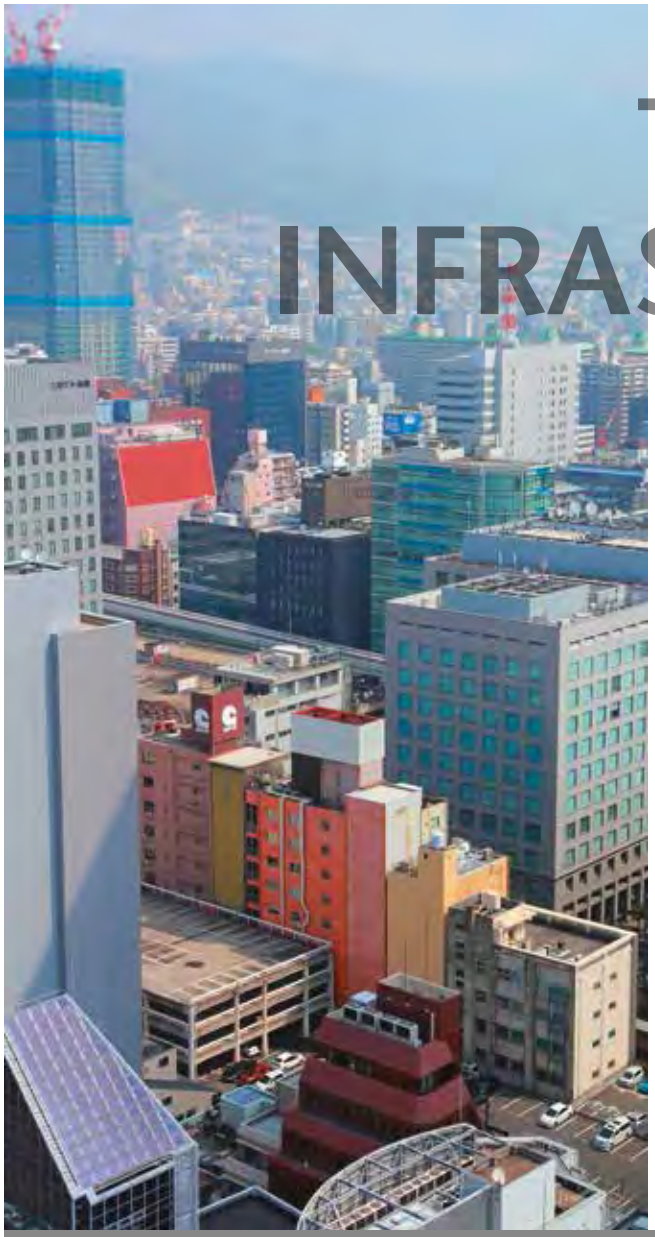

# THE URBAN INFRASTRUCTURE INITIATIVE

## FINAL REPORT

wbcsd urban

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# FOREWORD

This report sums up the experiences of 14 leading global companies that worked collaboratively with 10 cities around the world to advance urban sustainability through the World Business Council for Sustainable Development's Urban Infrastructure Initiative (UII). The companies come from a range of industry sectors and, as WBCSD members, are committed to promoting sustainable development.

The initiative has demonstrated the value for cities in working with business early in the development of their sustainability strategies. This report recommends several ways to overcome barriers to such business involvement. These recommendations are aimed at cities, businesses themselves and other key stakeholders.

The recommendations of the UII will open up new opportunities for businesses to drive the urban sustainability agenda forward. This has benefits for the private sector, including the members of this project, as well as for cities. However, it is important to note that the member companies carried out this initiative collectively and with no opportunity for direct commercial gain.

The objective, as with all WBCSD programs, has been to accelerate business solutions for a sustainable world – a world in which nine billion people can live well, and within the planet's resources, by the year 2050.

# WBCSD PRESIDENT'S STATEMENT

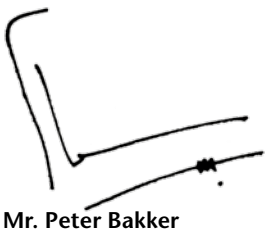
The Urban Infrastructure Initiative (UII) is a truly groundbreaking project. It leverages two of the most powerful global forces for sustainable development – city sustainability leadership and business innovation and solutions delivery – and demonstrates the real value and synergies of strategic public-private collaboration.

I would like to thank the UII Co-Chairs – Cemex, GDF Suez and Siemens – and the 11 other industry-leading participating companies for their foresight and dedication in establishing the UII and making it a success. I also would like to thank the 10 cities around the world that have made the initiative possible through their willingness to be pioneers of an exciting new model of cross-sector engagement.

At the WBCSD we know that innovation and collaboration can be difficult in the real world. We see that the lessons and recommendations in this report provide a clear way forward for cities, business solutions providers and other key actors – such as city associations and international financial institutions – who will all need to work together to make transformational action happen.

And the WBCSD is all about making action happen. The WBCSD's Action2020 Initiative will catalyze sustainable business solutions at scale to address the world's most urgent environmental and social priorities. Working with city leaders, citizens and other city sustainability initiatives to co-create and implement innovative business solutions to the complex cross-cutting challenges facing the world's cities will be central to this agenda. The UII has provided a wonderful foundation for the realization of these partnerships for action in practice.

For all of us, the challenge and the opportunity are clear: Sustainable cities are the key to achieving a sustainable world.



**Mr. Peter Bakker**
**WBCSD President**

# ASSURANCE GROUP CHAIRMAN'S STATEMENT

Cities all over the world are facing challenges with regards to the realization, operation and maintenance of urban infrastructure and services. In more mature economies, infrastructure improvements are required to maintain standards of living and economic competitiveness. In economies that are seeing rapid urbanization, the scale and pace of this urban development will require investments in urban infrastructure over the next three decades that exceed all previous investments put together. In both contexts, better planned and smarter urban infrastructure will be required to meet the challenges of climate change adaptation and mitigation. These challenges are further compounded by competing demands for resources, making cost efficiencies an imperative.

New and radical thinking is required – in the way we plan and design water and sanitation systems, buildings, solid waste management facilities, energy supply and distribution, mass transit systems, and communications. While new technologies are emerging every day and can help cities and metropolitan regions "do more with less," transformative progress will require that these systems be conceived, planned and designed in a much more holistic manner so as to create the conditions for development that are more sustainable.

The Urban Infrastructure Initiative (UII) has been an important first step in this direction. By involving several leading global companies to help a given city make better informed decisions, the initiative has broken new ground on several fronts. It has obliged very different companies with very different cultures and areas of focus to work as a team. It has equally obliged different departments and services of a local government to work as one. It has engaged cities and technology companies in an intensive dialogue and exchange of ideas on what works and what to avoid. By bringing together companies that are involved daily in the implementation, operation and maintenance of urban infrastructure, this has been, without a doubt, a new and unprecedented approach to helping cities shape their respective development strategies and policy options.

Last but not least, it is my firm belief that one of the most important but perhaps intangible benefits from the UII experience has been that all parties have learned from this unique initiative and from each other. I am sure that I speak on behalf of all of the members of the Assurance Group in saying that what has kept us engaged and excited throughout the duration of the UII has been listening to and tracking those lessons learned. This report synthesizes many of those lessons in the form of recommendations. It is imperative for all of us, in our different roles, to use what we have learned to help forge new business models and new forms of partnerships that can help move all of us towards a more sustainable urban future.

**Mr. Nicholas You**
**Chairman**
**Urban Infrastructure Initiative Assurance Group**

# EXECUTIVE SUMMARY

**The WBCSD Urban Infrastructure Initiative (UII) is an innovative global project demonstrating the role of business as a strategic partner to help cities turn their ambitious sustainability visions into a reality.**

**The UII is a multi-sector collaboration between 14 leading global companies that worked with 10 cities around the world. The outcomes of this major initiative suggest that all cities seeking to realize their sustainability objectives can benefit from engaging with business early in the planning and strategy development process. Early engagement leverages the capability of business to identify innovative and cost-effective solutions to complex, cross-cutting urban sustainability challenges. It allows business input to be provided where it is of greatest value to decision-making and can create an innovative 'laboratory' in which cities can explore and evaluate ideas and solutions in a dynamic and inexpensive manner. Ultimately, this involvement can help cities and their citizens make better-informed decisions about accelerating progress towards sustainability.**

Cities are at the leading edge of the global sustainability agenda. By 2050, 70% of the world's population will live in cities – this is where the battle for a sustainable future for humanity will be won or lost. Cities around the world are rising to this challenge by pursuing ambitious objectives that will make them more competitive, resource-efficient, resilient and inclusive.

Realizing these visions in practice is a complex challenge for city leaders. In particular, they will typically necessitate major transformations in the design, construction and operation of a city's infrastructure systems – including buildings, energy, mobility, telecommunications, water, sanitation and waste management services – and optimizing the inter-linkages between these systems.

Businesses that are committed to sustainability and experienced in delivering effective solutions can help cities navigate these challenges and turn a high-level vision into practical and implementable action plans. Business can play a vital role not only in providing specific infrastructure, technology, services and financing solutions, but also in contributing to the strategy that will support the overall optimization of urban systems to drive sustainability.

While there are already excellent examples of cities and business working together at the strategic level, this is the exception rather than the rule. This represents a major missed opportunity.

The WBCSD established the UII to advance the urban sustainability agenda by showcasing the critical role that business can play as solutions providers and by providing a platform for collaborative strategic engagement between cities and business. The UII brings together 14 leading member companies – Cemex (Co-Chair), GDF SUEZ (Co-Chair) Siemens (Co-Chair), ACCIONA, AECOM, AGC, EDF, Honda, Nissan, Philips, Schneider Electric, TNT Express, Toyota and United Technologies – with an array of knowledge and skills to help unlock opportunities for urban authorities to create cities that are more sustainable, efficient and livable.

This multi-sector, multi-company group worked with the following leading cities: Turku (Finland); Tilburg (The Netherlands); Ahmedabad, Rajkot, Surat and Vadodara in Gujarat State (India); Yixing (China); Kobe (Japan); Guadalajara (Mexico); and Philadelphia (USA). In each city, the UII mobilized a multi-disciplinary team of company experts to work collaboratively with senior city officials. These teams took an integrated, cross-sector approach to analyzing the city's major sustainability challenges and to developing an innovative "solutions landscape" (i.e., a portfolio of practical solutions) to address these challenges.

While the UII is a pilot project that has worked with a relatively small number of leading cities, this report summarizes the evidence – particularly the perspectives of city leaders – that suggests that the early involvement of business can be of real benefit to any city administration aiming to advance sustainability.

The initiative has demonstrated the willingness and ability of business to be a strategic partner for cities in advancing the urban sustainability agenda. It has shown that leading businesses have a detailed understanding of the challenges and constraints that cities face and can be valuable contributors in helping cities find solutions. This report highlights a number of potential applications where the early, collaborative involvement of business should be considered by cities.

From a global perspective, bringing together the powerful synergies of city sustainability leadership and business innovation and the delivery of solutions represents an enormous "win-win" opportunity to drive rapid transformation towards sustainable development. Cities will win by getting practical, cost-effective solutions in order to realize the sustainability aspirations of their citizens. Leading businesses will win through the unlocking of markets for innovative products and services that will be essential in delivering this transformation, forming the foundation for the urban green economy. The UII has made an important contribution in pioneering how this global opportunity can be realized in practice.

## THE RECOMMENDATIONS FOR CITIES, BUSINESSES AND OTHER ORGANIZATIONS TO TAKE THIS AGENDA FORWARD ARE FOR:

### CITIES TO

1. *Work with business as a key stakeholder in sustainability strategy development.*
2. *Develop or enhance stakeholder engagement and consultation processes to leverage the value of working collaboratively with business.*
3. *Clarify the scope for early business engagement in sustainability strategy development under local regulatory frameworks and consider removing the barriers to business engagement that are not in the public interest.*
4. *Create or strengthen cross-departmental coordination to enable integrated solutions to urban sustainability challenges.*

### BUSINESSES TO

5. *Pursue opportunities for sustainability strategy partnership with cities.*
6. *Collaborate with other businesses and professional experts on urban sustainability strategy development.*

### INTERNATIONAL ORGANIZATIONS, NON-GOVERNMENTAL ORGANIZATIONS (NGOs) AND URBAN PROFESSIONAL ASSOCIATIONS TO

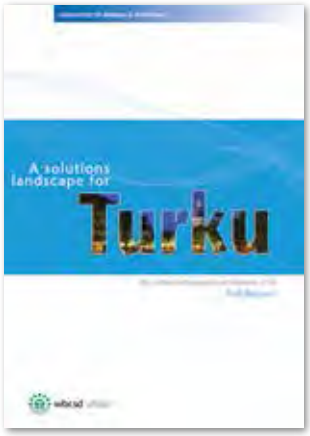
7. *Support and facilitate strategic engagement between cities and business as an effective tool to drive urban sustainability.*


Figure 1 UII partner cities


TURKU
TILBURG
GUJARAT CITIES
YIXING
KOBE

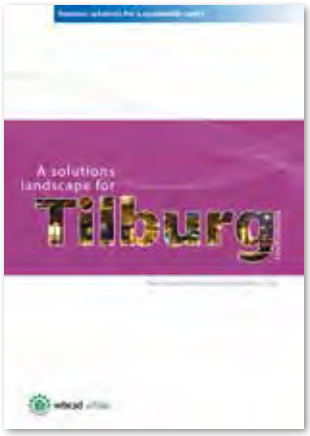
# UII SOLUTIONS LANDSCAPE REPORTS: OVERVIEW

## TURKU (FINLAND)


**City Overview:** Sixth largest city in Finland.
**Population:** 180,000.
**UII Companies:** Siemens (lead), ACCIONA, GDF SUEZ, TNT Express, Toyota, and United Technologies.
**Date of Workshops:** Dialogue: December 2010; Transformation workshop: March 2011; Report launch: October 2011.
**Main Challenges:** Transport and logistics, energy supply, and energy use.
**Solutions Landscape:** 18 initial solutions were proposed in 3 clusters (energy supply, energy use, transport & logistics) with 8 priority solutions identified.

## TILBURG (THE NETHERLANDS)


**City Overview:** Sixth largest city in the Netherlands.
**Population:** 200,000.
**UII Companies:** TNT Express (lead), AGC, CEMEX, Schneider Electric, and Siemens.
**Date of Workshops:** Scoping discussion: February 2010; Dialogue and transformation workshop: September 2011; Report launch: May 2012.
**Main Challenges:** Translate the city's 2045 climate neutral vision into specific projects to be implemented in the near future.
**Solutions Landscape:** 10 priority solutions were identified covering business parks, buildings, transport and energy supply.

## GUJARAT CITIES (INDIA)



**City Overview:** Ahmedabad, Rajkot, Surat and Vadodara are the four largest cities in Gujarat State, India.

**Population:** The populations of the four cities range between 1.4 and 6.3 million.

**UII Companies:** United Technologies (lead), ACCIONA, AECOM, AGC, GDF SUEZ, Schneider Electric, and Siemens.

**Date of Workshops:** Dialogue and transformation workshops: July 2011; Report handover and expert workshop: July 2012.

**Main Challenges:** Urban planning, energy efficiency and wastewater management.

**Solutions Landscape:** Urban planning was the 'umbrella' under which solutions for energy efficiency and wastewater management were considered. 10 solutions were proposed in each of the 3 solution categories.

## YIXING (CHINA)



**City Overview:** A county-level city in Jiangsu province at the center of the Nanjing-Shanghai-Hangzhou delta.

**Population:** 1.25 million.

**UII Companies:** Schneider Electric (lead), AECOM, and Siemens.

**Date of Workshops:** Dialogue: April 2012; Transformation workshop: October 2012; Report launch: June 2013.

**Main Challenges:** Urban planning, transport and mobility, and energy efficiency (industrial sector and buildings).

**Solutions Landscape:** The enhancement of urban planning through a strategic master plan was proposed, supported by specific solution recommendations covering transport and mobility and energy efficiency.

# UII SOLUTIONS LANDSCAPE REPORTS: OVERVIEW

## KOBE (JAPAN)



| | |
|---|---|
| **City Overview:** | Major Japanese city representative of many of the economic, demographic and environmental issues in Japan. |
| **Population:** | 1.5 million. |
| **UII Companies:** | AGC, Honda, Nissan, Toyota (four joint-lead companies), with Schneider Electric, Siemens, and TEPCO (in the initial phase). |
| **Date of Workshops:** | Dialogue; June 2012; Report handover ceremony: May 2013. |
| **Main Challenges:** | Income per head in 2009 lower than in 1990, rapidly aging population and rising greenhouse gas (GHG) emissions from the commercial and household sectors. |
| **Solutions Landscape:** | Four major solution sets were proposed covering: energy and energy efficiency, sustainable mobility, knowledge network formation and internationalization, disaster resilience and reconstruction.<br>The CASBEE-City sustainability assessment tool was proposed as a key tool for enhancing sustainability performance and evaluating solutions. |

## GUADALAJARA (MEXICO)



**City Overview:** Second largest city of Mexico and capital of Jalisco.
**Population:** 4.4 million.
**UII Companies:** CEMEX (lead), ACCIONA, GDF SUEZ, Schneider Electric, and Siemens.
**Date of Workshops:** Dialogue: May 2012; Transformation workshops June to July 2012; Report launch: September 2013.
**Main Challenges:** Mobility and logistics, security and social development, buildings & housing, waste.
**Solutions Landscape:** 20 solutions were identified in the 4 main challenge areas with direct and indirect linkages between solutions also highlighted.

## PHILADELPHIA (UNITED STATES)



**City Overview:** Second largest city on the East Coast of the United States and the country's fifth-most-populous city.
**Population:** 1.5 million.
**UII Companies** Siemens (lead), AECOM, Schneider Electric, TNT Express, Toyota, TNT Express, and United Technologies.
**Date of Workshops:** Dialogue: March 2012; Transformation workshops: May to November 2012; Report launch: November 2013.
**Main Challenges:** Building on existing urban sustainability initiatives and programs under the *Greenworks Philadelphia* plan to achieve efficiencies and synergies.
**Solutions Landscape:** Integrated solutions focusing on place-based approaches (focusing on the EcoDistrict model), sustainable infrastructure and mobility. Solutions to enhance the efficiency and environmental performance of the city's vehicle fleet were also proposed.

# 01
# INTRODUCTION

## THE URBAN WORLD

Today, more than half of the planet's inhabitants are living in urban areas. By 2050, more than 70 % of the global population will live in cities. The scale and pace of urbanization in the coming decades is unprecedented in human history.

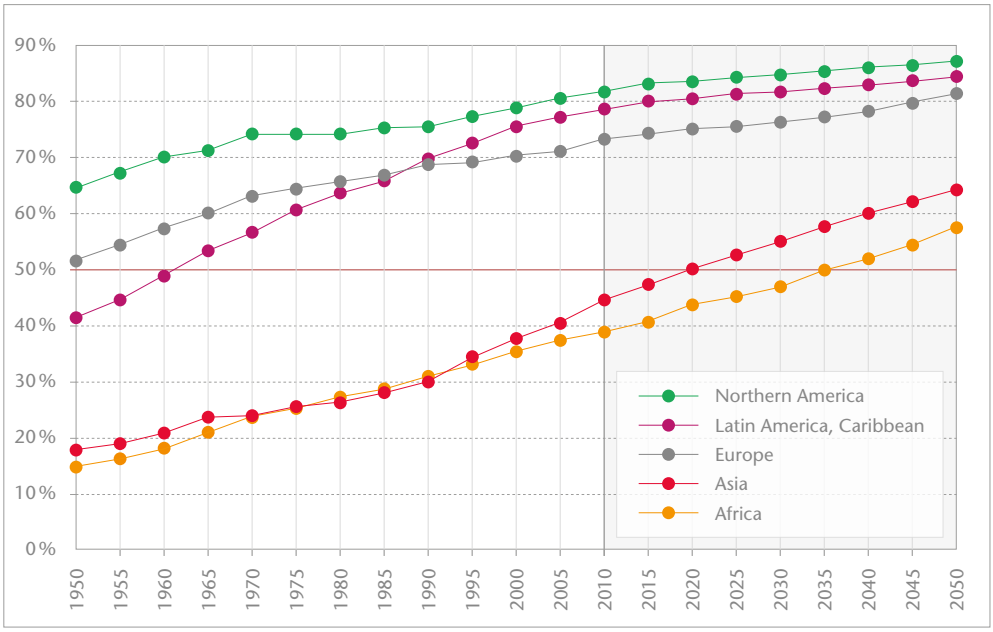



Figure 2 Growth of proportion of the population residing in urban areas by region (1950 to 2050)
*Source: United Nations, Department of Economic and Social Affairs, Population Division (2012)*

**The battle for sustainable development will therefore be won and lost in cities.** Cities already consume up to 80 % of global material and energy supplies and produce around 75 % of carbon emissions.[1] With current energy- and resource-intensive modes of urban development, the addition of 3 billion more city-dwellers by 2050 is likely to significantly exceed the ecological carrying capacity of the planet.

