerful than MapAble, QGIS is a freeware application which support JOIN, UNION, and other analytical mapping functions. However, it does not come with data, and it requires a sophisticated user. Similar mapping programs are available for use on a smartphone. For example, Lau (2012) notes that an *ArcGIS* app permits access to access maps and edit GIS data. In addition, there are Smartphone apps to assist planners with daily tasks rather than being pure spatial or urban plan development applications. Lau (2012) and Evans-Cowley (2017) list the best planning Applications (apps) for 2012 and 2017.

Many smart city apps include options for residents to **report** 'environment-centric' problems, such as potholes in roads, defective streetlights, or water leak (Badger, 2011). Those citizens with smart phones can use them, with interfaces such as *Google Maps* or *Open Street Map,* to 'geo-tag' locations can also alert officials of needed transortation improvements, or to measure noise levels in a city (Kleinhans et al., 2015; Evans-Cowley, 2011). Ertiö (2015) and Evans-Cowley, (2011) mention other apps that have been developed for one-way communication and participatory sensing.

Mobile phones can be used with an application processing system to send text messages to applicants to keep them advised on the progress of a land development application or to request information (Evans-Cowley, 2011). If there is a database of all residents' contact numbers, then this can be used by the municipality to **inform residents** of applications in their vicinity, of development plans and proposals being considered and for other procedures of public participation. Such functions are possible with mobile phones using text messages, and do not necessarily require smart phones.

Ertiö confirms that actual planning apps (other than geo-information apps) are still rare (2015:316). Most apps support one-way information flows: some are for informing (municipality to citizens); and, others enable reporting (citizens to municipality), but few enable dialogue. Communities are increasing using mobile phones for business, livelihood strategies and social networks (Carlson, 2012). Chiumbu (2012: 194), points out that there is an emerging mobile phone culture in Africa, where a mobile phone enables multiple activities, including community activism.

However, **participatory planning** is one area where the potential use of mobile and smartphones has been stressed in the literature (Ertiö, 2015; Angelidou, 2015: S8; Kleinhans et al., 2015). Instead of one-way communication, these apps "bring opposing views together, aiming for a convergence" of opinions or proposals, and contribute to collaborative planning (Seltzer and Mahmoudi, 2012: 5). Kleinhans et al., confirm that social media and networking tools are increasingly being used to foster dialogue and co-production of ideas, and reaching the "expertise of quieter voices" (2015: 241).

Crowdsourcing is defined as finding answers from people affiliated through the internet; collective intelligence; "an open innovation mechanism based on and enabled by information and communication technologies" (Seltzer and Mahmoudi, 2012: 7); and, "an online, distributed problem-solving and production model" (Brabham, 2012: 308). It can be used as a tool to stimulate a cooperative, and simultaneously competitive, approach to participatory planning. It is based on the premise that a non-expert in a field may have a better insight into a problem and thus be better able to solve it than someone in the field who may be encumbered with pre-conceived ideas. For this approach to work, several components need to be in place. Existing on-line platforms need to be improved and all platforms need to be visually attractive and user-friendly (Brabham, 2012). There must be a clear definition of the problems, along with strong feedback mechanisms, including clear guidelines on how citizen input is evaluated and contributes to solutions (Ertiö, 2015: 316). In addition to clearly defining the problems, Selzer and Mahmoudi (2012) point out that the problem-solvers should be able to work independently of each other, allowing a measure competition. Furthermore, public acknowledgement of contributions is important. Care must be taken to avoid manipulation of the process in favour of a few (Brabham, 2012).

The common feature of all the smart planning approaches discussed in this paper is that they require access to some form of computer, be it a smart phone, or a more conventional workstation, both with access to the Internet. Mobile phones are becoming ubiquitous in South Africa: only some four percent of households do not have access to a mobile phone, and most of those these households are in the rural areas where access can be restricted by the lack of signal or connectivity.

Although a large segment of the population has access to a mobile phone, access to the Internet is more limited. Only one quarter of the population and just under half of all urban residents, enjoy access to the Internet through a mobile phone, while less than half of all South African households have access to the Internet through any channel (Stats SA, 2015). Without internet access, the seamless connection to the rest of the world is denied, leading to 'stuckness' in places of deprivation for many South Africans (Schoon and Strelitz, 2014). Access to the internet in cities and town is generally determined more

by cost – of both the mobile data and the handset – than availability of the signal. South Africa has one of the highest average prices for data (van Zyl, 2016). Handsets (smart phones) are also expensive, and often affordable only when linked to a 2-year contract. This places smart phones out of reach for the poor.

This lack of access to the internet limits many of the typical smart city mobile (smart) phone applications used in metropolitan cities (e.g. see Albino et al, 2015). Crucially, it also means that most integrated smart phone apps, (for example, see Kitchen, 2014; Albini et al, 2015: 17; Evans-Cowley, 2011), are inappropriate for most South African cities. A further important implication is that at least half the households in a non-metropolitan municipality do not have access to social media sites, again limiting their use for planning related communication in smaller cities (Chiumbu, 2012; Schoon and Strelitz, 2014). Thus, while social media and sophisticated smartphone apps could be used for community information and participation, they could be considered exclusionary and discriminatory in the South African context, as their use will overlook the greater proportion of the community – usually the poorest with the least voice – thus exacerbating the existing digital divide and other deep rooted inequalities (Ertiö, 2015; Angelidou, 2014). At best their use should be combined with other forms of participation and media that are not dependent on internet connectivity.

POTENTIAL FOR SMALL SMART CITIES IN SOUTH AFRICA

Although it is unlikely that the non-metropolitan cities of South Africa will be able to adopt many of the smart city technologies that require major investments in ICT and sensing infrastructure, there are affordable technologies that an enable them to earn the epithet "smart city". Certain of these technologies can be enabled by government, such as SPISYS, National Spatial Planning Data Repository, and the eLodgement systems developed by the Free State office of DRDLR. Access to data and technology, such as that offered by Mapable®, can be sourced at a reasonable cost from private companies. Others are linked to smartphone technologies and apps, available to planners and those fortunate enough to have a smartphone with internet access.

Nonetheless, with the growth, and penetration of mobile phones in South Africa, the situation mentioned above may change, particularly in urban areas. A recent report by Marketline (2016) indicates that over 70% of all mobile phones sold in South Africa are smartphones. Carlson (2012) confirms the growing penetration of smartphones for internet access among lower income communities.

Access to the Internet is key in unlocking the potential of smartphones to enable a smart city. This implies that for a smaller city to become smart, it must facilitate universal Internet access, that includes affordable, preferably free, access for its poorer citizens. Some cities, such as Tshwane and Stellenbosch are already providing internet access, while the Western Cape Provincial Government is also rolling out free Wi-Fi (Projectisizwe.org: online; IT News Africa, 2014).

Figure 8: Researchers see potential in mining social media data for better urban planning.
Source: Keystone Crossroads [ii]

While affordable smartphones may be a few years away, Moore's rule-of-thumb, that computing power will double every two years while the price decreases (Sneed, 2016), may soon be realised in cheaper smartphones. Nevertheless, alternative internet access points should be available at public libraries and government offices and related sites for the community.

Finally, planners and leaders of smart small cities should be encouraging app developers – through crowdsourcing or other means – to create a new generation of apps that will enable the smarter city. These can relate to infra-structure, governance, the natural environment and community, or planning support systems. Applications that support and enhance community participa-tion and collaborative governance are among the most important in creating a smart city of any size.

Smartphones also hold a promise for improved geo-data gathering for plan-ning purposes. Applications for planning, and particularly participatory plan-ning are an area of opportunity for application developers. As Evans-Cowley states, "if a planner can dream it up, then it may be possible" (2011: 6).

—

References

Albino, V., Berardi, U., and Dangelico, R. M. 2015. Smart cities: Definitions, dimensions, performance, and initiatives. Journal of Urban Technology, 22(1), 3-21.

Angelidou, M. 2014. Smart city policies: A spatial approach. Cities, 41, S3-S11.

Angelidou, M. 2015. Smart cities: A conjuncture of four forces. Cities, 47, 95-106.

Badger, E. 2011. Urban Planning in the IPhone age. CityLab, 2 November 2011, http://www.citylab.com/tech/2011/11/iphone-apps-urban-planners/413/ [Accessed 8 March 2017]

Biermann, S. 2011. Planning Support Systems in a Multi-Dualistic Spatial Planning Context, Journal of Urban Technology, 18:4, 5-37, DOI: 10.1080/10630732.2011.648432

Campbell, MM, Nel, V and Mphambukeli, T. 2016. Emalahleni: Dirty but keeping South Africa's lights on; in Marias, L, Nel, E. and Donaldson, R. Beyond the great and mighty, reflections on secondary cities in South Africa. Routledge

Carlson, A., 2012. Social capital and the use of ICTs by small-scale entrepreneurs in Soweto, South Africa. Digiworld Economic Journal, no. 86, 2nd Quarter. p. 85-102

Chiumbu, S., 2012. Exploring mobile phone practices in social movements in South Africa–the Western Cape Anti-Eviction Campaign. African Identities, 10(2), pp.193-206.

Ertiö, T-P. 2015. Participatory Apps for Urban Planning—Space for Improvement, Planning Practice and Research, 30:3, 303-321, DOI: 10.1080/02697459.2015.1052942

Evans-Cowley, J. S. 2011. There's an App for That: Mobile Applications for Urban Planning. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1951069 [10/3/2017]

Evans-Cowley, J. 2017. The best planning apps for 2017. Planetizen. 4 January 2017. https://www.planetizen.com/node/90507/best-planning-apps-2017 [8 March 2017]

Fiscal and Finance Commission (FFC). 2016. Submission for the 2017/18 Division of Revenue for an Equitable Sharing of National Revenue. Midrand: Fiscal and Finance Commission. http://www.ffc.co.za/2-uncategorised/144-2017-18-submission-for-the-division-of-revenue [Accessed 18 June 2015]

Fiscal and Finance Commission (FCC). 2013. Rural municipalities struggle to maximise their limited tax base- Current own revenues insufficient to support service delivery mandates in rural municipalities. http://www.ffc.co.za/index.php/docman-menu-item/policy-briefs-2013/157-2013-policy-brief-1-rural-municipalities-struggle-to-maximise-their-limited-tax-base [Accessed 18 June 2015]

Goodspeed, R. 2014. Smart cities: moving beyond urban cybernetics to tackle wicked problems. Cambridge Journal of Regions, Economy and Society, 8, 79–92. doi:10.1093/cjres/rsu013

Happich, J. 2016. Smartphones to accelerate urban planning. EETimes Europe. 30 August 2016. http://www.electronics-eetimes.com/news/smartphones-accelerate-urban-planning [Accessed 8 March 2017]

Harrison, C. and Donnelly, I.A., 2011, September. A theory of smart cities. In Proceedings of the 55th Annual Meeting of the ISSS-2011, Hull, UK, Vol. 55, No. 1.

Harrison, P. 2014. Regional and spatial development Background paper for 20 year review. RSA: The Presidency, Pretoria

IT News Africa. 2014. 10 African cities with free Wi-Fi. 22 April 2014 http://www.itnewsafrica.com/2014/04/10-african-centres-with-free-wi-fi/ [Accessed 10 March 2017]

Kitchin, R. 2014. Making sense of smart cities: addressing present shortcomings. Cambridge Journal of Regions, Economy and Society, rsu027.

Kleinhans, R., Van Ham, M. and Evans-Cowley, J., 2015. Social Media and Mobile Technologies to Foster Engagement and Self-Organization in Participatory Urban Planning and Neighbourhood Governance, Planning Practice and Research, 30:3, 237-247, DOI: 10.1080/02697459.2015.1051320

Lau, C. 2012. Smart Phones Can Make Smart Planners. California Planning and Development Report, 3 April 2012. http://www.cp-dr.com/articles/node-3164 [Accessed 8 March 2017]

MapAble®. 2017. What is MapAble®?. http://www.mapable.co.za/index.php/tour/what-is-mapable [14 March 2014]

Lazaroiu, G.C. and Roscia, M., 2012. Definition methodology for the smart cities model. Energy, 47(1), pp.326-332.

Marais, L. (ed). 2014. Outside the Core: Towards an understanding of intermediate cities in South Africa. Johannesburg, SACN

Marais, L. and Cloete, J. 2016. The role of secondary cities in managing urbanisation in South Africa, Development Southern Africa, DOI: 10.1080/0376835X.2016.1259993

Marketline. 2016. Mobile Phones in South Africa. London: Marketline.

Municipal Demarcation Board (MDB). 2012. State of municipal capacity assessment 2010/2011. www.demarcation.org.za/index.php/capacity-assessment

Pelzer, P., Geertman, S., van der Heijden, R. and Rouwette, E., 2014. The added value of planning support systems: A practitioner's perspective. Computers, Environment and Urban Systems, 48, pp.1

Projectisizwe.org. 2016. The time for free internet access in South Africa is now. 1 July 2016 http://www.projectisizwe.org/index.php/2016/07/01/the-time-for-free-internet-access-in-south-africa-is-now/ [accessed 8 March 2017]

Schoon, A. and Strelitz, L., 2014. (Im)mobile phones: "Stuckness" and mobile phones in a neighbourhood in a small town in South Africa. Communicare: Journal for Communication Sciences in Southern Africa, 33(2), pp.25-39.

Seltzer, E. and Mahmoudi, D., 2013. Citizen Participation, Open Innovation, and Crowdsourcing Challenges and Opportunities for Planning. Journal of Planning Literature, 28(1), pp.3-18.

Shapiro, J. M. 2006. Smart cities: quality of life, productivity, and the growth effects of human capital. The review of economics and statistics, 88(2), pp.324-335.

Sneed, A. 2016. Moore's Law Keeps Going, Defying Expectations. Scientific American, 19 May 2016. https://www.scientificamerican.com/article/moore-s-law-keeps-going-defying-expectations/ [Accessed 10 March 2017].

Söderström, O., Paasche, T., and Klauser, F. 2014. Smart cities as corporate storytelling. City, 18(3), 307-320.

South Africa. 2000. Local Government: Municipal Systems Act (Act 2 of 2000). Pretoria: Government Printer.

South Africa, 2003. Spatial Data Infrastructure Act (Act 54 of 2003). Pretoria: Government Printer.

South Africa. 2013. Spatial Planning and Land Use Management Act (Act 16 of 2013). Pretoria: Government Printer.

Statistics South Africa (Stats SA) 2015. General household survey 2014. http://www.statssa.gov.za/publications/P0318/P03182014.pdf [accessed 17 July 2015]

Turok, I. and Borel-Saladin, J. 2013. The Spatial Economy.   Background Research Report for the Integrated Urban Development Framework. [Online] available at: http://www.cogta.gov.za/index.php/iudf.

Turok, I. and Borel-Saladin, J. 2014. Is urbanisation in South Africa on a sustainable trajectory? Development Southern Africa, 31(5): 675-691.

Van Huyssteen, E., Oranje, M., Robinson, S. and Makoni, E. 2009. South Africa's city regions: a call for contemplation… and action. Urban Forum, 20: 75–194.

Van Zyl, G. 2016. Data prices: How SA compares to the rest of the world. Fin24tech. 30 September 2016. http://www.fin24.com/Tech/Multimedia/data-prices-how-sa-compares-to-the-rest-of-the-world-20160930 [Accessed 10 March 2017].

SURVIVING AND THRIVING

AN EXPLORATION ON COMMUNITY MAKING AND PUBLIC PARTICIPATION IN PLANNING OF THE HISTORICAL AND CULTURAL AREA OF DONGSI SOUTH

Zhao Xing

Some achievements of
"Investigation on the oral history
of Shijia Hutong.
Photo by Project Team

INTRODUCTION

Urban planning has been a significant part of public decisions since the publication *Urban and Rural Planning Law of People's Republic of China* was released in 2007. That document, for the first time, defined the legal status of public participation in planning and established its role as a necessary part of making and implementing plans.

Today in line with new urbanization policies, great attention is paid to the importance of public participation in urban planning as the focus of urban planning in China has shifted from massive construction of new urban areas to the transformation and renovation of urban built-up areas. Thus, the implementation of urban planning needs to be based on the understanding and cooperation of the local residents and property owners. Along with improving living standards and civic consciousness, citizens commonly pay more attention to problems of urban life. In this coming era, people are beginning to understand planning and to participate in planning decisions actively.

Meanwhile, guidance on social governance have been put forward by the central government since the Third Plenary Session of the 18th CPC Central Committee. Public participation in planning is seen as a crucial method and entry point to stimulate a community's internal forces and to improve com-

munity making[i], while also serving as a bridge connecting the government and the public.

Recognizing the opportunity to play a leading role in community participation planning, the Beijing Municipal Institute of City Planning and Design (hereinafter referred to as BICP) designated the historical area of Dongsi South in Chaoyangmen Subdistrict, Dongcheng District as a pilot project for a long-term, comprehensive and profound exploration of public participation in urban planning and community making. This project is intended to promote innovation social governance and to facilitate the successful implementation of plans for the urban renewal of several historical streets.

During the past two years, the Shijia Hutong Heritage Preservation Society (hereinafter referred to as SHHPS) has been working to collecting social resources from the project area. They have identified a series of improvement projects and undertaken several educational pilot projects including: identification of potential improvements to public space, compilation of the oral history of Shijia Hutong, the formulation of community convention and "Design for the People" exhibitions which enhances blocks' physical environment and promotes a collective humanistic spirit. Furthermore, a preliminarily working mechanism has been established, with governmental support, to foster social cooperation and public participation . The experimental practice in the Dongsi South Area was intended to provide a practical operation model for social governance and the promotion of "top-down" and "bottom-up" protection and the renovation of historical areas in accordance with basic-level government and current administrative systems. Additionally, it was intended to establish a new path for planning and the redevelopment of existing urban stock.

THE FOUNDATION OF PUBLIC PARTICIPATION IN CONSTRUCTION OF HISTORICAL DISTRICTS IN OLD AREAS IN BEIJING

Among all urban districts, historical districts have the most remarkable social issues, abundant historical restoration and adaptive use problems, and complicated networks of stakeholders. Because of these issues, it is both necessary and difficult for the public to participate in planning. Despite the difficulties, Beijing has undertaken a series of historical area planning projects since 2007 to organize and encouraging of the public to participate in the planning process. In addition, the local government has successively conducted various activities to encourage public participation such as establishing public workshops about regulatory plans of the central city, setting pilot projects of the responsibility planner system in the Shichahai area, renovating activity rooms in the Juer Community at Jiaodaokou Street, and encouraging the public to participate in planning and protection of Xintaicang historical and cultural area.

Based on years of practice, we have gradually realize that the exploration of ways to encourage public participation in historical area planning is a long-term task requiring constant promotion and continuous re-thinking and revision. To enhance public participation and to accommodate alternative implementation mechanisms and policy suggestions, a four-phase working concept of "experi-

---

i Community making: residents living in specific geographical range proceed from community life and face various social problems by continuous group actions using all kinds of social resources and powers. They share same goals and values, establish close social relations and work for common social welfare.

menting, deepening, summarizing and sublimating" has been made.

· The first phase is experimenting. Based on our working methods and experience accumulated from public participation in pilot projects in Shicha Lake, Juer Community and Xintaicang, our existing public participation skills can be confidently applying.
· The second phase is deepening. After choosing pilot areas, systematically public participation practices, in street planning, shall be conducted via the responsibility planner system in blocks. In addition, a comprehensive and sustainable working mechanism shall be established gradually to promote the implementation of street planning.
· The third phase is summarizing. Based on experimental practices, methodologies shall be concluded and summarized gradually so as to develop the output capability of alternative technologies to provide consulting services for more similar projects.
· The fourth phase is sublimating. In line with accumulated theories and practices, policy mechanisms shall be set up to provide the foundations for promoting public participation in planning and implementing urban plans.

The historical and cultural area of Dongsi South has been in the deepening phase of since 2014. In addition, multiple practices of public participation in planning and community development have been conducted with the purpose of accumulating experience by establishing duplicable working mechanism and modes.

PRACTICAL THINKING METHODS OF PROMOTING COMMUNITY MAKING AND PUBLIC PARTICIPATION IN CONSTRUCTING THE HISTORICAL AND CULTURAL AREA OF DONGSI SOUTH

SETTING UP PRACTICAL PLATFORMS

The historical and cultural area of Dongsi South is one of three identified historical and cultural areas in Beijing. It is under the administration of the Chaoyangmen Subdistrict Office in Dongcheng District. In 2010, the Chaoyangmen Subdistrict Office and the Prince's Charities Foundation (China) selected Shijia Hutong as the pilot project for a "community workshop" during which the public could participate. Based on residents' opinions from this workshop, it was decided to change the designation of the 24th courtyard in Shijia Hutong to the Shijia Hutong Museum. In 2013, the museum was first opened to the public and became the first neighborhood museum of Hutong's culture in Beijign. It is referred to as "an exhibition hall for culture, a reception room for residents and a meeting hall for the community". It has been widely welcomed and has been popular among local residents since its opening.

Almost at the same time, BICP finished the compilation of the *Conservation Plan for the Historical and Cultural Area in Dongsi South,* having been assigned this task by the Beijing Dongcheng Municipal Commission of Urban Planning. This document provides guidance for the area's protection and renovation. After completing the plan, the subdistrict office invited BICP to follow the street construction as it progressed. Based on this cooperation, BICP took the local government as a platform and managed to promote the "bottom-up" protection plan.

Dongsi South Area

Figure 1: Location of
historical and cultural area of
Dongsi South Street. Photo
by Project Team
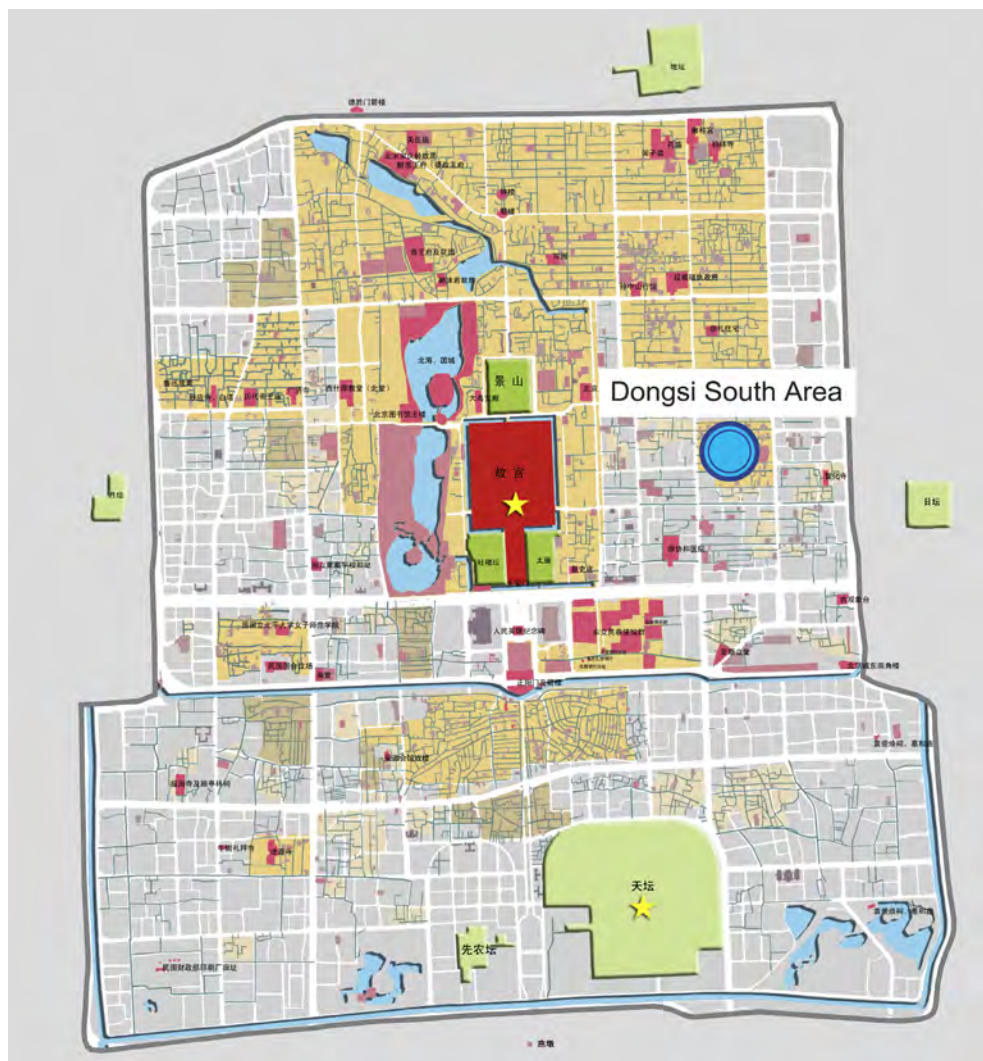
The establishment of the Shijia Hutong Museum and corresponding formulations of protection plans provided a solid public and governmental support base for the public in participating in street planning. Thus, planners, the government, residents and social groups started to actively discuss how to develop various strategies to promote protection and renovation of the Dongsi South area based on cooperation between residents and social elites. On September 24, 2014, the subdistrict office and BICP jointly promoted the establishment of a social organization "SHHPS" which combines residents, property institutions, local governments and various social groups together so that they can cooperatively participate in street construction. Additionally, BICP's planners, who were assigned as responsible planners and counselors of SHHPS, participated in the entire process of preparation and establishment.

东四南历史文化街区保护规划
DONGSINAN HISTORICAL AREA CONSERVATION PLAN

北京市规划委员会东城分局
北京市城市规划设计研究院
2013年08月

Figure 2: Conservation Plan for
the Historical and Cultural Area in
Dongsi South.
Photo by Project Team

ESTABLISHING THE RESPONSIBLE PLANNER SYSTEM

As responsible planners who have been following up and participating in street construction, the group managed to take SHHPS as a platform and introduced planning ideas to the government's day-to-day operations. In addition, based on residents' wishes, implementation of these projects was promoted. Furthermore, the major duties of responsible planners are listed as follows:

DEFINING WORKING GOALS AND METHODS

Responsible planners shall undertake heritage preservation projects which attract wide local support, promote great social awareness, and which promote people's livelihood (which is the most important issue for residents). Moreover, they should establish the goals of community self-governing and the development of social participation mechanisms, so as to promote implementation of street renovation projects and enhance urban governance.

INTEGRATING AVAILABLE RESOURCES

During the process of project planning and implementation, planners shall bring their professional expertise and knowledge of other projects into full play to comb resources of space, capital and policies for street planning. Meanwhile, they shall introduce intelligent human resources to the project so as to enhance the development of street protection and renovation.

MAKING AND IMPLEMENTING WORKING PLANS

On the basis of collected opinions, planners shall formulate working plans for specific jobs in the SHHPS and they shall report these plans to the board of directors for deliberation. At the same time, they shall enhance project implementation by controlling its schedule and directions. In addition, they are supposed to guarantee the development of SHHPS's operation and project implementation.

MAKING WORKING PLANS

By taking advantage of SHHPS, we managed to choose representative pilot projects by following multiple principles of: 1) setting a practical and controllable scale; 2) focusing on residents' wishes: and 3) observing the Society's orientation so as to encourage the public to participate in successful project

implementation. To improve the material space of historical street and to re-vive the humanities environment, we decided to the following actions first.

1. Improve the public environment in courtyards: taking the public environ-ment in courtyards as an entry point, we tightly focus on heritage preserva-tion and the improvement of people's livelihood. In order to promote plan implementation, public opinion is collected about ways to solve practical problems in Dongsi South area.

2. Undertake humanistic education in the community: taking cultural educa-tion activities as the starting point, street protection and renovation efforts are strengthened via cultural activities. Meanwhile, the shared community consciousness is developed by exploring the community's features and re-inforcing the history of these places.

Driven by pilot projects, it is hoped that solid project implementation can be combined with soft social governance. Hopefully, internal self-governing power could be united while improving street heritage and people's livelihood.

AN EXPLORATION ON PROMOTING PUBLIC PARTICIPATION IN PLANNING AND SOCIAL BUILDING VIA COMBINING SPATIAL IMPROVEMENTS WITH SOCIAL GOVERNANCE

ENHANCE THE PUBLIC ENVIRONMENT IN COURTYARDS
MAKING PROJECT PLANNING

Courtyards are important and the most distinctive physical components of the historical and cultural streets in older areas of Beijing. However, along with a growing population and increasing buildings, traditional courtyard houses be-come compound households. Due to insufficient living areas, excessive build-ings and housewares take up original living space. Old public space shall satisfy residents' demands of walking, storage and drying clothes. In addition, there are various severe living problems such as pavement distress, impeded drain-age and mosquito-breeding.

SHHPS took public space in courtyards as the starting point to implement protection plans and community development for three reasons. First, pub-lic space in courtyards is a gray zone which means it is not private or public property. It has been in need for organizational improvement for many years. Therefore, SHHPS, works as third party organization to bridge the gap between the government and individuals. Second, improving public space in courtyards is a step towards implement the protection plan for historical streets. Third, since public space in courtyards concerns public businesses which are closely related to the people's interests, such projects can work as an entry point to develop a courtyard self-governing mechanism to encourage people to for-mulate a long-term and voluntary negotiation mechanism to maintain living environment and form a virtuous circle.

CHOOSING PILOT COURTYARDS

Eight pilot courtyards with different scales, values and preservation situations were selected from the historical and cultural area in Dongsi South. Generally speaking, these courtyards can be classified into two types of "well-preserved courtyards" and "poorly-preserved courtyards".

"Well-preserved courtyards" refer to those courtyards which have satisfactory protection and more intrinsic or historic values. With these courtyards, planners managed to win over more social resources to build a better reputation for them and enhance their heritage values. Take the 45th courtyard in Shijia Hutong as an example. It is a listed protected site and is a well-preserved structure. However, it has not been repaired for many years. Its floral-pendant gate has been damaged badly and was about to collapse, endangering people's security. Under normal circumstance, it is hard for this kind of historical buildings with a satisfactory, but not high, protection status to obtain enough attention and capital for renovation. To overcome this problem, SHHPS applied for a specialized fund from the Historical City Committee in Dongcheng District and invited a professional team from Beijing University of Technology to protect these courtyards' values.

"Poorly-preserved courtyards" are typical compounds of households. Residents who live there crave renovation. In these cases, planners attempted to invite professional design institutions to help residents to solve various livability problems such as limited space utilization, lack of night lighting, the need for barrier-free transportation, and solutions for drainage and clothes-drying issues. The planners used SHHPS as a platform to collect resources and capital for these project using specialized funds from the subdistrict office, community public welfare fund and the sponsorship from the foundation previously mentioned.

Figure 5: Current situations of "poorly-preserved courtyards". Photo by Project Team

Figure 6: Volunteers from six design institutions participating in pilot projects. Photo by Project Team

DESIGNING WORKING MECHANISM

In order to guarantee that renovation plans were professional and the public participation process suitable, SHHPS invited 6 professional design institutions, including the China Central Academy of Fine Arts, the Beijing University of Technology, the Beijing Institute of Architectural Design and BICP, to serve as volunteers to take charge of the participatory renovation design of 8 courtyards. On behalf of SHHPS, responsible volunteer planners took the lead and formulated a 5-phase implementation plan consisting of the five following steps: early scouting; participatory design; mobilization; implementation; and long term maintenance.

In addition, four improvement criteria have been proposed. They are: 1) using space reasonably and guaranteeing safe and convenient living environment; 2) beautifying courtyard environment and exhibiting cultural features; 3) promoting neighbor communication and enriching public life; and, 4) developing public participation and establishing self-governing mechanism. Improvement criteria were used as guidance for public participation in planning, designing and implementing.

During the process, planners formulated implementation principles such as: receiving governmental resources; calling for social assistance; and, organizing public participation. They provided professional technology and built a base of consensus to motivate plan implementation.

IMPLEMENTATION RESULTS AND EFFECTS

As this pilot project gradually developed, we anticipated both physical space improvements and that residents could change their ideas about the neighborhoods.

We undertook several efforts to achieve this later objective using a participatory design process, where residents were guided to familiarize themselves

Figure 7: Project startup conference.
Photo by Project Team

with the project through mutual communication and negotiation. They started discussing relevant public affairs. In the process of designing, each design institution conducted an average of ten face-to-face communication with residents. In addition, they organized meetings twice a week so that designers could communicate with each other to formulate renovation plans in the right direction. Based on the workshop and achievement exhibition held by Beijing Design week, residents were encouraged to participate in discussions and to actively modify plans with the planners.

Figure 8: Mobilization meetings.
Photo by Project Team

Secondly, residents were encouraged to change their minds during project discussion so that they could understand that decisions on public affairs seek a balance between personal interests and collective interests and that sometimes private interests need to be sacrificed for public interests. Therefore, all interested parties were invited to participate in mobilization meetings before construction. During discussions about information symmetry and openness, residents started to realize that if they wanted to improve courtyard environment, each family should make concessions for public interests.
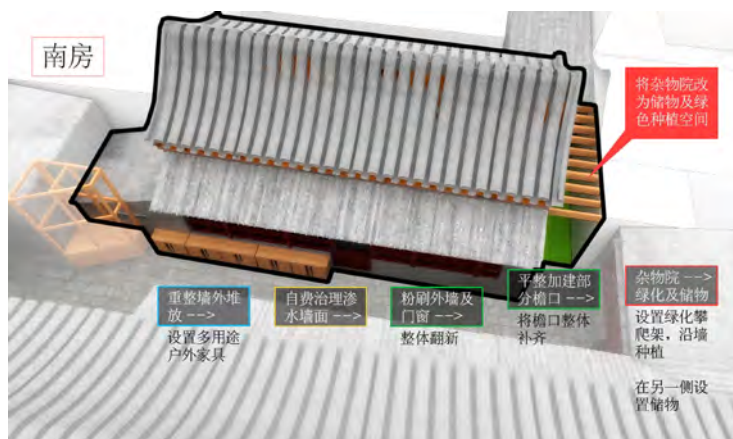
Figure 9: Design plans specific
to each household.
Photo by Project Team

Figure 10: Courtyards after they
voluntarily have been cleaned by
the residents.
Photo by Project Team

On the basis of comprehensive communication in the earlier stage, residents began to be conscious of the fact that it was necessary for them to participate in renovation and community making. Hence, before construction, residents voluntarily cleaned most sundries in their courtyards. In addition, during construction, once there were problems, residents, community offices, designer, planners and construction teams held coordination meetings on the scene to solve them through negotiation. As a result, a cooperative consciousness was developed.

When the main part of this project was finished, a "Courtyard Convention" was formulated collectively to embed the project conclusions made by residents' families. For example, in the 4th courtyard in Qianguaibang Hutong, residents proposed several community conventions including: "neighbors shall care about and respect each other"; "negotiation is the first step for solving problems"; "maintain front doors clean"; and, "no illegal construction". Hopefully, a long-acting self-governing and maintaining mechanism could be established within courtyards to improve the material environment so as to realize a virtuous circle.

With two years of implementation, five courtyards in the area have been constructed and 3 courtyards will be completed renovated by this year. Thanks to multi-channel funds from the government and collective efforts made by planners, designers, residents and social workers, valuable buildings in these courtyards have been effectively renovated while useless illegal buildings

have been dismantled. Outdoor items that must remain were placed in custom-made cabinets with night illumination. In addition, residents could grow flowers and vegetables in courtyards. In a word, both public space heritage in courtyards and space utilization has been greatly improved.

BEFORE

AFTER

Figure 11: The 45th courtyard in Shijia Hutong before and after renovation.
Photo by Project Team

BEFORE

AFTER

Figure 12: The 4th courtyard before and after renovation.
Photo by Project Team

tigating the oral history of Shijia Hutong, formulating community convention, and holding a "Design for People" Exhibition of Beijing Design Week. Moreover, in the early stage of the project they managed to gradually cultivate a community self-governing organization by introducing residents to their community, exploring shared memories, developing homeland visions, and establishing civic consciousness.

INVESTING ORAL HISTORY OF SHIJIA HUTONG

Zhang Yiran, who lives in Shijia Hutong, has been voluntarily undertaking an investigation on the oral history of Shijia Hutong since 2013. Together with SHHPS, responsible planners invited a team from Beijing Forestry University to do this work with them. On the basis of written record and to enhance the idea of community making, an exhibition of oral history achievements and "Hutong Story-telling party" was organizing to encourage residents to participate in discussion and share their life stories. The collection of the oral history not only provided a solid foundation for studying this street's history but also promoted the integration of residents' shared memory and future visions.

FORMULATING COMMUNITY RESIDENT CONVENTIONS

The formulation of community resident conventions was cosponsored by SHHPS and the neighborhood committee. Responsible planners assisted the organization by using public participation methodologies. This activity was conducted as a round-table tea party in Shijia Hutong Museum. Residents were invited to discuss existing problems and put forward suggestions. During the discussions, residents made a voluntary proposal to formulate a "Hutong convention". After a series of discussion, the convention document was written by a resident and translated into English. During Beijing Design Week, this convention was displayed in Shijia Hutong. In addition, a grand signing ceremony was hosted. This convention not only strengthen residents' sense of belonging and pride but also developed a shared homeland consciousness and encouraged behavior principles of mutual supervision.

Figure 13: Signing ceremony of Hutong Convention. Photo by Project Team

Figure 14: The opening ceremony for Beijing Design Week. Photo by Project Team

BEIJING DESIGN WEEK AND "DESIGN FOR THE PEOPLE" EXHIBITION

To further promote the "bottom-up" idea of street renovation, Beijing Design Week has been hosted for two years in a row. The exhibition, with the theme of "Design for the people", was organized collectively. It included achievement displays, discussions on community making, and abundant artistic and cultural activities. This exhibition and display was used to help residents to understand the latest news about plan implementation and community making. Beijing Design Week also served to publicize the protection and renovation mode which combined two mechanisms of "top-down" and "bottom-up" in Dongsi South Street area. Furthermore, it managed to attract more interested social resources and powers.

PRACTICAL ACCOMPLISHMENTS

Based on two years of practical experience, the implementation of the physical plan for the historical area has been remarkably successful. In addition, it has preliminarily integrated the humanistic spirits of the community while accumulating renovation and practice methods, which includes platform establishment, public participation, and community making. Moreover, major accomplishments are listed as follows:

1) This project gained increasing governmental and social support.
During implementation, various governmental departments as the Historical City Committee, Cultural Committee, Civil Affairs Bureau in Dongcheng District and Chaoyangmen Subdistrict Office provided specialized funding support via different channels. Additional social resources and small grants were gained from institutions such as Chaoyangmen Community Foundation and the Beijing Red Wall Garden Hotel.

2) With improvements to material space, the implementation of this pilot project developed satisfactorily.
Thanks to joint efforts made by various interested parties, several courtyards have been constructed, which not only improved street heritage and people's livelihood but also accumulated practical experience that similar projects shall

use public participation as an entry point by promoting community self-governing and basic-level society administration.

3) Residents started participating in protection and renovation of the street in different ways.
When participating in renovation projects and humanistic education, residents started to gain a new understanding of their communities. In addition, they played a role in making decisions on community affairs, while standardizing their behavior. Several capable and enthusiastic residents would become leaders for community self-governing organizations in the future.

4) The number of social participants kept growing while the professional fields keep expending.
At present, a team with volunteers majoring in planning, architecture, anthropology, sociology and media studies has been expanded. Moreover, the project has gradually established long-term cooperation experience with many social enterprises and universities such Beijing University of Technology and China Central Academy of Fine Arts. As a result, cultural institution integration, which provides local services for local communities, has been established.

5) This project acquired positive social evaluations.
Currently, the preservation and renovation mode of the historical area of Dongsi South, with its characteristics of public participation in planning and community making, has been reported by a large number of mainstream media such as *Qian Xian,* publicized by Beijing Municipal Party Committee, and Oriental Outlook. Furthermore, it was reported during the Torrents of Spring, a program organized for the two-year anniversary of General Secretary Xi Jinping inspection Beijing. All these reports demonstrate the concern and approve that governments at all levels have for the project.

CONCLUSION

Taking SHHPS as a platform, a voluntary street renovation process has been developed in the historical and cultural area in Dongsi South. It combines both patterns of "top-down" and "bottom-up" planning and is independent of the need for massive investment. Combining plan implementation and community making together, the project took heritage preservation as an entry point and promoted social governance and people's livelihood. As a result, it cultivated internal social forces from residents to local government. It has gathered together and integrated various resources as well as multiple social groups devoted to ancient city protection. This project developed several cooperation partners during project implementation. In addition, several cultural service institutions have been established in the area, which grow stronger as the area develops. Moreover, the project took government at the basic levels and integrated support from at every level of government as much as possible. In this way, governmental support can be connected with residents' self-governing competence. These achievements present a fine strategic ability of "basic governance" which has values of promotion and duplication.

   In the pilot project of the historical and cultural area in Dongsi South, great working experience and social resources have been accumulated. Therefore,

facing the current situation where there are many similar renovation projects in other cities, we hope that more projects can be promoted by building more high-level implementation organizations and integrating the experience and resource among different regions. Therefore, BICP has started establishing "Beijing Community making Center", which is an overall municipal planning platform for "city renovation and community making". This institution is regarded as a platform which collects more professional resources in the field of city renovation. It has established a bank of professional institutions that can provide services for local residents. Addition, it offers city renovation and community making services including organizing, planning, implementing and operating to governments and project subjects.

Although a period of exploration and practice has been conducted, public participation in planning is still a new field. Currently, urban planning and projected implementation is dominated by professionals. We are transforming that situation into a plan implementation mode guided by planners and participated by communities. Further equal cooperation between planners and communities will be developed by enhancing residents' competence in the future. In the end, a plan implementation mechanism led by communities and assisted by planners will be finally realized.

Residents' understanding and participation is not only the foundation of urban construction, but also is the basis for stable social development. In line with urban and social transformation at present, planners will need to keep on changing their thinking patterns and lead to the combination of internal force derived from "bottom-up" communities and "top-down" policy guidance. In addition, planners will need to keep exploring innovative urban governance which promotes communities to survive and thrive and enhances independent development of streets.

—

PLANNING CITY – REGION FOOD SYSTEMS

Editors
Yves Cabannes and Cecilia Marocchino

It is with extreme sadness that we note the passing of one of the authors, Mónica Bifarello in June 2017, while finishing her article. Her legacy, as an exceptional professional and an extraordinary human being will remain in the minds and hearts of all those who had the fortune to know her. This whole section on integrating food into urban planning is dedicated to her memory.
Prof. Yves Cabannes, Editor

CITY REGION FOOD SYSTEMS AS HUMAN-CENTERED PLANNING

Yves Cabannes, Cecilia Marocchino, Jorge M. Fonseca

Figure 1: Metropolitan Region of the capital city of Costa Rica, San José © Jorge Fonseca

PLANNING CITY REGION FOOD SYSTEMS

For Review 13, our food planning section focuses on *planning city region food systems*. While literature on this topic is limited, and there exist very few planning manuals that properly consider city and region food system planning, some cities and regions have made huge progress over recent years. The four examples presented in this section are among the most interesting ones and they make visible innovative practices from both the Global North and South.

Both this foreword and the different papers presented in this section critically examine the definition coined by RUAF Foundation, a leading world-wide think tank and Resource Centers on Urban Agriculture and Food Systems, and the Food for the Cities Initiative of the United Nations Food and Agriculture Organization. According to them *"City region food systems (CRFS) (to) encompass the complex network of actors, processes and relationships to do with food production, processing, marketing, and consumption that exist in a given geographical region that includes a more or less concentrated urban centre and its surrounding peri-urban and rural hinterland; a regional landscape across which flows of people, goods and ecosystems services are managed"* [FAO-RUAF 2015].

In its search to break the urban-rural divide, the suggested FAO-RUAF concept of city region food systems only provides partial clarity. The challenge is to construct a concept that includes the spatial dimension of the food systems while also referring to the connectivity between different elements of the food systems, actors and different spaces in a given geographical region. Food planning should connect them all in a comprehensive mode.

Each of the articles in this section provides a rural/urban dimension that can be "classified" as city region planning. The city-region and global-local nature of

food systems obliges us to move beyond city limits and therefore brings a clear focus on the spatial dimension of the food systems, including both urban and rural areas. Food systems are considered here as the intersect of three sub-systems: 1) activities all along the food chain, from "seeds to table"; 2) the sub-systems of actors involved through planning and through its implementation; and, 3) multi-scalar spaces, sometimes limited to a neighborhood, or a group of neighborhoods, or related to a district or the city as whole or to a metropolitan region. Even if food systems imply a multi-scalar perspective from global to local, the articles presented in REVIEW 13 focus primarily on the regional down to metropolitan level, as well as municipal and intra-municipal scales.

The city region dimension also embraces the linkage between different levels of governments as a key challenge. Dealing with the jurisdiction of two or several local governments is already a challenge for those who assist in city-region food planning. In fact, many believe the "distance" between what the region and the city seek, makes integrated development food planning a hard-to-reach task for the coming future.

This paper critically examines the notion of City Region Food System in light of four different and innovative food planning practices:

· Rosario where an emergency urban agriculture program was launched and integrated into the city planning in 2001. This action came in response to one of the worst economic and social crisis faced by Argentina. It slowly evolved over the past 15 years into a Food System Planning at the scale of Rosario Metropolitan Region.

· The second case from Portland Oregon, tells in detail how food and planning are interconnected both in Portland and its Metropolitan area, providing a new way to see the 'City-Region complex". It examines Multnomah County as well, of which Portland is in the driving seat.

· The third narrative refers to Milan rural metropolis and the neo-ruralisation of this Italian city. As highlighted by the authors, despite Milan being "celebrated as the uncontested Italian capital of design and fashion and renowned for its financial and cultural services" it is a major agricultural centre. The paper brings first-hand information on the role of planning in this relatively unique harmonious co-existence of different "complex systems".

· The last of the papers revisits the City Region Food System planning approach of the Garden City movement both from Ebenezer Howard original vision and from the planning practices. It examines carefully the production and evolution of food related spaces in Letchworth, the first Garden City built in the United Kingdom. It concludes with the reasons behind a unique resilient food producing city, despite its closeness to London and its expansion.

By analysing and putting in perspective these four cases we address the following questions:

· First, taking into account the definition of city region food systems as operational base for the various planning exercises, we explore to what extent the city-region context is the most appropriate for food system planning and what are planning instruments that may be used to integrate, directly or indirectly, food systems at city-region levels.

· Secondly, we examine how city region food systems planning might be crucial for developing human-centred planning, that can improve the quality of life of both the urban and rural populations.

PUTTING THE CASES IN PERSPECTIVE

To address these two questions, the following dimensions of food systems planning are detailed in the four cases studies:

i) The specific entry point into the food system and the gradual connection with other food and no-food systems topics at urban and regional levels;

ii) The contribution of physical [or territorial] planning to translate planned food strategy in spatial terms;

iii) The concrete outcomes [or benefits] obtained thanks to introducing food into planning.

KEY ENTRY POINTS AND GRADUAL CONNECTION WITH FOOD AND NO-FOOD SYSTEMS

In **Milan**, the entry point was the preservation of the rural landscape of the city's fringe together with the environmental issues and the promotion of local food production. These efforts now are being embedded into plans for the region.

Portland - Promoted local food production in recognition that the land was very fertile and suitable for different types of cultivation. Since 1973, Portland has used strong land use planning to preserve the peri-urban and rural areas and to promote food production around the city. It has developed a sustainable food resource database and urban food zoning codes to provide in-depth information to better inform policy makers and support the enhancement of local production. The protection of local food production gradually evolved into more systemic thinking about food distribution, including using food carts and local food farmers markets to make local food more accessible. Planning has played a crucial role in the gradual evolution of this systemic thinking through various strategic and sectorial food systems planning efforts including: 1) the Portland Plan Food System report, preparatory for the Portland Comprehensive Plan, which included maps locating community gardens, restaurants, grocery stores; 2) the Multnomah Food Action Plan,which reinforced local food options, healthy diet, equity and food security; 3) the Climate Action Plan,

which discusses food systems as an area to invest to tackle issues related to energy crisis; and finally, 4) the Portland Peak Oil Task Force whose final report discusses the development if a less-energy intensive food supply and promoted a shorter food supply chain. This system of planning has been crucial not only for enabling different sectors (food and non-food) to intervene, but also for fostering coordination among different level of governments (metropolitan, city, and county levels) at urban and metropolitan (regional) level. An interesting finding revealed with this case is that the "region dimension" in the theoretical definition of city region food system is, in reality, the spatial contribution provided by the "metropolitan area" where an institution (Metro) has jurisdiction over three Oregon State counties (Clackamas, Multnomah and Washington).

Rosario - The key entry point was the political, economic and social crisis raging in Argentina in 2001. In 2002 the urban agriculture programme was developed by the Municipality of Rosario, in collaboration with a local NGO, as an immediate assistance strategy for producing healthy, agro-ecological food and guarantee direct sales through farmers markets located in the city. As the country gradually began to recover from the crisis, urban agriculture was consolidated into a permanent activity and was mainstreamed as a municipal policy. The urban agriculture programme, after 15 years, has led to a more comprehensive approach including urban social agribusinesses (e.g. fruit and vegetable processing plant) in addition to more than 700 farmers markets and fairs that are held each year. The Urban Agriculture Program has been also able to leverage traditional knowledge to generate new products and to preserve products that had largely been lost, through the establishment of the seed bank. The urban agriculture program took the opportunity to foster inclusion and the involvement of various stakeholders in the decision-making process.

The evolving metropolitan strategic planning highlighted the need to put Rosario in a regional perspective and build the interconnectivity between urban and regional areas. As in Portland the city region dimension of Rosario is equivalent to the Rosario metropolitan area, comprising a set of cities and towns. The greatest challenge facing Urban Agriculture in Rosario today is to scale up by moving beyond the city limits and incorporating the entire metropolitan region. Metropolitan planning is a key entry point for mainstreaming urban agriculture and food systems at city-regional level.

Letchworth – The Key entry point was the promotion of a food self-sufficient town that would also recycle its food waste into green manure and be part of a network of towns that would provide markets for such local-grown food. The Garden City concept, which influenced Letchworth, addresses many aspects of the food system including production, distribution, collective preparation and consumption and waste recycling as integral part of the city. The concept encompasses many actors related to food systems (even different age groups and social groups) and it considers multiple food related spaces [from back yard to green belt and rural land between garden cities]. Therefore, Letchworth illustrates the very notion of City-Region Food Systems and also illustrates the innovative concept of city-region as social city, where people and community are empowered and where a human-centred planning aims at improving the quality of life of both the urban and rural population.

The fully developed concept of Garden City region is introduced as a region-

al cluster of a collection of similar settlements each of a population of about 32,000 and all linked together through public transport, trains and water canals, combining to create a Social City of about 250,000. These links would enable to movement of goods and people and importantly agricultural produce.

The analysis of the four cities reveals that the starting point of Food System Planning processes may differ substantially from one city to another, and that the planning can led by potentially quite different actors. The integration of food into planning can be driven by a multiplicity of locally valid reasons or circumstances. What is important is to develop a systemic plan that will remain through time and which has the capacity to connect food and no-food sectors, actors and spaces in a coherent, comprehensive and systemic way.

Another key finding is that the planning instruments that integrate food systems at city-regional level are often the outcome of a long-term process that "modify the planning culture" [Borelli, Portland] and they range from more comprehensive and strategic plan to sectorial plan that directly or indirectly address the food systems.

CITY AND REGION FOOD STRATEGY TRANSLATED IN SPATIAL TERMS THROUGH PHYSICAL PLANNING

Each case brings essential lessons for planners, as city region food system planning needs, as a priority, very specific planning instruments, land regulations and land use zoning and a capacity to enforce the implementation of the plan. Last year's Review Food Planning editorial insisted on the critical role played by City Food Council and City charters (processes that involve different food related actors) to generate urban food systems plans. We refer to these findings as a priority for planning city region food systems in addition to specific planning instruments.

Milan developed two very distinct instruments, one at city level and the other at regional levels, that operate within the same agricultural boundary and complement each other. in the 1990's the Lombardy Region established the Agricultural Park of South Milan [PASM] as a regional agricultural production area. It includes a third of the Milan Metropolitan area, encompassing 61 municipalities and 1,400 farms and farm-related properties in the perspective of neo-ruralization of the city.

About 20 years later, the Milan Agricultural District [DAM] was created by the Municipality of Milan. It created a joint effort by the city of Milan and local famers to strengthening the urban-rural interactions. This effort gradually evolved in a more comprehensive approach including food distribution, formal agreement (Framework Agreement for territorial development 2013) and holistic guidelines for food policy 2015-2020, including healthy food, food systems sustainability, food education, food waste and research in agro-food sector.

Even if more modest in terms of size, the recent development on **Rosario** points towards the same direction, when 200 hectares of productive urban land became an integral part of the Metropolitan Plan. Of note, is that these rural spaces in the Metropolitan Region are for intensive farms, and are quite different and quite complementary to the allotments, community gardens and backyard gardening that fall under urban agriculture. These farms are essentially business or social economy based farms for supplying local market or regional ones.

The long-standing experience of **Letchworth** in the UK and the original messages of the garden city movement tell us exactly the same story. This plan designated an estate [around 1000 hectares] earmarked as rural land (non-constructible) and intended to be rented out to a regional enterprise to produce primarily corn and ahi flowers for omega 3. In other words, the plan introduced, or maintained, a double planning system of rules, one referring to agricultural / rural land, and the other one to urban agriculture, in residential or close to residential areas. And what remains fascinating is how the urban and rural cultivated space are intertwined and co-exist, for a better environment system, and green continuity in cities.

SOME CONCRETE AND FORMAL OUTCOMES FOLLOWING INTEGRATION OF FOOD INTO PLANNING
POLICY AND PLANNING DOCUMENTS

The food planning processes in the mentioned cities produced formal and concrete outcomes that are fundamental for the successful and long-term integration of food into urban planning. While the state law on Urban Growth Boundary has produced mixed perceptions regarding Urban Sprawling in the Portland area, The Portland Plan Food System report was instrumental for including food in the Portland Comprehensive Plan and for the development of the Multnomah County Food Action Plan. The Lombardy Regional law (n.24/1990) that established the Agricultural Park of South Milan was key for the creation of the Milan Agricultural District, for the development of the Rural District Strategic Plan, for the development of both the protocol agreement "strategy for the rural development of Milan", for the framework agreement for territorial development), and for the recent development of the Milan Food Policy. In Rosario, the Urban Agriculture Municipal policy was the trigger for further integrating urban agriculture in the metropolitan strategic planning.

2.3.2 SUSTAINABLE SYSTEMS

Another fascinating observation is how planning, and planning rules, associated with changes in Governance and strong grassroot and producers' movements have made these systems sustainable. **Rosario** is still active 15 years down the line and continues innovating, shifting from an emergency program to a generation of green belts and a Regional food system, without losing its urban agricultural dimension. **Letchworth** is another vivid example of success through over 100 years, and the reasons for this longevity are detailed in the article. **Milan's** preservation of one third of the Metropolitan Region as prime agricultural land has resisted close to 30 years of speculative expansion of the city without [too many] problems. Finally, in **Portland** "the number of acres dedicated to cultivation remained unchanged in recent years [in the Willamette valley, close to Portland], amounting 16.4 million acres that accounts for 26.7 % of the total area of Oregon" [see case]. One powerful lesson is that Portland has been able to control its urban sprawl and not eat up arable land thanks to innovative planning rules, a strong political willingness, and strong community mobilization.

Figure 3: Djarkata, Indonesia. Good example of short food circuit. Local fish is sundried and still provides affordable proteins to part of the population of one of the largest metropolis in the world.
© Yves Cabannes

KEY LESSONS LEARNED AND RECOMMENDATIONS FOR PLANNERS

KEY LESSONS LEARNED
CITY REGION AS A METAPHOR

One of the major lessons of this cross cases analyses is that the City Region emerges much more as a metaphor than as a concept or even as a notion, from a planning perspective (and at this stage we limit our comment to planning, not discussing whether or not it is appropriate for Food systems). However, this metaphor is quite useful to move from one level of food planning [be it a city, a town, a region, a county or a district] to a multi scalar approach that intends to link up human settlements of quite different sizes (small agricultural based urban settlements, towns, intermediate cities, megacity, metropolitan region, etc.) and their hinterland.

As far as food planning is concerned, each one of the cases introduces a different definition and it seems difficult to encapsulate the Social City and the Garden City into the same "Region" than Metropolitan Rosario that served as a base for integrating Food into planning.

In addition, the *Region* side of the equation might be a misleading notion since it does not apply well for small nations and for most of the 49 island nations, primarily from the Pacific or the Caribbean. "City-Region" for small islands nations such as Grenada, the Bahamas or Tuvalu is not quite appropriate from a planning perspective, as each one of these islands is not a Region as such… and most of them have towns and no cities. And yet, these island nations represent about 20 % of all existing nations. Another ambiguity of the term is that in the English language, and not only in the UK, cities and towns refer to quite different realities, be it according to the countries' population size, legal status, nature of power, etc. To move beyond its metaphoric value, planners need to explore diverse food systems realities in order to appropriate the concept and use it in their daily practice.

Figure 4: Haiti, North Road between Cap Haitian and Ounaminthe: Improvements of roads and local transport systems is an integral part of City Region Food systems Planning in the perspective of improving nutritious food security.
© Yves Cabannes

IMPORTANCE OF PEOPLE, PRODUCERS AND RESIDENTS AND THEIR ORGANIZATIONS: TOWARDS A PEOPLE CENTRED FOOD SYSTEM PLANNING

One of the central lessons drawn from the cross-sectional analysis is probably the central role of people and their organisation for planning sustainable City Region Food System and the key role that planning can play in empowering people. This is clearly illustrated in **Letchworth** and in the Garden City case, where Grassroots organisation played a fundamental fostering role to keep alive a city region food spirit through time. Efficiently seconded by a solid multi-stakeholder organization with clever influence on land use, practices such as watershed conservation derived precisely out of the perceived garden's impact on human development. Similarly, the city of **Milan** evidenced (through some of the initial projects following the implementation of the Food Policy 2015-2020) the feasibility to feed children with local staple foods, thanks to both a conscious multi-stakeholder advocating approach and an efficient association of producers. In **Rosario**, producers and primarily women and their associations played a key role to turn urban agriculture from a crisis mitigation program into a tool for social interaction, and for developing appreciation for food values, including the recognition of credence values (e.g. knowing who produces is a hidden plus). Rosario's case demonstrated how food stimulates family-oriented thinking into conquering the surrounding regions for improving income and wellbeing. The renewed value given to food systems deriving from increased interaction with community and nature, was not ignored by the Municipality, thanks in part to the lobbying of the multi-stakeholder groups. This bears an important lesson for planners that food planning needs to be participatory, and need to involve producers and common citizens and this supposes to empower people.

NET CONTRIBUTION TO THE NEW URBAN AGENDA

Emerging in the implementation of the New Urban Agenda and notably in the assistance to countries by agencies such as the UN FAO: a simplistic food system concept may limit the dialogue across geographical boundaries. Rather, in pursuing regional/provincial/county engagement with cities, and vice-ver-

sa, people's overall wellbeing, beyond food, is of paramount importance. We conclude, that those perceived non-food elements, such as economic development of rural communities (in and off farm), impact of land use on overall resilience of people, and especially the wellbeing of people, individually and in community, is a feasible argument in the horizon for prompting many food action plans intersecting governments.

Figure 5: The Central Market in Riga is one of the largest food market in Europe. It consists of 4 main pavilions (meat, fish, vegetable and dairy pavilions) that come around commercial rows and stalls. © Yves Cabannes

RECOMMENDATIONS FOR PLANNERS

As the various experiences translate into spatial terms and solutions (physical, land use plans, zoning regulations etc.), the role of urban and regional planners becomes crucial in connecting the different components of the food systems and in linking up food related issues with other urban sectors.

The lessons learned strongly suggest that urban and regional [food] planners need to go beyond their professional boundaries and promote a holistic and multi-disciplinary approach. One leading objective that needs to be pursued is to foster the development of sustainable food system within urban, peri-urban and rural areas, connecting cities and towns among themselves and with their rural surrounding.

