



EIP-SCC

European Innovation Partnership
on Smart Cities and Communities

Integrated Infrastructures & Processes

Graham Colclough
20th June 2017 AC Updates





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European Innovation Partnership
on Smart Cities and Communities

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Urban Platforms

...learning to herd cats

The Humble Lamppost

4 ...a new use for an old asset





EIP-SCC

European Innovation Partnership
on Smart Cities and Communities

Integrated Infrastructures & Processes

Breakout Session

Graham Colclough
20th June 2017 II&P Breakouts

Integrated Infrastructure & Processes

IN PLACE

- Urban Platform
 - Svet Mihaylov
 - Andrew Collinge
 - Lutz Heuser
 - Holger Tallowitz
 - Bard de Lathouwer
- Humble Lamppost
 - Wim Jansen
 - Hans Nouwens
 - Lutz Heuser

WELCOME!

- Small Giants
 - Trevor Gibson

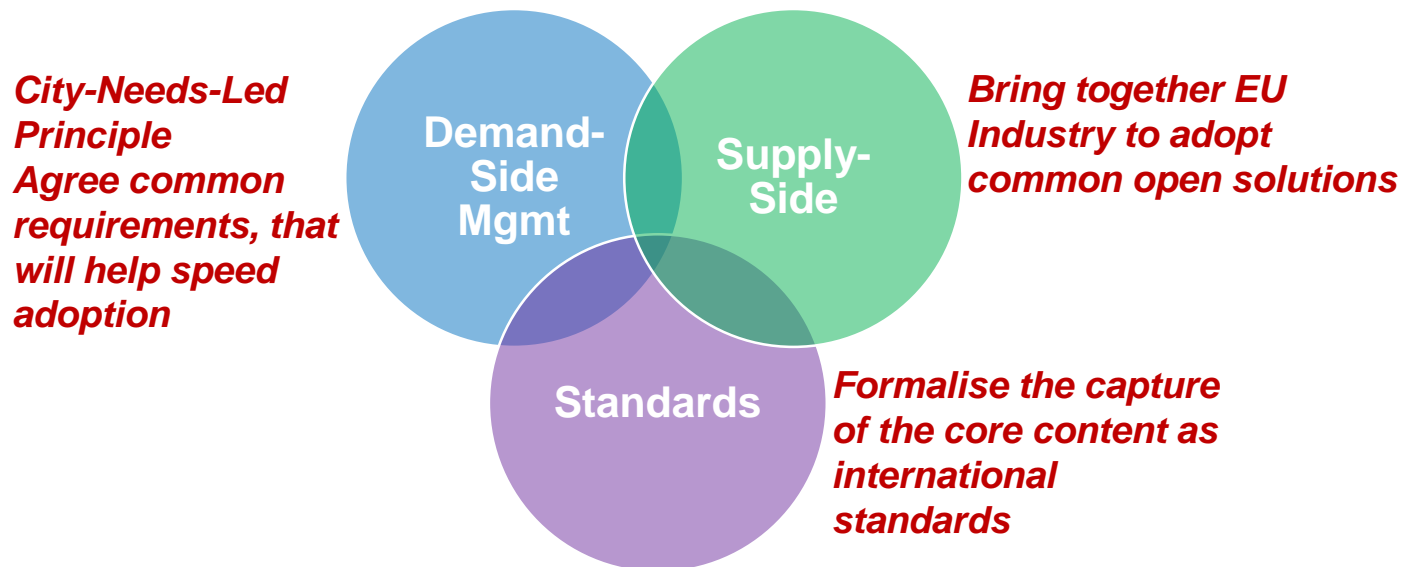
2018 POTENTIAL

- City Resilience
- Asset Mgmt
- ...?...