Furthermore, the concentration of people, resources and infrastructure in cities is making societies more vulnerable to disasters and the adverse impacts of climate change, such as sea-level rise and storm events.[2] Cities are therefore likely to bear a major share of the burden of the costs and risks associated with climate change adaptation, as well as the responsibility of establishing much more resilient infrastructure.

The particularly rapid urbanization being experienced in many developing countries often overwhelms cities, which struggle to develop adequate infrastructure, resulting in significant negative effects on local communities and the environment.[3] Haphazard urban growth sees poorer sections of the population with little choice but to live in informal settlements or slums, which often provide very limited access to basic social services and livelihood opportunities.

New urban development (and the renewal of existing urban areas) needs to be focused on achieving much higher levels of energy and resource efficiency if cities are to remain within the ecological carrying capacity of the local and global environment, while also ensuring universal access to essential services (e.g., healthcare, water and sanitation, energy) for all city dwellers.

BOX 1 highlights the scale of urban growth in India and China and the enormous investments needed to provide supporting infrastructure. These examples underscore the urgent need to establish sustainable urban development models – once cities and their infrastructure are laid out, it is very costly and very difficult to change them (the "lock-in" effect).

[1] UNEP 2012
[2] The World Bank 2008
[3] UNEP 2011

*BOX 1 – UNPRECEDENTED URBAN GROWTH: INDIA & CHINA*[4]

*India's urban population grew from 290 million in 2001 to 340 million in 2008, and it is projected to reach 590 million by 2030. The country will have to build 700-900 million square meters of residential and commercial space each year to accommodate this growth. It needs investments of $ 1.2 trillion to build 350 – 400 kilometers of subway lines and up to 25,000 kilometers of new roads per year. Similarly, China's urban population is expected to increase from 636 million in 2010 to 905 million by 2030. It is predicted that by 2050, the country will need to invest 800 – 900 billion RMB per year to improve its urban infrastructure.*

## CITIES AS SUSTAINABLE LEADERS

While cities face many challenges, they are also leading the global transformation towards inclusive green economies and sustainable development. They will generate the majority of national gross domestic product (GDP), and are the primary centers of technological and social innovation. Compact cities with mixed-use urban form are more resource-efficient than any other human settlement pattern for a given level of economic output. Integrated design strategies and technologies are available to improve urban transport, the construction of buildings, and the development of urban energy, water and waste systems in such a way that they significantly reduce resource and energy consumption while avoiding lock-in effects.[5]

Furthermore, if cities are planned and managed effectively, they can help ensure universal access to services and employment and thus play a critical role in reducing poverty and social exclusion. Cities will also be at the forefront of the creation of "green jobs,"[6] with many of the major opportunities for the greening of the labor market associated with the urban economy.

These challenges and opportunities have placed cities at the center of the sustainability agenda and many city leaders and municipal authorities are taking action. Around the world, cities are establishing ambitious visions and targets to drive transformational action – as evidenced by the cities presented in this report. The sustainability agendas vary from city to city but often include these key elements:

- **Climate change mitigation.** Cities have set ambitious objectives for the reduction of greenhouse gas emissions, some going as far as committing to becoming "climate neutral."[7] These objectives are often pursued through comprehensive programs focused on priority sectors / issues, such as building and industrial energy efficiency, renewable energy production, public transportation, low-carbon mobility and water / wastewater management.
- **Disaster and climate resilience.** Cities are taking the lead in developing strategies to ensure resilience to disasters and adaptation to the effects of climate change, often through fundamental changes in urban planning, infrastructure design and city management.
- **Livability and social inclusion.** Promoting the well-being and quality of life of citizens and ensuring inclusiveness for the poor and marginalized sections of society is fundamental to urban sustainability. Cities are addressing these complex challenges through multifaceted strategies focusing on equitable social development, universal access to services and improvement of local environmental quality.

[4] Ibid.

[5] Ibid.

[6] According to the United Nations Environment Programme (2008), a green job is "…work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute(s) substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution."

[7] No net carbon emissions.

- **Green economic development.** Cities are pursuing transformational economic development strategies based on growing green industries and technology clusters and the promotion of green jobs.
- **Smart technologies.** Cities are actively adopting or promoting new technologies that are frequently enabled by the enhanced connectivity of new information and communication technologies (ICT). They enable fundamental improvements in the operation and management of key infrastructure within the city to improve quality, efficiency and environmental performance, as well as providing new or better services.

Action at the city level is being complemented and stimulated by cooperation and knowledge sharing at the national, regional and international levels. Organizations such as ICLEI – Local Governments for Sustainability and the C40 Cities Climate Leadership Group actively promote best practice sharing between cities and provide advocacy platforms to ensure urban sustainability is given appropriate consideration in national and international policy agendas.

## COMPLEX CHALLENGES REQUIRE MULTI-STAKEHOLDER SOLUTIONS

The case for action by cities is compelling. A sustainable city is more competitive, helps to lift citizens out of poverty, and makes it possible for everyone to live better lives. Sustainable cities use resources more wisely, thrive economically, create more inclusive communities, and are more resilient to disasters and environmental change.

There are now many examples of leading cities making significant progress towards sustainability. However, finding practical and cost-effective solutions to complex, cross-cutting urban sustainability challenges remains a dilemma even for sustainability forerunners. City leaders acknowledge that they cannot find these solutions alone, and that a coalition of key stakeholders – municipal authorities, other levels of government, citizens, community groups and civil society, academia, as well as the private sector – will need to work together to find solutions and to make them happen.

The critical role of business in particular is one aspect of the urban sustainability agenda that is receiving increased attention. This is the focus of the Urban Infrastructure Initiative.

# 02

# THE URBAN INFRASTRUCTURE INITIATIVE

## OVERVIEW

The WBCSD established the Urban Infrastructure Initiative (UII) in 2010 as a major contribution to scaling up the role of business as solutions provider for urban sustainability challenges. The UII is a unique platform for the demonstration of the valuable role that business can play through early collective engagement in the sustainability planning and strategy process to support cities in realizing their visions.

The UII brings together 14 leading member companies – Cemex (Co-Chair), GDF SUEZ (Co-Chair), Siemens (Co-Chair), ACCIONA, AECOM, AGC, EDF, Honda, Nissan, Philips, Schneider Electric, TNT Express, Toyota and United Technologies – with an array of knowledge and skills to help unlock opportunities for urban authorities to create cities that are more sustainable, efficient and livable. These companies are sustainability leaders and have a strategic interest in unlocking markets for the innovative solutions that will be essential in driving urban sustainability transformations around the world (see BOX 2). The opportunity to align sustainability with the expansion of strategically important future markets provides a strong rationale for collaboration, even between companies that are traditionally competitors.

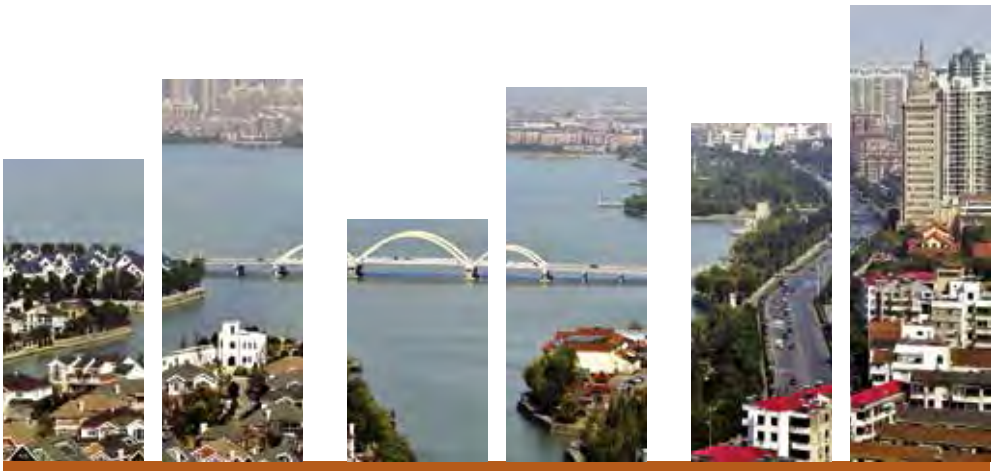
*BOX 2 – VISION 2050: THE ROLE OF BUSINESS IN REALIZING A SUSTAINABLE FUTURE*

*The importance of cities in advancing sustainability was one of the key messages of the WBCSD's Vision 2050,[8] the result of an extensive investigation bringing together more than 200 companies and external stakeholders in some 20 countries. Vision 2050 lays out a pathway to a world in which 9 billion people can live well and within the planet's resources by 2050.*

*Vision 2050 identifies the transformation of cities as one of the areas offering huge opportunities for business to contribute to sustainability. Trillions of dollars of investment will be required to transform the urban environment, minimizing waste and providing citizens with the basic elements of human well-being in a resource- and energy-efficient manner. Business input to urban planning will be required to establish innovative solutions for the design and management of buildings, spaces and infrastructure that will drive the needed urban transformation. Major business opportunities exist in construction, waste management, water and sewerage, energy, and mobility.*

*Vision 2050 emphasizes that while business will be a key solution provider in these areas, it will need to work in partnership with every level of government, with civil society, and with citizens in general.*

[8] See www.wbcsd.org/vision2050.aspx.



*BOX 3 – REFLECTIONS FROM CITIES ON THE ROLE OF BUSINESS*

***Aleksi Randell, Mayor of Turku***
*"Sustainable urban development can only be created in cooperation with partners who bring different perspectives and knowledge to the process. Businesses are important partners as they have expertise and solutions to offer. Many businesses have revised their business models for cities to identify holistic solutions instead of purely technical ones. This suits us well."*

***Berend de Vries, Deputy Mayor of Tilburg***
*"A real paradigm shift is needed in order to create a sustainable society. Greening the economy is at its core. And nowadays businesses are challenging local authorities more and more on the issue of sustainability. We believe that all stakeholders have a responsibility and should take an active role in the sustainability challenge, especially the business community."*

***Francisco Ayón López, Mayor of Guadalajara***
*"The sustainability of cities cannot be achieved by isolated efforts, but requires the involvement of governments, society and business."*

***Michael A. Nutter, Mayor of Philadelphia***
*"Cities need to continue to share best practices with one another while also problem solving alongside our partners in the private sector who share many of our goals."*

## ROLE OF BUSINESS

**Business plays an essential role in the transformations required to achieve urban sustainability.** The key infrastructure, technology, services and financing solutions that will support the sustainable visions and strategies of cities are predominantly developed, designed and implemented by businesses. The critical role of "solutions provider" means that business is an important stakeholder for cities as they develop and implement sustainability programs.

In addition, business has a vast array of knowledge, expertise and capabilities that cities can draw on to help navigate the interconnected challenges they face in turning a high-level vision into a practical, implementable action plan. With many cities seeking to drive major transformational investment with limited resources and fiscal constraints,[9] well-informed strategy development and decision-making becomes essential to achieving success. Business can provide this input in a number of key areas including:

- **Innovative and effective solutions.** To achieve their sustainability visions, many cities will need to leverage the possibilities of new innovative technologies while also scaling up existing proven solutions. For example, smart electricity grids and water networks can greatly improve the efficiency, reliability and environmental performance of key urban infrastructure while also allowing consumers to make better informed usage decisions and reduce their bills. The use of intelligent transport systems (ITS) can significantly reduce congestion and vehicle emissions and encourage the use of public transport. As for promoting energy efficiency in buildings, much of the technology is already available and success lies in driving market transformation and implementation.[10] The rapid evolution of technologies combined with the complexity of implementing solutions in a real city environment make this a highly challenging domain for city decision-making. Businesses have a deep knowledge of existing and emerging solutions and the benefits, opportunities, risks and costs associated with them. They can provide useful insights to support city decision-makers and citizens to help analyze how these solutions could meet the needs of their city and to establish the right incentives to drive market deployment. Businesses can also share their experiences in implementing solutions in other cities to show how they can work in practice.
- **Integrated approaches to addressing urban challenges.** The necessary transformations of urban infrastructure to drive sustainability requires an integrated approach and a system-wide perspective from the outset (see BOX 4). A broad range of economic, social and environmental priorities must be considered within organizational and resource constraints. Optimal solutions will require cross-cutting actions supported by complex collaboration across technical departments and stakeholder groups, rather than separate, isolated initiatives. A 2012 report by the United Nations Environment Programme described the necessity of an integrated approach as "...perhaps the greatest challenge to realizing [urban] sustainability in the long-term."[11] Businesses can bring wide-ranging experience from different sectors to help cities understand complex systemic challenges and develop holistic, integrated solutions.
- **Financing and implementation.** Mobilizing the financial resources and expertise to implement transformational sustainability programs presents a real challenge for many city administrations (see BOX 4). Many businesses have expertise in the opportunities and limitations of public-private partnerships (and other models of private sector involvement) that can mobilize private capital and know-how to help cities scale up implementation, improve service delivery, and/or manage risks more effectively. In other instances, the best solution may be to establish policies and incentives that drive the market deployment of solutions that minimize public investment requirements; here business can provide important inputs to support effective policy design. Business can also help city authorities establish priorities and roadmaps for solution implementation that can help maximize progress towards objectives over time when financial resources are constrained.

[9] OECD 2013
[10] WBCSD 2009
[11] UNEP 2012, pg. 9

- **Development of the local green economy.** Business is at the center of the development of the local green economy. Business can provide critical inputs to the development of policies to enhance the expansion of green sectors and industrial clusters, and highlight key enablers and constraints (e.g., workforce skills gaps). As noted by the OECD, this input is critical to ensuring that green growth strategies work and meet actual demand.[12]
- **Business sustainability leadership and best practices.** Many leading businesses, in particular WBCSD members, have set themselves ambitious sustainability goals and have substantial experience in driving their own sustainability programs and initiatives. Their experience can provide additional valuable insights for cities developing their own programs.

*BOX 4 – WHY FOCUS ON INFRASTRUCTURE?*

*Infrastructure is central to many of the key challenges facing cities and local governments around the world. A recent report from McKinsey estimates that the world will require $57 trillion in infrastructure investment to 2030 – more than the current value of the worlds' existing infrastructure – with the majority of investment needed in urban centers.[13] This a global issue: advanced economies need to maintain and replace aging infrastructure, while fast-growing cities in the developing world need major investments just to provide basic levels of services to rapidly growing populations.[14] Cities face major challenges in financing this infrastructure, particularly with the constraints on public sector resources and commercial debt in the wake of the financial crisis.*

*Further complexity comes as cities are also seeking to drive sustainability and improve resilience to climate change and natural disasters. Achieving many ambitious sustainability targets will necessitate major transformations in the design, construction and operation of a city's infrastructure systems – including buildings, energy, mobility, telecommunications, water, sanitation and waste management services – and optimizing the inter-linkages between these systems.*

*A system-wide perspective becomes particularly important as new infrastructure technologies evolve and become increasingly connected. For example, many cities are seeing the simultaneous deployment of low- or zero-energy buildings, renewable energy technologies suitable for the urban environment, the development of smart electrical grids, and the growing market uptake of electrically-chargeable vehicles. Individually these developments can generate opportunities for major reductions in energy use and emissions and to improve resilience. However, these elements are inter-linked and their co-evolution needs to be considered holistically if cities are to fully optimize the overall benefits of evolving urban infrastructure systems.*

Cities have long sourced solutions and services from the private sector and have engaged businesses to design, build, operate and maintain major infrastructure. However, under this traditional model, businesses are generally involved late in the city's planning/implementation life cycle, when the opportunities to promote innovation and provide this valuable strategic input are limited. **Cities and businesses need to develop new models of collaboration early in the planning process so as to leverage the full capability of the private sector to drive innovative solutions and support effective decision-making.**

There are examples of leading cities working with business early in the planning process to help advance their sustainability agendas. However, this is currently the exception rather than the rule. This represents a major missed opportunity for cities.

[12] OECD 2013

[13] McKinsey Global Institute (2013)

[14] Ibid.

While every city has a different economic, social, cultural and regulatory context, there are several common factors that appear to limit early engagement with businesses:

- **Lack of awareness of the potential business contribution.** Cities are often unaware of the constructive role that business can play and/or the value business can bring to their strategic planning processes. The 2013 LSE Cities survey, a major survey of leading cities, found that around 60% thought industry input from business associations was very important or important in formulating a city's sustainability strategy, while around 50% thought the input from individual businesses was very important or important.[15] In some respects these figures present an encouraging picture, but they also suggest that raising the awareness of the critical contributions that business can make to strategy development is required.
- **Perception of biased input.** City officials may not have full confidence that business representatives will give input that is in the city's best interests and assume that they will use an engagement only as means to pursue their own commercial interests.
- **Lack of suitable engagement processes.** Cities may not have processes in place that enable strategic engagement with business early in the planning cycle, or they may be unsure of how such a process could be established or integrated into existing regulations or stakeholder engagement and planning processes.
- **Regulatory-related constraints.** Regulations – in particular those relating to public procurement – can limit interactions between cities and the private sector. Such regulations are intended to ensure the integrity and effectiveness of public procurement and planning processes. However, these rules (or more importantly, how they are applied and perceived in practice) may have the unintended consequence of losing valuable input from business that could benefit the city and its citizens. Risk-averse public officials may avoid engagement with business simply to ensure compliance. Businesses may avoid contributing to planning discussions if there is a risk that it may exclude them from bidding/participating in the implementation of projects or activities arising from the plans.

## THE UII: DEMONSTRATING THE VALUE OF EARLY BUSINESS ENGAGEMENT

The UII was established to demonstrate the valuable role that business can play in supporting cities in turning their sustainability vision into a practical, cost-effective action plan through early engagement in the strategy and planning process (see Figure below).

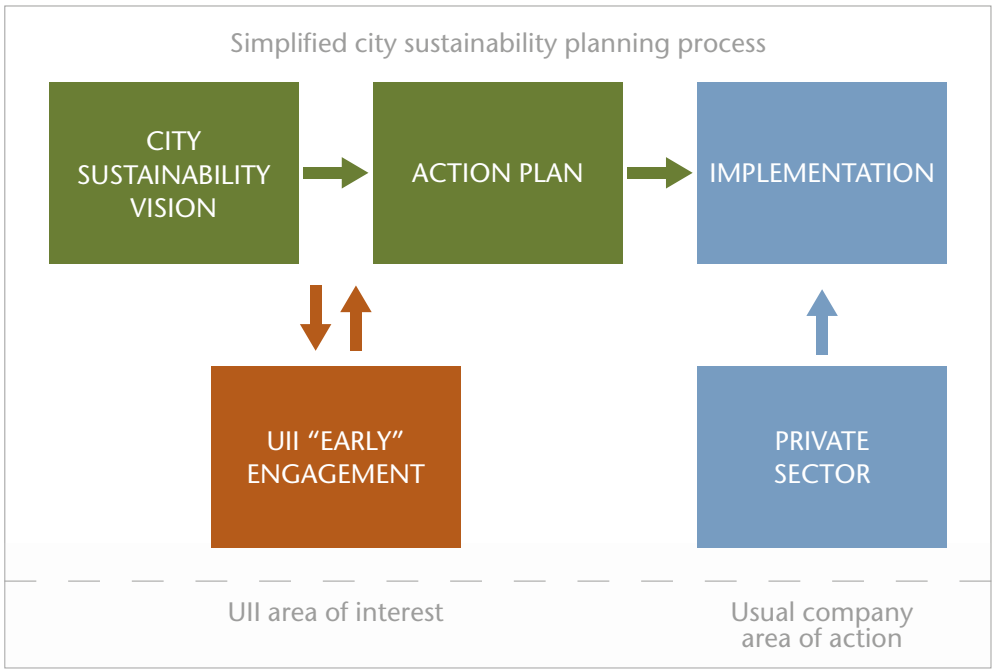



Figure 3 UII: A new model of city-business engagement for sustainable development

[15] LSE Cities 2013


Figure 4 Areas of city infrastructure expertise

The initiative developed an innovative engagement platform to mobilize multi-company, multi-sector expertise. The aim was to work collaboratively with cities to identify a portfolio of potential solutions to address holistically the complex cross-cutting sustainability challenges cities face.