—

MILAN RURAL METROPOLIS THE NEO-RURALISATION OF THE CITY

Stefano Quaglia, Jean Baptiste Geissler

Figure 1: Rice Park.
Source: Associazione Parco delle
Risaie, 2015

INTRODUCTION

Milan is internationally recognised as a tertiary city-hub, celebrated as the un-contested Italian capital of design and fashion and renowned for its financial and cultural services. Yet, this European metropolis is also a major agricultural center, both in Italian and European contexts, as defined by agricultural land coverage and the number of farms. This mixed-use nature of the Metropolitan region is not a new phenomime. Since the Middle Ages, Milan has been characterized by a longstanding tradition of agricultural practices.

However, in the mid-1900s its urban/agricultural character has been affected by several dynamics. The most significant *phenomena* have been rural de-population, as rural residents' migration toward industrial and tertiary urban activities, and the correlated rapid urbanization process. Both have caused degradation to Milan's peri-urban and rural landscape, with dire effects on natural resources, mostly soil and water (Borasio, Prusicki, 2014). Milan and its metropolitan outskirts (with a growing population of over 3 million) are also facing other challenges such as: urban sprawl; climate change; additional in-migration flows; and, natural resource depletion. All of these factors have contributed to a fragmentation of the agricultural landscape and to an impoverishment of the metropolitan food quality and production facilities, as well as ever increasing tensions related to social injustice and food poverty.

To address these issues, Milan has recently started a process oriented to the improvement of its food system sustainability. Because of the proactive role of citizens and local authorities, Milan has moved to integrate its the food system into the urban agenda, conferring to this topic a crucial importance for planning and development of the city. This effort has been pursued to achieve

a balance between the strong urbanisation pressure and the importance of

Metropolitan City of Milan
Urbanized Areas
Corn
Rice
Beet
Vineyard
Fruit
Vegetable crops
Horticultural crops
Seeds
Forage crops
Industrial crops
Farmland
Uncultivated land
Set-aside land
Other cereals
Other Crops

Milan

Lombardy
Region

0 25 50   100 Km

Figure 2: Milan metropolitan rural system – Agricultural land use. Ssource: elaborated by Massimiliano Granceri on ERSAF data, 2012.

preserving the ecosystem services (e.g. food production, soil and water regulation, urban cooling, air purification and recreational services) provided by the green-agro infrastructure in the peri-urban interface.

Milan's vision translated into the implementation of many projects, policies, and practices to achieve the city neo-ruralisation strategy, with the twofold aim of protecting the urban and peri-urban rural spaces and enhancing the production of quality food. Furthermore, this vision was strengthened by both the recognition of the multi-functional role of agricultural and the engagement of a wide range of local stakeholders to assist in developing a shared urban-rural strategy.

This strategy proposes an interesting approach for planning and managing the Milan metropolitan rural system, which consists of 66,000 ha of utilised prime agricultural land mainly producing cereals, industrial and forage crops (as showed in Table 1). The adoption of this innovative approach is oriented to overcome the historical conflict between urban and rural areas, drawing inspiration from the utopian idea of Campagnes urbaines introduced by Donadieu (2013), who advocated considering them as integrated spaces and not as conflicting territories.

CROPS	PRODUCTIVE SURFACE (hectares)	TOTAL HARVESTED PRODUCTION (kilograms)	AVERAGE PRODUCTION PER HECTARE (kilograms/ha)
Cereals			
Wheat	4 686	283 500	116,02
Barley	2 515	148 448	59,03
Oat	74	2 640	35,68
Rye	235	8 813	37,50
Triticale	1 425	76 687	53,82
Rice	12 117	678 552	56,00
Corn	18 950	2 312 075	122,01
Sorghum	363	26 005	71,64
Other cereals	73	3 474	47,59
Total cereals	40 438		
Industrial crops			
Soy	2 750	84 165	30,61
Colza	490	13 354	27,25
Sunflower	5	108	21,60
Totale industrial crops	3 245		
Protein plants			
Pea	181	4 668	25,79
Other protein plants	14	189	13,50
Total protein plants	195		
Tuber plants			
Potato	13	4 100	315,38
Horticultural crops			
Industrial tomato	100	59 221	592,21
Other horticultural crops	761		
Total horticultural crops	861		
Forage crops			
1. Meadows			
Silage	8 300	4 840 980	583,25
Rye-grass	2 900	1 073 000	370,00
Other meadows	2 590	1 036 000	400,00
Total erbai	13 790		
2. Temporary grasslands			
Polyphytic temporary grassland	2 140	995 100	465,00
Alfalfa	1 530	749 700	490,00
Other temporary grasslands	130	60 450	465,00
Total temporary grassland	3 800		
3. Grasslands			
Permanent grassland	7 680	3 801 200	494,95
Pasture	100	48 450	484,50
Total grasslands	7 780		
Wood crops			
Vine	202	14 631	72,43
Apple tree	5	860	172,00
Pear tree	5	620	124,00
Other fruit	38	1 458	38,37
Total wood crops	250		

Table 1: Metropolitan main crops production.
Source: Metropolitan City of Milan, 2014

In this context, we outline how urban planning strategies of the food system were integrated into the Milan metropolitan area. We show the process that is bringing this metropolis to develop a long-term strategy able to improve its sustainability, resilience, and food security.

THE NEO-RURALISATION OF MILAN
REGIONAL APPROACH - PASM

The linkage between urban development and food production in the Milan metropolitan area emerged in the 1970's. At that time, concerns were expressed related to the environmental impacts of urbanisation on natural and rural spaces, especially those localized in the peri-urban interface of the city, and the gradual abandonment of agricultural lands. They mobilized a bottom-up effort to find a way to preserve the rural landscape of the city's fringes. This trend reached a turning point in the 1990s, when *Parco Agricolo Sud di Milano* (PASM – Agricultural Park of South Milan) was established, with the aim of mitigating the effects of the rapid urbanization in the peri-urban areas and to provide support to produce local food (Magoni & Colucci, 2015).

The Lombardy Regional law n.24/1990, that established the PASM, defined it as the governing authority of a park in the Province of Milan (now Metropolitan City of Milan) with the responsibility to pursue the following objectives:
· Landscape and environmental protection and recovery of green continuity between the city and its countryside;
· Improvement of ecological balance of metropolitan area;
· Protection and enhancement of agricultural and forestry activities;
· Improvement of the citizens' recreational and farming fruition[i].

The regional authority introduced a tool aimed at integrating these objectives and protecting the environment through the valorisation of the multi-functional role of agriculture, thereby re-creating the traditional synergy between Milan and its rural outskirts.

Nowadays the PASM is one of the main agricultural park in Europe, extending over 47,000 ha, including a 36,500 ha agricultural area (UAA), which covers a third of the Milan metropolitan area, encompassing 61 municipalities and 1,400 farms and farm-related properties. Even though the majority of PASM consists of agricultural land, it also contains elements with high natural value and complex ecological functions, such as wooded and wet permanent areas, trees and hedges (although in the past century there has been a substantial degradation of these natural resources). Other characteristic elements of the park are the ancient and wide irrigation system, shaped by the Adda and Lambro rivers and smaller waterways, artificial canals and karst springs, as well as the historical abbeys, farmhouses and castles.

---

i Gazzetta Ufficiale, Lombardy Region Law n. 24/1990 "Istituzione del parco regionale di cintura metropolitana Parco Agricolo Sud Milano". Available at:
www.gazzettaufficiale.it/atto/regioni/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=1990-12-29&atto.codiceRedazionale=090R1242 [consulted 01/2016]

PASM
Metropolitan City of Milan
Municipality of Milan

```
0        meters    15,000
scale 1:150,000
```
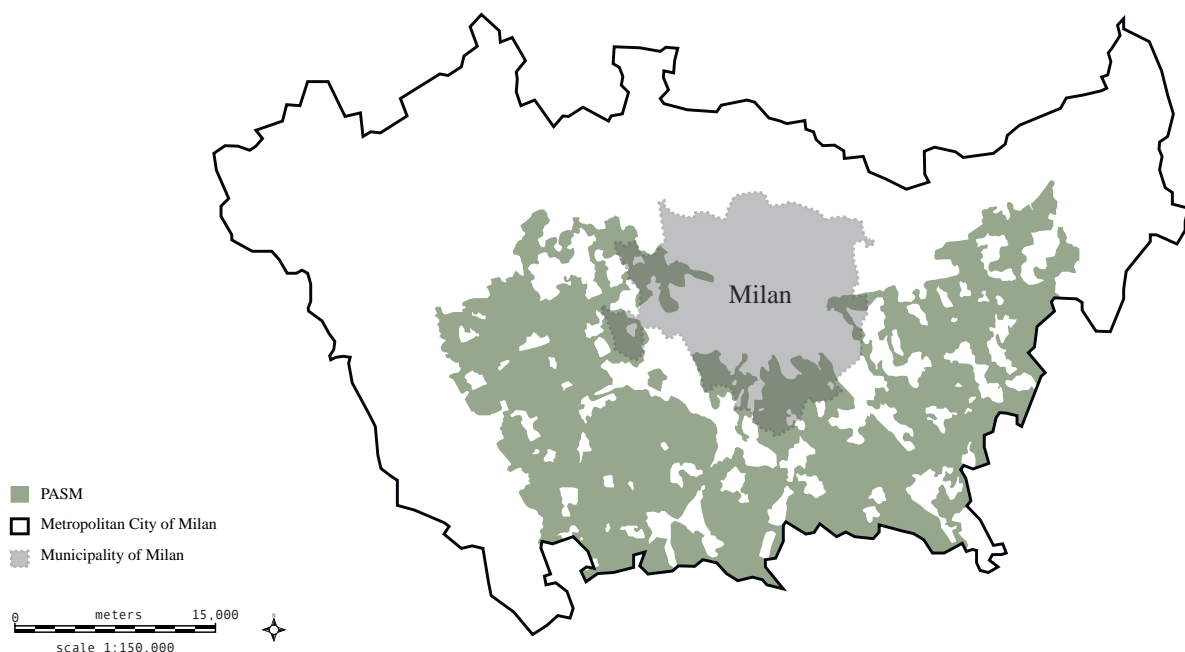
Of note, the productive nature of the PASM was to be maintained, for the goal was not of creating "green belts", such as London's, or peri-urban parks such as Paris. Instead the focus was on the preservation of the physical and environmental characteristics of this territory and the creation a model agricultural production areas. For example, areas with high availability of water are characterized by intensive cultivation of cereals, in particular rice and corn are typical products of the PASM. Areas with less water are allocated mainly to the alimentation of livestock, primarily for industrial dairy production. The other types of crops are grown but they represent marginal portions of the local production (as showed in Table 2), implying the need to supply these food items from external markets, both Italian and international.

Figure 3: Map of Parco Agricolo Sud di Milano – PASM.
Source: Re-elaborated by Stefano Quaglia on Metropolitan City of Milan Data, 2010

CROPS	HECTARES	% OF TOTAL
Corn	17 337	47%
Rice	10 699	29%
Grassland and permanent pasture	4034	11%
Autumn-winter cereal crops	2018	6%
Soybean	1830	5%
Tree crops	465	1%
Horticultural and floricultural crops	117	0%
Total	36 500	100%

Table 2: Crops cultivated in the PASM.
Source: Re-elaborated on data Migliorini, Scaltriti, 2012

PASM is managed by the Metropolitan City of Milan through the "*Piano Territoriale di Coordinamento*" (PTC – Territorial Coordination Plan) introduced in 2000 with the aim of defining land use within the park boundaries. PTC identifies rules for the protection of natural and agricultural areas, as well as the cultural heritage and waterways, and for the fruition of open spaces. Indeed, the PTC sets the specific planning competencies of the governing authority, responsible for the definition of implementation plans (sector plan, natural reserve and peri-urban park plans).

However, as observed by Vescovi (2014), the initial lack of and then late adoption of an implementation plans represents one of the main limits towards the integration between urban and rural development. Lack of implementation undermined the original multi-functional purpose of the PASM and limited its role to that of a passive urban policy tool for contrasting urbanisation pressures.

It also is important to consider the threats to agricultural production. They are deriving from demographic growth, urbanization of peri-urban areas and the development of new infrastructures. For example, between 1999-2009 the PASM has lost 1,042 ha of rural land (CRCS, 2013). In addition, the reliance on monoculture practices, has also contributed to the loss of agro-biodiversity. These dynamics are predicted to have heavy impacts on this territory, reducing its ability to respond to the local food demand from the 15.93% in 2011 to an estimated 12.89% in 2020 (Province of Milan, 2011).

PLACE-BASED PROGRAMS

All these features and dynamics of PASM resulted in a complex territory, where parks, wilderness, agricultural activities, and urbanized areas coexist. A good illustration would be the Muggiano enclave. Situated at the extreme west of Milan's municipal territory and cut off from the rest of the city by the ring road (*tangenziale*), it is an agricultural enclave with a quite important productive function. But it also hosts a park with recreative purpose (fishing, boating), and elements essential for the biodiversity of the whole area (waterbodies, green corridors). This complexity is an opportunity for Milan, but it also inherently carries considerable stakes in terms of governance, infrastructure development and development paths. Oddly areas like Muggiano, with strong latent potential, are currently losing inhabitants and productive capacity. To continue they would have to invent their own development path, a place between production and conservation.

Because of both the substantial political inertia to implementing adequate policies and the environmental risks for the food production, in the recent years various place-based programs have been carried out, in the metropolitan area of Milan, with the overall aim of enhancing the landscape values, producing quality food. These new efforts focused on methods to improve the sustainability of the local agricultural production and develop a new model, alternative to the conventional one, through the integration of the food sovereignty[ii] approach (Calori, 2009). It has been showed by initiatives of food education and local product sales carried out by the community-supported agriculture (CSA), as well as the diffusion of "ethical consumerism" culture and new markets and forms of short chain around Milan (Tricarico, 2014).

---

ii Food sovereignty is the right of each nation to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity" (Via Campesina, 1996).

CREATION OF THE MILAN AGRICULTURAL DISTRICT

Among the many policies and projects introduced was the creation of the *Distretto Agricolo Milanese* (DAM – Milan Agricultural District) in 2011. A joint effort of the City of Milan and local farmers, the program serves as a key component of the integration of urban planning and food systems in a perspective of neo-ruralisation of the city.

The DAM is a non-profit association, recognized as a Consortium by the Lombardy Region and, indirectly, as a Rural District by the European Commission[iii]. The program involves 31 farms with a total of 1,500 ha within the Municipality of Milan. It represents an innovative model of territorial governance aimed at developing a territorially embedded agricultural production, through the valorisation of local farms and the quality of landscape, protecting common goods as water and soil, and fostering the distribution and commercialisation of local food production.

Figure 4: Distretto Agricolo Milanese (DAM) [Milan Agricultural District]. Source: DAM, 2011

The District works as a coordinating body gathering together public and private stakeholders to strengthening the urban-rural interactions. It is backed by a Strategic Plan (*Piano del Distretto Rurale di Milano*) approved in 2011. The Strategic plan was developed considering the direction of the Common Agricultural Policy (CAP), which are oriented towards the promotion of territorial ruralisation policy, and the goals defined by the European Strategy 2020 in terms of raising level of employment, reducing poverty, and mitigating climate

---

iii The European Commission, through the Decision C (2008) 7843 of 10 December, has given its consent to the grating of State aids for implementing the Rural District Contracts.

change's effects. The goals of the Plan refer to the following key issues:

· *Production*: protection of common goods, as water and soil; diversification of agricultural production, both for establishing better relationships between local demand and supply, and for improving the quality of rural landscape; increase products processing capacity on-site; improvement of accommodation capacity.
· Marketing: promotion of local food production and direct sales through new distribution channels.
· Territorial protection and safety: protection from micro and macro criminality, especially in terms of land abuse, and upgrading of the farms to the current normative.
· Ecosystem and landscape services improvement: maintenance of green and blue infrastructures and requalification and valorisation of historical and natural elements (e.g. farmhouses, karst springs, canals and wooded areas)[iv].

This plan therefore represents an innovative approach towards the neo-ruralisation of the city, thanks to its vision based on the key role played by the famers who become the main actors. Local authorities are their partners. Agricultural areas are a strategic asset for the sustainable development of metropolitan area.

Moreover, the partnership between the DAM and local authorities has been strengthened with the signature of the "*Protocollo d'Intesa – Strategia per lo sviluppo rurale di Milano*[v]" (Agreement Protocol - Strategy for the rural development of Milan) in May 2012. This Agreement, developed on the vision of DAM's Strategic Plan, can be considered as the starting point of a pathway aimed at defining an urban-rural shared development strategy, between public and private stakeholders involved in the metropolitan food system.

A leading project of the DAM is the *Parco delle Risaie* (Rice Park), an agricultural area of 650 ha within the PASM boundaries, which was strongly exposed to the threat of urbanization. Its recovery and valorisation started thanks to the mobilisation of citizens and farmers, with the assistance of a not-profit association, *Associazione Parco delle Risaie Onlus*. In 2008, a bottom-up process for re-establishing both the natural and agricultural features of the area and its socio-economic value was begun. It goals were to strengthen the linkages between urban and rural contexts by a direct involvement of local stakeholders and authorities. The association's strategic vision was defined by a democratic decision making-process. It is implemented, through financing and promotion of fund raising initiatives, by developing the citizens' knowledge and participation in the project, recovering the rural landscape and pursuing the farming's multi-functionality, as well as fostering the diffusion of local rice production.

iv Consorzio DAM-Distretto Rurale Milanese, (2011), Piano del Distretto Rurale di Milano. Un processo di neoruralizzazione di Milano. Available at: http://consorziodam.com/wp-content/uploads/2012/07/PIANO-DISTRETTO-AGRICOLO-RURALE-DI-MILANO.pdf [consulted 02/2016].

v Protocollo d'Intesa-Strategia per lo sviluppo rurale di Milano. Available at: http://www.agricity.it/wp-content/uploads/Politiche/Protocollo-firmato.pdf [consulted 02/2016]

FRAMEWORK AGREEMENT FOR TERRITORIAL DEVELOPMENT

The implementation of these projects in the metropolitan territory has triggered a debate between institutions and farmers, leading in 2013, to the Lombardy Region's promotion of the "*Accordo Quadro di Sviluppo Territoriale*[vi]" (AQST-Framework Agreement for Territorial Development). This agreement created a new form of governance, called the "Milan Urban Metropolis". It was accompanied by an Action Plan addressing several macro-objectives, such as improvement of irrigation system, landscape and environmental requalification, multi-functionality, valorisation of rural culture and the innovation of production, distribution and marketing.

Through the signature of AQST, three other rural districts, located in the metropolitan area, have been involved in the process of neo-ruralisation*: Distretto Agricolo della Valle Olona* (D.A.V.O); *Distretto Neorurale delle Tre Acque di Milano* (DiNaMo); *Distretto Rurale Riso & Rane*. The involvement of metropolitan districts must be considered as an important aspect of this agreement for it permits both the extension of the neo-ruralisation strategy to a wider range of stakeholders and creates of a network of actors able to work as a system while previously actors worked alone to achieve ends.

These districts, even if they share the same organizational structure, are however characterized by different ambitions. Actions taken by the DAM, the DiNaMo and the D.A.V.O. are more aimed at finding innovative role for farms, responding to market changes under a perspective of urban-rural synergies redefinition and improving agriculture multi-functionality. Conversely, the role of *Distretto Riso e Rane* is mainly oriented to the industrial production, even if it maintains a strong linkage with the valorisation of rural landscape (Vescovi, 2014).

DISTRICTS DENOMINATION	DISTRICT TIPOLOGY	LEAD ORGANIZATION	N.OF FARMS INVOLVED	RURAL LAND COVERED (HA)
DAM-Distretto Agricolo Milanese	Rural	Municipality of Milan	31	2 000
Distretto Agricolo della Valle dell'Olona-D.A.V.O.	Rural-Fluvial	Fiume Olona Consortium	29	1 500
Distretto Neururale delle Tre Acque di Milano	Rural	Metropolitan City of Milan	60	5 500
Distretto Rurale Riso e Rane	Rural	-	61	3 500

The implementation of these place-based policies demonstrates a growing interest for the rural district model in the Milan metropolitan context. The reasons such governance models are popular include its capacity of developing collaborative networks and sharing urban-rural development strategy between local authorities, farms, NGOs, CSA and dwellers. In addition, the active role played by the farmers is crucial to pursuing to achieve an alternative model of agricultural production; one mainly related to the metropolitan food demand and, potentially, able to ensure an economic growth in the next years.

Table 3: Accredited Rural District in the Metropolitan City of Milan. Source: Metropolitan City of Milan, 2013

---

vi Accordo Quadro di Sviluppo Territoriale (AQST) "Milano Metropoli Rurale". Available at: http://lombardia.rurbance.eu/media/activity/AQST/TESTO_ACCORDO_AQST_MMR_DEF.pdf [consulted 02/2016]

EXPO 2015, LOCAL AND INTERNATIONAL DEVELOPMENTS

Regarding the rural districts, the DAM serves a key role in the process of re-ru-ralisation of the city. It has collaborated with the Municipality of Milan on several projects related with the Expo 2015 (e.g. the "Vie d'Acqua", a discussed project for the recovery and valorisation of peri-urban landscape around Milan). This mega-event, hosted by the City of Milan tackled the topic "Feeding the Planet, Energy for Life!" and triggered many local and global initiatives around the theme of food. It represented a further step towards the integration of food and urban systems. It also built bridges with existing initiatives within the territory. For instance, it is worth noticing that PASM was present in Expo, mainly through two pavilions (Slow Food and Cascina Triulza). Its presence took the form of film projections, animations for children, laboratories, and debates.

More ambitiously, the food themes momentum created by Expo 2015 has been used by the municipality for elaborating important internal and external projects. In particular, the vision of the municipality is now oriented to exploit the material and aesthetic resources "unlocked" by hosting the mega-event and has contributed to the development of its legacy plan, with the aim of boosting the implementation of the city re-ruralisation strategy.

Considering that, beyond the urban physical transformations around the city, the main legacy of Expo2015 is represented by the definition of the Milano Food Policy 2015-2020 and the Milan Urban Food Policy Pact.

MILANO FOOD POLICY

At the local level, the authorities initiated a process called "Milan Food Policy", aiming at better understanding the city's food system, identifying problems and opportunities, consulting and mobilizing stakeholder, and translating this knowledge into concrete action.

The elaboration of the food policy started with the work of experts, who gathered data on several aspects of the Milan food system. A working group organized their results around ten themes: Governance, Education, Waste, Access, Wellbeing, Environment, Agroecosystem, Production, Finance and Trade. This effort resulted in the publication of a document, "*Le dieci questioni della Food Policy*" (the 10 questions of the Food Policy) that was widely distributed to inform and engage with both stakeholders and citizens. The document was used to support the following actions:

· In February 2015, the municipal council defined its priorities and objectives for the development of the Food Policy.
· In March 2015, the third sector was consulted at the occasion of a side-event at "Fa' la cosa giusta", the largest Italian fair on sustainable lifestyles organized every year in Milan.
· In April 2015, a dialogue was initiated with start-ups and small businesses of the food sector.
· In May 2015, to reach as many citizens as possible, the report's recommendations were broken out to conform to the 9 administrative subdivisions.
· In June 2015, large private firms from the food sectors have been consulted.
· The results of this processed was wrapped up and discussed in a "Town Meeting" open to the public, that was held in July 2015.

The concrete outcome of this process was the adoption, by the Milan City Council in October 2015, of guidelines for the Food Policy 2015-2020.[vii] This document the "linee guide" set up five priorities, all subdivided in detailed potential paths for actions:

· Guarantee healthy food and sufficient drinkable water for all
· Promote Food System's sustainability
· Food education
· Fight against waste
· Support and promote scientific research in the agro-food sector

At the end of the document, the authors also listed the tools that are to be developed in support of these guidelines and recommended actions. They recommended the creation of a Food Metropolitan Council, which would help mobile and be responsible to all the relevant actors. The discussions and deliberations of such an institution should be backed by a strong monitoring system, able to provide relevant data and information on the local food system.

A first implementation project related with this policy has recently been announced by the City of Milan. In collaboration with the DAM and *Milano Ristorazione*, the company in charge of Milan's collective restauration, local authorities want the rice served in school canteens to come from local short supply chains[viii]. The goal represents a first step towards connecting local production, and especially the one coming from PASM, with local consumption. The project moreover has a cultural and educative component, for rice is an important local production (see table 1 and 2) that is already strongly put forward in the PASM context with the *Parco delle Risaie* (cf. supra).

**INTERNATIONAL DEVELOPMENT:
THE MILAN URBAN FOOD POLICY PACT**

The Milan Urban Food Policy Pact was conceived as an effort from the municipality to take advantage of the momentum created by Expo2015 to put food related issues at the agenda of cities worldwide. Signed by over 150 municipal and metropolitan authorities worldwide, it aims at encouraging them to engaging with these issues, and to spread good practices drawn from international examples. Current developments include setting up an international award to encourage cities to take concrete steps into implementing the actions suggested by the pact. A technical assistance including monitoring tools will be backed by FAO's "Food for Cities" programme.

---

vii Milan Municipal Council 05/10/2015 deliberation n°25, available at: http://www.foodpolicymilano. org/wp-content/uploads/2015/10/CC-n.-25-del-5.10.2015.pdf [consulted 02/2016]

viii City of Milan's website [Italian]: http://www.comune.milano.it/wps/portal/ist/it/news/primopiano/ tutte_notizie/urbanistica/riso_cascine_tavole [consulted 04/2016]

Figure 5: Paddy fields in Milan.
Source: Associazione Parco delle
Risaie, 2015

CONCLUSION

Milan has been confronted, in the last half-century, with challenges not un-common to major European metropolises: rapid and spreading peri-urbani-sation, increase of air pollution level, climate change effects, growing internal demand, degradation of green and blue infrastructures and increasing com-plexity of food provision logistic.

The originality of the Milanese case has been its capacity, quite early if we are to compare it to similar cities (especially in the Italian context), to recognize food production and distribution as a relevant urban issue. This local mobilisation around food-related themes had concrete outcomes, chiefly the creation of the PASM and the DAM, as well as the promotion of educational and informational initiatives and projects to improve food access and reduce waste.

The PASM, despite its passive role as just a barrier to urban sprawl, is a quite unique example of a voluntary action taken to preserve agricultural produc-

tion capacity within a metropolitan territory (or at its immediate proximity). Coupled with the ambitious institutional arrangement of the DAM, it helped maintaining a significant level of local food production, while encouraging bottom–up initiatives in favour of biodiversity preservation and the strengthening of urban-rural relationships.

In addition, the implementation of DAM, as well as the other rural districts, appears as an important step taken towards the creation of a more democratic decision-making process for achieving a sustainable management of agricultural land and increasing the resilience of urban food system.

As ambitious and original these elements might have been, there were not exempt of flaws. Indeed, articulating environmental protection priorities with urban development policies, while paying special attention to the local food production, appear as a critical challenge for Milan.

It requires a clear and democratic governance structure, availability of economic resources and a long-term strategy for the implementation of shared objectives. The PASM's management of the peri-urban spaces in the last decades appears to have failed to that these factors fully into account. Actually, in spite of its successes in preserving the agricultural capacity of this territory, it has arguably not been able to propose adequate policy for developing a strategy oriented towards the integration of interacting factors such as urban agriculture, land use management and food security.

That experience, however, reinforced by the recent place-based initiatives developed in the Milan context, can be considered as a positive stepping stone in the process towards the enhancement of Milan food system, from municipal to regional scale. This has been especially relevant in the recent period in which the city has been taking advantage of the momentum created by Expo 2015, bringing financial resources, political will and media attention. Local authorities therefore engaged in a process aiming at defining an overarching "Food Policy". With the close collaboration of experts, a large consultation was started and resulted into the adoption of detailed guidelines by the Municipal Council.

It is yet too early to assess the concrete results of this process, although it has the potential for improving the metropolitan food system, especially from sustainable and resilient points of view. Still, even the beginning of its implementation can be considered a progress. Beyond the institutional initiatives that are progressively being developed to translate these words into concrete projects, the debates around Milan's food system have arguably contributed to shifting individual and business practices. As far as the latter is concerned, a noteworthy initiative has been taken by the Esselunga supermarkets, 49 of which started selling locally produced rice (under the brand "DAM") in April 2015[ix].

—

ix City of Milan website [Italian]: http://www.comune.milano.it/wps/portal/ist/it/news/primopiano/
tutte_notizie/urbanistica/riso_distretto_milanese [consulted 04/2016]

References

Borasio, M. & Prusicki, M. (2014), Milan rural metropolis. A project for the enhancement of waters towards the neo neo-ruralisation of territorial system in Milan, Scienze del Territorio, 2, pp. 135-146.

Calori A., (2009), Dal Parco Agricolo alla regione milanese: empowerment degli attori per la riconquista della sovranità alimentare, Pianificare tra Città e Campagna. Scenari, attori e progetti di nuova ruralità per il territorio di Parto, pp. 91-114.

CRCS – Centro di Ricerca sul Consumo di Suolo, (2013), Nota CRCS sul consumo di suolo nei parchi lombardi. Available at: http://www.consumosuolo.org/files/2015/09/CRCS_aree-protette.pdf [consulted 02/16].

Donadieu P., (2013), Campagne Urbane. Una nuova proposta di paesaggio della città, Donzelli, Roma.

Magoni, M. & Colucci, A., (2015), Protection of Peri-Urban Open Spaces and Food-System Strategies. The Case of Parco delle Risaie in Milan, Planning Practice & Research, pp. 1-15

Migliorini, P. & Scaltriti, B., (2012), Evaluation of sustainability of the farms in the Agricultural Park of South Milan and their production chain, New Medit, 4, pp. 53-56. Available at: www.iamb.it/share/img_new_medit_articoli/479_53migliorini.pdf [consulted 01/2016]

Province of Milan, (2011), SEA- Environmental Report of the Provincial Plan. Available at: http://allegati.provincia.milano.it/pianificazione/allegati/piano_territoriale/adeguamento_in_corso_adottato/VAS_Rapporto_ambientale.pdf [consulted 01/2016].

Tricarico L. (2014), Imprese di comunità nelle politiche di rigenerazione urbana: definire e inquadrare il contesto italiano, Working Paper Euricse, n. 68|14.

Vescovi, F., (2014), Parco Agricolo Sud ed Expo 2015: per una nuova governance dell'agricoltura periurbana milanese, Territorio, 70, pp. 92-100.

Via Campesina, (1996), Food Sovereignty: A Future without Hunger, Position paper. Available at: http://www.voiceoftheturtle.org/library/1996 Declaration of Food Sovereignty.pdf [consulted 01/2016]

FROM AN EMERGENCY URBAN AGRICULTURE PROGRAM TO A REGIONAL FOOD PLANNING SYSTEM

CRITICAL OVERVIEW OF 15 YEARS OF PRACTICES, PLANNING AND POLICIES. ROSARIO, ARGENTINA

Mónica Bifarello*, Sabrina Arcamone

Farmers selling their produce at Plaza Suecia Fair. Source: Social Economy Secretary, Rosario´s Municipality

INTRODUCTION

Urban Agriculture in the city of Rosario has turned out to be one of those public policies which leaves an indelible mark on the local territory. Born as a strategy to mitigate the problems of poverty and unemployment, over time it has been consolidated as a truly innovative alternative in the field of social economy. Fifteen years after its beginnings, its foundations have been strengthened, its activities have become diversified and sustainable; and new challenges are emerging for the future. The reality is that Urban Agriculture has gone beyond the limits of a simple program, and has been transformed into a complex process of social learning that has introduced significant innovations into the city's public policy-making process.

One of the most significant innovations of this process is how it transcended its origins as a reactive strategy to enhance food security. It has become a proactive approach fostering discussion, and ultimately the implementation of ways to recover urban and peri-urban land for agroecology and organic food production. It has fostered a linkage between urban agricultural and local urban planning. Furthermore, the process brought about a holistic vision that has been developed around Urban Agriculture. We now know that urban agriculture is not limited to only food production; it incorporates various components of the food chain. It reinforces specific knowledge and know-how about: recognizing the characteristics of different type of soils and soil preparation; adding value through agro-industry; natural cosmetics and medicine; and, commercialization channels. In addition to these specific aspects, Urban Agriculture promotes the important principles of fair pricing, responsible consumption, respect for the environment, cooperative and soli-

darity-based relationships among stakeholders. These factors uniquely characterize our local experience.

The goal of this article is to provide an overview of the history of Urban Agriculture in Rosario, with an emphasis on the positive transformations that it has generated in urban planning, as well as to discuss the main present and future challenges that it faces.

ORIGIN AND EVOLUTION OF URBAN AGRICULTURE IN ROSARIO

In 2001 the national government fell in Argentina, as a result of a period of deep recession and the imposition of neoliberal policies, all of which produced political, economic and social crisis. Increased unemployment, emigration and growing poverty were the consequences of the application of exclusionary, wealth-concentrating macroeconomic policies, based on the structural adjustment recipes of the IMF and the World Bank. The deterioration in the legitimacy of both state and civil society institutions sparked numerous protests in public spaces, and broke down trust between citizens and their representatives.

During this period, numerous families were leaving behind their provinces of origin and hoping to escape the regional crisis. These migrant families, left decimated and vulnerable, came from the northern part of the country, from provinces like Chaco, Corrientes and Santiago del Estero. Most of these migrants were traditional small rural farmers.

It is important to note that since the end of the 1990s, the city had been embarking upon a set of social policies which had begun to set it apart from the rest of the country. Of particular note was the construction of an accessible public health care system, based on solidarity and an emphasis on primary care; as well as strong social welfare policies, focused primarily on young children. In Rosario, these migrants hoped to find social stability, access to health care, and the chance to restart their lives and livelihoods.

However, by late 2001 the city of Rosario had one of the highest unemployment rates in the country; everything appeared to be collapsing under the weight of the crisis.

In February 2002, in order to confront the crisis, the Secretary of Social Outreach of the Municipality of Rosario put into motion an Urban Agriculture Program. In collaboration with a non-governmental organization named CEPAR (the Center for Agro-Ecological Production Studies), it brought together a group of agricultural engineers who had been working on a program of agro-ecological huertas, or urban gardens, aimed at vulnerable families living in marginal areas of the city since the end of the 1980s. (The early effort was known as the Pro-Huerta Program of the National Institute of Agricultural Technology (INTA) and the National Ministry of Social Development.)

The primary objectives established for the Urban Agriculture Program were: to produce healthy, agro-ecological food of a high biological value; to establish a rapid-growth food production system; and, to guarantee direct sales through farmers markets located in popular spaces in the city. A key idea was to use vacant lots for production activities to avoid the spread of irregular settlements.

In this first phase, under pressure to address the economic emergency (2002-2004), the Urban Agriculture Program was established as an immediate assistance strategy. The gardens were established as a space of social support, facilitating access to safe food products and a basic source of income. Almost

immediately, the Urban Agriculture Program began to make a significant contribution to the food security of families socially vulnerable, while helping households to save money in a context of economic crisis and scarce resources. The first actions taken by the program, such as accompanying the new urban farmers, providing training in the field, and the inauguration of the first farmer's market validated the program as a productive activity that provided an opportunity for certain groups of unemployed people.

As the country gradually began to recover from the crisis, urban agriculture was consolidated into a permanent activity, with secure spaces for production and commercialization, and was mainstreamed as a municipal policy.

The availability of secure land for production shows that the activity can be a stable employment alternative for some sectors, and at the same time, can transform the urban landscape in an educational and inclusive way. One far-reaching innovation which notably bolstered urban agriculture efforts was the passage of municipal ordinance no. 4713. This act invited all land owners to cede their properties for a period of two (2) years, free of charge, to the Municipality of Rosario for use by the Urban Agriculture Program. In exchange, the ceded property would be exempt from the payment of the General Property Tax and the Vacant Lot Surcharge established by the Tax Code, in addition to negotiating other exemptions from the Provincial Real Estate Tax.

With this policy tool, plots which were little more than garbage dumps were transformed into urban agriculture spaces. Some plots were immediately productive. Others, with unproductive site attributes, were transformed into urban gardens using techniques to enhance the value of the soil, such as: producing compound fertilizer (vermicomposting; recycling organic wastes through living processes); planting green fertilizers (to enhance the biological activity of the soil and encourage a greater diversity of species) and producing and applying biopreparations, phytostimulants and other elements.

Today, the Urban Agriculture Program operates under the Secretariat of Social Economy of the Municipality of Rosario, and has developed fully equipped plots with larger surface areas, covering a total of 25 ha. The program has demonstrated its potential and positioned as a strong and permanently entrenched public policy, which is continuing its progressive and balanced growth, based on ongoing collaboration among all stakeholders.

Figure 1: Hort in the Garden Park "Bosque de los Constituyentes". Source: Social Economy Secretary, Rosario´s Municipality

SPACES AND TOOLS DEVELOPED BY THE URBAN AGRICULTURE PROGRAM IN THE CITY:

The **Garden Parks** are five large public spaces, serving both educational and productive purposes, complete with infrastructure, equipment, and a landscape-focused design. In these spaces, in addition to farming and training activities, cultural and sports activities take place, as they are ideally suited for recreation. They feature large working plots measuring 900 m^2, for larger-scale production as well as smaller plots for growing vegetables, aromatic and medicinal plants.

Along the **train track corridors**, the basic infrastructure necessary to grow vegetables and aromatic plants was installed. These spaces are normally occupied by irregular settlements.

The **garden farms** are plots containing a collection of herbal plants, bushes and trees (vegetables, aromatic and medicinal plants, and flowers), which have been adapted to the climate and growing conditions of Rosario. They are spaces for demonstrations and training developed in public places (plazas and parks) where organoponic techniques are applied.

Healthy gardens are demonstrative and training sites located on the grounds of public municipal hospitals where medicinal plants are cultivated. In order to centralize the production of vegetable and aromatic plant seedlings and to prepare compound fertilizer, a **nursery** has also been installed in the city.

In addition, and with the objective of giving added value to the primary production and to integrate the entire production chain, **three Urban Social Agribusinesses** have been established in the city: a Natural Cosmetics Production Plant, a Fruit and Vegetable Processing Plant and an Integrated Produce and Cosmetics Processing Plant. These plants can produce preserves, washed and cut produce for consumption and for salads. Natural cosmetic products are also produced by hand, using aromatic plants, along with organic insect repellants.

With respect to the spaces where urban farmers can sell their products, more than 700 farmers markets or fairs are held each year, where the farmers have stands to sell to the public. In addition, the municipality purchases bags of produce from the farmers which are offered during special events in exchange for recyclable waste (paper, electronic and computer articles, etc.).

PARQUES HUERTAS Y AGROINDUSTRIAS

Huertas y Parques Huertas

1- La Tablada
2- Molino Blanco
3- El Bosque
4- Hogar Español
5- Los Horneros
6- Rosarina Linda
7- El Huerterito de la Newbery
8- La Paloma
9- El Aromito

10- El Orégano
11- Corredor verde de las Vías
12- Corredor verde de las vías Pauhen
13- Centro demostrativo para la Huerta en Casa
14- Jardín Saludable Medicinal Hospital Carrasco

Agroindustrias

A- Agroindustria de Verdura y Cosmética Natural
B- Agroindustrias del Oeste

Rosario=

Figure 2: Spaces by the Urban Agriculture Program in the city. Source: Planning Secretary of Rosario

ROSARIO AND THE REGION

The city of Rosario is the nucleus of the Rosario Metropolitan Area (AMR), comprised of a set of cities and towns located in the southern part of the province of Santa Fe. The towns and communities within the AMR are: Acebal, Álvarez, Alvear, Arroyo Seco, Capitán Bermúdez, Coronel Domínguez, Empalme Villa Constitución, Fighiera, Funes, General Lagos, Granadero Baigorria, Ibarlucea, Pérez, Piñero, Pueblo Andino, Pueblo Esther, Ricardone, Rosario, San Lorenzo, Soldini, Villa Gobernador Gálvez and Zavalla. These communities are united by geographic proximity and the services – and challenges – that they share (transportation, waste disposal, industrial sites, etc.). Approximately 1.5 million people live in the AMR, in an area of 1770 km^2. This territory is highly heterogenous and complex, both socially and economically.

Under current legislation, metropolitan areas in Argentina do not have their own government. Civil officials are elected at the local level (either municipal-

ities with populations of more than 10,000, or *comunas* for populations of less than 10,000). The next higher authority is the government of the Province of Santa Fe.

To fill the gap in regional governance and to forward the institutional consolidation of the AMR was the 2010 creation of a Metropolitan Coordinating Body (ECOM), which occupies the intermediate space between province and municipal governments. It functions to "coordinate and promote public policies with a regional impact. It is organized as a strategic partnership among the localities and serves as the leading institution for development projects at the metropolitan level." This body, presided over by the city of Rosario, also has a "Council of Government, comprised of all of the member community's mayors and *comuna* presidents and a Board of Directors, which is the executive body for implementing the decisions of the Council and which serves as the legal representative of the Body. There is also an Executive Secretary and a Technical Advisory Council" (taken from the institutional documents of the ECOM).

Figure 3: Social Economy´s Fair in Suecia Park, Rosario. Source: Social Economy Secretary, Rosario´s Municipality

For operational purposes within the AMR, and based on multiple studies and assessments conducted in the region, four corridors have been identified. These corridors have become the organizing axes or "backbones" which are of great use in addressing the problems identified in the area. The corridors are:

· **North Corridor**, which basically stretches along Route 11, alongside the Paraná River from Rosario to the northern part of the Area;
· **Northwest Corridor**, comprised of the communities located along the length of Route 9;
· **West Corridor**, located along Route 33 and Route 14; and,
· **South Corridor**, which links the communities located to the south of Rosario, along both the Paraná River and Route 21.

The vast diversity of these backbones is related primarily to the size and the economic and technical capacity of the different localities to initiate and sustain local development processes. Despite its high degree of interdependence, the AMR has traditionally been very fragmented with limited efforts at cooperation. This situation has been changing, thanks to years of concerted effort reinforced by the Strategic Metropolitan Plan (2008-2018) and the recent creation of the Metropolitan Coordinating Body.

With respect to its economy, the productive structure of the AMR is diversified (Herzer, 2005). Greater Rosario is characterized by small and medium-sized enterprises, industrial areas, and a belt of traditional "*quintas*" or farms bordering the city of Rosario, which have traditionally been incorporated into the urban agriculture movement through the cultivation of organic produce, in a project known as the "green belt".

There is still an ongoing debate regarding the current and future geographic scope and limits of urban agriculture in Rosario. While we know that the dynamic nature of urban projects makes it difficult to specify the territorial scope of the next stages, it is clear in principle that it will not be the entire region. This is because of the heterogeneous interests and forms of production, and that current trends point toward an extension toward the west corridor of the AMR, by virtue of its traditional forms of production and the interest of local actors.

For example, one characteristic of Rosario that has favored the development of Urban Agriculture is its long history of land use planning. This tradition started in 1960s, when traditional physical planning used broad strokes to identify the areas of growth of the city. This changed and was enhanced in the late 1990's, when the local society began to fully engage in the strategic planning process, a process which has continued to this day. The idea today is to take a multidisciplinary and multi-sectoral approach to planning and to seek consensus among the main stakeholders regarding the principles that will guide the growth and development of the local territory over the medium and long term.

Rosario's first Strategic Plan was begun in 1996 and completed in 1998. The main contributions of this Plan – which aimed at restoring the identity and pride of the city around five thematic areas: Work, Opportunities, the Relationship between the City and the Paraná River, Creation, and Encounter – were its emphasis on the use, enjoyment, accessibility and equilibrium of public spaces and the importance placed on citizen participation and collaboration among public, private and social stakeholders. (These same themes provided the foundation for the Urban Agriculture program when it emerged in the wake of Argentina's economic crisis of 2001.)

Ten years into its implementation, after approximately 90% of the proposed projects had been executed, a second Plan was debated and formulated named the Metropolitan Strategic Plan (PEM-2008). This Plan added the necessary Metropolitan dimension to the territorial analysis, and identified the need to see Rosario from a regional perspective. One of its main outcomes of this plan was the Metropolitan Coordinating Body.

Part of the Metropolitan Strategic Plan (PEM-2008) is a section, named "Metropolis of Opportunities and Citizenship", which calls for valuing the role of local governments and a commitment to strengthen territorial processes. It supports the practices of solidarity-based economy, through networking among the different levels of government and community and social organizations.

This Plan also notes that the processes which form a part of the development of the social economy, along with the actors which promote its values, need to be strengthened by addressing the following main areas:

1. Building the capacity of production units and the distribution, commercialization and financing systems by:
   a) Providing training in specific areas that will help producers to increase the value and quantity of their products and to incorporate appropriate technology.
   b) Consolidating solidarity-based commercial structures, by establishing new sales outlets and reorganizing existing ones.
   c) Developing adequate instruments to capture or create lines of credit.

2. Fostering the growth of production units: the goal is to promote these strategies as an alternative for those citizens who have not been able to integrate into the formal job market, providing tools for learning and for obtaining the inputs necessary to launch their activities.

3. Promoting strategic projects with social value for the region, by establishing larger-scale enterprises.

The third Strategic Plan, known as "Rosario 2030", is currently being debated, with an emphasis on the physical and social integration of the city which, despite the many public policies implemented, continues to struggle against a constant dynamic of segmentation. We believe that the Social Economy in general, and Urban Agriculture in particular, will have much to contribute to this integration, by encouraging harmonious co-existence, lowering the levels of violence, building territorial ties and forging new civic identities.

We must also mention that city's Urban Plan, which as a complementary instrument to these overarching plans, has incorporated into the physical planning structure the current and potential spaces where an agri-food system can flourish.

Along these lines, the 2007-2017 Rosario Urban Plan states: "The La Tablada Garden Park, which is a part of the auspicious municipal Urban Agriculture Program, was inaugurated as the first initiative of this type in May of 2007. The garden parks were conceived of as multi-functional public spaces, managed in a participatory way by the state and civil society, functioning as bands of nature designed and created by man using ecological farming techniques. They include productive areas for growing products for household consumption as well as the sale of vegetables, flowers, medicinal plants, bushes and trees co-existing with landscaped areas for recreational purposes.

These enterprises are intended to supplement the income of the urban farmers, by facilitating their access to a larger working area and better production conditions; recover public spaces for social and productive uses, with a view to enhancing the urban landscape and the environment; improve the health of the population (producers and consumers) by providing access to produce with high biological value through ecological cultivation techniques; and to build the productive capacities of the actors associated with each Garden Park, by offering training programs and organizing specialized activities." [i]

In a region where the main economic activity is soy monocropping and soy

---

i http://www.rosario.gov.ar/web/ciudad/planeamiento-urbano/plan-urbano-rosario/libro-plan-urbano-rosario-2007/2017 Page 248

exportation, it is very encouraging that Rosario's urban planning process incorporates the development of programs like Urban Agriculture and the Green Belt Project, which point toward a different form of production. It is not only about providing crop diversification, it maintains the traditional production values, knowledge and cultures of the people who are sustaining the production, the landscapes and spaces where we grow our food. This approach is absolutely noteworthy, and for this reason the experience has attracted international attention.

Figure 4: Social Economy´s Fair in Suecia Park. Source: Social Economy Secretary, Rosario´s Municipality

VALUING THE LOCAL EXPERIENCE AND COORDINATION AMONG THE DIFFERENT LEVELS OF GOVERNMENT

Since the 1990s, Rosario's social and political actors have agreed on the need to better drive local development and have been working towards this goal. As a result, the planning focus has been expanded to include both the city and the metropolitan area or region.

The establishment of Urban Agriculture in Rosario as a local system of production, transformation, distribution and consumption of healthy food required the active participation of the set of political and social actors within the territory. The provincial government and the local authorities (municipalities and town/community commissions) are indispensable for achieving the proposed goals. Their cooperation is vital to engage civil society organizations and the society as a whole. This is very important, because the practice of urban agriculture, as a local public policy, requires the reconstruction of the socio-cultural fabric, and the restoration of a collective and solidarity-based sense of our common life

A number of civil society organizations have been involved in the evolution of this program, such as the Rosario Foundation, environmental organizations, the Association for Dynamic Biological Agriculture in Argentina (ABBDA) among others. These organizations generally come together on a temporary basis to coordinate specific activities or initiatives. They also contribute to the program through their linkages with other important stakeholders, such as well-known traditional restaurants in the city and famous Argentine chefs, who promote the consumption of the food produced in urban gardens.

In the beginning stages of the development and operation of the Urban Agriculture Program, the Municipality of Rosario coordinated with partners like the Center for Agro-Ecological Production Studies (CEPAR), which is comprised of a group of agricultural engineers who were pioneers in the program and provide technical and methodological assistance.

The municipality also works in conjunction with the different levels of government, such as the provincial government, through its livelihoods and social development departments, the national government, through the National Institute of Agricultural Technology (INTA), whose Pro Huerta program provides seeds and technical assistance. It alsoworks with civil society organizations like the Network of Urban Farmers Civil Association, which brings together a significant number of producers in the city, represents them in various forums and advocates for their interests.

The Program has also leveraged a large number of projects and funds from international cooperation agencies, such as the International Economic Cooperation Institute of Italy (ICEI), and other partners from Canada, the Netherlands and Peru (IDRC, RUAF, IPES, the Regional "Cities Growing the Future" Program), as well as the Urban Management Program for Latin America and the Caribbean of UN-Habitat (UMP-LAC/Habitat).

Figure 5: Hort in the Garden Park "Bosque de los Constituyentes". Source:
Social Economy Secretary, Rosario´s Municipality

URBAN AGRICULTURE AS A REGIONAL PROJECT

As the Urban Agriculture experience has progressed, a new challenge has emerged for the Municipality, which consists of repurposing approximately 200 hectares of land belonging to 30 urban farmers, located in horticultural establishments in the city of Rosario and the *comuna* of Soldi. (These lands are part of a larger 824-hectare protected area for horticulture production, In accordance with Municipal Ordinance No. 9144/13 which regulates productive land) and converting them into sustainable food production systems

This project, called the "green belt", involves other localities in the West Corridor, stretching along Route 33 and Route 14, and therefore its implementation requires coordinating with different departments within the municipality, such as environment, economic production and social economy, while at the same time involving joint decision-making with other communities, thus involving the provincial government as a key strategic player.

In August 2016, the Green Belt Project was launched, to implement a transition plan toward agro-ecological production and good agricultural practices, under the framework of the concept of Sustainable Agriculture. This project is beginning with 15 experiences of transitioning toward agro-ecological production systems in horticultural production units, covering a total surface area of 20 ha.

The transition to agro-ecology is a process that implies not only substituting inputs or reducing the use of agrochemicals, but also promotes a change in the attitudes and values of social stakeholders with respect to the management and conservation of natural resources, and the social relations among those stakeholders.

The farmers who agreed to undergo this conversion process toward agro-ecological techniques have exchanged experiences with the urban gardeners of the Urban Agriculture Program, bolstered their productive capacities. They are gradually increasing their scale of production and have begun to engage in direct commercialization efforts through fairs and farmers markets, with the goal of participating in a proposed permanent public market to be established in the city this year (2017).

Another tool that this project enables the agribusinesses of the Urban Agriculture Program to receive the agro-business products thereby add value to them and identify them with a certification or seal. In this way, we can offer them to commercial outlets on a scale that is in line with the normal production levels thereby guaranteeing the market for agro-ecological products and demonstrating to those who have not yet joined the program of the validity of this type of production; without which it would fail as a project.

As the Green Belt Project progresses, there will be a significant growth in the production of safe and highly nutritional food made available to the public for consumption, which will in turn have a positive impact on the health and working conditions of the producers who become part of the process.
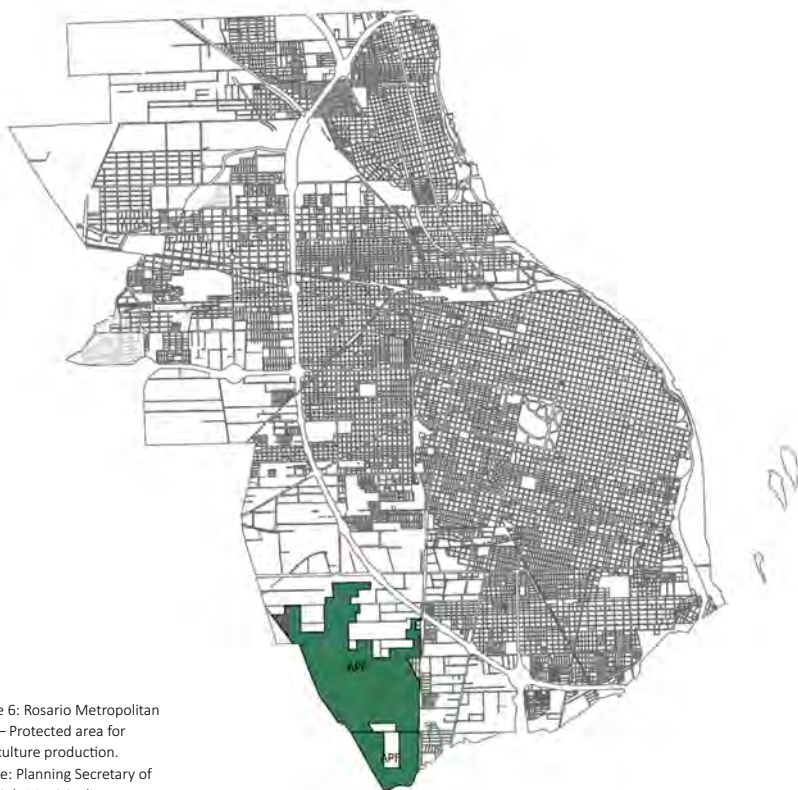
Figure 6: Rosario Metropolitan Area – Protected area for horticulture production. Source: Planning Secretary of Rosario´s Municipality

CREATING A REGIONAL FOOD SYSTEM

The strategic horizon for Urban Agriculture in Rosario and its region is the creation of a Regional Food System. The program began addressing the root causes of the reproduction of poverty as well as including groups of people who were on the margins of the labor market and encourage broader participation in decision-making. It quickly evolved into an urban social policy which systematically promotes sustainable and cooperative development.

Strengthening the institutional framework in terms of a system – not just a set of food growing activities – will make it possible to break the cycle of the intergenerational transmission of inequality. We know that there are many types of inequality, and that one of its dimensions is generated by economic structures, and therefore innovative systems are needed with a very deep knowledge of the territories where they will be introduced. Another key dimension of inequality being addressed is gender inequality, given that women make up a significant percentage of urban farmers.

Rosario has developed all of the factors which (according to Gutman 2003) are present in local agriculture/food supply systems:

· Specialization in a product or range of products;
· A context or "setting" understood as the set of social, cultural and historical factors which have taken root among the population and local institutions;
· The capacity for innovation and a learning dynamic facilitated by the dissemination of knowledge, information and traditional know-how;
· An emphasis on cooperative relations among agents.

To these we can add other facilitating elements in the construction of a regional food system:

· The experience of reorganizing urban and peri-urban spaces for the production of organic and ecological foods;
· Operating through networks of responsible production and consumption;
· The sustainability of a local process of consensus-building among stakeholders, which forms the foundation for exploring ways to scale up;
· The value of deploying integrated strategies.

CHALLENGES AND RECOMMENDATIONS

Just as the Municipality of Rosario states: "The program implies considering Urban Agriculture as a sustainable activity in its three dimensions: economic, social and environmental", we believe that these three dimensions were addressed by the Program with many successes during these 15 years of institutional experience. But we also know that securing its future will require moving from a set of activities organized under a program to a true agri-food system.

We propose five actions to be taken to strengthen agro-ecological production and to further the evolution and impact of this local experience.
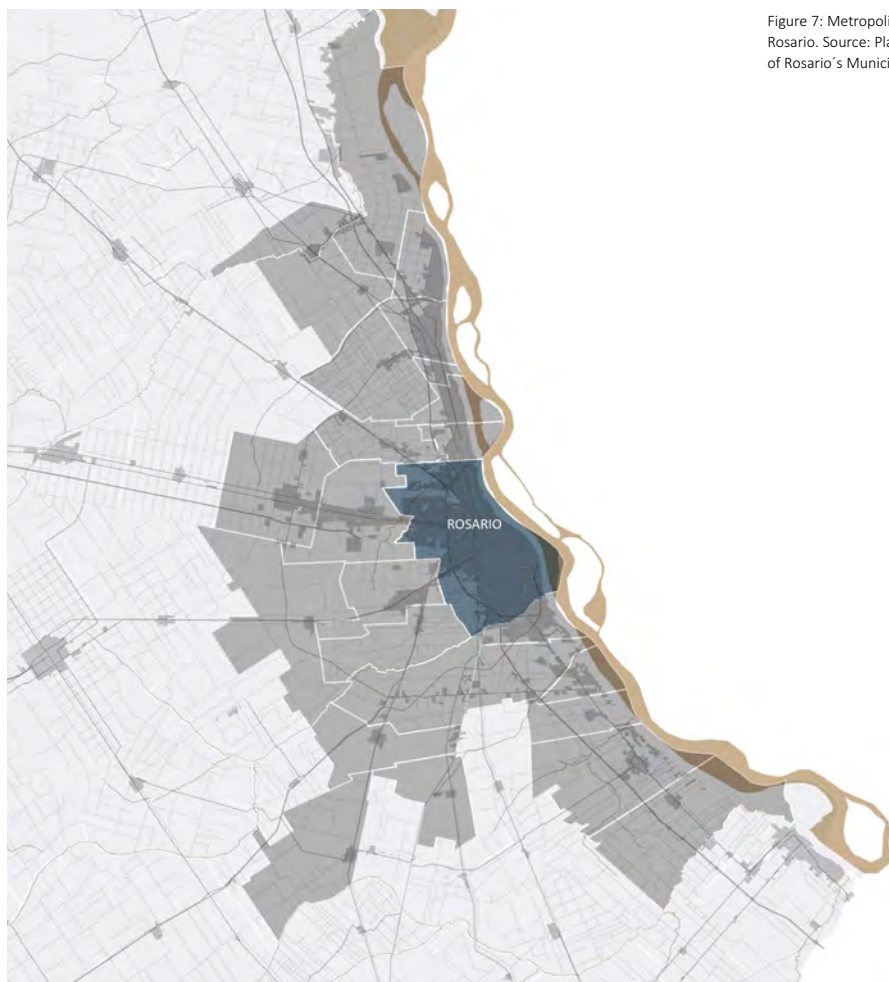
Figure 7: Metropolitan Area of Rosario. Source: Planning Secretary of Rosario´s Municipality

1. Work must be done to obtain agro-ecological quality certification, either granted by government agencies or by using a participatory guarantee system that gives consumers confidence in the products that they are buying and consuming.

While it is true that in Rosario, there is a certain degree of recognition on the part of consumers who buy these products, based on their trust and familiarity with the forms of production promoted by the Urban Agriculture Program, moving towards a formal certification system guaranteeing that these items were produced with respect for the environment, and for the principles of equity and justice, would enhance the visibility of the process and provide an even greater degree of confidence.

The International Federation of Organic Agriculture Movements (IFOAM) promotes the creation of Participatory Guarantee Systems (PGS), which are locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange." (IFOAM12).

These Participatory Guarantee Systems in addition to technical standards, incorporate other social, equality and ecological elements within the production process, while at the same time empowering both producers and consumers.

In light of what we have discussed with respect to the geographic distribution of urban gardening within the Rosario Metropolitan Area, it would be interesting for a proposal such as this to be led by the Metropolitan Coordination Body (ECOM).

2. We recommend the establishment of a regional sustainable public procurement system.

The purchasing power of governments is an objective fact, which could directly impact the development of the Urban Agriculture and Green Belt programs, guaranteeing stable production and sales volumes.

Government purchasing of agro-ecological products to be served at hospitals, school cafeterias, and other institutions would help to enrich the diet of those who most need good nutrition, but who have limited access to it. It would also benefit the producers, who could plan their crops around a stable program of government purchases. Sustainable public-sector procurement is a tool that promotes social equality, environmentally-friendly production and technological innovation while influencing the market in general; however, it is an area that is not often prioritized.