Urban Platforms

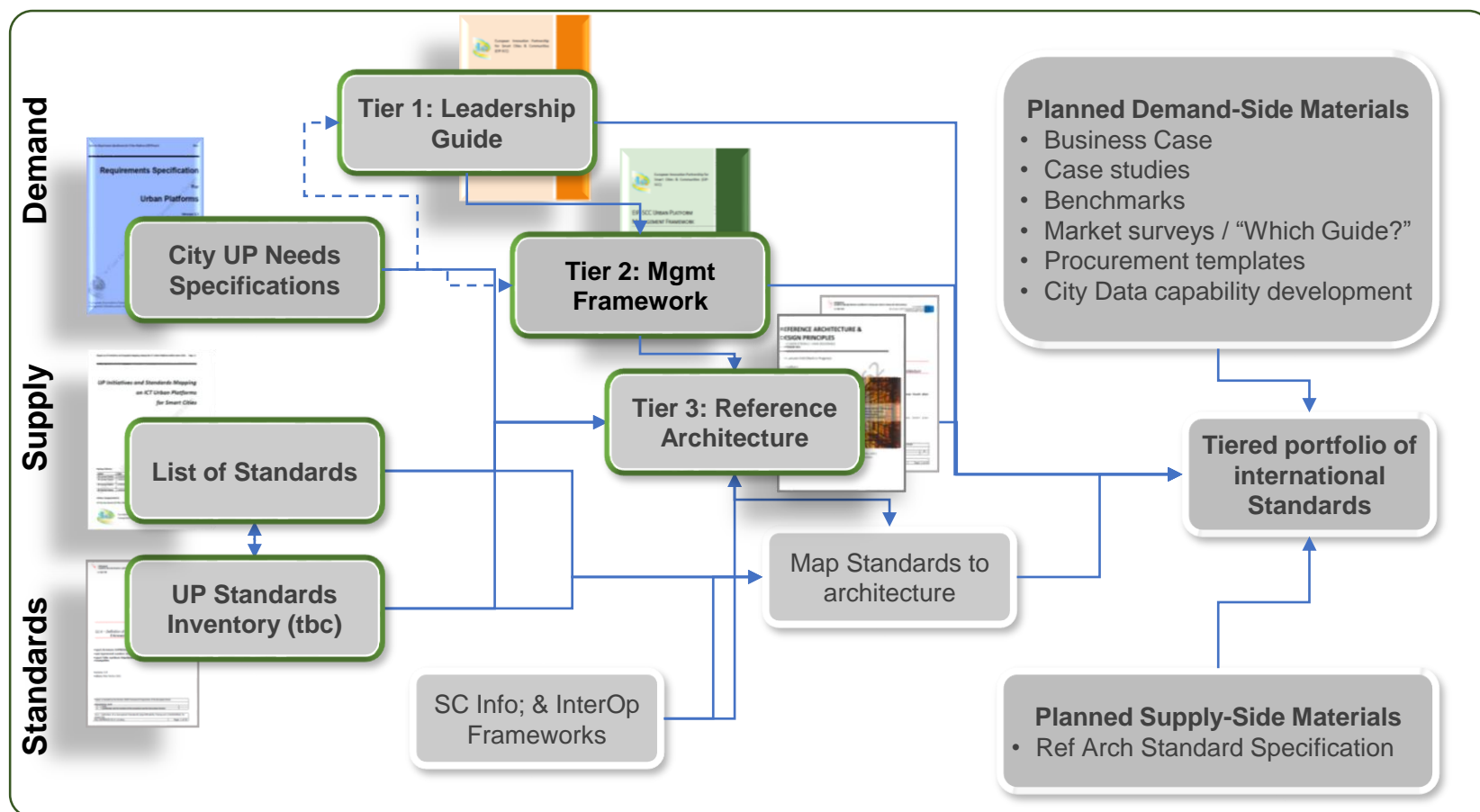
...learning to herd cats

Urban Platform Initiative: Set-Up & Goals



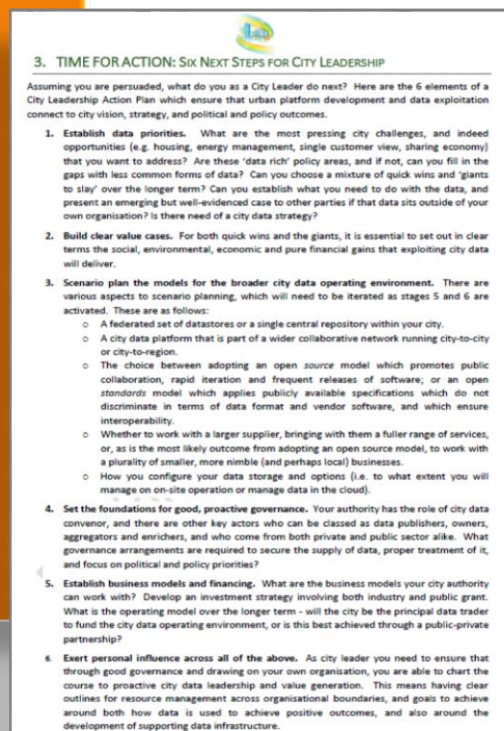
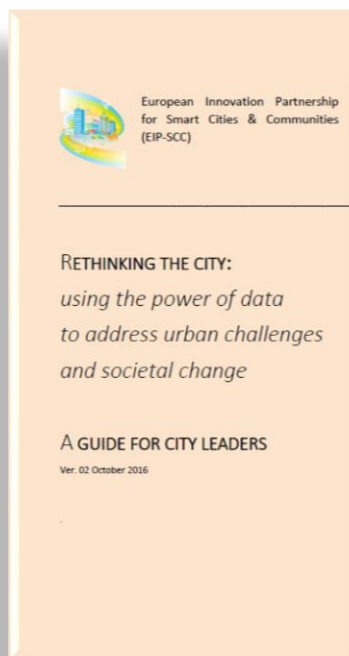
- By **2016** have **reference templates** for tenders in place to allow cities to plan in an integrated way
- By **2018**, create a **strong EU city market** for Urban Platforms
- By **2025**, ensure that **300m residents of EU cities** are supported by Urban Platform(s) to manage their business with a city and that the city in turn drives efficiencies, insight and local innovation through the platform(s)

UP: where in the roadmap...



