Smart City Project Methodology

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Contents

1. Introduction

➢ The objective of this presentation is to present the

- Overall methodology for the Smart City Project
- Expert Teams' proposal to utilise a Smart City Assessment Framework tool for the "Comparative Study of the EU – China Smart City pilot projects"
- Rationale and benefits of utilising the Smart City Assessment Framework tool are discussed

➢ A first draft of the Smart City Assessment Framework is provided for discussion

- Feedback on the draft to be incorporated into the final version of the Smart City Assessment Framework for approval

➢ A first draft of the Smart City work package allocations

2. Methodology
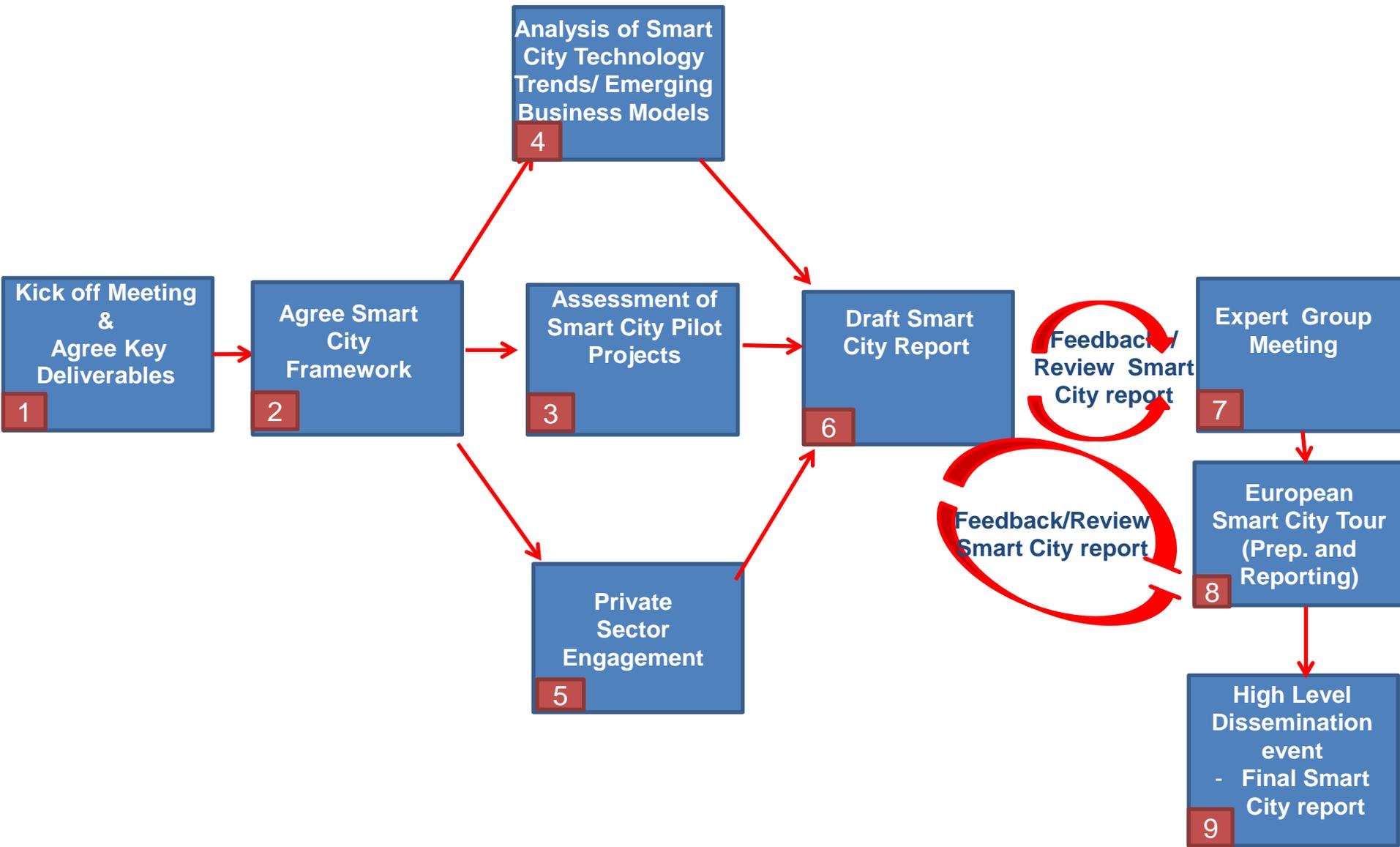
3. Definition of Smart City (1)

➢ There are many definitions of Smart City used around the world and the concept is sometimes used in ways that are not always consistent

