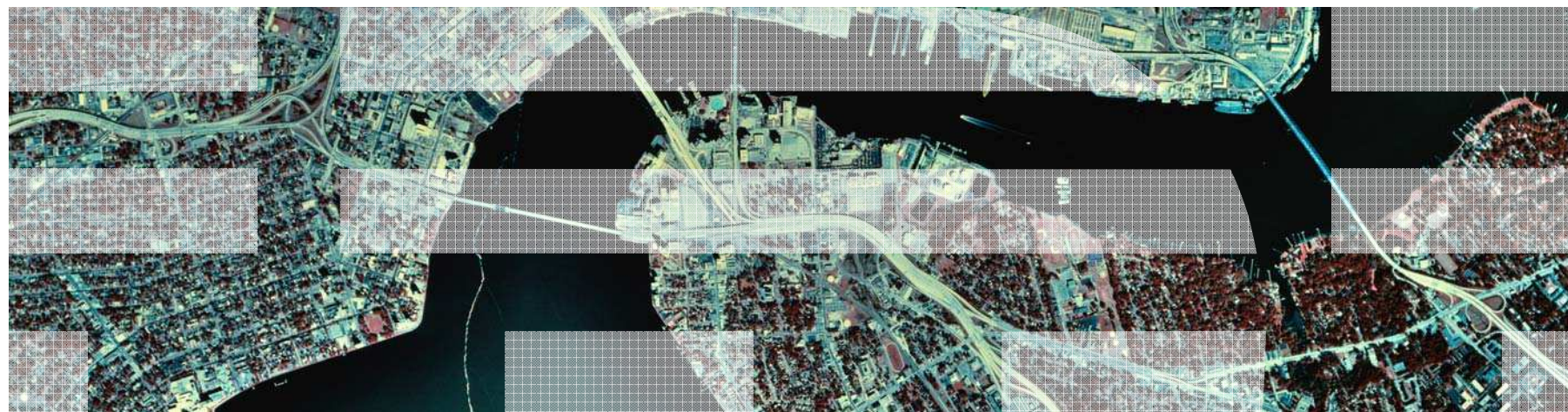


# A vision of smarter cities:

How cities can the lead way into a prosperous and sustainable future

Dr Mary Keeling, IBV Center for Economic Development

**15th April 2010 IBEC-CBI Joint Business Council North West Plenary**



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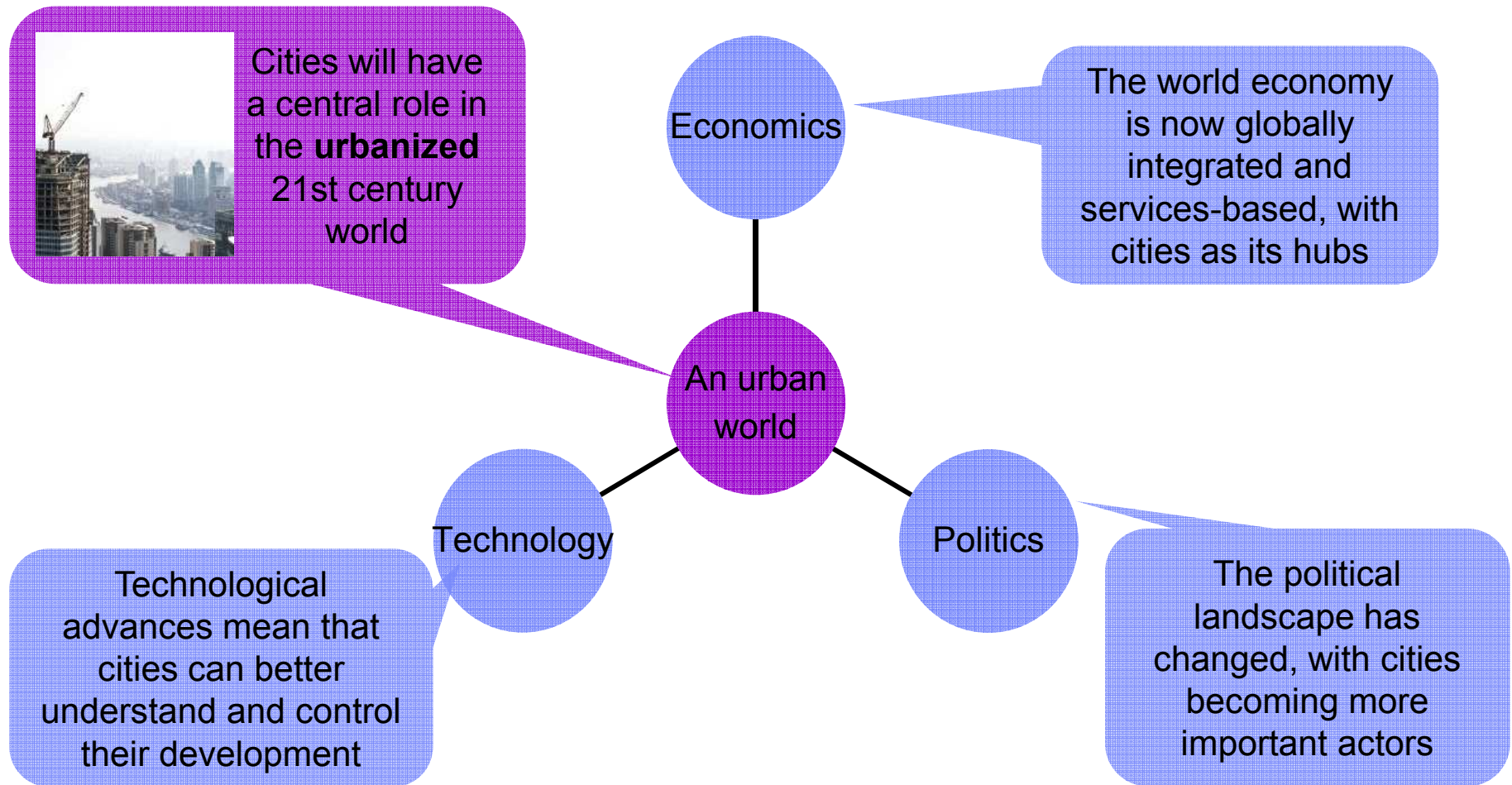
## Contents