Leadership Guide

A short crisp advisory / key action guide for political and professional city leaders



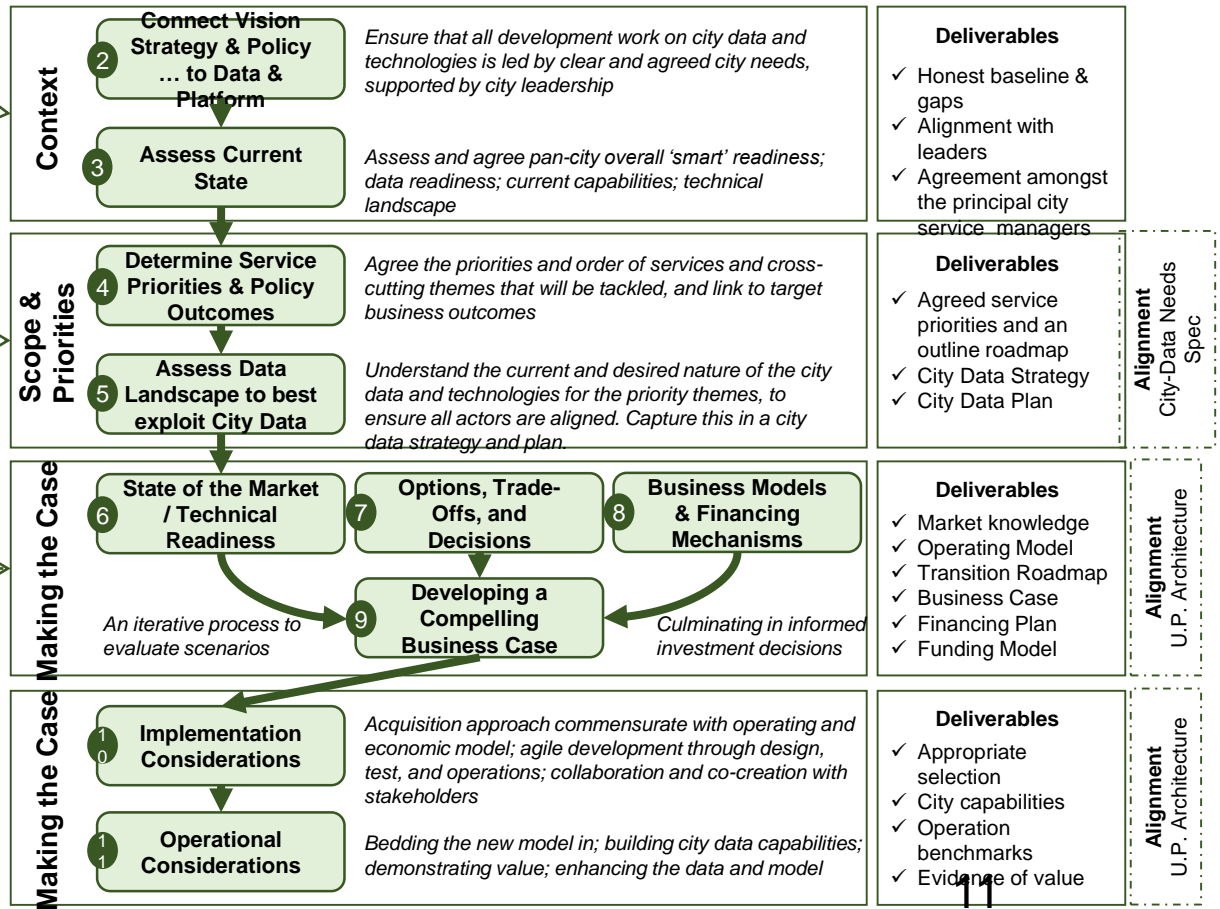
Six Next Steps for City Leadership

- 1. Establish data priorities**
- 2. Build clear value cases**
- 3. Scenario plan the models for the broader city data operating environment**
- 4. Set the foundations for good, proactive governance**
- 5. Establish business models and financing**
- 6. Exert personal influence across all of the above**

Mgmt Framework – city toolkit



- Input Leadership Guide**
- Priorities
 - Operating Model
 - Business Models & Financing