The 14 UII member companies formed a dynamic, multi-sector group with expertise in many infrastructure sectors and experience in strategy, finance and project management. Their business is in buildings, energy, water, engineering, equipment, materials, mobility and logistics, support services, and integrated solutions and systems covering the infrastructure life cycle, from design to operation and maintenance (see Figure above). Collectively, UII members employ more than 2 million people and have revenues of more than $900 billion. They span the globe and, as WBCSD members, demonstrate a strong commitment to sustainability.

The UII engagement methodology was specifically designed to demonstrate the key capabilities that business can bring to support sustainability decision-making, while also providing a practical demonstration of how the barriers to city-business engagement can be overcome.

The UII tested this approach by working with 10 cities in different regions of the world. The partner cities were at different stages of development, offered different systems of governance, and had different urban development and sustainability challenges.

## THE UII APPROACH

The engagement approach used by the UII in working with partner cities had five main steps, which are described in more detail below (see Figure 5). The first steps were facilitated by 'bridging organizations' – respected third party stakeholders that have a detailed understanding of the local context. The bridging organizations were ICLEI – Local Governments for Sustainability (Turku and Tilburg); The State Government of Gujarat (Gujarat cities); the Business Council for Sustainable Development in China (Yixing); Japan Facility Solutions (Kobe); The Inter-American Development Bank (Guadalajara); and the Urban Land Institute (Philadelphia).

1. **Identify partner cities.** The UII worked with the bridging organizations to identify suitable cities to work with in key regions of the world. The criteria for the selection were: an existing sustainability vision; the strong commitment of the city leadership to implement this vision; and a willingness to engage constructively with business. In the initial design of the initiative, the objective was also to seek medium-sized cities by population. In many regions of the world, cities this size are growing quicker than larger cities but often have fewer resources available to deal with this growth. In practice, the UII ended up working with cities of a range of sizes.
2. **Agree on the scope and process for the engagement during initial discussions with the city.** A meeting with city leaders helped to identify the main topics to be considered by the UII and to determine the process to be followed.

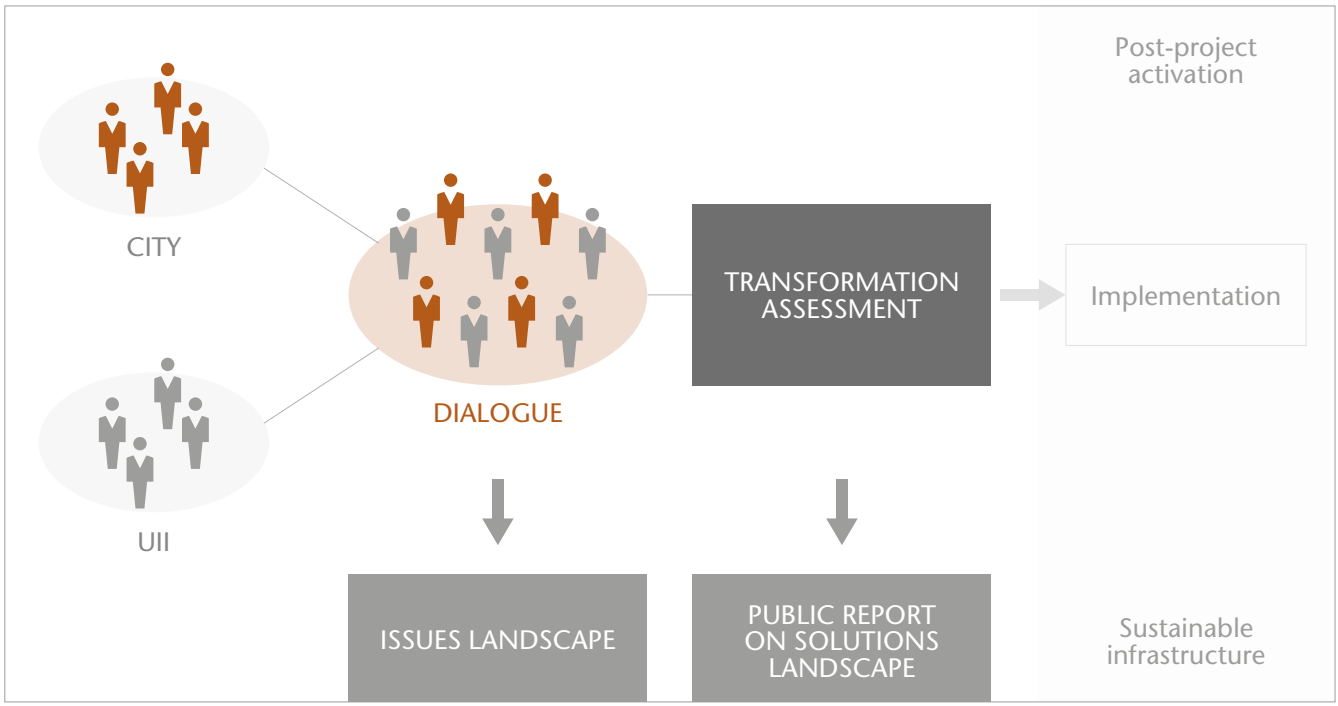



Figure 5 UII approach overview

This discussion triggered a dialogue which led to agreement on priority issues to be addressed during the engagement.

3. **Engage in dialogue with the city to put together an "issues landscape."** This dialogue brought together businesses and city officials to jointly discuss the issues the city faced and the areas where businesses could best contribute to developing practical solutions. During the dialogue, the UII team gained a full understanding of the city's sustainability vision and targets and the barriers to progress. The dialogue ended with agreement on the transformation process to follow.
4. **Organize a transformation assessment to create a "solutions landscape."** In each city, the UII mobilized a multi-disciplinary team of company experts to work collaboratively with senior city officials. These teams took an integrated, cross-sector approach to analyzing the city's major sustainability challenges and to developing a "solutions landscape" (i.e., a portfolio of solutions) to address these challenges. The UII engagements were several steps removed from tendering and procurement processes, allowing a wide-ranging conversation with total transparency. The UII functioned like a laboratory in which cities explored and tested different options.
5. **Publish a public report on the conclusions and recommendations.** Individual city solutions landscape reports are available at www.wbcsd.org

## ASSURANCE GROUP

In common with other WBCSD projects, UII established an Assurance Group of eminent independent individuals as a core element of the project's governance. The Assurance Group was charged with ensuring, and ultimately testifying, that the UII maintained a high level of integrity, independence and accountability. The Assurance Group, made up of highly experienced and knowledgeable urban planning and sustainability experts, was also able to offer important guidance and advice on the design, development and implementation of the UII. The members of the group were:

- Nicholas You (Chair), independent consultant, former Senior Advisor of UN-Habitat, Nairobi, Kenya.
- Cheong Koon Hean, CEO of the Housing and Development Board, Singapore.
- Kees Christiaanse, Professor of Architecture & Urban Design at ETH Zürich, Switzerland.
- Mario Gandelsonas, Director of the Center for Architecture, Urbanism and Infrastructure at Princeton University, New Jersey, USA.
- Jaime Lerner, architect and urban planner and former Mayor of Curitiba, Brazil.
- Shin-ichi Tanabe, Professor of Architecture at Waseda University, Tokyo, Japan.

The Group reviewed progress at critical points in the project. It met with the project co-chairs three times and provided an independent review of this report.

# 03

# UII SOLUTIONS LANDSCAPE REPORTS[16] SUMMARIES

# EUROPE

## TURKU (FINLAND)

**City overview**
Turku is one of Finland's leading cities, with a population of approximately 180,000. It plays an important role in the region's economy and in advancing sustainability within the region.

Turku is experiencing the same megatrends as other cities. It has a growing and aging urban population that has rising expectations for personal mobility. Energy security and climate change considerations require energy savings as well as cleaner energy sources. An agreement with the Ministry of Employment and Economy commits the city to advancing energy efficiency and the use of renewable energy. The rise of Internet shopping creates more local deliveries, adding to congestion and emissions.

**UII engagement**
The UII entered into a dialogue with Turku with the assistance of ICLEI – Local Governments for Sustainability acting as the bridging organization. The dialogue identified key issues that were subsequently addressed in a series of workshops held in Turku City Hall in March 2011. Participating companies were Siemens (lead), ACCIONA, GDF SUEZ, TNT Express, Toyota and United Technologies.

**Sustainability vision & issues landscape**
Sustainable development is one of Turku's core values and the city is a signatory to the Covenant of Mayors. It launched a Climate and Environment Program in 2009 that aims to reach a target for greenhouse gas emissions 20% below the 1990 level by 2020. Approximately 60% of electricity and 30% of district heating already comes from renewable energy sources. A biogas project is also underway, generating fuel from landfill for use in public transport vehicles.

The Climate and Environment Program is supported by a Sustainable Energy Action Plan (SEAP) focusing especially on buildings, equipment and transport, and also influencing markets and citizens' consumption patterns.

The initial dialogue with UII considered three broad topics: city center development, land use and energy. It concluded that Turku's SEAP would be the focus for UII's involvement, with three key areas that represent the major sources of greenhouse gas emissions in the city and the major opportunities to achieve sustainable energy targets as well as improve the quality of life for citizens:

- Transport and logistics
- Energy supply
- Energy use

[16] A more complete report on each city engagement is available at www.wbcsd.org/urban-infrastructure.aspx

## *BOX 5*

### *JARKKO VIRTANEN, TURKU DEPUTY MAYOR*

*"Many businesses have revised their business models for cities to identify holistic solutions instead of purely technical ones. This suits us well. Sustainable development is a long-term core value for the City of Turku and creating new partnerships is part of our strategy.*

*UII is a well-designed attempt to overcome the gaps in knowledge, resources and processes that are holding back progress. The local government network ICLEI provided a good bridge and helped us to get started. And we were impressed by the overall work and analysis of WBCSD on urban sustainability.*

*Our responsible directors and leading experts had a unique chance to work intensively with experts from the UII companies to find the best possible solutions for Turku. This was a very creative but realistic process where we presented our challenges and the companies proposed solutions. Together with the UII partners we developed a portfolio of new actions for our sustainability program. Some can be implemented now and others will be useful for our new programs and strategies.*

*We are now better aware of the solutions and new forms of cooperation that advanced businesses can offer. The early engagement of businesses means we are now well-placed to use this knowledge in planning our new strategies and actions. We will also look for ways to make this new approach part of our regular strategy and program process.*

*We are moving towards implementing many of the actions and will probably develop our future sustainability strategies in even closer cooperation with businesses. We have already started a three-year partnership project for studying new methods and solutions for urban sustainability."*

**Solutions landscape**
The transformation workshops considered 18 solutions in three thematic clusters covering infrastructure and operational solutions.

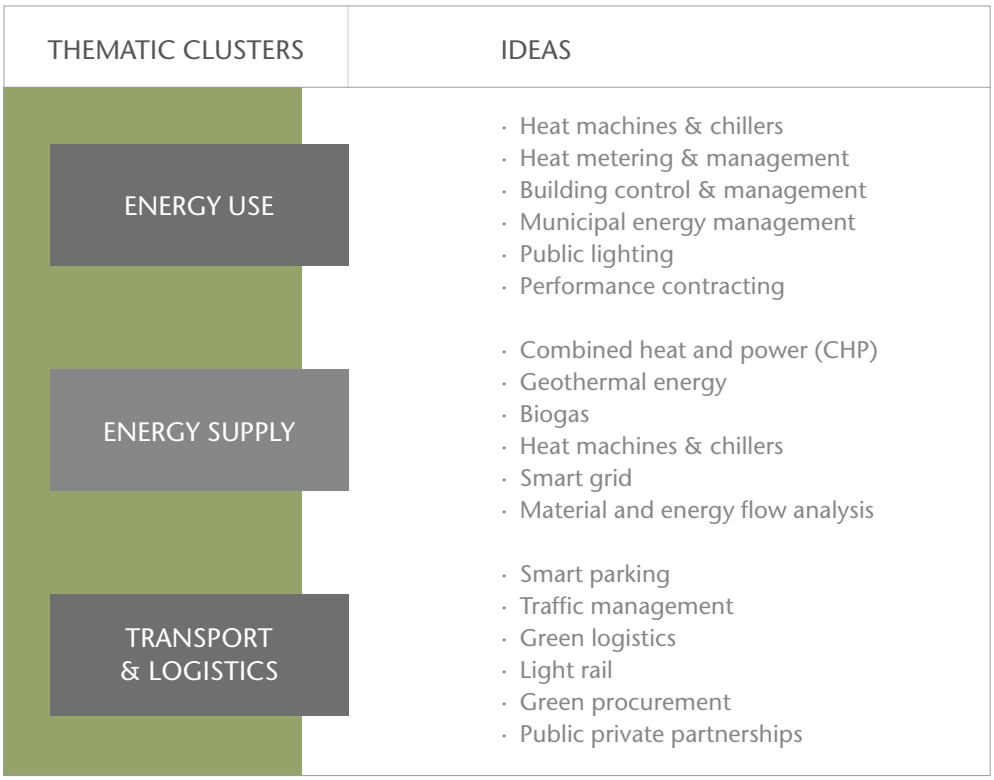



Figure 6 Initial Solutions landscape for Turku

The city staff judged the priorities based on the potential impact on the city and the ease of implementation, and identified the following eight priority solutions:

- **Building control and management.** Use electronic communication between equipment from different manufacturers so that building and energy managers can collect and report information across different systems.
- **Municipal energy management.** Create a management focus on the city's energy use, improving understanding, planning and control of energy consumption in areas such as public lighting, public buildings and municipal facilities.
- **Biogas.** Capture and burn methane from decomposing vegetation and garbage, animal and human manure in sewage treatment plants and landfill sites, producing compost as a by-product.
- **Material flow analysis.** Study areas and activities to quantify inputs and outputs and understand the flows, identifying process and behavior changes to achieve environmental improvements.
- **Green logistics.** Innovate with technology, supply chain features and collaborations to cut congestion and reduce greenhouse gas emissions.
- **Green procurement.** Use the city's purchasing power to choose goods and services with lower impacts on the environment.

- **Public private partnerships.** Collaborate to enable the private sector to contribute physical infrastructure and resources to achieve lower emissions.
- **Traffic management systems.** Reduce bottlenecks and congestion and make the most of all transport modes by communicating dynamic public and private traffic and parking information, with real-time information on current conditions, the best route and parking options, and links to public transport.

Action relating to these solutions could begin immediately, without the need for in-depth studies, lengthy consultation, or political or financial negotiation. The engagement also identified two longer-term solutions for Turku – development of a light rail system and the establishment of a smart electricity grid. These solutions would build on the immediate opportunities to create a sustainable transport and energy infrastructure, but would require further analysis and resourcing.

**Outcomes & lessons learned**

The UII engagement allowed Turku's city officials to consider a variety of ideas and to engage with businesses collectively to consider practical solutions that will help achieve the city's vision. The city appreciated the proposal of new solutions that were grounded in the needs of the city and based on the best available practices. For example, the UII introduced the concept of a municipal energy management structure together with building control systems to improve control of the city's own building energy consumption and meet energy-efficiency goals.

It was the perspective of the city that the companies' inputs on energy and transport created a valuable and well-informed dialogue early in the planning process. The city learned not only about new technical possibilities but also new conceptual approaches. Some of these insights might otherwise only have come from trial and error, which could have been costly.

The presence of company experts from different sectors stimulated more fruitful discussions than single-sector engagement and produced a range of views and solutions for the city. Inputs from logistics and energy experts demonstrated the potential of capturing biogas from the city's waste, some of which could be used in the city's vehicles.

In addition, it was the city's view that the engagement helped to build their confidence in their sustainability strategies and programs. The dialogue confirmed the direction of Turku's overall strategy and the key elements of the implementation plan, allowing the city to move forward with greater certainty.

Following the UII engagement, Turku continued to explore the potential for light rail systems identified as a longer-term solution in the UII engagement.

The UII report *A solutions landscape for Turku* was delivered in February 2012.

See online: http://www.wbcsd.org/uiiturkureport.aspx

## TILBURG (THE NETHERLANDS)

### City overview

Tilburg is the sixth largest city in the Netherlands, with a growing population of more than 200,000, including a large student population. It is a relatively young city by European standards, celebrating its 200th anniversary in 2009. It originally grew as a center of the wool industry, and textiles were a dominant part of the local economy until production moved to low-wage countries in the 1970s. Since then it has developed varied economic activity, although some of the old textile mills and factories remain and are ripe for redevelopment. It is an important logistical center, close to the ports of Rotterdam and Antwerp and the industrial Ruhr valley.

### UII engagement

ICLEI – Local Governments for Sustainability facilitated the initial engagement between the UII and Tilburg. The UII team consisted of representatives from TNT Express (lead), AGC, Cemex, Schneider Electric and Siemens.

The UII and the city of Tilburg agreed the engagement would focus on translating the city's 2045 climate neutral vision into specific projects to be implemented in the near future. Working with Tilburg's environment team, UII devised a workshop structure to identify potential solutions for four key issues (see below). The city mobilized key officials working on various policy areas as well as representatives from the local business community and academia to join the UII team in the workshops, held in September 2011. To make sure the identified solutions could be implemented, the engagement team identified "enablers" that would make a transformation possible.

### Sustainability vision & issues landscape

The city's ambition is to be climate neutral and protected against climate change by 2045. It is targeting $CO_2$ emissions reductions of 30 % by 2020 and 60 % by 2030 (compared to 2009). Initial engagement between the UII team and the city identified the climate vision as the focus of the UII contribution. The vision was impressive but the city needed to provoke action to begin moving towards it, especially with the involvement of the business sector. Discussions centered on four building blocks, each of which could contribute significant carbon reductions with the right solutions:

1. Business parks, which provide a third of the city's employment
2. Buildings – residential, commercial and industrial
3. Transport – especially the transport of goods around the city
4. Energy supply.

**Solutions landscape**

The workshops identified 10 potential solutions suitable for further exploration (BOX 6). The city representatives prioritized the opportunities based on their potential sustainability impact and their feasibility.

In addition to the development of specific solutions, the UII team identified a number of key enablers that could help drive action towards the city's ambitious sustainability goals: regulation; communication; education; entrepreneurship; and funding and financing mechanisms.

**Outcomes & lessons learned**

The UII engagement helped the city to develop plans that will translate its long-term vision into reality. It broke down the high-level ambition to specific goals and proposed specific projects to achieve these goals. The workshops allowed city officials to consider a variety of ideas and to engage with businesses collectively in a broad context rather than in relation to specific tenders.

Engagement with global as well as local businesses highlighted the need for goals to be realistic, while involvement with companies from different sectors enabled the identification of multi-sector city solutions, such as the sustainability-oriented development of the city's business parks.

From a process perspective, the city has expanded the use of the dialogue model demonstrated by the UII. The city now includes an extensive dialogue process with a range of stakeholders – including business – as part of its planning approach for sustainability.

This approach could be applied easily to other cities in the region, although similar cities may also benefit from cooperation within the region or with a cluster of nearby cities. Early business engagements like this could be possible in the Netherlands on the condition that the city bring all parties equally around the table.

The UII report *A solutions landscape for Tilburg, the Netherlands* was delivered in May 2012.