### **Cities take centre stage**

Tackling challenges and threats

Building a smarter city

# The global environment has changed, making cities a critical level of action



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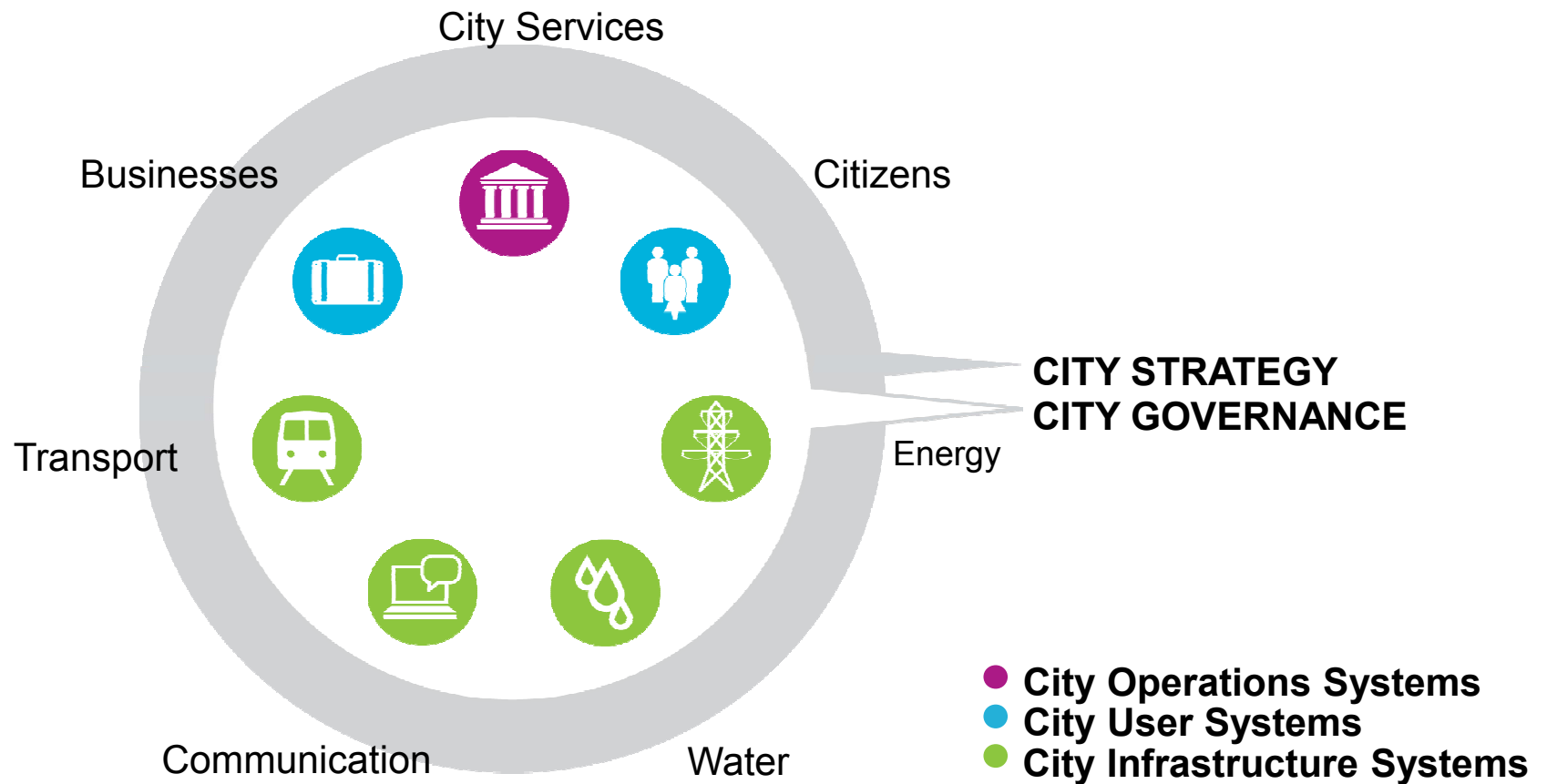
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Cities take centre stage