Currently, the urban farmers of the green belt who have incorporated agro-ecological practices sell more than 50% of their production volume to the wholesale fruit and vegetable markets, without being able to differentiate their products from all of the others purchased by the wholesalers which are grown using agro-chemicals. This demonstrates to us the need to expand and guarantee sales outlets in order to increase the number of producers willing to transition toward agro-ecological forms of production.

3. It is essential to have adequate monitoring and evaluation instruments to measure progress and outcomes, as well as to plan activities in the future.

At present, no specific and reliable system of indicators has been designed, with a comprehensive approach that can serve as the basis for future medium and long-term planning.

4. We recommend strengthening research into technical and production-related innovations.

The Urban Agriculture Program has been able to leverage traditional knowledge to generate new products or to preserve products that had largely been lost. For example, there is a seed bank which keeps a record of biocultural diversity, and a biodynamic calendar which seeks to harmonize crop cycles with the rhythms of nature.

The creation of seed banks is fundamental in guaranteeing the conservation of native seeds. The Ñanderoga Seed Bank, created in Rosario in 1992, today has more than 700 varieties of seeds (vegetables, ornamental, medicinal and aromatic plants, fruit and forest trees), cared for by more than 300 people (called seed godmothers or godfathers). The conservation is done in a natural and artisanal way, and the seeds are recorded in a very simple database. This Seed Bank is coordinated by the staff of the Urban Agriculture Program of the Municipality of Rosario.

Meanwhile, in the green belt, a transition process is being carried out to transform the soil, which was traditionally treated with agrochemicals, into completely organic soil. All of these initiatives would benefit from a greater level of professionalization and the incorporation of appropriate technology.

5. It will be necessary to achieve economic sustainability for producers, and for the entire Urban Agriculture value chain.

This implies increasing the municipal and provincial budgets allocated toward this effort, while exploring improved forms of self-sustainability: fairs, markets, value-added processing, and getting more and more people involved in the experience. Along these lines there are some incipient microcredit funds targeted toward urban farmers, which should be encouraged and expanded.

Addressing these factors will be crucial in building a regional agri-food system, which is economically strong and productive, without losing the identity that Urban Agriculture has built and sustained over 15 years in our city. An identity based not on merely technical aspects, but rather on values of inclusion, fair trade, cooperation and a commitment to more human cities. In this sense, in planning a food security strategy, the greatest challenge facing Urban Agriculture in Rosario today is to scale up by moving beyond the city limits and incorporating the entire metropolitan region.

ACKNOWLEDGEMENTS

—

References

Institutional documents from the Municipality of Rosario.

Herzer, Hilda, *Situación del hábitat de los municipios del área metropolitana de Rosario en materia de suelo y vivienda* [The habitat situation in municipalities of the Rosario Metropolitan Area in terms of land and housing]. UN-ECLAC, 11/2005, Project Documents Series No. 39.

Graciela E. Gutman and Silvia Gorenstein, *Territorio y sistemas agroalimentarios. Enfoques conceptuales y dinámicas recientes en la Argentina* [Territory and agri-food systems: Conceptual approaches and recent dynamics in Argentina]. Desarrollo Económico, Vol. 42, No. 168 (Jan.- Mar., 2003), pp. 563-587

PORTLAND PLANS FOR A CITY - REGION FOOD SYSTEM

Nunzia Borrelli

Figure 1: Urban farming is becoming more prevalent across the United States.
Source: Pinterest https://i.pinimg.com/originals/f0/ba/6b/f0ba6b6cda1ae24985c560b935afb143.jpg

INTRODUCTION

Portland is often cited as an example of a city with strong land use planning controls. Over the last few years Portland has been commended for its attention to food system and food planning. This article identifies how issues related to food were incorporated into the territorial planning of Portland City.

To develop this article several official documents were read; statistical data were collected; and, 36 semi-structured interviews with professionals and stakeholders were carried out during a fieldwork conducted in August and September of 2014.

PORTLAND

Portland is the largest city in the state of Oregon (USA) and is the governmental seat of Multnomah County. The city covers 145 square miles (376km²) and had an estimated population of 619,360 in 2014. It is part of a much larger the Metro area which spans portion of the States of Oregon and Washington (Portland Portland–Vancouver–Hillsboro, OR–WA Metropolitan Statistical Area [MSA]), where approximately 2,348,247 people (US census, 2014) live. The MSA includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon, and Clark and Skamania Counties in Washington

From an economic and industrial perspective, Portland is focusing its resources on enhancing the competitiveness of businesses in four areas of industry: Clean Tech and Sustainable Industries (CTSI); Activewear; Software; and, Ad-

vanced Manufacturing. At the same time, it is working towards developing a sustainable economy and neighbourhood vitality[i].

There are currently three elements that make the city of Portland so interesting. First is the content value of real estate that allows to keep property tax lower. The second is the interest in environmental policies. Portland is the leading United States city in terms of green buildings and use of bicycles for transportation. Thirdly is the low cost of living. Portland has a cost of living index that stands at an index value of 15.2 compared to Los Angeles at 32.3 or San Francisco which has an index value of 66.5[ii]. Despite having gained focus on sustainability issues, it maintains a relatively low cost of living. These elements mean that Portland has comparative advantages with respect to other West Coast American cities.

Portland is located 70 miles east of the Pacific Ocean at the northern end of Oregon's most populated region, the Willamette Valley. Downtown Portland straddles the banks of the Willamette River which flows north through the center of the city, thereby creating the east and west neighborhoods of the city.[iii] Less than 10 miles from downtown the Willamette River flows into the Columbia River, the fourth-largest river in the United States, and part of the boundary between Oregon from Washington state.

Climate is characterized by warm, dry summers and cool, rainy winters. The precipitation pattern has little rainfall during the summer months and more than half of annual precipitation falling between November and February.

The presence of volcanoes, the mild climate, and the rain in winter make the land very fertile and suitable for different types of cultivation.
The Willamette Valley is characterized by extensive farming. Some of the main products are apples and other fruits, livestock, dairy, potatoes, and mint. Oregon is also one of the four major regions in the world for the cultivation of hazelnuts: it grows 95% of the total USA production. There are approximately 38,600 active farms, and this number has remained unchanged in recent years. The number of acres dedicated to cultivation also is stable, about 16.4 million, accounting for 26.7% of the total area of Oregon. In terms of employment, the agricultural sector provides work to over 454,000 people in Oregon, but the unemployment rate is higher than in the non-agricultural sector, standing at 12.3%. The average income per capita of those employed in the agricultural sector was $ 30,237 in 2008, while the average overall employment earnings stood at $ 34,704 (Source: USDA – U.S. Dept. of Agriculture).

Also significant is the data on organic farming (Organic Agriculture). The total number of acres devoted to such crops nearly doubled in 3 years, from 69,988 in 2006 to 130,644 at the end of 2008 (Source: USDA – U.S. Dept. of Agriculture).

---

i Portland Development Commission report, 2014,
http://www.pdc.us/about-the-pdc/annual-report.aspx

ii Portland Development Commission report, 2014,
http://www.pdc.us/about-the-pdc/annual-report.aspx

iii Burnside St, however, crosses the city from east to west, forming five quadrants in which the city is divided. In the south of the city is the downtown area. The oldest part Chinatown, Old Town, 23rd Ave and the Pearl District are located in Northwest.

THE SPATIAL PLANNING SYSTEM IN PORTLAND

Figure 2: Portland Metropolitan
Area Jurisdiction Boundaries.
Source: Metro
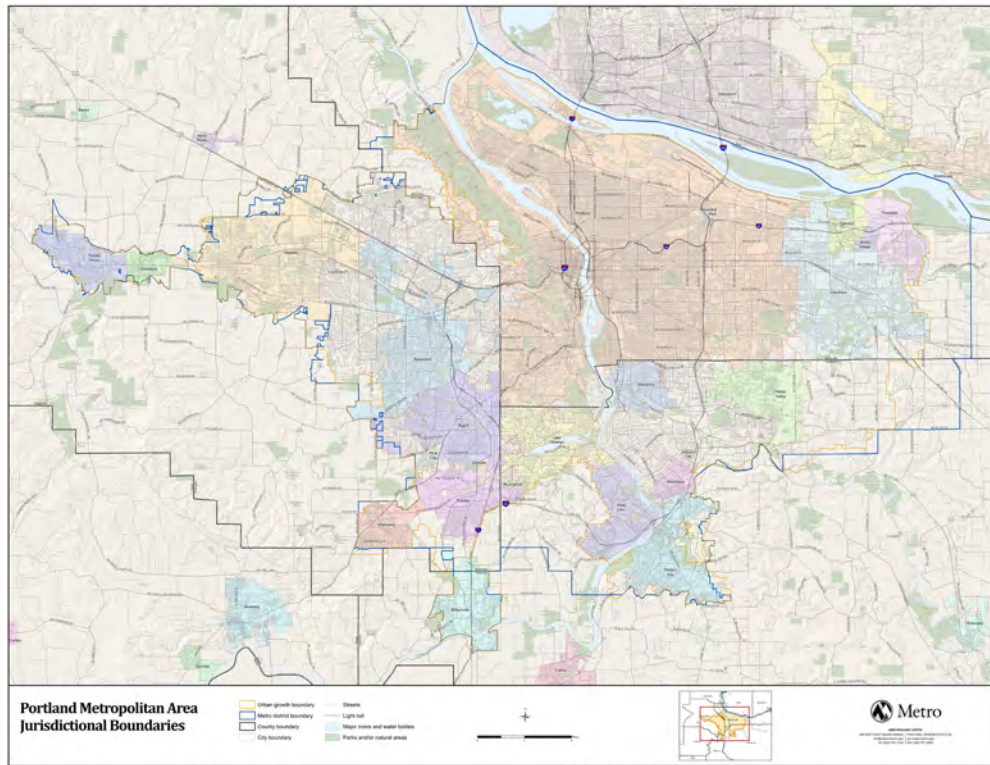
Portland strong land use planning controls are, in part, derived from land conservation policies adopted, in 1973, when the Oregon Governor (Tom McCall) "convinced the Oregon Legislature to adopt the nation's first set of statewide land use planning laws"[iv]. With a coalition of farmers and environmentalists, McCall persuaded the Legislature that the "state's natural beauty and easy access to nature would be lost in a rising tide of urban sprawl"[v]. In this legislation, urban sprawl was seen as an enemy of the environment, and therefore as a process to be controlled. The law also created the Land Conservation and Development Commission and the Department of Land Conservation and Development.

In 1978, an agency named 'Metro' (see box below) was established to carry out the mandate of the State law in the Portland Metropolitan Area, which encompasses three Oregon State counties: Clackamas, Multnomah and Washington, including the City of Portland. Part of its responsibility was to regulate the existing and future growth borders of the City of Portland, including the extent of the transport system. To do this the agency has established "Urban Growth Boundary" (UGB) to define the outer edges of the urbanized area. The state law requires Metro to assess, on a six-yearly basis, the need to expand the boundary to accommodate the next 20 years of anticipated housing and job growth. "Since 1979, the Metro Council has expanded it by around 32,000 acres. In November 2015, the Metro Council unanimously decided for the first time not to expand the growth boundary" (Metro, 2015).

---

iv   http://pdxscholar.library.pdx.edu/oscdl_ugb/#

v   http://www.oregonmetro.org/urban-growth-boundary

Figure 3: Boundary between land fields and housing.
Source: http://chatterbox.typepad.com/portlandarchitecture/2010/12/the-urban-growth-boundary-and-homebuilder-humble-pie.html
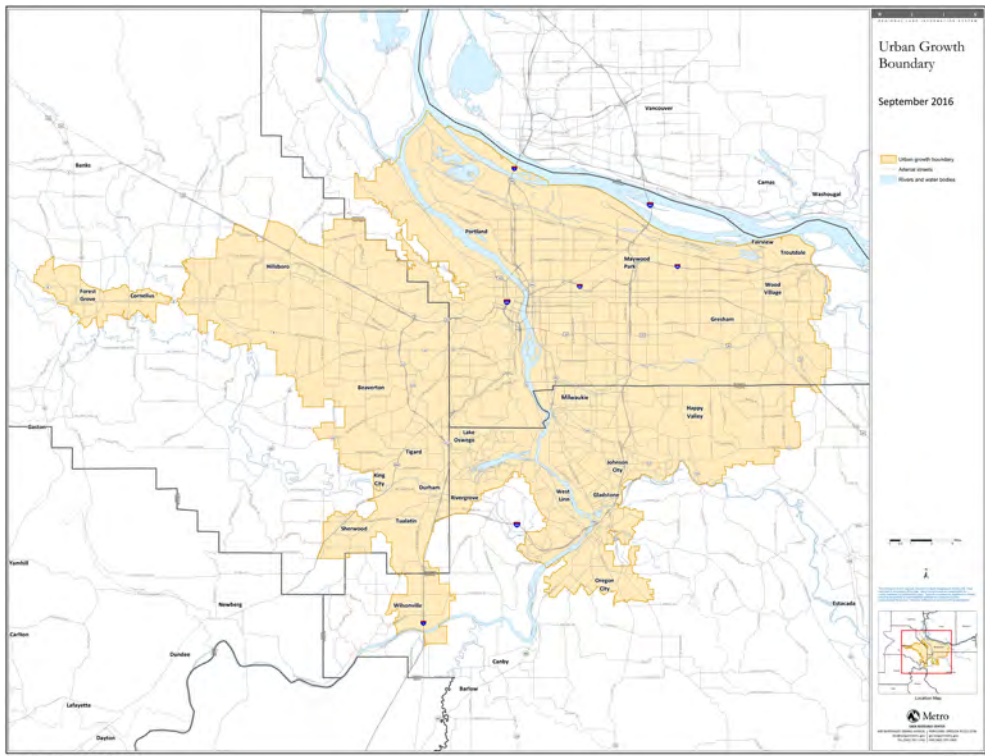
Figure 4: Urban Growth Boundary. Source: Metro

DEFINITION OF METRO

"Metro is a public agency that works with communities, businesses and residents in the Portland metropolitan area. (…) Metro serves more than 1.5 million people in Clackamas, Multnomah, and Washington counties. The agency's boundary encompasses Portland, Oregon and 24 other cities – from the Columbia River in the north to the bend of the Willamette River near Wilsonville, and from the foothills of the Coast Range near Forest Grove to the banks of the Sandy River at Troutdale. (…) The Metro Council consists of a president, elected region-wide, and six councilors who are elected by district every four years in nonpartisan races. The Metro Auditor, elected region-wide, is responsible for oversight of Metro's annual financial statements and for conducting performance audits. The council appoints a chief operating officer to carry out council policies and manage Metro operations. The chief operating officer oversees a diverse workforce of more than 1,600 employees including park rangers, economists, teachers, scientists, designers, planners, animal keepers, stagehands and cartographers. Hundreds of volunteers lend a hand at Metro's parks, cemeteries, natural areas, offices and visitor venue. (…..) As the only directly-elected regional government in the United States, Metro has helped shape the political, economic, social and built landscape of the Portland metropolitan area since 1979. Working with communities, businesses and leaders across 25 cities and 3 counties, Metro addresses issues related to land use, transportation, garbage and recycling, parks and nature, economic development and cultural amenities".

Source: http://www.oregonmetro.gov/

There has been much debate concerning the effects of the UGB in the Portland Metro Region and whether it has actually stopped urban sprawl and preserved farmlands (Jun, 2004). Several studies have already demonstrated that there are contradicting results on the effects of UGBs on urban development. For example, some argue that Portland's UGB has helped to curb urban sprawl (Kline and Alig, 1999), while others claim that Portland's processes of suburbanization are not more preferable than that of other metropolitan areas (Cox, 2001).

In any case, the containment of sprawl is extremely relevant for the production of local food as it helps to preserve rural areas and contributes to the densification of sustainable urban growth. In addition to defining urban growth boundaries, new policies were introduced regarding sustainable mobility, environment safeguarding, local community empowerment and the food system. The last topic is of interest in this paper.

The planning system in Portland takes sprawl control seriously and gives great importance to the involvement of different social actors in the evolution of governance processes.

Interest in controlling sprawl has been seriously conditioned by land fertility.

Over the last few years Portland has moved aggressively to integrate land use planning and food systems and food planning. The City of Portland has recently updated the City's 1980 Plan and the 1988 Central City Plan in a new document called the Comprehensive Portland Plan. The plan is built on the work carried out by the community through a future visioning process (visionPDX),
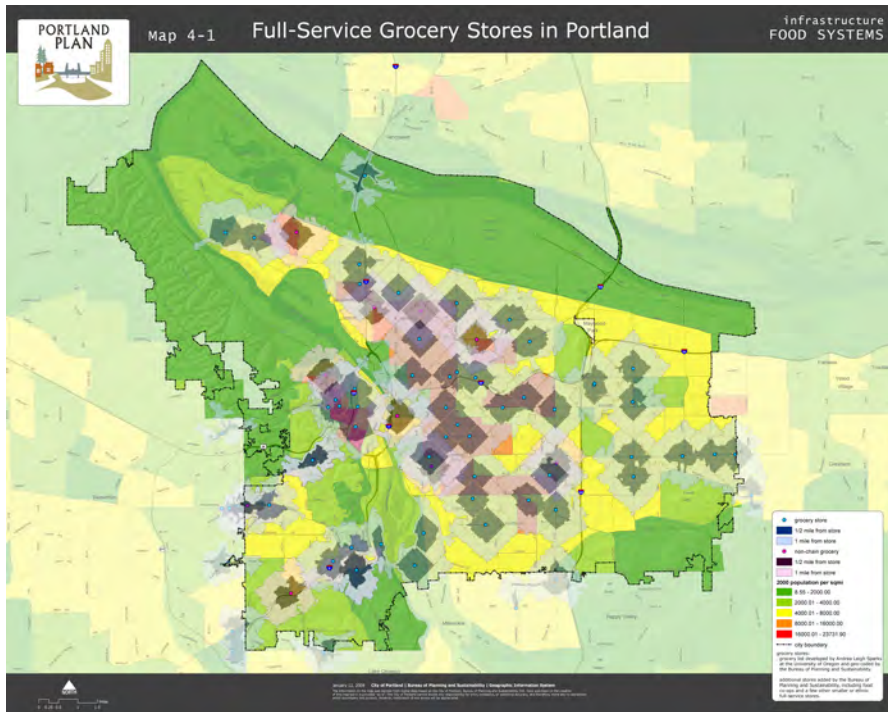
Figure 5: Full-Service Grocery Store Map.
Source: Portland Plan

which captured the shared values of sustainability, equity and accessibility, and community connectedness and distinctiveness. As part of this larger planning process a wide examination of food issues was developed in a separate document called the Portland Plan Food System.

This document provides a way for Portland to take the next step to plan for food systems and explores a wide variety of food topics. It also summarizes key food issues and recommendations. The main aim of the Portland Plan Food System is to contribute to public debate on food as a planning issue to allow fuller consideration of policy choices and investment priorities.

Another document, the Multinomah (County) plan also identifies the key issues of a food action plan and aims to: "reinforce local food by increasing viable local options in the food system; improve healthy eating by making healthy choices an easier option for all; promote social equity by building systemic justice, health, and food security; increase the economic vitality by promoting a thriving local economy" (Multnomah County, 2010).

Another example of the planning focus on food issues is the City of Portland's Climate Action Plan (2015) which contains a chapter on Food and Agriculture and states that "the total carbon footprint of the food system may be larger than passenger transportation" (City of Portland et alt., 2015)

Today the city of Portland is recognized in literature on spatial planning and urban and regional studies both for having developed an excellent territorial planning system (Abbot, 2000; Ozawa,2004; Saltzar, 2011), and for having taken very seriously the national laws of Oregon regarding the "urban growth boundary": such laws define the limits of the city development and clearly sets the boundaries between urban and rural areas.

FOOD AND SPATIAL PLANNING TOOLS

The analysis of food planning in the city of Portland needs to be investigated at two levels. The first concerns how food gets into the planning tools at an urban, metropolitan and county scale. The second level concerns the urban food policies themselves. Such policies in the city of Portland depend on the "Food Sustainable Program" and tackle issues related to the evaluation of local production and accessibility to local food. To do this analysis we will focus on the three previously mentioned food planning document: the Portland Plan Food System report, that is preparatory for the Portland Comprehensive plan, Multnomah Food Action Plan, the Climate Action Plan. We will also examine a fourth document the Portland Peak Oil Task Force final report.

The Portland Plan Food System report includes a summary of what is currently known about Portland's food system, a review of how other municipalities are approaching food systems and other ideas on the topic of food policy. The main aim of this report is to provide a background research to support the Portland Plan processes and policy choices.

It contains several planning recommendations and guidelines as follows:

1. To identify grocery access as a priority for economic development and provide fast-track permitting for grocery stores in underserved areas. Establish a walkability standard (e.g., a quarter- to half-mile) or for access to retailers/sources of fresh produce as part of the 20-minute neighbourhood concept[vi];
2. To promote the access to healthful foods: encourage convenience stores, liquor stores and ethnic food markets, especially in areas with limited access to full-service grocery stores, to carry fresh produce through incentives programs or otherwise;
3. To facilitate the access to land: remove obstacles to growing, distributing and selling food in residential zones;
4. To provide land for growing food through using City or other public resources; require space for community gardens on multi-family housing developments;
5. To designate or to prioritize vacant land, rights-of-way, easements and other lands for urban agriculture and orchards; encourage growing on rooftops;
6. To remove zoning and land use barriers to farm stands, farmers markets and CSA drop-off sites, support direct marketing by providing or helping to secure permanent market sites;
7. To consider using zoning code provisions to avoid a concentration of unhealthful food providers or "formula" restaurants within neighbourhoods and near schools. Make new chain retail stores conditional uses;
8. To assess and plan for local food processing/wholesaling/distribution facilities to connect local agriculture to markets such as retailers, restaurants, schools, hospitals and other institutions;
9. To support access to healthful foods through purchase; serve only food consistent with dietary guidelines in government-owned buildings and at events.
10. To disseminate information about healthful eating habits; offer residents classes in gardening, cooking or composting; encourage or support community food assessments as important tools to identify the needs of specif-

vi A 20-minute neighborhood is a place with convenient, safe, and pedestrian-oriented access to the places people need to go to and the services people use nearly every day: transit, shopping, quality food, school, parks, and social activities, that is near and adjacent to housing.

ic communities"[vii]. Additional Policy directions are included which discuss developing stand-alone food plans and about incorporating food into comprehensive plans.

The Multnomah Food Action Plan defines a 15-year strategy to achieve a local, healthy, equitable, and regionally prosperous food system. It defines clear goals and collaborative actions to achieve success. The main aim is the plan underlines the importance of accelerating education, empowerment, planning integration, and investment in the food system. The plan affirms the need to cultivate a culture that values and is dedicated to sustainable food system outcomes. The plan hypothesized a number of actions oriented to help people in understanding the add value of promoting the use of local food or low carbon food.[viii]

The Climate Action Plan (CAP) was produced by the city of Portland and the Multnomah County. In 1993, Portland was the first city in the United States to create a local action plan for cutting carbon. Since then, the City of Portland and Multnomah County have collaborated to produce updated climate plans that help guide the design and implementation of City and County efforts to reduce carbon emissions. Since 1990, total local carbon emissions have declined by 14 percent while 75,000 more jobs were added to the economy and the population grew by 31 percent.

In the Climate Action plan, food system investment is presented as one method to tackle issues related to the energy crisis. The main objective is to reduce the consumption of carbon-intensive foods and support a community-based food system. Two main aims are defined. The first concerns the reduction in the use of high-carbon food such as beef, cheese and pork which have been shown to generate the most carbon emissions per ounce. Residents of Multnomah County can reduce the impact of food choices on climate change — and improve personal, environmental, and economic health — by choosing "low-carbon" foods. The second aim concerns local food or the community-based food system. Although eating locally produced food has a smaller impact than choosing low-carbon food, the consumption of local food can reduce transportation emissions, strengthen the local economy, help preserve the region's agricultural land base and support a community-based food system that can reshape our relationship with food.[ix]j

The last document to be taken in consideration is the Portland Peak Oil Task Force's final report. It declares "a constrained energy future calls for a less energy-intensive food supply, with crops grown locally, processed less, processed locally and shipped over shorter distances[x]." In spatial planning the new 'low carbon' prospective calls for a replacing of energy and matter flows, especially between urban and rural domain. In this framework, research on food systems has increased considerably in urban and spatial planning literature. It is becoming clear that planners should begin to take into account questions about food self-reliance, farmland preservation and food distribution.

---

vii   City of Portland Bureau of Planning and Sustainability, Portland Plan Food System Report, 2009, p.95

viii For any other information see Multnomah County, 2010, Multnomah Food Report

ix   For any other information see City of Portland and Multnomah County, 2015, Climate Action Plan (CAP)

x   http://www.portlandoregon.gov/bps/article/126582)

FOOD POLICIES AND PRACTICES

Twelve years ago the City of Portland Bureau of Planning and Sustainability started a program named the Sustainable Food Program. Interest in the development of the Sustainable Food Program is closely interconnected to the fertility of the Willamette Valley. This Program promotes several practices for improving the knowledge of food initiatives. One practice was the development of Sustainable Food Resource Database. This database contains all the information on initiatives and organizations linked to the production and consumption of sustainable food. Another practice was the development of the Urban Food Zoning code where everything about the production, distribution of local food is classified (from community gardens to garden markets and farmers' markets). The classification aims, on a basic level, to identify the resources available in the territory, but more precisely to provide in depth information on the production, consumption and distribution of food which can in turn help define and shape future interventions. The overall objective of these practices was to remove any barriers in the production of local food and, especially, to define policies for the enhancement of local production.[xi]

Another interesting initiative was "the Portland FoodHub". The Portland Foodhub lists 500 restaurants, 230 schools, and 1,400 farmers, ranchers, fishermen, and specialty producers." The FoodHub Ecotrust in Portland, OR, has received approximately $ 250,000 to build an online platform that brings together producers, consumers and distributors of food. The objective of the Food Hub is to create a connection between producers, who in most cases reside in rural areas and Farmers' Markets in the city. It is a tool that seeks to overcome the urban-rural divide by using new technologies[xii].

There are many practices connected to food that have impacts on the spatial planning system. Some activities effect accessibility, affordability, and availability of food; others are connected to local food production and tend to concern urban agriculture, community gardens and the eco-roof.

Affordability "indicates the product of a seller's stated prices and the consumer's purchasing power"[xiii]. The actions implemented to satisfy affordability requirements have already been introduced in the previous paragraph, but particular attention should also be given to "food stamps". Food Stamps provide food-purchasing assistance to low-and no-income people living in the U.S. It is a federal aid program and it is now known as the Supplemental Nutrition Assistance Program (SNAP). SNAP helps low-income households—who do not need to be destitute to qualify for assistance—purchase food to meet their nutritional needs (on this topic see McClintock, 2015,2016).[xiv]

In addition to issues connected to affordability, problems related to accessibility and availability are also highly relevant. Accessibility indicates the consumer's ability to physically travel to a food source and return with his/her purchases. It evaluates primary determinants include geographic distance,

---

xi The Sustainable Food Program has contributed to the creation of farmer markets

xii See: http://www.ecotrust.org/

xiii Armstrong K., 2009, p.7

xiv Food banks are a natural partner in SNAP outreach because of their direct connection to food insecure families in the community. The Food Bank does not provide SNAP benefits; however, the Food Bank does help food pantry participants sign up for SNAP through outreach programs. By connecting eligible families with SNAP, food banks help provide food insecure households with a consistent and stable means to purchase their own food.

Figure 6: Foodcart in Portland.
Photocredit: Nunzia Borrelli

transportation choices and urban form variables, such as terrain and the quality of all types of transportation infrastructure (Armstrong K., 2009, p.7). Availability, on the other hand, indicates the presence of an adequate variety of food types needed to meet the consumer's dietary requirements and personal preferences (Armstrong K., 2009, p.7).

Food carts offer a solution to problem related with accessibility and availability. Food Carts are mobile food units. They can be most efficient when coupled with Food Cart Pods (see Figure 6) which are surface lots with more than a few carts"xv. Use of Food Carts can also develop the regional food economy. Multnomah county is working to establish more local food hubs: i.e. to develop and support additional food hubs (e.g. farmers' markets, food cart pods and an all-year-round major public market) and to increase demand of vendors of regional food. In Portland, there are over 500 food carts available at any given timexvi. Another interesting issue related with the availability, accessibility and affordability of food is the reduction of food deserts. A food desert is an area with little or no physical or economical access to foods needed to maintain a healthy diet (but often served by plenty of fast food restaurants).

With regards to the Food Cart, a range of different opinions were collected during onsite investigation, with some of responses being very positive, others very negative. Positive assessments concerned the ability of Food Carts to make different kind of food easily available at competitive prices. Moreover, the food sold in Food Carts was quality guaranteed because of the City of Portland regulations requiring to be licenced and to pass a health inspection prior to being able to establish a Food Cart. By contrast, criticisms tended to be about the use of urban empty spaces. Many of those interviewed said that the presence of a Food Cart was linked to the need of making large empty spaces in the city of Portland more "productive" but argued that this did not have a real impact on the local economy.

The promotion of local food farmers' markets is another strategy for making local food more accessible (see Figure 7). They represent opportunities for making healthy food, produced locally, easily accessible. Obviously, the aim is also to promote the development of the local economy through food production, which is currently still quite weak. In Portland there are 49 farmers'

---

xv   http://www.foodcartsportland.com/
xvi http://www.foodcartsportland.com/

Figure 7: Farmer Market in Portland.
Photocredit: Nunzia Borrelli

markets with 189 local vendors. These Farmers' Markets accommodate on average 12,000 visitors a week over a time frame of approx. 5 hours. Twenty one percent 21% of the food is produced locally[xvii].

Finally, there are 4 programs for collecting surplus food: the Portland Fruit Tree Project; Urban Edibles; Urban Gleaners; St. Vincent de Paul (Portland Plan –Food System Report, 2009, p.40).

The topic of urban agriculture is quite different from the previous one but is also very interesting. Urban agriculture relates to the production of local food in eco-roofs and in community gardens.

A community garden is a place where people, often neighbours, collectively garden a plot of land together. Community gardens can be a single large plot to which every member contributes and then all share in the harvest, or they can be split into multiple plots used by individuals and families. Activities relating to the Portland community gardens are managed by the city of Portland Community Garden Program[xviii] which is supported by a number of associations, the most notable being the Friends of Portland Community Garden[xix].At the time this article was written there are 50 urban gardens in the city of Portland, serving about 3,000 people. There are other gardens that other organizations operate, but there is not an official number of the total community gardens in Portland

The concept of Eco-roof (see Figure 8) takes the green roof idea a step further, adding the benefit of providing food as well as potentially creating opportunities for community building. Moreover, the Eco-roofs can decrease stormwater runoff, saves energy, reduces pollution and erosion. In the City of Portland, Eco-roof projects are managed by the city of Portland Environmental Services. There are currently (2014) 596 Eco-roofs in Portland of which 447 are being built Ecoroofs (extensive greenroofs and rooftop agriculture) and 149 are built roof gardens (intensive greenroofs). The office in charge for the Ecoroof management is the environmental services of Portland City.

---

xvii   https://www.portlandoregon.gov/parks/finder/index.cfm?ShowResults=yes&AmenityTypeID=8

xviii http://www.portlandfarmersmarket.org/

xix   https://portlandcommunitygardens.org/

Figure 8: Eco-roofs in Portland.
Photocredit: Nunzia Borrelli

	Number of Eco-roofs in Portalnd
Farmer Markest	49
Food cart	500
Community gardens in the city of Portland	50
Eco-roof in Portland	596

Table 1: Synthesis of some data concerning food accessibility and local food production in the city of Portland. Source: Author's elaboration from different sources, see footnotes xvi, xvii, xviii, xix

CONCLUSIONS

Portland is a city that is at the forefront in the development and definition of food policy and food planning. The attention being given by the City of Portland to these issues is clearly influenced by the fertility of the Willamette Valley, which calls for the development and implementation of practices that help protect the land and by the regional growth planning system that is aimed to control sprawl control and is capable of encouraging the development of food policy and the development of food planning.

Based on the observations of the Portland case study, it is possible to conclude that the food system is intrinsic to territorial planning: i.e. the food system needs to be strategic and the topic of food needs to be included into sectorial territorial policies, such as those relating to transport, health, environmental quality, and the promotion of local communities.

Moreover, the diffusion of concepts such as City-Region, Metropolitan City or Metropolitan Area, help highlight the fact that urban land use planning must be undertaken as metropolitan planning, given the ever-growing importance of the urban-rural relationship. In a prospective of territorial policy that is highly focused on a metropolitan scale and on the urban-rural relationship, the added value provided by food planning becomes increasingly evident. Food planning can help tackle some of the main problems of metropolitan planning; i.e. the regeneration of rural areas, the development of urban agriculture and sustainable strategies for cities.

—

References

Abbot, C 2001, Greater Portland: urban life and landscape in Pacific Northwest. Philadelphia:University of Pennsylvania Press.

Allen, J, Potiowsky, T 2008, "Portland's Green Building Cluster Economic Trends and Impacts", Economic Development Quarterly, Vol. 22, no.4, pp. 303-315.

Armstrong, K, Chapin, E, Chastain, A, Person, J, VanRheen, S, White, S 2009, Foodability Visioning For Healthful Food Access In Portland, Portland State University

City of Portland , 2006, Portland Peak Oil Task Force, http://www.portlandoregon.gov/bps/article/126582

City of Portland Bureau of Planning and Sustainability, 2009, Portland Planning Food system report, http://www.portlandonline.com/portlandplan/index.cfm?c=51427&a=272588

City of Portland and Multnomah County, 2015, Climate Action Plan (CAP), https://www.portlandoregon.gov/bps/49989

Cox, W 2001, American dream boundaries: urban containment and its consequences (www.gppf.org/pubs/analyses/2001).

Heying, C 2010, Brew to Bike. Portland's Artisan Economy, Open Book.

Jun, M-J 2004, The effects of Portland's urban growth boundary on urban

development patterns and commuting. Urban Studies, vol. 41, n.7, pp. 1333–1348.

Kline, J. & Alig, R 1999, Does land use planning slow the conversion of forest and

farm lands, Growth and Change, vol.30, pp. 3–22.

McClintock N, Mahmoudi, D, Simpson, M, and Santos, JP 2016, Socio-spatial differentiation in the Sustainable City: A mixed-methods assessment of residential gardens in metropolitan Portland, Oregon, USA. Landscape and Urban Planning, vol.148, pp.1-16.

McClintock, N 2015, A critical physical geography of urban soil contamination, Geoforum vol. 65, pp.69-85.

Metro 2015, Growth Management Fact Sheet, http://www.oregonmetro.gov/sites/default/files/Growth-management-factsheet-20160115.pdf

Multnomah County, 2010, Multnomah Food Report, https://multco.us/multfood

Ozawa, C 2004, The Portland Edge. Challenges and Successes in Growing Communities, Island Press Washington.

Saltzar, E and Carbonell, A (eds), 2011, Regional Planning in America. Practice and prospect, Lincoln Institute of land policy.

Websites

http://www.ecotrust.org/

http://www.usda.gov/wps/portal/usda/usdahome

http://www.portlandfarmersmarket.org/

https://www.portlandoregon.gov/bps/49989 (Climate Action Plan)

http://www.portlandonline.com/portlandplan/index.cfm?a=273154 (Portland Food Plan)

http://www.pdc.us/about-the-pdc/annual-report.aspx (Portland Development Commission Report)

http://billmoyers.com/content/12-cities-leading-the-way-in-sustainability/

http://www.foodcartsportland.com/

https://portlandcommunitygardens.org/about/

https://www.portlandoregon.gov/parks/finder/index.cfm?ShowResults=yes&AmenityTypeID=8

http://www.pdc.us/welcome.aspx

http://www.oregonmetro.gov/urban-growth-boundary

FOOD IN GARDENS CITIES IN PLANNING THEORY AND PRACTICE

REVISITING THE CONCEPT OF CITY – REGION IN LETCHWORTH AND SURROUNDING GARDEN CITIES

Yves Cabannes, Philip Ross

INTRODUCTION
PLANNING FOOD IN GARDEN CITIES

Letchworth, the world's first Garden City sits about 50 kilometres north of London. Its design was meant to bring the best of town and country together as defined in Ebenezer Howard's visionary 1898 book Garden Cities of To-morrow. Today, geographically, demographically, and physically Letchworth leans in part towards London and the metropolis and in part towards the more rural region of the East of England. As an unintended metaphor for this, by chance, today half of the town's population receive London-based local television and half receive television programmes focused on the East of England and the rural economy.

The business of Letchworth and its population isn't farming, but agriculture and food formed part of the original plan for Letchworth and those principles remain strong today. One of the things that made Letchworth different from settlements that went before it was that it didn't separate out people and their living space from food production. There was also a vision of a City Region with

it own food system or infrastructure. Visit and tour the town today and you will see generous green spaces and agricultural land in plenty.

Garden Cities are often studied with a view to their architecture and master plans, however this paper explores and revisits one aspect relatively little studied: how food was planned within garden cities. This explorative work considers the contributions of key actors that turn ideals into reality. It starts with E. Howard (see Figure 2) and his philosophical vision for Garden cities; exploring what have been his key contributions, as far as food is concerned. Then we look as well at the contribution of the first garden city planners, Barry Parker and Robert Unwin, and more precisely at what place had food in the original 1903 master plan and those that followed. Next, we focus on what remains in Letchworth today of these original principles and this is done through a detailed multi-scalar examination of the various food related spaces and their use. It concludes on the legacy of the City region as a concept. We then examine how Letchworth positively contributed to food production in times of both World Wars and discuss why such a resilience and uniqueness was possible and propose three explaining factors that led to creative and multiple food related partnerships through time. This section highlights the contributions of residents and their organisation, and primarily the Horticulture and Allotment Society, and tries to identify the extent they shaped specific food spaces. Finally, we draw lessons from Letchworth, as the first Garden City, that could be useful for food planning of XXI century City Regions in other parts of the world.

FOOD IN GARDEN CITIES: REVISITING LETCHWORTH AND THE GARDEN CITIES / CITY REGION CONCEPT IN THEORY AND PRACTICE IN THE UK

THE VISIONARY: EBENEZER HOWARD.
THREE KEY CONTRIBUTIONS

Howard's contributions, as far as City Region Food system planning is concerned, evolve around three ideas that will be briefly developed and illustrated: the first one envisions a revolutionary place for his time on food in Cities; the second is an original City region concept, quite in opposition with the growth that Cities such as London or Liverpool were going through in the late nineteenth century; and the third, is that food production, transformation and distribution could be a key urban economy driver, a quite original and quite counter intuitive for planners that were used to consider industry as a main economic engine for city development.

ENVISIONING FOOD IN GARDEN CITIES

It is important to consider what Britain was like at the turn of the 20th Century. The country had industrialised, but new homes had tended to follow the pattern of back-to-back housing. These were terraced homes with concrete yards at the rear (usually where the outside privy was located) which didn't provide the means for people to grow their own food. Howard recognised the importance of not just a city that could grow food, but the importance of empowering people to be able to grow food at small scales as well as a larger one.

In practice, this would mean land by homes for growing food, whether as gardens or allotments. He also looked at "socialised food-related features" included some of the houses having "common gardens and co-operative kitch-

Figure 2: Portrait of Ebenezer Howard

ens" (Howard, 1946:54) and the improvement of land not in use for building, where fruit trees could be planted or a dairy set up (Miller, in Parsons and Schuyler, 2002:106). He also envisioned allotment areas in a park like settings and a productive agricultural periphery. Susan Parham of the University of Hertfordshire notes *"Howard was particularly concerned with the possibilities for agricultural production in close vicinity of such settlements".* Howard saw these as being of benefit to the farmer in producing a local food market and to inhabitants in lowering food costs. As far as Letchworth was concerned, a strategic decision was to ring the town with what we now call a 'green belt'. This was a ring of agricultural land around the town.

In short, Ebenezer Howard wanted people to live in a town that was self-sufficient in food that would recycle its food waste into green manure and be part of a network of towns that would provide markets for such food. The delivery mechanism was in three parts, firstly the community ownership of land that underpinned the entire city and made it economically viable, secondly the green belt made of up cultivated and uncultivated farm land and thirdly the provision of allotments in the town. For land ownership Howard discussed the doctrine that *'all men are equally entitled to use the earth'*" [ibid, p76]. This clearly influenced his thought as it linked too with a radical English tradition from the Diggers' Movement around 1649 who resisted the enclosure of the Commons.

The goal of a Garden City is to be a place that is 'socially, ecologically and economically sustainable' according to the Garden City Declaration which was agreed at the Letchworth Conference on 'Building a new garden city movement' on 22nd February 2017. These link very closely with Howard's original goals. There are different ways to achieve such goals, as Howard himself discussed in his book. In recent years the provision of Community Land Trusts has proved itself as a vehicle for common land ownership that foster urban agriculture and increase. This central issue will be developed later on in this article.

Figure 3: Garden City Diagram

Typology proposed by Howard in his diagram that are food and agriculture related

His idealised garden city would house 32,000 people on an estate of 6,000 acres (2,400 ha), planned on a concentric pattern with open spaces, public parks and six radial boulevards, 120 feet (37m) wide, extending from the centre. The aim was that the garden city would be self-sufficient and when it reached full population, another garden city would be developed nearby.

The Garden City Diagram included in the original manifesto already gives a comprehensive account of the variety of spaces (11 in total) that should be a part of each of the garden cities. Further on, we'll examine what remained in the various plans made from this diagram, and what remains to-day and what has been expanded.

The external portions of the diagram mention various land uses: 1.) New forests; 2.) Cow pastures; 3.) various large farms; 4.) fruit farms and 5.) a sewage farm that can be understood as a farm that would recycle and make benefit of the sewerage produced by the city. All these spaces are part of the external ring, or green belt. Interestingly some of this farmland was intended for socially excluded groups, such as a "farm for epileptics", giving a hint of how the country and farming could provide solutions to health problems. The inclusion of an "agricultural college" transmits the idea of agriculture in cities as a vivid laboratory of modern and intensive agriculture, practiced in the large and fruit farms.

Another set of productive spaces are more related to home, and of a more "urban nature" such as: smallholdings for single family farming and tree planting: various allotments; and, finally gardens directly linked to houses. Children Cottage homes complement the catalogue and mirror Howard's social concern with abandoned children and the virtue than farming could bring to such a destitute groups.

AN ORIGINAL CITY REGION CONCEPT

His vision fits into a city region concept, which he called the Social City. Howard's perspective when he envisioned Letchworth, was not of a single Garden City but a regional cluster of a collection of similar settlements each of a population of about 32,000 and all linked together through public transport, trains and water canals, combining to create a social city of about 250,000. These links would enable the movement of goods and people and importantly agricultural produce. Such a model was revolutionary for its time, and opposite to the linear city proposals or the "oil stain" natural expansion of a city such as London. Self-sufficiency for settlements would be through industrial zones and farmland that would ring each city. These would like a belt which would link the growth of the settlements; provide green space and income as well the capacity for food production. These principles are schematically represented in his Garden City Diagram (see Figure 3).

When he made his original proposals over 100 years ago the population of the UK was about 40 million, now it numbers around 60. The first Garden City was Letchworth, founded in 1903 in Hertfordshire. Another followed in the 1920s nearby as Welwyn Garden City. The *Social City* wasn't fully achieved but new towns did fill the Hertfordshire and nearby countryside inspired by some of the garden city proponents such as Stevenage, Hemel Hempstead, Milton Keynes and Hatfield.

Figure 4: City Region Garden city concept [round shape]: The Social City

However, what was particularly of interest with Letchworth was that it didn't separate out food and the people who consumed it. The growing of food, through the provision of land that could be cultivated either in the form of allotments, large gardens, intermediate holdings as well as larger farms located in the ring of agricultural land were key Social City principles. In our book 21st Century Garden Cities of To-morrow [2015] this is also reflected in its fourth key principle. Garden Cities *Provide access to land for living and working to all: The Garden City promotes urban agriculture, the ability for citizens to grow their own food even in an urban area. There is a right of free and fair access to the land for all residents to grow their own food whether it through common allotments, common land, farms, productive streets and parks or private gardens. Alongside this is the right for affordable housing and also the right of access to resources in urban areas to build or run their individual or collective businesses or workshops. It is a productive city that aims at its own self-sufficient providing opportunities for agricultural work, crafts, commerce and industry. Rents are provided to encourage self-sufficiency and regeneration, provided in partnership with tenants not just for tenants. The goal is for the City to be productive and sustainable in its own right not as a dormitory settlement.*

FOOD PRODUCTION AS A KEY URBAN ECONOMY DRIVER

Environmental, social, economic and political concerns were the backbone of Howard's thinking that led to the foundation of Letchworth Garden City in 1903. The city not only included the first "Green Belt" but land was seen as a productive asset in which the farmer would certainly benefit from the market generated by the proximity of the town.

As far as larger scale farming was concerned, Howard saw the new settlement, and later the network composing the Social City, as providing a market for agricultural produce. Though, Howard's vision was limited to providing the means for food production, he describes portions of the garden city estate being held by *"various individuals in large farms, small holdings, allotments, cow pastures etc.".* Howard noted *"it is easily conceivable that it may prove advantageous to grow wheat in very large fields while cultivation of vegetables, fruits, and flowers can be grown by individuals".*

Rent-Rate Concept – Economics of food link with town ownership model

Letchworth is the first example of the integration of Urban Agriculture (UA) into town planning under social, political and economic premises. Ebenezer Howard wrote that "The rate-rent that which will be readily paid by farmer, small occupier, and allotment holder, would be considerably greater than the rent he paid before: (1) because of the presence of a new town population demanding new and more profitable farm products, in respect of which railway charges can be largely saved; (2) by the due return to the soil of its natural elements; (3) by the just, equitable, and natural conditions on which the land is held and (4) by reason of the fact that the rent now paid is rate and rent, while the rent formerly paid left the rates to be paid by the tenant." (Howard, 1902: 64)

The rate-rent concept outlines Howard's vision of not only urban planning, but also of community management in which it produces the revenue used to provide public services such as schools, hospitals, and communications.

Food processing in Garden Cities

While food production for self-consumption, business or leisure remains traceable through texts, plans, testimonies and pictures, much less exists on the processing of the locally produced food.

One example is The Letchworth Bacon Co. Ltd (see Figure 5), which proudly claims to be producing "finest English food" and marketed "Letchworth Bacon from Local pigs". The company employed about 80 staff members in the 1950's that processed locally grown pigs into a large range of different products, such as bacon, ham, sausages, meat pie and distributed them through its truck fleet. This integrated company clearly illustrates the economic dimension of food in Garden cities and the prevalence of "locally produced food' in a perspective of self-sufficiency, as idealised by Howard [pictures from Garden City Collection archives, consulted in 2017]. This industry was located within the large Industrial Estate and highlights that industry and agriculture were at the core of the Garden City concept.

This example even if limited is not isolated and all through its over 100 years of existence processing of local produce can be found in Letchworth. One of the last cases, that will be referred to at a later stage being beer made from local apple species.

Figure 5: Letchworth Bacon Company Poster from 1957

Marketing food in Garden Cities

As for markets for such produce, none were specifically created as Howard noted *"yet farmers and others are not by any means limited to the town as their only market but have the fullest right to dispose of their produce to whom ever they please"* (ibid, p 26). Interestingly Letchworth suffered from being a new town and the existing town of Hitchin was anxious about the impact Letchworth would have on its own prosperity. As a result, Letchworth never received a formal Charter to hold a permanent market in the town. Even If Howard hadn't defined a specific market for the food produced locally, he envisioned the settlement itself as *the* market and commented, *"in other words the combination of town and country is not only healthy, but economic"*. He stated *"consider vegetables and fruits, farmers, except near towns, do not often grow them now. Why? Chiefly because of the difficulty and uncertainty of a market, and the high charges for freights and commission."* (ibid, p 12)..

Just as with his general crusade against absent landlords, the goal was to help farmers escape the "spider's web" of middlemen and speculators. Susan Parham, from University of Hertfordshire notes that "the green belts proposed by Howard were not just a landscape setting for his Garden Cities but a highly productive agricultural component of the economic base underlying these settlements, and it is notable that Howard saw urban food waste and human waste going back into the countryside round these settlements to enrich the soil".

The view around food production was that it was linked with "fair rents" and fair tenures. Howard believed that the garden city could use market forces by "converting competition from an active into a latent force to be brought into play or held in reserve". Howard explained that this was possible because the Garden City was the sole landlord. The accomplishment of a successful market for food was linked with the tenure of the land – that it was held commonly and used for the common good. He saw tradesmen and businesses as 'municipal servants' and that the garden city model could help to minimise their risks. (ibid, p 54).

These were the objectives of the garden city, and he was at pains to explain the logic of such an approach, though we haven't seen any great plan to implement such solutions in Letchworth in terms of specific marketplace or businesses. A 'free-marketeer' would say that Howard was doing right thing in creating the conditions for growth and business rather than in trying to control and generate it directly, others could say he left it to chance. In the next sections we shall explore how Howards' ideals were transformed by planners and adapted to a unique social economy model that gave to the city its current physical /spatial shape

THE PLANNERS' CONTRIBUTION:
ROBERT UNWIN AND BARRY PARKER

Both Barry Parker [1867 – 1947] and Robert Unwin [1863 – 1940], the principal urban planners for Letchworth turned Howard's philosophical principles and ideals into a development plan. The original Master Plan, designed late 1903, and approved and adopted in February 1904, focused on the "city" side of the garden city and gave its shape to its centre. It covers only a portion of today's Letchworth City. Only some food related spaces, such as gardens, allotments and smallholdings, were designed in the plan and those close to the cricket fields can still be identified.

However, analysis of the detailed subsequent plans later developed by Letchworth Estate Office, give extraordinary details about the integration of food related spaces. They reveal how food spaces were consolidated into neighbourhoods and how they were creatively developed through time. They also illustrated good examples of how to include food into urban planning at city-region levels. Out of the series of plans developed by the Estate Office of First Garden City Ltd [1918, 1925, 1929, 1931, 1936, 1946 and 1952], the 1925 master plan of the town area remains interesting as it ends up the most creative planning period of the garden city movement, while Ebenezer Howard was still alive.

Comparing with the plan elements mentioned in Howard's diagram (see Figure 7) the 1925 plan shows the inclusion of the large farms [Norton Grange Farm, Standalone Farm and Manor Farm] and the fruit farm called for by Howard. A poultry farm, not indicated in the diagram, became a reality. The agricultural college became a Seed warehouse and trial grounds, still highlighting the willingness of the garden City to carry out experiments to modernise agriculture and adapt it to the urban environment. A nursery indicates the importance of tree planting. However, no references are made to the new forests, cow pastures, and the farm for epileptics indicated in the original diagram. In relation to the home-related productive spaces: many existing and new allotments are elements in the 1925 plan, and the smallholdings referred to in the original 1903 plan have expanded and are organised in two large areas. These are family based. Front yard and backyard garden correspond to the original gardens mentioned in Howard's diagram. Also missing in the 1925 plan are the Children Cottage homes.

The later plans display elements of both Howard's philosophic vision and conventional planning practices. For example, the biggest civic society to be established in the new garden city was the Horticultural Society. Parker, Unwin and Howard were all members, clearly indicating their closeness to community led development. In addition, many new colonists to the garden city were keen to get closer to nature and to become self-sufficient, undoubtedly strongly influencing the later development and planning of the fledging town. At the same time the early designs included large parks and planted avenues, representatives of city beautiful planning principles of that day. In this sense, one could say that Garden City, as designed by planners, was not only about food, but also about a delicate balance between food, beauty and urban values that were dominant at that time.
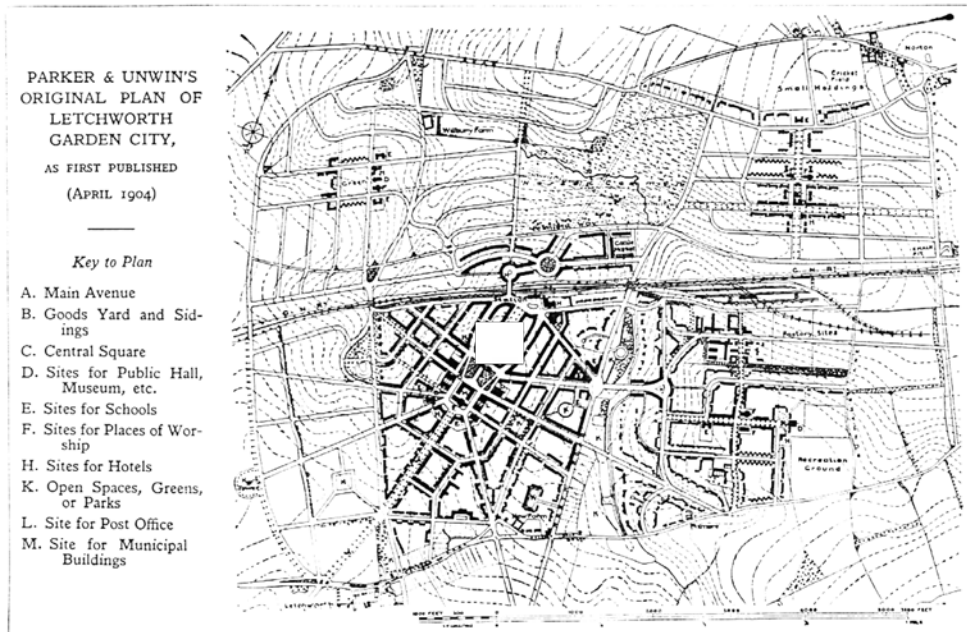
Figure 6: Letchworth. Original Plan as first published 1905. Source: LGCHF, Letchworth Garden City Heritage Foundation

Figure 7: Letchworth Master Plan from 1925. Source: LGCHF, Letchworth Garden City Heritage Foundation

INTEGRATION OF FOOD INTO PLANNING AND DAY TO DAY LIFE IN LETCHWORTH TODAY

THE GARDEN CITY IN 2017: WHAT REMAINS OF THE ORIGINAL PRINCIPLES AND PLANS

Figure 8: Aerial View of LGC in 2017

The aerial view of LGC taken in 2017 (see Figure 8) provides a clear proof that the original plans as designed by Unwin and Parker have been largely implemented, respecting both the original ideals and their planning materialisation. This is important to underline as most of the new towns that were built in the UK, and various of them contain garden cities elements, have been profoundly modified to the point that it is difficult to still find originals features. In global terms, the overall Letchworth Garden City estate is 5,500 acres, with 3,000 of these classified as rural. A total of 2241 acres are commercially farmed. The 13.6 miles long Greenway, a circular walk around the whole border of the town, was built and is popular with cyclists, runners, and walkers. In summary, 55 % of the Estate is still rural, against 64 % in 1925 and 83 % in the original manifesto. This large proportion of rural land still is unique compared to other New Towns.

The balance between food and beauty as introduced in all the master plans up to the 1930's is still perfectly perceived once you stroll LGC (see for instance Figure 10). Generous spaces, and perspectives of large alleys, a beautiful Commons and many parks give the city a unique feature and go hand in hand with food related spaces that will be briefly detailed hereafter.

Figure 9: The Garden City today- central part

Figure 10: Norton Commons. Letchworth Garden city was planned for beauty not only food

EVOLUTION OF FOOD RELATED SPACES.
WHAT REMAINS OF THE ORIGINAL CATALOGUE IDEALIZED
BY HOWARD AND DESIGNED BY PLANNERS

GREEN BELT… FOR THE FIRST TIME!

Howard intended to produce "planned, self-contained, communities surrounded by greenbelts, containing carefully balanced areas of residences, industry, and agriculture". The green belts that would ring a garden city would be given over to food production and provide breathing space between the settlements. But for Howard (1902: 9), the greenbelt around the garden city was to ensure its bounded quality and to stop the town having unlimited growth. Modern scholars see other functions that the green belt performed. Susan Parham notes, "of immense practical use in maintaining a productive spatial, environmental and economic relationship with the town it served". [2]

Although Howard didn't expressly consider it to be a green belt in modern parlance, the advantages of it caught on. In the 1930s there were campaigns

for a clear barrier of undeveloped land against ribbon development and urban sprawl. Because of these campaigns and other local initiatives, the first Green Belts were designated in London and Sheffield, the former assisted by an Act of Parliament in 1938. By 1955, Green Belts were firmly supported by both national planning legislation and policy.

Figure 11: Agricultural estate.
Source: LGCHF, Letchworth
Garden City Heritage Foundation

FARMING LAND AND AGRICULTURAL ESTATE [MANOR FARM]

The farmland had been operated directly by Letchworth Garden City Farms, a subsidiary of the LGC Heritage Foundation that manages the City like a Community Land Trust. In 2008, the farm produced revenue of £1.4 million, but quite a limited profit. As a result, in 2011 the Foundation outsourced the operation of the farms to a sole local company, Rand Brothers. Currently this firm mainly grows wheat (see Figure 11), and *ahi* flower for Omega 3 production, sugar beet and rapeseed. In addition to cultivation, there is a small herd of rare breed of Aberdeen Angus.

The rent for the agricultural land generates an income for the Heritage Foundation of around £300,000 a year (Heritage Foundation, 2015). The town council of Letchworth in the early 2000s operated on a similar budget to the farm revenue though this was raised through taxation. Indeed, that budget is comparable with that of other small Parishes or Town Councils. This shows that endowing a town with agricultural land can encourage food production and raise revenue for the town to spend. Another income benefit of the leasing arrangements is the encouragement of good farming practise. Today 2500 acres of farmland are in the Natural England Higher Level Scheme (HLS) and the lease specifies that this is maintained according to the highest standards of soil conservation.

Howard had envisaged food waste being used for farming and today Letchworth residential food waste is used to fertilise the farmland. Within a few weeks of waste being thrown out it's helping to grow crops on the farm. By restricting the use of harmful chemicals, the waste recycling also ensures that the farmland is a clean and safe environment for Letchworth residents to enjoy[i].

---

i   http://www.letchworth.com/heritage-foundation/about-us/funding-our-work/our-farming-operations

STANDALONE FARM

Figures 12: Standalone educational farm.
Source: LGCHF, Letchworth Garden City Heritage Foundation

Figures 13: Standalone educational farm.
Photo by Cecilia Delgado

In addition to food production, some of the farmland provides educational benefits. Standalone farm set in 125 acres (50.6 hectares) was mentioned in the 1925 master plan as an operating farm. Today it still functions as a working farm with an emphasis on child educational and social activities. It is popular beyond the borders of Letchworth, with children from more urban backgrounds coming to visit. Their familiarity with the animals and idea of farming rose hugely in comparison with others from a more urban background in London. It is managed directly by the Heritage Foundation and subsidised thanks to the benefits made through the benefits of the Community Land Trust (see Figures 12 and 13)

WILDFLOWERS MEADOWS
Through their agreements with Natural England, wild flower meadows are maintained on areas adjacent to the Greenway to encourage butterflies and bees. They are part of the Entry Level and Higher Level Schemes, which means that they have signed up to various restrictions, including larger than usual margins and certain type of planting schemes. Because of the stewardship models and the Greenway, the Foundation received one of the larger grants from Natural England as part of a 10 years programme starting in 2008.

Letchworth's experience demonstrates that its urban food production areas are compatible with the highest levels of environmental protection. In more general terms, it suggests that Community-Private Partnerships bring benefits, not only in social and economic terms, but also, probably just as importantly, in environmental terms.

COMMUNITY AND COMMERCIAL ORCHARD

Figure 14: New Community Orchard

The development of a fruit farm was one of Howard's concepts and it was included as an element in the original plans. But it was only realized in 2010, when 450 apple trees were planted *"to create a community Orchard and the first new commercial Orchard in Hertfordshire for decades. Since the 1950's, more than 60 per cent of Orchards in England have vanished – largely down to housing or industrial developments taking over"*[ii]. *As with the wildflowers meadows, special care was given from the outset to grow local species and to insure stewardship of the land, with a strong community component: This was consistent with Howard's original view where "The Orchard will be divided into two areas: the smaller Community Orchard will consist of traditional local Hertfordshire varieties of apple, pear, plum and gage, with the community able to pick the fruit for themselves. The larger Commercial Orchard will be planted with apple varieties suitable for producing apple juice and cider on a commercial basis" [ibid].* Today, according to David Ames[iii] from LGC Heritage Foundation, "residents are free to come and collect apples at no cost, but interestingly it has taken a few years for residents to believe that they really can collect up the apples and for word to spread" (see Figure 14).