See online: http://www.wbcsd.org/uiitilburgreport.aspx

*BOX 6 – SOLUTIONS LANDSCAPE FOR TILBURG*

1. *Business park Internet marketplace – to bring complementary businesses together and allow them to match supply and demand*
2. *Total cost of ownership approach to business parks – to overcome a short-term outlook on energy-efficiency investments*
3. *Requirements for building energy efficiency – "sticks" to accelerate action alongside incentives (or "carrots")*
4. *Replacement of inefficient houses – to overcome homeowners' inability to finance improvements*
5. *Energy label obligation – to achieve a jump of at least one level in the A-G labeling system as a requirement for every property sold*
6. *"Comply or explain" on zero-emission building – to incite developers to create zero-emissions homes or explain why it has not been done*
7. *Showcase city buildings – to educate citizens and businesses and stimulate a desire for high standards*
8. *An open network for goods delivery – to consolidate deliveries, reducing traffic volumes*
9. *A building manifesto for Tilburg – to stimulate action by requiring signatories to take specific actions*
10. *A business green guide for the city – to promote companies that meet sustainability requirements.*

## *BOX 7*

### *BEREND DE VRIES, DEPUTY MAYOR OF TILBURG*

*"It [the engagement] reinforced our thinking that the stakeholder approach is the way to go. And at the end of the day, we might have the plans, but it is businesses that can convert a plan or idea into action.*

*We have identified a portfolio of potential projects with a clear idea of the priorities and possibilities, ranging from a new approach to our business parks to replacing housing with very low energy efficiency.*

*Working with the UII opened up an entire new network for us. Dialogue is crucial and mutual inspiration can lead to new ideas and business cases. We want to follow up and turn those business cases into local Green Deals. This makes good business sense and makes Tilburg more sustainable."*

# ASIA

## GUJARAT CITIES (INDIA)

**Overview**
Gujarat is one of the most industrialized and urbanized states in India. It is known as "The Urbanized State of India" and will soon have more people living in cities than in villages for the first time in its history. Per capita GDP is almost twice the national average, and Gujarat has the fastest growing state economy in the country. However, rapid urbanization and industrialization have had some adverse impacts on quality of life and the environment. Inconsistent regulatory measures and enforcement have resulted in haphazard growth and unplanned urban development. This has led to poor air and water quality, inadequate wastewater management, intermittent energy supplies, and degradation of ecosystems and habitats. The rapid expansion of electricity generation, mostly using coal, has increased greenhouse gas emissions that contribute to localized pollution problems and wider climate change.

**UII engagement**
Gujarat is the first region in which UII companies collaborated with more than one city, and also with the state government. The four cities that the UII worked with – Ahmedabad, Rajkot, Surat and Vadodara – have populations of between one and six million and are growing fast. Seven global companies and their colleagues in India took part in this engagement: United Technologies (lead), ACCIONA, AECOM, AGC, GDF SUEZ, Schneider Electric and Siemens. They worked with officials from the government of Gujarat and municipal corporations to identify key challenges specific to Gujarat cities, and to propose practical solutions. The companies also met with the state Urban Development and Urban Housing Department (UDUHD) and the Gujarat Urban Development Corporation (GUDC).

The UII team met officials in each of the four cities in July 2011 to agree on the issues landscape. The company representatives identified the key challenges in each city and common to them all, prioritized them, and suggested solutions that could help them meet those challenges in a holistic manner.

**Sustainability vision & issues landscape**
State and city leadership are very conscious of the need for development to be inclusive and sustainable. The state government is acting on climate change, and Gujarat is the only Indian state with a Climate Change Department. It has been proactive in promoting renewable energy projects as a means of meeting demand without adding significantly to emissions. In 2009, Gujarat became the first state to announce a comprehensive solar energy policy.

Gujarat's cities are taking the lead in many aspects of sustainable urban development in India; for example, Ahmedabad's successful bus rapid transit system is now being replicated in other major Indian cities.

Initial dialogue considered the broad topic of sustainable urban development and identified energy efficiency and wastewater management as specific challenges UII could help the cities to address. To ensure a long-term holistic approach, the UII team addressed these specific issues under the "umbrella" of urban master planning. Specific issues addressed included professional and technical capacity, regulatory and infrastructure challenges.


Figure 7 Solutions landscape for Gujarat Cities

**Solutions landscape**

Multiple strategies were identified within urban planning, energy efficiency and wastewater, and each strategy consisted of a number of potential solutions, as summarized in Figure 7. Urban planning provided the overarching framework under which energy efficiency, wastewater and other sustainability issues were considered.

The urban planning solutions are a package to be implemented in three stages. The foundation consists of a long-term master plan, and individual plans for integrated mobility and open spaces. The second stage, which will build on this base, will introduce regulatory policies for urban boundaries and new townships, and procedures for quality assurance and control. Finally, supporting actions will complete the plan, with pilot projects on database development, sustainability, and smart growth in the cities, and programs for a knowledge partnership and technical / vocational training.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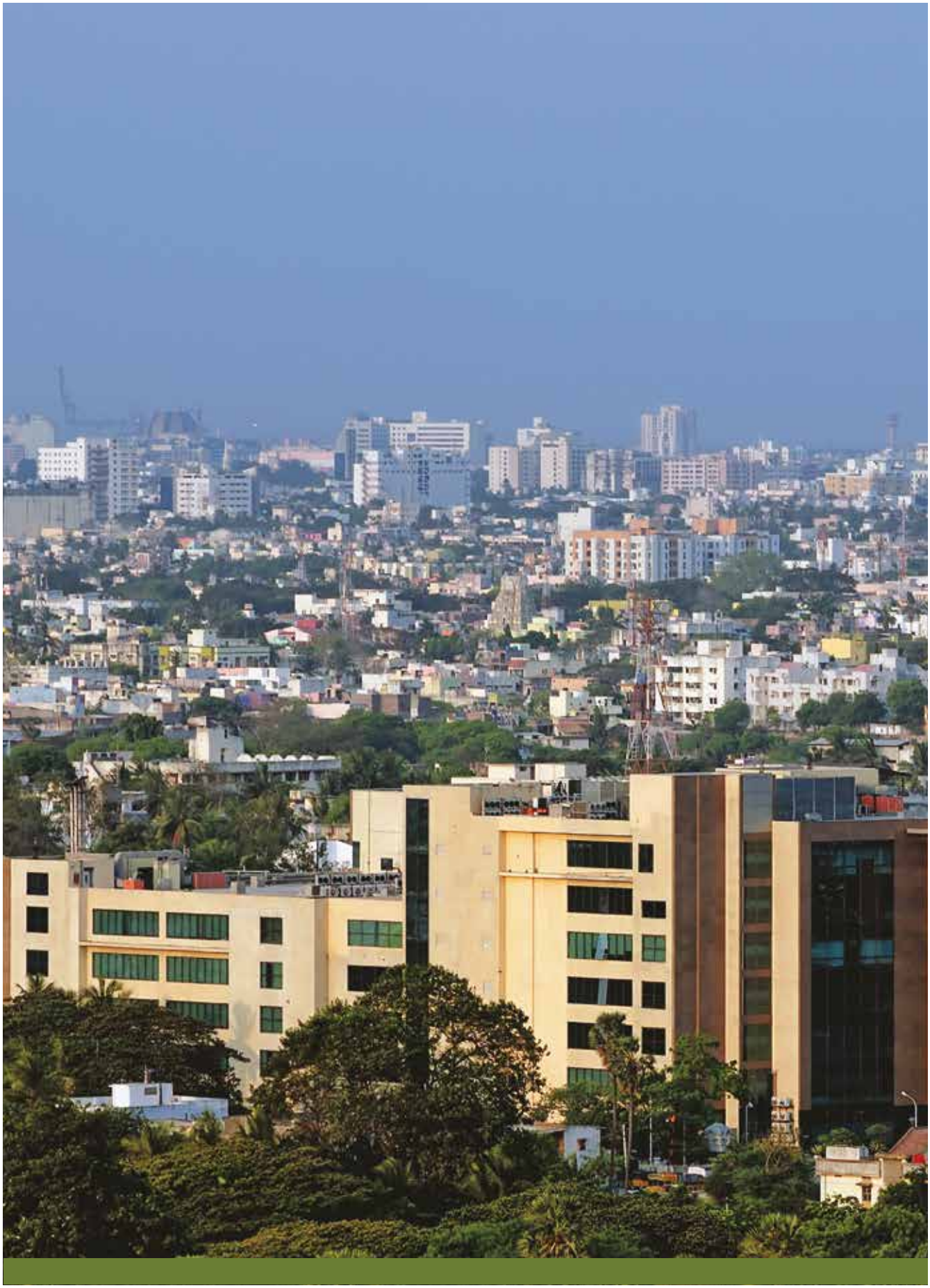

The energy efficiency solutions focused on energy use in non-municipal buildings, which offer many opportunities for improvement and will be critically important given the rapid expansion of the partner cities. The co-benefits of these solutions were also highlighted: lower operation and maintenance costs, increased productivity, improved well-being and comfort of building occupants, and increased building and component durability and flexibility.

The solutions for wastewater management focused on improving the knowledge base and regulation; cost-effective opportunities to enhance the efficiency of infrastructure and promote new environmentally-friendly treatment technologies; and consideration of potential private sector participation and investment models to drive implementation.

**Outcomes & lessons learned**
The engagement helped officials understand how business could contribute to sustainability goals by identifying practical solutions. It demonstrated that if companies have a chance to understand the visions and the challenges, they can come up with new and effective solutions.

The cities welcomed the approach of multi-sector companies discussing the different challenges the cities face in meeting their development ambitions. Having a multi-sector company team stimulated interaction with and between officials from different areas of urban development who might not have otherwise worked as closely together. A group of companies working together also resulted in a more "rounded" solutions set representative of the range of options available.

The UII also provided some additional opportunities for engagement with the participating cities during the course of the UII process, which served to further demonstrate the value that such a dialogue platform can allow. In one example, the city administration decided to participate in a new central government solar policy, and had appointed a third party consultant to develop a roadmap for compliance with the requirements of this scheme. UII was requested to peer review the proposal, and worked with the city and consultant to provide feedback on the city's Solar City Master Plan. In another example, the city administration was carrying out a master planning process, as well as developing a by-law on energy efficiency. Having built up the relationship with UII companies, the city officials were able to readily seek the UII team's expert feedback on the draft master plan and draft by-law. This input helped the city more fully understand the opportunities to drive local market transformation and incentivize sustainable solutions within city by-laws.

Local laws and regulations would generally not prevent individual companies from working with a city on sustainability solutions and subsequently responding to a tender. But bringing together a group of companies made it possible for this process to move much faster and to take a broad, multi-sector perspective.

The 28 solutions described are likely to be applicable to many other Indian cities. There are several growing networks of cities in India focusing on sustainability issues, which could provide excellent learning platforms for the dissemination of the lessons from the Gujarat cities engagement more broadly.

The UII report *A solutions landscape for Gujarat Cities, India* was delivered in July 2012.

See online: http://www.wbcsd.org/uiigujaratreport.aspx

## YIXING (CHINA)

**City overview**

Yixing is a county-level city in Jiangsu province at the center of the Nanjing-Shanghai-Hangzhou delta region with a population of 1.248 million. It is a historical city dating back to the 4th century. Several sites are protected by the provincial government, and Yixing is increasingly seen as a major destination for ecotourism centered around the Longchi Mountain Provincial Nature Reserve. The city also boasts a large water area, with lakes, canals and the Liyi River. Several expressways link the towns in the vicinity of Yixing and connect the city to major centers, including Shanghai.

**UII engagement**

Representatives from three companies (Schneider Electric (lead), AECOM and Siemens) and the WBCSD worked with officials from several city departments to identify key sustainability issues and propose solutions. The engagement was facilitated by the China Business Council for Sustainable Development and began in April 2012 when the UII team met the mayor and vice mayor of the city and officials from several city bureaus. Over the following months the company experts carried out a transformation study to develop solutions, priorities and a high level implementation plan, culminating in a major workshop with senior city officials held in October 2012.

**Sustainability vision & issues landscape**

The city has set out a clear goal for its long-term development: to become China's "demonstration city of scientific and sustainable development." As part of realizing this ambition, the city has completed strategic research on establishing Yixing as the "Oriental Water City." The strategy includes a plan for Yixing to highlight its natural environment and to develop new sustainable models of urbanization. The Yixing municipality has also commissioned a concept plan for a High-Speed Railway New City, an emerging urban district integrating travel services, cultural recreation, business and housing.

During the dialogue, UII learned of the city's sustainability vision and key challenges and developed an issues landscape covering three broad areas. The overarching issue was urban planning, providing the framework within which other specific issues such as transport and energy efficiency can be integrated:

- Urban planning – lack of clarity on the urban structure and its borders; conflict between development and protection of the old city; and logistical problems as the city expands.
- Urban transport – Yixing wants to prioritize public transport and improve the road network to address increasingly severe congestion.
- Energy efficiency – low carbon goals require the city to improve energy efficiency, especially in the industry sector and in buildings.


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**Solutions landscape**

The UII team developed a broad solutions landscape, covering energy and transport, integrated under an overall approach to urban planning.

A comprehensive urban planning framework can enable Yixing to be a pilot project for sustainability and smart growth in China. Two immediate priorities were identified to help drive progress towards sustainable urban planning:

- **Rational land use and appropriate urban structure.** Use of a scientific approach to optimizing land use, based on preserving and protecting ecosystems, preventing urban sprawl and reducing the city's ecological footprint.
- **Protection of ecological and cultural assets through compact mixed-use urban design and green infrastructure.** Optimization of land use, favoring of environmentally-friendly mobility and public transport, and establishment of a continuous band of protected green space, parks and gardens, wetlands and waterways.

The UII team suggested that city of Yixing establish a high-level strategic plan that could link these actions to ensure an integrated approach to land use, urban design, green infrastructure and transport. This plan could be developed and refined over time through additional studies, benchmarking and citizen feedback.

A comprehensive approach to addressing transport and mobility challenges is critical for a fast-growing city like Yixing that is confronted with major increases in traffic every year. The key recommendations for the improvement of the transport and mobility environment included measures to make Yixing a more pedestrian- and bicycle-friendly city; implementing transit-oriented development that dovetails with compact mixed-use urban design; and adopting a concerted, multimodal approach to making better use of existing transport infrastructure, information and traffic management systems.

The UII team identified energy efficiency as a major opportunity area to drive sustainability improvements in Yixing, developing a number of priority solutions to reduce industrial and building energy use. Energy efficiency in buildings must be closely monitored and improved because of the rapid growth of the city. An overarching recommendation was to set up an energy management center to provide better information for policy-making and performance improvement, supported by a city sustainability tracking and management dashboard.

The solutions for transport / mobility and energy efficiency are presented as roadmaps with quick wins and strategies for the short, medium and long-terms (see Figure 8 and Figure 9).

**Outcomes & lessons learned**

The city benefited from the multi-sector composition of the local UII team and its members' experience in other Chinese cities. This allowed UII to take an integrated approach, with master planning as the umbrella for solutions to more specific challenges. The engagement enabled officials from several city departments to discuss sustainability challenges which they normally consider in isolation from each other. The interconnected nature of the challenges facing Yixing requires such a cross-cutting approach.

The UII approach and many of the solutions would apply to many other Chinese cities as the challenges are similar for many urban authorities faced with fast-growing demand for improved infrastructure and services. Nevertheless, tailoring solutions to the unique circumstances of Yixing was an important element of the success of the initiative.

As an outcome of the UII engagement, the city of Yixing has begun a detailed feasibility evaluation of the development of a tram system for the city, working with the China NDRC Transport Institute.

The UII report *A solutions landscape for Yixing* was delivered in June 2013.

See online: http://www.wbcsd.org/uiiyixingreport.aspx

| 2020 / LONG-TERM | |
|---|---|
| • Light railway and metro at city center and linking major transport hubs and town<br>• Automated real-time traffic management and passenger guidance systems<br>• Intelligent transport as part of Smart City Initiative<br>• Urban, inter-urban and national road networks and public transport interaction | Implementation of most advanced transport technologies and role of transport in Yixing's smart city initiative. |
| **2017 / MEDIUM TERM** | |
| • Integrated multimodal transport management platform with real-time data mining and predictive transport management capabilities<br>• Park & ride infrastructure (including bike sharing) at suburban areas<br>• Last mile public transport coverage (e.g., APM and bikes)<br>• Reliable and comfortable public transport (e.g., tram) linking major transport hubs and towns | Focusing on advanced information systems and multimodal transport infrastructure. |
| **2014 / SHORT TERM** | |
| • Integrated traffic management system with priority given to public transport<br>• Real-time fleet management and advanced passenger information systems<br>• Walking streets and bike- and car-sharing schemes<br>• Improved pedestrian crossings in the city center | Focusing on city center and major corridors, and major transport hubs and system integration. |
| **6 MONTHS / QUICK WINS** | |
| • Adaptive signal control to balance the traffic load across urban network<br>• Traffic data assessment and drill-down analysis to optimize traffic management strategies<br>• Re-organized traffic flows and road network (e.g., one-way roads)<br>• Upgrade of existing parking facilities and public transport facilities, and implement stronger enforcement | Focusing on assessment and planning, and laying foundation for the next steps. |

Figure 8 Yixing transport / mobility solutions roadmap

| 2030 / LONG-TERM | | |
|---|---|---|
| Industry | Buildings | Citizen Engagement |
| • Full deployment in target industries and partial deployment in other sectors | • Scale-up to all government buildings and approximately 30 - 40 % of commercial buildings | • Set up a fund for green entrepreneurship |
| **2017 / MEDIUM TERM** | | |
| Industry | Buildings | Citizen Engagement |
| • Total of about 30 projects in the three target industries | • Extend pilot to approximately 30 government buildings and approximately 10 commercial buildings | • Extend sustainability reporting requirement to all companies in Yixing |
| **2014 / SHORT TERM** | | |
| Industry | Buildings | Citizen Engagement |
| • Launch 3 pilot projects in each of the target industries | • Launch a pilot project with approximately 10 government buildings and approximately 3 commercial buildings | • Launch 'Smart Yixing' communication campaign<br>• Build a sustainability museum<br>• Push biggest companies in Yixing to report their sustainability performance |
| **6 MONTHS / QUICK WINS** | | |
| Industry | Buildings | Citizen Engagement |
| • Launch 1-2 trial projects in some of the target industries | • Launch 1-2 pilot projects in government buildings | • Set and publish clear standards for company sustainability reporting<br>• Request all major companies to carry out detailed energy audit |

Figure 9 Yixing energy efficiency solutions roadmap

## *BOX 8*

### *MR. ZHANG LIJUN, MAYOR OF YIXING*

*"As the national sustainable development pilot district approved by the Ministry of Science and Technology, Yixing has been exploring its sustainable development path through accelerating the transformation process of industrialization and urbanization. We aim for 'green economy, urban and rural co-ordination, resource conservation, friendly to environment and benefiting the public'.*

*It is our honor to closely cooperate with the WBCSD on the Urban Infrastructure Initiative (UII) Project. The comprehensive research report covering urban planning, transport and mobility, and energy efficiency reflects the international perspective adapted to the local circumstances. I am confident that through the in-depth cooperation with WBCSD and scientific guidance of Yixing UII report, the city, as the 'Capital of Chinese Pottery and Oriental Water City', will pragmatically take the sustainability pathway in a better way."*

## KOBE (JAPAN)

**City overview**
Kobe City is representative of many of the economic, demographic and environmental issues facing Japan's predominantly urban society. The city, founded during the 8th century, has a population of more than 1.5 million and also has substantial rural and forest areas. After being reconstructed following devastating damage in the Second World War, it was hit again by the Great Hanshin-Awaji Earthquake in 1995. The city now faces a number of economic, environmental and social challenges, including income per head in 2009 lower than in 1990, a rapidly aging population, and rising greenhouse gas (GHG) emissions from the commercial and household sectors.

**UII engagement**
A team of seven global companies – AGC, Honda, Nissan, Toyota (four joint-lead companies), with Schneider Electric, Siemens and TEPCO (in the initial stages) – worked with officials from several city departments to identify key sustainability issues and propose solutions. The UII companies were assisted by Dr. Murakami, Chief Executive of the Institute for Building Environment and Energy Conservation (IBEC) and Professor Emeritus of the University of Tokyo, and Professor Ikaga of Keio University. Japan Facility Solutions (JFS) facilitated the relationship with Kobe and with the academics, and coordinated the engagement and reporting.

The engagement began with a dialogue session in June 2012 bringing together city officials, the UII team and supporting experts. They discussed the city's sustainability vision, challenges, plans and priorities. City officials presented the ambitions for 2050 set out in the Kobe City Environmental Future City Initiative, stressing the importance of social challenges such as the super-aging society. This dialogue identified the issues landscape – the focus for the UII transformation study.

**Sustainability vision & issues landscape**
Kobe City established the Fifth Master Plan in 2010, covering the period to 2025. The plan aims to revitalize the city in harmony with nature. It envisages preserving the abundant natural environment, striving for sustainable community development, and taking major steps towards a low carbon society. Specific plans for the first 5-year period to 2015 are concerned with creativity and innovation, local economic development, population and livelihoods.

In 2012, the city also launched the Kobe Environmental Future City Initiative. It focuses on policy measures for the environment, a super-aging society and other challenges, and visualizes what the city would look like in 2050. The Initiative aims to create a human-centered city in which citizens can live healthy lives with disaster-resistant infrastructure.