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# Cities are based on a number of core systems which are central to their operation and development

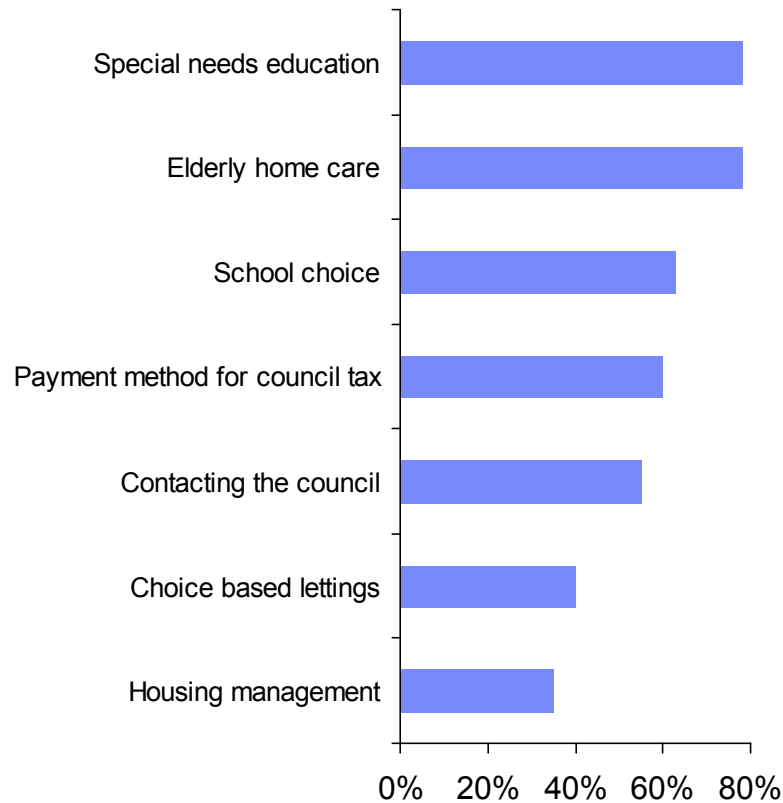


# Cities are under pressure to tackle the significant interrelated challenges they face



## City services: Under pressure to deliver greater choice and more responsive services with limited budgets

### % of people who think choice in the following services is important (UK)



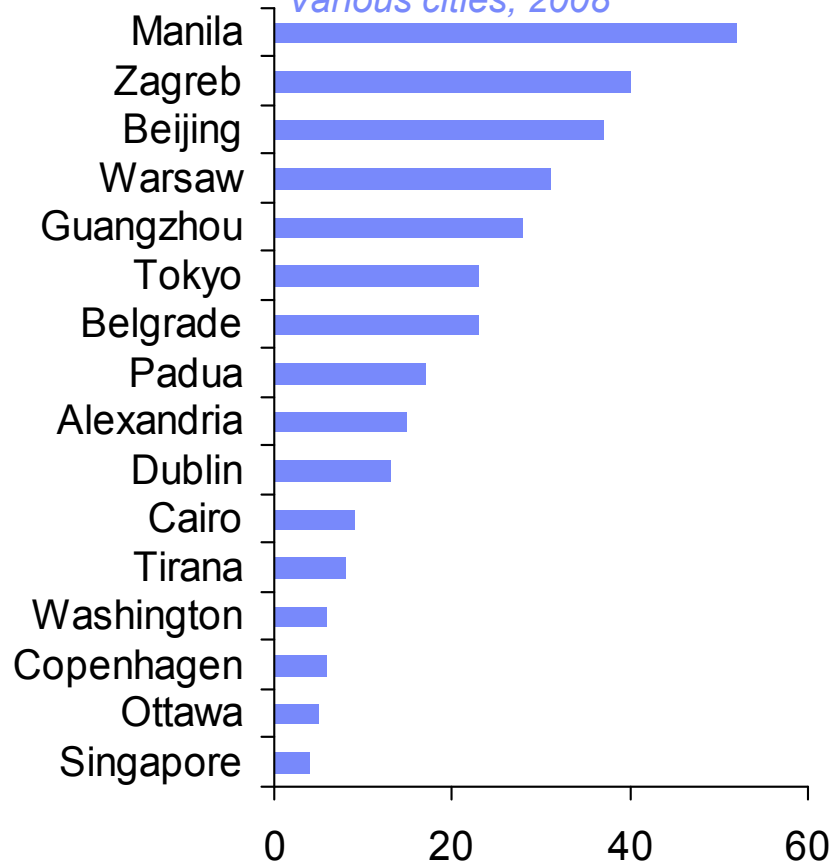
Source: Audit Commission, 2004  
% of respondents giving the highest three scores (out of ten) when asked how important choice in each service

- Councils face budgetary pressures as they try to maintain everyday services and achieve efficiency savings with limited financial resources
- City of Derry Airport faces a deficit of £4m
- Belfast City Council
  - cut £7 million of costs out of budgets since 2006
  - will cut a further £2 million from budgets from the start of April 2010

## Business: Cities must balance complex regulatory requirements with the need to minimize unnecessary administrative burdens