ALLOTMENTS

Allotments are small land holdings, granted to residents to grow vegetable gardens. In 1924 the Horticultural Society reported that there were "320 allotment holders: 250 from garden city limited and from different other institutions including 4 factories". Today there are approximately 270 allotments, of which 70 are controlled by the Heritage Foundation and the remainder mostly

---

ii http://www.greenway.org.uk/news/around-450-trees-be-planted-new-orchard consulted in March 2017

iii   Ames, D, communication with authors, May 2017

with the local council. In addition, a local housing association at Howard Cottage has established and cultivates some plots. Though the population is about twice as big now, given the demographic and lifestyle changes of the last 80 years, this is still a high comparative number.

Figure 15: Allotments and farmed green belt at the rear. Photo by Yves Cabannes

Even if the number of plots has slightly decreased through time, new ones have been recently created similar to the recent development of the orchard. Of note "… an allotment site at Cade Close was developed for Hartington Place approximately 10 years ago and more importantly housing layouts included allotments in the village green layouts to the front of properties (see Figure 15). There are some examples remaining at Common View, which is typical of this type of arrangement, but sadly residents there are less keen to use these areas for vegetables and they often become ornamental gardens"[iv].

Figure 16: New Allotments close to recently built eco-housing L.G.C. Photo by Yves Cabannes

INDIVIDUAL FRONT YARD AND BACKYARD GARDENS
Today in Britain, when people talk of a 'front yard' or a 'backyard' they usually mean areas of hard standing – i.e. concrete or tarmac. Many of the older homes in Letchworth have long gardens or green areas in the front or back of

---

iv   Mail from D. Ames, LGC Heritage Foundation, May 2017

the houses. These cultivated areas were the result of the Temperance Movement, which was strong in Letchworth, so much so that alcohol was not sold for nearly 60 years. Belief was that if people had large gardens they could grow food and wouldn't be drinking at the pub. Today the Letchworth requirement is that all front gardens must be at least 1/3 green (i.e. not paved car parking areas) much to the annoyance of many residents. The growth in car ownership with people wanting to park on their property and not on the street has put pressure on this policy.

SMALL HOLDINGS

As in some other European garden cities inspired neighbourhoods, these holdings, much larger than allotments plots allowed for family-based farming around their homes or places to grow fruit. While they were integral part of the original typology of food related spaces, and quite significantly expressed in the early plans, they have largely disappeared.

LETCHWORTH'S LEGACY ON CITY REGION CONCEPT – AFTER 100 YEARS

Figure 17: Letchworth Pedestrian Avenue today - the legacy remains

In summary, the Letchworth story maintains an alternative way to look at City Region Food Systems, even if not all the legacy has been maintained. It is clear that Letchworth pioneered the formal involvement of food production systems in the planning process. The legacy of the back-to-back housing [see box below] in the UK with its squalor and disease and its dis-empowering of people provided the backdrop for the Garden City movement. Instead of high density, low amenity communities, the garden city idea was in part to give people some land with soil that could empower them to grow their own food.

What remains remarkable in Letchworth, and needs to be understood by food planners, is the permanent re-invention and adaptation capacity of the actors in the city to generate innovative approaches, without going too much astray from the original ideals of food related planning.

Back-to-back houses are a form of terraced house in the United King-dom. Many thousands of these houses were built during the Industrial Revolution for the rapidly increasing population of Britain's expanding factory towns. The passage of the Public Health Act 1875 meant that no more were built; instead byelaw terraced houses took their place. Usually of low quality and high density, they were built for work-ing class people. These houses were usually small, e.g. a two-up two-down (two rooms on each of two floors) or three floors of one room each. Two houses share a rear wall, or the rear wall of a house directly abuts a factory or other building. Because three of the four walls of the house were shared with other buildings and therefore contained no doors or windows, back-to-back houses were notori-ously ill lit and poorly ventilated; sanitation was of a low standard. They often had backyards, which were a small space surrounded by walls at the back of a house, usually with a hard surface. No green space for growing food.

Space and empowerment: A key concept of the garden city was about em-powering people and communities. This was realized by creating space for food at residential gardens, at neighbourhood allotments, farmland that would ring the town, and at region level where transportation systems would link settlements together to create markets.

So, of this vision what has been maintained? There are key changes from that vision of the early 20th century. Firstly, the formal Social City system wasn't implemented, though as Brian Love (2014) has shown in his book *Connected Cities* Hertfordshire does have an informal network of new towns, partly linked by rail. At a City level, the fact that the farmland is a part of the formal garden city estate has meant that it has been maintained for the common good and remains in 'common' ownership, albeit via the Foundation.

The nine connected cities shown on the map indicate that these connect-ed cities broadly compose a City Region and that it is far from the original radio-concentric / round shaped model as envisioned by Howard, and much closer to the concept of the linear city as idealised in 1882 for Madrid by Ar-turo Soria. A fundamental difference lies in the fact that in the Social City large agricultural pieces of land were cultivated between smaller self-reliant cities, whereas Soria's concept was to develop primarily urban fabric along a set of infrastructures facilities and transport systems.

RESILIENCE OF GARDEN CITIES FOOD SYSTEM AT TIMES OF CRISIS: LETCHWORTH DURING THE FIRST AND SECOND WORLD WARS

A distinguishing feature of Letchworth master plan was low-density housing. Homes were built at densities of between four an acre [16 per hectare] for detached homes, to 12 an acre [48/ha] for terraced cottages. All houses were to have gardens large enough to keep a family in fresh vegetables- a stipulation which was to prove effective during the years of the First World War and those of "dig for victory" during the Second World War.

WORLD WAR I

When the Letchworth Horticultural Society annual food show, was organized in 1914, on the 10th anniversary of the city, Ebenezer Howard invited the residents to take seriously food production: *"Dear Brothers and sisters. The war has already raised the price of food, and prices may yet further advance – even after the war comes to an end, and may be yet a long, long way off"* Johnson, K, compiler (1988), Such an invitation clearly indicates the importance he was giving to the productive dimension of a garden city, quite far indeed, from the aristocratic notion of idle parks and gardens such as Regent Park or Hyde Park that had been flourishing in London.

Interestingly the First World War kicked up the number of allotments holders, that continue increasing once the war was over. The 90 wartime gardens increased to 320 in 1924, of which various were within factories premises. In 1930, the Allotment holders and cottage gardeners protection association was "*probably the most flourishing Society in Letchworth*" and counted 230 members [ibid]

DIG FOR VICTORY CAMPAIGN DURING WORLD WAR II

In 1938 Britain imported some 55million tons of food. The outbreak of war meant that importation of food stopped almost overnight and the nation had to cultivate its own land. This meant that every available space was put in use. A new frontline of this campaign was launched under the name of Dig For Victory. Beans became a regular part of the everyday diet, carrots replaced sweets and onions briefly became worth their 'weight in gold'. The result was that formal gardens lawns and even sports pitches were turned into gardens so that vegetables could be grown. People were also encouraged to keep animals. Even recipes were provided on how the best use could be made of vegetables fruit, eggs and meat. In Figure 18 a poster is shown directed to women, which highlights their role as food producers and contributors to the war efforts. The poster indicates, as well the complements, of urban agriculture [onions, Brussels sprouts, broccoli, cabbages in the poster] and rural agriculture [wheat, barley for bread, potatoes, fodder for dairy cows] within a City Region Food Planning system. Dig for Victory was very successful exceeding all expectations. Between 1939 and 1945 imports of food were halved and the increase of British land use for food production increased by 80 %.

We have already noted how Letchworth positively reacted to the strong directions given by E. Howard himself at the break of First World War. The receptivity of the Horticulture Society was a stimulus to produce and diversify food production. This was made possible because also of the planning model that allowed for food production and food transformation. Such conclusion is even
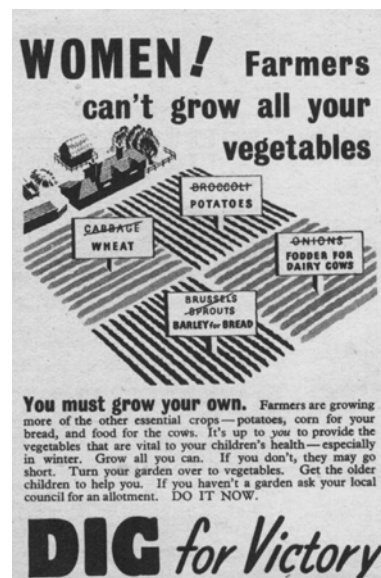

Figure 18: Poster Dig for Victory Campaign

stronger when analysing how Letchworth reacted to Dig for Victory Campaign. Its impact in Letchworth was quite high: about 120 new wartime allotments were added in 1941 to the existing ones summing up 798 in total, a significant number for a city still under construction. The mobilisation was not only coming from the Allotment Society, other contributed. For example, the Tennis Club planted one court with potatoes, and new clubs emerged for poultry and rabbits rising [ibid, chapter 19]. Even if women were one of the main targets of the campaign, youngsters were mobilised as well, as Figure 19 suggests. In the post-war years, which were marked by poverty and reconstruction this self-sufficiency movement kept its impetuous. As proof, between 1945 and 1949, the request for plots continued [ibid, chapter 20]

Figure 19: Letchworth schoolboys growing food

WHY WAS ALL THIS POSSIBLE: THREE FUNDAMENTAL REASONS

LAND AS A COLLECTIVE ASSET: COMMUNITY LAND TRUST

What make this city unique is not only the plan and the planning process, but more importantly its land property regime. Most of the Letchworth land (excluding residential areas that were privatised in the 60s) is still owned by the **Letchworth Garden City [LGC] Heritage Foundation** that operates like a community land trust. The organisation is the successor to the original company that owned Letchworth. Ebenezer Howard's original plan was for residents to hold shares in the company and this did happen, but when a property company tried to buy up all the shares and effectively demutualise the town, the town was nationalised by Parliament as the Letchworth Garden City Corporation. The new Foundation established in 1995 is the successor to that. As a consequence, any farmer, allotment holder or business company active in the industrial estate are leaseholders, and pay a lease to the Heritage Foundation.

THE ROLE OF THE HERITAGE FOUNDATION

The Foundation manages and holds many of the original assets of the Garden City, comprising offices, shops, factories, houses, farms, community amenities and most of the commercial, industrial, and agricultural land. Income gener-

ated from property, farming and other activities is channelled back into the Garden City in two ways: reinvest to maintain the fabric of the estate and its landscape, and funding for a wide range of charitable enterprises and endeavours in LGC.

The uniqueness of the land regime relies as well on existing structures [Heritage Foundation and its redistributive role of ground rent captured] and social movement such as the Horticulture Society, founded in the early time of the development of the city, which remains the guardian of the social, cultural and environment dimension of the garden city.

LGC Heritage Foundation is a not-for-profit organisation structured as an Industrial and Provident Society registered with the Registrar of Friendly Societies. It has property and land assets in the town worth some £127m and generated an annual income of 7.6 million pounds in 2011-212 and £4.5m in 2015, from ground rents and other ventures

The Heritage Foundation operates several subsidiaries. These Limited Companies enable the Foundation to operate a number of trading activities, which fall outside its charitable status. One of them, of direct interest to understand how the food system works, was Letchworth Garden City Farms Ltd., which is responsible for farming the 2500 acres of agricultural land as well as the Foundation's Forestry and landscaping divisions.

The governance structure of LGC Heritage Foundation is composed of an elected Chairman, a Board of Management [9 members] who work with the Chief Executive and his executive team. This group determines strategy, set policies and makes decisions on key matters. The Board of Governors sum up to 30 members: 10 are nominated, appointed by registered LGC clubs and 2 are from the Country and District Council. These two members are the bridge with the Public sector. In addition, LGC registered voters elect 6 members and finally 14 are appointed by the Board of Management for their relevant experience in areas pertinent to the Foundation. Such a power structure is different from most of the Community Land Trusts existing in the USA, in which usually one third of the members are direct beneficiaries, one third are residents that live outside the community land trust but share its ideals and one third are representative of the public interest.

The Heritage Foundation operational structure counts around 145 staff members. It is broadly divided into two major areas: Income (property rent; IT services; Farm Company, Cinema and Venues) and Charitable Activities (Grants, Day Hospital, Transport Services, Tourist Information Centre, Museum, Heritage and Landscape management). In addition, the LGC Heritage Foundation has an unofficial duty to represent the Garden City movement and while in good stewardship it has been able to lead on this agenda.

CONTRIBUTION AND RESILIENCE OF COMMUNITY BASED ALLOTMENT AND HORTICULTURAL ASSOCIATIONS

As noted in the book *21st Century Garden Cities of To-morrow* [Cabannes & Ross, 2014] access to the land provided both the ability to grow food but also helped engender a sense of citizenship through place, purpose and belonging. The provision of large gardens facilitated this by providing allotments for citizens eager to embrace the change. What inspired other new garden cities was the realisation that success of a city resulted from both its architecture and its social structures. The new garden city movement brought a fresh focus

Figure 20: Movement against animal pain

on garden cities. Today Letchworth and the original garden city movement is being used to inspiration for layout, design, governance and use of sustainable materials in both the short and longer term.

Success in Letchworth is also attributable to the formal structure of the Heritage Foundation and to those multiple voluntary institutions created by local citizens. Of specially note is the *Horticultural Society,* now called the Letchworth District Gardeners Association.

Different local clubs and societies have contributed as well to shaping food related spaces and change land use. Each of these organizations brings a different edge to the food system including such diverse agendas as Youth movement against animal pains, as illustrated in Figure 20; Haven Social Club for rural women workers during Second Word War or Transition Town Letchworth involved in the newly planted Community Orchard and Tree Planting.

In addition, the recently founded New Garden Cities Alliance argues strongly that a Garden City is about the visible and invisible architecture. It is not to be a place based on charity and paternalism but on empowerment and active citizenship. The goal of a Garden City is to be a place that is 'socially, ecologically and economically sustainable' according to the Garden City Declaration which was agreed at the Letchworth Conference on 'Building a new garden city movement' on 22nd February 2017. A key point of discussion at that conference was on the principles associated to the land that should be hold as a common good. The following sub-sections contain examples of the benefits community based food related organizations bring to the city.

ENHANCING BIO-DIVERSITY IN CITIES THROUGH
FOOD PRODUCTION

A remarkable dimension of the Allotments and Horticultural Association is its net contribution to food for the city: primarily vegetables, but occasionally also including such diverse item as chicken, rabbits, eggs, apples, honey, pears and other fruits and berries. As noted in a book review on the activities of the Association the following produce was either presented at the annual show, or produced for self-consumption: poultry [1911]; "sweet peas, potatoes, dandelion wine, beekeeping" [1912]; carrots and shallots, vegetables, fruit, flowers and

eggs [1933-35]; 'broad beans, beetroots, carrots, autumn onions, jam, roses, round and kidney potatoes, and cabbages"[1949-1951].

The capacity to adapt to evolving food tastes through the century and diversify the fresh food produced clearly indicates that allotment holders do contribute to increasing the city bio-diversity, a dimension often forgotten when addressing City Region Food planning. At the opposite of the commercial farms, that produces a very limited number of items.

Figure 21: Archive Picture of Food fairs competitors

Another observation is that at the end of the Second World War, the Allotment Society, with its 900 members was proudly observing that Letchworth is *"producing more food than when the estate was farmland, 40 years ago"* [ibid, chapter 19]. Ten years later, "*Dr Norman Macfayden, the most loyal past president, pleaded with gardeners to keep records to prove that even more food was produced in a garden City that in the fields that were there fifty years before"* *[ibid, chapter 22, 1952/1956 period].* Both testimonies are an important lesson for City and Regional Food planners, or for planners in general, insofar urban models, when properly planned and designed are compatible with increased self-sufficiency and increase of nutritious food for the benefit of the residents.

KEY ROLE OF FOOD FAIRS AND FOOD SHOWS FOR MAINTAINING FOOD LEGACY ALIVE

Allotments continue to thrive in the town and the Horticultural Society (Letchworth Gardeners' Association) is proving to be a hardy annual with over 700 members. In 2017 will mark the 53rd Annual Summer Show and 111th Autumn show[v]. This latter event features prizes for roses, dahlia's, fuchsia's, sweet peas in the flower section and traditional vegetables like onions, carrots, runner beans, cucumbers, marrows, potatoes, shallots, parsnips, sweet corn, leeks and presumably a more recent addition of chilli plants. Homemade beer, wine and chutney also feature in the show and competition (see Figure 21). Today most gardens are used to grow food not so much for subsistence, but for recreation or leisure, and often gardeners seek to grow challenging crops too.

---

v http://ldga.org.uk/wp/wp-content/uploads/2017/02/LDGAShowSchedule2017.pdf

The role of the food fairs and the shows where local people present their best flowers, fruit, vegetables or transformed products such as jams or chutneys explains much about why a culture of food was maintained, and developed in the Garden City. The hundred years review of the Association, describes them with great details and pride.

SUPPLY AND TRADING CENTRE AT CITY AND DISTRICT LEVEL

As illustrated in figures 22 and 23, the Letchworth District Gardeners' Association set up and manages a trading centre for Letchworth District allotment holders. Only Gardener's Association Members may make purchases at the store. This trading centre plays a crucial role as it buys in bulk and sells them without profit and in smaller quantities to the members. Moreover, volunteers store helpers are able to give advice on all the products available in store. The trading centre plays a convening role for allotments holders to meet, discuss and exchange know how, and avoid isolation (as the allotments are scattered over the whole city). This space close to a large allotment serves as a regular training centre, with practical classes and conferences provided by selected invitees. This place, shaped by the community facilitates connections among the network of allotments holders and allows shifting from micro-local spaces to the garden city as a whole. It probably contributes to the Association's sustainability.

Figures 22 and 23 Trading center for allotment holders.
Photos by Yves Cabannes

SUSTAINABILITY OF THE ALLOTMENTS
AND HORTICULTURAL ASSOCIATION

The declaration made on the 90th anniversary of the Association, in 1996, is quite enlightening on *why* the original ideals and land use on garden cities food planning remained present one hundred years later: *"Rooted in the island tradition of self sufficiency and nourished by the basic elements of those human needs for food and beauty, it is an organism [L Allotments and Horticultural Association] which will survive any conditions in a foreseeable future".* City Region food planning depends as well on the sustainability of resident association and on their capacity to being actively involved in food related matters, such as food production, annual show to stimulate food production, short circuit and fairs, collective buying of seeds and bio fertilisers, as happens today or involvement in educational activities such as in the educational farm.

THESE THREE PRINCIPLES TOGETHER LEAD TO CREATIVE PARTNERSHIPS: CENTRAL ROLE IN THE "GARDEN CITY MULTI-ACTOR FOOD SYSTEM"

One of the central lessons drawn from this close examination is that the three factors just introduced (Land as a collective asset; the role of the Heritage Foundation and the long-standing contribution of community based Allotment and Horticultural Associations were combined in Letchworth to produce food related partnerships between a large array of actors. These partnerships are shaping food spaces and are at the core of the food system. Three of the resulting partnerships are presented as examples.

PROTECTION OF HEDGEROWS AND SOIL CONSERVATION: PARTNERSHIP BETWEEN THE BUSINESS SECTOR, THE HERITAGE FOUNDATION AND A BEEKEEPERS ASSOCIATION.

Hedgerow Management is carried out by Rand Brothers Ltd, as part of the agreement with the Heritage Foundation. As stressed by J. Webbin[vi], "The hedgerows are maintained in blocks on a three year rotation in line with the Agri-Environmental Agreement with Natural England. This means that no more than one third of the hedges are cut in any one-year. There are a number of benefits to biodiversity through this type of Hedgerow Management. The farmland around Letchworth comprises of over 50km of hedges". This example brings an important element on the legacy of garden City as promoting food production [here by Rand Brothers Ltd under a lease with the Heritage Foundation], in the perspective of inserting food production within a sustainable model of soil conservation respectful of environment.

Thanks to the management of hedgerows and agriculture free from chemical pesticides, a beekeepers association currently has 25 hives located throughout the estate. *"The bees not only act as pollinators for our crops, but are also used as training facilities for new bee keepers"* [vii]. This example again highlights the role of the local actors, in this case a private company committed to sustainable development and a local grassroots association to maintain the flame of food related activities.

The roads as well feature wide verges and are tree lined. In fact, the number of trees makes the town once of the worst urban centres if you suffer from tree pollen. Though the term 'garden city' isn't about flowers and trees, but more about the social objectives, undoubtedly there is a strong garden feel to the town, and a realisation of the goal of bringing town and country truly together.

---

vi   John Webbin, J Biodiversity, March 25, 2015, Posted by Paul McKenna on Friday 20 Mar, 2015- 13:42
vii Webbin [ibid]

THE WYND COMMUNITY GARDENS: PARTNERSHIP BETWEEN THE HERITAGE FOUNDATION, THE ROYAL HORTICULTURAL SOCIETY AND OTHERS.

Figure 24: Partners celebrating the opening of the Wynd Community Garden, Letchworth

Opened in 2014 and located at the heart of Letchworth, results from another successful partnership spearheaded by the Heritage Foundation. A second one followed at the Standalone farm referred to already. They were created with the Royal Horticultural Society, Britain in Bloom group ARCH and local volunteers. Even if their intention is not so much to grow food, this initiative "*also delivers a learning programme to run alongside the project, which included a series of introductory gardening sessions*"[viii] (see Figure 24).

NEW ORCHARDS: AN EVOLVING PARTNERSHIP BETWEEN VARIOUS LOCAL AND NATIONAL ASSOCIATIONS

The community and private orchard planted in 2010 and its further developments resulted from various partnership involving LGC Farms / Heritage Foundation, Natural England, Transition Town Letchworth, a small local company and volunteers from schools and from the city.

In 2014, the apple trees were mature enough and **Apple Cottage Ciders**, a local producer got volunteers to harvest the apples that were turned into cider for a local beer festival. They are also supplying local pubs with a unique variety of cider made from a Hertfordshire variety of apple. This example highlights again the modernity of food chains, adapted to local market niches and generating local jobs. What is original here is that they are perfectly fitting into a sustainable model with the Heritage Foundation playing a key role [lease of the orchard], along with young volunteers participating in the picking up of the apples and a collective ownership of the land that allows for this sort of enterprise to start up.

---

viii http://www.letchworth.com/rhs, consulted June 2017

CONCLUDING REMARKS ON GARDEN CITIES AND CITY REGION FOOD SYSTEMS

A key lesson from the historical analysis of Letchworth and the Garden City movement is that lively Food systems need to consider: 1. collective and communal land property regimes as part of the overall land regimes; 2. The need for strong organisations, such as the Heritage Foundation to own, manage, develop and redistribute the benefits of the land, 3. The importance of grassroots organisations able to maintain the city region food chain spirit alive through time; and, 4. A business sector committed to a locally based sustainable food system. The combination of these elements emerges as one key reason behind the permanence and the positive evolution of the first garden city through its well over hundred years of life. In addition, this combination has generated creative partnerships that constantly renewed and shaped food related spaces transforming some land uses and contributing positively to the City Region Food system.

A second lesson is that the Garden City as a Social City concept and the planning experience of Letchworth illustrate the very notion of City Region Food Systems**.** Why? Because they are an evolutionary combination of:

Multi-scalar and multiple food related spaces [from back yard to green belt and rural land between garden cities]. These multiple spaces are the physical base of the Food System and are essential to be taken into account by urban and regional planners.

Multiple symbiotic food related actors. The creation of positive partnerships working in synergy with the key role played by the LGC Heritage Foundation, as the steward and owner of most of the land

Multi sectorial dimensions. Various sectors in the city, such as waste management, environment protection, or economic policies and job generation have been related one way or another to food. This multi-sectorial dimension relates as well to the fact that through history food related activities have happened through the whole food chain - from the "apple tree to the pub" and from the "land to the table". In addition, food plays a fully an inclusive role, linking up different age groups and social groups, youth or women during the war through multiple actions and multiple spaces in the city.

Our analysis suggests that city and regional planners need to learn the lessons from Letchworth and the Garden City movement. They need to be aware of evolving planning principles for city region food systems innovative solutions for increasing self-sufficiency in cities and for more resilient food systems. The role for planners should not be to "design and formulate" only, but to empower residents and give people the tools, including the land, to create their own solutions. What this means is that planners today need to think about the long term provision of green- food and non-food- spaces as a community asset, provide strong governance to make sure that remains the case; and, to recognize that food related income, including land rental income, can contribute to the long economic sustainability of the settlement. Food related efforts can also contribute to the social, ecological and economic sustainability of the place.

ACKNOWLEDGMENTS

—

References

Cabannes, Y & Ross, P (2015) **21ˢᵗ Century Garden Cities of To-morrow. A Manifesto**, London: New Garden City Movement publisher, Lulu market place, London

Dalbey, M (2002), **Regional visionaries and metropolitan boosters**: Decentralization, Regional Planning, and Parkways During the Interwar Years

Howard, E (1902), **Garden Cities of To-morrow** (2nd ed.), London: S. Sonnedschein & Co,

Howard, E (1946), **Garden Cities of To-morrow,** edition with Introduction by Lewis Mumford

Johnson, K, compiler (1988), **Gardener's city, a history of the Letchworth allotments and horticultural associations 1906 -1998**

Letchworth Garden City Heritage Foundation (2015) **Annual report**

Love, B, **Connected cities** (2014), Blurb Incorporated

Shemoel, A, (2012), **Rightful Land Use, The Case and Implications of Urban Agriculture in Letchworth, UK**, London, Development Planning Unit, Master course dissertation.

REGIONAL AND RURAL PLANNING

REBIRTH OF THE GRAND CANAL PRESERVATION OF THE CANAL LINEAR CULTURAL HERITAGE CORRIDOR AT HANGZHOU

Wang Jianguo, Yang Junyan, Chen Haining

Figure 1: Bird View of the Grand Canal
(Hangzhou Section). Photo Credit: XU Haohao

THE GRAND CANAL
AND ITS HANGZHOU SECTION

In the ancient times, there was no express delivery as we have today. Instead, the ancestors pursued the goals of quicker and safer conveyance of goods by using waterways and ships. Where a waterway went, there resources, fortunes and cultures would be. Canals, developed in the form of human-made waterways, reflected the society's wisdom and strength for survival, and usually embody outstanding engineering technologies. Canals emerged in response to the requirements of urban development and they breed and spread brilliant civilizations in their eras. Today, even though some or parts of these civilizations have been destroyed, intangible wealth remains along the canal paths.

While canal construction was undertaken at a national level to facilitate national city-building and strategic objectives, there also were substantial cultural effects. Canal development greatly influenced the lives of the broad masses of people in communities along their routes. For instance, the commercial wealth of the canal promoted the growth of attractive and gorgeous street cultures in towns and cities along the canals. The administration of the canal nurtured the historic Chinese system of the scholar-bureaucrat class. In fact, some historians contend that the cultural side effect of the Grand Canal was similar to that of City States in Medieval Italy, where the rich culture in Florence and other cities led to a Renaissance in Europe (Zheng, 1986; Chen, 2013). Canals brought about economic development, social change, cultural diversity, and other changes which had profound impacts on urban development pattern of later eras.

The Grand Canal, which is also known as the Beijing-Hangzhou Grand Canal.

It is the longest man-made canal in the world with a length of 1,776 kilometers (1,104 miles). Its origin can date back to the Spring and Autumn Period (771-476 BC) in Chinese history, when King Fuchai of Wu dug the Han Canal as part of a plan to push his army northward to conquer the Central Plain (Hsu, 1999). Afterward, other smaller canals were constructed and renovated to run through the middle and eastern regions of China, linking five of the nation's main river basins including the Hai River, the Yellow River, the Huai River, the Yangtze River and the Qiantang River together (UNESCO, 2014). During the period of the Sui Dynasty (561-618 AD) these different canals were eventually combined, creating the Grand Canal.

Starting at Beijing in the north and ending at Hangzhou in the south, the Grand Canal passed through the coastal regions of eastern China, the richest areas of that time, and connected the national political center and the national economic center (Chen, 2013). For more than two thousand years, it provided uninterrupted long-distance conveyance and provided the vital functions of water supply, irrigation, flood control, among others.

Figure 2: The Grand Canal and Canal Cities in Hydrogical Map of China (partial). Source: Hangzhou Urban Planning Bureau

A proverb about old Beijing says, "the City of Beijing came through floating along the canal". To facilitate construction in Dadu[i] or Beijing, during the Ming and Qing Dynasties, enormous timbers, bricks and stones were transported

___

i   The capital of the Yuan Dynasty, in what is now the center of modern Beijing.

from the southern areas of China to these Imperial Cities through the Grand Canal. Beijing, at the "beginning of the Grand Canal", is generally recognized for its political status as the long-term capital of the nation.

Hangzhou, the southern terminal city of the Grand Canal, grew to prominence because of the canal and today is the capital city of Zhejiang Province. Located in the northern area of that city, the Gongchen Bridge, spans across the Hangzhou Section of the Grand Canal, marking the end of the canal. Over the centuries, this ancient stone bridge witnessed numerous busy shuttling ships on the canal, and even till today we still can imagine the scenery through its majestic profile.

In addition to the conveyance of building materials, a distinctive characteristic that differentiate the Grand Canal from other canal heritages, is summarized in the term "caoyun" which means "transporting grain and strategic raw materials, supplying rice to feed the nation" (UNESCO, 2014). To support caoyun many practices were implemented such as the construction and maintenance of watercourses, and the construction of various hydraulic facilities and storage facilities. The supporting management system, established at the same time, evolved into one of the most important economic and social mechanisms in ancient China. Rich cultural heritages remained today.

Yet the goods transported to Beijing through the canal not only included grains and building materials, it also included tea. Hangzhou is one of the most famous tea-growing areas, famous for the Longjing variety of tea. After arrival in Beijing, some of the tea began to be traded for horses (Jenkins, 2010; Chen, 2013), a practice which resulted in the formation of the Tea Horse Road. Additionally, the route of the Shaanxi-Gansu Tea Horse Road became part of the Silk Road. Thus, cargo from the City of Hangzhou and other locations along the Grand Canal, moved throughout the world due the miraculous internal connections between the Grand Canal, the Tea Horse Road and the Silk Road.

Converging great technologies of every dynasty, the Grand Canal was the "national highway system" or "national high-speed rail system" of ancient China. The canal was designated a UNESCO World Heritage Site in 2014.

PRESERVATION FOR THE LARGE-SCALE LIVING LINEAR CULTURAL HERITAGE CORRIDOR

From a global perspective, the Grand Canal was the earliest, longest and most complex canal in the world. It linked five of the nation's main river basins and traveling across boundaries in the north and the south of China. The Grand Canal promoted a unified, magnificent national pattern of politics, economy, society and culture. It was one of the most significant achievements in water transportation engineering before the industrial revolution. It embodied the outstanding wisdom of our human ancestors to adapt to, transform and harmoniously coexist with nature. Its cultural heritage, reflective of its great age and spatial scales, are expressed in the very plentiful heritage sites of wharfs, ship locks, bridges and dams, government office buildings, official warehouses and feudal guild houses standing along the waterway. The core cultural values of the Grand Canal can be defined and summarized as:

· The living historic cultural heritage
· The important urban functional lifeline
· The flowing and thriving interconnected place
· The corresponding urban green corridor for the city

Even today, the Grand Canal, consisting of the tangible and intangible cultural heritages, maintains a strong vitality. It is a place where the ancient meets the modern, which is the canal's most precious fortune. The urban agglomerations along it are one of the most important arteries of economic development in China.

Today's Hangzhou is a historical and cultural city not only famous for its gorgeous natural and humanistic sceneries, but also well-known for the emerging technology hub. The city leads the revolution of smart economy by building a smart city in contemporary China. It is home to booming e-commerce and Internet finance industries, many of which incorporate cloud computing, big data and other Internet of things (IOT) technologies. The city is becoming prominent as the global center of e-commerce. As a result, the City of Hangzhou hosted the eleventh G20 Summit in 2016, and has been selected to host the Asian Games in 2022. It also aims at being the national innovation center of Internet finance by 2020.

In such an IOT era of e-commerce and Internet finance industries with today's rapid progress in aviation, high-speed railways, highways etc, we have a totally new transportation system. Compared with these modern methods of carrying goods and information, the transportation function of the Grand Canal is gradually waning. In addition, fast-paced modern urban construction have resulted in a series of serious challenges to the ancient canal. There are fewer and fewer interactions between the canal, the city and the people. The City of Hangzhou, which became prosperous because of the Grand Canal, has become alienated from it. From the perspective of the surrounding urban environment along both banks of the Grand Canal, especially for its Hangzhou Section, the key problems we are going to focus on are:

· **Isolation of the styles and features** between the ancient and the modern structures along both banks of the Grand Canal;
· **Isolation of the spaces** between the Grand Canal and the City of Hangzhou;
· **Isolation of the sightseeing activities** between the sceneries of the Grand Canal and those of the City of Hangzhou.

Consequently, it is now time to consider how we can leave the great canal for our descendants in another millennium. It is time for thoughtful consideration about how and what preservation work should be undertaken in the context of accelerated urbanization.

We propose that preserving the cultural heritage of the Grand Canal has its own characteristic which can be summarized into three specific key words; one is *"large-scale"*, one is *"living"* and the other is *"linear"* (*3 "L"*). The key word *"large-scale"* indicates the grand scale of the canal, both in time and space. The key word *"living"* indicates that the canal is still carrying on the important urban functions of conveyance (coal transportation from north to south), water supply (South-to-North Water Diversion Project), irrigation, flood control and so on (Xinhua Daily, 2012). Finally, the key word *"linear"* indicates the specific form of the regions' cultural heritages in relation to the canal. In fact, the concept of a *"linear cultural heritage"* is an emerging field in international cultural heritage preservation. The term enhances the conceptions of *"cultural route"* and *"cultural heritage corridor"*. It mainly refers to tangible and intangible cultural heritage groupings located in linear or zonal regions. These groupings represent the movement routes of human beings,

Figure 3: Daily Activities along the Banks of the Grand Canal (Hangzhou Section). Photo Credit: XU Haohao

and they embody the development routes of regional cultures (Shan, 2006). Accordingly, we can define the Grand Canal as a *"large-scale living linear cultural heritage corridor"* (Shan, 2009; Yu, et al., 2009).

Because of the canal's specific circumstances, preservation requires different ways and methods compared with those for traditional cultural heritages. There are three perspectives regarding this issue:

· **The historical perspective** - It is necessary to consider preservation for the cultural heritage of the canal from the views of *authenticity* and *integrality*. The preservation work should keep the collective memories and emotions for the tens of millions of people living, and who have lived, along both banks of the Grand Canal. It should focus at efforts to maintain the vibrant historical features of cultural and industrial prosperity to ameliorate the identical appearances of today's cities that often lack individual characteristics.

· **The developmental perspective** - It is necessary to enhance the internal relationships between the canal and the urban environment from the views of *dynamics* and **reciprocity**. The preservation work should closely connect the economic and social development of the cities and the towns distributed along both banks of the Grand Canal, aiming to achieve better life qualities for local communities by promoting their physical environments.

· **The systematic perspective** - It is necessary to guide landscape construction from the views of *systematization* and *interactivity*. The preservation work should establish a system of sceneries and sightseeing activities going on along both banks of the Grand Canal. This system should aim at revitalization efforts for the activities that are relevant with the canal, to restore the extraordinary vitality in concert with management and planning work for the post-application era as a UNESCO World Heritage Site.

The "Grand Canal" in the following paragraphs specifically refers to "the Hangzhou Section of the Grand Canal".
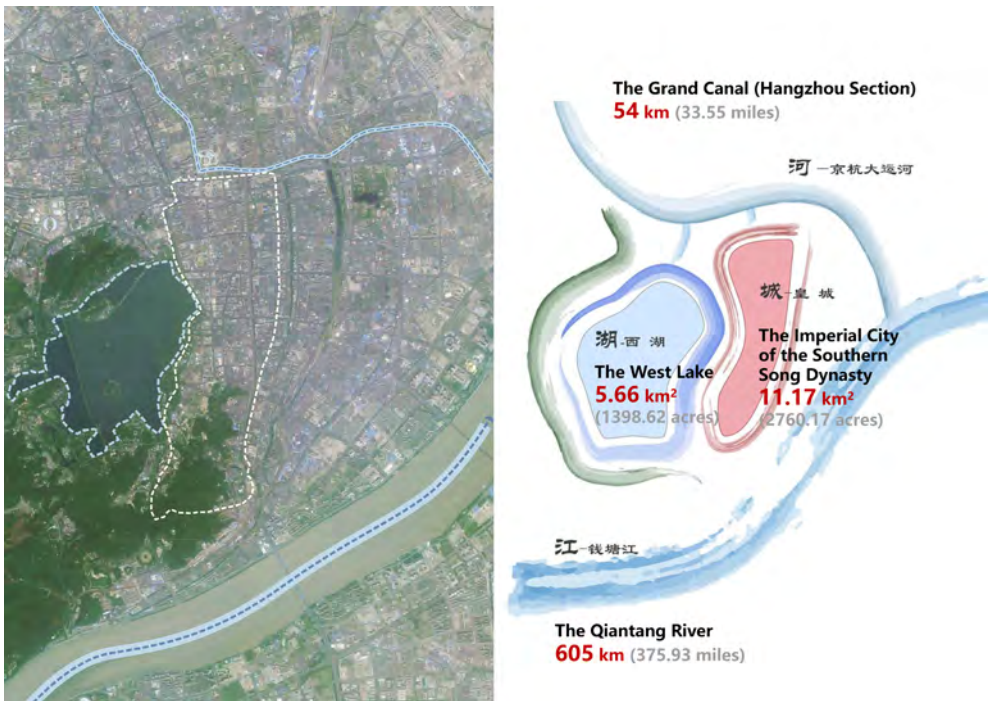
THREE MAPS:
THE CANAL, THE CITY, AND THE PEOPLE

DEFINITION OF THE PROJECT AREA

The Urban Landscape Promotion Project along Both Banks of the Grand Canal (Hangzhou Section) consists of both a focused area and a research area. The focused project area, where maintenance, promotion and revitalization work will occur, is a 90km² area along both banks of the Grand Canal (also known as the Hangzhou Section). It starts at the Sanbao Ship Lock in Jianggan District in the south and extends north to reach the municipal boundary of Hangzhou. It includes the middle and eastern watercourses of the canal for a total length of 54 kilometers (33.6 miles). The fields along both banks have project area widths ranging from 500 meters (1,640 feet) to 1,000 meters (3,280 feet) based on actual site situations.

We have also identified a 160km² research range in the main city of Hangzhou. This area consists of the fields, located to the south of the highway around the city (offset one block) and to the north of the highway, together with surrounding elements of wetlands, roads and mountains.

Figure 4: Locational Relationship and Size Comparison between the Grand Canal (Hangzhou Section), the West Lake, the Imperial City of the Southern Song Dynasty and the Qiantang River

The Grand Canal (Hangzhou Section)
54 km (33.55 miles)

河 一京杭大运河

城 · 皇 城

The Imperial City of the Southern Song Dynasty
11.17 km²
(2760.17 acres)

湖 · 西 湖
The West Lake
5.66 km²
(1398.62 acres)

江 一钱塘江

The Qiantang River
605 km (375.93 miles)

OBJECTIVES OF THE PLAN

With the intent to rebirth the Grand Canal to benefit the local communities, the *objectives* of the project are:

· To solve the three key problems which are: isolation of the styles and features between the ancient and the modern; isolation of the spaces between the Grand Canal and the City of Hangzhou; and, isolation of the scenic sightseeing opportunities between the canal and the city;

· To provide design solutions for each of the three key elements *"the canal,*

the city, and the people" which will also maintain interrelations between each element; and,

· To discuss the dynamics and relationships between the historical characteristics, the city-canal interactions, and the sightseeing activities.

Figure 5: Bird View of the Urban Landscape Promotion Project along Both Banks of the Grand Canal (Hangzhou Section)

CONCEPT FOR THE PLAN

We envision incorporating the objectives for each element (the canal, the city and the people) by developing a general design framework which produces a landscape blueprint to capture the following concepts:

· *The canal relates to a history of thousands of years:* five-waterii system leads to unite the lakes and the harbors;
· *The city embraces urban spaces interacting with the canal:* six urban cores converge to shape the urban ecological corridors;
· *The people sightsee both the landscape of the canal and that of the city:* eight active arteries and veins interweave to reveal the vibrant communities.

Based on the proposal of the project, the 54-kilometer long canal serves as the routes to enjoy the urban landscape and constitutes an important part of the urban landscape itself.

The three following maps will illustrate our concept. These maps were developed through nine technological methods as well as Global Positioning System (GPS) and Geographic Information System (GIS) technologies. An additional feature of the concept is its role to enhance the City of Hangzhou as a new livable smart city, while positioning the local communities along both banks of the Grand Canal as new vibrant smart communities.

---

ii "Five-water" illustrates the five categories of water blended in the natural basis of the City of Hangzhou, which shape Hangzhou as a mountains-and-waters type city, i.e. sea (the East Sea), river (the Qiantang River), lake (the West Lake), stream (the Xixi Wetland) and canal (the Grand Canal).
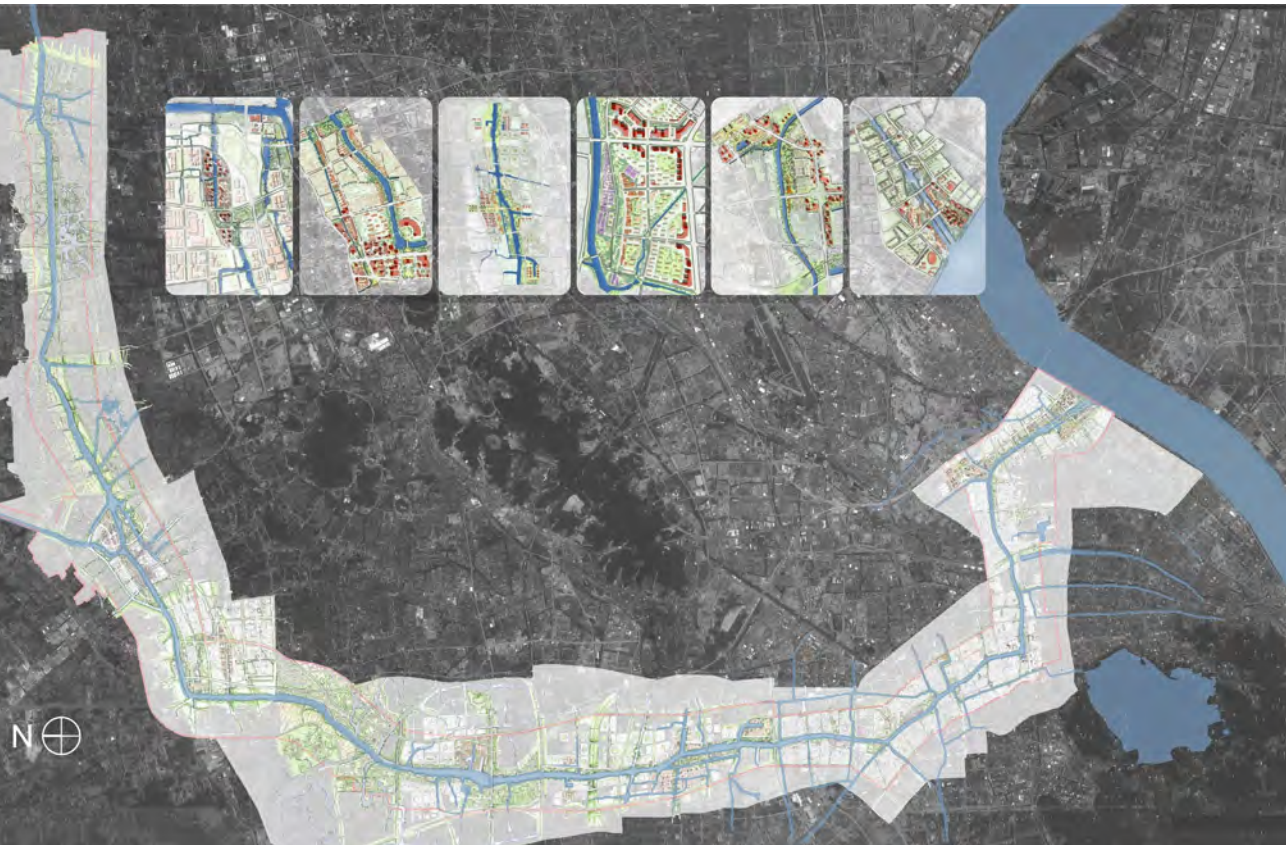
Figure 6: Master Plan of the Urban Landscape Promotion Project
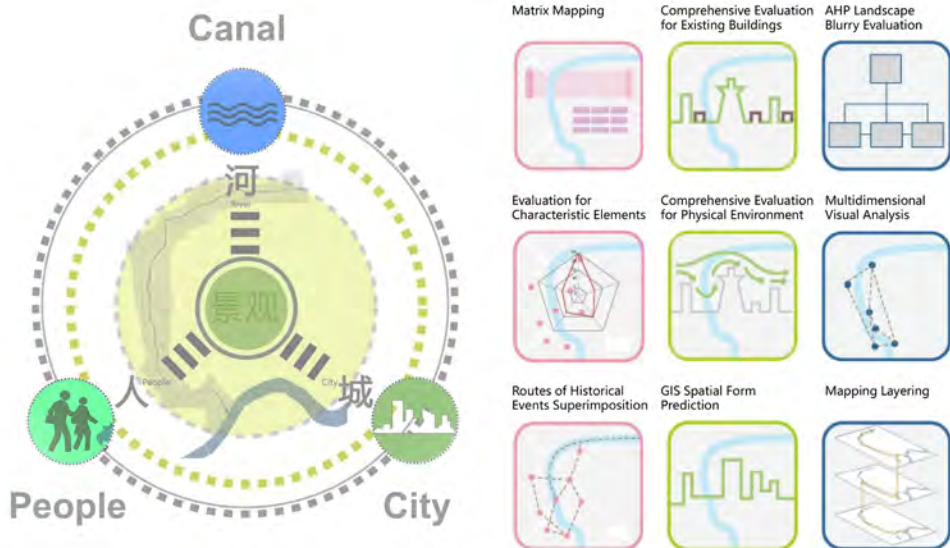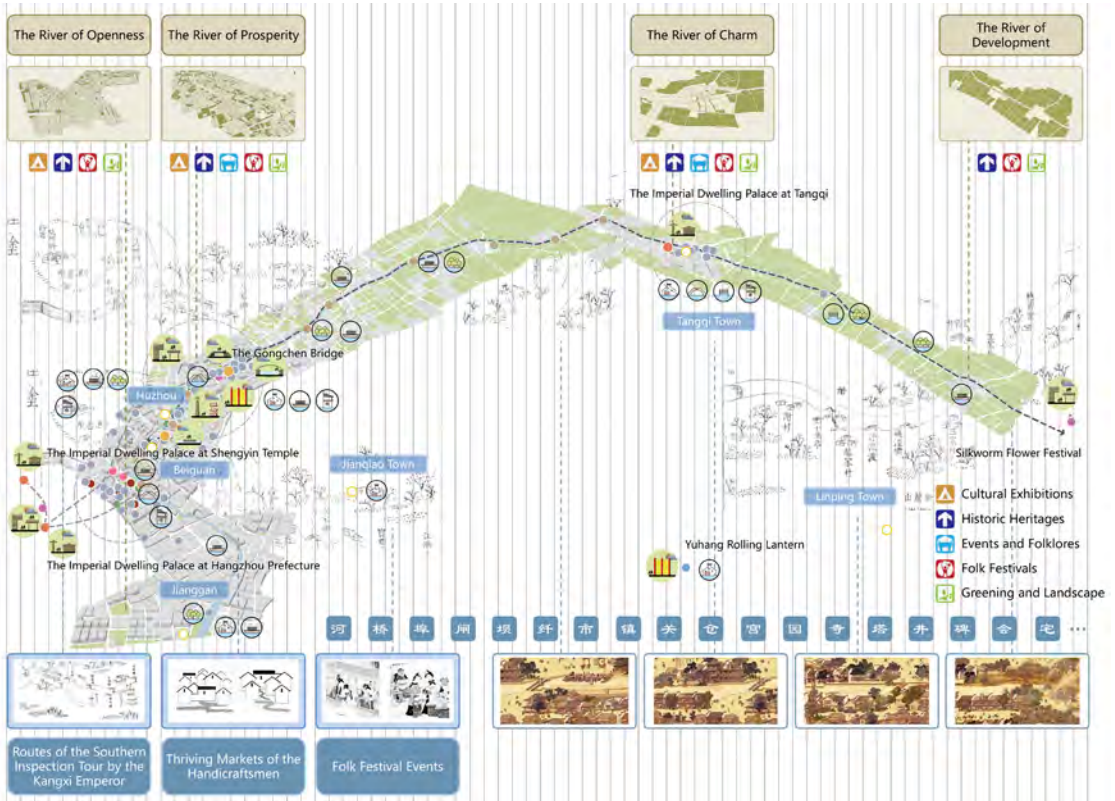along Both Banks of the Grand Canal (Hangzhou Section)

Figure 7: Concept for the Plan and the Nine Technological Methods

Figure 8: The Holography System
Map of the Image of the History

THE FIRST MAP: THE CANAL RELATES TO A HISTORY OF THOUSANDS OF YEARS

The first map is **the Holography System Map of the Image of the History**. "The canal relates to history of thousands of years" by incorporating and adopting the core values, characteristic elements and historical events which occurred since its construction. These have been recorded into a holography system map which serves as the image of the history. It is used to show preservation areas and land use utilization of historic landscapes along the Grand Canal. The map provides a global vision of the Grand Canal, and was produced by incorporating three methods:

Method 1. Matrix Mapping: The position of the Hangzhou Section of the Grand Canal (compared to other sections within other cities along the canal) was defined through research and analysis of three parts types of data base: 1) the hydrological system in China including both the canal system and the five-water system; 2) the basin length and the age of construction for each section of the canal; and 3) the total GDP and the quantity of heritage points in cities along the canal.

Compared to the other canals that have been listed as UNESCO World Heritage Sites, the Grand Canal is the oldest and the longest canal. It is also one of the canals with the largest engineering features and the only canal with the signature of "*caoyun*". Compared to other canal cities, Hangzhou is the historical and cultural city where the ancient meets the modern. From the point of view of Hangzhou urban pattern, illustrated

by the five-water system, the Grand Canal is the origin of prosperity and openness for the city. This matrix identified the three core values of the Grand Canal from a global perspective.

Method 2. Evaluation for Characteristic Elements: We identified five categories of characteristic spaces for the canal, which could be described as "two islets, three branches, three harbors, four coves, and seven joints". In addition, within the eighty-one historical elements of the Grand Canal, the planning scheme extracted twenty-two categories of characteristic spaces, including such diverse categories as bridges, ports, ship locks, dams, and etc. The distribution of the existing characteristic elements was used to identify historic blocks, such as found in Tangqi and Qiaoxi, as well as the three clusters located to the south of the Wulin Square.

Method 3. Routes of Historical Events Superimposition: The planning scheme endowed the spatial forms of the Grand Canal with humanistic feelings which strengthen the place characteristics of historical events. For instance, the routes of the southern inspection tour by the Kangxi[iii] Emperor prompted the establishment of markets and trade centers by numerous handicraftsmen. The inspection also influenced folk customs and festivals.

THE SECOND MAP: THE CITY EMBRACES URBAN SPACES INTERACTING WITH THE CANAL

The second map is **the Morphology System Map of the City-Canal Spaces**. It is intended to illustrate how "the city embraces urban spaces interacting with the canal". To exhibit this city-canal interactive relationship, we created a morphology map for comprehensively displaying superimposed reconstructions of existing buildings and simulations of future spatial forms, which had been optimized for the physical environment of the city-canal spaces. The map visualizes the ideal model of urban forms along both banks of the canal from the perspective of city-canal interaction. It was constructed using the following three methods (labeled Methods 4 to 6):

Method 4. Comprehensive Evaluation for Existing Buildings: For the comprehensive evaluation for existing buildings, the project excluded lands where construction was prohibited. This development-excluded zone had a total area of around 39km^2, including lands designed for ecological conservation (mainly in the Tangqi Wetland), historic cultural heritages, green parks, and etc., as well as the lands with planning schemes approved with a total number of 153 blocks. We then evaluated the existing buildings on the remaining land which could support development. During this process, we identified the lands where demolition should occur, areas where reconstruction or partial redevelopment might occur, as well as areas to support future development.

Figure 9: (next page) Simulation and Analysis of Physical Environment in Guanjiayang

Figure 10: (next page) Simulation and Analysis of Physical Environment in the Heritage Park of the Refinery

iii   The Kangxi Emperor, 1654-1722 AD.

WANG JIANGUO
YANG JUNYAN
CHEN HAINING
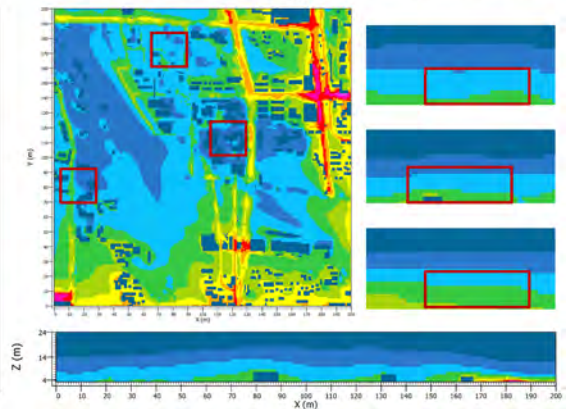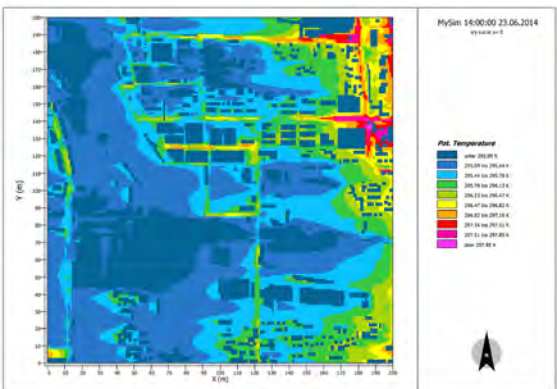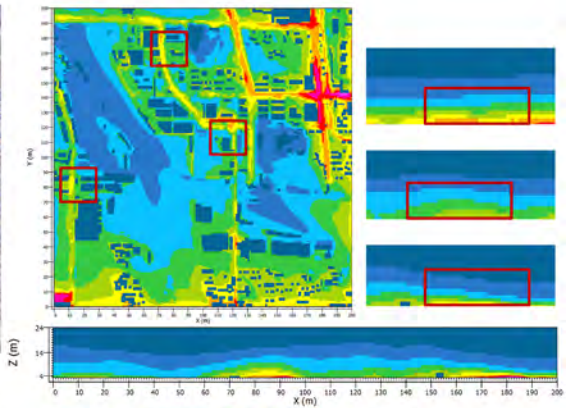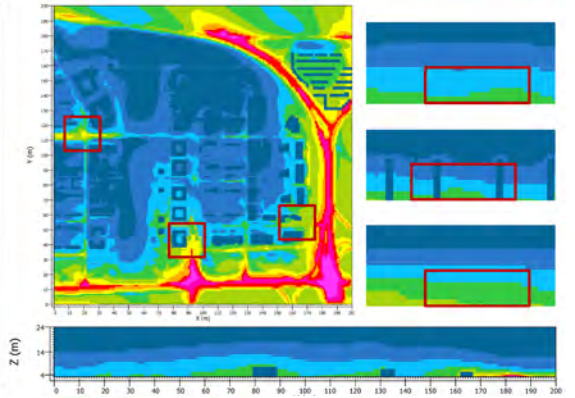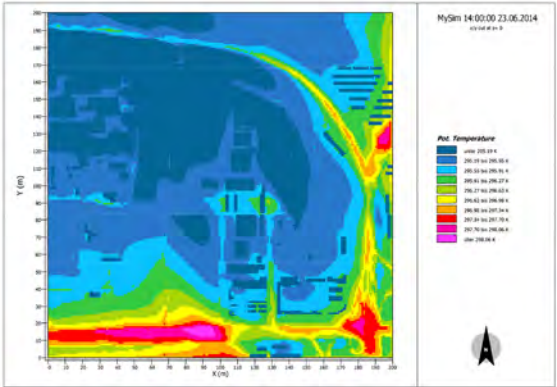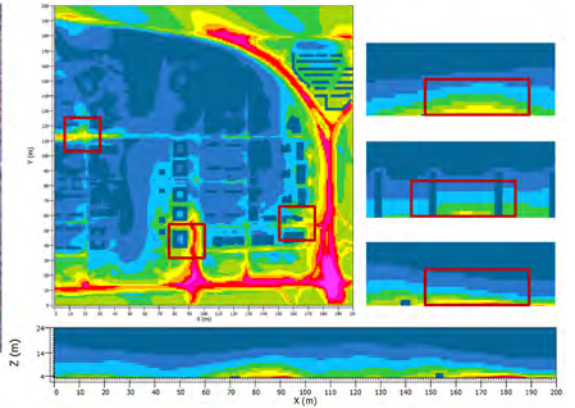
Method 5. Comprehensive Evaluation for Physical Environment: The Grand Canal should play an important role in improving and promoting urban physical environment of the City of Hangzhou, as it is such a large-scale linear open space. We conducted research to determine the thermal, wind and acoustic properties along the canal to assist in assessment of canal zones' physical environment. Simulation and analysis of the thermal environment was carried out using the software platform of Ecotect, which is based on the principles of computational fluid dynamics (CFD). The simulation and analysis of wind was accomplished using the software platform of Fluent, while the simulation and analysis of acoustic environment was done by the software Raynoise. The resulting information was used to promotion strategies for the physical environment including the control measures for the spatial forms along the Grand Canal.