The dialogue session between the UII team and city officials touched all three components of sustainability – social, environmental and economic. Four major issues were identified as the focus of the UII engagement:

1. **Energy & energy efficiency.** Kobe has successfully reduced greenhouse gas emissions 11% below 1990 levels. However, recent increases in emissions from the commercial and residential sectors necessitate further action on energy efficiency and scaling up the deployment of renewable energy technologies.
2. **Sustainable mobility.** Greenhouse gas emissions and traffic congestion are major issues associated with transport and mobility in Kobe. The city is also concerned about the social aspects of mobility, particularly to ensure there are appropriate mobility options for the aging population.
3. **Knowledge network formation and internationalization.** The city authorities recognize the importance of building on existing knowledge assets to enhance the city's economic competitiveness and encourage local development of green industries and clusters.
4. **Disaster resilience and reconstruction.** The city has especially valuable knowledge in disaster resilience and reconstruction. However, it is felt that more could be done to share this knowledge with other cities in Japan and the wider region.


Figure 10 Mobility strategy for Kobe

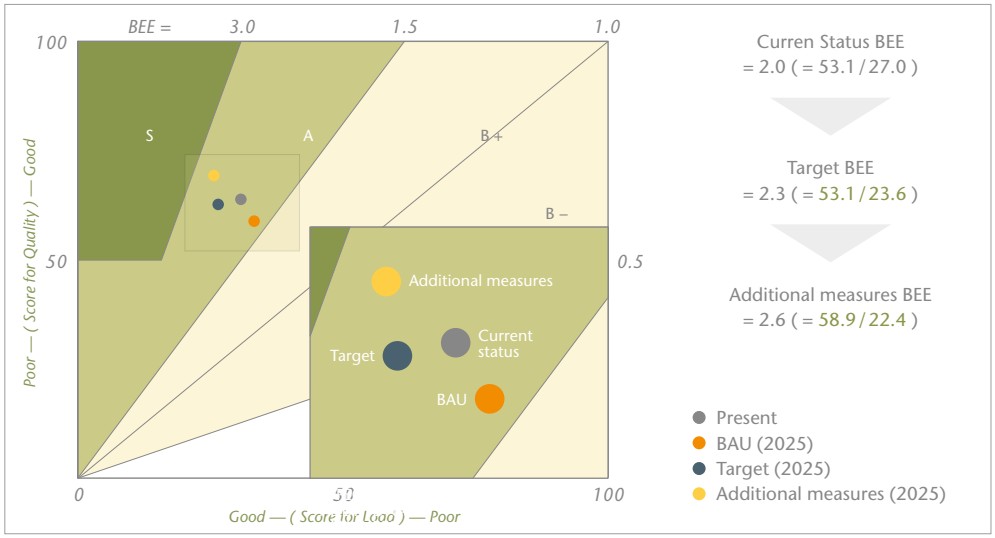



Figure 11 Kobe City assessment using CASBEE-City
*Source: Ikaga Laboratory, Keio University (2012)*

*BOX 9 – CASBEE-CITY*

*CASBEE-City is a modeling tool to evaluate the sustainability performance of cities using a triple-bottom-line approach of environment, society and economy. The tool produces a Built Environment Efficiency (BEE) index score for a city based on social, environmental and economic quality and activity, divided by environmental load. The model gathers data under six major categories which are divided into 18 major subsets of indicators. CASBEE-City was utilized in the UII dialogue with Kobe as it is already used by a number of other Japanese cities. UII commissioned Ikaga Laboratories at Keio University to perform an evaluation of key scenarios for Kobe City's sustainability performance. Figure 11 shows the result of an assessment for 2012 and projections to 2025, including the potential impact of specific UII recommendations (combined with the city's current planned programs). The current BEE for Kobe City 2012 is 2.0, and this falls to 1.7 if no specific policy measures are undertaken by 2025 ("business-as-usual: BAU"). The implementation of the Kobe City Environmental Future City Initiative and the New Kobe City Master Plan will raise the BEE from the current level to 2.3 by 2025. The CASBEE-City modeling then found that the additional impact of implementing the additional UII recommendations – a number of solutions focused on mobility, energy efficiency and renewable energy – could further increase the BEE score to 2.6.*

**Solutions landscape**

The UII team worked collaboratively with Kobe city to develop 14 solutions across the issues identified during the dialogue. In summary, these solutions covered the following:

- Using the Comprehensive Assessment System for Built Environment Efficiency (CASBEE)-City sustainability assessment tool to clarify the route to improve the environmental, economic and social performance of the city and to visualize progress. The use of the CASBEE-City also demonstrated the additional impact of the solutions proposed by UII on the overall sustainability performance of the city (see BOX 9).
- Reducing emissions from energy generation and use by promoting improvements in building energy efficiency; expanding the application of renewable energy technologies; and promoting the expansion of local energy management systems.
- Providing safe, reliable and environmentally-friendly mobility for the citizens of Kobe city through implementing a sustainable mobility strategy, with a particular focus on meeting the needs of an aging population. An overview of the proposed Mobility strategy is presented in Figure 10.
- Contributing to business creation, and the vitality and appeal of Kobe city by facilitating the development of a knowledge-based economy.

**Outcomes & lessons learned**

The city of Kobe appreciated the UII's endorsement of its long-term sustainability plan and the use of the CASBEE-City model to provide consistent measurements and to assess the mixture of programs from an integrated perspective.

The engagement demonstrated to Kobe the potential to have an open and trusting relationship with a group of businesses. The city valued the proposed solutions and is particularly interested in pursuing sustainable mobility solution concepts. Having a multi-sector team brought a rounded view of the challenges and solutions rather than individuals focusing on an isolated topic. The companies also brought detailed familiarity with central government policies, providing useful insights into national policy-making affecting urban sustainability outcomes.

The solutions developed with Kobe would be beneficial to many other cities all over the world, especially cities wishing to learn from Kobe's unique knowledge in improving disaster resilience.

Tools like CASBEE-City can be a very useful addition to a sustainability dialogue process, by providing a mechanism to holistically assess the potential impact of solutions.

The UII report *A solutions landscape for Kobe City* was delivered in May 2013.

See online: http://www.wbcsd.org/uiikobereport.aspx

# THE AMERICAS

## GUADALAJARA (MEXICO)

### City overview

Guadalajara is Mexico's second largest city and the capital of the state of Jalisco. The Guadalajara metropolitan area includes the Municipality of Guadalajara (which the UII worked with) and six adjacent municipalities and has a total population of more than 4.4 million. It is experiencing the same challenges as other large urban centers in Latin America. Rapidly growing urban sprawl has put excessive pressure on existing infrastructure. The effects are wide ranging, with adverse impacts on the quality of public transport, road networks, buildings and public spaces, and waste disposal. These impacts spread beyond purely environmental concerns, intensifying problems such as insecurity.

### UII engagement

Five companies (CEMEX (lead), ACCIONA, GDF SUEZ, Schneider Electric and Siemens) came together to propose practical solutions to the key challenges faced by the city that were identified and prioritized in a workshop held in May 2012. The solutions emerged from a series of workshops and meetings between the city and local UII experts held in Guadalajara between June and July 2012. The workshops addressed the key opportunities to tackle the city's sustainability challenges, plans and priorities.

### Sustainability vision & issues landscape

Guadalajara has a vision to transform the city into a modern, sustainable metropolis that offers a high quality of life. The city wants to use its influence on the municipalities in the entire metropolitan area to invigorate and channel efforts towards an integrated and rejuvenated Guadalajara. The scale of the challenges means there is a clear need for a roadmap to guide successive administrations and ensure the continuity needed to transform the city.

The dialogue identified the main challenges and defined the key areas where business input could help to develop practical solutions to stimulate the desired transformation. They cover four broad themes:

1. **Mobility and logistics.** The city identified the need for a more comprehensive vision to tackle inadequate public transport and congestion.
2. **Security.** Guadalajara's citizens share a perception that the city is insecure and has problems with violence. This is the result of multiple and complex factors like poverty, low educational coverage, marginal social benefits, lack of employment and limited local livelihood opportunities.
3. **Buildings and housing.** Over the last 10 years, Guadalajara has lost more than 200,000 inhabitants to suburban areas. The city center requires repopulating to achieve increased density. As people have moved away, the housing stock in the city center has also deteriorated.
4. **Waste.** Currently, the city disposes of most waste without recovering any of its inherent value, losing significant potential for value creation. In addition, there is no adequate infrastructure for waste segregation.

### Solutions landscape

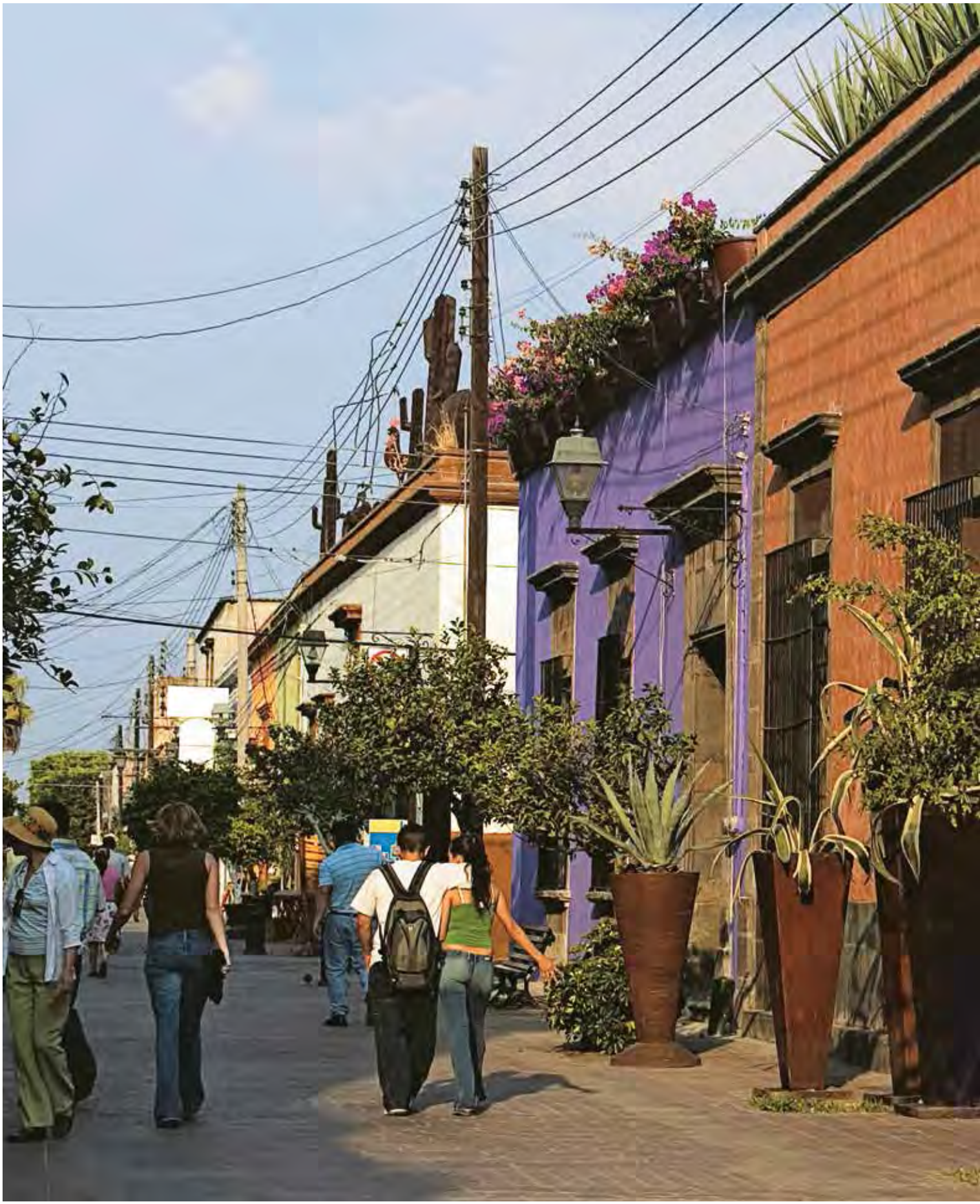
The UII team developed specific strategies in each of the four broad themes defined during the initial dialogue with the city. The team defined specific geographical boundaries and worked at different scales to address each of the topics. As a result, some solutions are related to the historical center of the city while others address the Municipality of Guadalajara or even the whole Guadalajara metropolitan area.

A series of workshops dealing with specific problems as well as the overall objective provided a platform to jointly identify actions in each of them. As a result, the UII team proposed solutions that recognize the integrated nature of sustainability. Specific measures would improve mobility, reduce violence and insecurity, revitalize the historical center and transform solid urban waste management.

This combination enabled 20 cross-cutting solutions which respond not only to the problems of a specific topic but also tackle other issues directly or indirectly, contributing to the overall transformation that the city envisages. Figure 12 indicates the direct and indirect contribution each initiative makes to each strategy.

The city representatives prioritized the proposals based on their potential impact and their feasibility in Guadalajara, taking into account technical, political and economic factors. As a result, a plan of action was developed with milestones and deadlines aligned with the service periods of the municipal administrations, recognizing that the implementation of many solutions would require action that extends across multiple city administrations.

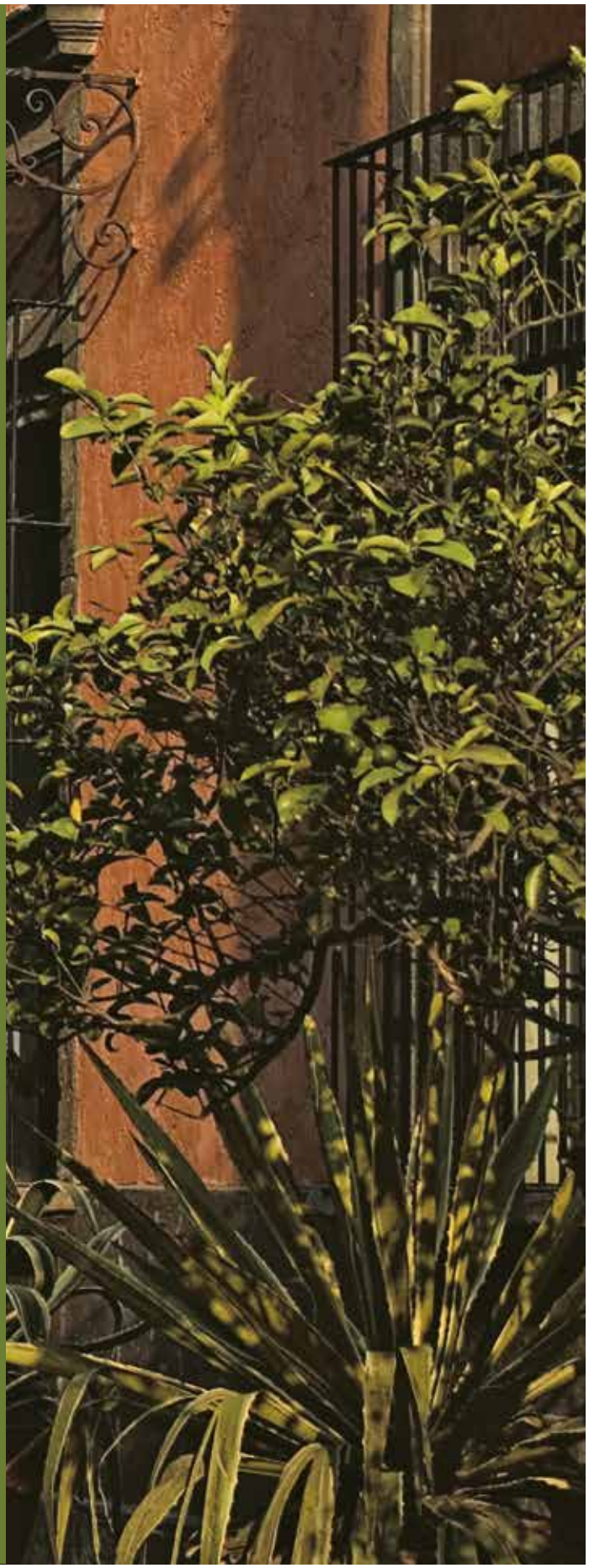

Figure 12 Guadalajara: solutions overview and inter-linkages



## *BOX 10*

### *FRANCISCO AYÓN LÓPEZ, MAYOR OF GUADALAJARA*

*"The sustainability of cities cannot be achieved by isolated efforts, but requires the involvement of governments, society and business. Together, we can develop high-impact integrated solutions that generate immediate results for the people. Guadalajara's transformation requires a modern and sustainable infrastructure program that ensures high quality of life, integrity, and safety. It is with this intention that Guadalajara has developed together with the WBCSD a transformation plan for our city, with a comprehensive, modern and far-reaching vision."*



**Outcomes & lessons learned**

The city benefited from an integrated approach to urban sustainability challenges which allowed the development of interconnected/cross-sector solutions, as shown in Figure 12.

For example, initiatives to reduce car use and promote non-motorized transport developed under the mobility category also contributed to several solutions in the building category, and included the creation of a pedestrian and cycling network. This also contributes to many other areas, such as reusing and recycling the city's existing urban structure and the city's aim to transform downtown Guadalajara (Solution 14). The proposal would improve parks and recreational areas and would help to enhance the image and identity of the city (Solution 16). Additionally, proposed interventions would help to keep inhabitants from moving to suburban areas and boost the repopulation of the city center (Solution 15), helping to reduce the perception of insecurity that currently blights the city and strengthening community identity and activity.

The UII also proposed solutions based on the member companies' experience in implementing and successfully running them in other cities. For example, the team raised the possibility of an integrated traffic management system to improve the utilization of road infrastructure, reduce traffic congestion and optimize traffic flows at peak hours. The concept was new to Guadalajara. Officials were unaware of the potential of existing technology which could be applied to the existing installed infrastructure in the city, and of the additional benefits that the current installed technology could provide through integration and upgrade.

Many of the proposed solutions could be applied to other Mexican and Latin American cities. For example, traffic congestion, insecurity, land-use policies and waste disposal are challenges affecting most large cities in the region. They could also be easily extrapolated to other rapidly developing countries which are facing metropolitan-scale challenges, such as unplanned urban expansion and infrastructure under increasing pressure.

Having companies from different sectors in the team brought a broad perspective and achieved a better understanding of the issues and challenges the city is facing than would have been the case with single-sector engagements. It enabled UII to develop interconnected, impactful solutions.

Several of Guadalajara's challenges go beyond the city's boundaries and affect other municipalities. Issues such as expanding and modernizing the public transport system, establishing a citizen participation program, and segregating solid urban waste require the involvement of the entire metropolitan area. The city therefore has to use its influence on adjacent municipalities to create common goals and a shared vision.

The scale and range of the challenges points to the need for a roadmap to guide successive administrations and establish the continuity needed to transform the city. The incoming mayor in 2013 expressed interest in many of the proposals which fit with the actions and guidelines of his program. He aimed to clearly define the proposals that were most applicable and achievable in his term of office over the following 3 years.

The report *A solutions landscape for Guadalajara* was delivered in September 2013.

See online: http://www.wbcsd.org/uiiguadalajarareport.aspx

## PHILADELPHIA (UNITED STATES)

**City overview**
The City of Philadelphia is the second largest city on the East Coast of the United States and the country's fifth most-populous city, with a population of 1.5 million. Under the leadership of Mayor Michael A. Nutter, the City of Philadelphia has established itself as a national urban sustainability leader. Mayor Nutter has set the objective of making Philadelphia "the greenest city in America."

**UII engagement**
The UII engagement with the City of Philadelphia was brokered through the Urban Land Institute (ULI), which acted as the bridging organization.

The City of Philadelphia and the UII team (Siemens (lead), AECOM, Schneider Electric, Toyota, TNT Express and United Technologies) had a number of initial discussions exploring the possibilities for potential collaboration and identifying ways in which the UII could add value to the city's existing sustainability actions.

In October 2011, an initial meeting identified the opportunity to work together. A major issues landscape workshop with the City of Philadelphia was held in March 2012 and explored the range of sustainability issues and challenges facing it. This meeting identified the option of the UII exploring the integrated solutions or the "bundling" of initiatives to achieve efficiencies, synergies and transformational outcomes. A further meeting in May 2012 explored one potential opportunity area in more detail: the strategic opportunity to further drive sustainability transformation around the management of the City's vehicle fleet and transport requirements.