**Number of days to start a business**

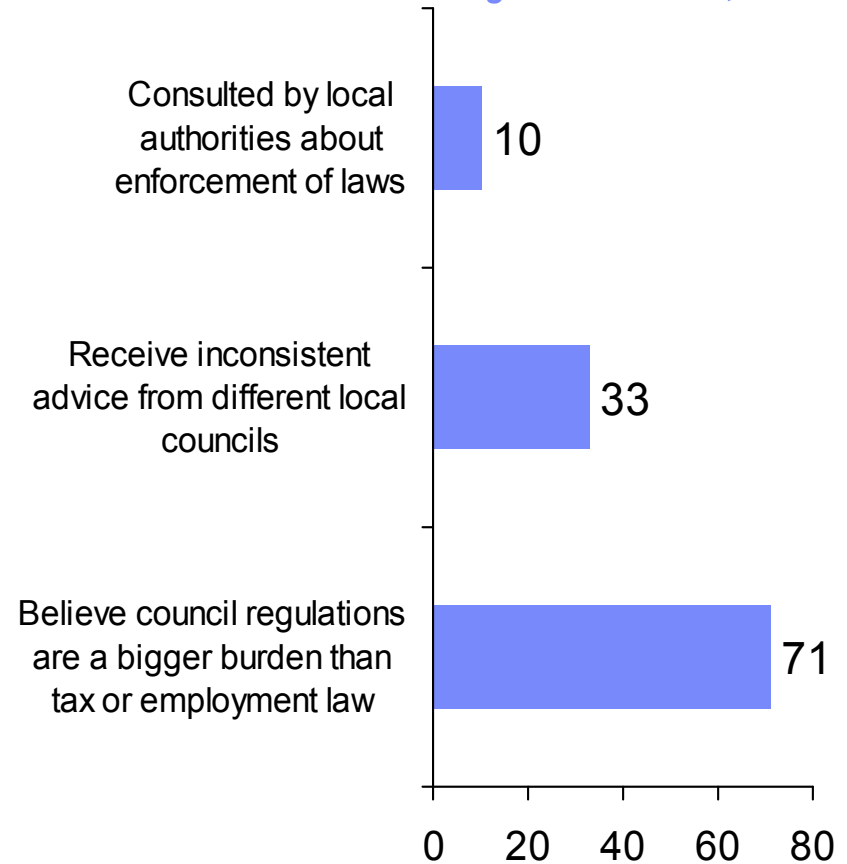
*Various cities, 2008*



Source: World Bank

**Demands on business**

*% of small business in England & Wales, 2008*

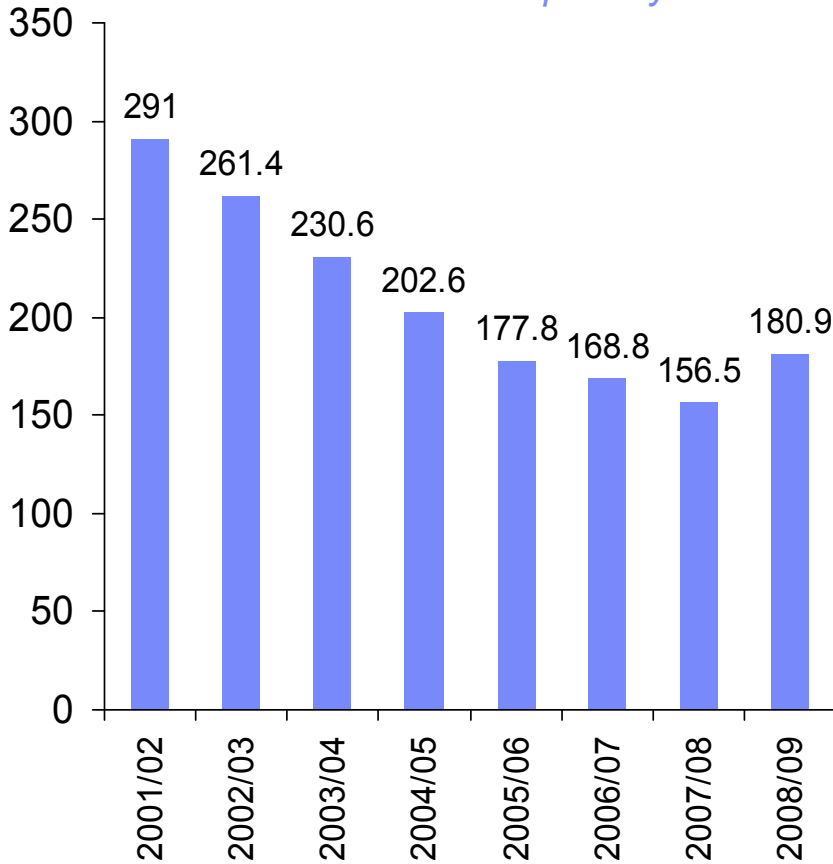


Source: LBRO/Ipsos-MORI 2008

# Water: Problems with water efficiency, leakage, quality and the threat of flooding pose a significant challenge for cities