Method 6. GIS Spatial Form Prediction: Our examination of ideal urban landscape forms along both banks of the Grand Canal was based on both existing circumstances and the prediction of future spatial intensity. Therefore, the planning scheme simulated intensity and height of the future spatial forms along the Grand Canal based on the GIS technological platform. Buffer analysis, Kernel density estimation and Kriging interpolation calculation were applied to superimpose and analyze eight factors of the index system, including urban land prices, urban center systems, and rail transit stations. We used the resulting information to inform our judgment as we developed optimal spatial forms along the Grand Canal.
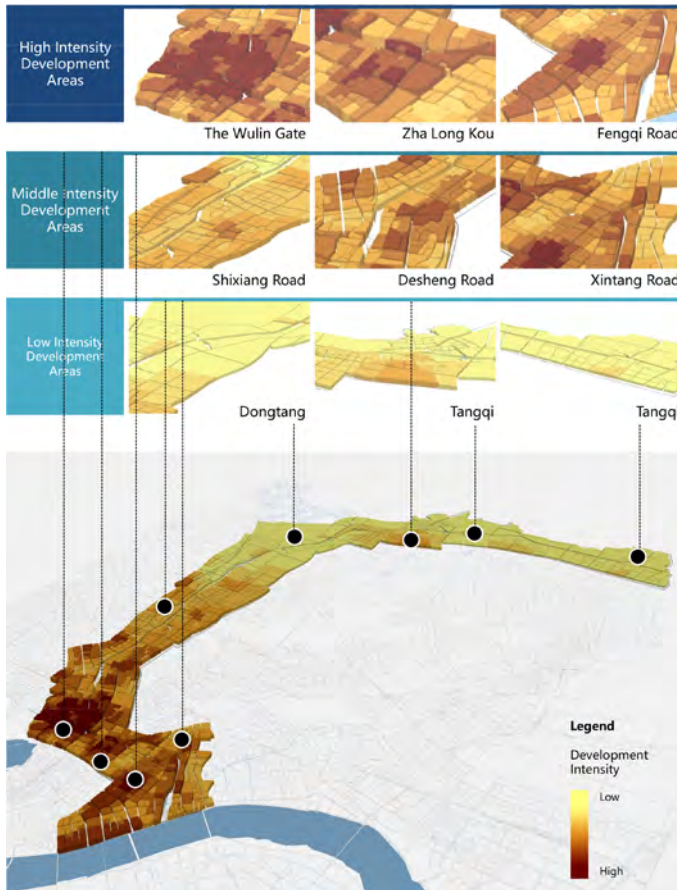
Figure 11: Prediction of Future Spatial Intensity based on the GIS Technological Platform
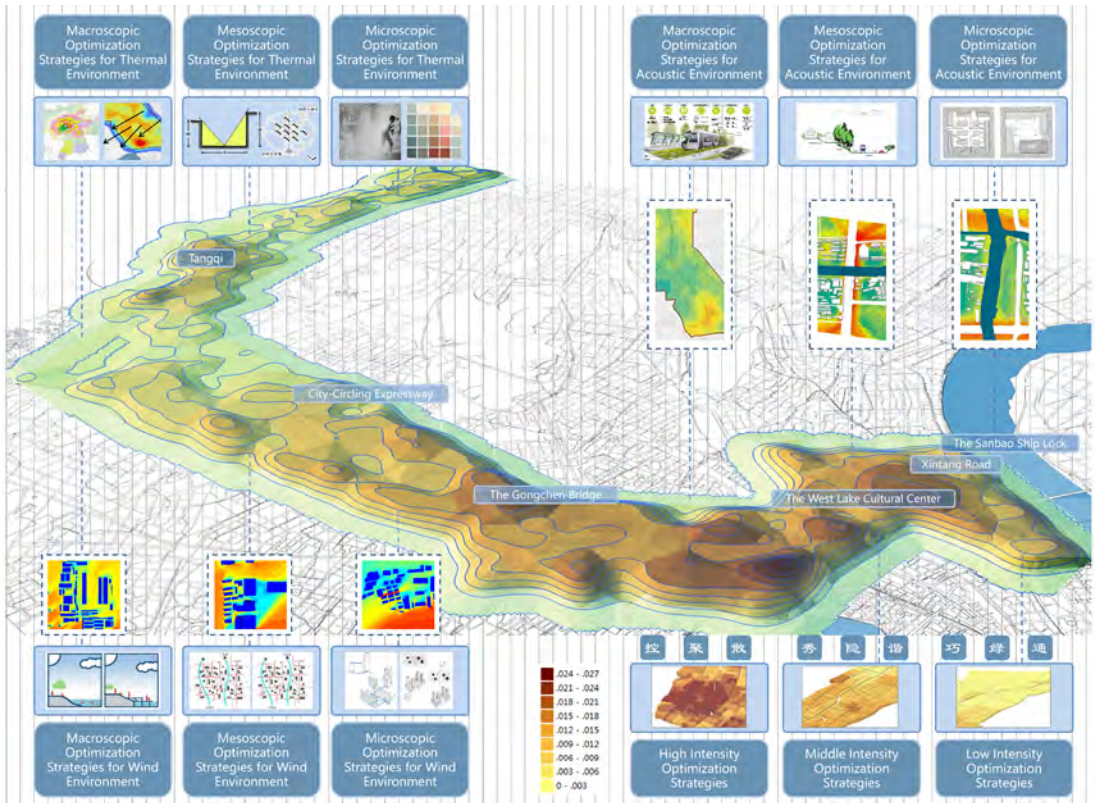
THE THIRD MAP: THE PEOPLE SIGHTSEE LANDSCAPE OF THE CANAL AND THE CITY

The third map is ***the Sightseeing System Map of Dynamic Optesthesia***. This map organizes and superimposes evaluation results of the visual landscape, the overlooking system and the dynamic sightseeing system to identify the sightseeing system map. It displays a dynamic optesthesia to exhibit the interactive relationships between the people and the canal. It focused on two key scientific issues. The first is the sightseeing system for the Grand Canal based on sightseeing modes from different speeds, trajectories, and visual angles of people, vehicles and boats. The second promotes the urban features along the large-scale living linear cultural heritage corridor.

Previous efforts to develop a sightseeing plan based on landscape features in China and abroad paid more attention to a single movement-oriented circumstance, where the visual perception changes were generated by movement. This kind of sightseeing perception research always put the serial static viewpoints as the starting points. However, the experiences and feelings of the same landscape from the same visitor in different sightseeing systems are not entirely the same. The elements which affect people's visual perception also include movement speeds and movement trajectories, sightseeing distances, and visual angles from the ornamental object. As a result, the sightseeing system would not be a single existence even in the same landscape.

We argue that the composite and dynamic sightseeing model we used in this project is an improvement compared to the static sightseeing model, especially in large-scale landscape environments. Our resulting map made

Figure 13: The Sightseeing System Map of Dynamic Optesthesia
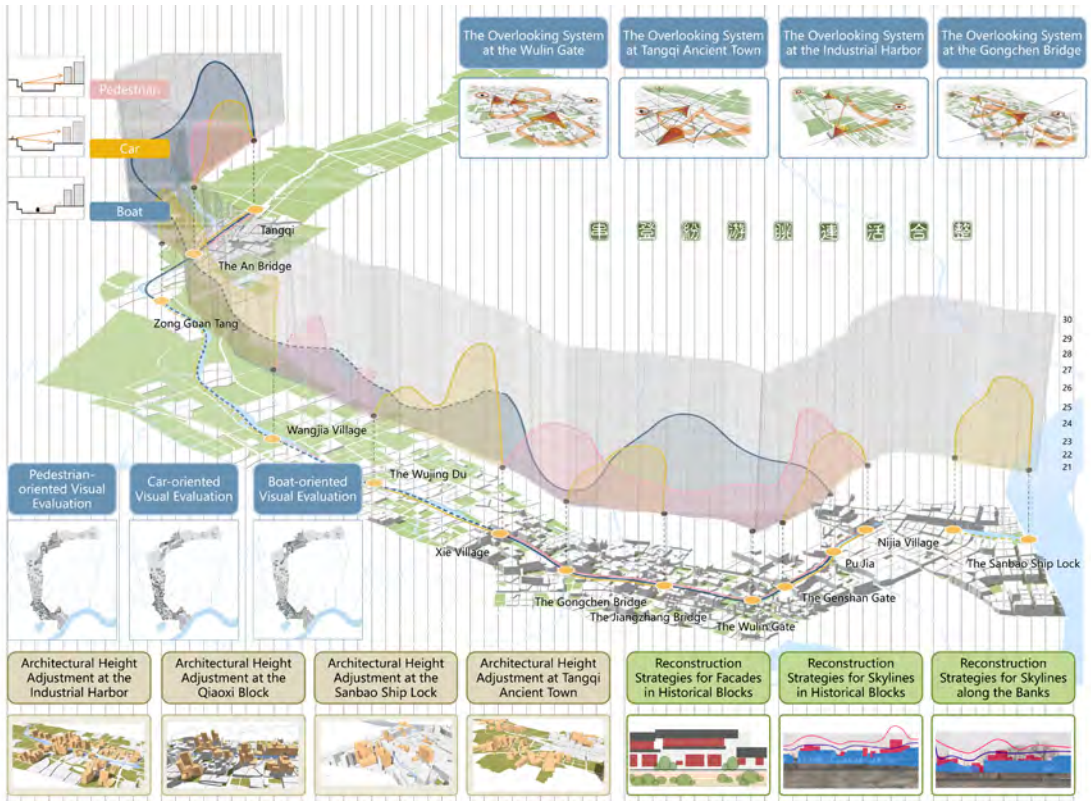
clear the dynamic sightseeing model along the canal from the perspective of people-canal interaction. Our process is composed of three methods (labeled Methods 7 to 9):

Method 7. AHP [iv] ***Landscape Blurry Evaluation***: The AHP landscape blurry evaluation was an analysis of 25 central viewpoints on the Grand Canal and 38 facades along the canal, one by one and each from three aspects and nine elements. These elements included the aspects of urban skyline, architecture form and visual perception. The guidance for landscape promotion planning in the next step would be implemented according to the results of this evaluation.

Method 8. Multidimensional Visual Analysis: The canal's landscape overlooking system was established from four perspectives: touring on the boats; sightseeing from the banks; viewing from the bridges; and, overlooking from the buildings. The comprehensive analysis of the effects based on height limitation was carried out for sightseeing activities around the Grand Canal and the West Lake. According to the existing development plans, there would be six main cluster areas of high-rise buildings around the West Lake in Hangzhou. Taking this into account, we were able to recommend the short-term, the medium-term and the long-term future construction arrangements for high-rise buildings in

---

iv Analytic Hierarchy Process (AHP) is a structured technique developed by Professor Thomas L. Saaty for analyzing complex decisions based on mathematics and psychology.

Hangzhou based on the two main viewpoints of the Grand Canal near the West Lake. Consequently, the Wulin Gate, the Sanbao Ship Lock and the New City of Grand Canal would be the cluster areas of high-rise buildings which should be given priority to construct.

Method 9. Mapping Layering: Dynamic sightseeing is one of the main characteristics of the sightseeing activities related to the Grand Canal. Hence, we built landscape intention models under different speeds, based on interaction relations between the sightseeing perception and three movement modes including boating, walking and bicycling.

THE FUTURE-ORIENTED CONCEPTION AND STRATEGIES

Based on our three analytical maps about the canal, the city and the people, we proposed an urban landscape plan for the Grand Canal based on the conception of *"one grand heritage area".* This plan consists of nine design strategies, six focused planning districts, twelve action plans, and twenty-four-section designs.

The conception of "one grand heritage area" not only sets forth the single heritage domain of the Grand Canal, but also integrates the characteristic cultural and natural heritages resources in the Grand Canal, the West Lake, the Imperial City of the Southern Song Dynasty[v] and the Qiantang River from the holistic layer of Hangzhou. The canal is proposed to be the sightseeing vehicle to communicate with the slow traffic system of green corridors. It is intended to cascade the sightseeing and recreation system, to build up the heritage preservation platform, and to establish the spatial framework incorporating the conception of grand heritage area with "one canal, one lake, one city, one river" for the City of Hangzhou.

The nine urban landscape promotion strategies could be summarized based on the project and relevant research as:

1) ***Perfection strategy*** for five-water system *on the layer of canal landscape promotion:* This strategy establishes the Grand Canal as the vehicle to advance the interactions between the city and the canal in Hangzhou. It uses the Canal, as the fifth water body, to unite the four other kinds of water bodies, which include sea, river, lake and stream by means of tour routes and which weave through the water system and between the proposed green corridors.

2) ***Exhibition strategy*** for culture diversity along the canal. This strategy calls for the exhibition of the multi-cultures along the canal including a deep analysis of the canal culture and its historical, industrial and urban cultures germinating by the canal.

3) ***Combination strategy*** for planning and heritage monitoring. This put forward the relevant ideas and methods for a heritage monitoring program of the canal. It is envisioned that this strategy will be the basis for the post-application era of the West Lake as a UNESCO World Heritage Site.

---

v The Southern Song Dynasty, 1127-1279 AD.

4) **Optimization strategy** for the city-canal structure *on the layer of urban landscape promotion.* This program optimized the spatial relations between the city and the canal from three aspects. It proposes the optimal distribution for high-rise buildings along both banks of the Grand Canal. It offers construction guidance for waterfront buildings. And finally, it establishes overlooking corridors.

5) **Improvement strategy** for quality of public spaces. This work guides the systematic construction of waterfront public spaces; optimizes the physical environment of public spaces, and includes the planning for night scenes along the canal. It lays emphasis on the spatial relations between the canal and public spaces, such as public green spaces, squares, waterfront pedestrian streets, portal nodes, boulevards, ecological corridors, landscape parks, and so forth. It also improves the thermal, wind, and the acoustic environment by calling for the construction of wind corridors, traffic calming zones and the optimizal forms of high-rise buildings. Furthermore, the promotion strategies were put forward 24-hour scene-planning of the Grand Canal.

6) **Shaping strategy** for architectural features and characteristics. This strategy sorts architectural features along the canal into five categories for guidance, i.e. the old city areas, the ancient towns, the countryside areas, the industrial areas and the new towns. The architectural features and characteristics were shaped holistically based on the distribution of colors along the canal and landmark buildings in the point-and-plane integration manner.

7) **Construction strategy** for green slow traffic systems *on the layer of sightseeing activity promotion.* This program organized the slow traffic systems depending on waterfront spaces and public greening. It afforded sightseeing routes for the citizens and tourists as recreation places for fitness activities and leisure.

8) **Revitalization strategy** for canal vitalities. This section of the overall plan calls for planned activities, incorporating traditional sports, folk performances, special cuisines and tourism, along the canal in order to illustrate an in-depth perception of canal vitality through multi-layer tour experiences ranging from half-day tour, one-day tour to multi-day tour.

9) **Creation strategy** for the new "Ten Sceneries of the Grand Canal". This strategy advances landscape coordination in the grand heritage area. It proposes the creation of the ten sceneries along the Grand Canal, while echoing the West Lake across the distance.

Additionally, the planning scheme proposes six focused planning districts and twelve action plans. The role of these special areas is to transform the static ultimate blueprint to an action plan that could be effectively operated and implemented. The twelve action plans included the preservation action for city-canal structure, the renovation action for waterfront development, the perfection action for five-water system, the experience action for canal cul-

ture, the planning action for architectural features and characteristics, etc. It proposed to push forward urban landscape promotion along both banks of the Grand Canal in a planned way with annual specific plans.

Besides, the planning scheme of the project, we divided the design range of the Grand Canal into twenty-four design sections. Within each section specific planning and design standards would be used for water, landscape along the canal, waterfront buildings, open spaces, sightseeing systems, etc. From the perspective of history and culture, each section has preservation measures of exhibition, consolidation, combination and extension. From the perspective of urban space, each sections has optimization measures of controlling, assembling, hiding and greening; and finally, from the perspective of canal sightseeing, each design section has sightseeing measures of connection, touring, overlooking and vitalization.

CONCLUSIONS AND DISCUSSIONS

The Grand Canal is a large-scale living linear cultural heritage corridor. Overall, the urban landscape plan along both banks of the Grand Canal (Hangzhou Section) integrates a dynamic and complicated evolutionary process which includes resources and endowments of the Grand Canal (including sceneries of the canal and scenes of the city) and the sightseeing system, into a three-layered systems embodying the canal, the city and the people. The systematic design contained the conception of *"one grand heritage area"*, including three objectives and images as well as nine design strategies. It identified six focused planning districts, twelve action plans, and twenty-four-section design for the Grand Canal.

In summary, the core issues of the *Urban Landscape Promotion Project along Both Banks of the Grand Canal (Hangzhou Section)* and its relevant revitalization work are intended to coordinate heritage preservation, urban design and sightseeing organization efforts. The project integrates research with design, seeking to achieve innovation embodied in three aspects:

· It proved to be platform to innovation planning theories and technologies. The urban planning and design proposed land use controls for large-scale spatial forms and used evaluation theory for landscape visions of the future based on the forecasted urban landscape preservation and enhancement along both banks of the Grand Canal. It constructed the urban form model for the project by using digital platforms such as GIS.

· It innovatively utilized the design method of interaction between "sceneries" and "sightseeing" to produce the urban planning and design along the full 54 km^2 (13,344 acres) project. It put forward twelve action plans and design guidelines for twenty-four sections to achieve dynamic implementation, baseline control, long-acting management.

However, as a large-scale living linear cultural heritage corridor, preservation work for the Grand Canal is multielement and multidimensional. The work processes we used are not only dynamic and complicated, but also holistic and consecutive, which has made it very difficult to inherit the soul of its cultural connotation. Also, the interdisciplinary cooperation in urban planning and design and the incorporation of advanced conceptions and technologies, many on frontiers of practice, make the institutional framework very essential. Good governance and public participation will facilitate the work from various perspectives.

In addition to the Grand Canal, there exist other similar linear cultural heritages in China which are various in forms and contents, such as the Tea Horse Road, the Silk Road, and the Straight Road Site of the Qin Dynasty. We hope that *The Urban Landscape Promotion Project along Both Banks of the Grand Canal (Hangzhou Section)* can serve as an example and an entry point to discuss preservation for these other large-scale living linear cultural heritage corridor.

Finally, we hope that the scientific attitudes and methodology which produced the plan for the Grand Canal can finally contribute to the common societal objective to promote sustainable development towards a smart city. The Grand Canal as one of the most precious cultural heritages, containing the collective memories and emotions of tens of millions of people, and we hope that it will still be vital for our descendants in future millennium.

Figure 14. Bird View of the Grand Canal (Hangzhou Section).
Photo Credit: XU Haohao

References

Chen, W. (2013) *Walking on the Canal Line — A Study of the Historical Cities and Buildings along the Grand Canal*. Beijing: China Architecture and Building Press, pp.1-13.

Hsu, C. (1999) 'The Spring and Autumn Period', in Shaughnessy, E.L. and Loewe, M. (ed.) *The Cambridge History of Ancient China: From the Origins of Civilisation to 221 BC*. Cambridge: Cambridge University Press, pp. 564.

Jenkins, M. (2010) *National Geographic: The Tea Horse Road.* Available at: http://ngm. nationalgeographic.com/2010/05/tea-horse-road/jenkins-text (Accessed January 27th, 2017).

Shan, J. (2009) 'Focusing on the New Type of Cultural Heritage — Conservation for Cultural Route Heritage', *China Ancient City*, 23(5), pp. 4-12.

Shan, J. (2006) *Focusing on Linear Cultural Heritage, Advancing Conservation and Application for World Heritage for the Beijing-Hangzhou Grand Canal*. Available at: http://news.xinhuanet.com/newscenter/2006-06/09/content_4669344.htm (Accessed February 7th, 2017).

UNESCO (2014) *The Grand Canal*. Available at: http://whc.unesco.org/en/list/1443/ (Accessed January 25th, 2017).

Xinhua Daily (2012) *Application for UNESCO World Cultural Heritage Site: How to Attach Equal Importance on Preservation and Development in "Living Heritage"?* Available at: http://politics. people.com.cn/n/2012/0928/c70731-19146000.html (Accessed February 20th, 2017).

Yu, K., Xi, X., Li, D., Li, H. and Liu, K. (2009) 'On the Construction of the National Linear Cultural Heritage Network in China', *Human Geography*, 24 (3), pp. 11-16, 116.

Zheng, S. (1986) 'Florence and the Renaissance', *Time + Architecture*, 3(2), pp. 63-65.

AN INTEGRATED LARGE LANDSCAPE
THE DELAWARE & LEHIGH NATIONAL HERITAGE CORRIDOR

Elissa M. Garofalo

Figure 1: The D&L Trail, popular with bicyclists, follows the historic transportation route of anthracite coal from mine to market. Restored Section 8 of the Lehigh Canal in Easton's Hugh Moore Park is also home to Pennsylvania's only mule-drawn canal boat ride.
Source: Delaware & Lehigh National Heritage Corridor

The Delaware & Lehigh National Heritage Corridor[i] and State Heritage Area ("D&L Corridor") follows the Delaware and Lehigh Canals and the Lehigh Valley Railroad, stretching 160 miles from the City of Wilkes-Barre, in the mountainous coal region of northeastern Pennsylvania, to the Town of Bristol, located along the Delaware River near Philadelphia. Uniting Luzerne, Carbon, Northampton, Lehigh, and Bucks counties, the D&L Corridor commemorates the nationally significant, integrated historic transportation routes of rivers, canals, and railroads – and the people and communities involved – that brought anthracite coal from the mines to fuel the early nineteenth century American Industrial Revolution. Many historically significant industries and their adjacent towns (which survive today) were founded within the Corridor to take advantage of the transportation system.

Today the D&L Corridor is managed by a 501(c)3 nonprofit corporation whose role is to coordinate the collective efforts of numerous public, private and volunteer stakeholders who have collaboratively undertaken the mission to celebrate, preserve and make accessible the scenic rivers, historic canals and towns, mountains, green valleys, natural areas, recreation areas, remnants of early industries, and the distinct social and religious heritages which are the essence of the D&L Corridor.

---

i National Heritage Areas (NHAs) are defined by the National Park Service (NPS) as "places where natural, cultural, and historic resources combine to form a cohesive, nationally important landscape. Through their resources, NHAs tell nationally important stories that celebrate America's diverse heritage. They are lived-in landscapes." Unlike National Parks, NHAs are not owned by the federal government.

NATIONALLY SIGNIFICANT HERITAGE
OF THE CORRIDOR

Pennsylvania was the driving force of American industry in the 19th century. The Commonwealth's industries employed more people and produced more goods with more dollar value than any other state. Pennsylvania was the world's center of iron production, surpassing by the 1880s even the industrial might of Britain and Germany. And Pennsylvania was the nation's powerhouse, supplying 95% of the hot-burning, high-energy anthracite coal that ignited America's Industrial Revolution. That revolution began in the five counties-- Bucks, Northampton, Lehigh, Carbon, and Luzerne--that are now designated the Delaware & Lehigh National Heritage Corridor. This is the place where America was built, the cradle of the American Industrial Revolution.

How did this slice of the Keystone State become the birthplace of modern America? The answer lies in the confluence of waterways, minerals, and minds that met here in the mountains and valleys bisected by the beautiful, but narrow and rocky Lehigh River, and bounded on the east by the still-wild Delaware.

The key mineral was anthracite coal. Hidden beneath the mountains of north-eastern Pennsylvania, a mammoth source of energy lay undiscovered for millions of years. Anthracite coal is purer, harder, and has a higher carbon content than any other coal. This means it burns hotter, cleaner, and longer than any other solid fuel. It is vastly superior to the fuels--wood, charcoal, dung, peat, straw, and even soft coal--that humans had used for millennia to cook their food, heat their dwellings, and make tools, implements and ornaments from metal. When anthracite's energy was finally tapped here in eastern Pennsylvania, chemistry, metallurgy, industry--and all of American life--was changed forever.

So full of anthracite were these mountains that nearly all the stories of its discovery tell of someone simply finding it on the ground. The first people who were intrigued or persistent enough to get the coal to ignite found it made a hotter fire than any they had experienced. And since, as Henry Adams wrote "The Pennsylvania mind...in practical matters it was the steadiest of all American types; perhaps the most efficient…" several people independently--in the Wyoming Valley, in the Schuylkill Valley, and in Philadelphia-- decided to investigate how this fuel could be used.

But using coal on a large scale meant getting it from the wild and remote mountains to Philadelphia. In the early 19th century, William Penn's "greene country town" of Philadelphia was the financial, industrial, commercial, and intellectual center of the United States. A hundred miles to the north, however, the mountain roads were little more than Indian trails and since the Native Americans had mostly been driven out, almost no one lived there. Furthermore, the only way to move large quantities of any heavy, bulky cargo was by water--and the only water available was two rushing, rocky rivers; the Schuylkill or the Lehigh, which fed into the Delaware and thence to Philadelphia and its port.

Inspired by the canal system built in Britain, two Philadelphia businessmen, Josiah White and Erskine Hazard, decided that adapting the Lehigh River to deliver coal to Philadelphia was a better idea. In 1818 they founded two companies, the Lehigh Canal Company and the Lehigh Navigation Company. The Navigation company improved on earlier attempts to ship cargo using rafts which floated over and around the multiple obstructions in the Lehigh river, by building weirs, to create small pools in the river, equipped with drop gates,

Figure 2: Panther Valley coal miner photographed by remarkable documentary photographer, George Harvan of Lansford, PA. Source: National Canal Museum Archives

which opened creating small floods to carry the rafts over obstacles and to the next pool in the navigation system.

White, who was one of the most prolific American inventors of his time, focused on taming the rivers, while Hazard, the well-connected son of one of America's pioneers of the insurance business, courted investors and found the money. The company they founded in 1822, the Lehigh Coal and Navigation Company (LC&N), successfully completed a canal, in 1829, along the Lehigh River from the company mines in Mauch Chunk, PA to Easton, PA, at the confluence of the Lehigh and Delaware Rivers. There, the Lehigh Canal intersected with both the Delaware Canal, built by the Commonwealth of Pennsylvania, and the privately owned Morris Canal, providing access to both the ports of Philadelphia and New York. Once the LC&N established a flourishing coal mining and delivery business, they set about bringing the nation into the industrial age, by fostering the change from using charcoal to using their anthracite to smelt iron. For example, in 1840 the Crane Iron Works, funded by the LC&N and located near Lock 36 of the Lehigh Canal, was the first anthracite powered blast furnace in America.

Not long after the completion of the canals, anthracite powered steam railroads were being constructed following the alignments of the canals. For example, in 1837 the Lehigh and Susquehanna Railroad was built by the LC&N to facilitate transporting coal to the upper section of the Lehigh Canal. By the early 1850's the Lehigh Valley Railroad (LVRR) was constructed along the eastern bank of the Lehigh River traveling from the coal fields to Easton, where it (like the earlier canals) intersected other rail lines. Of note, one of the founders of the LVRR owned a company which repaired locks and built canal boats for the LC&N.

All during this period of rapid transportation and industrial growth, immigrants from Europe located to the Corridor. Irish were employed to dig the canals and built the rail lines. Welsh were employed to mine the coal and work at the early iron plants. Later mills, such as the 20th Century industrial giant Bethlehem Steel, and their towns blossomed in the Corridor to house new immigrants to fill the growing number of industrial jobs.

Figure 3: Illustration depicting Lehigh Canal Weigh Lock #2 near Mauch Chunk (present day Jim Thorpe, PA).
Source: National Canal Museum Archives

These five counties are one of the places in the world where geology and geography met human genius, with momentous results. The biographer David McCullough writes "I [have never] been able to disassociate people or their stories from their settings, the "background." If character is destiny, so too, I believe, is terrain." The story of the Delaware & Lehigh National Heritage Corridor is how the terrain of eastern Pennsylvania, from the resource-rich wilderness mountains to the north to the educated cosmopolitan commercial environs of Philadelphia, coupled with the "Pennsylvania mind" and the extra-ordinary drive and energy of thousands of native-born and immigrant Penn-sylvanians, triggered a social and economic transformation that changed the entire United States.

THE ORIGINS OF THE CORRIDOR PARTNERSHIP

To understand the factors and players who were instrumental in the Corridor's designation and to capture the thinking about the heritage area approach in its early years, it's important to revisit events that began taking place as soon of the canal stopped operation in the early twentieth century.

Efforts to preserve the Delaware and Lehigh canals began as early as 1931 when the LC&N, which acquired the Delaware Canal from the State in 1858, transferred 40 miles of the Delaware Canal back to the Commonwealth of Pennsylvania, which enabled the creation of the Delaware Canal State Park. Over the years, as LC&N transferred additional segments of canal into public and private hands, the declining condition of some sections caused residents to voice their concern to local leaders. Many of these people had a working connection with the canals, and found value—environmental, recreational, aesthetic, and historical—in the canal system. Concerned with threats to the integrity of these waterways, some residents took action into their own hands. In 1978, the nonprofit organization Friends of the Delaware Canal helped the canal to achieve national historic landmark designation.

The National Park Service first acknowledged the canal system when it docu-mented the national significance of the Delaware and Lehigh canals in a 1977 National Urban Recreation Study. However, in the early 1980s the National Park Service declined the Commonwealth's offer to transfer ownership and management of the Delaware Canal to the NPS because of high maintenance costs and the lack of a formal study of this proposal.

Throughout the 1980s, as preservation, parks, and recreation leaders with-in Pennsylvania discussed the Delaware and Lehigh canals, their ideas about the future of the region gradually merged. The thinking of these leaders was informed by visits to the Illinois & Michigan Canal National Heritage Corridor[ii], Blackstone River Valley National Heritage Corridor[iii], Chesapeake & Ohio Canal National Historical Park[iv], and Lowell National Historical Park[v], where they saw the impacts of NPS involvement on the preservation of historic canal resources.

These leaders adapted their observations to the D&L region, where the con-cept of "regionalism" and its inherent possibilities led to new collaborations between the state, the NPS, and neighboring jurisdictions. In 1988, the NPS and

---

ii   https://iandmcanal.org/
iii https://www.nps.gov/blac/index.htm
iv   https://www.nps.gov/choh/index.htm
v   https://www.nps.gov/lowe/planyourvisit/index.htm

the Commonwealth of Pennsylvania sponsored a seminar in Scranton to discuss the idea of a heritage approach in the Lackawanna Valley that would represent the resources and themes that were related to, but not included in, Steamtown National Historic Site[vi]. The meeting brought together economic development, historic preservation, trails, and parks experts. The meeting strengthened political support for heritage areas in the state and has been credited with influencing the formation of the Pennsylvania Heritage Parks Program.

National bipartisan political support from key members of Congress also was critical to the D&L Corridor's national designation. Congressman Peter Kostmayer, a Democrat, first became involved in 1984 in response to constituent requests to "do something" about the condition of the Delaware Canal in Bucks County. Congressman Don Ritter, a Republican, became involved through an economic development initiative to create a Lehigh River heritage corridor. As pressure from their constituents grew in breadth and intensity, both Congressmen joined efforts and championed legislation to establish a heritage corridor that encompassed the canals along both the Delaware and Lehigh rivers. After the Scranton seminar, in 1988, both legislators, along with the state, supported a heritage conference in Bethlehem, PA that focused specifically on the D&L region; a meeting which influenced the movement of the D&L's federal legislation through Congress.

In addition to local activism and federal and state leadership, another motivating force for the D&L's national designation was the inherent quality of the resource. One early D&L advocate noted, "It helps if the resource has a strong, iconic image, an image that people relate to." The Corridor's visible reminders of the past and abundance of natural beauty made many residents strong advocates for preservation, and their support made the designation and subsequent management planning process clearly a public priority and effort.

ACHIEVING A SUSTAINABLE ORGANIZATIONAL STRUCTURE

The Delaware and Lehigh Canal National Heritage Corridor Commission was established by the United States Congress in 1988. It created a Federal Commission mandated to produce a Management Plan and to establish an active, successful partnerships between local government, state agencies, the National Park Service and other federal agencies as well as business, civic and environmental organizations.

While successful in developing a plan (discussed in the next section) and engaging the stakeholders, getting the funds to implement the Plan was a problem. Local government financial resources in the D&L's five county region of eastern Pennsylvania were limited. For example, the northernmost counties were still recovering from the decline for anthracite coal along with its attendant job loss and reduction of tax revenues. The Lehigh Valley was trying to reduce the impact of the shuttering of Bethlehem Steel's operations on the south side of Bethlehem, a loss of over 14,000 Steel jobs and many more service jobs reliant on the plant and its employees. Only Bucks County had a complement of high capacity partners and a network of agencies to preserve and benefit from its picturesque landscape. In addition, National Heritage Areas
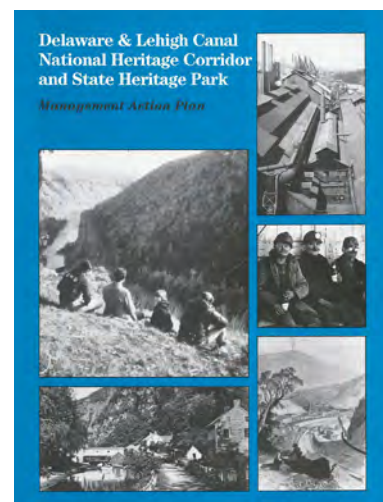

Figure 4: Cover of the Management Action Plan. Source: Delaware & Lehigh National Heritage Corridor

---

vi   See: https://www.nps.gov/stea/index.htm

were conceived as a partnership program that ultimately would be weaned off federal funding. There was no appetite by the private sector to contribute to a governmental agency. While nimbler than most, the Commission organization was still saddled with the rules and regulations tied to federal funding. In general, it was viewed as a funding source, despite its limited financial resources, rather than a potential recipient of private funding.

Although the D&L's original Federal authorization was extended and reauthorized in 2003, the fiscal writing was already on the wall.   It was time to somehow diversify its funding or shutter the operation and turn its mission and operations over to other more established conservancies. Working for over a year with the National Park Service's Vermont-based think tank, the Conservation Study Institute conducted a study of the D&L Corridor organization's work to date and published its 2006 Sustainability Report. Anticipating the recommendations of this study, in 2005, the Delaware and Lehigh National Heritage Corridor, Inc., a 501(c)3 nonprofit (private, not Federal) corporation was established to mirror the original management entity.

With $150,000 raised from the Miles of Mules art project (described later in this article) and a directive from public and private partners, the federal commission's authorization ended in 2007, putting the non-profit fully in charge. Finally, in 2009, Congress granted authorization to the Delaware & Lehigh National Heritage Corridor, Inc.

PLANNING FOR THE CORRIDOR

The D&L Corridor's Management Action Plan, first published in 1993 and updated in 2013, provides a durable framework to cultivate the region's living landscape and partnership system. The Plan was developed using an open, inclusive, collaborative approach to ensure that the plan would be responsiveness to local needs and opportunities and meaningful to local communities.

The D&L Corridor has a broad mission with heritage as its platform for action. This plan is organized around a single, simple vision: making the D&L Corridor a major national asset and destination. In this vision, the D&L Trail and linking it to other trails throughout the corridor are central to the National Heritage Corridor as a complete experience. It also envisioned a full experience along the entire corridor, which combined history, communities, and nature. In effect, the creativity of the early American Industrial Revolution is our legacy to bring forward into this 21st century place, with our "product" today being an enjoyable place supporting an outstanding quality of life and a culture of continuing innovation. The primary audience for the D&L National Heritage Corridor is the residents of the five-county Corridor region. Full success in achieving this vision means that residents of all ages will learn about and enjoy the Corridor so that they will undertake lasting stewardship of this special resources.

To achieve its mission the following plan goals were adopted:

1. **Foster Connections and Stewardship:** *Promote deeper connections among communities, neighbors, and the land and greater appreciation of the Corridor's history and its cultural and physical assets in order to foster stewardship and commitment to sustaining and improving the region's quality of life.*

2. **Create a Robust Regional Network of Trails:** *Create a fully connected regional trail network supporting recreation, wellness, and interpretation, using both the "spine" of historic transportation routes (canals and rails)*

and other linking routes.

3. **Educate and Interpret:** *Establish a common interpretive framework and a cooperative system of interpretive and educational facilities and programs.*

4. **Advance Economic Vitality:** *Bring new vigor and resilience to the region's economy and enhance amenities available to residents and visitors alike.*

5. **Encourage Partners:** *Encourage all partner organizations and communities to participate fully in Corridor initiatives, play effective roles in advancing Corridor goals, and leverage financial support to bring new vigor to the region's economy and assets.*

6. **Build Long-Term Sustainability:** *Build constituencies and accomplish projects that generate interest, investment, and momentum to sustain the Corridor over time.*

The main landscape elements of the Corridor plan consist of a Passage (i.e. Spine), Reaches, Counties and Linkages. The Spine is the pathway along both canals and the Lehigh and Susquehanna Railroad, a distance of 165 miles. Reaches are landscapes along the spine containing a critical mass of historic resources related to the history of the Corridor. Eight reaches were identified in the plan. Linkages are trails or roadways which serve as connectors to adjacent communities, historic sites and other trails. The plan for these elements were summarized using the terms: Connect; Preserve; Revitalize, Celebrate and Sustain.

"Connect," addresses the proposal to develop a hiking trail along the entire spine of the Corridor. Designated the D&L Trail, it will encourage regional linkages to other trails to create a robust regional network of trails.

"Preserve," covers the main activities needed to encourage public appreciation for the heritage assets of the D&L Corridor. These are interpretation of the region's themes and stories by the D&L Corridor organization and partners and expansion of the D&L Corridor organization's premier educational program, "Tales of the Towpath." It also addresses two classic "preserve" issues, preserving the structural integrity of the Delaware Canal and the Lehigh Canal and preserving the cultural landscape of the reaches within the D&L Corridor. It reiterates commitment to the Lehigh Valley Greenways Conservation Landscape Initiative supported by the Pennsylvania Department of Conservation and Natural Resources (DCNR).

"Revitalize," offers strategies centered on D&L Corridor communities to encourage greater participation and visibility for community revitalization efforts related to heritage assets. The role of the D&L Corridor organization is to serve as regional "coach" for historic preservation and to encourage preservation efforts which make critical contributions to community revitalization.

"Celebrate," organizes the D&L Corridor's approaches to heritage tourism, community heritage and traditions (including events), and volunteerism.

Finally, "Sustain," addresses the needs of the D&L Corridor organization in business management and resource development (fundraising). A section on communications focuses on the needs of the D&L Corridor organization for marketing and coordination to ensure that the Corridor's visibility is the best it can be and that it reaches its audiences effectively.

IMPLEMENTING THE HERITAGE CORRIDOR PLAN

If the 1990s were about planning and inventorying for the Delaware & Lehigh National Heritage Corridor successful future, the first decade of the 21st century was all about putting those plans into action. The current focus is on creating enduring public/private partnerships with a variety of stakeholders, to ensure that goals of cultural, historical and natural resource protection are met.

COMPLETION OF THE D&L TRAIL

With 86 of the D&L Trail's 165 miles located within Lehigh Gorge and Delaware Canal State Parks, the D&L had a jumpstart on completing the path that would connect residents, visitors, communities, and businesses to the backbone of its story of innovation, conservation and industrial might. The slow and steady process of filling in the gaps began in earnest.

The D&L organization became highly effective at leveraging grant dollars from the National Park Service with complementary funding from the Commonwealth of Pennsylvania. Partnerships with municipal and non-profit organizations throughout the corridor created a decentralized web of influence with the D&L organization taking on the role of wizard behind the curtain.

Trail miles were designed and built. Volunteers systematically helped maintain and improve them.

Figure 5: Newly installed marker at Mile 61.
Source: Delaware & Lehigh National Heritage Corridor

At this writing, approximately 92% of the D&L Trail spine is built. We have a goal to connect all 165 miles by 2020 but the low hanging fruit has been picked and remaining gaps are complicated with the present day needs of active railroads and antiquated bridge replacement projects taking priority. However, the region is fortunate to have forward thinking regional planning partners in place in the Lehigh and Delaware Valleys, as well as strong support from the PA Department of Conservation and Natural Resources, PennDOT and the Philadelphia-based William Penn Foundation. At least three gaps will be closed in 2017 with the construction of a $3.4 million bike/pedestrian bridge across the Lehigh River at Jim Thorpe, a road/railroad crossing at Middleburg Road in Luzerne County and a connector in Delaware Canal State Park at Tyburn Road in Bucks County.

Figure 6: Bicyclists cross the rail
with trail Nesquehoning Trestle
located at the southern terminus
of Lehigh Gorge State Park near
Jim Thorpe, PA.
Source: Delaware & Lehigh
National Heritage Corridor

DESIGN GUIDELINES

In 1995 *Visually Speaking,* the D&L design guidelines, were published. This 98-
page document contained criteria developed by Clough Harbor & Associates of
Philadelphia with the assistance of regional stakeholders.   Stakeholders within
the Corridor were encouraged to use these guidelines which defined the D&L
Corridor's graphic environment for signage, display and print materials. It pro-
vided the basis of an integrated, Corridor-wide interpretive system that would
build on local partner strengths and consistently tell the D&L's mine-to-market
story.   It also was the beginning of the D&L's brand with its logo, color and type
recommendations. Using the original guidelines and additional specifications
developed for trails and downtown districts, more than 600 directional signs
and waysides are now installed up and down the Corridor.

Figure 7: D&L interpretive panel
designed using Visually Speaking
guidelines found along Delaware
Canal.
Source: Delaware & Lehigh
National Heritage Corridor

Figure 8: Trail Tenders install native plant garden along Lehigh River in Bethlehem, PA.
Source: Delaware & Lehigh National Heritage Corridor

VOLUNTEER CORP

Another initiative established the D&L's volunteer corps, through a partnership with the Wildlands Conservancy, one of the Region's most engaged environmental stewards. This action produced the Trail Tenders program, which focused on maintenance of trails for walkers, bikers, cross-country skiers and equestrian riders. Volunteers undertook litter cleanups, repair drainage problems, patch trails, clean and replace signs, control invasive plants, plant native species, and undertook trail enhancement projects. Their work continues to enable the public to access historic canal and railroads sites and scenic natural areas.

Dedicated supporters, some of whom are retired professionals, also assist the D&L organization by sitting on board committees, becoming museum docents, staff associates, trail patrol and good will ambassadors.

D&L TRAIL ALLIANCE

The second such alliance was indeed anticipated in the plan, although it was originally called a "project" of a grander (and unwieldy) idea for a "Stewardship Compact." The "D&L Trail Alliance" is a partnership of more than one hundred federal, state, municipal, non-profit, and private stakeholders in the stewardship and promotion of the 165-mile D&L Trail. A stewardship council of landowners shares best practices and coordinates policy for the trail, while three regional councils provide technical assistance to the Alliance and attend to local trail issues, volunteer trail maintenance, and programming. The Alliance's long-term vision is the sustainable stewardship of the D&L Trail and the dozens of intersecting trails that form an eastern Pennsylvania regional trail network.

MILES OF MULES

In 2002 four organizations – the D&L and three art groups- partnered to present Miles of Mules an amazing public display of life-sized fiberglass mules. The physical results were dozens of decorated fiberglass mules placed throughout the five county Corridor. They were designed and executed by artists - from renowned to emerging, from school children to nonprofits. This corridor-wide arts project drew public attention to the region's shared heritage (mules pulled canal boat, worked in the mines and helped plow farm fields) and raised funds to seed a non-profit 501(c)3 corporation that would ultimately replace the federal commission.

STRATEGIC ALLIANCE WITH THE NATIONAL CANAL MUSEUM

Following an 18 month discovery process, the Delaware & Lehigh National Heritage Corridor and Hugh Moore Park & Museums Inc. (HMPHM) signed a three-year strategic alliance agreement under the eaves of the Emrick Technology Center. Effective August 8, 2013, this legal action included a management services agreement that essentially made HMPHM a subsidiary of the D&L.

As the press release read "This unique and innovative alliance combines the assets of the Congressionally-mandated heritage corridor which preserves the trails and canals along the route from the coal mines at the source of the Lehigh River to the port of Philadelphia—mine to market--with the collection and story-telling prowess of the Smithsonian-affiliated museum. Together, we conserve and celebrate local heritage."

Hugh Moore Park, the new home of the relocated and downsized National Canal Museum and D&L offices offers a place where visitors can experience the full Corridor story: museum, archives, fully operational section of the Lehigh Canal with working boat pulled by two mules. Situated on an island that was bequeathed to City of Easton by the creator of the Dixie Cup, the Emrick Center is shouldered by the Lehigh River, a section of the former Lehigh Valley Railroad that is still active, a restored Locktender's House as well as remnants of the Lehigh Valley's original industrial park.

TALES OF THE TOWPATH EDUCATION PROGRAM

Tales of the Towpath is an interdisciplinary, standards-based curriculum for fourth- and fifth-grade students. The program is offered free-of-charge to participating schools thanks to funding acquired from local and regional foundations, banks, corporations, and state and federal agencies.

The Tales of the Towpath curriculum introduces students to mid-19th century life along the Lehigh and Delaware canals and helps them understand the canals' role in the growth of the American Industrial Revolution. It introduces Pennsylvania and American history on a local scale. An illustrated children's book authored by Dennis Scholl, carries the same name and is the central piece of the curriculum. Its story follows the life of a young Irish boy whose adventures along the canals introduce him – and readers – to towns, industries and people who were shaping eastern Pennsylvania and the nation in the 1850s.

Tales of the Towpath debuted as a pilot program in 2007 in two classrooms in the Allentown School District. Today it is being taught in 82 public, parochial, private and charter schools in the five counties served by the Delaware & Lehigh National Heritage Corridor. It ultimately received the Pennsylvania Council for the Social Studies Outstanding Program of Excellence Award.
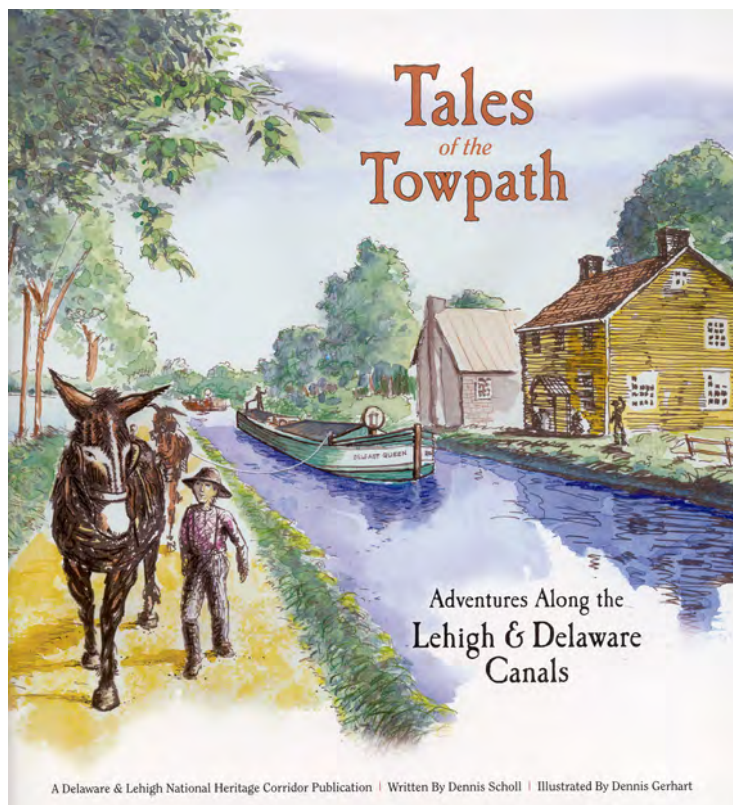
Figure 9: Cover of 'Tales of the Towpath', the story book that is the basis for curriculum taught in seven Corridor school districts. Source: Delaware & Lehigh National Heritage Corridor

OTHER INITIATIVES

Two regional revitalization efforts, Corridor Market Towns and Landmark Towns of Bucks County, were developed and helped breathe new life into small downtowns historically connected to Corridor resources.

When the PA Heritage Parks Program was supplanted by the DCNR led Conservation Landscapes in 2004, the D&L adjusted its sails and moved to greener programming. In 2005 the Superfund reclamation project at Lehigh Gap Nature Center was awarded the Secretary of Interior's Conservation Partnership Award.

LOOKING TO THE FUTURE

In 2017, the D&L Corridor preserves, interprets and leverages the nationally significant history of the 165-mile transportation route between Wilkes-Barre and Bristol, Pennsylvania. By building and maintaining public and private partnerships, we create four vital connections.

First, we connect people to the enduring industrial heritage of the Corridor through education and preservation of historic sites and cultural resources. This is best exemplified by our signature programs centered at the National Canal Museum and on the Josiah White II, Pennsylvania's only mule-drawn canal boat. This includes the museum itself and the Tales of the Towpath educational curriculum. Program offerings at Hugh Moore Park and the Freemansburg Canal Education Center help bring our history alive through field trips, canal boat rides, themed dinner cruises, walking tours, summer camp, as well as the archives located in the Emrick Center.

Secondly, we connect people to health and wellness through outdoor

Figure 10: Example of signage based in Visually Speaking graphic design guidelines. Source: Delaware & Lehigh National Heritage Corridor

recreation by reclaiming the historic transportation route as the D&L Trail. After successfully approaching St. Luke's University Health Network (a hospital system that was original founded by Asa Packer to serve the needs of his railroad crews, coal miners and iron workers) the D&L spearheaded the Get Your Tail on the Trail wellness program. It is designed to help address the region's alarming challenges with obesity and build awareness of the regional trail network centered on the D&L Trail and accessible to population centers that are most in need. The program was expected to attract a few hundred people but in just three years, over 5,200 participants registered and logged over 1.8 million miles walking, running, biking, snowshoeing and more on local trails. A chapter program that can be supported by other health networks is now in development.

The third vital element is to connect towns and cities to opportunities for economic development along the D&L Trail and Corridor. By moving from the analog to digital age, we are beginning to use data driven strategies and community self-assessment tools to gain insight and develop targeted programs that will help diversify funding streams, as well as target programming that resonates with the needs of communities and the traveling public. By using geospatial and temporal information, localized data in trailhead communities is being identified and analyzed. Findings will inform sustainable strategies that support completing, enhancing, maintaining and enhancing the D&L Corridor trail and organization.

Finally, we connect people to nature and the environment through conservation and education. Without our rivers and resulting geography, White and Hazard and all the subsequent development that took place in the Corridor in the 19th and 20th centuries would never have happened. The D&L and the Philadelphia based William Penn Foundation understand the value of our waterway to the health and welfare of the region. Today, almost all the D&L's programs center on the Delaware, Lehigh and Susquehanna Rivers. Why? Because if our residents and visitors can touch the resource, they will come to understand it. The D&L Trail follows our rivers, making it easier for people to access the Delaware River Watershed and understand its importance historically and to our future.

With a more diversified funding base, the merger of the D&L and Canal Museum complete, and a reorganized management structure in place, the D&L's Board of Directors looks to the future. The transformation of a pseudo government agency that focused on project management to an enterprising high functioning nonprofit will require continued evolution. During three recent strategic planning workshops, participants identified several new priorities for the coming 3-5 years:

· Hire high-capacity manager for museum and archives
· Create a large mobile exhibit / "tiny house" museum to move around the corridor
· Develop an intermediary program to assist visiting trail users and other travelers to the Corridor
· Expand Fundraising Resources
· Expand educational programming
· Invest more resources in processing archival collections
· Contribute more resources to Trail Towns program
· Establish a preservation program for historic sites along the trail

A BRIEF TIMELINE OF D&L CORRIDOR ACCOMPLISHMENTS

YEAR	ACCOMPLISHMENT
1988	National Heritage Corridor designated by Congress and federal commission established
1992	Management action planning completed
1993	Designated as Pennsylvania State Heritage Park for significance to the state's industrial and cultural history 1995 Published Visually Speaking design guidelines
1995	Published Visually Speaking design guidelines
1998	Established Trail Tenders volunteer corps with Wildlands Conservancy Extension Re-authorization granted by Congress
2000	Corridor Market Towns (regional revitalization program) launched
2003	Extension/re-authorization granted by Congress Published additional elements of Visually Speaking "Miles of Mules" (Corridor-wide arts project)
2004	Lehigh Valley Greenways Conservation Landscape Initiative established
2005	Began operating under non-profit status
2006	Published Conservation Study Institute's Sustainability Report, a study of the D&L Corridor organization's work to date Awarded Secretary of Interior Conservation Partnership Award with Lehigh Gap Nature Center Established Landmark Towns of Bucks County (a regional "Main Street" program)
2007	Sunset of federal commission's authorization (non-profit now fully in charge)
2008	"Tales of the Towpath" children's book and curriculum published
2009	Extension/re-authorization granted by Congress Published Landmark Towns Strategic Wayfinding Plan
2011	First grant award from William Penn Foundation Established D&L Trail Alliance "Tales of the Towpath" education program received PA Council for the Social Studies - Outstanding Program of Excellence Award
2013	Strategic Alliance with National Canal Museum Largest segment of D&L Trail built (Black Diamond Trail and Trailhead project); 135 miles of the D&L Trail now complete 20th Anniversary Pennsylvania Keystone Award presented to D&L Trail
2014	Freemansburg Canal Education Center established
2015	National Canal Museum and Josiah White II canal boat received major overhaul
2016	North Branch Land Trust receives $978K to design and build 6.5 miles of D&L Trail in Luzerne County Get Your Tail on the Trail health initiative attracts 6,000+ participants over four years who logged more than two million miles walking, running or biking along the corridor
2017	D&L and Hugh Moore Historical Park & Museums, Inc. merge; D&L is surviving entity D&L becomes first National Heritage Area to achieve Smithsonian Affiliate status

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

Zhang Nenggong, Weimin Zuo, Martin Dubbeling, Mindong Ni, Zhe Chen

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 1: Impression Xiaojia River District. Source: KuiperCompagnons

'TRULY THE LANDSCAPE SOUTH OF THE RIVER IS GOOD' (DU FU)

江南逢李龟年	**Meeting Li Guinian South of the River (Du Fu 712-770 AD)**
岐王宅里寻常见	In Prince Qi's mansion house, I met you often,
催九堂前几度闻	By Cui Jiu's hall, I heard you several times.
正是江南好风景	Truly the landscape south of the river is good,
落花时节又逢君	I meet you again in the season of falling blossom

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

To live in the countryside with nature has always been an important theme in Chinese culture. Villages in the countryside were long regarded as cultural seeds; a refuge where intellectuals, poets, philosophers, and scholars, like Du Fu, could retreat away from the busy cities. The rural world in China was the firm basis for civilised poetic life, governed by tradition and social harmony. The rural world respected nature but also was the economic base of the cities.

Despite their importance, during China's long and turbulent history rural communities were disturbed by wars and conflicts between cities, dynasties and ideologies. But over the ages, rural traditions proved to be resilient and harmony always returned in the countryside and the villages of China. Now in the last decades, the fast economic development and rapid urbanization of China has caused the countryside and the villages to become abandoned. Life in the cities provides more chances for higher education, better jobs and better living circumstances.

The Xiaojia River District is one of the areas near Ningbo where the essence of the countryside and life in villages still exists. There the way of life, synonymous with social harmony, respect for nature and observance of traditional ways, can be maintained for the present and future generations of inhabitants of Ningbo. The Ningbo Urban Planning and Design Institute and the Ningbo Urban Planning Bureau joined forces with KuiperCompagnons and the Connecting Cities Network to make a spatial development strategy for the Xiaojia River District. This strategy has ideals and ideas that are valid and important for the future Ningbo and may serve as a reference for other cities in China.[i]

Figure 2: Location of the Xiaojia River District in the Ningbo urban agglomeration. Source: NBPI

---

i The spatial strategy for the Xiaojia River District is published in a report: 'Ecological Diamond and Urban Green Valley, Conceptual Plan and Urban Design for the Metropolitan and Countryside District of Xiaojiajiang', NBPI, KuiperCompagnons and Connecting Cities, March 2016.

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

ABOUT NINGBO

Ningbo is a coastal city located in southeast China. Modern Ningbo includes the historic city, three new satellite cities and several adjacent counties. This area has Shanghai on the north, Hangzhou on the west, Taizhou on the south and East China Sea on the east. Lying in the east of Zhejiang province, Ningbo sits at the mid-point of the Chinese coastline, towards the south of the Yangtze Delta. Ningbo lies between the ocean and low-lying mountains to the southwest with coastal plain and valleys in between. Water, mountains, fields and villages are the basic components of the region.

Figure 3: Downtown Ningbo, at the confluence of the Yuyao and Fenghua Rivers. Photo by: Ting Wu

The historic city of Ningbo is one of China's oldest cities. Its history dates to the Neolithic Hemudu Culture (5500- 3300 B.C.). Ningbo's historic city and urban core is centred on the confluence of the Yong and Yuyao Rivers. Located along the eastern coast of the country, it developed as a port and maritime trading centre. Like many other Chinese cities, it has experienced rapid urbanization and urban expansion resulting from the creation of development zones established in the 1980s and 1990s. The city now has a population of 7.6 million and spans over an area of 9.816 square kilometres. Ningbo's GDP reached 854 billion Yuan (128 billion USD) in 2016 and ranked as the 16th city in China. The manufacturing and services industries are the two major components of modern Ningbo's economy.

Like other cities that experienced rapidly development, Ningbo's growth had negative effects such as the encroachment of urban ecological space, a relatively low level of urban quality, and lack of urban identity. In addition, Ningbo's previous development concepts left a noticeable number of unaddressed issues regarding ecological environmental protection, infrastructure construction, and urban quality formation. In recent decades, the booming Ningbo economy has resulted in rapid industrialization and urbanization. Besides economic growth and an increase of wealth and prosperity, this fast urbanization also resulted in challenges to the goal to create a liveable and loveable environment for Ningbo citizens. To realize this Chinese dream, Ningbo must secure a green and liveable urban environment where future generations can find a healthy, educational and recreational environment that is close to nature.

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

LEGEND

Residential areas	Industrial areas	Infrastructure areas	Developmental standby areas — Expressways
Public facilities	Logistics and warehouse areas	Public Parks	Tourist attractions — Suburban railways
Commercial areas	Transportation system areas	Suburban Construction Land	Beaches — Railways
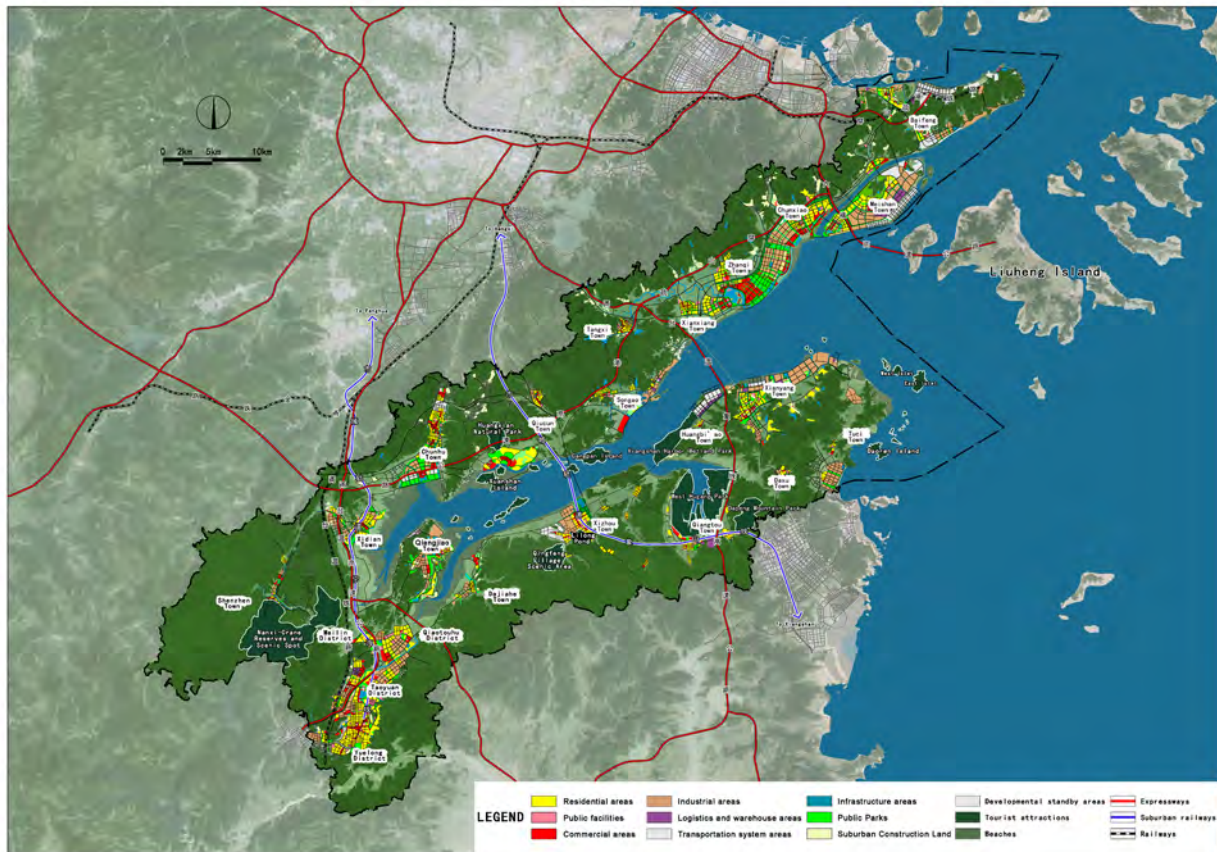
The challenges in combining urban development with ecological conservation are not new to the city of Ningbo. In 2014, Ningbo was one of the laureates of the ISOCARP Awards for Excellence for a well-balanced and innovative regional plan to develop the Xiangshan Harbor, while protecting the biodiversity of the vulnerable marine environment and combining this with modern fishery and coastal tourism.[ii] More recently, Ningbo has been appointed as a national experimental city for ecological restoration and urban renovation. In particular it has been designed to combine urban planning, landscape design and water management to enhance flood safety and water resilience to improve the living environments and wellbeing of the citizens of Ningbo. Over the next 3 years, Ningbo will receive financial support of approximately 60 million USD for so called 'Sponge City' developments and projects, which were introduced to respond to 'China's New Normal' policy.[iii] These projects will become a showcase for thousands of towns and urban developments in China. The experiences of these projects are now inseparable elements of the new Master Plan that aims to make Ningbo a more attractive, competitive, liveable, and sustainable city in the decades to come.