The UII team worked with the City of Philadelphia from August 2012 to April 2013, primarily through a series of workshops and meetings, to further understand these opportunities and to develop the solutions landscape.

**Sustainability vision & issues landscape**
To help further realize the bold objective of making Philadelphia "the greenest city in America," the City of Philadelphia has developed *Greenworks Philadelphia*, an ambitious and comprehensive urban sustainability action plan. *Greenworks Philadelphia* considers sustainability through five lenses: energy, environment, equity, economy and engagement. Each lens has an overarching goal with measurable targets laid out and specific initiatives designed and described to help Philadelphia reach the targets by 2015.

The 2013 progress report highlights that work on 95% of the 166 *Greenworks* initiatives is either complete or underway. Philadelphia has made significant progress towards its objectives, including already exceeding the target to reduce residents' driving by 10%. Municipal energy use has fallen by 7% since 2008, and alternative energy use has grown for four consecutive years to reach 14%.

In collaboration with the City, two areas were identified where the UII could potentially add value and support the impressive progress that had already been made under the *Greenworks* plan:
- **Integrated solutions.** Exploring the potential to use integrated solutions/approaches to further drive efficiencies, synergies and transformational outcomes. The focus of the solution development was on place-based approaches to drive district-scale transformation; sustainable solutions for enhancing the performance of core urban infrastructure; and integrated mobility solutions to enhance mobility and connectivity within the city.
- **Fleet management.** Working with the City of Philadelphia's Office of Fleet Management (OFM), operational and technical solutions were identified to improve the performance and efficiency of the city vehicle fleet operations.

**Solutions landscape**
The UII team identified a portfolio of potential **integrated solutions** to further move the City of Philadelphia towards its sustainability goals. The solutions focused on three inter-related opportunities to add value:
1. "Quick wins" that can be implemented in the short term and could result in measurable additional progress towards *Greenworks* objectives by 2015. Examples include enhancing its building management capability to reach the target of 30% reduction in energy use.
2. Longer-term solutions and approaches that can help lock-in and scale up the successes achieved under *Greenworks* to achieve city-wide transformation.
3. Key areas to further scale up private sector engagement, innovation and investment in support of the City of Philadelphia's sustainability goals, including public-private partnerships (PPPs).

The UII team focused on operationalizing the concept of the eco-district in key areas of the City of Philadelphia, developing infrastructure solutions for energy, energy efficiency and water management, and a set of integrated mobility solutions for public and private transport. New approaches to financing were also proposed to scale up implementation and encourage further innovation and investment from the private sector.

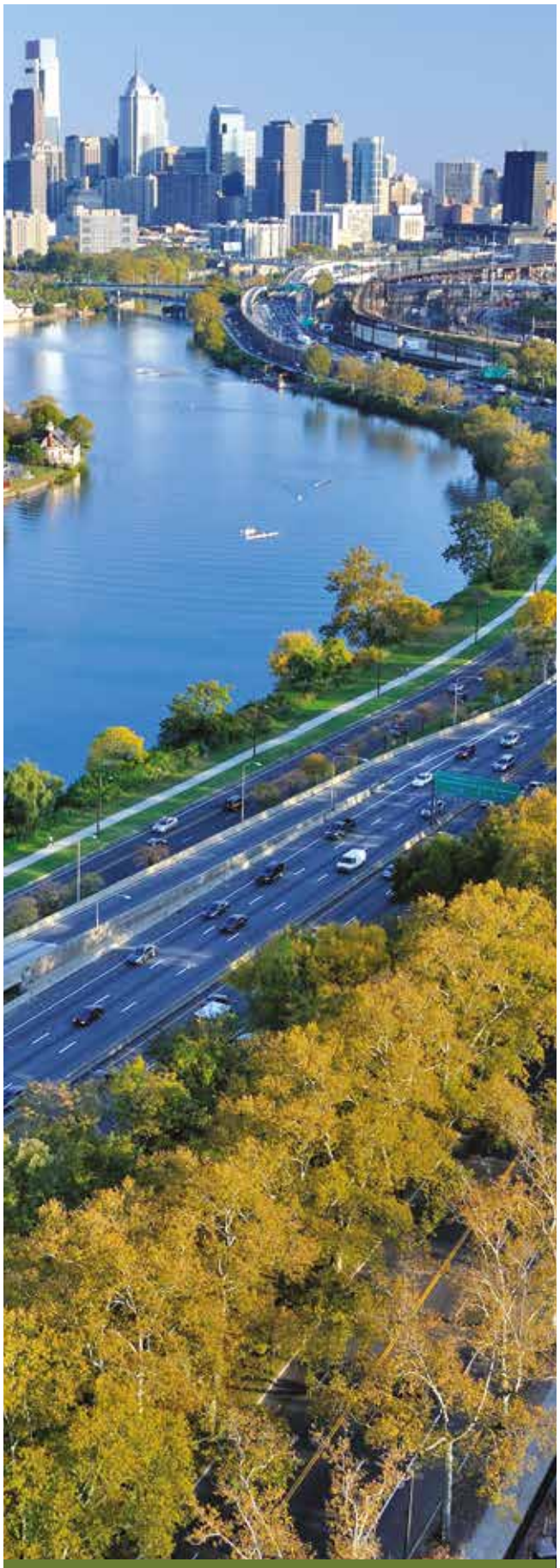
In parallel, the UII team worked with the OFM to identify potential operational and technical solutions to support improvements in the performance, efficiency and management of its 6,000 vehicles. The solutions focused on vehicle optimization, the use of telematics, training, and a strategy for making choices about alternative fuel technologies for different vehicle types.

The UII team proposed a number of specific financing measures to scale up identified solutions. In addition, the following broad-based strategies were highlighted to help up scale up implementation and financing:

- Increase the productivity of existing and planned infrastructure.
- Scale up the deployment of PPPs for the elements of infrastructure requirements that are suited to this model of financing and project delivery.
- Create collaborative groups of cities to work with the private sector to encourage innovation and drive economies of scale.
- Convene a financing summit to bring together key stakeholders to strategize on the future architecture of project delivery and investment to order to accelerate change.

While many of the solutions require broad-based or long-term action, there are a number of potential quick wins:

- Establishing an EcoDistrict pilot.
- Enhancing the building asset management capability of the administration to prioritize maintenance planning and building retrofits.
- Engaging with private and public players in the parking industry to scale up the implementation of smart parking approaches and investments in green stormwater infrastructure.
- Initiating a feasibility study of the Roosevelt Boulevard Bus Rapid Transit.
- Investigating and trialing an integrated mobility software platform.
- Deploying fleet optimization software tools, combined with the targeted use of telematics, to help the OFM improve operational efficiency and cost performance, while also reducing fuel consumption.



## *BOX 11*

### *MAYOR MICHAEL A. NUTTER, CITY OF PHILADELPHIA*

*"In the United States, after decades of neglect and decline, cities are again growing, repositioning themselves as places ripe for innovation and investment. To house, move, and employ urban dwellers now and into the future, municipalities must maintain and upgrade aging infrastructure, expand economic opportunities, and improve quality of life. In recent years, many mayors have realized that sustainability is a powerful framework to address these varied responsibilities.*

*In order to build capacity for urban sustainability solutions and accelerate their adoption, we simply must work collaboratively. Cities need to continue to share best practices with one another while also problem solving alongside our partners in the private sector who share many of our goals. The Urban Infrastructure Initiative engagement allowed us to do just this. By bringing city staff together with representatives from WBCSD member companies to delve into specific policy and program areas, the process facilitated a two-way knowledge transfer.*

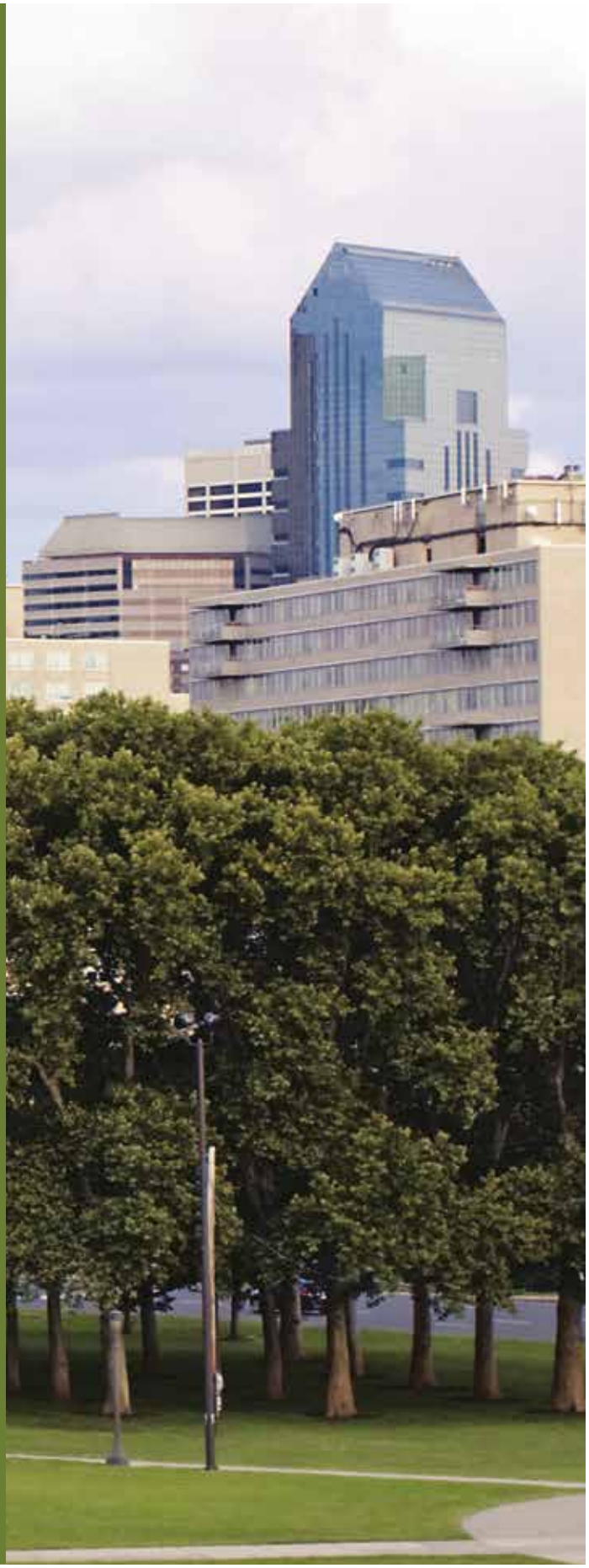
*It proved to be a tremendous opportunity for us to share our thinking, successes and challenges in an open exchange. We came away with new ideas, benefitted from technical expertise, and gained meaningful external validation.*

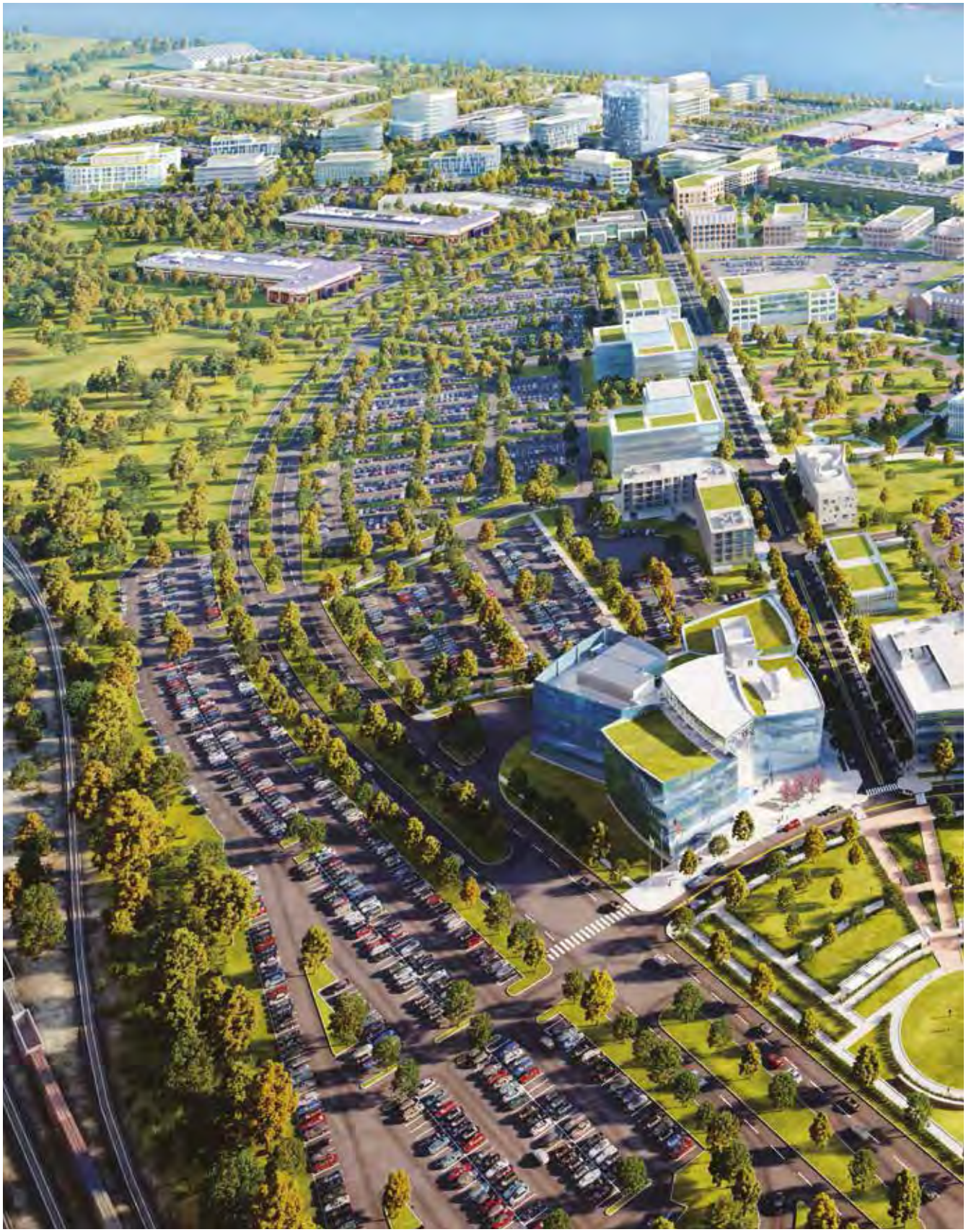
*This kind of cross-sector collaboration is a win-win and I am thrilled that we had the opportunity to participate in such a thoughtful exchange."*

### *KATHERINE GAJEWSKI, DIRECTOR OF SUSTAINABILITY, CITY OF PHILADELPHIA*

*"As a practitioner in a relatively young and quickly evolving field, exchange is invaluable. While I work closely with peers in other cities, there is not yet a clear infrastructure in place that brings sustainability focused city employees together with those working on similar initiatives within the private sector. UII presented a unique value proposition in this regard.*

*We have already begun to advance work around opportunities identified as part of the engagement. Beyond receiving highly valuable technical assistance and advice, the UII helped us to establish relationships with business that we can now continue to develop."*





Philadelphia Navy Yard

| FOCUS AREA | SOLUTIONS |
|---|---|
| **Place-based approaches** focused on driving district-scale sustainability in Philadelphia, providing a platform for broad-based stakeholder engagement and the integrated deployment of sustainable infrastructure and mobility solutions. | • EcoDistrict development in the Navy Yard and Lower Schuylkill district<br>• Aerotropolis concept for Philadelphia International Airport (PHL)<br>• Transit-oriented development |
| **Infrastructure solutions** to enhance the sustainability performance of core urban infrastructure – buildings, energy, water management and streets – with specific consideration of how these approaches can be moved forward in Philadelphia. | • Smart grids<br>• Enhancement of municipal building energy efficiency<br>• Smart water networks<br>• Green stormwater infrastructure<br>• Complete streets concept |
| **Mobility solutions** to enhance public and private mobility and connectivity within Philadelphia with a focus on the opportunities for technology to enhance the performance of existing infrastructure and systems. | • Integrated corridor management<br>• Bus rapid transit<br>• Smart parking<br>• Integrated mobility platform |

Figure 13 Integrated solutions for Philadelphia

**Outcomes & lessons learned**

The integrated approach of the UII resulted in solutions that cut across the City of Philadelphia's departmental responsibilities, especially in relation to the proposal for eco-districts. Similarly, proposals for mobility solutions covered various modes and different service providers.

The UII proposals benefitted from the team members' experience in several cities and the knowledge and experience they brought from different sectors. This supported the development of practical solutions connecting technologies and functions. The multi-company approach contributed to effective engagement with the City of Philadelphia, allowing for a wide-ranging discussion at a strategic level.

The City of Philadelphia found the engagement helpful in accessing private sector insights that are not easily available to public sector bodies. It brought new ideas, technical expertise and external validation of the *Greenworks* program. The City of Philadelphia has begun work to develop some of the opportunities identified by UII.

Key lessons learned during the engagement included the need to develop a shared understanding of issues, approaches and opportunities, given that the public and private sectors have quite different perspectives and tend to use different language to describe challenges and think about solutions. The engagement emphasized that its sustainability challenges are closely interconnected and require holistic solutions, and that sharing thinking with the private sector can help a city look beyond the immediate imperatives that typically preoccupy officials.

The UII report *A solutions landscape for Philadelphia* was delivered in November 2013.

See online: http://www.wbcsd.org/uiiphiladelphiareport.aspx

## UII WORKSHOPS AND REPORT LAUNCHES

Yixing Solutions Landscape report launch with Mayor Zhang Lijun and Mr. Cheng Siwei – Beijing, June 2013

Yixing Solutions Landscape report launch with Mayor Zhang Lijun and Mr. Cheng Siwei – Beijing, June 2013

UII workshop with city of Yixing and UII members
Yixing, October 2012

UII workshop with city of Yixing and UII members
Yixing, October 2012

Gujarat Solutions Landscape report launch with city of Ahmedabad, Rajkot, Surat and Vadodara, the Government of Gujarat State and UII members – Ahmadabad, July 2012

Gujarat Solutions Landscape report launch with city of Ahmedabad, Rajkot, Surat and Vadodara, the Government of Gujarat State and UII members – Ahmadabad, July 2012

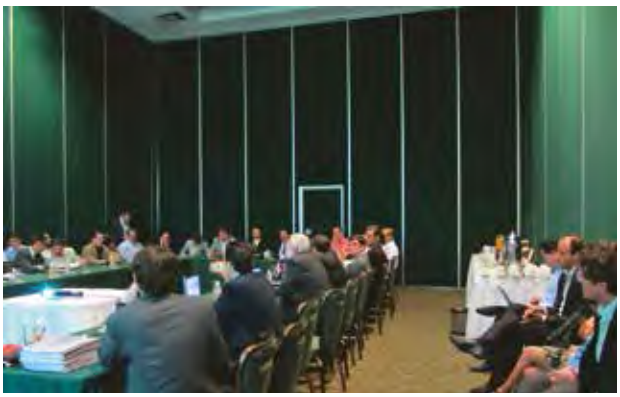
Philadelphia Solutions Landscape report launch with Mayor Nutter
Philadelphia, November 2013

UII workshop with city of Philadelphia and UII members
Philadelphia, November 2012

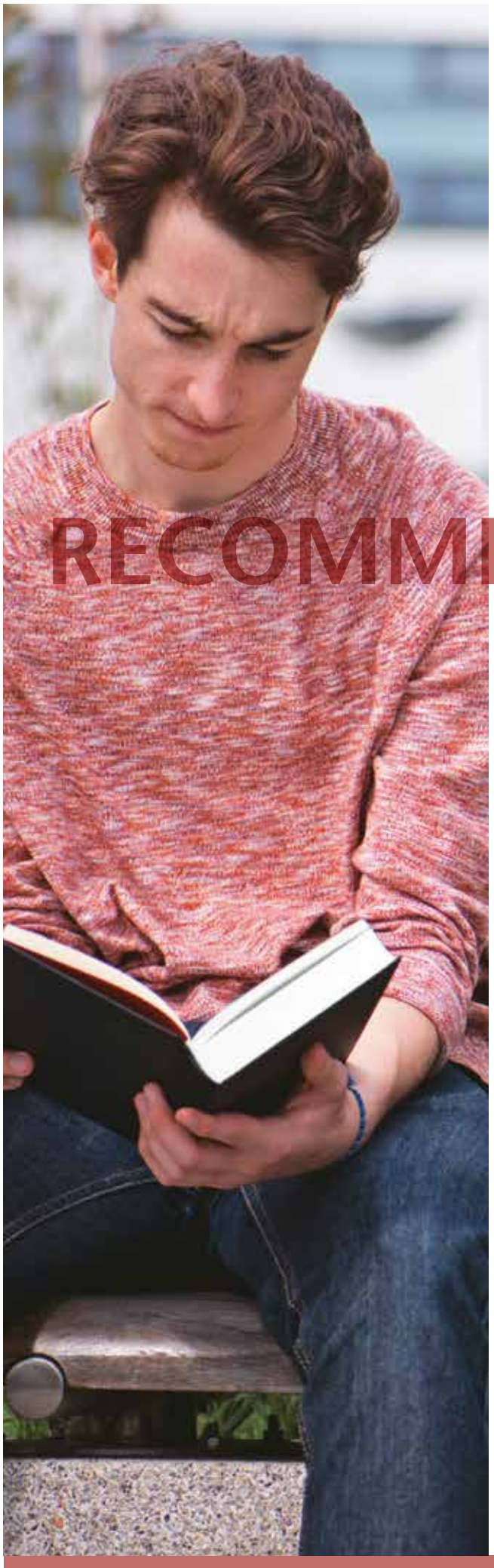
Kobe Solutions Landscape report handover ceremony
Kobe, May 2013

UII workshop with city of Kobe and UII Japanese members
Kobe, June 2012

Tilburg Solutions Landscape report launch with Deputy Mayor Berend de Vries and Peter Bakker (WBCSD President)
Tilburg, May 2012



UII workshop with Guadalajara city and UII members
Guadalajara, April 2012



# 04 FINDINGS AND RECOMMENDATIONS

## DEMONSTRATING THE VALUE OF THE UII FOR PARTNER CITIES

The purpose of the UII was to demonstrate the value of early, strategic involvement of business in helping cities turn their sustainability visions into a reality.