## Northern Ireland water leakage levels

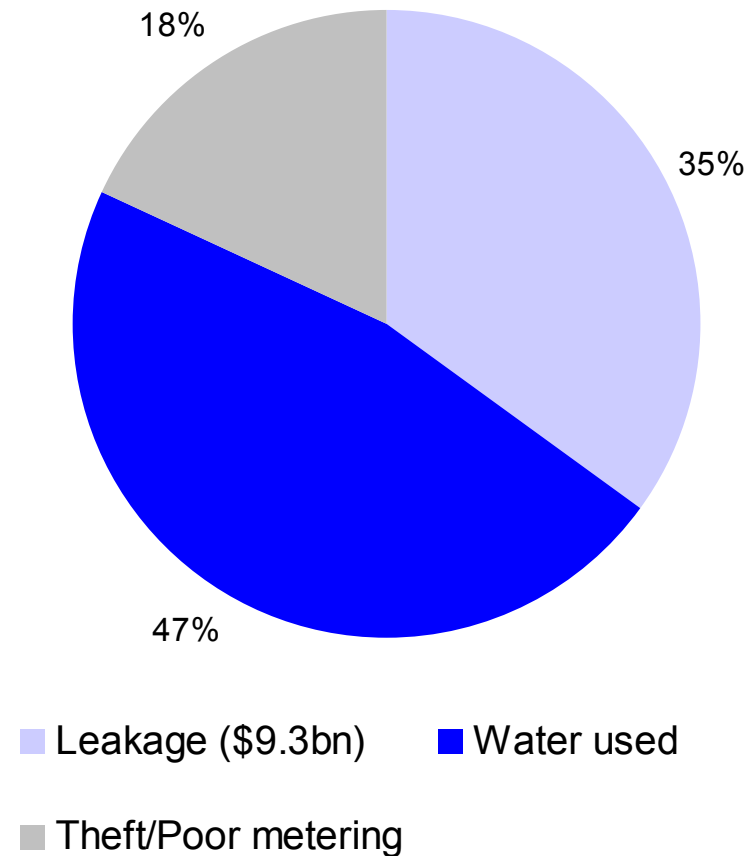
Millions of liters per day



Source: NI Water Annual Report 2008/09

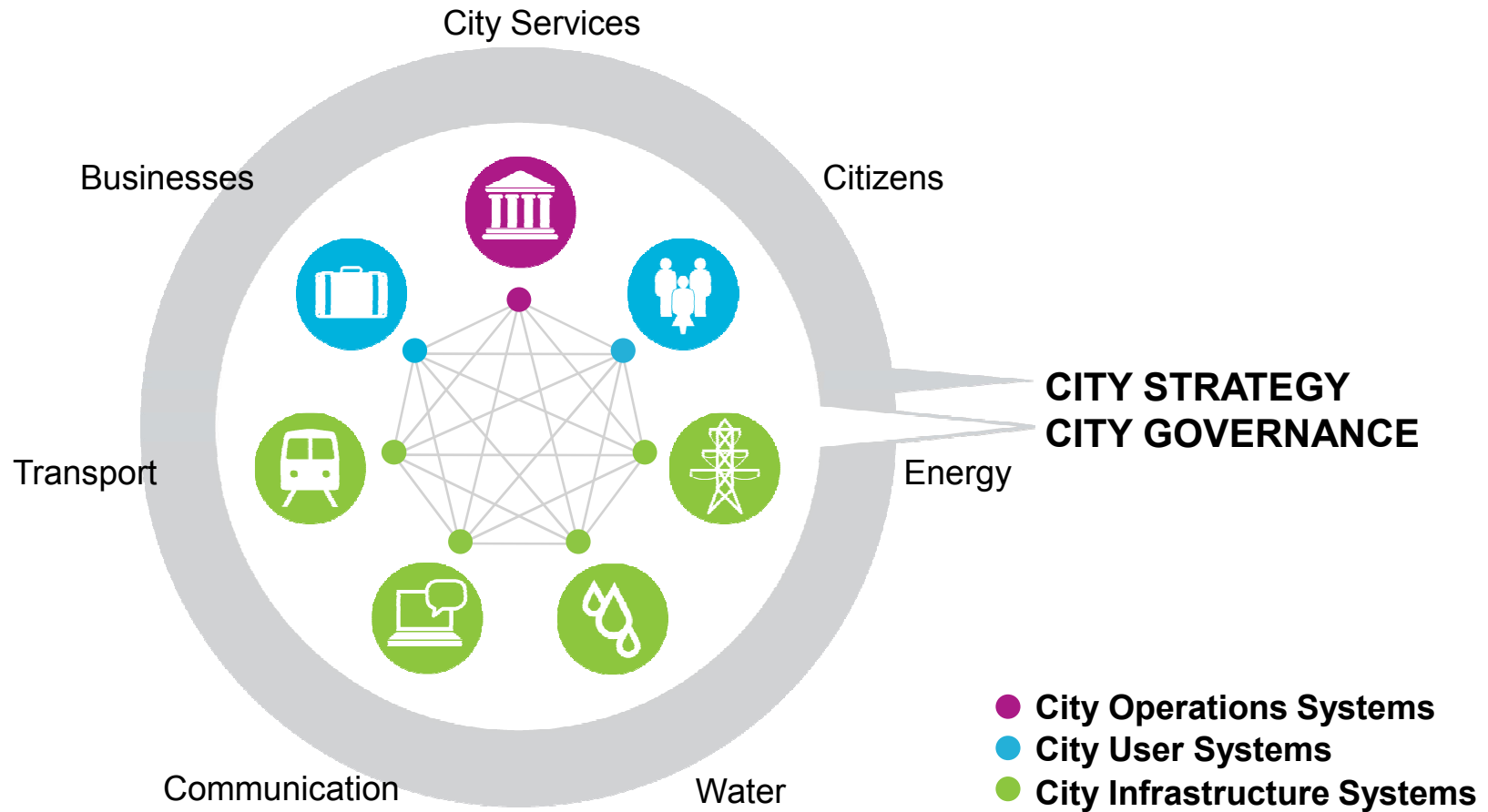
## Current usage of global water supply

Estimated Cost in brackets



Source: World Bank, SIWI, WEF, UNCTAD

# Cities face interconnected challenges and to address one challenge, they need to be aware of them all



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**Building a smarter city**

A smarter city is one that uses technology to transform its core systems and optimize finite resources

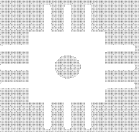
**We live in a world of finite resources, such as energy, water, land, skill**

**We live in a world of pervasive technologies, sensors, networks**



**Cities can use technology to transform their core systems and maximize finite resources**

# 'Smart' requires that solutions be instrumented, interconnected and intelligent

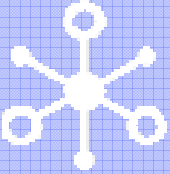


**Instrumented**

*Instrumentation enables cities to gather more, better quality, and more timely data than ever before*

*This offers the ability to measure, sense and see the exact condition of everything*

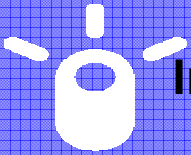
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**Interconnected**

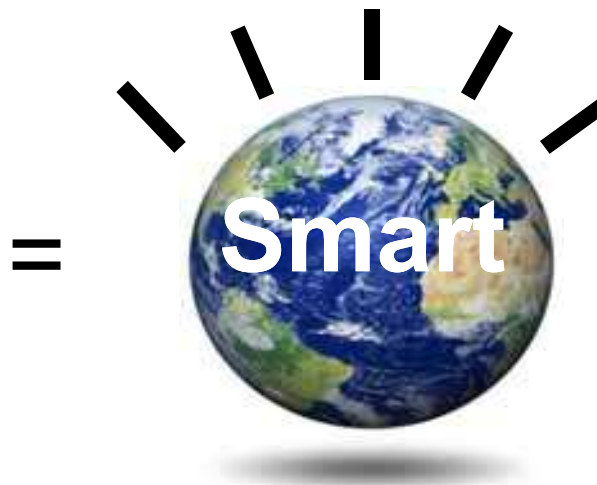
*Interconnected technology offers the potential for cities to connect data, systems and people in ways that were not previously possible.*

+