Figure 4: The Ningbo Urban Planning and Design Institute (NBPI) received one of the 2014 ISOCARP Awards of Excellence for the spatial strategy for the conservation and development of the Ningbo Xiangshan Harbor. Source: NBPI

ii   https://isocarp.org/awards/awards-for-excellence/
call-for-entries-for-the-isocarp-awards-for-excellence-2014/

iii   The term New Normal implies the need to slow down economically and to reconstruction or rebalancing of the economy more towards consumer spending and technological innovation.

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 5: Drone images of the Xiaojia River District, illustrating the green landscapes dominated by small-scale farmlands, forested mountains, dense water networks, and scattered small villages.
Source: NBPI

XIAOJIA RIVER DISTRICT

The Xiaojia River District is a very special area in Ningbo. It is one of the remaining large green areas close to the centre of the city, where millions people live, work, and recreate. In comparison with the hectic and busy city centre, the Xiaojia River District can be characterized as a green oasis where the speed of life slows down. The area has a rich history and large cultural heritage. The attractive green landscapes are dominated by small-scale farmlands, forested mountains, dense water networks and scattered small villages. Three quarters of the total site is undeveloped. The area has an intensive water network, which makes up 12% of the Xiaojia River site surface and 16% of the core Xiaojia River site surface. The site is surrounded by mountainous land on the east periphery. There are three hills inside the Xiaojia River site, the 140m high Long Mountain in the southwest side and two small mounts in the centre. The Long Mountain is seriously damaged with 9 quarries on both sides where building materials were excavated.

Despite the many potentials and opportunities for Xiaojia River District, it also faces upcoming urbanization, an aging population and shrinking villages. A strong new perspective for the area is required.

This article describes a development strategy that offers new perspective and aims to protect the environmental and cultural heritage and simultaneously improves the socio-economic position of the area. This strategy builds upon the existing unique identity, and aims to secure a long term integrated development of the area, to make it attractive for visitors and citizens of Ningbo, and for the local population. The strategy has the ambition to protect the natural, ecological, spatial, social, cultural, and economic values of

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

the Xiaojia River District. This is to be achieved by delicately addressing these values simultaneously in an integrated manner, guided by five ambitions. The ambitions are: to use water as the spirit of the area; to protect ecology by development and activation; to create new socio-economic perspectives for the villages; to integrate touristic, iconic, recreational and leisure functions; and lastly, to provide and infrastructure for low carbon mobility.

Figure 6: Photos of the Xiaojia River District illustrating the present identity, activities, and spatial challenges. Photos by: Rob van der Wijst

ECOLOGICAL RESTORATION AND URBAN RENOVATION ACT

In 2016, the Central Economic Working Conference of the Chinese Government adopted the strategy to strengthen urban and rural planning and design, to restore natural and ecological vital areas and to encourage renovating urban areas. This new policy, developed by the Ministry of Housing and Urban Rural Development (MOHURD), marks the beginning of a new phase in China's urban-rural planning and reconstruction. The Ecological Restoration and Urban Renovation Act emphasises the need for nation-wide tasks and targets on a local and city level. In effect, MOHURD directs regional and local governments to retrofit and redevelop cities to improve the quality of life for citizens. This works in two steps. First, the regional and local governments set minimum

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

standards to prevent harm from development in ecological areas by guiding urban development in reasonable and responsible ways. Secondly, the planning policies of these governments need to focus on improving the quality and efficiency of developments in built urban areas and need to pay special attention to promote an improved living environment.

Ecological Restoration and Urban Renovation are a transition in both the urban development policy as well as the administrative of urban governance. Ecological restoration encourages the repair of damaged natural features and the enhancement of ecological qualities and landscapes. It also emphasises the relationship between urban and ecology, between protection and development, and between human and nature. Urban Renovation, on the other hand, aims to upgrade urban functions and infrastructure and to improve urban identity and vitality through organic urban renewal. The planning and urban design of the Xiaojia River District is an important component of the Ecological and Urban Redevelopment Act project. National and local governments support these projects to create a high-quality result over a long period of time. Introducing the Xiaojia River planning and urban design project and piloting the development in an ecological controlled area is done to create a strong local identity and an improved urban vitality. Presently, the governments are adopting new roles and are guiding development proactively rather than controlling and protecting passively. The ambition for the Xiaojia River District is to effectively protect ecological areas from urban expansion, to improve the conservation of natural habitats as well as cultural heritage, and to utilize the resources in the ecological areas and to uplift other potential spatial, social, cultural, and economic values.

BALANCE BETWEEN ECONOMY AND ECOLOGY

The Xiaojia River District serves as an important chain in the 'safety belt' around the city of Ningbo by preserving green spaces and other spaces to improve water retention. Water therefore is a very important element in the project area. The Xiaojia River and its branches dominate large parts of the area, especially in the south. The river and all the connected waterways, streams and ditches offer potential opportunities for ecological development and the development of new natural areas.

The strategic location of the Xiaojia River District, as the place where the Ningbo ecological corridors intersect, defines the overall spatial strategy and leading philosophy for the Xiaojia River District as an 'Urban Park Valley'. It is urban since the area serves the needs of citizens of Ningbo Metropolitan Region. It is a park that promotes, improves, stimulates, and enhances the health and wellbeing of its visitors. And it is a valley as it is part of the inseparable combination of an intensively used agricultural lands located in a network of rivers and streams, cradled between the inaccessible and extensively used mountains. It combines historic and welcoming villages with a beautiful and natural landscape and an attractive system of streams and rivers. It is a landscape in which the visitors can wander and linger and at the same time enjoy and profit from the good, balanced, and healthy village life. As its counterpart, the green mountains in the Xiaojia River District are very important in the overall vision and concept of the Urban Park Valley.

There are 23 administrative villages in the planning area with a total population of 14,000 people, most of whom are employed in agricultural activities.

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 7: Analyses of the existing landscape of the Xiaojia River District. Source: NBPI, KuiperCompagnons and Connecting Cities Network

Villages are distributed loosely along the Xiaojia River and the Yong River and among the fields and mountains. The rest of the land consists of equal portions of industrial, village, and other built land uses. In the past decade, the Xiaojia River area has been profoundly changed by nearby urban growth. Buildable (filled) land has doubled to accommodate industrial and commercial land use. Additional buildable land, prone to further expansion, is agglomerated near the entrance of Xiaogang highway in the north; an area mainly composed of furniture sellers, motor dealers and sewage treatment plants. Several polluting industries, landfills, and a funeral home are scattered in the site and lower its overall environmental quality.

The five ambitions for the future development of the Xiaojia River District - water, environment, society, economy, and mobility - all serve a higher purpose and common goals in a combined effort to accomplish ecological restoration, urban renovation and to provide a new economic perspective.

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 8: Spatial frameworks for the ecological restoration of the landscape, for improving and extending the water system and for the redevelopment of the Xiaojia River Villages. Source: NBPI, KuiperCompagnons and Connecting Cities Network

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 9: Spatial frameworks for the ecological restoration of the landscape, for improving and extending the water system and for the redevelopment of the Xiaojia River Villages. Source: NBPI, KuiperCompagnons and Connecting Cities Network

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
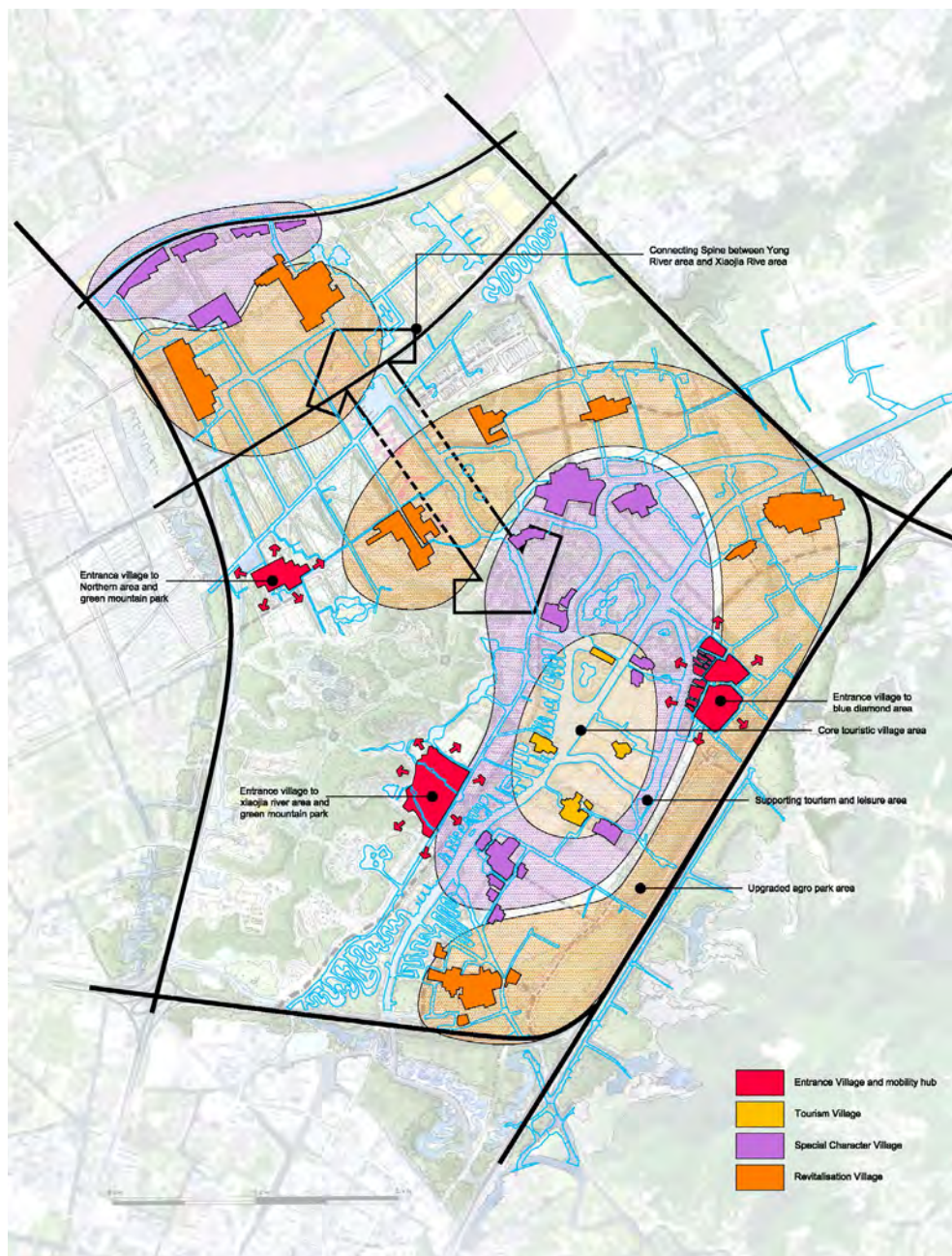MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 10: Spatial frameworks for the ecological
restoration of the landscape, for improving
and extending the water system and for the
redevelopment of the Xiaojia River Villages.
Source: NBPI, KuiperCompagnons and
Connecting Cities Network

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

WATER AS SPIRIT OF THE AREA

Water is the heart and soul of the Xiaojia River District. It is the living organism that has shaped both the appearance of the area and the minds of the people living here for centuries. Water gives the area its cultural and historical meaning, and it will also do this in the future. In Xiaojia River District the water network will be taken up as backbone of the area. It will connect all functions like living, working, leisure, tourism, and ecology and it connects the variety of landscapes, areas, and functions. Accessibility by water will serve people as well as goods and nature. The water network will be used as strong fundament for the natural and ecological networks which connect the most valuable areas.

Improving and extending the water system is a priority and a guiding principle in the proposed planning and design solutions for the area. The ground and surface waters should experience increases in quality, and the quantities of water will be controlled. Improving water safety is an important objective. It will be achieved by increasing the retention of peak discharges, storing stormwater runoff, and delaying the discharge of runoff into the waterways. In the future, the Xiaojia River District will be well known for its attractive and high-quality water system that brings esthetical quality, economic prosperity, and natural values.

MAXIMIZING ECOLOGICAL FUNCTIONS

The Dragon Mountain is a most visible and attractive landscape feature in the Xiaojia River District. It dominates the flat agricultural surroundings and is a beacon of the district from Ningbo city. It is a valuable icon for the area. The mountain is degraded by mining activities. Many quarries have created scars in the edges of the mountain. For the future of the Xiaojia River District it is proposed to first stop all further mining. The existing quarries will be used to accommodate and facilitate functions that support tourist development of the area, but continued mining is not desired in the valuable natural and agricultural landscapes surrounding the mountain. The quarries create isolated locations that can accommodate these new functions and activities in the landscape. With this approach, the mountain combines harmoniously its natural beauty, ecological values and accommodates new functions that activate the liveliness, vibrancy, and tourist attractiveness of Xiaojia River District. New functions would only be allowed if they fit in the old quarries and do not harm the landscape. Outside the quarries, touristic activities will be developed, such as hiking, mountain biking and other extensive sports. The existing burial grounds will remain, but future extensions of these activities will be limited and eventually stopped.

The strategic approach for the farmlands of Xiaojia River District focuses on preserving the agriculture and improving the socio-economic strength of these areas. It is proposed that the agricultural activities in the area be maintain as much as possible as these areas have the best soils of Ningbo region, are rich of nutrients and therefore, are very suitable for food production. The landscape of small-scale agricultural lands has a high spatial quality and can be used to create an attractive overall landscape experience in the Xiaojia River District. Maintaining the agricultural land uses and activities in the area also continues a long tradition of the people of the Xiaojia area, and thus strengthen the historical identity of the area. Besides maintaining the agricultural uses from food production, landscape and identity perspectives, the farmland areas

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

also require improvement of their socio-economic strength. A more diverse economic baseline is proposed to create a more flexible and resilient economy. New economic drivers are introduced that complement the agricultural uses and diversify the works and possibilities of farmers. Agricultural education for schools and the development of agro-infotainment, are examples of new functions that are in line with the main agricultural use, are suited to the local population capacities, and which bring new opportunities for the farmers.
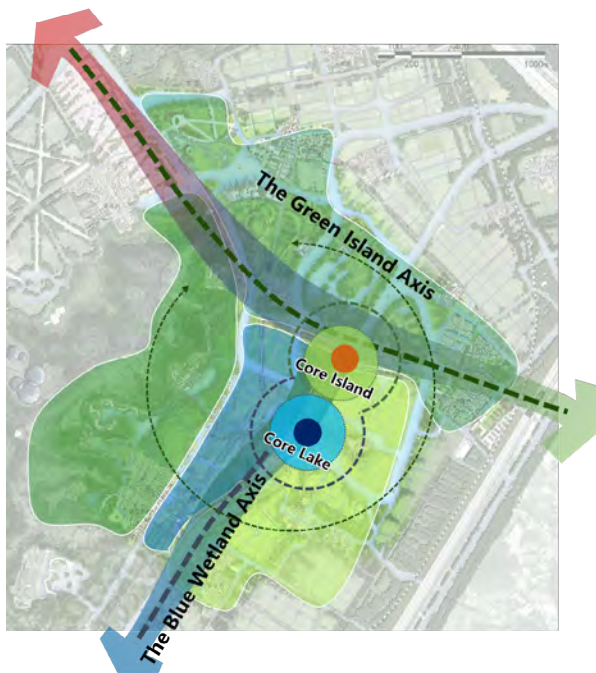

Figure 11: Spatial frameworks for the development of the central island and central lake in the Xiaojia River District.
Source: NBPI, KuiperCompagnons and Connecting Cities Network

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

Figure 12: Landscape design for the core area of the Xiaojia River District. Source: NBPI, KuiperCompagnons and Connecting Cities Network

NEW PERSPECTIVES FOR VILLAGES

The villages are home to people, traditions, culture, and the history of the Xiaojia River District. However, considering the existing demographic composition and the expected pre-plan development of the area, it was difficult to exactly predict the future of the villages. Therefore, the strategy proposes to maintain, revitalize, and develop new activities the existing villages. Since the villages are solitary entities in the surrounding landscapes, they are very well fitting in the future vision of the area. However, in principal, extensions and new villages are not approved.

All villages are different. Each one has its own qualities, size, strengths, citizens, etc. In the strategy, the characteristics of each is identified and considered to determine their future profile. For example, villages along water can for example become a touristic water village. A village close to main infrastructure can become an entrance village where visitors enter the park and would be developed with specific facilities and services for this purpose. The urban, socio-economic, cultural, tourist and historical qualities of the villages

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

will be improved depending on the proposed future use and the characteristics of the specific village. However, In cases where the village shrinks in population and functions, it is of importance to not decrease the level of urban and living quality. Therefore, abandoned buildings should be demolished as soon as possible and replaced by functions that add quality to the area, or new functions (e.g. tourist related facilities) should be integrated in the abandoned buildings.

TOURISM AND LEISURE ECONOMY

It is important to focus on a strong and single theme that appeals to families, and in China extended families, inn the strategic positioning of the Xiaojia River District as a tourism destination. All (young and old, male and female visitors, young couples, groups of children, friends and retired people) should feel attracted to at least one of the themes and attractions. In general, residents within two hours of traveling account for 80% of the visits to theme and attractions parks. In order to draw visitors from outside the Ningbo region, the Xiaojia River District should have both a large scale and a critical mass of attractions for a one-day visit and multiple attractions with activities and experiences that can occupy two or three days. A true successful tourist destination would also have supporting recreation uses such as high-quality hotels, convention and conference facilities, resorts, recreational shopping and dining experiences, and sports activities including water-related activities. There should also be excursions into other nearby local tourism and mixed-used areas.

The Xiaojia River District can be developed into a destination on its own where visitors can have many and alternate experiences that provoke multi day visits. The economic value created by the impact of the tourism oriented theme park on surrounding complementary properties such as hotels, resorts, and shopping centres is not to be underestimated. There are six basic principles for successful tourist destinations based on theme and attraction parks.

· A family appeal (for young and old, male and female), with a mix of adventure, recreation, and leisure activities, designed to operate in all seasons and in all weather conditions.
· One or more themed environments, linked to the nature, culture, pride, and achievements of the region that create a unique and 'must see' and 'must experience' destination.
· A pay-one-price admission policy that includes 'ambient entertainment', with local hosts in the villages, guided walks, boat tours, musicians, and performers.
· A very high investment level for each attraction and activity that provides participant control and encourages interplay between the visitor and his environment.
· High quality entertainment, service, maintenance, cleanliness, sanitation, dining, overnight stays, mobility, and sustainability.
· Enough attractions and activities (entertainment content) and quality to create an average visitor length of stay of five to seven hours and, when fully developed, three to five days.

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

LOW CARBON MOBILITY

Preserving the Xiaojia River District as a metropolitan green belt is also a matter of limiting both motorized traffic limitation and road infrastructure through the site. Every metropolitan green belt faces the challenge of avoiding the segmentation of its landscape by urban infrastructure. The spatial strategy aims to balance three factors: the accessibility of the area (to and from Ningbo), the connectivity of local communities with other communities in nearby districts, and the preservation of the Xiaojia River District's natural landscapes. Keeping commuting traffic offers the opportunity to innovate and create new solutions for mobility that will take care of the natural environment of the site and create added local value.

Achieving smart synergies between green mobility, eco-tourism, landscape, local communities, parking management and mobile applications, is the key to transform this challenge into an opportunity. One of the main interests of a green and multimodal transport model is to create nodes of social and economic life. In these nodes the design takes care of the environment, the landscape and of the image of the villages. These nodes are where visitors can meet and interact with local villagers, where they can discover greener and slower lifestyles in a modern rural area.

A multimodal and eco-friendly transport system provides accessibility to everyone through a diverse range of transport modes. One of the keys of success of such network is to integrate each mode not only technically, but also in terms of management. By co-locating Park and Ride with a shared bicycle, water shuttle, or cable car, users can save time and money and easily access every site with practical combinations that include fare integration. A mobile

Figure 13: Arial views illustrating the ecological restoration of the landscape, the water system, and the villages in the Xiaojia River District. Source: KuiperCompagnons

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

application dedicated to Xiaojia River District will inform Ningbo citizens, in real time, about the best way to enjoy the area. That way, users can be informed of the availability of parking places, shared bicycles, shuttle and cable car schedules, and plan their own combination of trips through the site before they arrive.

TOWARDS THE URBAN PARK VALLEY

The successful development of the Xiaojia River District depends on interventions and investments in both the river system and the mountains in the planning area. All interventions, both on large and small scale need to be realized and maintained in the highest standards. Another complexity in the redevelopment of the Xiaojia River District is that many present activities and developments will need to be stopped or changed on a large scale and on short notice. The mining and quarrying activities as well as the rapidly expanding burial grounds need to be stopped to prevent further damage of the mountainsides. Existing heavy and smaller industries need to be relocated to new locations outside the planning area. At the same time both the water system and basic infrastructure will need to be redeveloped for the future uses and activities in the area.

To use water as the spirit of the site coincides with greater use of water related activities, attractions, and landscaping. The combination of an active water park with both traditional and cultural themed activities, as well as ecological development, will activate a renewed appreciation for the villages and local agricultural production. This will create a new, stable, and continuous perspective for the local communities and local economy. Prerequisite and paramount for the integration of tourism, recreational and leisure functions is that the Xiaojia River District be dramatically changed into a unique and iconic area that attracts many visitors from within and beyond the region.

Figure 14: Visualisations illustrating the ecological restoration of the landscape, the water system, and the villages in the Xiaojia River District. Source: KuiperCompagnons

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

CONTRIBUTION TO URBAN HEALTH

The ultimate goal of the Urban Park Valley is to stimulate and to move the emotions of its visitors and to make the City of Ningbo into a greener and healthier city. The Urban Park Valley has one single theme that runs throughout the area: Urban Health. It is a place where the citizens and families of Ningbo can relax, enjoy ambient entertainment, be one with nature, learn about a healthy lifestyle, exercise and return home with a positive attitude and with ideas to improve their own living environments. The family appeal, the inclusiveness and the variety of attractions and learning experiences related to Urban Health insures that the Urban Park Valley can be revisited many times. The Urban Park Valley complements other thematically mixed-use destinations in the region and green belt around Ningbo.

The central and lower part of the Xiaojia River District is rich with water. The water in the Urban Park Valley is part of a natural and now urban, and therefore polluted, water system. To turn this water system into the cleanest of the region requires interventions and investments that start upstream and outside the planning area. A clean and crystal-clear water system is an absolute requirement to make this area 'ecological, enjoyable, entertaining and educative'. High quality water provides the historic and welcoming villages with a beautiful and natural landscape and it provides an attractive system of streams and rivers in which the visitors can wander and linger and enjoy and profit from the good, balanced and healthy village life.

The mountains in the Xiaojia River District are very important in the overall vision and concept of the Urban Park Valley. The mining industry has affected the mountains beyond any chance of natural repair or recovery. Even after an immediate moratorium of the mining activities, the quarries represent a safety hazard. The best way to deal with the quarries is to convert them into new facilities that enhance 'advanced, attractive, active and adventurous' activities. These facilities are predominantly artificial, using modern and proven techniques and have an enormous scale, taking benefit of the enormous size of the open quarries. Wherever the mountains still are intact, they should remain green and covered with vegetation. It also is proposed to develop the quarries into greenhouses that compass tropical gardens and aquaria, leisure areas, indoor swimming pools, and sports facilities that stimulate families and groups to actively participate and interact in a tropical environment. Other quarries will be redeveloped into areas for luxury housing and a luxury resort for visitors of the Urban Park Valley.

Urban Health is an important issue in China that addresses issues like food security, obesities of the younger generation and healthy aging. Development of the Xiaojia River District represents a major investment to create a healthier Ningbo.

—

ECOLOGICAL RESTORATION AND URBAN RENOVATION IN NINGBO'S XIAOJIA RIVER DISTRICT

ZHANG NENGGONG
WEIMIN ZUO
MARTIN DUBBELING
MINDONG NI
ZHE CHEN

References

Dubbeling, M., Meijer M. and et al., 'Sustainable Urban Design, The Next Step, Perspectives and Examples', Blauwdruk Publishers, 2010.

Gaines, J. and Jager, S. 'Albert Speer & Partners: A Manifesto for Sustainable Cities, Think Local, Act Global', Prestel Publishing, 2009.

Pötz, H. and Bleuzé, P., 'Urban Green-Blue Grids for Sustainable and Dynamic Cities', Coop for Lif Publishing, 2012.

Powell, K. 'City Transformed, Urban Architecture at the beginning of the 21st Century', Laurence King Publishing, 2000.

United Nations, Bureau International des Expositions, Ministry of Housing and Urban Rural Development (MOHURD) of the People's Republic of China, Shanghai Municipal People's Government, 'Shanghai Manual, A guide for Sustainable Urban Development in the 21st Century, The Commercial Press, 2016.

WHAT'S IN A NAME? THE DIGNITY OF AN ADDRESS IN A SMART CITY

Boipelo Molelekoa, Thulisile Mphambukeli, Verna Nel

Figure 1: A view typical informal settlement. Photo by Rouve Bingle

PREFACE

Durkheim spoke of the 'anomie' of the city referring to alienation and ano-nymity from a social or psychological perspective. However, in the global south this anonymity can be physical as well, such as that found in informal settle-ments located within South Africa's cities. These places, unlike most formal, surveyed and registered sites, have no street names or street addresses.

Besides the socio-psychological effects of being marginalised, the lack of street addresses can have practical implications, such as loss of public services and the denial of financial opportunities and citizenship rights. This paper will describe the experiences of residents at two informal settlements in the Free State (South Africa), as well as the frustrations of municipal and emergency services personal regarding the lack of addresses. These experiences must be understood in the context of South African legislation and policy and the lack of academic research on the issue. The paper will also provide some sugges-tions for possible solutions.

INTRODUCTION

■ In places without addresses one has to rely on landmarks: "turn left at the XXX billboard, and then right at the old pepper tree." But when your spouse is dying, will the ambulance find the right pepper tree?

What is the function of an address in a smart city – or any city for that matter? Many of us consider an address no more than a record of where we stay. However, that record has numerous functions. An obvious one is to define the physical location of a house, an apartment, an office suite or any other building in two or three dimensions of space. In high tech 'smart cities', an address can be the virtual location of a sensor that reports on the status of any of several municipal services. An address can also be its record of the location in space, as contained in official cadastral data in a geo-spatial database. However, there are other equally important qualities of an address that relate to municipal governance, the safety and security of residents and even citizenship. In these cases, the lack of an address can deny urban residents certain civic rights. This is the case for many residents of urban areas in the global South.

Although many definitions of a smart city emphasise the use of technology to improve citizen's lives, or the knowledge economy (Angelidou, 2014; Kitchin, 2014; Harrison and Donnelly, 2011), other definitions stress the human and governance elements of a city and the ability of the smart city to adapt to and meet users' needs (Albino et al., 2015: 5). For Dharmavaram & Farvacque-Vitkovic (2017: 13):

■ "**Street addressing is a crucial component in initiatives to develop smart cities**… cities across the globe are embracing the concept that aims to improve city management through integration with developments in ICT. Street addressing provides a crucial link in developing a dynamic urban database management system …. that feeds into municipal information systems (MIS); it supports municipal services, … it supports economic development and is also valuable to the private sector." (emphasis in the original)

Social inclusion of the global South, being 'smart' may not require expensive technology, instead it may demand innovative means of meeting residents' needs. It is in this context that this paper explores the issues and options for a smart city related to the issues of street addresses. The following section provides some background on the history and benefits of street addressing, before considering the social and political aspects of an address. Thereafter, two South African case studies are presented. The paper then discusses smart options to deal with the problems arising from a lack of addresses, including those that can possibly circumvent political and social contestations.

A BRIEF BACKGROUND TO STREET ADDRESSES

Some form of address has always been necessary to locate places and to direct merchants or pilgrims to their destinations. The more complex the area, the greater the need for an addressing system. Roads are the backbone of trading routes as well as urban areas, hence road names emerged early in history. However, urban street names developed slowly, often linked to clusters of artisans or trades, or informal landmarks. In time, with the need to identify properties for tax purposes and better administration, street names became more important. From the 17th century onwards, there were many attempts to structure European cities, and revolutions and riots heightened the need for naming of streets for security purposes. During the 19th and 20th centuries, increasingly complex systems and networks of street addressing developed in the USA and Europe which were carried over to their colonies as well as Latin America (Universal Postal Union, 2012; Coetzee et al., 2007).

Not all addresses are physical: a post-box is not a location, but a delivery point. What addresses have in common is reference to a place or the road network. The level of detail required in an address depends on the purpose for which it is required; individual street numbers are vital for emergency services, whereas suburb names are adequate for market analysis (Coetzee et al, 2007: 17-19).

The addressing systems, as developed in the USA and several Western nations, form the basis of a recommended addressing system (American Society of Planning Officials, 1950; Corwin 1978). The World Bank document "Street Addressing and the Management of Cities" is a technical guide or toolbox for developing countries (Farvacque-Vitkovic et al, 2005: viii). This system is seen as an opportunity to map the city for use by multiple municipal departments or agencies, collect data in a systematic manner about the residents and create a database of the built environment with "rich information" (Farvacque-Vitkovic et al., 2005: 3), that can be expanded over time as required.

While there are numerous systems for generating addresses (Coetzee et al.,2007), there are common principles, and those below are summarised from the American Society of Planning Officials (APA) (1950), Corwin (1978) and the South African Geographical Names Council (2002):

· The system should be simple, as uniform as possible across the entire city, and flexible enough to accommodate urban growth and change;
· There should be continuity of name along the length of the street including curves or bends. However, if the street is interrupted by barriers (e.g. freeways, railways or rivers) it may be preferable to have a new name to avoid confusion if people approach the place from the wrong direction;
· Names should not offensive, vulgar, blasphemous, indecent, discriminatory or derogatory in any way. Some authorities frown upon names that could be a promotion for a particular product, service or firm;
· The names should be pronounceable for the majority of the population. Ideally, they should be short enough to fit onto a street pole and a map (this is particularly relevant for short streets and culs-de sac);
· Although named streets are more difficult to find than streets named with numbers (although the latter usually occur in a sequence and thus can denote distance), yet there is greater sales appeal for houses on named streets, particularly those with romantic or rustic names. Using names in alphabetical sequence has the benefits of both options. Duplications should

be avoided (including the same name attached to multiple avenues, roads or crescents, such as Mandela Avenue and Mandela Boulevard) or homonyms within the city;

· Local colour and historical associations add identity to a community. Themes per neighbourhood or quarter, also support local identity and urban legibility;

· Avoid names of living persons as they may fall from favour (Osabutey, 2014, South African Geographical Names Council, 2002; Van Mead, 2016, Koopman and Deane, 2010; Azaryahu, 2011).

THE IMPORTANCE OF STREET ADDRESSES

There are several reasons for street addressing. Firstly, it can create a user-friendly city by facilitating movement around the city and locating places, especially by emergency services and the police. Secondly, it enables local governments or utilities to identify their users and maintain their infrastructure. Thirdly, it can enhance municipal revenues and urban management by identifying and locating (potential) tax payers (Dharmavaram, and Farvacque-Vitkovic, 2017; Swope, 2014). Corwin (1978) adds other benefits of street addresses, such as the expeditious delivery of mail and packages, avoiding negative consequences such as the loss of goods and mail incorrectly or poorly addressed, and traffic accidents due to drivers searching for a place. For small businesses, it can literally, 'put them on the map' (Osabutey, 2014: online). The lack of addresses is an impediment for urban development (Su, 2016)

CIVIC PRIDE AND BELONGING

Other benefits of street addresses may appear to be less pragmatic, but are no less important. Civic pride is noted by several authors (Helleland, 2012; Universal Postal Union, 2012; Osabutey, 2014). The lack of addresses according to the American Society of Planning Officials (1950: 3) leads to a "[s]ubconcious feeling of estrangement towards the community on the part of residents and visitors" while Corwin (1978), believes it leads to an unfavourable impression of the city to visitors and local businesses. Farvacque-Vitkovic et al, (2005: 21-22) link street naming to civic identity, as

■ street addressing … creates a common ground on which the concepts of urban space and civic community/identity can come together. …. A city is, first and foremost, a means for coexistence, exchange, communication, and integration. Street addressing is just one of the many requirements that will help a city achieve social integration.

Social inclusion is pertinent to the manifestation of unregulated development and informal settlements that have grown rapidly with limited control by municipal authorities in cities of the global South. Such settlements often have no formally registered lots, insecure tenure and few street names, let alone addresses. Often, the provision of services (including street addresses), in settlements deemed to be 'illegal', is withheld, for fear that their provision implies acceptance of such settlement and creates an undesirable precedent (Farvacque-Vitkovic et al, 2005: 38). As some 60 to 90 percent of Sub-Saharan

Africa's urban residents reside in informal settlements (Parby et al., 2015), this implies that majority of residents could live without an address.

The lack of an address can have far reaching consequences that effectively exclude residents from the benefits of citizenship. As noted by the Universal Postal Union (2012:10), small businesses may be denied access to credit, if they have no formally recognised address. In South Africa, proof of a physical address is essential for many financial transactions such as opening an account at a bank or a store, or even obtaining a sim-card for a mobile phone, under the Financial Intelligence Centre Act, 38 of 2001 (FICA). Furthermore, where evidence of an address is required to register as a voter or obtain a national identity document to access social services, the lack of an address effectively denies residents their citizenship rights (Universal Postal Union, 2012; Ministry of Local Government and Rural Development, 2010).

ADDRESSES, PLACE NAMES AND THE PRODUCTION OF SPACE

Place and street names, and therefore addresses, are intrinsically linked cultural and political processes and particularly place making (Azaryahu, 2011). Toponyms form part of the symbols that contribute to the identities of places, and those of the people that reside there (Van Mead, 2016, Helleland, 2012). If identities can be informed by place names, what is the effect of namelessness?

There is cultural power in street naming, and people chose names that reflect their perspectives and worldviews (Augustins, 2004). The right to name places is often appropriated by the ruling class: this is reflected in the renaming of places and streets with a regime change (Azeryahu, 2011; Van Mead, 2016; Koopman and Deane, 2005). However, place naming can be a battle-ground for street names - as has been the case in Tshwane (Pretoria) (Swanepoel, 2009; Makwiting, 2016)- where various groups seek to promote their identity and express their democratic right to fashion space by attaching names with significance to them. Guyot and Seethal (2006: 1) contend that if "toponyms reflect the identity of a place, their changes are indicative of the multiple identities contained in one place or territory." Consequently, the process of street and place naming reflects cultures, power and citizen rights.

Figure 2: Changing street names in Tshwane, workers being trained on how to put up the new street names and 'red-line' over the old names. Photo by M v d Vyver (City of Tshwane)

Alderman and Inwood, (2013) maintain that place names represent "broader rights of people to participate in the production of place and to have their cultural identities and histories recognized publicly" (p2) and that "[s]patial justice stresses the spatiality of belonging, recognizing that social (in)justice does not simply have geographical outcomes; rather, space plays a more fundamental role in constituting and structuring the broader processes of discrimination or equality" (p3). Thus, the denial of an address can be constituted as social injustice.

PARTICIPATION AND SOUTH AFRICAN POLICY

The rights to an address and the right to name places are part of the politics of belonging, and to participate in these processes is part of the right to partake in decision-making concerning the fashioning of space and place (Alderman & Inwood, 2013). This need for participation does not emerge strongly in most technical documents consulted (American Society of Planning Officials, 1950; Corwin, 1978; Farvacque-Vitkovic et al, 2005; Ministry of Local Government and Rural Development, 2010; Universal Postal Union, 2012; Dharmavaram & Farvacque-Vitkovic, 2017). An exception is the South African Geographical Names Council (2002).

The right to participate in local government affairs is entrenched in the South African Constitution (South Africa, 1996: §152 (1)(e)) as well as legislation governing local government affairs. All strategic municipal plans, policies and by-laws are expected to be communicated to all residents and public comments should be taken seriously. However, politics and power often play their role, and the participation processes can be watered down (Mautjana and Maombe, 2014) or the process can become so heated that no action is taken. This is often the case in respect of street-naming, and is one reason why many settlements do not have street names. Implementing citizen rights requires "substantial state involvement alongside citizen engagement and oversight" (Parnell and Pieterse, 2010:151).

SOUTH AFRICAN CASE STUDIES

Coetzee and Cooper (2007) confirm that addresses were never allocated in large swathes of South Africa, including rural regions, black urban areas and now, informal settlements. The data on addresses is too limited to determine the extent of the backlog, but it could be around five million addresses. Two examples of the impact of a lack of addresses in different municipalities in the Free State Province are briefly discussed in this section.

MEQHELENG/ FICKBURG SETTLEMENT; SETSOTO MUNICIPALITY

Setsoto municipality falls within the Eastern Free State bordering Lesotho. Ficksburg/ Meqheleng was developed along apartheid planning principles, with a formal, well serviced town (Ficksburg) and a less well serviced 'township' for Blacks on the outskirts of the town (Meqheleng). The township has grown informally and in an unregulated manner over the past two decades. Although the state has provided many subsidised houses to the poor, along with basic services, street names and addresses have been neglected.
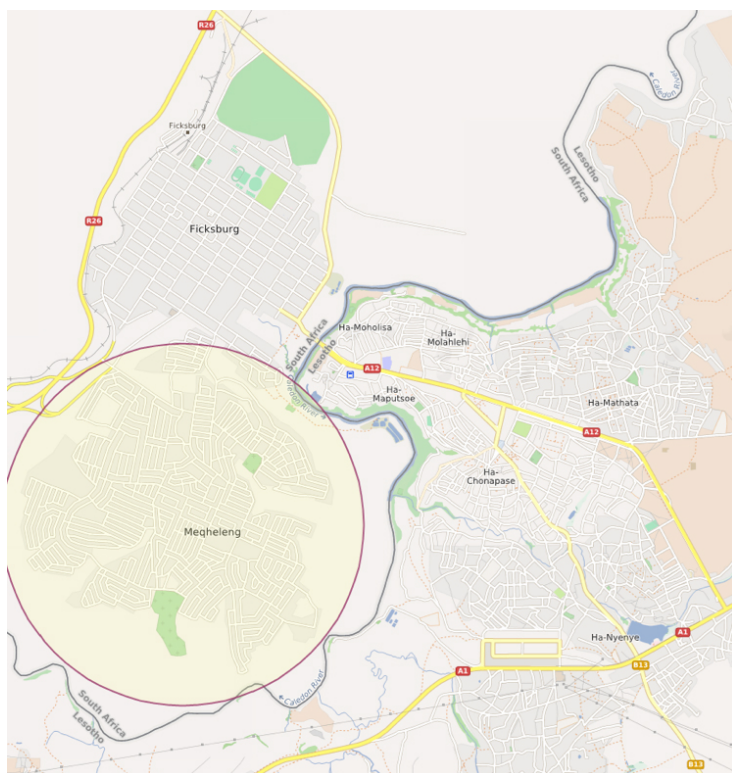
Figure 3: Locality plan of Megheleng.
Source: Mabable.co.za

To understand perceptions around the lack of addresses on municipal service delivery, interviews were conducted with purposively selected senior municipal officials responsible for planning, finance and engineering services. To gauge the impact on the community, a questionnaire with the same questions used for the interviews, was sent to ward councillors, community development workers, residents, police, ambulance and firefighting services, and the South African Postal Services.   In all, 60 responses were received.

The responses from the community indicated that streets without names make it difficult to access the area and it loses its identity.

■ A street without a name is like a human being without
  identity because a name identifies a person
■ creates a sense of belonging ... where there are no
  names, history has not unfolded
  (Anonymous responses from research respondents)

According to the Councillors and community development workers, the lack of street names and addresses is due to the lack of financial and human resources in the municipality. It was felt that the low priority accorded to street names and addresses is evidence that the importance thereof is not understood by municipal governing agencies.

The Financial Manager, however, bemoaned the lack of addresses, as it meant that municipal accounts could not be delivered. Furthermore, without an address linking the point of service provision to a client, residents denied

that the account was theirs and thus refused to pay the bill. This has a detrimental effect on municipal finances.

The engineering services respondents contended that lack of street names and addresses makes it difficult for the municipality to provide and maintain its infrastructure. The Post Office pointed out that it cannot deliver mail, unless an employee knows the addressee or someone with the same last name.

The Emergency Services (fire and ambulance services) indicated that the lack of an address or clear landmarks leads to loss of life and property. The current landmarks were not of assistance and it was difficult to respond to emergencies timeously. The absence of street names contributed to an average of 40% of lost lives that could have been saved. Thus, to be able to effectively respond to an emergency, they must spend time and resources familiarising themselves with the area.

Figure 4: Grasland informal settlement.
Photo by Rouve Bingle

GRASLAND, MANGAUNG

Grasland is situated in in Bloemfontein, Mangaung. It developed in the late 1990s as a small squatter camp, where Black people invaded private property in a small-holdings area located in the south-eastern periphery of the city. Over time it has grown, parts of the area have been formalised, while other parts remain informal, with limited access to basic services. The area is prone to crime and violence, muggings and murder. Street names and addresses are largely absent, even in the formal areas.

This study adopted a phenomenological approach to understand the lived experiences of residents in the absence of adequate service delivery by the municipality. Interviews were conducted with 18 local residents, municipal officials and the two ward councillors; these interviews were open ended allowing the respondents to freely express their perceptions and experiences.

One municipal official indicated that there are inadequate finances to formalise the area, but according to a councillor, the area is not considered a priority for upgrading because there are many Lesotho immigrants (whom the municipality assumes are illegal immigrants) residing in the area. Furthermore, the municipality has insinuated that, as many of the residents are either unemployed or have very low incomes, providing basic services to residents who
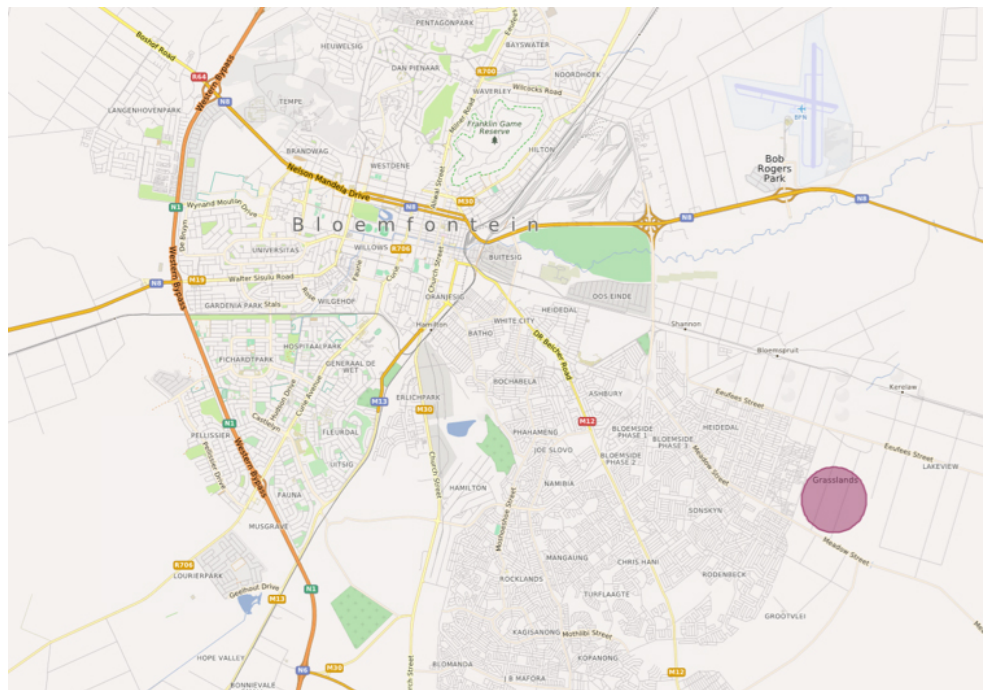
Figure 5: Location of Grasslands.
Source: Mapable.co.za

cannot afford the payment for these services is not financially worthwhile. Consequently, the area remains largely unserved and neglected, with serious health and safety consequences as revealed by respondents' comments.

■ We hear gun shots but we don't know where they get the guns from. We are mostly complaining about the police – police here take 4 hours to 5 hours to come after you have called them...

■ Last week when I was pushing my trolley to work by those houses, some people I think they were four, were pushing a person along the way... I took my phone to call the police to come quickly before this guy is brutally beaten ... They took long to come and I knew that when they come they will want to know the house number and I will tell them that I am on the streets but I had directed them where I was...The police took long to get here. [The victim] he is no more, he died.

■ You have to take someone who is sick to the ... [a well-known landmark] if they need an ambulance, [because the ambulance will never find the house itself]

■ People die because the ambulance won't come [because they don't know where to go]

(Anonymous responses from research respondents)

This case study reveals that the lack of an address is more than an inconvenience – it is life threatening if the ambulance, fire services or police cannot access or find the site of the emergency.

Figure 6: Land marks and advertising serve as addresses in informal settlements.
Photo by Rouve Bingle

OPTIONS FOR ADDRESSING IN AFRICA

It is clear from the case studies and the literature, that the lack of street addresses has a negative impact on municipal finances and the provision of essential services. Furthermore, there are social and psychological effects on the community relating to a sense of belonging, a sense of history associated with the place, and civic pride. Implied in the responses are the right to the city, the right to access financial services and the rights of citizenship.

These responses echo the literature on the subject. Clearly, street addresses are more than a street name on a pole or a number on a house; they have far ranging consequences for a community and should thus be a priority for local government.

The question then arises, what are the most effective and cost-effective means of providing addresses for a community? There are several options that a smart city could take, and the most pertinent of these are discussed below.

FORMAL ADDRESSING SYSTEMS

Much work has been done on developing formal addressing systems, such as those advocated by the American Society of Planning Officials (1950; Corwin, 1978), Coetzee et al., (2007) and the World Bank (Farvacque-Vitkovic et al., 2005; Dharmavaram and Farvacque-Vitkovic, 2017). The process adopted by the World Bank[i], while comprehensive, is labour intensive, and is often cou-

---

i The process adopted by the Word Bank has three main phases: preparation, implementation and maintenance. The preparation phase includes designing the system and establishing a 'street addressing unit' responsible for implementing the programme. The implementation phase includes the following activities: a media campaign to alert residents to the process; mapping the areas to be named as well as a to identify owners and tenants and any utility meters in operation; physically numbering the buildings or units and recording the addresses (linked to occupiers and owners); erection of street names signs; and producing a cadastral map with street names. The maintenance phase includes media campaigns and physical maintenance of the existing street names and building numbers as well as updating street maps. Entrenching the system in the municipality and utility service providers by insisting that the addresses created in the process are used as references in billing and new services connections is also important. Each of these activities consists of a number of other activities, most of which have financial, human resource and IT implications. See Farvacque-Vitkovic et al, 2005 for the full process.

pled to an informal settlement upgrading programme, which can be a long, and sometimes contentious process. Farvacque-Vitkovic (quoted in Swope, 2014), believes that working city-wide, but on a street level, is the fastest and most effective route to provide residents with an address that provides access to the city. Furthermore, working on a street level generates maps and related data for the street upgrading and street lighting phases. Additionally, the street data can be linked to occupancy and tax registers.

This process appears to have effect (Dharmavaram & Farvacque-Vitkovic, 2017), but it does require a dedicated team and political support (Swope 2014). Mapping and database technology is required for the geographic and other data capturing phrases, while specialist expertise is needed to set up the codification system, that can be a complex process (Farvacque-Vitkovic et al., 2005; Coetzee et al., 2007).

As street naming is a political process – linked to cultural emblems and symbols of power – it may generate controversies (Ndletyana, 2012; Swanepoel, 2009; Guyot and Seethal, 2007), that may bring the process to a halt. While this process has many benefits, the political nature of the process as well as the resource requirements can be a constraint. However, there are options less dependent on a name and can thus avoid the controversies over names.

SNOOCODE

The SnooCode is a mobile app developed by Sesinam Dagadu to solve the problem of a lack of address in Ghana. The code uses an algorithm to generate a unique alphanumeric code for any place, which then serves as an address. "It replaces the street name, the house number and everything" (Dagadu, quoted in Douglas, 2015: online). All that is required is to download and install the app (available for Android or IOS for free) and then generate the unique, permanent code for that location. The code can be sent to someone with the app, and location can be plotted on a map. It also can provide navigation directions (Nasara, 2017). This system does not require access to the internet. According to Dagadu, it is more accurate than traditional addressing systems and it functions better in an environment where few people are very literate, unlike a conventional system (Cranchon, 2015).

SnooCode is being implemented in Ghana (Cranchon, 2015; Swope, 2014). It has the potential to save lives during an emergency or disaster, as people merely must send their codes to the emergency services and they can then find the precise location (Matthews, 2014; Cranchon, 2015). Of importance, this code is acceptable in Ghana as an address for opening financial accounts, is used by couriers and taxis, and is available for all municipal services. SnooCode has been recognised as a critical technology for "timely emergency care across Africa and in the battle against infectious and vector-borne diseases like malaria, cholera and Ebola, by allowing healthcare professionals to identify the centres of disease and other outbreaks" by the World Health Organisation (Pulse, 2017: online).

WHAT3WORDS

What3words is an addressing system that has allocated a unique combination of three words to every 3m x 3m square anywhere on Earth. It is based on an algorithm available across devices and smartphones to provide a precise, individual identification of any location across the world with the three words that function as an address. The three-word code makes it easy to remember a location (Wired, 2017). It can be linked to other apps, such as the UN-ASIGN crowd-sourcing app developed for use in disasters to identify areas of crisis by permitting the geo-tagging of specific locations. Because the system links a code to a specific grid, it is useful for locating places or activities on campuses, large parks, showgrounds and even nature reserves (Gye, 2016).

This system can be used by businesses for navigation or linked to their core businesses. Besides generating the three-word code, the ArcGIS geocoder developed by what3words enables 'reverse geocoding' as it converts the What3Words grids into coordinates (ArcGIS Marketplace, 2016). What3words ad is being implemented in Mongolia, Côte d'Ivoire (Post & Parcel, 2016), and Djibouti (what3words, 2017) as their official addressing infrastructure. It is under consideration in Tanzania (Anderson, 2015), Tonga and Sint Maarten (Shankland, 2017). Although English was originally used, 13 other languages as diverse as Russian, Swahili and Turkish are available. The British Museum has apparently tagged all its artefacts with this geocode (Gye, 2016).

However, unlike the SnooCode, what3words is not supported by a navigation tool. As each 3x3 portion of land has its unique three-word code, adjacent portions will have totally different codes, so there is no pattern to the codes for a specific area (Shankland, 2017).

CONCLUSIONS

If smart cities are about people, "socio-economic progress and more liveable, secure, functional, competitive and sustainable cities" (Kitchin, 2014:132), and "proactive government services and efficient utilities" (Goodspeed, 2014: 86), then universal street addressing should be one of its core functions. From the case studies presented in this paper, it is evident that a street address is essential to health and safety of residents. Conversely, the neglect of street addresses can be life-threatening, and may deny access to social and economic services and even citizenship rights. The disregard of the needs of residents in poor and informal settlements is the antithesis of a smart city's objectives.

Figure 7: what3words provides a precise and incredibly simple way to talk about location.
Source: https://what3words.com

Figure 8: Neither street names nor addresses in Grasland informal settlement.
Photo by Rouve Bingle

Besides the very practical issues of being able to find a place for emergency responses or deliveries, the social-cultural aspects of street and place names cannot be discounted. Names are like symbols, filled with memories and meaning. This connection with culture and history can create a sense of place and thus, belonging, but is also open to manipulation and power plays. The contestation over names can result in legal battles and delays in street-naming.

The potential for disputes over street names is one of the drawbacks of a formal naming system as proposed by the World Bank and others. In addition, there are high costs associated with these traditional approaches. Finally, a street naming system based on numbers (such as in Manhattan) can work well where there is a regular street pattern, but will be more difficult to implement in an area with an irregular or organic layout such as those often found in informal settlements.

Codes, such as the SnooCode or what3words, can meet practical needs of an address – access to civic and economic services, safety and delivery of services. However, these codes are devoid of meaning and may therefore, be unable to meet the psychological and social needs embedded in place, history and identity.

A smart city can use codes for the practical component of addresses, but a really smart city will engage its residents in the process of naming streets and creating places with identity. It will seek to promote citizenship and give its people the dignity of an address.

—

References

Albino, V., Berardi, U., and Dangelico, R. M. 2015. Smart cities: Definitions, dimensions, performance, and initiatives. Journal of Urban Technology, 22(1), 3-21.

Alderman, D. H. & Inwood J. 2013. Street naming and the politics of belonging: spatial injustices in the toponymic commemoration of Martin Luther King Jr, Social & Cultural Geography, DOI:10.1080/14649365.2012.754488

American Planning Association. s.a. Street Naming and Property Numbering Systems. California.

Anderson, M. 2015. Tanzania: the smartphone apps putting Africa's fastest-growing city on the map. The Guardian, 22 September 2015. https://www.theguardian.com/global-development/2015/sep/22/tanzania-smartphone-apps-africa-fastest-growing-city-dar-es-salaam-map

Angelidou, M. (2014). Smart city policies: A spatial approach. Cities, 41, S3-S11.

Augustins G. 2004. Naming, dedicating: street names and tradition, History and Anthropology, 15(3): 289-299

Azaryahu, M. 2011. The Critical Turn and Beyond: The Case of Commemorative Street Naming. ACME: An International E-Journal for Critical Geographies, 2011, 10 (1), 28-33 https://ojs.unbc.ca/index.php/acme/article/viewFile/883/739

Coetzee, S. and Cooper, A. K. 2007. What is an address in South Africa? South African Journal of Science 103: 449-458

Coetzee, S., Cooper, A.K., Piotrowski, P., Lind, M., Wells, M.M., Wells, E., Griffiths, N., Nicholson, M.J., Kumar, R., Lubenow, J. and Lambert, J., 2007. What address standards tell us about addresses. South African Journal of Science, 103(11), pp.449-458.

Corwin, M.A., 1978. Street-naming and Property-numbering Systems (No. 332). American Society of Planning Officials.

Cranchon. 2015. Snoocode Knows your Address – Find out how. 6 August, 2015. http://www.cranchon.com/2015/08/06/snoocode-knows-your-address-find-out-how/ [20 March, 2017]

Dharmavaram, S. and Farvacque-Vitkovic, C. 2017. Street addressing for better governance and better commerce- a global trend. Paper presented at 2017 World Bank Conference on Land and Poverty, The World Bank- Washington DC, March 20-24, 2017.

Douglas, K. 2015. SnooCode: A solution to the lack of formal addresses in Ghana and beyond. How we made it in Africa, 14 August 2015. https://www.howwemadeitinafrica.com/snoocodeasolutiontothelackofformaladdressesinghanaandbeyond/ [17 March 2017]

Farvacque-Vitkovic, C., Godin, L., Leroux, H., Verdet, F and Chavez, R. 2005. Street Addressing and the Management of Cities. Washington DC. The International Bank for Reconstruction and Development / The World Bank.

Goodspeed, R. 2014. Smart cities: moving beyond urban cybernetics to tackle wicked problems. Cambridge Journal of Regions, Economy and Society, 8, 79–92. doi:10.1093/cjres/rsu013

Guyot, S. and Seethal, C. 2007, Identity of place, places of identities, change of place names in Post-Apartheid South Africa. The South African Geographical Journal, 89(1):55-63. <hal-00201762>

Gye, H. 2016. Better than GPS? The brilliant online gadget that identifies every 10 sq ft patch of land on the planet- and gives each one its own unique three-word name (so what's YOUR back garden called?). Mail Online, 22 February 2016. http://www.dailymail.co.uk/news/article-3458234/The-Etonians-realised-three-words-pinpoint-planet.html [24 March 2017]

Harrison, C. and Donnelly, I. A., 2011, September. A theory of smart cities. In Proceedings of the 55th Annual Meeting of the ISSS-2011, Hull, UK, Vol. 55, No. 1.

Helleland, B. 2012. Place names and identities, in Helleland, B., Ore C.-E. & Wikstrøm S. (eds.) 2012. Names and Identities, Oslo Studies in Language 4(2), 2012. 95–116. (ISSN 1890-9639) http://www.journals.uio.no/osla

Kitchin, R. (2014). Making sense of smart cities: addressing present shortcomings. Cambridge Journal of Regions, Economy and Society, rsu027.

Koopman, A and Deane, J. 2005. New names for old. Transformation in the streets of Pietermaritzburg. Natalia, 35:85-90

Makwiting, N. 2016. Tshwane Metro and AfriForum in street name battle. SABC News, Saturday 16 January 2016. http://www.sabc.co.za/news/a/74e2b8004b558a0eb270ba425ab4c119/Tshwane-Metro-and-Afriforum-in-street-name-battle-20161601 [23 March 2017]

Matthews, C. 2016. Finding your way in a country without street addresses. BBC News. 1 February 2016. http://www.bbc.com/news/world-africa-35385636 [21 March 2017]

Mautjana, M. H, & Maombe, G. 2014. Community participation or malicious compliance? Africa Insight, 44(2):51-67

Ministry of Local Government and Rural Development (Ghana). 2010. Street naming and property numbering system (Street addressing system) Operational guidelines. https://www.giz.de/en/downloads/en-street-addressing-system.pdf   [15 March 2017]

Nasara, A. 2017. Are you tired of getting lost from wrong directions? Why not try SnooCode Mobile App for easy and convenient directions. JBKlutse, 27 February 2017. http://www.jbklutse.com/snoocode-mobile-app/   [24 March 2017]

Ndletyana, M. (2012). Changing place names in post-apartheid South Africa: accounting for the unevenness, Social Dynamics: A journal of African studies, 38:1, 87-103

Osabutey, A. 2014. Where the streets now have names. Citiscope, February 10, 2014. http://citiscope.org/story/2014/wherestreetsnowhavenames [17 March 2017]

Parby, J.I., Lozano G. N., Mason, D., Lall, S. V.,Dasgupta, B., Young, C. 2015. Stocktaking of the housing sector in Sub-Saharan Africa. Washington DC: The International Bank for Reconstruction and Development / The World Bank. Report 000388925.

Parnell, S. & Pieterse, P. (2010). The 'Right to the City': Institutional Imperatives of a Developmental State. International Journal of Urban and Regional Research Volume 34(1):146–162

Pioneering app gives millions of Ghanaians access to ambulances, Pulse, 14 February, 2017. http://pulse.com.gh/bi/tech/snoocode-pioneering-app-gives-millions-of-ghanaians-access-to-ambulances-id6221864.html   [24 March 2017]

Su, X. 2016. Lack of street addresses as a bottleneck for urbanisation. Africa from an Asian perspective 26 November, 2016. https://www.africanexponent.com/blogs/asianperspective/4511-getting-lost-as-a-transaction-cost-for-development

Shankland, S. 2017. What3Words digital addresses spread to island nations. CNET, 3 February 2017. https://www.cnet.com/news/what3words-digital-addresses-tonga-sint-maarten-island/

South Africa, 1996. Constitution of the Republic of South Africa (Act no. 108 of 1996). Pretoria: Government Printer.

South African Geographical Names Council. 2002. Handbook on Geographical Names. Pretoria:

Department of Arts, Culture, Science and Technology. http://www.dac.gov.za/sites/default/files/Handbook%20on%20Geographical%20names.pdf

Swanepoel, N. 2009. Capital letters: material dissent and place name change in the 'new' South Africa, 2005-2006. Anthropology Southern Africa, 32(3&4): 95-105

Swope, C. 2014. Naming streets in urban slums part of a "street-based" upgrading approach. Citiscope, February 11, 2014. http://citiscope.org/story/2014/namingstreetsurbanslumspartstreetbasedupgradingapproach [17 March 2017]

Universal Postal Union. 2012. Addressing the world – An address for everyone. A white paper by the International Bureau of the Universal Postal Union, Berne.