The UII worked with leading cities with ambitious sustainability visions supported by quantified objectives and targets (see BOX 12). A core strength of these cities is the motivation and expertise of city officials, which underpins these visions and objectives. In all the partner cities, the UII worked with highly capable civic leaders, managers and urban professionals with a passion for making their cities more sustainable.

The interest of these leading cities in pioneering a new way of working with business gave a strong initial indication that these cities saw the potential value of working with the UII. While working with the UII was of no financial cost to the city, it did often require substantial time commitments from senior city representatives for the dialogue and preparatory activities.

*BOX 12 – SUSTAINABILITY LEADERSHIP OF UII PARTNER CITIES: EXAMPLES*

- ***Turku's** Climate and Environment Program, launched in 2009, targets greenhouse gas emissions per capita 30 % below the 1990 level by 2020. The city has already achieved significant progress in renewable energy, with approximately 60 % of electricity and 30 % of district heating coming from renewable sources.*

- ***Tilburg** has a bold ambition to be climate neutral and climate resilient by 2045 – zero net carbon emissions and protected against climate change effects.*

- ***Gujarat's** state and city leadership are very conscious of the need for development to be inclusive and sustainable. Gujarat is the only Indian state with a Climate Change Department and was the first state to announce a comprehensive solar energy policy. Gujarat's cities are taking the lead in sustainable urban development in India; for example, Ahmedabad's successful bus rapid transit system is now being replicated in other major Indian cities.*

- ***Yixing** has set a clear goal for its long-term development: to become China's "demonstration city of scientific and sustainable development" by 2020. As part of the realization of this ambition, the city has developed a plan to become the "Oriental Water City," highlighting its natural environment and developing new urban sustainability models.*

- ***Kobe** has developed the Kobe Environmental Future City Initiative, focused on addressing major sustainability challenges. It targets a 25 % reduction in GHG emissions below the 1990 level by 2020 through clean energy production and energy efficiency. It also includes measures on disaster resilience, knowledge development and cluster formation, and addresses the challenges of a rapidly aging society.*

- ***Guadalajara** has a vision to transform the city into a modern, sustainable metropolis at the center of an integrated and rejuvenated region.*

- ***Philadelphia** aims to be the greenest city in North America and has established the Greenworks Philadelphia plan to make progress on this objective. Greenworks Philadelphia considers sustainability through five lenses: energy, environment, equity, economy and engagement. Each lens has an overarching goal, with 15 measurable targets laid out and specific initiatives designed and described to help the city reach the targets by 2015.*

*BOX 13 – CITY PERSPECTIVES ON THE VALUE OF THE UII*

***Jarkko Virtanen, Deputy Mayor of Turku***

*"Designing and implementing sustainability solutions in partnership between cities and companies requires the city to have a solid sustainable development strategy – or processes to develop one – and the companies to have sustainability at the core of their business models and service. Our experience with the WBCSD's Urban Infrastructure Initiative has been very encouraging and has brought new solutions and cooperation possibilities to our awareness.*

*"Our responsible directors and leading experts had a unique chance to work intensively with experts from the UII companies to find the best possible solutions for Turku. This was a very creative but realistic process where we presented our challenges and the companies proposed solutions. Together with the UII partners we developed a portfolio of new actions for our sustainability program. Some can be implemented now and others will be useful for our new programs and strategies.*

*"We are now better aware of the solutions and new forms of cooperation that advanced businesses can offer. The early engagement of businesses means we are now well-placed to use this knowledge in planning our new strategies and actions. We will also look for ways to make this new approach part of our regular strategy and program process."*

***Berend de Vries, Deputy Mayor of Tilburg***

*"[The UII engagement] reinforced our thinking that the stakeholder approach is the way to go. And at the end of the day, we might have the plans, but it is businesses that can convert a plan or idea into action…Working with the UII opened up an entire new network for us. Dialogue is crucial and mutual inspiration can lead to new ideas and business cases. We want to follow up and turn those business cases into local Green Deals. This makes good business sense and makes Tilburg more sustainable."*

***Zhang Lijun, Mayor of Yixing***

*"It was an honor to closely cooperate with the WBCSD on the Urban Infrastructure Initiative. The comprehensive research report covering urban planning, transport and mobility, and energy efficiency reflects the international perspective adapted to the local circumstances. I am confident that through the in-depth cooperation with WBCSD and the scientific guidance of the Yixing UII report, the city, as the 'Capital of Chinese Pottery' and 'Oriental Water City', will pragmatically take a better path towards sustainability."*

***Francisco Ayón López, Mayor of Guadalajara***

*"The sustainability of cities cannot be achieved by isolated efforts, but requires the involvement of governments, society and business. Guadalajara's transformation requires a modern and sustainable infrastructure program that ensures high quality of life, integrity and safety. It is with this intention that Guadalajara has developed together with the WBCSD a transformation plan for our city, with a comprehensive, modern and far-reaching vision."*

***Michael A. Nutter, Mayor of Philadelphia***

*"In order to build capacity for urban sustainability solutions and accelerate their adoption, we simply must work collaboratively. Cities need to continue to share best practices with one another while also problem solving alongside our partners in the private sector who share many of our goals. The Urban Infrastructure Initiative engagement allowed us to do just this. By bringing city staff together with representatives from WBCSD member companies to delve into specific policy and program areas, the process facilitated a two-way knowledge transfer. It proved to be a tremendous opportunity for us to share our thinking, successes and challenges in an open exchange. We came away with new ideas, benefitted from technical expertise, and gained meaningful external validation."*

After the UII engagements were completed, city leaders were asked to reflect on the value their city realized from the collaboration. BOX 13 summarizes their perspectives. The views of ICLEI Europe on the UII are also presented (see BOX 14). ICLEI is a leading global association of cities and local governments dedicated to sustainable development. ICLEI acted as the bridging organization for the cities of Turku and Tilburg.

Business has important knowledge and expertise that cities can draw on to help navigate the interconnected challenges they face in turning high-level visions into an implementable action plan. Figure 14 highlights some specific examples of how the UII engagements were able to bring these capabilities to the discussions with the partner cities.

In the longer-term, the value of these contributions will be measured through how these business inputs help cities accelerate progress toward their sustainability vision. While it was too early to evaluate this impact at the time of this report, there is already emerging evidence of beneficial outcomes. Both the cities of Turku and Yixing are conducting detailed assessment of mobility options to enhance their public transportation systems. The city of Tilburg has expanded its use of the UII dialogue model to enhance the effectiveness of sustainability planning processes. The City of Philadelphia is drawing on the UII's recommendations to improve the efficiency of the City's vehicle fleet and to strengthen the administration's asset management capabilities to advance progress toward their municipal building energy use reduction target. The WBCSD will continue to monitor these outcomes over time.

Furthermore, a number of the UII partner cities have also said they benefited from the validation they received from the UII expert teams of key elements of their existing strategies and plans. These endorsements can give city leaders and officials additional confidence to pursue their ambitious or challenging objectives.

*BOX 14 – ICLEI PERSPECTIVES ON THE VALUE OF UII*

***Wolfgang Teubner, Managing Director, ICLEI Europe***

*"Advanced technology and innovation are urgently needed to ensure sustainable urban development. Energy-efficient buildings, highly efficient lighting and smart grids will be needed to ensure energy security and the mitigation of climate change. Resilient infrastructure and systems will be needed to enhance the adaptive capacity of cities in the light of climate change and more frequent extreme weather events. Sustainable and efficient solutions for urban transport and mobility can significantly reduce GHG emissions and noise, improve air quality, and help to create high-quality public spaces. Technological solutions can contribute to enhancing and sustaining healthy ecosystems and ecosystem services, for example by reducing water consumption. For urban planners and decision-makers, it is therefore key to know which technological solutions are available or which innovations can be provided by industry in order to successfully address their challenges and achieve strategic goals.*

*Consequently ICLEI is convinced that the engagement of the private sector in urban planning processes can help to find optimized solutions and drive technological innovation for the sustainability challenges cities face. Therefore, ICLEI is committed to working with the private sector and to strengthening and facilitating the dialogue between solutions providers and cities. The WBCSD Urban Infrastructure Initiative has, in an exemplary way, demonstrated the benefits of early engagement and dialogue between the public and the private sector. This is why ICLEI actively supported the dialogues in Europe and is looking forward to developing further cooperation with the WBCSD in support of urban sustainability."*

| CONTRIBUTIONS OF BUSINESS TO STRATEGY DEVELOPMENT AND DECISION-MAKING | UII EXAMPLES |
|---|---|
| **Innovative and effective solutions** | • **New technologies.** In all of the UII engagements, cities were keen to explore how new and emerging solutions could help them address key challenges. The UII teams worked collaboratively with city officials to analyze how such technologies could be effective given each city's unique circumstances. Examples include:<br>o Intelligent transport systems: Turku, Tilburg, Yixing, Kobe, Guadalajara, Philadelphia.<br>o Smart electrical grids and local energy management systems: Turku, Kobe, Philadelphia.<br>o Green infrastructure: Gujarat cities, Yixing, Philadelphia.<br><br>• **Energy efficiency in buildings.** Improving the energy efficiency of a city's building stock is a priority in most cities given the significant proportion of energy use and carbon emissions associated with buildings. It is also an area where driving change can be challenging and was consequently identified as a priority issue by all 10 UII partner cities. The UII companies were able to share their industry-leading experience of driving major improvements in energy efficiency within municipal building portfolios and within cities more broadly. The proposed solutions cover design and planning regulations, technology, market enhancement measures, policy incentives, consumer awareness and engagement, and innovative financing mechanisms.<br><br>• **Experiences from other cities.** Cities have a long-established culture of sharing successes and experience through city associations, exchange visits, etc. Engaging with business offers additional opportunities to learn about innovative and effective solutions that have worked in other cities. Examples from the UII engagements include:<br>o In Tilburg and Turku, the UII team was able to share experience of other European cities in developing green logistics schemes.<br>o In Guadalajara, the UII team was able to bring knowledge of how Mexico City had established a single integrated planning regulation to facilitate the renewal of the historic city center.<br>o Solutions for wastewater management in Gujarat benefited from the team's knowledge of successful projects in Chennai and private sector involvement in natural wetland restoration in China.<br>o The Philadelphia UII team drew on their experiences of other leading US cities in defining the value of the EcoDistrict model. |
| **Integrated approaches to addressing urban challenges** | • **Urban planning.** Effective urban planning provides the framework for addressing urban sustainability challenges and is particularly important for fast-growing cities in the developing world. In both Yixing and Gujarat, the UII team worked directly with cities to identify how enhanced urban planning approaches could help address urban infrastructure challenges in an integrated manner. These discussions directly informed solution discussions in other areas, such as sustainable mobility.<br><br>• **Integrated solution development.** A focus of the UII was to help cities understand challenges and develop solutions in an integrated manner. For example, in Guadalajara the UII team worked with the city to develop an integrated package of solutions to address the city's sustainability goals. The team was able to map systematically how solutions across four main areas – mobility and logistics, buildings and housing, security and waste – could support and reinforce each other. In Philadelphia, the UII team helped develop a package of integrated solutions to complement the existing initiatives under the Greenworks Philadelphia Plan. A key concept was the use of the EcoDistrict model as a platform for optimizing and integrating innovative infrastructure solutions at the district scale.<br><br>• **Working across departments.** City administrations often face challenges of addressing issues that cut across a number of organizational/functional responsibilities. A key benefit of the UII engagements was providing a platform for promoting and supporting inter-departmental dialogue and overcoming concerns about shared functional responsibilities, duties and budgets.<br><br>• **Working across municipal boundaries.** Many cities need to address problems or implement solutions that extend across municipal or administrative boundaries. This was the case for Guadalajara, where the Municipality of Guadalajara was one of seven municipalities making up the city's greater metropolitan area. The UII team explicitly identified the solutions which required cross-boundary approaches for effective action and implementation.<br><br>• **Integrated assessment tools.** Working with Kobe, the UII introduced the use of the CASBEE-City tool as a platform for the integrated understanding of challenges and evaluation of solutions. |

Figure 14 Contributions of business to strategy development and decision-making: UII examples

| CONTRIBUTIONS OF BUSINESS TO STRATEGY DEVELOPMENT AND DECISION-MAKING | UII EXAMPLES |
|---|---|
| **Financing & Implementation** | • **Solution prioritization.** Cities face a complex array of choices in determining the appropriate strategy and solutions for achieving their sustainability visions. In all the UII engagements, the team assisted the city by identifying the key considerations and next steps, and developed a basic prioritization analysis of the suggested solutions landscape.<br>• **Implementation roadmaps.** In Yixing and Guadalajara, the UII teams developed high level implementation roadmaps at the request of the cities to assist with the prioritization and sequencing of key solution proposals.<br>• **Private finance options.** In Gujarat, the UII team presented a range of potential options for mobilizing private capital to support the implementation of proposed wastewater management solutions. In Philadelphia the UII team made specific financing recommendations for proposed infrastructure and technology solutions, supported by several broader strategies including the use of public-private partnerships and collaboration between groups of cities and the private sector to encourage innovation and drive economies of scale.<br>• **Market mechanisms.** A number of the UII engagements provide solutions and recommendations for creating and enhancing local markets for energy efficiency technologies and services. For example, in Yixing the UII proposed several market-based policies to encourage energy efficiency improvements and suggested possible financing mechanisms. |
| **Development of the local green economy** | • **Green economic development.** In several of the city engagements, the UII was asked to provide input to identify how the growth of the local green economy could be accelerated. In Tilburg, the UII gave recommendations on enhancing the sustainability of the city's business parks – a central element of the local economy – such as the establishment of an Internet market place to facilitate use of waste materials, waste heat, etc. In Kobe and Philadelphia, the UII emphasized the opportunity of city authorities to actively support the local establishment and growth of green businesses by driving demand for sustainable solutions and providing opportunities for their market deployment. |
| **Private sector sustainability leadership** | • **Energy Efficiency in Buildings (EEB) Manifesto.** The EEB Manifesto – a set of voluntary measures to drive action on building energy efficiency – was a key outcome of the WBCSD's Energy Efficiency in Buildings Project.[17] More than 100 major companies have signed the manifesto to pledge implementation in their own building portfolios. The UII teams in Tilburg and Kobe proposed that local versions of this innovative voluntary measure could be a low-cost tool to catalyze action among local building owners.<br>• **City fleet management.** The UII team was able to share best-practices from the private sector in improving the operational and environmental efficiency of large vehicle fleets as well as supporting the uptake of low-emissions vehicle technologies. |

Figure 14 Continued

[17] http://www.wbcsd.org/work-program/sector-projects/buildings/eeb-manifesto.aspx

## INSIGHTS FOR BUSINESS

The UII dialogues also had the value of being a two-way process that enhanced the business understanding of the challenges and opportunities of the partner cities. Key insights obtained by the company participants in the UII engagements include:

- **Resource and capacity constraints.** Working directly with cities helped build further understanding of the resource and capacity constraints that cities often face in realizing their sustainability visions. This lesson reinforces the important role business plays in helping to identify efficient and cost-effective solutions. It also highlights the value of helping cities identify mechanisms to scale up private sector investment in support of the city's vision, as a key strategy for maximizing the impact of limited public resources.
- **City processes and decision-making.** The nature of the UII provided insights not normally available when executing specific contracts to meet predetermined requirements. Company participants gained greater understanding of city government processes and the interactions between different city departments and functions. The dialogue process provided useful insights into political priorities and considerations that have an important influence on decision-making.
- **Cross-cutting nature of urban sustainability challenges.** Working with city officials on early stage sustainability strategy provided further insights on the cross-cutting nature of urban sustainability challenges. It emphasized the need for companies to work together to help cities achieve their sustainability visions. The UII teams also saw how cities are increasingly recognizing the value of working across departments and technical functions to analyze sustainability challenges and identify solutions. These cross-departmental platforms provide an excellent point of engagement for collaboration and problem-solving with the private sector.
- **Cross-company learning.** Team members found it valuable to work with colleagues from different sectors and different professional backgrounds. They gained important knowledge about technologies and industries that they do not normally have an opportunity to work closely with, as well as sharing perspectives with those in their own sectors. The value realized from this cross-company collaboration reinforces the potential for multi-company solutions to complex urban sustainability challenges.

## DIALOGUE AND COLLABORATION BETWEEN CITIES AND BUSINESS

The UII developed and tested a new approach for dialogue and collaborative engagement between cities and business early in the sustainability planning process. This approach was applied in a number of different countries/regions around the world, confirming its applicability in a range of different economic, political, social and cultural contexts. Through this diverse experience, the UII was also able to identify a number of factors that supported effective dialogue and collaboration between cities and business:

- **Support and involvement of the city leadership.** The support and involvement of the mayor in the UII engagement was an essential ingredient for success. It sent a clear signal of its importance and value. It also provided a mandate for the participation of other senior civic leaders, managers of key departments within the administration, as well as other senior planning, technical and sustainability professionals. The willingness of city leaders to bring together these key decision-makers and experts together with a group of businesses was critical in providing the right environment for cross-fertilization to flourish.
- **Effective exchange between experts.** A unique characteristic of the UII approach was the opportunity for city experts and company team members to have broad-based interactions in their areas of expertise, sharing ideas and insights. These two-way exchanges were central to the effectiveness of the UII dialogues and validated the allocation of time in the process for city and company representatives to build understanding of each other's perspectives and a shared view of challenges and potential solutions.
- **Local and outside expertise.** While the required company expertise varied from city to city, the UII transformation teams were able to bring a mix of local and outside expertise. This ensured a detailed understanding of the local context, while also providing best practices from other cities in the same country or even internationally.
- **Bridging organizations.** Bridging organizations played an important role in the UII city engagements. They helped facilitate the early discussions to identify the issues landscape and the scope of the UII engagement, and expedited the relationship development between the UII team and the city. This suggests an opportunity for key stakeholder organizations to play an important role in encouraging effective city-business engagement more broadly.

| BARRIER | UII CONTRIBUTION |
|---|---|
| **Lack of awareness of the potential business contribution** | The UII demonstrated through working with 10 different cities the constructive and valuable role that business can play in helping cities address the key challenges they face in realizing their sustainability visions. Through its communications activities, the UII has also sought to promote further discussion within the urban sustainability domain about the potential contribution of business solutions providers. |
| **Perception of biased input** | The UII engagements showed how leading businesses can take a demand-driven and collaborative approach to understanding and addressing a city's challenges, and can provide objective, technology- and vendor-neutral advice on potential solutions. |
| **Lack of suitable engagement processes** | The UII demonstrated a process for multi-company collaborative engagement with cities in the early stages of the strategic and planning process to realize an urban sustainability vision. This process has shown to be useful in cities of different sizes and economic, political, social and cultural contexts. |
| **Regulatory-related constraints** | The benefits of the UII approach to partner cities provides a rationale for cities interested in expanding their engagement with business on sustainability to analyze how regulation (or how regulation is applied in practice) may prevent or constrain beneficial engagement. |

Figure 15 Overcoming barriers to city-business engagement

## ADVANCING URBAN SUSTAINABILITY

Making cities more sustainable is one of the key challenges facing humanity in the 21st century. City administrations are already taking the lead, with ambitious visions and programs to make their cities more sustainable, as exemplified by UII partner cities.