**Intelligent**

*Intelligent technology – in the form of new computing models that can analyze information and relationships - enables cities to use predictive insights for informed decision making and action*



Each core system can be made 'smarter' through instrumentation, generating more and better quality data for cities than ever before

System	Elements	Instrumentation
<b>City Services</b>	<ul style="list-style-type: none"> <li>▪Public service management</li> <li>▪Local government administration</li> </ul>	Creation of local authority management information system
<b>Citizens</b>	<ul style="list-style-type: none"> <li>▪Health and education</li> <li>▪Public safety</li> <li>▪Government services</li> </ul>	Patient diagnostic and screening devices
<b>Business</b>	<ul style="list-style-type: none"> <li>▪Business environment</li> <li>▪Administrative burdens</li> </ul>	Data gathering about use of online business services
<b>Transport</b>	<ul style="list-style-type: none"> <li>▪Cars, roads</li> <li>▪Public transport</li> <li>▪Airports, seaports</li> </ul>	Measuring traffic flows and toll use
<b>Communication</b>	<ul style="list-style-type: none"> <li>▪Broadband, wireless</li> <li>▪Phones, computers</li> </ul>	Data gathering via mobile phones
<b>Water</b>	<ul style="list-style-type: none"> <li>▪Sanitation</li> <li>▪Freshwater supplies</li> <li>▪Seawater</li> </ul>	Gather data for water quality monitoring
<b>Energy</b>	<ul style="list-style-type: none"> <li>▪Oil, gas</li> <li>▪Renewable</li> <li>▪Nuclear</li> </ul>	Fit sensors to gather data on usage across the energy system