Definitions of Smart City
• A smart city is one that uses information and communications technologies to make the critical infrastructure components and services of a city — administration, education, healthcare, public safety, real estate, transportation and utilities — more aware, interactive and efficient. [1]
• A city "connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city" [2]
• A city can be defined as 'smart' when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory action and engagement [3]
• A city "combining ICT and Web 2.0 technology with other organizational, design and planning efforts to dematerialize and speed up bureaucratic processes and help to identify new, innovative solutions to city management complexity, in order to improve sustainability and livability."[4]

[1] Forrester Research, (2010)
[2] Foundations for Smarter Cities. IBM Journal of Research and Development, (2010)
[3] Caragliu, A; Del Bo, C. & Nijkamp, P (2009). "Smart cities in Europe". Serie Research Memoranda 0048
[4] Toppeta, D. (2010), The Smart City Vision: How Innovation and ICT Can Build Smart, "Livable", Sustainable Cities.

3. Definition of Smart City (2)

➢ Common themes in Smart City definitions

  ▪ Strong focus on the use of *Information Communication Technology* ("ICT")

  ▪ Enabling city infrastructure to be more *interactive* and *efficient* in order to facilitate **social**, **cultural** and **urban** development

  ▪ *Participation* and *engagement* of many *stakeholders*

  ▪ Innovative *business models* and *solutions* to manage the complexity of cities

4. Smart City Assessment Framework[1]

➢ The Expert Team has designed a Smart City Assessment Framework which incorporates the key characteristics that are common to Smart City projects[1]

➢ There are several benefits from utilsing a framework to assess the Smart City pilot projects

- Common language and understanding of Smart City concepts
- Mechanism for delivering normalised information that is easily accessible
  - Procedures developed for capturing, validating and analysing data to ensure consistency

[1] The Expert Teams' Smart City Assessment Framework incorporates the findings from several papers that have proposed Smart City frameworks including: "Understanding Smart Cities: An Integrative Framework" Hafedh Chourabi, Taewoo Nam, et al, IEEE Computer Society, 2012; Smart City Framework," A Systematic Process for Enabling Smart+Connected Communities, Gordon Falconer, Shane Mitchell; September 2012

4. Smart City Assessment Framework(2)

➢ The objective of the assessment framework is *not* to rank the Smart City pilot projects

➢ The goal is to *compare* the various characteristics of each Smart City project in order to

- Identify "good practise" in the various components of a Smart City project
  - Assessed against a common set of criteria
- Quantify the benefits from Smart City projects
- Understand emerging challenges in Smart City projects

4. Smart City Assessment Framework(3)

➢ The Smart City assessment framework comprises of nine characteristics

  - Smart City Strategy
  - Stakeholders
  - Governance
  - Funding
  - Value Assessment
  - Business Models
  - ICT Infrastructure
  - Smart City Services
  - Legal and Regulatory policies

4. Smart City Assessment Framework(4)

Characteristic	Description
Smart City Strategy	▪ Does the city have a Smart City vision and clear objectives? 　○ Pilot cities are likely to have different objectives depending on their specific vision and objectives for the city ▪ Does the Smart City project have quantifiable targets (KPIs)? 　○ Are KPI's benchmarked against international standards e.g. "Global urban competitiveness index", "Innovation Cities Program" etc. ▪ Does the city have a strong ICT expertise at the strategic level of the city e.g. a CIO?
Stakeholders	▪ Who are the key stakeholders involved in decision-making of the city? ▪ What are the roles, responsibilities and inter-relationships of stakeholders? 　○ Government, regulators, land and property developers, ICT service providers and integrators, utility providers, transport operators, citizens, etc. ▪ How, if at all, is citizen engagement involved in the smart city initiative?
Governance	▪ What is the organisational/management and governance structure of the Smart City initiative? 　○ What is the role of the leader and champion of the project? 　○ Is there collaboration and communication between the various stakeholders? 　○ Is there transparency/accountability of the various stakeholders?