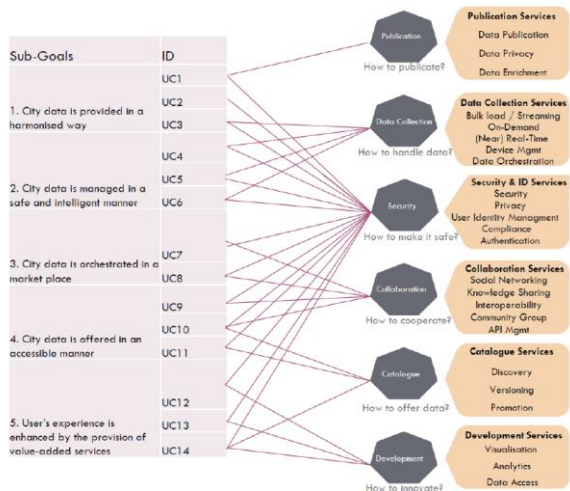
Alignment City-Data Needs Spec

Alignment U.P. Architecture

Alignment U.P. Architecture

Standards Mapping

Consistent with City-Needs Spec; an inventory of standards initiatives



SDO Activities evaluated

1. IEC
2. ISO
3. ISO/IEC-JTC1
4. IEEE
5. ITU-T
6. OneM2M
7. Open Geospatial Consortium
8. CEN/CENELEC/ETSI

Regional / NSOs

1. AENOR
2. DKE/DIN
3. OASC
4. World Smart City community

Application Layer	
Standard	Description
ISO/IEC 9545:1994	Refines the description of the application layer contained in the basic reference model for OSI (ITU-T Rec. X.200 / ISO/IEC 7498-1). Provides a framework for coordinating the development of existing and future application layer recommendations and standards. Is provided for reference by application layer recommendations and standards. The purpose is to facilitate a coherent and modular approach to the structuring of specifications for application layer behavior.
ISO/IEC 13249	Information technology - Database languages - SQL multimedia and application packages
ISO/IEC 27034	ISO/IEC 27034 offers guidance on information security to those specifying, designing and programming or procuring, implementing and using application systems, in other words business and IT managers, developers and auditors, and ultimately the end-users of ICT. The aim is to ensure that computer applications deliver the desired or necessary level of security in support of the organization's Information Security Management System, adequately addressing many ICT security risks.
ISO/IEC 30128:2014	ISO/IEC 30128:2014 specifies the interfaces between the application layers of service providers and sensor network gateways, which is Protocol A in interface 3, defined in ISO/IEC 29182-5. This International Standard covers <ul style="list-style-type: none"> • description of generic sensor network applications' operational requirements, • description of sensor network capabilities, and • mandatory and optional interfaces between the application layers of service providers and sensor network gateways

Mapping Activities

1. Reference Architecture Urban Platform
2. Technical Infrastructure
3. Data Management
4. Data Access (API Connector to get access to Data)
5. Smart Data (Enriched Data)
6. Smart Services
7. Security and Privacy

Reference Architecture(s)

REFERENCE ARCHITECTURE & DESIGN PRINCIPLES
 EIP SCC WORK STREAM 2 – MAIN DELIVERABLE
 23 SEPTEMBER 2016

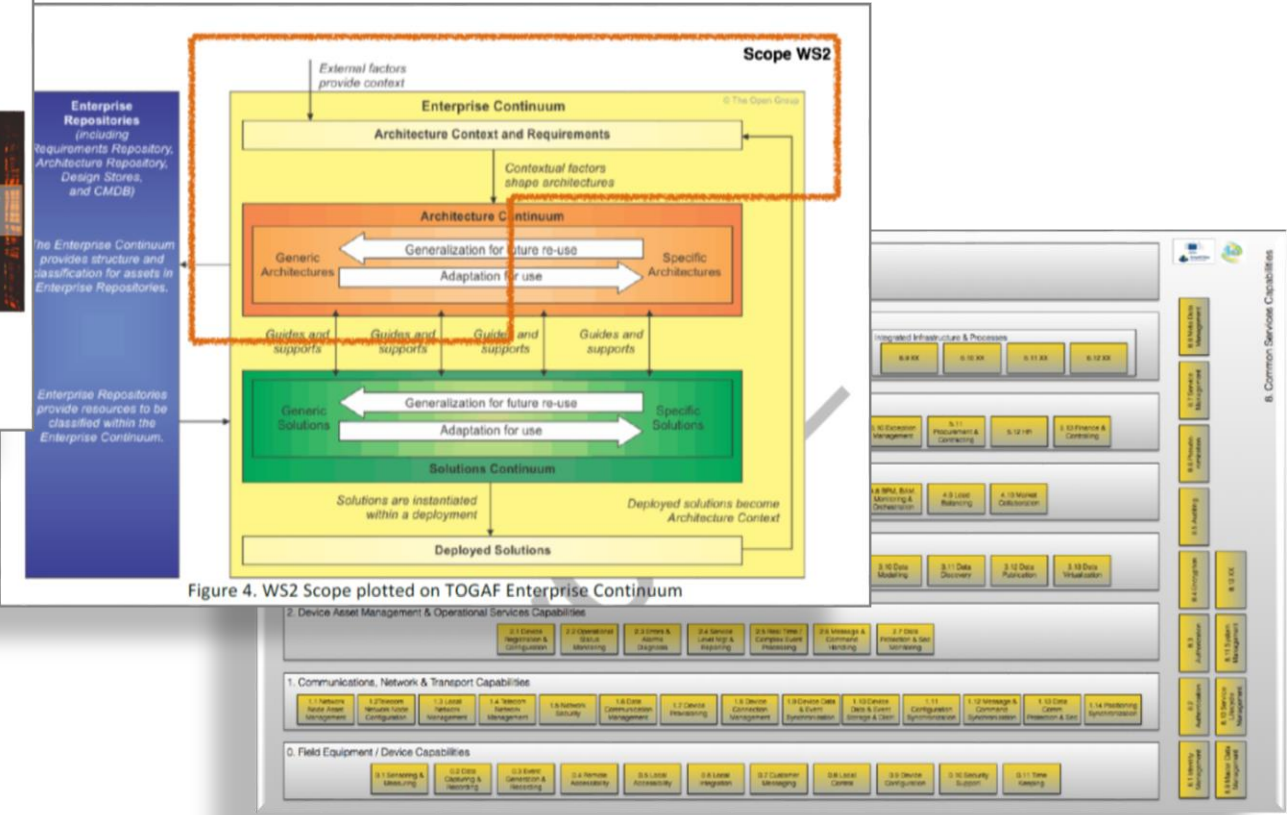
Draft, version 0.62 (Work in Progress)