Van Mead, N. Where the streets have new names: the airbrush politics of renaming roads. https://www.theguardian.com/cities/2016/jun/28/streets-new-names-airbrush-politics-renaming-roads The Guardian Cities, 28 June 2016. [17 March 2017]

What3words for ArcGIS 2016. ArcGIS Marketplace. https://marketplace.arcgis.com/listing.html?id=bb98aa7851324393a415e484f6f344e8 [17 March 2017]

What3words. 2017.   Addressing the world. https://what3words.com/summary/ [2 February 2017]

Wired, 2017. What3words: the story behind the global addressing system. Wired, 15 February 2017. http://www.wired.co.uk/article/startup-of-the-week-what3words [21 March 2017]

ISOCARP URBAN PLANNING ADVISOR TEAM (UPAT) PROJECTS

Editor
Martin Dubbeling

BODØ: A GATEWAY TO THE ARCTIC

ISOCARP Urban Planning Advisory Team (UPAT)

"New Airport, Next City, Smart Bodø"

NEW AIRPORT / SMART CITY

The city of Bodø, in Norway, is the administration centre of the County of Nordland, and is the largest city in the county with 50,000 citizens. Bodø serves as the administrative centre of Nordland, a Norwegian county, whose districts include Helgeland, Salten, Lofoten, Ofoten and Vesterålen[i]. Nordland's long coastline faces both the Norwegian Sea and the Atlantic Ocean. Functionally, Bodø is also part of the region informally known as Salten and has strong relationships with other far north communities in Sweden, Finland, and Russia. Culturally, the indigenous Sami people reinforce these cross-border relationships. The expression "Foltilfolksamarbeid" or "cooperation with people" is an important value to the region. Bodø is experiencing rapid growth in population and is transforming into a larger, modern Norwegian city.

In February 2014, the city council adopted the overall strategic plan – Bodø 2030. The vision for Bodø 2030 is to become "an attractive capital in the North". This strategy contains six different focus areas including "sustainable city development".

Within this focus area of sustainable city development, the city stated their climatic goal: Bodø will be an innovative low emission city, where the citizens feel safe from nature-related dangers. As a result, Bodø stated its intent to reduce of its climate gas emissions and to adapt itself to its future climate. The Plan foresaw that both innovation and new technologies will be central elements to achieve its goals.

At the same time, the strategic plan was being completed, the national gov-

---

i   (Bodø Kommune, 2017 (translation))

ernment decided to end military air activity in Bodø within the next 7-10 years. This airport, used by both the military and serving the adjacent passenger airport terminal was constructed in the 1950's and has a maximum remaining useful life of ten years. In response to airport challenge, Bodø Kommune[ii] developed two different scenarios. The first called for a new runway 80 metres parallel from the existing runway. The second option, now agreed as preferred by the Norwegian government, involves the building of an entirely new airport one kilometre to the southwest of the existing runway. This option, partially built on reclaimed land, would reduce the number of properties affected by noise pollution.

The release of land within the airbase to the city, coupled with the need to construct a new airport runway by 2024-2026, added a new perspective to the process of rethinking the future development of the city. The preferred scenario would give Bodø around 340 additional hectares of land for urban development. The area is larger than Central Park, New York, US, and could contain housing for up to 25,000 people. It also could be transformed into a large new business area or a mixed land use development.

With the opportunity to move the airport and build a completely new city near the historic city centre, Bodø Kommune saw the opportunity to build the world's smartest and most sustainable city. This ambition to create a better quality of life and more opportunities for Bodø citizens, as well as for visitors, led to questions such as:

· What could the city look like in 2065?
· What kinds of technology could be integrated into a future city?
· How could buildings of the future be formed?
· What kind of energy sources could be used in future cities?
· How could Bodø be used as a test bed for smart and sustainable technology while provide jobs and create economic opportunities through the international export of this knowledge?

UNDERSTANDING THE PEOPLE AND PLACE

In the early 19th century the city was an important, even if small, centre for Nordland. From herring to other species like stock and halibut, fisheries evolved into more consistent urban and economic activities including, but not restricted to, commerce, health care and education (Olsen, 2011).

Today, Bodø's fisheries, fish farming and related products are highly valued internationally, with 1 in every 9-salmon eaten in the world originating from the waters around Bodø. Many of these fish are caught and processed by small island communities. These delicacies are greatly appreciated for their quality, especially in places such as Tokyo and New York. Although fish exports are currently delivered to market by boat then road and plane from Oslo, these premium fish exports offer potential to subsidise direct international passenger flights from Bodø.

The city played an important role during WWII, as a fighter base for Allied forces. Unfortunately, this placed the city in the line of fire, which left much of it destroyed and occupied during World War II. Despite heavy losses, the city has risen from the ashes and expanded its strategic role during the Cold War as a NATO air fighter base.

---

ii ² The community of Bodø including its government

Over time the city, NATO airbase, and the passenger airport became intertwined. A unique set of circumstances brought together not only the traditional uses and economic activities related to fisheries, but also a growing aviation and defence sector with the fighter base: new families' ties, a global perspective, and an open sky safeguarded by combat planes.

"We used to interrupt classes and wait for the planes to pass so that we could continue the class. Because of the noise, you see." a resident said.

Although the city does not aspire to attract mass market tourism, there are opportunities to grow this sector. Currently visitors to Bodø arrive by plane, car, ship and train seeking out singular experiences of natural spectacles offered. It is in Bodø that the world's strongest tidal currents can be experienced, the Saltstraumen. An extraordinarily beautiful landscape of sea and mountains where hiking, sailing, and fishing offers a wide range of outdoor activities. The midnight sun and the possibility to see the northern lights during wintertime, also widen the season for visiting the area.

Figure 3: The long waterfront area of Bodø has numerous attractive areas.
Photo by: Ernst Furuhatt

In recent years Bodø has also strengthened its offer of quality restaurants (many using fresh local produce), and the performing arts (bolstered primarily through development of the Stormen concert hall and library). The distinctiveness of the city and its environs therefore attracts domestic and regional guests, as well as those from further afield.

Both the NATO airbase and Bodø airport have created international connections, as have the fisheries and tourism industries. It is therefore important to understand Bodø's location not just in a fixed geographical sense, but also to recognise its place in a broader international community. Although relatively remote and with only a modest population, Bodø is well integrated internationally. Norway has demonstrated leadership and a willingness to cooperate internationally, through its role as a founding member of the United Nations (UN), the North Atlantic Treaty Organization (NATO - created in the aftermath of the Second World War), the Council of Europe, and The European Free Trade Association (EFTA). Within this context, Bodø's northern location is of international geopolitical interest.

Although public *referenda* have twice voted against joining the European Union (EU), Norway has close ties and voting rights in the EU Common Security and Defence Policy, the Schengen Area Agreement, the European Defence Agency and in several other programmes.

One of the most relevant EU programmes is *Interreg Baltic Sea Region*, which promotes the development of cross-border planning tools to facilitate innovation, Natural Resources development and Transportation in the Baltic Sea region[iii]. The *EU Strategy for the Baltic Sea Region* (EUSBSR) establishes priorities to the territory, which is seen as a macro-region (European Union). These are important matters when it comes to discussing Bodø's global position. Membership of these organisations manifests itself clearly in Bodø, not only with the presence of the NATO airbase, but also through standards of governance and trade agreements. In summary, the people of Bodø have pride in their city, its unique location, and have a global mindset.

The decision to relocate the airbase changed *the status quo* of the city and has created *momentum*. From this challenge of losing an important part of the community and a major employer, Bodø saw the opportunity for relocation of the airbase to become a smart, international city, transforming itself functionally and physically into an innovative hub with a high-quality environment, strong society, and excellent infrastructure.

---

iii «The Interreg Baltic Sea Region Programme 2014-2020 supports integrated territorial development and cooperation for a more innovative, better accessible and sustainable Baltic Sea region. Partners from countries around the Baltic Sea work together in transnational projects on common key challenges and opportunities. » Available in http://www.interreg-baltic.eu/about-the-programme.html

THE UPAT AND ITS ROLE

Bodø Kommune engaged Habitat Professionals Forum (HPF) and the International Society of City and Regional Planners (ISOCARP) to assemble an Urban Planning Advisory Team (UPAT). The team comprised academics and practitioners from 10 countries working together for one week through an intensive and creative process to: 1.) provide a professional assessment of the Smart Bodø concept; 2.) evaluate how the existing city can best connect and integrate with any new areas of development; 3.) write recommendations for future use and land management; and, 4.) carry out comparative research between best practices in cities around the world.

Figure 4: Members of the Bodø UPAT team exchanged analyses and ideas about Bodø with the inhabitants of the city.
Photo by: HPF/ISOCARP Bodø UPAT Team

The UPAT team took a whole society perspective of city development that would connect public health, education, welfare, environment, culture, governance, business development and technology development together. The priority was to assess the Smart Bodø concept, and identify how the new airport could act as a catalyst for world class urban development, economic growth, technology, and sustainability.

The UPAT team's goal was to find new urban advantages that could intermingle with the extensive work already done by Bodø Kommune. While in Bodø, the UPAT team visited and met with several stakeholders including: Nordland County, Bodø Municipality, the Nord University, the Royal Norwegian Airforce, Avinor, and developer Hundholmen. These encounters allowed for a comprehensive understanding of future possibilities for territorial change and local redevelopment.

A literature review of the main strategic documents available in English, and a consistent set of presentations, showed Bodø in a competitive position not only as an important trade and tourism hub in Northern Europe, but also in its adaptive capacity[iv] towards the implementation of innovative tools that may contribute to a greener, more sustainable, and lively city.

---

iv «Adaptive capacity is the ability to adjust to and shape change. Adaptive capacity is defined as a vector of resources and assets that represents the asset from which adaptation actions and investments can be made (Golden & Powell, 2000). Adaptive capacity and connectivity are considered as important attributes of Urban Resiliency. For example: the improvement of infrastructural connectivity may increase the socioeconomic adaptation by promoting: land use diversity, promoting urban continuities and public transport alternatives» (Eraydin & Tasan-Kok, 2013)

To understand the local context, meetings were held with technical and political actors. Listening to the local community was also recognised as critical, and a public session organised at the library was especially valuable. The open event was structured as an interactive workshop and proved to be a special asset, providing a wider and deeper-rooted view of how Bodø citizens live now, and their ideas for the future of the city.

From this context, several potential paths began to emerge. To progress these ideas, a multilevel, phased approach to the long-term development of the city was adopted. The team members then took responsibility for studying certain locations, themes, ideas and benchmark case studies in greater detail.

LOOKING AT OTHER EXAMPLES OF SMART GROWTH

Smart was the big-ticket concept that the UPAT team aimed to take advantage of, to make the most of the city and the future airport. A challenging view towards innovation, green and blue growth.

The UPAT Team considered other good examples[v] that have something in common, not only with the vision for 'Smart Bodø – Smart Airport', but directly with:

· Offering great urban facilities and high quality public spaces by the water (Oslo, Norway);
· Creating value from knowledge and intermodal transport into the *Human Capital of Scandinavia* (Malmö, Sweden).

Although these catalyst projects for urban regeneration each warrant a detailed study for lessons of use in Bodø, for brevity here we have focused on the key lessons from Malmö and Oslo.

In 2012, the Academy of Urbanism voted Oslo the European City of the year. "The major transformation of Oslo's waterfront into an attractive, high-quality, higher-density, mixed-use development is illustrative of the efforts that the city has put into land reuse and regeneration, reducing the need for new space for development, while minimizing the impact on the environment" (The Academy of Urbanism).

The "Fjord City" project guides long term development of newly released areas along the coast of Oslo. At lot of the areas today consist of shipyards and port operations. The project´s vision is to develop housing, offices, and recreational areas. The project started in 2000 and consists of several subprojects such as Aker Brygge, Bjørvika, Havnepromenaden, and Tjuvholmen, among others. Aker Brygge was the first area to be regenerated and was developed from 1985-1998. The area now has a recreational harbour, public promenades, and mixed-use developments. It is a popular destination for both tourists and locals, as it is mostly car-free. Other subprojects such as "Bar Code" in Bjørvika, "Sjøbadet på Sørenga" (outdoor sea-pool) and the Opera house are all examples of great successes that attract both locals and tourists.

Malmö, a former industrial city of 315,000 people, has been reinventing itself since the mid-1990s as a knowledge-based city focusing on green growth and sustainable urban regeneration. After suffering from economic decline in the 1970s and 1980s, the final shock for the city came in 1994 with the fail-

---

v For other examples see PLAN, issue 5: Bilbao by Juan Alvaro Alayo, Paris/Lyon by Paul Lecroart, Lisbon by Sofia Morgado.

Figure 5: The Oslo "Fjord City" plan [vi]

Figure 6: Havnepromenaden, Oslo (Lunke 2015)

ure of the re-industrialisation of the former shipyards in the Western Harbour leading to a loss of some 25,000 jobs.

In 1995 'Value-based Planning' was introduced, providing a more holistic long-term approach to the development of the built environment. The Vision Malmö 2015 process brought stakeholders together to strategically use the full potential of the Öresund rail- and road that would link to Copenhagen, Malmo University, the City Tunnel & Central Station, and the 100% energy self-sufficient show-case housing development Bo-01 on the Western Harbour. These city elements have become key anchors for regeneration of the city.

Close to the city centre, the Western Harbour (Västra Hamnen) is a 175-hectacre redeveloped brownfield that forecasts to bring 20,000 new jobs, students, and homes for 15,000 residents. Together with other transformation projects

vi   Available at: https://www.oslo.kommune.no/politikk-og-administrasjon/slik-bygger-vi-oslo/fjordbyen/

Figure 7: Malmö: Tomas Ottosson (2005)

in the city, such as the social housing estate of Augustenborg, the Western Harbour is managed as a living lab for sustainable urban regeneration with a close dialogue between city planning, utility companies, and private developers. The area's Masterplan (2000, revised in 2007 and 2013) focuses on urban quality and creative solutions for clean energy, water treatment, waste management, car-free mobility, experimental housing, and public access to the waterfront.

These strategies have helped Malmö to experience rapid growth after 1995, including 20 % more residents and 34% more jobs. Malmö's masterplan has won many international awards for it sustainable urban strategy, including the WWF Earth Hour Capital Award 2011. The city is a European leader in cleantech and green roofs.

Malmö 's new *motto* is 'A good life for everyone.' The slogan incorporates the city's emphasis on good housing, education and healthcare, and the ambition to be the best city in the world for sustainable urban development by 2020 using 100% sustainable energy. However, many low-income groups may not reap equal benefits from the city's growth. Acknowledging this potential gap, the city set up the Socially Sustainable Malmö Commission in 2010 which produced a strategy for inclusive heath, welfare, and justice.

Fugure 8: Malmö: La Citte Vita

Figure 9: The Bodø UPAT team jointly worked on finalizing the maps with the spatial development strategies for Bodø. Photo by: HPF/ISOCARP Bodø UPAT Team

DESIGNING FUTURES

Bodø has the luxury of physical space, as well as time, in which to grow. A possible pathway for Bodø could be to prioritise urban growth around the inner harbour, and to refocus job growth, citizens, students, and visitors toward a green high-tech economy with phased growth between 2015-2050. The airport and air base lands purchased by the Bodø Kommune could be held in a public trust and activated with temporary uses, such as recreation or agriculture, until the city needs it for long term expansion.

The team attempted to grasp the wholeness of the territory and its complex variables: changing intermodal infrastructures (i.e., air, sea, rail, and road); an evolving society open to acquiring modern, knowledge-based skills; and, a cozy city centre that can act as an international hub for innovative trade, tourism, and sea-related industries.

As the UPAT's strategy began to take shape, principles to the "New Airport-Next Bodø" vision were identified:

1. Smart Identity— Create an identity for Bodø as the "Gateway to the Arctic". Establish Bodø as the centre of the "High North" with a strong focus on liveability, technology, and a vibrant compact city life. Prioritise inner city densification around Nyholmen East Harbour and establish a multifunctional waterfront along the West Harbour.

2. Smart Growth—Prepare a long-term phasing strategy (2015-50) for the decommissioned airport aimed at decontamination, land preservation, and managing efficient land use changes. Future growth should be clustered as self-sufficient mixed use compact nodes. Urban sprawl along the highway corridors should be contained through densification strategies.

3. Smart Economy—Create new growth clusters for a green high-tech economy in addition to a state-of-the-art logistics hub with processing zones augmented by airport, seaport, rail, and highway connections.

4. Smart Green Links—Reinforce connections with the land- and seascapes to make the best use of existing natural assets which should be preserved, enhanced, and easily accessible for people to enjoy.

5. Smart Mobility—Establish a multimodal transit hub that provides accessibility for all age groups.
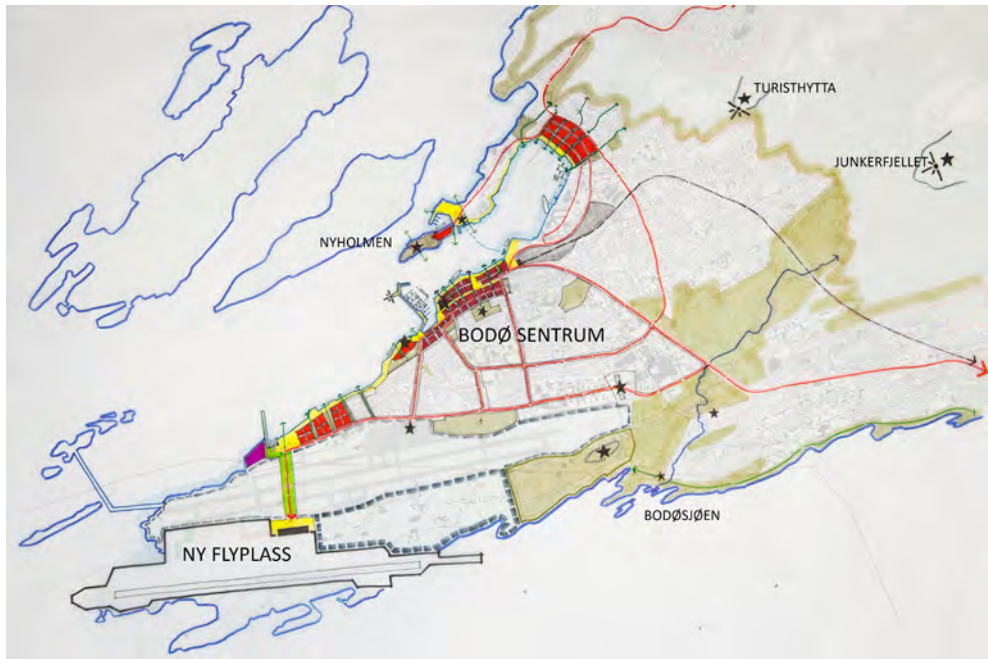
The first phase (Phase I 2015-2025) primarily focuses on initiating the re-development of the inner-city harbour, shifting the airport to the south, and related land management. The Airport Development Programme (I) establishes the new airport, the terminal building, temporary access roads, and a small logistics port to handle construction activity. This phase will lay the foundation of a new West Harbour associated with the New Airport Terminal. It is envisaged to accommodate both recreational and logistic activities, and will be part of the new "Gateway of the Arctic" project. The industries in the inner harbour (East Harbour) could be gradually shifted to a new harbour (West Harbour) located towards the west of the new airport, thus freeing up land for housing, hospitality, and mixed-use redevelopment. A harbourfront promenade and an urban beach could take place at the edge of the water.

The intensification of the city centre should continue during this phase with key projects such as a destination hotel on the Nyholmen peninsula, a heritage park, and a cultural re-use of the dramatic former herring oil factory. Of course, new medium-density housing should be created during this phase to trigger further regeneration of the East Harbour. Medium-density housing within pockets of industrial land around the West Harbour should also be encouraged. This waterfront strategy will potentially initiate a process that endows Bodø with a definable harbour district, distinct in its setting and character.

An open space strategy connecting the Stormen Konserthus with the new West Harbour will open up new vistas, string together new housing developments, improve access to the water, and contribute to the quality of life of Bodø citizens. A battery powered shuttle service can connect the new airport with the city centre, which can potentially extend to Nyholmen at a later date.

While the new airport is expected to be fully operational by 2025, NATO might retain some legacy functions for part of the new airport, which will be out of bound for immediate use. Additionally, a substantial amount of land will be released and must be decontaminated before it can be put to use in the
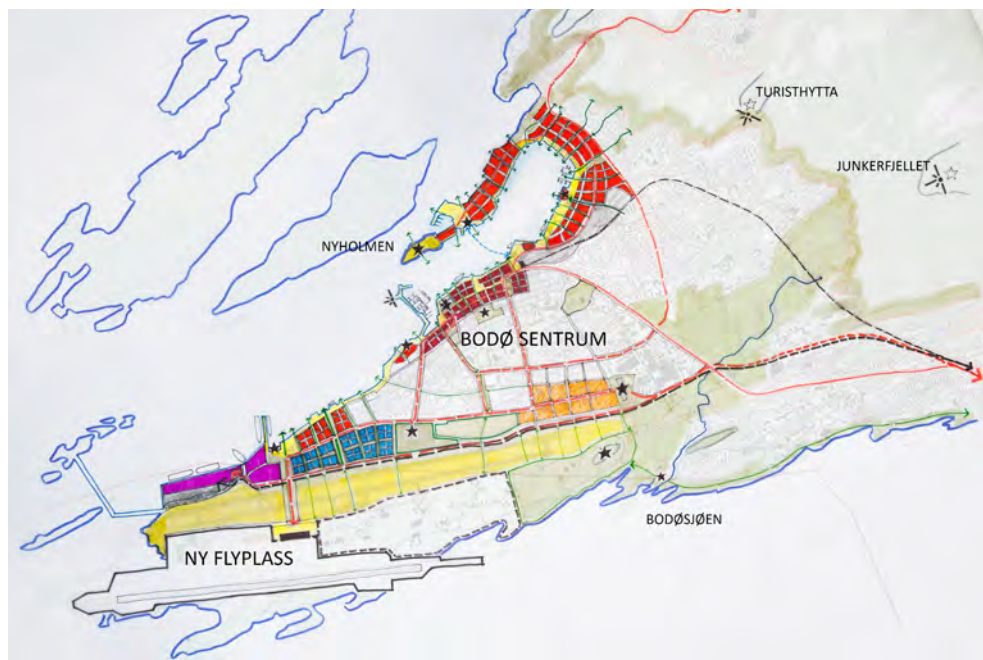
next phases. Opening part of the former airbase to the public as a heritage and nature park that connects to Bodøsjøen historic site and Bodømarka open space could initiate some new recreational, historic, and ecological potential for the city.

The intermediate phase (Phase II 2025-2035) completes the projects initiated in the first phase and gives shape to a compact city centre, especially around Ny Holmen peninsula, the East Harbour, and the West Harbour. A new waterfront promenade connects these assets, linking the West Harbour with the cultural destinations of Ny Holmen through the city centre and the East Harbour. The Ny Holmen peninsula regeneration, now complete with its new hospitality, recreational, and housing projects is expected to reinforce the image of Bodø as an attractive cultural hub. The relocation of the main ferry- and rail logistic activities to the West Harbour means that the East Harbour could be redeveloped as an extension of the city centre. This could open onto the water, with a new park and marina, and possibly a leisure or other cultural landmark as an anchor. This area has the potential to redevelop nearly 70 hectares around the Inner Harbour—that is more area than the current city centre!

By this time, the temporary road between the New Airport Terminal, the new Cruise Terminal, and the city centre will have transformed into a large avenue that opens onto the water, providing an exciting "Bodø Experience" to the first-time visitor. This project is expected to improve the attractiveness of the new West Harbour and offer potential for convention facilities. Smaller ferries would continue to operate out of the existing facility in the city centre with a potential connection to the hotel in Ny Holmen.

The Airport Development Programme (II) firmly anchors the Sea-Air-Rail Logistics' Hub around the West Harbour. Commercial development related to the airport is located in this area. Assisted by a new highway and a strategic railway connection, the West Harbour can position Bodø as the "Arctic Gateway". A fish processing and distribution centre can be established as part of this phase to
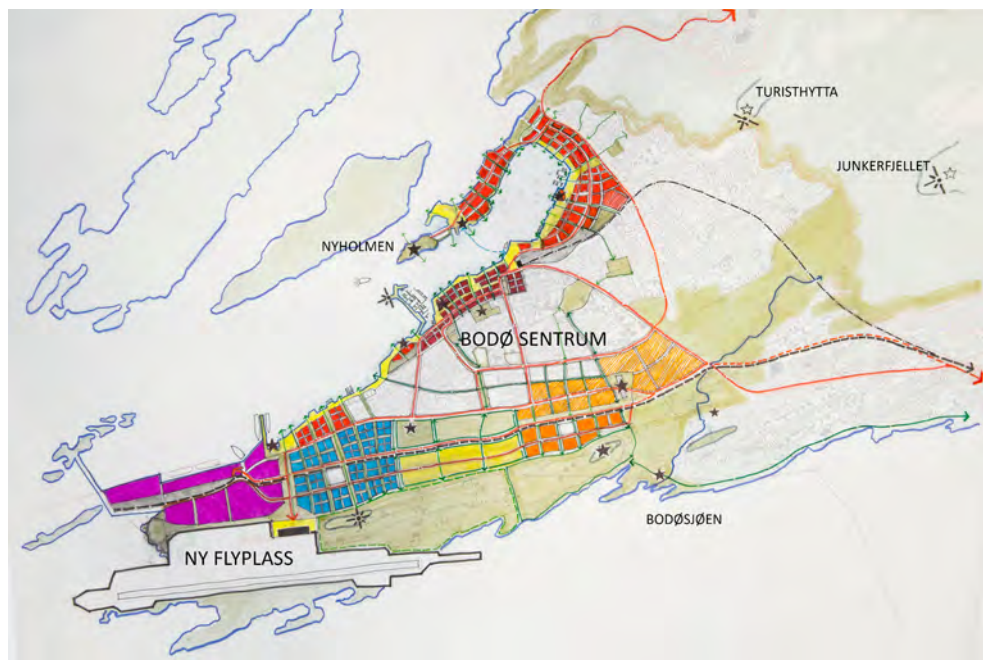
Figure 12: Phase III 2035-2050.
Source: HPF/ISOCARP Bodø UPAT Team

move Bodø up the value chain. A part of the decontaminated airport land can be utilized as an initial Airport Smart City Centre Hub specializing in innovative technologies. While the size and nature of these developments will depend on market dynamics, they should be clustered around the West Harbour where infrastructure and logistics would be easily available.

Land preservation is key during this phase to suppress sprawl around the airport. The transformation process should be guided by a comprehensive land management strategy starting with the establishment of a land bank. An immediate strategy is to create a temporary aviation park for recreation, open air events, urban agriculture, and community activities until further growth clusters are envisioned. Consider Berlin's Tempelhof Freiheit as a case study to reference. The aviation park would reinforce the idea of bringing nature back into the city and opens new hiking/biking trails that connect the city centre and waterfront promenade with the larger nature trails across Junkerfjellet. The scale of this site also offers the possibility of testing life-scale smart sustainable technologies.

A Cold War Museum in "Bunker 96" is proposed on the eastern end of the aviation park which can make use of the striking landscape and link back to the Norwegian Aviation Museum. Incidentally, this area is rich in Iron Age archaeology and can be associated with the Bodøsjøen Heritage Site. Bodin church is also a cultural asset for the area. There is a potential to create a modest tourist hub around these features and creating water edge bike- and footpaths should be explored further.

Bodø's long term future hinges upon the efficient utilization of the airport site (Phase III 2035-50). Bodø's population growth is projected at 1.15% and is expected to reach 75,000 inhabitants by 2065. The city centre intensification project, when complete in the east and west harbours, would be enough to absorb this population growth. Likewise, should population growth be higher (in the region of 1.6%), or considered over a longer time frame to 2050, this spatial arrangement should prove effective. Any further development on the

airport land should be guided by a clear vision, identity, and global positioning strategy of Bodø. There are numerous possibilities: Bodø as the "Gateway to the Arctic", a key logistics port, an established cultural and tourism hub, a smart city with high-tech knowledge industries and innovative businesses, or even a new university town. Regardless of the nature of development, the planning prerogative for the Airport Development Programme (III) should be to establish a series of high intensity mixed use growth nodes supported by efficient and smart mobility systems.

As the city travels towards the south, a consolidation of the retail functions around Stormyra and City Nord could be expected. This might transfer some of the future developmental load towards a restructured area designed as a mixuse, car-free sub city centre. This shift of gravity should be integrated into the Airport Development Programme (III).

Bodø should judiciously utilize the airport land for its immediate growth and sustainable future. The growth pattern should strengthen the identity of Bodø as a city connected to its natural assets. Further sprawl should be arrested along the eastern and northern highways, especially around the Stormyrveien where the Rønvikjordene ecological zone offers to bring nature back into the city. The aviation park is expected to be reconfigured to accommodate growth pressures, but should continue to be the critical hinge in the overall open space framework for Bodø.

Further exploration is required to understand strategic positioning of Bodø as an attractive destination of the "High North." Bodø has substantial strengths including existing administrative and cultural trading connections, specialized industries like aquaculture and aviation, natural assets, tourism, and above all, proud residents who are passionate about their strong historical/cultural associations. Unlocking the airport site offers a rare opportunity to build upon these strengths and discover a new future for Bodø.

People hold a fascination for the Arctic, the northern lights, and the midnight sun. To experience these natural wonders, as well as a wide range of temperatures and extremely windy conditions, Bodø is the right city. To experience a walkable cosy city, Bodø could also be the right place. However, public spaces should be lived in, thus should be designed quite differently than they are in other parts of the world.

Challenges to designing public space in an Artic City
This is a challenge only matched by the "Smart Bodø" concept as it opens a whole new range of possibilities not found elsewhere. Ideas from the public consultation held in the city included: tunnels to shield cyclists from wind and rain; and sheltered shopping areas with playground structures. An abundance of water gives rise to opportunities to create or sustain urban pools and other water features that could be multi-functional during varying seasons (such as pools in summer, and ice skating rinks in winter) [vii] Small spaces could be transformed into pocket parks and streets could be improved by making them more functional for pedestrians and cyclists. Should parking lots appear on the periphery of the city border, its tops could be easily used as gathering places.

---

vii   For more information on the Public Consultation, please see PLAN, Issue 5, "Pop-up Projects Provide Potential for Smart Bodø" by Mercedes Beaudoin.

Temporary interventions organised by the community in a *Tactical Urbanism* way (Lydon & Garcia, [2015]), should be considered and promoted. This planning methodology allows cities to strengthen intergenerational and multicultural bonds among citizens.

Temporary uses, such as hydroponic farming or recreation could be based on the airfield site. Phytoremediation[viii] (The Architectural League of New York) could also be used as part of a phased approach to different interventions.

Removing street parking, improving pavements, removing dissonant elements (*e.g.* choosing furniture collections adjusted to climate, eliminating inharmonious shop signs, and physical barriers) and introducing shared street concepts would invite people to simply walk around and explore their own city. These are simple initiatives with a strong result: cleaner places reactivated as collective, wider and safer walking areas.

Above all, public spaces should be welcoming, flexible, and adjusted to a wide range of pedestrians, from children to elderly, from locals to tourists, to temporary workers. As the emergent innovative sector will certainly invite newcomers from other regions and countries, population density and diversity is expected to grow.

Given the geographic conditions, light—or its absence—plays the utmost role not only in the perception and liveability of the city, but also in the opportunity to include interactive features. These features could include media art with useful applications embedded (*e.g.* public transportation schedules and news). Seamless technologies and a simple smartphone is all we need to find ourselves in the IoT (Internet of Things) world (Digital Art & Innovation).

Bringing knowledge to the forefront by reinforcing the role of Nord University in the new fabric of the city should be also considered as of great interest.

Instead of expanding the city fabric onto land that may be saved, increasing the density, both built and populational, in the inner city should be a first choice. New projects, such as the harbour, could allow for the development of a networked entrepreneurial ecosystem in the existing urban tissue by developing land use diversity, thus liveability.

This type of project could harness the potential of the underused and derelict buildings while improving the city's income and capacity. Heritage should be preserved and social inclusiveness and diversity should be welcomed.

Soft mobility should also play an important role in the approach to public space. This could include electric bike lanes, wayfinding, driverless vehicles, and improve the mobility to and from the new airport.

The inner city of Bodø public space design would, by this, become an extension of sustainable priorities under the umbrella of the New Urban Agenda goals. Remarkably, by moving towards a low emission society, energy efficiency (tidal, wind, solar water sources) and waste control (The New Urban Agenda) (Pettersen & Helland).

---

viii PHYTOREMEDIATION is the direct use of living green plants for in situ, or in place, removal, degradation, or containment of contaminants in soils, sludges, sediments, surface water and groundwater. It is ecologically friendly, solar-energy driven clean-up technology, based on the concept of using nature to cleanse nature. It is an environmentally sound technologies (ESTs) An alternative or complimentary technology that can be used along with or, in some cases in place of mechanical conventional clean-up technologies that often require high capital inputs and are labour and energy intensive.
Referred by the United Nations Environment Programme, Division of Technology, Industry and Economics, Available at: http://www.unep.or.jp/Ietc/Publications/Freshwater/FMS2/1.asp

FINDINGS AND NEXT STEP

Bodø's journey to becoming a smart and sustainable gateway to the Arctic requires a clear vision, supported by the coordination over many years of hundreds of decisions and actions that will accumulate to significantly change the city. It would helpful for Bodø to focus on key outcomes, yet be flexible enough to absorb changes in circumstance and technology. It all comes down to the question: 'How far can you look into the future of Bodø, and do you like what you see?'

Building on the *momentum* of the Urban Planning Advisory Team visit, and the decision by the Norwegian government to build an entirely new airport to the east of the existing facility, it will be important to continue engagement with the community and key stakeholders, to ensure they are able to meaningfully be included. To involve as many residents and surrounding community members as possible, there could be a dedicated "urban room" where residents are able to see plans and scale models of plans for various projects in their city (this idea itself coming from a resident at the open event held at the library). A suggestion box could also be placed at the library, and a space created online for consultation/project updates.

In the next 5-10 years ideas that emerged from the open events, meetings with Bodø Kommune staff, and the UPAT could be trialled such as: a "here to there" ferry service; pedestrian only street; card for local resident services / transport; or testing of driverless vehicles for local journeys.

A development agency should be created to lead the multiple infrastructure and regeneration projects. This organisation, Bodø Kommune, Avinor, the port authority, and others will need to commission specialist studies including into the feasibility of integrated rail /port and airport connectivity. To deliver these major projects the city will grow in population and talent as it seeks a skilled workforce. Training and employment opportunities for locals should be identified, along with housing needs for visiting workers. Planning controls are likely to be needed to safeguard land for potential future redevelopment or infrastructure and a city inventory of existing assets with a calculation of their replacement costs and times should also be prepared.

In summary, the gauge of change and quality of development Bodø is seeking to achieve will require not only a clear vision, but also patience, cooperation, and the strength to make difficult decisions.

The city should build on its strengths and opportunities—there are plenty!

—

HPF/ISOCARP UPAT team members and hosts, from left to right: Tomas Norvoll (County Council President of Nordland), Ida Pinnerød, (Mayor of Bodø), Juan Alvaro Alayo, Arunava Sarkar, Elizabeth Reynolds (Team Leader), Mercedes Beaudoin, Faye Beaman, Frode Træen, Sofia Morgado (Rapporteur), Martin Dubbeling (ISOCARP Vice President UPATs), Andreas Lorentzen, Paul Lecroart, Andrea Marthinsen.

Photo by: Per-Inge Johnsen

HPF/ISOCARP UPAT team members and hosts, from left to right:

Karoline Nilssen (Bodø Kommune)

Daniel Bjarmann-Simonsen (Bodø Kommune)

Mercedes Beaudoin

Kristoffer Larsen Seivåg (Bodø Kommune)

Sofia Morgado (Rapporteur)

Faye Beaman

Andreas Lorentzen

Frode Træen

Andrea Marthinsen

Paul Lecroart

Arunava Sarkar

Elizabeth Reynolds (Team Leader)

Martin Dubbeling (ISOCARP Vice President UPATs)

Not on this picture: Juan Alvaro Alayo

REFERENCES

Bodø Kommune. (2017 (translation)). Bodø, Facts, strategies and national and regional guidelines.

Digital Art & Innovation. (n.d.). Retrieved 06 21, 2017, from Creative Digital Experiences: http://www.digitalarti.com/

Eraydin, A., & Tasan-Kok, T. (Eds.). (2013). Resilient Thinking in Urban Planning. Springer.

European Union. (n.d.). Retrieved 06 2017, 21, from Interreg Baltic Sea Region funding cooperation: http://www.interreg-baltic.eu/about-the-programme.html

European Union. (n.d.). About the EU. Retrieved 06 21, 2017, from Official website of the European Union: http://europa.eu/european-union/index_en

Fourth Industrial Revolution. (n.d.). Retrieved 06 21, 2017, from World Economic Forum: https://www.weforum.org/

La Citta Vita, Malmo Canal Housing. Figure 4 from: https://www.flickr.com/photos/la-citta-vita/4749158313

London, M. o. (Ed.). (n.d.). Retrieved 06 2017, 21, from Queen Elizabeth Olympic Park: http://www.queenelizabetholympicpark.co.uk/

Lunke, K (2015), Havnepromenaden på Sørenga, sett mot Barcode. Figure 2 from: https://no.wikipedia.org/wiki/Havnepromenaden_(Oslo)#/media/File:Havnepromenaden_p%C3%A5_S%C3%B8renga,_sett_mot_Barcode.jpg

Lydon, M., & Garcia, A. ([2015]). Tactical Urbanism. Short-term Action for Long-term Change. Island Press.

Olsen, B. E. (2011). Bodø- liv, lys, og landskap/-Life, Light and Landscape. Forlaget Nordlandsbilder.

Ottoson, T., (2005). Houses, Västra Hamnen, Malmö. Figure 3 image from https://commons.wikimedia.org/wiki/File:Houses,_V%C3%A4stra_Hamnen,_Malm%C3%B6.jpg

Pettersen, M. V., & Helland, M. (n.d.). National Participation [Norway]. Retrieved 06 21, 2017, from The New Urban Agenda: http://habitat3.org/the-new-urban-agenda/preparatory-process/national-participation/norway/

The Academy of Urbanism . (n.d.). Retrieved 06 21, 2017, from The Academy of Urbanism: https://www.academyofurbanism.org.uk

The Architectural League of New York. (n.d.). From Brownfields to Greenfields: A Field Guide to Phytoremediation. (M. Mogilevich, Editor) Retrieved 06 21, 2017, from Urban Omnibus. The Culture of City Making: http://urbanomnibus.net/

The New Urban Agenda. (n.d.). Retrieved 06 21, 2017, from Habitat III: http://habitat3.org/the-new-urban-agenda

RESHAPING MEMORY LANE INTO A NEW URBAN POLICY

THE CASE OF ZHONGSHAN AVENUE IN WUHAN, CHINA

ISOCARP Urban Planning Advisory Team (UPAT)

"Wuhan Zhongshan Avenue District"

INTRODUCTION TO THE UPAT

Wuhan is located at the confluence of the Yangtze and Hanshui Rivers and is comprised of the three towns of Wuchang, Hankou, and Hanyang (Figure 2). Wuhan, a fast-growing city of approximately 10 million inhabitants, is the capital of the Hubei Province in Central China. Wuhan is China's largest inland port and a major stop on the Beijing-Guangzhou Railway and as such, is one of China's most important hubs of water and rail transportation and communications.

Wuhan aspires to be an urban innovation in China, ahead of, and in line with, the new national urban policy for China[i]. It is also well aligned with the New Urban Agenda adopted at the Habitat III conference in Quito last October, and with UN-Habitat's 2015 International Guidelines on Urban and Territorial Planning. In keeping with these policies, the Chinese leadership wants to achieve a more compact, better integrated, more socially inclusive, better connected, and climate resilient city. However, it remains a huge challenge to keep up with the fast pace of urbanisation while keeping and/or making the old and new cities liveable, breathable, and thus less car-dependent[ii].

Figure 1: The ISOCARP Wuhan UPAT team explores the newly renovated Zhongshan Avenue District. Photo by Wang Zhiming

---

i 'China´s New Urbanization Policy- Guidelines for the strengthening of urban planning of built environment, related public services and governance methods, State Council – 6 February 2016, unauthorized translation by EC-Link

ii See also 'Urbanization and Human Settlements Developments in China', Mao Qizhi, ISOCARP Review 08, 2012 and 'Planning for Low carbon Eco-cities in China – new pathways', Stanley Yip, ISOCARP Review 09, 2013

Figure 2: Location of Zhongshan Avenue in Wuhan. Source: WLSP

In 2009 Wuhan received its first ISOCARP Award for Excellence for its new comprehensive city-wide strategic plan, prepared by the Wuhan Planning and Design Institute (WPDI). The ISOCARP Award jury commented that the new city-plan is setting the ecological framework for a more sustainable metropolitan city-region – showing a "*sophisticated understanding of the relationship between microclimate considerations, open space provisions, as well as transportation and building strategies as key elements of sustainable comprehensive planning in Wuhan*"[iii]. Since then, this plan has been regularly reviewed and continues to act as a strategic tool guiding new development and the future growth – see Figure 3.

While Riverfront high-rise construction is still the most visible staple of urban expansion and densification, Wuhan is also investing heavily in the regeneration of the existing urban fabric and historic areas of the city including the Tanhualin District in Wuchang, and the Zhongshan Avenue District in Hankou[iv]. Both cases exemplify the policy intention to reconnect with the past and ensure Wuhan's rich cultural and architectural heritage is preserved for generations to come.

The area of study, Zhongshan Avenue was originally built as a ring-road around the historic town of Hankou and has over time developed into Wuhan's most important commercial and transport artery. Zhongshan itself is a common name given to Chinese roads, usually in honour of Sun Yat-sen, better known in Chinese as "Sun Zhongshan", who is considered by many to be the "Father of Modern China"[v].

In 2013, Wuhan Municipal Government's planned to close Zhongshan Avenue to facilitate the construction of a new metro. This action provided a unique opportunity for the Wuhan Land Use and Urban Spatial Planning Research Centre (WLSP) to initiate the 'Zhongshan Avenue District Renewal Plan.'

---

iii   See also 'New Comprehensive Planning of Wuhan', ISOCARP Review 06, 2010

iv   See also 'Urban growth without sprawl – Wuhan's metropolitan development', J.Verweij e.a, 2010

v   See https://www.britannica.com/biography/Sun-Yat-sen

Figure 3: Wuhan Urban Plan 2010-2020.
Source: WLSP

A LONG STREET WITH A GREAT STORY

Towards the end of the Qing Dynasty, Hankou was one of the Yangtze River cities that was opened to foreign trade by the 1858 Treaty of Tienstin. Many famous clippers, such as the British Cutty Sark, loaded tea at Hankou in the late 1860's and early 1870's. The American travel writer Harry A. Franck wrote in the 1920's that Hankou "*is a bustling city, wholly Western in its architecture and layout, even though completely surrounded by China, its buildings looming high into the air, with several theatres, even though they offered only American movies, with automobiles dashing their imperious way up and down the river-front Bund.*"[vi]

Hankou, Shanghai, and Tianjin are known as the three 'concession' districts in modern Chinese history. From 1861 to 1898, the UK, Germany, Russia, France, and Japan established their own concessions in Hankou, hence the term 'the concession area' as place-name. Once all five concessions were

---

vi Source: http://www.willysthomas.net/HankowInfo.htm

established, ports and freight yard warehouses were opened along the river, large public-service buildings were constructed on the main avenue, and embassies, banks, churches, hospitals, schools, hotels, and other public service buildings, as well as mansions, villas, flats were built on the business street located on the western side of the concession- now Zhongshan Avenue[vii]. As a result, exquisite European buildings featuring great architecture such as Hankou's red-brick water tower – Wuhan's tallest building from 1909 until 1924 –still stands as one of the most famous landmarks– see Figure 4. The intermingling of foreign people, Sino-Western streets, and exotic lifestyles can still be seen in the buildings of Hankou to remind people of this dazzling era.

On October 10, 1911, the revolution to establish the Republic of China and replace the Qing Dynasty led to the involvement of Hankou in the struggle between Hubei revolutionary forces and the Qing army. Although the revolution began in neighbouring Wuchang with a revolt started by members of the New Army, revolutionaries quickly captured major strategic cities and towns throughout the province, including Hankou on October 12. The Qing Dynasty Army recaptured Hankou later, but as the revolution spread throughout China, eventually the town and the province came under control of the Republic of China.

Figure 4: Historic map of Hankou. Source: https://upload.wikimedia. org/wikipedia/commons/d/d0/ Hankow_1915.jpg

---

Figure 5: Historical and cultural resources in and around Zhongshan Avenue. Source: WLSP

The German and Russian concessions ended in 1917 and 1920, respectively. In 1929 the British concession formally came to an end. The government of Vichy France relinquished the French concession in 1943 (formally in 1946) while the Japanese concession came to an end with the surrender of Japan in 1945[viii]. Zhongshan Avenue was thus only gradually integrated into the new urban fabric and gradually transformed into the commercial axis to/from the new developing CBD in West-Hankou, including low-rise housing occupied by impoverished early rural-urban migrants like the Li-Feng community with their typical Linung housing style behind the commercial and historic facades of the avenue.

Zhongshan Avenue was built on the remnants of the city wall of Hankou, still visible on old maps – see Figure 4. Until recently, Zhongshan Avenue was a typical busy commercial road in Hankou, one of the three root-cities of Wuhan; heavily used and congested by motorized traffic mixed with pedestrians, motorbikes and bicycles. As a result, the quality of shopping and living along the Avenue suffered this seriously devaluated and degraded the cultural and architectural heritage of the Avenue and its surroundings.

As resultant of its multi-layered history, Zhongshan Avenue is more than just a street – it's a street with a unique history in China and thus globally. The Zhongshan Avenue District Renewal Plan is therefore much more than fixing and beautifying the street, after adding a new underground. It also is about reviving the fascinating 'history' of the Hankou artery and enabling current and future Wuhan generations to re-connect with its diverse past. Today more than 150 historical buildings and 19 boutique and arts & crafts shops are located along the Avenue, including 17 of Wuhan's most prestigious shops selling old clocks and watches, eye glasses, jewellery and pastries – see Figure 6.

---

viii Source: https://en.wikipedia.org/wiki/Hankou

Yiyuan Road~Jianghan Road
—Slow life culture and commercial experiencing area

Retain,
improvement
Transformation
Support and
intoduce

- Folkways culture blocks
- Gallery, Art Studio, auctions
- Light restaurant, boutique garden hotel
- Li Fen tourism destination

Jianghan Road ~ Qianjin first Road
– Shopping Paradise Core Area

Optimize and
improvement

- Traditionsl shops
- retail and boutique
- Fashion shopping district
- Open outdoor market

Qianjin first Road ~Wusheng Road
——International Trade Centeral Exhibition Area
Aisa-pacific fashion trend Leading area

Planning

Road—Slow life culture and commercial experiencing area

Shopping Paradise Core Area

Aisa-pacific fashion trend Leading area

International Trade Centeral Exhibition Area

- international trade exhibition center
- Main trend of the brand shop
- Fast fashion shopping street

Yiyuan Road

Jianghan Road

Sanmin Road

Wusheng Road

Figure 6: Area specific objectives of the Zhongshan Avenue Renewal Plan. Source: WLSP

THE ROADMAP TO A BETTER STREET

The Zhongshan Avenue District Renewal Plan was initiated as a response to the new Chinese urban policy and to the International Guidelines on Urban and Territorial Planning[ix]. These policy guidelines are reflected in the seven high-level objectives of the renewal plan: (1) commercial and residential co-habitation, (2) cultural heritage preservation and tourism, (3) quality retail and creative industries, (4) sustainable public under/over-ground transit transportation and transit oriented development, (5) pedestrian friendliness, (6) socially inclusive urban design and public space-making, and last but not least, (7) a participatory engagement of all the key stakeholders. These goals are further differentiated in space and time – see Figure 7.

The project planning started with the development of the new metro line and its five underground stations along the avenue, of which the second eastbound stop on Zhongshan Avenue was planned as the major underground station for Hankou. The cut and cover metro construction closed down the street for all traffic and created the need to plan for the Avenue's reconstruction after the completion of the metro. This post Metro construction planning started with a Shanghai based urban design bureau[x], which produced an illustration of the completed remake of the avenue. This product mainly produced artist impressions intended to inspire the city-level and district Wuhan decision makers – with apparent success. As a result, WLSP was appointed to develop the Zhongshan Avenue District Renewal plan, in line with the citywide master plan.

In developing this plan, WLSP put a tremendous effort into mapping the avenue, consulting with all key stakeholders (especially the district authorities and urban service providers), and in drafting the final renewal plans.

The resulting plan focused on creating a lively street and public spaces with rich historical cultural atmosphere. It was awarded ISOCARP's Merit Prize at the 52nd ISOCARP Congress in Durban, South Africa in September 2016 [xi]. The

---

ix   https://unhabitat.org/?mbt_book=international-guidelines-on-urban-and-territorial-planning

x   Ben Wood Studio

xi https://isocarp.org/isocarp-grants-awards-excellence-planning/

project was honoured for its inclusionary public participation and focus on the street as the umbilical cord within the network of the public realm, striving to improve public transport, protect the history and culture of place, and encourage community involvement.

While the planning phase – less than 2 years overall – may seem extremely short to non-Chinese planners, the implementation phase was done in a record time of one year. This is astounding, especially given the complexity of coordinating both underground and aboveground works simultaneously.

The overall length of the avenue is about 4.7 km long, however only the eastern section of about 2.8 km was entirely redeveloped with a strong emphasis on public space, retail upgrade, pedestrian-only street sections, cultural heritage conservation, and cultural programming. The reason why the western section was only marginally improved- both in planning and implementation- was not entirely clear, but is most likely due to time and budget restrictions, as well the transition to the Hankou car-centric CBD. As a result, it is hoped that the success of the more radical transformation of the eastern section will inspire a future 'spill over' to the western section. If not, it might be the other way around: the car-centric western section could potentially result in re-admitting car-transit over the entire stretch of the avenue. Therefore, monitoring and evaluating these projects are key to steer future development in the right direction.

Construction was in full swing in September 2016 as witnessed during a WLSP/UN-Habitat expert meeting to discuss the Zhongshan Avenue and Tanhualin planning in the light of the International Guidelines on Urban and Territorial Planning[xii]. The opening ceremony for the transformed Avenue took place, as planned, on 28 December 2016, attended by about 200,000 residents. The review team was truly impressed by the fast pace of implementation – despite the complexity of intervening in such a delicate urban fabric.

UPAT MISSION

WLSP invited ISOCARP to review the implementation process and to audit outcomes resulting from the Zhongshan Avenue Renewal Plan. The aim of this exercise was to obtain independent advice that improves the implementation process and explores the potential to expand the project to adjacent areas of the city. ISOCARP responded by assembling a 7-member international Urban Planning Advisory Team (UPAT) that travelled to Wuhan for one week (see Box 1 to present the team and its hosting organization). The team was hosted by the WLSP, which organized several field visits, at various times of the day and night, along the nearly 5km long Zhongshan Avenue and to adjacent parts of the city. It also included a tour at the impressive Wuhan Planning and Design Exhibition Centre. The team also enjoyed a memorable bike tour around the East-Lake, which Wuhan recently renovated to be the city's 'Green Heart'.

---

xii See https://www.uclg.org/en/media/news/implementing-planning-guidelines-wuhan-china

Box 1 – UPAT

The Wuhan UPAT was held during the last week of March 2017. Members of UPAT 2 were Jacob Modder (Team Leader), Frank D'hondt (Rapporteur), Taru Jain, Michael Stott, Deborah Lambert and Mercedes Beaudoin, Martin Dubbeling (ISOCARP Vice President UPATs) and Chen Zhe. UPAT's main task is to respond to an urban planning advisory request from a hosting organization, often a city. In the case of Wuhan's second UPAT the hosting organization was the Wuhan Land Use and Spatial Planning Research Centre (WLSP), mandated by the city- government, and represented by Mr. Chen Wei, Director of both WLSP and the Wuhan Planning and Design Institute (WPDI), that hosted the first Wuhan UPAT. During its proceedings, the UPAT team was assisted and supported by several staff members of both the WLSP and the WPDI, as well from the Wuhan Land Resources and Planning Bureau. After a pre-visit to the city of Shanghai and a high-speed-train travel to Wuhan, the UPAT spent more than half of its time on the field to observe in situ the implementation of the Zhongshan Avenue Renewal Plan, with the fourth day to prepare the presentation for the final day before heading out exactly one week after arrival in China. The UPAT typically consist of ISOCARP members and a multi-cultural variety of senior and junior urban planners. It reports back to both the hosting organization and ISOCARP's annual congress, through this Review Report and a more extensive PLAN magazine.

The review team spent 12 observation hours in Zhongshan Avenue, spread over morning, afternoon, and evening– to obtain a full time-space coverage of the long lane and its many back- and side streets. While data and documents provide useful and essential inputs for an expert-review, there is still no better way than to observe a situation with a multidisciplinary team of experts coming from different parts of the world. Contrary to data-fed computers, human brains are still superior in processing visual information combined with verbal communication to review the existing situation, while generating ideas and suggestions for incremental or structural improvements. Taking the right pictures is key to visualise both the challenges and opportunities: what you see is what you (can make) believe!

Figure 7: Key achievements of the Zhongshan Avenue Renewal Plan & Implementation.
Source: WLSP

Figure 8: Before/After the Zhongshan Avenue Renewal Plan & Implementation.
Source: WLSP

Inspired by the fast pace of implementation, the Zhongshan Avenue UPAT managed to efficiently use the 24-hour window—between the last site visit and the presentation of our findings to the hosting city-leadership and related stakeholders--to review via SWOT analyses the three subsections of Zhongshan Avenue. Then, we conducted a cross analysis of these three subsections to create a comprehensive SWOT review and provide detailed recommendations. Importantly, the recommendations were formulated to link Zhongshan Avenue adjustments with its adjacent neighbourhoods and city-networks. These recommendations culminated some free-of-thought ideas for a future Wuhan urban agenda and governance process that learn from the valuable lessons generated by the Zhongshan Avenue pilot project.

While all UPAT experts relied on existing normative assessment frameworks – such as the recent New Urban Agenda and its related International Guidelines on Urban and Territorial Planning – as well on their own experience-based judgment on what makes a great street and great city, we found it was equally important to develop a common framework and set of principles to reach a consensus within the team – see Box 2.

Box 2: What makes a great street?

The best streets are those than can be remembered. They leave strong, long-continuing positive impressions.

/ Makes a community and encourages participation
/ Facilitates interaction with all kinds of people
/ Accessible to all, easy to find and easy to get to
/ A desirable place to be, to spend time, to live, to play, to work, at the same time
/ A setting for activities that bring people together
/ Physically comfortable and safe, barrier free
/ Shady and pleasant on a hot day
/ Should not provoke a sense of confinement
/ Not just for the movement of people and vehicles but great places

In ISOCAP's REVIEW 11 Edition, 'Making Street 'SMILE' to Regenerate Cities – A Case of Chongqing, China', following principles were successfully tested: **S**mall, **M**aintained, **I**ntegrated, **L**ively, **E**njoyable.

The photo-montage in Figure 9 a/b shows a selection of photos that were viewed at the presentation expressing a combination of praise (Figure 9a) and some initial critical reflections (Figure 9b).
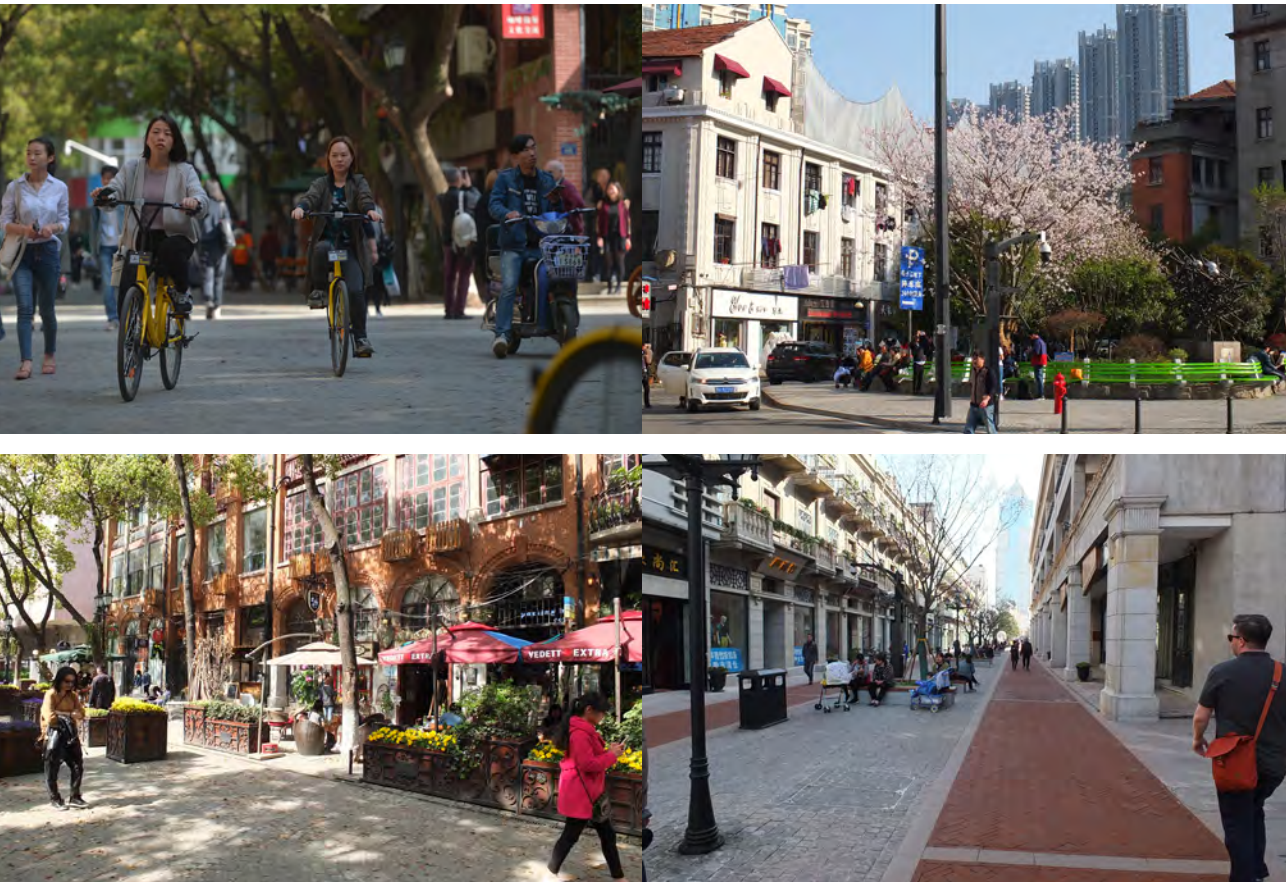

Figure 9a: Photomontage Review of Implementation Process Zhongshan Avenue Renewal Plan
Source: ISOCARP Wuhan Zhongshan Avenue UPAT team

Figure 9b: Photomontage Review
of Implementation Process
Zhongshan Avenue Renewal Plan
Source: ISOCARP Wuhan
Zhongshan Avenue UPAT team

At the end of the week the UPAT team presented its findings and recommendations, followed by feedback from a distinguished panel of diverse group of stakeholders and agency representatives from city, local and district government, Wuhan Metro, Wuhan University, and the Urban Planning Society of China. It was noted that a more comprehensive and evidence-based review would require access to before/after data and indicators – our first key recommendation to our 'host city'. The following summarizes the UPAT study.

In addition to providing findings and recommendations about the Zhongshan Avenue District Renewal Project, the team were also invited to consider and offer recommendations beyond the extents of this project. Therefore, the UPAT team considered everything from Zhongshan's immediate neighbourhoods to city-wide issues ranging from governance and policy issues to those pertaining to project construction and implementation.

The review was mostly based on visual observation, graphical plan/design reports with before/after simulations, internal group discussions and interviews with stakeholders.