** A detailed written description is required - not a simple "yes" or "no"!

4. Smart City Assessment Framework(5)

Characteristic	Description

Funding	▪ What is the value and the source of funding for the smart city projects (different sources may apply across various aspects of the project)?
	▪ What process was used to raise funding and how long did it take to secure funding?
	▪ Who are the key partners involved in raising the funds?
	  ○ How much of the funding was from private and public sources?
	  ○ What business structures have been established e.g. PPP, JVs?
	▪ Where there any funding issues e.g. budget over-runs, insufficient funding to complete the project goals?
	▪ What system/governance is in place for monitoring financial expenditure?

Value Assessment	▪ What are the economic , environmental, social and cultural outcomes from the Smart City project ? How is Return on Investment measured?, Is a holistic approach being taken to measure value creation ?e.g.
	  ○ The amount of business and jobs created? Improvement in workforce development and productivity?
	  ○ Reduction in C02 emissions, traffic congestion, etc.?
	  ○ Improvement in health services, increase in housing and community amenities?
	▪ Is the value assessed at the individual level or economies of scope and externalities also captured?
	  ▪ Are any frameworks/tools being used to measure the "Social Return on Investment'?

4. Smart City Assessment Framework₍₆₎

Characteristic	Description

Business Models	▪ What are the business models (different models may apply across various aspects of the project) are being used to monetise Smart City investments? Description should include
	  o Who are the customers?
	  o What is the customer value proposition?
	  o How are revenues generated? Direct sales, usage fees, subscription fee, leasing, licensing, brokerage fee, advertising fees?
	  o Who are the key suppliers and partners?

ICT Infrastructure	▪ What is the current investment in ICT infrastructure?
	  o What is the broadband (fixed and wireless) penetration?
	  o Has the city invested in data centre infrastructure? Cloud services?
	  o Has specialised equipment such as passive/ intelligent sensors been installed to monitor and measure data?
	  o Is there City wide inventory of software, systems and platforms to deliver smart city services? Or does each department keep their own records?
	  o Who are the suppliers, vendors, System Integrators involved in providing the smart city infrastructure?
	▪ Is the ICT infrastructure managed/shared across projects?
	▪ Is there a plan to roll-out ICT infrastructure to meet future demand?

4. Smart City Assessment Framework

Characteristic	Description
Smart City Services	▪ What smart city services have been developed ? 　○ A standard classification will be provided to aid comparison across pilot cities ▪ What are the benefits resulting from the services? 　○ See section on value assessment ▪ Provide a high level system/technical overview of each service and highlight whether the service 　○ Is scalable i.e. could the application be expanded within the pilot city and /or other cities? 　○ Are the services provided over the Cloud? 　○ Is a single service or part of a broader integrated offering? 　○ Has an open Application Programming Interface (API)?
Legal and Regulatory Policies	▪ What are the key legal and regulatory policies that have had a material impact (positive/negative) on the development of the Smart City pilot project, such as 　▪ Telecommunications 　▪ Building regulations 　▪ Security and privacy 　　○ Open data 　▪ Intellectual Property

4. Smart City Assessment Framework(8)

➢ For each characteristic of the Smart City Assessment Framework, the pilot projects will be assessed to ascertain their level of maturity/advancement

- Level 1 – Basic
- Level 2 – Intermediate
- Level 3 – Advanced

4. Smart City Assessment Framework (9)

Characteristic	Level 1	Level 2	Level 3
Smart City Strategy	• Smart City vision clearly articulated and related to overall city vision • Limited strategic focus on ICT	▪ Clearly defined and measurable Smart city KPI's ▪ ICT vision for the city	▪ Smart City KPI's benchmarked against international standards ▪ ICT vision and strategy with dedicated City CIO
Stakeholders	• Stakeholder roles & relationships clearly defined but **no** citizen engagement in design of service	▪ Stakeholder roles & relationships clearly defined with some citizen engagement in design of design of service e.g. feedback loops established	▪ Stakeholder roles & relationships clearly defined with **full** citizen participation in design of services
Governance	• Departmental governance structures	▪ Some cross departmental collaboration	▪ City-wide governance structures & shared performance targets combined with international collaboration