Main editors:
 Prof. Dr. Lutz Heuser & Drs. Jeroen Scheer MSc DCA

DELIVERABLE
 D4.2 – Definition of Smart City Reference Architecture

Project Acronym: ESPRESSO
 Grant Agreement number: 691720
 Project Title: sytEonic: Standardisation approach to Empower Smart cities and Communities

Revision: 4
 Authors: Andy Cox, Peter Farnley, Bart De Lathuysen, Eva Vilar, Bernhard Kemper, Jonathan Lomas



29th June Standards Development Organisation (International & Nation) Workshop

UP Suggested Forward Actions

1. Re-mobilise Governance Group
2. Test Leadership Guide in cities with politicians
3. Run Mgmt F'work workshops to ready cities
4. Improvement of Mgmt F'work
5. Manage 29th June BXL Standards Workshop
6. Mobilise across SCC01s
7. Cost, benefits, value case development
8. Develop further templates / tools
9. Ready EC / Initiative for ISO Nov conference
10. Ongoing communications
11. Pavilion Event needed?

The Humble Lamppost



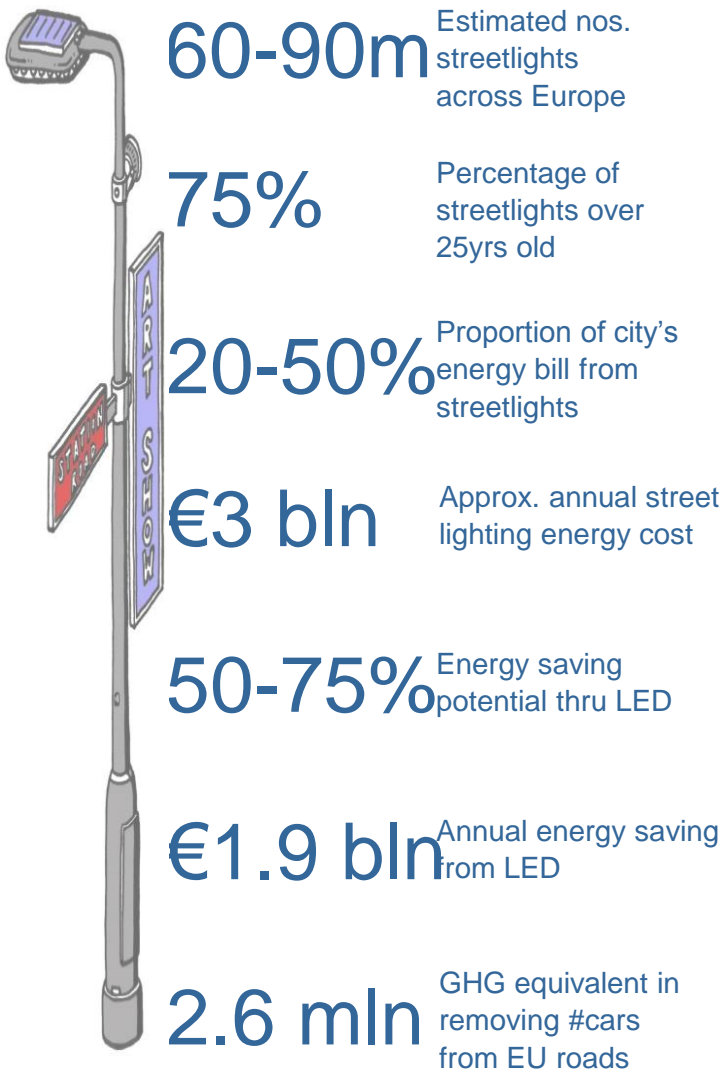
Hard going ...