However, the extent to which these goals are, or are being, implemented was hard for the UPAT Team to evaluate due to our inability to examine key data collected before and after planned construction of the Avenue was completed. For instance, we know that before the intervention, transit traffic accounted for 42% of all trips made and that the car traffic volume vary along

the Avenue. For example, in the Eastern section there are around 2,000 cars per hour while closer to the CBD, in the western section, there are about 8,500 cars per hour. However, we were not able to examine any traffic data collected after the intervention[xiii]. Hence, during the UPAT mission, the team relied on visual and verbal information to make its assessment about the planning process implementation.

Our judgement is based on secondary information such as a brochure made for the ISOCARP-awards of excellence and a series of intermediate urban design schemes for the different sections of the avenue – making it difficult to assess the conformity between plan and implementation. Also, out of our sight was the final decision-making process and the stakes of all key decision makers in the implementation of the plans. This issue will re-emerge towards the end of the Review Report, but in general more consistency and transparency throughout the entire planning cycle from conceptual idea to detailed urban design over integrated master plan is a primary recommendation for future planning operations. While this urban project also seems to be innovative in consulting and engaging residents and economic stakeholders of the avenue, lack of data and documentation prevented an evidence-based review on the quality and outcomes of the participatory planning approach.

PAVING THE WAY FOR BETTER AND MORE LIVEABLE STREETS - UPAT FINDINGS AND RECOMMENDATIONS

The overall impression of the transformation was very positive – in particular for the renewal of the first 2.8 km from east to west. Figures 10 a, b and c sum up the strengths, weaknesses, opportunities and threats identified for the three subsections that are under jurisdiction of three different district governments. Figure 10d provides the comprehensive analysis for the entire length of the 4,7 km avenue.

The Eastern Section: The Sherlock Homes exploration of the new memory lane was done from east to west, thus starting with the 3rd section in Jiangan District. The first encounter with the new street is impressive: a very human streetscape with sufficient pedestrian space, many new trees, a large collection of well-restored historical architecture, new plaza's and public art, and brand new high-frequency electric (non-polluting and silent) public buses with specially designed bus shelters. However, the encroachment of cars on the pavement, the relatively high speeds of cars, and buses honking at cyclists and pedestrians are some first emerging issues to address.

The size and design of Zhongshan's public spaces were not always in tune with the 'allure' of this prestigious avenue, but overall, they provide a great attraction for people to come out and enjoy street life again. While the landscaping and street furniture is generally high standard, there are several odd mishaps such as an electricity box blocking the pedestrian crosswalk, a bike-lane crossing obstructed by separation poles, and inconsistency in use of pavement materials (see the photomontage for some visual evidence). Additionally, the upgraded façade of the main avenue strongly contrasts with the

---

xiii   We felt that the volume of traffic was less, but the CBD-related section was still packed with cars, most likely traveling to/from the CBD .

Zone 1 SWOT Analysis

STRENGTH	OPPORTUNITIES	WEAKNESSES	THREATS
INCREASED PEDESTRIAN SPACE	BETTER INTEGRATION WITH OTHER SECTIONS/CBD	CAR CENTRIC DESIGN	DEVALUES REST OF AVENUE
2 METRO STOPS	GATEWAY TO CBD	POOR QUALITY LANDSCAPE/PUBLIC REALM	AIR QUALITY
MAIN TRANSIT ARTERY	GREEN SPACE/POCKET PARK OPPORTUNITY	LACK OF MEANIGFUL GREENSPACE	DISCONNECTED FROM ADJACENT NEIGHBOURHOODS
MIX OF LAND USES	QUALITY MIXED USE DENSITY/TOD ZONE	LACK OF PUBLIC SPACE PROGRAMMNG	OVER-GENTRIFICATION
UNDERGROUND SOUK	YOUTH FRIENDLY ENVIRONMENT	NO IDENTITY (COULD BE ANYWHERE)	FURTHER LOSS OF HUMAN SCALE
		MISMATCH WITH OBJECTIVES & GOALS	

Zone 2 SWOT Analysis

STRENGTH	OPPORTUNITIES	WEAKNESSES	THREATS
MANY HISTORICAL ASSESTS	BRING BACK PARK AND LAKE	NEIGHBOURHOOD CONNECTIONS	QUALITY OF MATERIALS
WATER TOWER AREA	EXPAND NIGHT MARKET & STREET FOOD	NEEDS INTEGRATION OF CYCLING	PEDESTRIAN SAFETY
JIANGHAN PEDESTRIAN MALL & LARGE PLAZA SPACE	MAIN JUNCTION OF METRO & BUS	LACK OF MEANINGFUL GREENSPACE	EXCESSIVE SPEED OF BUSES
MARKETS AREA	GREATER PROGRAMMING OF NEW PUBLIC SPACES	LACK OF PUBLIC SPACE PROGRAMMNG	IMPLEMENTATION OF KEY COMPONENTS
MIX OF LAND USES/CBD	EXPANDED PUBLIC ART	FRAGMENTED FROM LAND USE	BECOMES OVERCROWDED QUICKLY

Zone 3 SWOT Analysis

STRENGTH	OPPORTUNITIES	WEAKNESSES	THREATS
HUMAN SCALE	FURTHER REDUCTION OF TRAFFIC	CAR CENTRIC	GENTRIFICATION OF SURROUNDING COMMUNITY
LARGE COLLECTION OF HERITAGE BUILDINGS & CULTURAL RESOURCES	IMPROVE CONNECTIONS	DANGEROUS FOR PEDESTRIANS & CYCLISTS	TRAFFIC PATTERNS
REPRIORITIZATION OF ROAD SPACE	IMPROVE BICYCLE PRIORITY	LACK OF RETAIL DIVERSITY	DEVALUATION OF RETAIL MIX
PLAZAS & PUBLIC ART	ACTIVATE & INTEGRATE LI FEN COMMUNITY	PUBLIC REALM ENCROACHMENT BY VEHICLES	HIGH DENSITY RESIDENTIAL ENCROACHMENT
MUSEUM PEDESTRIAN STREET	CULTURAL & CREATIVE INDUSTRIES	VEHICULAR HIGH SPEED	NO LOCAL AMENITY
GOOD ACCESSIBILITY & CONNECTIVITY			

SWOT ANALYSIS - OVERVIEW

STRENGTH	OPPORTUNITIES	WEAKNESSES	THREATS
MANY HISTORICAL & CULTURAL ASSESTS	INSPIRING PILOT PROJECT FOR THE WHOLE CITY	NEIGHBOURHOOD CONNECTIONS	QUALITY OF MATERIALS & MAINTENANCE
WELL CONNECTED BY TRANSIT	SUCCESS GENERATES SUCCESS	NEEDS INTEGRATION OF CYCLING	PEDESTRIAN & CYCLIST SAFETY
REDUCED VEHICULAR TRAFFIC	NETWORK CONNECTIONS TO WIDER CITY & RIVER	LACK OF MEANIGFUL GREENSPACE	EXCESSIVE SPEED OF BUSES
INCREASED PEDESTRIAN SPACE	COMMUNITY REGENERATION & RENEWAL	LACK OF PUBLIC SPACE PROGRAMMNG	IMPLEMENTATION OF KEY COMPONENTS
EXAMPLE OF WORKING TOGETHER	INFLUENCING & CHANGING TRAVEL BEHAVIOURS	DISABILITY ACCESS	NO WAYFINDING STRATEGY
NEW LANDSCAPING & TREE CANOPIES	INTERNAL & EXTERNAL TOURISM	LACK OF IMPLEMENTATION CONSISTENCY	BECOMES A "ONE-OFF"
NEW TRANSPORTION MODES AND MODELS	PROMOTE ALTERNATIVE MODES TRANSPORT	LACK OF ENFORCEMENT	BECOMES OVERCROWDED

Figure 10: SWOT Analysis Zhongshan Avenue Renewal sections and overview
Source: ISOCARP Wuhan Zhongshan Avenue UPAT team

untouched 'backside'. This is especially that case where the traditional (and poor) Li-Feng communities live in their small and unhygienic houses in a myriad of narrow streets – a contrast that is charming for visitors but challenging for its residents and the district authorities. While the urban renewal plan includes an indicator that not more than 20% gentrification will be allowed, it remains unclear how this can be enforced and how at the same time the living conditions of the poor Li-Feng communities can be improved through a better integration in the likely economic revival of the new avenue.

This eastern section of Zhongshan Avenue has two access points to the new underground metro-line, with the Jianghan Road intersection as the main interchange with the metro line to the other side of the Yangtze River. While the metro-stations are well spaced and designed, the above-ground access-buildings contribute less to the spatial and street quality. However, merit goes to the iconic Art Gallery and its new Plaza located towards the end of the eastern section which includes the avenue's first entirely pedestrianized area with some lovely restored old shops. Cyclists are admitted here, but a properly-marked cycle lane could do wonders, as it would be the case for the rest of the avenue, including the sections where cyclist are not allowed to share the wide road with transit buses (see below).

THE MIDDLE SECTION

The middle-section in the Jianghan District is clearly the most vibrant place to be on the new memory lane, with the new plaza in front of the iconic redbrick water tower as its memory land mark. This is one of the most spectacular examples of a transformation from a car-centric to people-centric streetscape. Also, the side streets add a lot of diversity and vitality to this central area, albeit there is still a need for a smoother transition to and integration with the central plaza. Although many new trees were planted along the street and on the plaza, more green space is needed to absorb the ever-increasing popularity among families, youth and elderly as well wheelchair depending persons. As mentioned in the previous section, cycling was not entirely thought through for this section of the avenue and needs to be redressed.

THE WESTERN SECTION

The western section is the most problematic redeveloped section as it leads to Hankou's CBD that is still overly car-centric. While the first part west-bound from the core area still remain its human scale character, most of western section is more a remnant of the past with multi-lane car traffic and challenging pedestrian crossings. Maybe the unfinished metro stations in this section added to the problem of traffic congestion and pollution, but overall a re-profiling of the road might be needed to better align this section with the other parts of Zhongshan Avenue. Also, the quantity and quality of public space, landscaping and greening require a serious boost to match with the other two sections. Furthermore, the fact that bicycles are a rare sight in this section indicates a serious problem related to the overall goals and ambitions of the Zhongshan renewal plan. Another notable observation that needs to be addressed is the fake shopping facades and huge commercial billboards masking the adjacent poor neighbourhoods.

With that said, the western section has an interesting potential. Currently, there is the large underground retail-space similar a low quality 'bazar'. If a

critical mass can be achieved after opening the two metro-stations in this section, this bazar can upgrade to include cultural amenities and programming which might provide a quality alternative for above-ground street-life when the weather conditions are not as favourable as we experienced – and that seems to be quite often the case.

OVERALL

In overview, the strengths and opportunities of the transformation of Zhongshan Avenue largely outweigh the weaknesses and threats that were identified in our analysis. However, in terms of importance and relevance for future action, the identified weaknesses and threats need most attention to make this pilot project a complete success and – even more importantly – to function as a paradigm shift from a car-centric to a people-centric urban policy. This will be addressed below.

The sectional and overall SWOT analyses formed the basis of our recommendations for a more integrated approach on three levels: (1) continue to improve the transformed avenue, (2) expand the pedestrian-centric approach to the related street-network and neighbourhoods, and (3) mainstream this pilot-project into Wuhan's overall urban policy and planning as a key element of creating a World Class City in the decades to follow.

Recommendations to further capitalize on the tremendous interventions done so far are attributed to five clusters – see Figure 11.

USERS

It is recommended to look at future adjustments and improvements through the lens of the different users of Hankou's commercial and cultural axis: (a) residents from the street and local neighbourhoods, (b) commuters and visitors from other city districts and the wider city-region, (c) regional visitors from other cities and regions in China/Asia, and (d) international visitors from
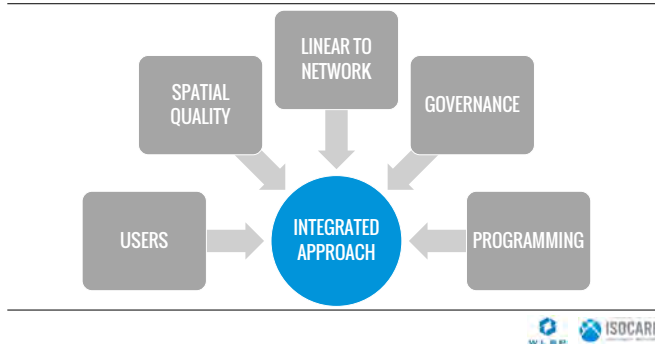
ONE STREET, ONE REGIME

Figure 11: One Street, One Regime
Source: ISOCARP Wuhan
Zhongshan Avenue UPAT team

further abroad. All these user groups have unique reasons and expectations when (considering) visiting Hankou's commercial memory lane, at different times of the day. The spatial layout, in addition to commercial and cultural programming, should proportionally cater to these different user-groups. Of course, prioritizing the needs and aspirations of the local population, including the poor communities through a pro-poor integrative urban policy, is vital.

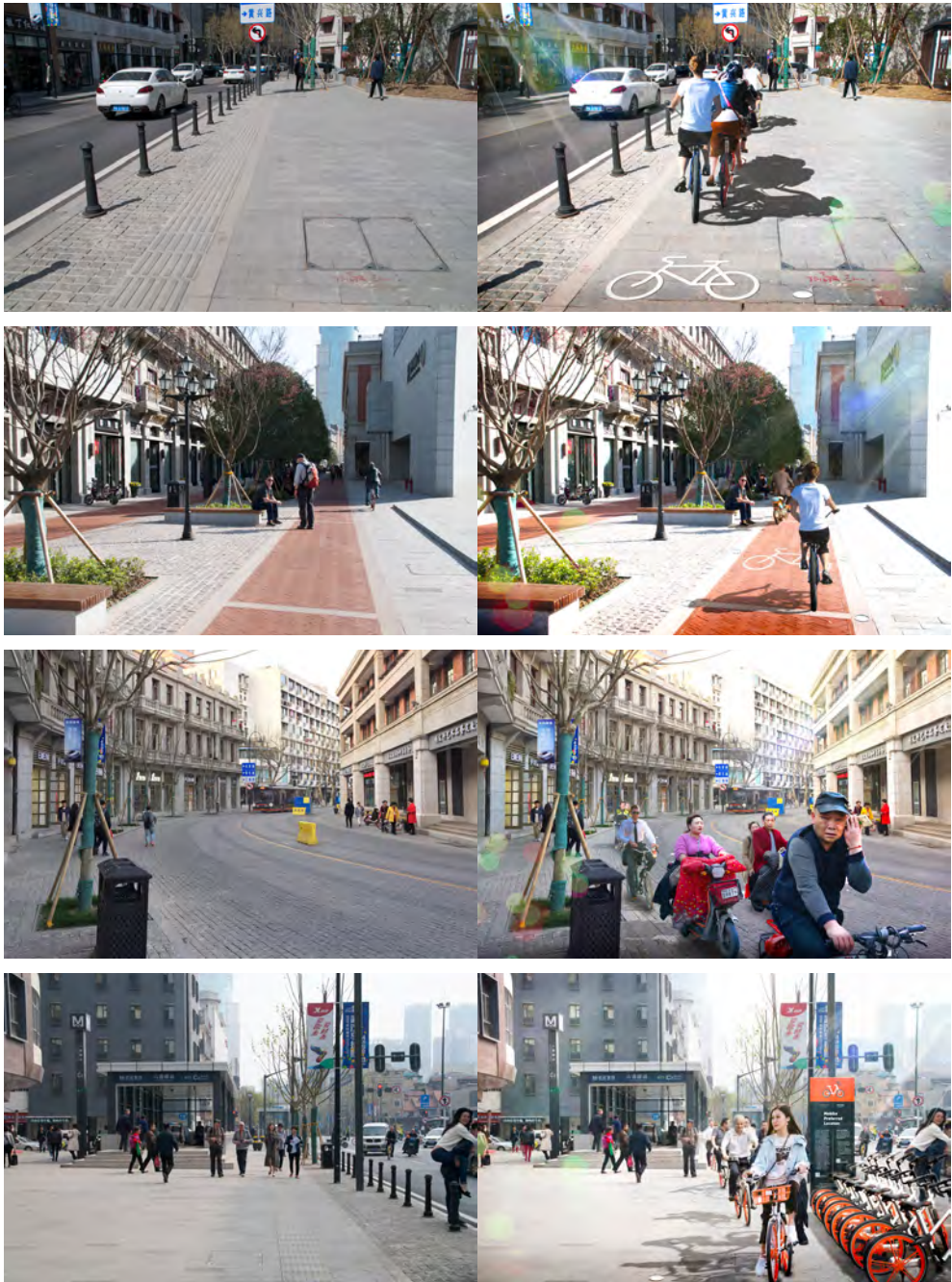A pedestrian and bicycle priori*zation* policy is not only helpful for all vul-

nerable populations such as the poor, children, elderly, and the disabled, but also appeals to a growing legion of 'green citizens' preferring biking or walking rather than car-driving. More than ever citizens of big cities are looking for mobility options that improve their fitness, basic health (e.g., air quality), and that make streets a place of destination rather than space of transit. Hence, the urban policy could be further reversed to favour slow traffic over motorized individual traffic, which translates into a more bicycle-friendly upgrade of the entire avenue that is well connected with other attraction points in the city.

Figure 12: Suggested Bike-lanes on memory lane
Source: ISOCARP Wuhan Zhongshan Avenue UPAT team

Figure 12 is suggesting some simple low-cost interventions to improve the biking experience in Hankou's memory lane, including dedicated bike lanes all along the avenue. Complementary, speed-reducing measures are required throughout the urban boulevard, for both cars and public transit buses, e.g. by applying speed-reducing strips or bumps, speed-detectors, camera's, etc. Furthermore, vehicle parking needs to be better planned and managed, by providing peripheral parking buildings, high-fare parking meters on the avenue, parking barriers between road and pavement, and a strict enforcement regime to extinct parking encroachment on pavements and crossings. This way a people-centric street will re-emerge, suitable for all ages, as part of the 8-80 City – a city that is liveable for children and elderly is liveable for all. Now the new lane is being 'used' a proper user survey could support evidence-based incremental improvements to foster an optimal balance of the different user needs and aspirations.

SPATIAL QUALITY AND UPGRADE PROGRAMMING

A user-oriented incremental adjustment of the avenue would lead to overall improved spatial quality of the street transformation. The post-intervention user-survey might result in the need for more social, educational, and cultural amenities and activities, as well in the need for more street furniture (especially benches in the western section), green spaces and parks, including a string of pocket parks and playgrounds along and behind the memory lane. Also, a socially secured regeneration and renewal of the poor neighbourhoods behind the avenue needs to be further programmed and implemented, with proper involvement of the local communities. This would result in a better integration of these poor communities in the economic, social and cultural regeneration of Hankou's central commercial axis. The overall Upgrade Programming should be done with special attention for spatial and design consistency in the layout of the street, the use of landscaping, and in materials. By giving special care during each stage of development from design to implementation, the errors of the fast implementation of the renewal plan will become lessons learned. This will enhance the 'One Avenue, One Regime' approach needed for a less fragmented and more continuous layout and flow of people, with an even stronger emphasis on the heritage aspects of Hankou's memory lane.

LINEAR TO NETWORK

While the Upgrade Programming for the avenue includes a betterment of the housing and living conditions of the residents and poor communities adjacent to the Zhongshan Avenue, additional planning and programming is required to expand this people-centric street upgrade to adjacent streets and avenues. This should include the CBD and the city-image-defining Yangtze and Han Riverfronts – re-branded and developed as Wuhan New City, thus connecting with the two other city-centres of Wuhan (respectively Wuchang and Hanyang, see Figure 2). This network approach also includes a substantial upgrade and expansion of a blue/green network with priority for recreational, walking and cycling activities – with commuter cycling at city-wide scale (and connecting the large blue/green spaces such as the river- and lakefronts e.g. East-Lake Green Heart).

Special attention needs to be paid to develop a Wuhan Wayfinding Approach with designated signposting for pedestrians and cyclists along the blue/green

network including historic-cultural routes such as Zhongshan's memory lane – that could again function as a pilot for a city-wide approach. Many world-class cities, such as London, have developed unique wayfinding projects that add to the international appeal and navigation of the city – e.g. London's Thames Pathway as part of 'Legible London' – see Figure 13[xiv].

Figure 13: London Thames Pathway Wayfinding.
Source: http://www.luphen.org.uk/images/2006/2006-03/2006-03-05-121852.jpg

GOVERNANCE

The transformation of Zhongshan Avenue could not have been successful without the strong cooperative leadership of the city and district govern-ments, working together with service providers such as the Metro agency, as well through consultation of the local population. Yet, there is always room for improvement and quality management from conceptual idea to repaving the street. The 'One Street, One Regime' approach as advocated above involves a temporary project management team approach with variable composition throughout the different stages of planning and implementation –bringing together all the relevant stakeholders around a joint declaration of intent, preferably morphing into a Community Based Organization that will monitor and maintain the quality of the new street, including social and cultural pro-gramming. The Zhongshan Avenue Renewal Pilot Project can serve as Training Ground for the betterment and expansion of 'street and neighbourhood' re-newal governance, including a set of Guidelines to deal with all the related issues in a localized way.

Ultimately, this people- and multiple user centric new street/neighbour-hood approach has a great potential to become the leading urban renewal strategy to implement policy goals for a more compact, better integrated, so-cially more inclusive, less car-depending and climate resilient city.

---

xiv See http://appliedwayfinding.com/projects/legible-london/

Figure 14 and 15 Round Table Discussion and Group photo. Photo by Wang Zhiming

ROUNDTABLE DISCUSSION

The presentation of the UPAT findings and recommendations was followed by a round of reactions and comments from stakeholders related to the Zhongshan Avenue Renewal and external Chinese experts – see Figure 14 for a group photo.

The Wuhan city-government Vice-Mayor and the three District representatives welcomed the UPAT review and reiterated the limitations to achieve all the planned objectives due to restrictions in time and budget. WLSP, Wuhan Real-estate corporation, Wuhan Central Service Department and Wuhan Metro all testified their interest and role in reshaping the Zhongshan Avenue to a less car-centric urban boulevard. Professor Li Zhigang, Dean of the School of Urban Design of the Wuhan University, stressed the importance of this kind of post-fact evaluation, as they can be learning grounds for future adjustments and similar interventions. In his view, despite some errors made in the planning and implementation of this pilot project, the Wuhan people can take great pride of the culture-driven transformation of a central commercial transit axis. The Dean further underlined the importance to bring back to life all the different layers of history in Zhongshan Avenue, reflected in both the physical and cultural space, while fighting an undesirable gentrification that would push out the traditional Li-Feng communities at the backside of the avenue.

Coming over from the capital Beijing, Dr. Shi Nan, the Secretary General of the Urban Planning Society of China, also echoed the findings of the UPAT

team and hoped it will be a 'leverage project' for the entire city and serve as an example for other Chinese and Asian cities. Dr. Shi Nan argued that this project and review clearly shows how important quality urban planning and design is to make a meaningful change in the city and for the life of its residents. He also hoped that more walking and cycling would be encouraged by establishing better and more consistent conditions for cycling and sharing bikes. The discussion was closed after some feedbacks from UPAT-members and a closing word by the chairing Deputy Director-General Liu Qizhi of the Wuhan Land Resources and Planning Bureau.

SUMMING UP

Zhongshan Avenue Renewal Plan won the ISOCARP Award for Excellence in 2016 for a good reason – the residents and the leadership of Wuhan City can certainly take pride of this achievement. While the ISOCARP Review Team was truly impressed by the pace and overall quality of the implementation of a great part of the plan, there is certainly room for further improvement. Such improvements include in the short term:

1. Design a comfortable, distinctly separated bike lane and give priority to cyclists and pedestrians along Zhongshan Avenue – preferably two-way for non-motorized and one-way for motorized traffic;
2. Give history and culture a more profound place in this Memory Lane (tangible and intangible cultural heritage);
3. Repair small errors (e.g., pavement, routing, spatial order)
4. Bring in more greenery as planned, but speed up this part of the implementation;
5. Make a wayfinding plan for all sorts of users and visitors of Zhongshan Avenue.

While further increasing and improving the retail diversity will boost the street-economy, the layered historic-cultural dimension of the new memory lane should be further fostered through cultural and educational programming. This should also include public art reflecting that cultural diversity, as part of a citywide public art master plan. A wayfinding strategy might tap into the multiple heritage layers of the historic avenue. The traditional Li-Feng community should be more actively involved in this strategy, as one of the main drivers of a Community Based Organization to pro-actively monitor and maintain the Zhongshan Avenue transformation.

The Zhongshan Avenue Renewal Plan and its current implementation provide a fantastic learning and training ground:

· To redesign planning processes from conceptual ideas to implementation and monitoring;
· To develop city-wide guidelines for pedestrian spaces, landscaping, transit and traffic management;
· To rethink agencies structure and project-based cooperation;
· To streamline delivery of urban services;
· To make it the start of a new and different approach and policy in urban planning;
· To add a new scale of planning and design- both the old-school neighbourhood scale as well new-style network approach;
· For a better integrated planning and better urban governance, well monitored through a transparent set of urban indicators and metrics.

Overall, the Zhongshan Avenue UPAT Review fits well in the symbiotic relationship between ISOCARP and Wuhan city. Back in 2011, Wuhan hosted g the ISOCARP world congress entitled 'Liveable Cities: Urbanising World'. This congress focused on fostering urban liveability and the corresponding planning approaches and methodologies, the new and innovative techniques for making planning more sensitive to climate change, and climate related aspects of urban physical planning and design[xv]. During the congress a Young Planning Professionals' Workshop 2011 was conducted to harness inspiriting ideas for a low carbon future development of Wuhan[xvi]. A year later, the Wuhan Planning and Design Institute hosted the first UPAT workshop in order to define development strategies and sustainable concepts for the Wuhan East Lake Scenic Area[xvii]. Hence, investing in a long-term cooperative relationship seems to pay off well for all.
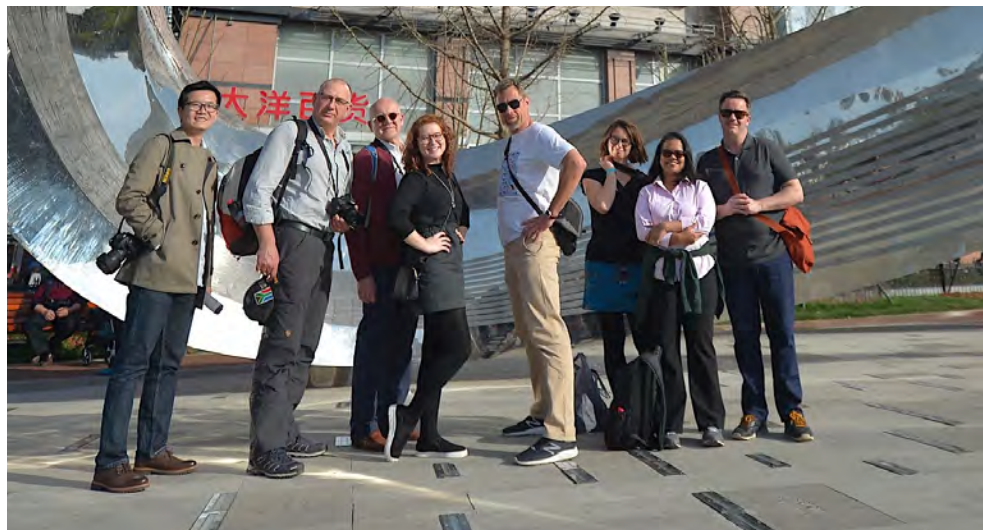
UPAT team Members, from left to right:
Chen Zhe
Martin Dubbeling (ISOCARP Vice President UPATs)
Jacob Modder (Team Leader)
Mercedes Beaudoin
Frank D'hondt (Rapporteur)
Deborah Lambert
Taru Jain
Michael Stott

Photo by Wang Zhiming

xv   See https://isocarp.org/activities/isocarp-annual-world-congress-2/47th-isocarp-congress-wuhan-china-24-28-october-2011/results-47th-isocarp-congress/

xvi   See https://isocarp.org/app/uploads/2015/07/2011_Wuhan_Report.pdf

xvii   See https://isocarp.org/activities/upats/past-upats/2012-wuhan-china/

References

Jos Verweij, Bert Smolders & Huang Huan, 'Urban Growth without Sprawl – Wuhan's Metropolitan development', in 'Scape 2', 2010, pp. 36-39

Hongyang Wang & Martin Dubbeling, 'The Big Jump Forwards: An Example of China's Pursuit Towards A New Pattern of Growth', in ISOCARP Review 09, 2013, pp. 188-199

Huang Huan, Bert Smolders & Jos Verweij, 'Cultural Heritage Conservation in Historic Wuhan – Urban Renewal and the Creative Industry', Paper for 44th ISOCARP Congress, 2008

Mao Qizhi, 'Urbanization and Human Settlements Development in China', in ISOCARP Review 08, 2012, pp. 48-63

Shi Nan & Yu Taofang, 'Energy Saving and Emission reduction: Chinese Low Carbon Strategy in 11th Five Year Period', in ISOCARP Review 06, 2010, pp. 118-141

United Nations Secretary General, 'New Urban Agenda – Outcome-document of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III)', A/CONF.226/4, 2016

UN-Habitat, International Guidelines on Urban and Territorial Planning, UN-Habitat publication, 2015

Wuhan Land Resources and Planning Bureau a.o., 'Promote the Revival of Old Urban Area by Improving Street Public Spaces – Wuhan Zhongshan Avenue District Renewal Planning', booklet presented for the ISOCARP Awards for Excellence at 52nd ISOCARP Congress, 2016

Wuhan Land Use and Urban Spatial Planning Research Centre & ben Wood Studio Shanghai LLC, 'Zhongshan Avenue District Renewal – People-centred Lively Street Through Participatory, Collaborative and Innovative Planning, unpublished article, 2016

Wuhan Planning and Design Institute, 'New Comprehensive Planning of Wuhan', The ISOCARP Awards for Excellence, in ISOCARP Review 06, 2010, pp. 252-255

Yang Jiang e.a, 'Making Streets SMILE to Regenerate Cities – A Case of Chongqing, China', in ISOCARP Review 11, 2015, pp. 172-187

ABOUT THE
AUTHORS

(In alphabetical order by last name)

ARCAMONE, SABRINA

Sabrina Arcamone. Attorney. She was the Legal and Technical Undersecretary at the Ministry of Social Development of the Province of Santa Fe from 2011 to 2015. She is currently the Undersecretary of Social Economy of the Municipality of Rosario.

BIFARELLO, MÓNICA

Mónica Bifarello. Bachelor of Political Science. She was the coordinator of strategic planning in the city of Rosario and the Province of Santa Fe, and was the Minister of Social Development for the Province of Santa Fe from 2011 to 2015. She served as an advisor to the Integrated Neighborhood Intervention Plan (Plan Abre) of the Santa Fe Province, and as a professor at the National University of Rosario. She passed away in June 2017 and the food section is dedicated to her legacy.

BORRELLI, NUNZIA

Nunzia Borrelli is Assistant Professor at University of Milano-Bicocca. She received bachelor's degree in Sociology from the University of Naples- Federico II, Italy. She also completed a Master's degree in Urban Management at Domus Academy in Milan, and she finished the MA in Planning and policy for city, territory and environment at IUAV – Venice. In 2005 she obtained the Ph.D. in Spatial Planning and Local Development, at Turin Polytechnic. Since completing Ph.D., she has both taught and been involved in various research activities. She conduced field research projects pertaining to local development, ecomuseums, cultural heritage and governance processes in Italy, UK and USA, China. She was visiting scholar at Loyola University of Chicago as fulbrighter; at Portland State University, at University of Newcastle upon tyne; and at Xiamen University (China). She have published several papers and three books.

CHEN, HAINING

Haining is doing her Ph.D. study and research at School of Architecture and Research Center of Urban Design at Southeast University in Nanjing, China. She received her Bachelor of Architecture degree from Southeast University, a Master's degree in Urban Design from University of Miami and a Master's degree in Urban Ecological Planning from Norwegian University of Science and Technology (NTNU). Rooting in China, studying abroad in the United States and Norway, Haining has taken participation in a number of research projects with specific academic interests on urban issues and sustainable development of the developing and industrializing countries, such as the slum upgrading project in Kisenyi of Kampala, Uganda, in collaboration with UN-Habitat, Slum Dwellers International (SDI) and Makerere University, as well as the fieldwork in semi-urbanized villages of Delhi, India, in collaboration with Indian Institute for Human Settlements (IIHS). Haining is now mainly focusing on urban design practices in China, especially the large-scale urban design projects with relevant research, continuing to do explorations in dynamic process of urbanization in contemporary China with the team members from Research Center of Urban Design, Southeast University.

CHEN, ZHE

Zhe Chen graduated as a Master in Urban Planning from School of Architecture and Urban Planning at the Huazhong University of Science and Technology in Wuhan. He was project manager at the Ningbo Urban Planning and Design Institute and worked on several strategic urban-rural research and transformation projects, such as the Ningbo Tri-River Core Project and the Ningbo Ecologic and Green Space System and the Conceptual Plan and Urban Design for the Metropolitan and Countryside of the Xiaojia River District. Currently Zhe Chen works at Lay-Out Planning Consultants Co., Ltd. in Ningbo.

DANG, ANRONG

Anrong Dang is a professor of urban planning at School of Architecture, Tsinghua University. He was first trained as a geographer and now a specialist in GIS applications in urban planning. He obtained his Bachelor's degree in Geography from Shaanxi Normal University in 1985, his Masters in Cartography and Remote Sensing from Northwest University in 1988, and his Ph.D. in Cartography and GIS from Chinese Academy of Science in 1997. He has been a professor in urban and rural planning at Tsinghua University since 2006. He has participated in many large projects in China with funding from the National Natural Science Foundation of China. He published more than 100 papers and five textbooks. In recent years, he has paid more attention to study on smart city planning based on information technology and big data. Dr. Dang received several awards from academic and professional associations, such as Awards of Ten University Outstanding GIS Innovative Teachers by China GIS Forum for Higher Education, Best PI Awards of the year 2007 by EarthWatch Institute, and Excellent Education Awards by The International Association of Chinese Professionals in Geographic Information Science.

FONSECA, JORGE M.

Jorge M. Fonseca currently serves as a Food System Officer with the Food and Agriculture Organization of the United Nations. In this capacity he was the FAO's technical leader in the Habitat III process, and currently serves as the Organization focal point in the New Urban Agenda phase of implementation, providing leadership at global level and country technical support through different projects with local governments. He actively support the global initiative for food loss and waste reduction (Save Food). Prior to joining FAO he was an Associate Professor at The University of Arizona, where he led the state's postharvest systems and produce quality research and extension program. He has served as expert or manager for diverse international development programs outside the UN agencies, including JIFSAN/Food Drug Administration, US-Agency of International Development, the Korea National Institute of Science and Technology. He has been hired by the private sector to consult multiple enterprises in 9 different countries. He was a visiting faculty at UNICAMP, Brazil and have taught postharvest system/agroindustry courses in different universities including Zamorano, Honduras, University of Buenos Aires, Argentina, and American University of Rome, Italy. Mr. Fonseca received his Ph.D. in food technology from Clemson University, South Carolina. He also holds three Master degrees, a M.Sc. in Horticulture also from Clemson, Master in Business Administration from the University of Costa Rica and the National University of San Diego, California and Master in International Food Governance and Society from the Open Univ. of Catalonia.   He is the author of over 150 scientific and trade-technical publications including thirty-five referee journal articles, with one publication receiving a US national press award, co-authoring a chapter of the IAASTD (International Assessment of Agricultural Knowledge, Science and Technology for Development), one book and eight book chapters.

GAROFALO, ELISSA M.

Elissa Garofalo's leadership at the Delaware & Lehigh National Heritage Corridor, Inc. brought about a merger with the National Canal Museum and a new model for non-profit management.   As a result of the merger, the D&L Corridor is the first National Heritage Area to achieve Smithsonian Affiliate status.

During her seventeen tenure 92% of the 165-mile D&L Trail has been connected; the "Get Your Tail on the Trail" wellness initiative received national recognition; the "Tales of the Towpath" educational curriculum has expanded to 82 elementary schools; the "Get Your Tail on the Trail" wellness initiative- launched in partnership with St. Luke's University Health Network – received national recognition; 4,000 students annually participate in related field trips; and the Lehigh Valley Greenways Conservation Landscape program has become a model conservation landscape program in the Commonwealth of Pennsylvania.

Garofalo developed two regional revitalization programs and directed the 2013 update of the Corridor's Management Action Plan. She is a steering committee member of Philadelphia's Regional Bicycle Network- "The Circuit", a member of the Strategic Planning Committee of the Alliance of National Heritage Areas and a seasoned facilitator for strategic planning, meeting and project management, focus groups and issue resolution.

She holds a Certificate from the Strategic Perspectives in Nonprofit Management Executive Education program at Harvard Business School. A Penn State graduate she was one of the Lehigh Valley's 25 Most Influential Women in 2016.

Before coming to the D&L, Elissa was a small business owner and one of America's first Main Street Managers. She pioneered efforts that led to Jim Thorpe's main street (Broadway) being named one of Great Places of America by the American Planning Association. She holds a B.S. in Urban & Regional Planning from the Pennsylvania State University. Elissa is the very proud mother of Maggie and Jay Marsden as well as an avid cyclist, paddler and lover of places where the outdoors meets our historic communities.

GEISSLER, JEAN BAPTISTE

Born and raised in Marseille (France), Jean-Baptiste studied urban policy at Sciences Po (Paris) and local economic development at the London School of Economics (LSE). He then worked for international organizations such as the World Water Forum and the World Bank Institute. He is now a project manager in a French regional development agency.

KENDRICK, CHRISTINE

Christine Kendrick is the Air Quality Lead and a Smart Cities Project Manager for the City of Portland Bureau of Planning and Sustainability. She also works closely with the Portland Bureau of Transportation developing use cases, research objectives and guidelines related to the deployment of sensors in the public right of way. Christine has a PhD in Environmental Science and Resources with a focus on urban air quality from Portland State University. Her work investigated how the roadside environment can be improved through the use of air quality and traffic-related data. Christine also has a background in toxicology research characterizing inhalation exposures to jet propulsion fuel and trichloroethylene air sampling in industrial and residential areas. She completed her BS in Environmental Health Science from the College of Public Health at the University of Georgia.

LI, JUAN

Juan Li is a Ph.D. candidate of urban planning at School of Architecture, Tsinghua University. She gained Bachelor's degree in Urban Planning form Wuhan University in 2014, and graduated with honor of Excellent Undergraduate Graduates. Then, she started doctoral education in Tsinghua University. She has published several papers with the topics ranging from geodesign, smart community, to open data et al. Her previous research experiences were mostly about quantitative analysis applying emerging new data to support urban planning. Now, she focuses on the publicness of city, public space, and public sphere, and tries to explore the reality of city and city life combining quantitative analysis with strong support of urban theory and theory of sociology.

MARTIN, KEVIN

Kevin Martin manages the Smart Cities and Information Technology teams for the City of Portland's Bureau of Planning and Sustainability. He and his team lead Smart Cities coordination and strategy for the City of Portland, both designing and managing their own projects as well as supporting other City agencies with project design, technology development and implementation, data management, analysis and evaluation, and community engagement and outreach. Kevin has a Master's Degree in Geography from Portland State University, where he focused on remote sensing and GIS. Kevin has also taught classes at Portland State University and Reed College.

MENDLE, ROMAN

Roman Mendle is Smart Cities Program Manager and coordinates ICLEI's work on City-Business Cooperation. His mandate at ICLEI includes advocating for citiesí interests in the Smart Cities debate and shaping the global understanding of Smart Cities as a means to become more sustainable, rather than an end in itself. Roman is also responsible for the strategic development of facilitation services for ICLEI Member cities to engage with the private sector, to benefit from city-business collaboration and to promote dialogue and cooperation between cities and businesses driven by sustainability goals and values.

MINNIE, STEPHANUS

Stephanus Minnie currently holds the position Free State Provincial Director responsible for Spatial Planning and Land Use Management Services in the National Department of Rural Development and Land Reform. He holds a BSc Hons degree in Geographic Information Science and is registered as a Professional GISc Practitioner with the South African Geomatics Council.

His current responsibilities are the facilitation of the implementation and monitoring of the Spatial Planning and Land Use Management Act 16 of 2013 and Spatial Planning Support services in the Department.

Under his leadership twelve municipal spatial development frameworks, one provincial spatial development framework and nineteen spatial planning and land use management by-laws was developed for the Free State province. Drawing from his engineering background he had a unique approach by leading Free State to be the first province where the local municipalities have included electronic lodgment of development applications as a mandatory requirement for any development proposed. This proved that the smart city concept can be rolled out in small municipalities where specific focus on enabling people through technology to improve their quality of life on the one hand, and on the other supporting local governments to provide more

efficient, effective and economical services are a realistic solution for the Rural South African municipal space. The legislating of the spatial planning categories furthermore provided for a methodological approach to enable all sector departments and related functions to be included but also to enable vertical and horizontal alignment of spatial planning through defining the roles of each in the spatial development frameworks to ensure the alignment of strategic intent of each.

Mr Minnie teaches Geographic Information Science for master students part time, at the Department of Urban and Regional Planning, University of the Free State.

MOLELEKOA, BOIPELO

Boipelo Molelekoa is an aspiring world class Spatial Planner with a passion for spatial justice holding a Bachelors Degree in Administration, Honours Degree in Spatial Planning and Masters Degree in Urban and Regional Planning (MURP)from the University of Free State.

Registered with the South African Council of Planners (SACPLAN), and also a Corporate Member of SAPI. I have indepth knowledge in resolving site/land disputes, compiling and assessing land use applications, scrutinize site development plans, formulation of land use management policies, collecting, analysing, interpreting and predicting spatial data and trends. Expert in strategic spatial planning, land use management and control, human settlements planning, research, management, advisory, stakeholder engagement, team work, training, mentoring staff and SPLUMA.

He currently works as a Senior Chief Town Planner at the Matjhabeng Local Municipality. Worked as Manager Urban Planning and Property Management at Setsoto Local Municipality in Ficksburg (Best performed Municipality in Free State 2015).

He worked at Mangaung Municipality as a volunteer, and also worked at a private firm (YB Mashalaba & Associates) as a Junior Town Planner in the past.

Thereafter he joined the Maluti-a-Phofung Local Municipality, where he acquired technical skills through land use management and control.

MPHAMBUKELI, THULISILE

Dr. Thuli Mphambukeli is currently a Lecturer at the Department of Urban and Regional Planning, University of the Free State (UFS). She obtained the degree of Bachelor of Community and Development Studies in 2005, the degree Master of Town and Regional Planning in August 2012 at the University of KwaZulu-Natal, the degree of Bachelor in Theology at Faith Bible College in 2014, and a PhD in Urban and Regional Planning in 2015 from UFS. She started her academic career as a tutor in Social Justice Education at the University of Natal in Durban in February 2003. She teaches and supervises at postgraduate levels at UFS and has taught for the Advanced Certificate in Education, Bachelor of Education and Masters in Education, University of KwaZulu-Natal. She also facilitated and designed the Gender and Labour Studies Diploma Programme for the Workers College from 2009 to 2012.

 Her research interests include Social Justice in Planning, Situated Urban Political Ecology, Human Security and Humanitarian Response, Community and Development Studies, the right to the city and power relationships, Integration of Human Settlements and Transport Planning, Informality, Urban Renewal, Land Use Management in Urban and Regional Areas; and Accessing Basic Services in Human Settlements.

NEL, DARREN

Darren has worked at University of Pretoria's Department Town and Regional Planning as an assistant lecture while undertaking research for his Master's degree in Town and Regional Planning, which he completed in 2016. Darren was involved in several research projects, the most noteworthy being the Resiliency Strategies for Aspirational African Cities. Darren is also a co-founder of the Think tank on Resilient Urban Systems in Transition (TRUST), whose fundamental aim is to understand resilience and mitigate the effects of climate change within urban and ecological systems. Darren has presented papers at several international conferences and has co-authored a book chapter. He has also given lectures and presented at workshops on spatial and urban morphological analysis.

While Darren has a strong academic background he also has experience working in practice. He has been involved with several high level spatial development frameworks, infrastructure investment plans and asset management plans. He has also done work on urban renewal strategies. His work includes projects across South Africa as well as in Kenya. Darren is currently employed by MapAble (Pty) Ltd as a Town and Regional Planner. His specialisations include urban complexity theory, urban resilience, urban morphology, regional planning and spatial analysis.

NEL, VERNA

After obtaining her undergraduate planning qualification from the University of the Witswatersrand, Verna Nel worked at Johannesburg municipality, a private firm and a national government department before joining the Centurion Town Council. Here she was responsible for spatial planning, land use management, local economic development and formulating the municipal town planning scheme. While employed there she obtained her Masters and Doctoral degrees through UNISA.

She was appointed head of the Centurion Planning Department in 1998 and continued to head the planning function in the unicity of City of Tshwane from July 2001 until 2008. Not only did this entail leading and managing the restructuring of the planning function, developing new processes for the coordination and administration of planning work but also preparing spatial plans, a new Town Planning Scheme and Outdoor Advertising bylaws for the city.

She was appointed at a professor at Urban and Regional Planning Department of the University of the Free State in 2009. Her interests are local economic development, urban complexity theory, urban resilience and land use management in a South African context.

NENGGONG, ZHANG

Nenggong Zhang is President of the Ningbo Urban Planning and Design Institute. Between 1995 and 2015 has led the Master Planning for Ningbo, the Conservation and Land Use Plan of Xiangshan Harbor Ningbo and the Ningbo Urban Area Masterplan 2005-2020. He also co-operated with Wuhan Planning and Design Institute in the development of national standard Code for Urban Flood Control Planning. Zhang Nenggong is member of MOHURD's Committee of Experts for Urban Design, the Committee of Experts for Famous Historical Cities and the Technical Committee for Standardization in Urban and Rural Planning. He is also Vice President of Zhejiang Society of Urban and Rural Planners, Vice President of Urban Planning Society of Ningbo, and member of Zhejiang Expert Panel for Planning and Design in Small Towns.

NI, MINDONG

Mindong Ni graduated as a Master in Urban Planning from School of Architecture and Urban Planning at the Huazhong University of Science and Technology in Wuhan. After his studies he worked as a planner in London and Paris. He is urban planner as project manager he is in charge of projects of the Ningbo Urban Planning and Design Institute that includes international cooperation, such as the Conceptual Plan and Urban Design for the Metropolitan and Countryside of the Xiaojia River District.

QUAGLIA, STEFANO

Stefano Quaglia, urban/environmental planner and researcher at Food and Agricultural Organization of United Nations in Rome. Graduated at IUAV-University of Venice in Planning and Policies for Cities, Environment and Landscape. During his academic and working activities, both in Italian and foreign institutions, he has developed specific interest and expertise in thematic fields related to urban planning, environmental science and political ecology, focusing on the integration between planning systems and urban food strategies, urban agriculture, forestry and agroforestry.

ROSS, PHILIP

Philip Ross is a former Mayor of Letchworth Garden City and is outspoken advocate and defender of Garden City values and principles.

In 2009, he won a landmark High Court battle that ensured that the Letchworth Heritage Foundation - who managed the Garden City estate - remained accountable to the people of the town. He has spoken and written on the issues of Garden Cities and sustainable development in both the UK and China. He was one of the authors of the 'Letchworth Declaration' led to the creation of the New Garden Cities Alliance (NGCA) in the UK. The NGCA aims to create a certification scheme for garden cities ensuring that garden cities retain a social meaning.

WANG, JIANGUO

Dr. Wang Jianguo is the Academician of Chinese Academy of Engineering, the Professor and Former Dean of School of Architecture at Southeast University located in Nanjing, China. He is the Director of Research Center of Urban Design in the university and the Director of National Supervision Board of Architectural Education. He graduated from the architectural department of Nanjing Institute of Technology in 1982 and received his Doctorate in Engineering from Southeast University in 1989. He is entitled the Cheung Kong Scholar by the Ministry of Education of the People's Republic of China in 2001. In the same year, he won the National Natural Science Fund for Distinguished Young Scholars. As a leading scholar in the field of urban design in China, he has published 7 monographs and more than 180 papers widely cited by SCI, EI, Web of Science, CSCD and CSSCI, covering a wide range of academic fields in urban design and architecture. He has been involved in a series of research and real projects concerning urban design, architectural design and heritage conservation, meanwhile receiving a number of prizes and honors from the practices. In the last three decades, Dr. Wang plays an important role in development of urban design studies in the context of rapid urbanization in China. The outcomes of his research have gone beyond the nation's experiences and conditions, and were highly recognized by international academic circle.

WOODBRIDGE, MICHAEL

Michael Woodbridge leads the Urban Research Team at the ICLEI World Secretariat. In this role, Michael coordinates the production of ICLEI's Knowledge Products, and collaborates with academic and research partners all over the world and ICLEI's own thematic experts to link relevant trends in sustainable urban development to ICLEI's capacity building work with local and regional governments.

XING, ZHAO

Zhao Xing, graduated from Architecture school of Tsinghua University, urban planner of Beijing Municipal Institute of City Planning and Design, secretary general of Shijia Hutong Heritage Preservation Society. She presided the Conservation Plan for the Historical and Cultural Area in Dongsi South, and now is doing long term study over the conservation of historical city, public participation of urban planning, and community making. The case in this article is performed by a team from BICP, the team members are Zhao Xing, Feng Feifei, Liao Zhengxin, Zhao Rui, Liu Jingyi and Jiang Weiwei.

XU, JIAN

Jian Xu is a Ph.D. candidate of urban planning at School of Architecture, Tsinghua University. He obtained Bachelor's degree in Geographic Information System form Zhengzhou Information Engineer University in 2001 and obtained Master's degree in Computer Application Technology from Shandong University in 2009. He has published several papers with the topics ranging from embedded geographic information system, smart city, to big data et al. His previous work and research experiences were mostly about geographic information system for intelligent satellite navigation system. Now, He focuses on big data application in urban planning, future city, mobile geographic information service.

YANG, JUNYAN

Dr. Yang Junyan is the Professor in Department of Urban Planning, School of Architecture at Southeast University. He is the Director of Research Institute of Central City Districts and the Vice Dean of Research Institute of Smart Cities in the university. He is also the member of Academic Committee in the Urban Planning Society of China. As the winner of the China Youth Science and Technology Award in Urban Planning, he is also the scholar supported by the "Program for New Century Excellent Talents in University" by the Ministry of Education of the People's Republic of China, the "Six Talent Peaks Project" of Jiangsu Province, and the "Incubation Program for Major Science and Technology Project" from the Dedicated Fund of Scientific Research for Central Colleges and Universities in China. He is the reviewer for National Natural Science Foundation of China (the discipline of urban planning and the discipline of human geography) and the consultant for Jiangsu Provincial Department of Technology. Dr. Yang's research mainly focuses on urban design and big data application in urban space. So far, he has directed 8 foundation projects including the National Natural Science Foundation projects and the Ministry or Provincial Technology Foundation projects, and has completed more than 30 major urban planning projects. He has published 8 monographs and nearly two hundred papers in academic journals, while receiving 35 awards for teaching and research.

ZHANG, DANMING

Danming Zhang is a Ph.D. candidate in Urban Planning, Tsinghua University. He graduated from Peking University with a degree of M.S. in Landscape Architecture, and has worked at Turenscape Design Institute as a project manager for 3 years. Current research focus is mainly on the empirical study of Chinese future urbanization process, and he has published several papers on Smart City and Smart National Park.

ZUO, WEIMIN

Weimin Zuo is senior planner of the Ningbo Urban Planning and Design Institute who graduated at Tongji University. She has 30 years of planning experience and was responsible for award winning projects both in Kunming, Yunnan Province, and Ningbo. She contributed to the Conceptual Plan and Urban Design for the Metropolitan and Countryside of the Xiaojia River District. She is member of the Zhejiang Department of Housing and Urban-Rural Development Technical Committee and Vice President of the Conservation Academy of Historic and Cultural City of Ningbo.

ABOUT THE
EDITORS

SHI NAN

Dr Shi Nan is the Vice President and Secretary General of the Urban Planning Society of China, Vice Director of the National Steering Board for Planning Education, National Commission for Planning Education Accreditation and National Board for Certified Planner System. His 30-year career in the planning area has focused on policy analysis and city master planning, which has seen him actively involved in major planning and research projects including Revision of National Planning Act of the People's Republic of China, National Standard for Planning Terminology, Innovation in Master Planning, etc. In addition, Dr Shi Nan has worked with major international organizations such as the World Bank, UN-Habitat, the UNDP, British Council and Rockefellers Foundations, and is the elected Vice President of the International Society of City and Regional Planners. A respected author of several books, including THE STATE OF CHINA'S CITIES, SOME OBSERVATIONS CONCERNING CHINA'S URBAN DEVELOPMENT, Dr Shi Nan's column for the respected academic journal the CITY PLANNING REVIEW, of which he is the chief editor, is the most popular planning literature in China. Dr Shi Nan is a professor at universities including Renmin University of China, Harbin Institute of Technology, Nanjing University, Tongji University, and the National Training Center for Mayors of China. His professional background includes Senior Planner at China Academy of Urban Planning & Design, Advisory to the City of Guangzhou, Xi'an, Dalian, Harbin, Shijiazhuang etc. He is a Council Member of China Association of Science and Technology.

FRAN KLASS

Fran Klass has been editing professionally for more than 40 years, including stints with medical publishers, a not-for-profit enterprise in the pharmaceutical arena, and a brief time spent in the world of "vanity," or self- publishing. A graduate of The Pennsylvania State University, now known as "Penn State," Fran was an English major with a minor in Secondary Education.

After a few ill-spent years teaching high school English, Fran moved into publishing, where she has held positions ranging from proofreader to managing editor. Fran has been the managing editor of a medical journal since its inception 30 years ago and continues to serve in this capacity to the present day.

Along with her husband, Jim Reilly, and their very assertive Wheaten Terrier, Maggie, Fran spends her non-editing moments scuba diving, playing tennis, and catering to the aforementioned Maggie.

JIM REILLY

Jim Reilly started his planning career with the award-winning firm of Wallace, McHarg, Roberts and Todd. His major assignments included plans for portions of the Inner Harbor in Baltimore, MD; work on the EIS of the Metro System in Washington, DC; route alignment planning for the Baltimore, MD transit system; and, Senior Project management of the Plans for Abuja, the New Federal Capital of Nigeria. Later, he worked as a senior planner and regional scientist for the State of New Jersey (USA) Office of State Planning and for the State of Maryland (USA) Department of Planning. While at these state agencies, Jim conducted statistical research about land use change and impacts associated with change. He use this research to author programs which used econometrics and Systems Dynamics to produce Planning Support models.

He has written numerous articles in various refereed journals. He is the 2004 recipient of the Gert Alberts award (ISOCARP) and the 2014 William R. Boggess Award (American Water Resource Association).

Jim is a disabled veteran, having served in the US Army (Reserves) Medical
Corp for 25 years. He served in two wars and is the recipient of 35 medals.
Jim is now retired, happily married to Fran (see Associate Editor), scuba dives, fly fishes, and travels.

YVES CABANNES

Yves Cabannes is an urban planner and Emeritus Professor of Development Planning, Chair of Development Planning [2006-2015] at Bartlett Development Planning Unit (DPU), University College London. He was previously lecturer in Urban Planning at Harvard University Graduate School of Design and the regional Coordinator of the UN Habitat/UNDP Urban Management Program for Latin America and the Caribbean and worked for many years with local governments, NGOs and social movements in various countries. He was awarded the United Nations Best practices award in 1996, along with other partners' institutions for their long-standing work on pro-poor urban development in Fortaleza Metropolitan Region in Northeast Brazil

He has worked as a researcher and practitioner in urban agriculture & Food sovereignty, collective and communal forms of land tenure, local currencies, participatory planning, municipal public policies, low cost housing, participatory budgeting, community-based micro credit systems and appropriate technologies for local development. He is an advocate on development and rights issues and was the convener for the UN Advisory Group on Forced Evictions (2004-2010) and the senior advisor to the Municipality of Porto Alegre, Brazil, for the international network on participatory budgeting. He is committed to civil society initiatives in different regions and a member of the board of the International RUAF Foundation - Resource Centres for Urban Agriculture and Food Security-, The World Fund for City Development (Metropolis), and Megacities Project.

Recent books and articles in English as author and co-editor include: Integrating Food into Urban Planning [Forthcoming 2016, co-editor, co-author]; Asian Cities by and For the people [forthcoming 2016, co-editor, co author, Amsterdam Free University press]; Financing urban and peri-urban agriculture; What do we know, What should we know, Chapter 14, in Cities and Agriculture [2015, Earthscan, Routeldge]; The democratic contribution of Participatory Budgeting [2015, co-author, London School of Economics]; Another city is possible! Alternatives to the city as a commodity: Participatory Budgeting, Dossier 1 [2015, co edited and co-authored book]; 21st Century Garden Cities of To-morrow. A Manifesto [2014, co-authored book]; Contribution of Participatory Budgeting to provision and management of basic services: Municipal practices and evidence from the field [2014, Working paper IIED]; Peri-urban agriculture, social inclusion of migrant population and right to the city: practices in Lisbon and London [2013, City, Routledge]; Financing Urban Agriculture [2012, Environment & Urbanization, Sage]; Pro-poor legal and institutional aspects of Urban and Peri-Urban agriculture [2012, book FAO Legislative Study Series].

CECILIA MAROCCHINO

Cecilia Marocchino is an urban and territorial planner with over than ten years of experiences in urban research and urban development planning in Africa, Latin America and Middle East. Her expertise and main areas of professional interest are: i) urban and territorial planning; ii) strategic and development planning; iii) participatory planning methodologies iv) urban governance; v) urban infrastructures and municipal services; vii) food system planning and management, mainly food distribution systems, including formal and informal activities.

Currently she is working for FAO headquarter as urban food planning expert, involved in various food system projects and activities related to food security and nutrition in cities. She has actively participated in the Habitat III process and in the consultations leading at the integration of food security and nutrition into the New Urban Agenda.

Cecilia has worked for UN-HABITAT in Jordan and in various cities of the Arab Region, providing technical support to local governments on urban development planning. She was also in charge of supporting cities in improving urban information systems including the establishment of UN-HABITAT local urban observatories and in strengthening the urban observatory network in the Arab Region with specific attention on the Habitat Agenda indicators. She was also working for the Arab Urban Development Institute (AUDI) as Reporting and Monitoring Expert for the UN-HABITAT/AUDI project "Promoting Urban Monitoring and Observation for Sustainable Urbanization in Arab Towns", mainly focused on secondary cities.

Cecilia has also worked for the Ministry of Foreign Affairs of Italy/Italian Development Cooperation in Ethiopia in supporting the local governments of the small towns of the Oromia Region. She has developed and implemented a gender-sensitive, integrated, multi-stakeholders approach to food retail distribution system including access to credit, formalization of informal activities, creation of cooperatives and small micro-enterprises, urban development planning, market infrastructures rehabilitation and capacity building to the local governments. In the Oromia Region Cecilia also worked on promoting urban agriculture and temporary farmers markets mainly addressing poor and vulnerable women.

In Ecuador Cecilia's work has been focused on the participatory budgeting system, urban agriculture, "productive households" and fair trade network organization and management. She was also involved in designing and implementing the European Commission Project on participatory budgeting system and good governance in various cities of Latin America and Europe.

MARTIN DUBBELING

Martin Dubbeling is an urban planner and development consultant from the Netherlands. He is founder and principal of Connecting Cities, an office for research, consultancy, design and communication in sustainable urban and regional planning. He combines his work as international consultant and urban planner and designer with organising Urban Planning Advisory Team (UPAT) Workshops for ISOCARP, the International Society of City and Regional Planners. As Vice President of ISOCARP he organised successful UPAT workshops in Singapore, Russia, Palestine, China and Norway. He was one of the international experts that contributed to the Conceptual Plan and Urban Design for the Metropolitan and Countryside of the Xiaojia River District.

ISOCARP
Knowledge for Better Cities

ISOCARP International Society of City and Regional Planners
AIU Association Internationale des Urbanistes
IGSRP Internationale Gesellschaft der Stadt- und Regionalplaner
AIU Asociación Internacional de Urbanistas