** Some pilot projects may not meet the basic (level 1) attainment level and where this is the case these are to be "red flagged"

4. Smart City Assessment Framework[10]

Characteristic	Level 1	Level 2	Level 3
Funding	• Funding for pilot project but no plan to expand funding beyond the pilot • Basic monitoring of financial expenditure	▪ Well formed funding plan in place to expand pilot to full scale project ▪ Well established system to monitor financial expenditure	▪ Funding secured , partnerships and business structures agreed for full scale roll-out
Value Assessment	• Business case assessed on an individual project basis	▪ Some non-financial factors included in value assessment	▪ Holistic value assessment (social/ environmental/ financial)
Business Models	• Business models are unlikely to be sustainable beyond the pilot phase	▪ Business models are likely to be scalable beyond the pilot phase (may not yet be proven)	▪ Proven and sustainable business models

4. Smart City Assessment Framework(11)

Characteristic	Level 1	Level 2	Level 3
ICT infrastructure	• ICT infrastructure meets current pilot project needs but is unlikely to meet full scale project	▪ Credible plan to meet targeted ICT investments e.g. Smart Grid	▪ City-wide integrated ICT investment plan
Smart City Services	• A few (<5) Smart city services	▪ Integrated Smart City services around the city environment	▪ Diversity of cloud-based Smart City services
Legal & Regulatory Policies	• TBD	▪ TBD	▪ TBD

4. Smart City Assessment Framework(12)

Smart City Assessment Summary for "ICT Infrastructure"

Smart City Project	Red Flag	Level 1	Level 2	Level 3
Project 1		√		
Project 2			√	
Project 3			√	
Project 4		√		
Project 5	√			
Project 6		√		
Project 7		√		
Project 8			√	
Project 9			√	
Project 10				√

Smart City Assessment Summary for "Smart City Project 1"

Characteristic	Red Flag	Level1	Level 2	Level 3
Smart City Strategy			√	
Stakeholders			√	
Governance			√	
Funding		√		
Value Assessment		√		
Business Models		√		
ICT Infrastructure		√		
Smart City Services		√		
Legal & Regulatory				

5. Work Package Allocation (1)

Activity	Description	Owner	Timeline
1	• **Agree project deliverables**	**All**	**30 May 2013**
2	• **Agree Smart City Assessment Framework** o **Including guidance for completing framework**	**JW to draft All to agree**	**7 June 2013**
3	• **Complete Smart City Assessment Framework for China and EU Pilot cities**	**TH - China ST - Europe**	**5 July 2013**
4	• **Analysis of Smart City Technology Trends and Emerging business models**	**JW – Lead Input from team e.g. TH, ST,**	**5 July 2013**
5	• **Private Sector (land and property developers, vendors, Telco's, SI's etc.) Engagement** o **Business models and funding** o **Technical standards** o **Scaling up /standardising smart city solutions**	**JW/TH – Lead Input from,**	**5 July 2013**

5. Work Package Allocation (2)

Activity	Description	Owner	Timeline
6	• **Draft Smart City Report**	JW - Lead Input from TH, ST, ??	13 Sept 2013
7	• **Expert Group Meeting**	TH Coordinate Input from team	3rd week Sept 2013
6	• **Revise Draft Smart City Report** o **Incorporating feedback from the Expert Group Meeting**	JW - Lead Input from TH, ST, ??	4 Oct 2013
8	• **Support Preparation of Study Trip** • **Consolidate Report on Study Trip and feed into study**	?? Coordinate ?? Report	Nov 2013
9	• **High Level Dissemination Event** o **Final Draft Smart City Report**	KYR/CB Lead JW – Lead Input from team	March 2014

6. Next Steps

➢ Team to review the proposed Smart City Assessment Framework
  ▪ Factors to consider
    o Is the information required likely to be available from the Smart City pilot projects?
    o What additional information should also be collected?
    o Are the description of the "levels" sufficient to differentiate the Smart City pilot projects?

➢ Feedback on the draft to be incorporated into the final version of the Smart City Assessment Framework