...however persistence pays off

From one use to another



Why the “Humble Lamppost” initiative



GOAL

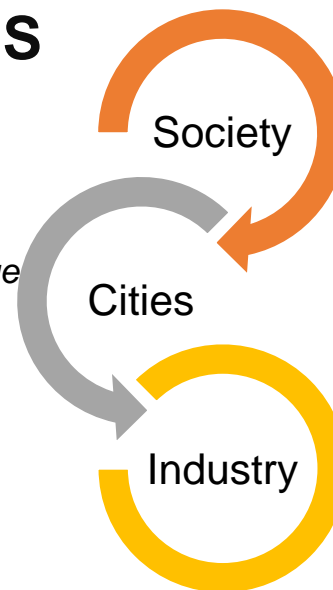
10m Smart Lampposts across EU Cities

VISION *‘Bootstrap the Smart City’*

*An open affordable component-based city lighting solution
...that enables other smart city initiatives;
delivered collaboratively between cities & Industry
to speed integrated valuable delivery*

& BENEFITS

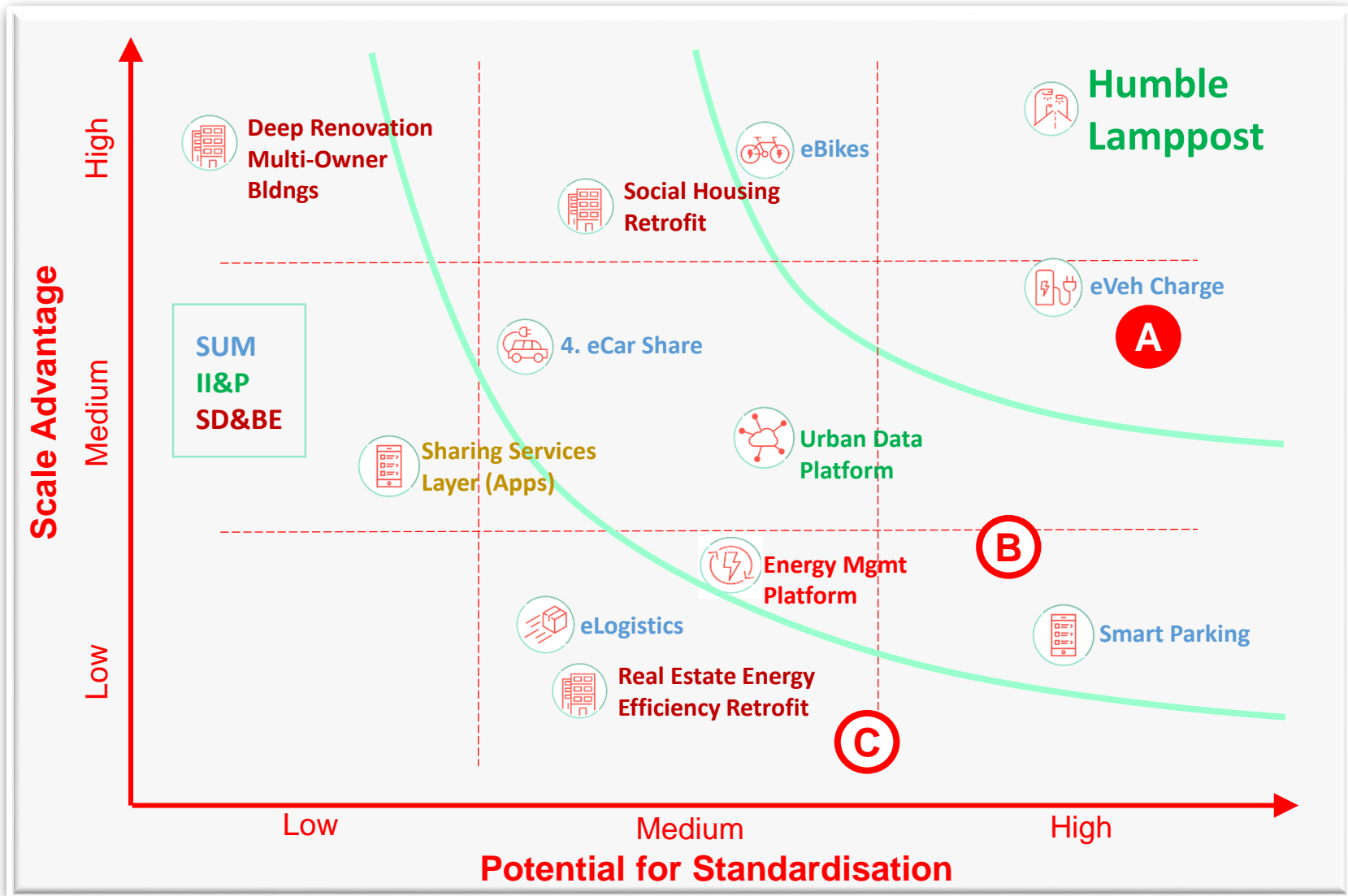
- Efficiencies
- Speed to value
- Image
- Confidence