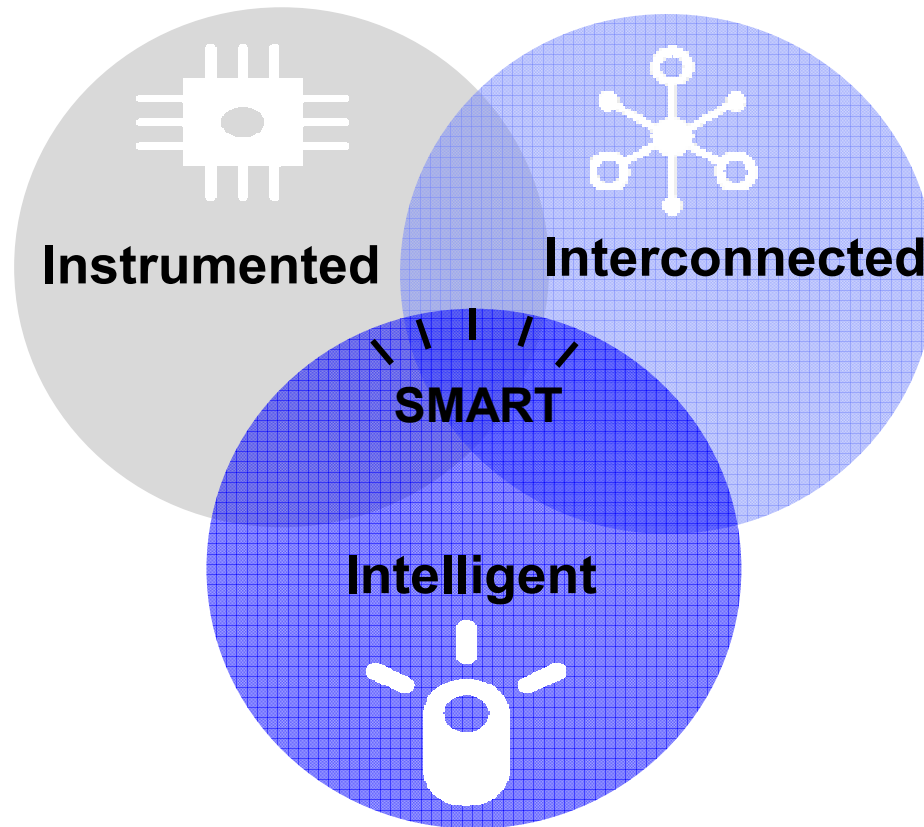
Each core system can be made ‘smarter’ through interconnection, connecting people, data and systems in ways not previously possible

System	Elements	Instrumentation	Interconnection	
<b>City Services</b>	<ul style="list-style-type: none"> <li>Public service management</li> <li>Local government administration</li> </ul>	Creation of local authority management information system	Interconnected service delivery	
<b>Citizens</b>	<ul style="list-style-type: none"> <li>Health and education</li> <li>Public safety</li> <li>Government services</li> </ul>	Patient diagnostic and screening devices	Interconnect records for doctors, hospitals, and other health providers	
<b>Business</b>	<ul style="list-style-type: none"> <li>Business environment</li> <li>Administrative burdens</li> </ul>	Data gathering about use of online business services	Interconnect stakeholders across city's business systems	
<b>Transport</b>	<ul style="list-style-type: none"> <li>Cars, roads</li> <li>Public transport</li> <li>Airports, seaports</li> </ul>	Measuring traffic flows and toll use	Integrated traffic, weather, and traveller information services	
<b>Communication</b>	<ul style="list-style-type: none"> <li>Broadband, wireless</li> <li>Phones, computers</li> </ul>	Data gathering via mobile phones	Interconnect mobile phones, fixed line, broadband	
<b>Water</b>	<ul style="list-style-type: none"> <li>Sanitation</li> <li>Freshwater supplies</li> <li>Seawater</li> </ul>	Gather data for water quality monitoring	Interconnect businesses, ports, energy users of water	
<b>Energy</b>	<ul style="list-style-type: none"> <li>Oil, gas</li> <li>Renewable</li> <li>Nuclear</li> </ul>	Fit sensors to gather data on usage across the energy system	Interconnect appliances & devices between energy consumers and providers	

## Each core system can be made 'smarter' through intelligence, giving cities unprecedented prediction powers

System	Elements	Instrumentation	Interconnection	Intelligence
<b>City Services</b>	<ul style="list-style-type: none"> <li>Public service management</li> <li>Local government administration</li> </ul>	Creation of local authority management information system	Interconnected service delivery	Immediate and joint-up service provision
<b>Citizens</b>	<ul style="list-style-type: none"> <li>Health and education</li> <li>Public safety</li> <li>Government services</li> </ul>	Patient diagnostic and screening devices	Interconnect records for doctors, hospitals, and other health providers	Patient-driven pre-emptive care
<b>Business</b>	<ul style="list-style-type: none"> <li>Business environment</li> <li>Administrative burdens</li> </ul>	Data gathering about use of online business services	Interconnect stakeholders across city's business systems	Customized service delivery for businesses
<b>Transport</b>	<ul style="list-style-type: none"> <li>Cars, roads</li> <li>Public transport</li> <li>Airports, seaports</li> </ul>	Measuring traffic flows and toll use	Integrated traffic, weather, and traveller information services	Real-time road pricing
<b>Communication</b>	<ul style="list-style-type: none"> <li>Broadband, wireless</li> <li>Phones, computers</li> </ul>	Data gathering via mobile phones	Interconnect mobile phones, fixed line, broadband	Information for consumers on city services in real time, on their own time
<b>Water</b>	<ul style="list-style-type: none"> <li>Sanitation</li> <li>Freshwater supplies</li> <li>Seawater</li> </ul>	Gather data for water quality monitoring	Interconnect businesses, ports, energy users of water	Real-time quality, flood, and drought control
<b>Energy</b>	<ul style="list-style-type: none"> <li>Oil, gas</li> <li>Renewable</li> <li>Nuclear</li> </ul>	Fit sensors to gather data on usage across the energy system	Interconnect appliances & devices between energy consumers and providers	Optimise the use of the system and balance use across time