Business will be a critical stakeholder in realizing these visions, and leading companies – including the members of the UII – are already playing a major role in helping cities implement their sustainability visions.

The UII has sought to demonstrate that contributions from business can be further enhanced by ensuring business is involved early in the planning process. Early and collaborative business involvement leverages the capability of business to identify innovative and cost-effective solutions to complex, cross-cutting urban sustainability challenges. It allows business input to be provided where it is of the greatest value to decision-making and can create an innovative 'laboratory' in which cities can explore and evaluate ideas and solutions in a dynamic and inexpensive manner. Ultimately, this involvement can help cities and citizens make better informed decisions about accelerating progress towards sustainability.

*BOX 15 – POTENTIAL AREAS FOR EARLY STRATEGIC ENGAGEMENT WITH BUSINESS*

- *Climate change action plans*
- *Climate change adaptation and resilience plans*
- *Green economic development strategies*
- *Innovation policy and cluster development*
- *Low-carbon mobility and logistics plans*
- *Development of intelligent transport systems*
- *Development/implementation of new sustainable urban development models (eco-districts, eco-blocks, etc.)*
- *District revitalization and brownfield redevelopment*
- *Energy efficiency in buildings strategies at building, portfolio, district or city levels*
- *Intelligent/smart city initiatives*
- *Smart infrastructure developments (smart grids, smart water networks, smart buildings, etc.)*
- *Security and social cohesion programs*
- *Public environmental awareness and behavior change programs*
- *Development of new/innovative infrastructure financing mechanisms*

While the UII is a pilot project that has worked with a relatively small number of leading cities, this report summarizes the evidence – particularly the perspectives of city leaders – that suggests that the early strategic involvement of business can be of real benefit to city administrations aiming to advance sustainability. Recommendations to cities on how they could integrate this approach in their own sustainability agenda are presented later in this chapter. In considering the applicability and practicality of early engagement with business, the following lessons from the UII experience are highlighted:

- **Overcoming barriers to engagement.** Common barriers appear to limit the extent of early business engagement with cities (see Chapter 2). The UII has shown how these barriers can be overcome; these are summarized in Figure 15.
- **Flexible and broadly applicable process.** The UII was able to generate value for a diverse range of cities around the world with different economic, political, social and cultural contexts. These cities also spanned a broad range of sizes – with populations from 180,000 to more than 5 million. This suggests the broad applicability of this approach.
- **Application to a range of city strategy and planning activities.** The UII engaged with cities on a range of strategies, programs and initiatives that supported their overall sustainability vision. This experience indicates that early strategic engagement with business could make a beneficial contribution to a variety of city strategy and planning activities. BOX 14 provides a list of potential applications suggested by the experience of the UII.

More broadly, the UII has demonstrated the willingness and capabilities of leading businesses to be strategic partners in advancing the urban sustainability agenda. It has shown that business has a detailed understanding of the challenges and constraints that cities face in pursuing their sustainability agenda and that business can be a valuable contributor in helping cities find solutions to overcome these challenges – particularly when involved early in the planning process.

From a global perspective, bringing together the powerful synergies of city sustainability leadership and business innovation and the delivery of solutions represents an enormous win-win opportunity in driving rapid transformation towards sustainable development. Cities will win by getting practical, cost-effective solutions to realize the sustainability aspirations of their citizens. Leading businesses will win through unlocking markets for innovative products and services that will be essential to delivering this transformation, forming the foundation for the urban green economy. The UII has made an important contribution in pioneering how this global opportunity can happen in practice.

## RECOMMENDATIONS

## FOR CITIES

### 1. WORK WITH BUSINESS AS A KEY STAKEHOLDER IN SUSTAINABILITY STRATEGY DEVELOPMENT

*The UII has demonstrated that cities seeking to realize their sustainability visions can benefit from engaging with business early in the planning and strategy development process. In fact, it may suggest that cities wishing to pursue an ambitious sustainability agenda are missing out if they are not seeking strategic input from leading private sector solutions providers. These are companies (or groups of companies) that provide technologies, products or services that a city could or will need to improve its sustainability performance.*

### 2. DEVELOP OR ENHANCE STAKEHOLDER ENGAGEMENT AND CONSULTATION PROCESSES TO LEVERAGE THE VALUE OF WORKING COLLABORATIVELY WITH BUSINESS

*It is the perspective of the WBCSD that city stakeholder engagement processes on sustainability issues often do not engage business in a sufficiently substantive manner.*

*The UII has shown that business can contribute highly relevant expertise and experience that can help achieve cities' and citizens' objectives. Cities should therefore consider enhancing the stakeholder engagement processes through which the private sector can make a valuable contribution.*

*There are a range of options for how early engagement can be operationalized in practice: it can be formalized or ad hoc, integrated into existing stakeholder engagement processes or as a stand-alone process. The UII experience of providing a platform for a number of city-business dialogues around the world yielded a number of useful success factors that should be considered in establishing such a process.*

*The following process design elements can help give cities further confidence in the integrity and effectiveness of the engagement:*

- ***Decision-making retained by city administrations.*** *The output of the engagement is a menu of options or ideas to help cities make better decisions. City officials retain leadership of the process and decision-making on the implementation of these ideas and such decisions are subject to the usual norms of public accountability and scrutiny.*
- ***Multi-company (and ideally multi-sector) involvement.*** *The involvement of a number of businesses representing a range of sectors helps to ensure that the input is the perspective of business in general rather than the interests of one individual company.*
- ***Clear segregation from procurement processes.*** *Engagement occurs early in the planning process, does not extend to specific project definition, and is clearly segregated from any procurement or tender processes.*

*These elements could be supported by the production of a public report and the involvement of a third-party oversight group, both elements that were applied in the case of UII.*

### 3. CLARIFY THE SCOPE FOR STRATEGIC BUSINESS ENGAGEMENT IN SUSTAINABILITY UNDER LOCAL REGULATORY FRAMEWORKS AND CONSIDER REMOVING BARRIERS TO BUSINESS ENGAGEMENT THAT ARE NOT IN THE PUBLIC INTEREST

*Cities are governed by regulatory and legal frameworks that set the rules or boundaries for engagement with the private sector. These rules are fundamental to achieving the public policy objectives of ensuring the transparency and integrity of public procurement processes, as well as achieving the best value for money for the expenditure of public funds. However, in some instances the application and interpretation of these rules may be deterring engagement between cities and business that it is ultimately in the public interest – i.e., through enabling the effective and cost-efficient achievement of a city's sustainability objectives.*

*The UII has demonstrated in practice how cities and business can engage in strategic dialogue in a way that maintains a clear segregation from procurement and provides objective, technology and vendor neutral advice. Furthermore, the feedback from partner cities indicates that this dialogue provides important constructive input to their strategy development and decision-making. Ultimately, supporting better-informed decisions can maximize the return from the deployment of scarce public resources and help ensure value for money in public investments.*

*Cities can take two steps to address barriers in this domain (where it is identified as an issue), possibly working with a knowledgeable third party such as a city association:*

- *A first step is to clarify for both business and city officials the parameters by which cities and business can work collaboratively under the existing regulatory framework. Clarity on how and when business can engage in strategy discussions without being excluded from commercial activities with the city at a later point in time, which would act as a disincentive for engagement, is of particular importance in some jurisdictions.*
- *Where there are institutional barriers to beneficial business involvement, these barriers should be examined critically to assess if there are possible modifications that can facilitate early business involvement while still achieving other key public policy objectives. This assessment process may be an activity for cities themselves or may require the participation of other regulatory authorities (possibly at the provincial or national level).*

### 4. CREATE OR STRENGTHEN CROSS-DEPARTMENTAL COORDINATION TO ENABLE INTEGRATED SOLUTIONS TO URBAN SUSTAINABILITY CHALLENGES

*The UII has provided an innovative platform for dialogue across different infrastructure sectors and city government departments. It has also been the experience of the UII that city administrations are increasingly using cross-departmental approaches to drive innovative thinking and integrated solution development for urban sustainability challenges. Cities should continue to create or strengthen this cross-departmental coordination. Coordination networks and groups have the added value of providing an excellent engagement point for dialogue with business on integrated solutions.*

## FOR BUSINESSES

### 5. PURSUE OPPORTUNITIES FOR SUSTAINABILITY STRATEGY PARTNERSHIP WITH CITIES

*Leading companies are already working with cities through a range of commercial and philanthropic activities to help them address their sustainability challenges. The UII has pioneered a new model of early engagement between business and cities to complement these activities and further scale up the private sector contribution to urban sustainability.*

*The WBCSD views early strategic engagement as a major mechanism for businesses to operationalize their commitment to sustainable development and an opportunity to work collectively to unlock the market for new, innovative solutions that will be critical in making cities more sustainable.*

*Businesses should be proactive in pursuing opportunities for sustainability strategy partnerships with cities in the way demonstrated by the 14 UII companies. It should be noted that this will require time and resource commitments and modes of working that may differ from standard commercial interactions, involving broad-based problem solving, freely sharing knowledge and expertise, and working constructively with non-conventional partners and other companies (including competitors).*

### 6. COLLABORATE WITH OTHER BUSINESSES AND PROFESSIONAL EXPERTS ON URBAN SUSTAINABILITY STRATEGY DEVELOPMENT

*Some businesses may not as a matter of course look to collaborate with others on urban sustainability. This may be because it is not an established practice or because of concerns about sharing proprietary information or losing competitive advantage.*

*However, it is the perspective of the WBCSD that leading companies (including competitors) have a clear shared interest in working together for urban sustainability. A review of the business opportunities in building sustainable cities published in the Harvard Business Review[18] also argues that the best opportunities to capture value from making cities more efficient will increasingly involve complex, often multi-company business models.*

*The UII has shown the value of businesses working together when engaging with cities early in the planning process. Cities often have a preference for working with a group of businesses for this type of strategic interaction, where they benefit from a diversity of perspectives and opportunities for innovative cross-sector thinking. UII companies have found they have also gained a lot from working together, especially when groups of companies bring complementary skills, expertise and solutions.*

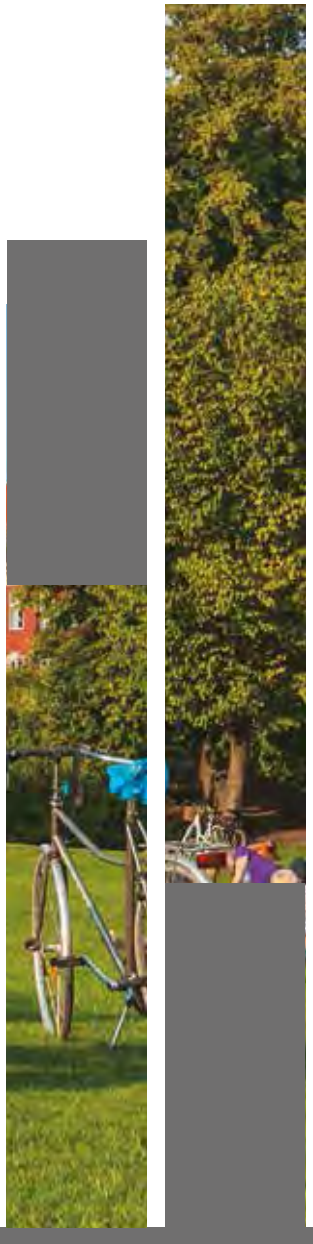
## FOR CITY ASSOCIATIONS, INTERNATIONAL ORGANIZATIONS, NGOs AND URBAN PROFESSIONAL ASSOCIATIONS

### 7. SUPPORT AND FACILITATE STRATEGIC ENGAGEMENT BETWEEN CITIES AND BUSINESS AS AN EFFECTIVE TOOL TO DRIVE URBAN SUSTAINABILITY

*City associations, international organizations, NGOs and urban professional associations promoting urban sustainability are increasingly recognizing the important contribution of the private sector. These organizations, as well as business associations like the WBCSD, can play a catalytic role by facilitating and advocating for early business engagement with cities. They should highlight the benefits and examples of best practice, and (depending on their organizational mandate) help broker constructive engagement activities between cities and the private sector.*

[18] Macomber 2013

# 05 CONCLUSIONS AND NEXT STEPS



The UII is a major global initiative to demonstrate the value of early, collaborative, strategic involvement of business in helping cities turn their sustainability visions into a reality.

From the experience of working with 10 cities around the world, the UII has made a number of recommendations for cities, businesses and other key stakeholders to further promote this critical form of collaboration between cities and business. The importance of this collaboration is being increasingly recognized but cities face barriers or uncertainty on how to take this agenda forward. The WBCSD believes that the example of the UII and recommendations in this report can provide some clarity and guidance on how cities and business can make early collaborative dialogue happen in practice to produce real benefits.

With the publication of this report, the WBCSD will engage with cities, city organizations, international institutions, NGOs and the wider business community to promote discussion on the key findings and recommendations. This can make an important contribution to the urgent global dialogue on how all stakeholders can work together to make cities more sustainable.

Furthermore, the WBCSD is actively evaluating what future role it can play, working with other leading global institutions, to scale up strategic engagement between cities and business to support transformational action towards Vision 2050. Catalyzing this action in the urban domain is a major focus of WBCSD's new Action2020 Initiative, the WBCSD's primary platform for business to help the world achieve a sustainable future.

To drive action and build on the success of the UII, the WBCSD will continue to seek opportunities to promote city-business collaboration for sustainable development. In this regard, one potential approach could be to work with city associations to establish collaboration platforms that catalyze business engagement with multiple cities in the same country or region, or groups of cities that share similar sustainability challenges.

This facilitation role could be complemented by further analysis and research with other leading institutions on other key enablers to scale up of the role of business as a provider of sustainable urban solutions. Such enablers include best-practice partnering and collaboration models, innovative financing mechanisms, measurement and metrics.

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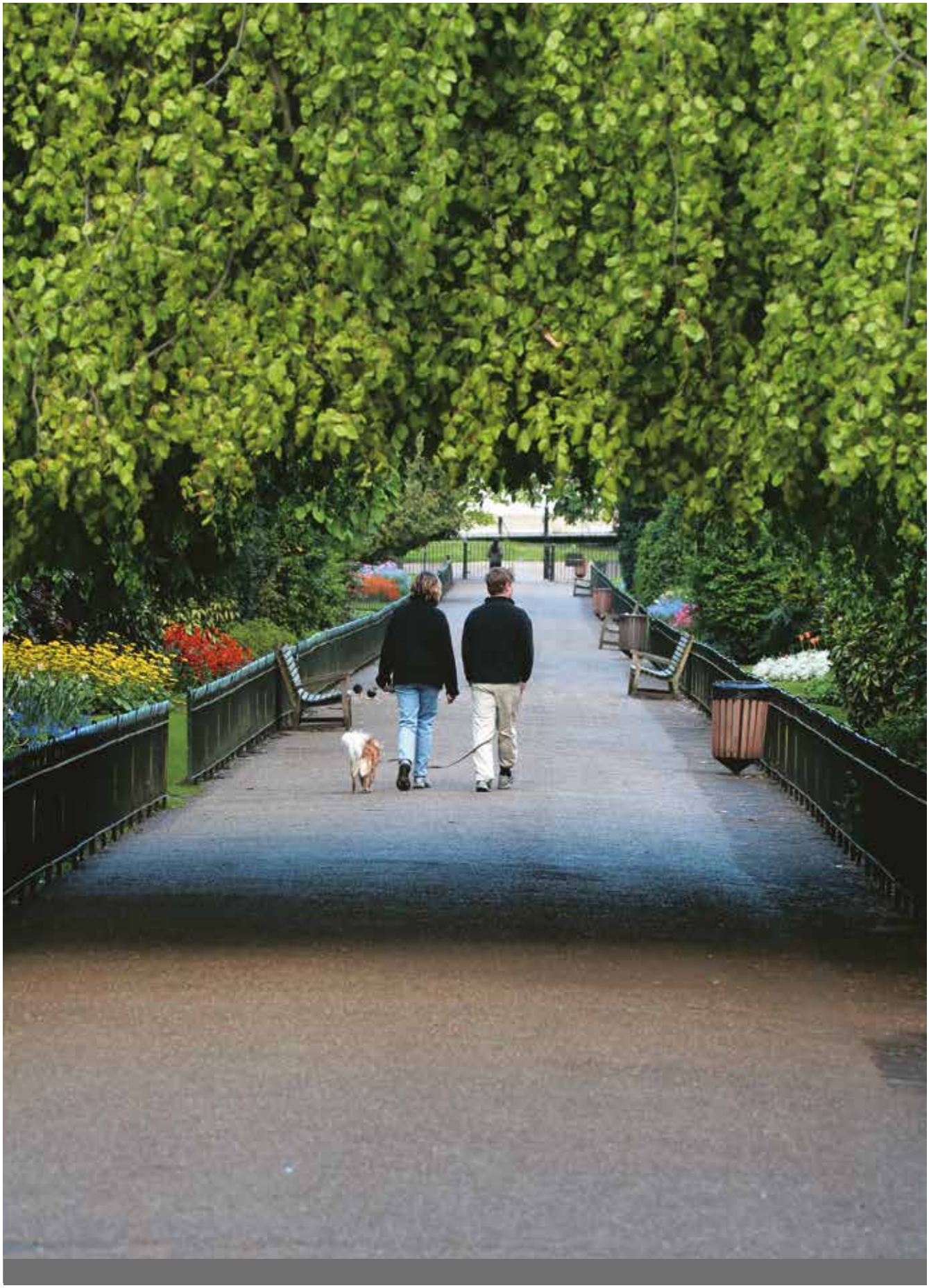

# UII MEMBERS

## CO-CHAIRS

A global building materials company that provides high-quality products and sustainable solutions to customers and communities in more than 50 countries throughout the world.

Provider of highly efficient and innovative solutions to individuals, cities and businesses in the sectors of electricity, natural gas as well as energy efficiency and environmental services.

Global partner for cities when it comes to the sustainable development of urban infrastructures with green, efficient products, solutions and financing models.

The WBCSD is a CEO-led, global coalition of some 200 companies advocating for progress on sustainable development. It aims to be a catalyst for innovation and sustainable growth in a world where resources are increasingly limited.

## MEMBERS

A leader in the creation, development and management of renewable energy, sustainable infrastructure and water services, contributing actively to sustainable development.

A provider of professional, technical and management support services, working to enhance and sustain the world's built, natural and social environments.

A global materials and components supplier of core technologies based on glass, fluorine chemistry and ceramics.

A leading player in the energy industry, active in all areas of the electricity value chain, from generation to energy supply, trading and network management, with expanding operations in the natural gas chain.

The world's largest motorcycle manufacturer and a leading automaker, providing a wide variety of products, ranging from mobility to power and clean energy production products.

A global manufacturer of automotive products and marine equipment, and provider of related services.

A diversified health and well-being company, serving professional and consumer markets in healthcare, lifestyle and lighting.

A global leader in energy management that provides solutions to make energy safe, reliable, efficient, productive and green in homes, buildings, industrial facilities, data centers and across the electrical networks.

A leading company in the transfer of goods and documents around the world with a focus on time- and day-definite service.

A global vehicle manufacturer contributing to the sustainable development of society through manufacturing and provision of innovative and quality products and services.

A provider of high technology products and services to the building systems and aerospace industries worldwide including United Technologies Building and Industrial Systems, United Technologies Aerospace Systems, Pratt & Whitney, and Sikorsky.

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## About the WBCSD

The World Business Council for Sustainable Development (WBCSD) is a CEO-led organization of forward-thinking companies that galvanizes the global business community to create a sustainable future for business, society and the environment. Together with its members, the council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the council helps drive debate and policy change in favor of sustainable development solutions. The WBCSD provides a forum for its 200 member companies – who represent all business sectors, all continents and a combined revenue of more than $7 trillion – to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The Council also benefits from a network of 60 national and regional business councils and partner organizations, a majority of which are based in developing countries.
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