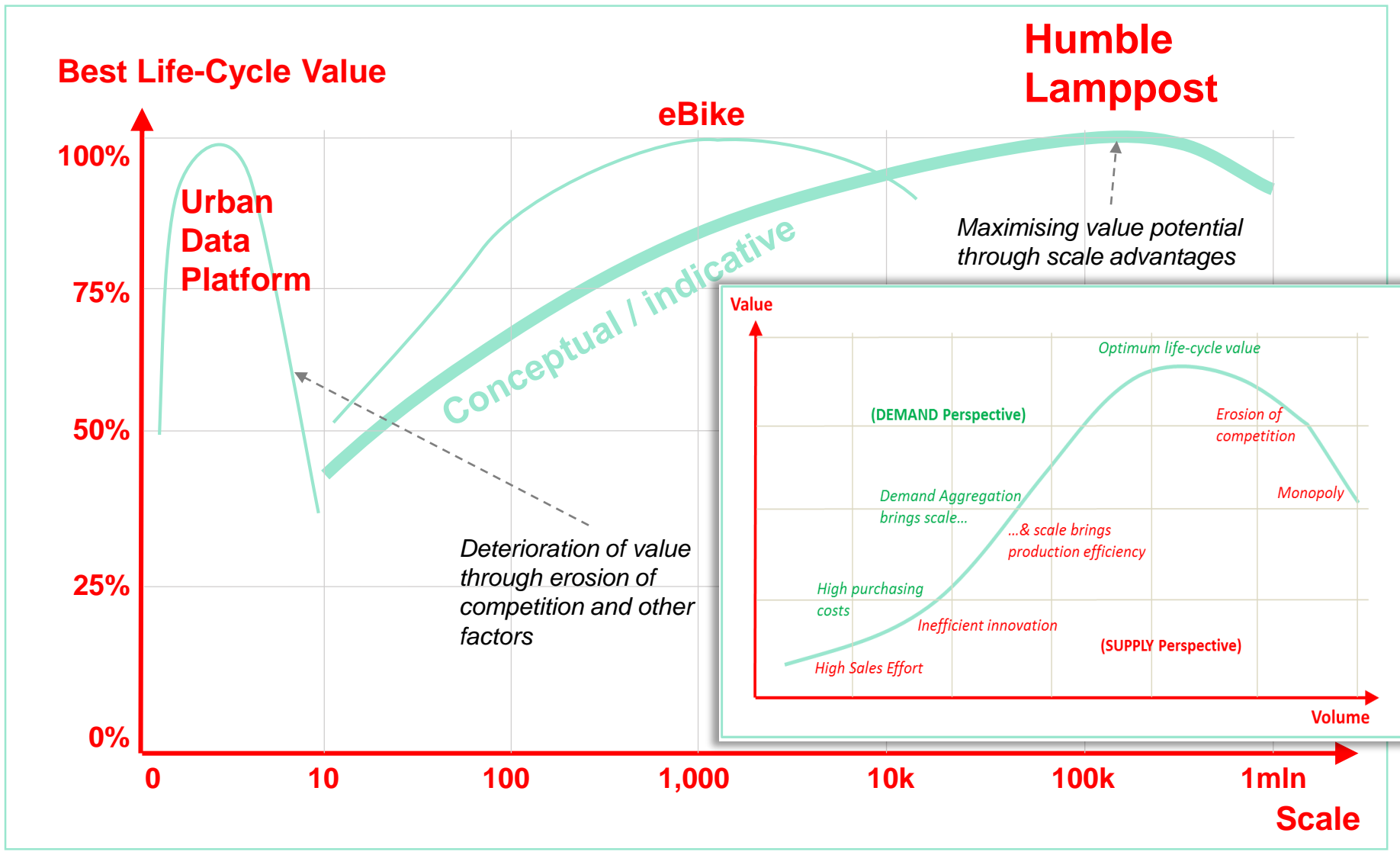
- Better experience
- Safer society
- Pride in community
- Lower taxes?

- Reduced sales cost
- New market
- Revenue / Profit
- Brand
- Export potential

HL – an obvious “Quick Win”



Optimising Economies of Scale



HL Focus & Deliverables to date...

FOCUS

- Demand Side Readiness
- Mobilise 'city-clusters'
- Engagement of SCC01s
- Tangible deliverables

DELIVERABLES

Demand Side

1. Leadership Guide (ShC/BSI)
2. Management Framework (D3.9)
3. HL Use Cases (ShC D3.11)
4. Demand Aggregation Case Study