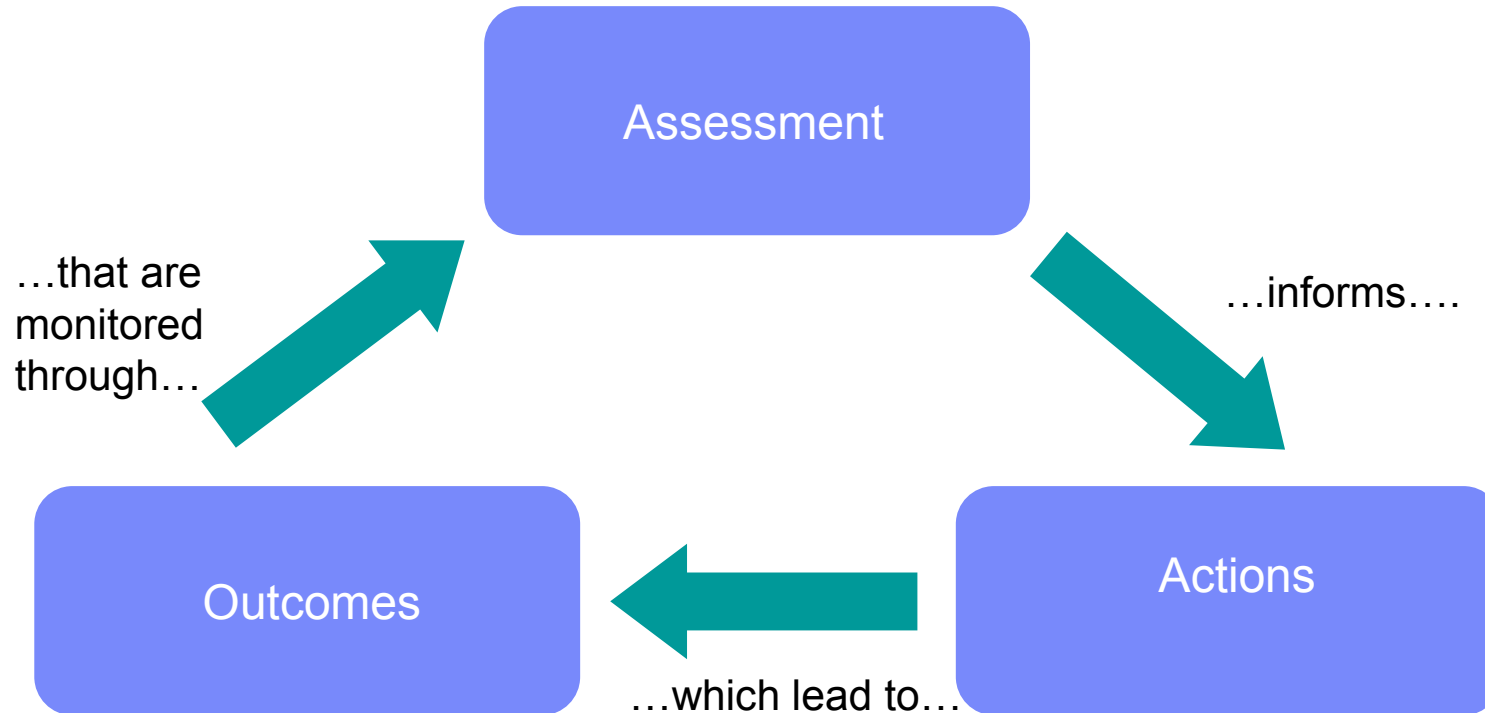
Cities that want to realise the full potential of smart solutions must utilise all three dimensions of 'smart' ...



## With limited resources, cities must focus on their core competencies to deliver an integrated strategy

- To put in place a plan for transforming into a smarter city, a city needs to do more than just strategize:
  - **Assemble the team**
    - **work seamlessly across its own organizational boundaries and partner effectively**
  - **Target all, not just one**
    - **the interrelationships between the various systems mean that ‘solving one’ is not an option – a holistic strategy is required**

## Becoming smarter requires an understanding and assessment of where you are today and what improvements are needed



...and as cities become smarter the instrumented, interconnected and intelligent solutions provide more and better information and data for better assessments!

## Cities built on smarter systems are best placed to survive and prosper in the new environment

*“The 19th century was a century of empires,  
the 20th century was a century of nation states.*

*The 21st century will be a century of cities.”*  
**Wellington E. Webb, Mayor of Denver, 2000**

- This is a **journey** for cities, not an overnight transformation, but the **first step** involves a shift in thinking and a break from the past
- As they strive for **sustainability and prosperity**, cities should grasp the opportunities that now exist in smarter systems
- For more details, please visit

[http://www-05.ibm.com/ie/emerging\\_business\\_centre/studies.html](http://www-05.ibm.com/ie/emerging_business_centre/studies.html)

A vision of smarter cities: How cities can lead the way into a prosperous and sustainable future

How Smart is your city? Helping cities measure progress