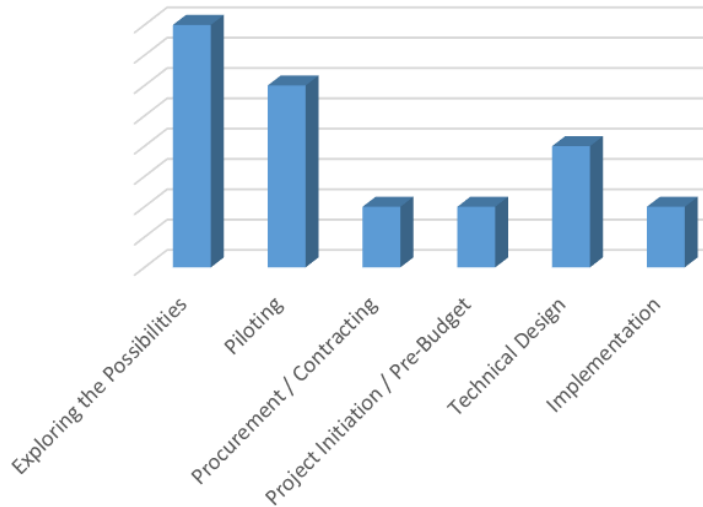
Supply Side

1. DIN ImHLa Specification (Non-light Use Case focus)

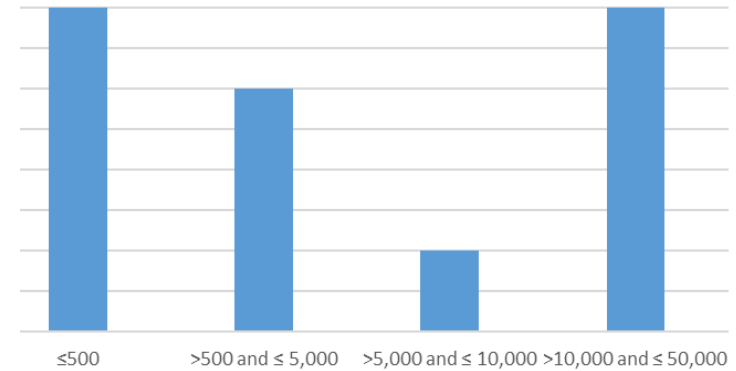
HL survey (prelim findings)... 1

[Link to Survey](#)

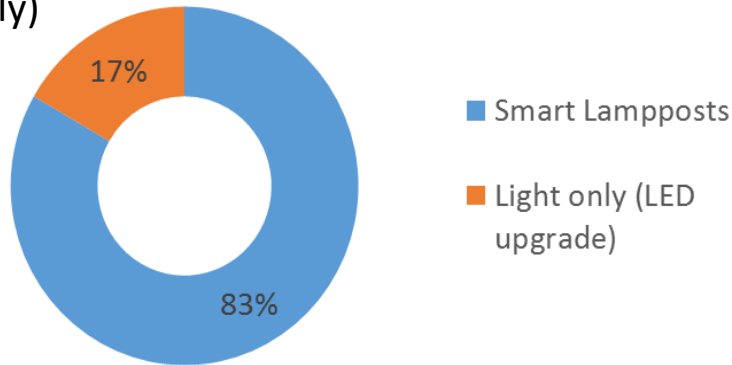
60% still at early stages (scope to influence)



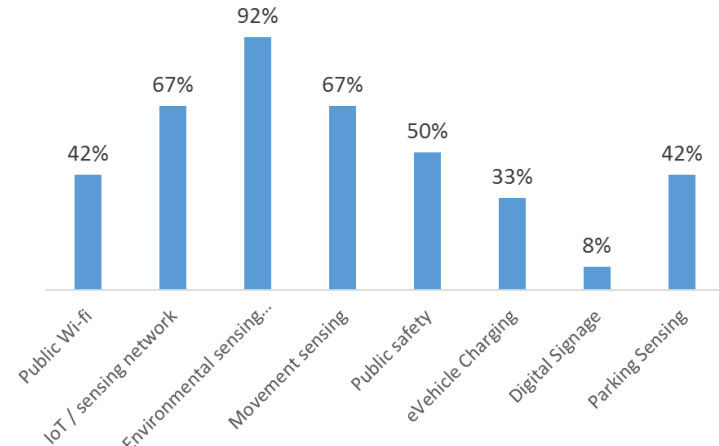
A spread of scales (consistent with mix of pilots and projects)



83% want smart Lampposts (cf LED only)



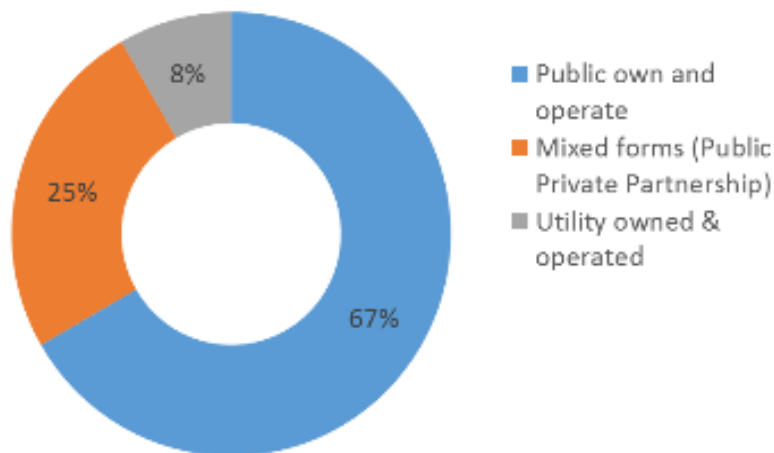
Most Use Cases incur cost (cf reap revenue)



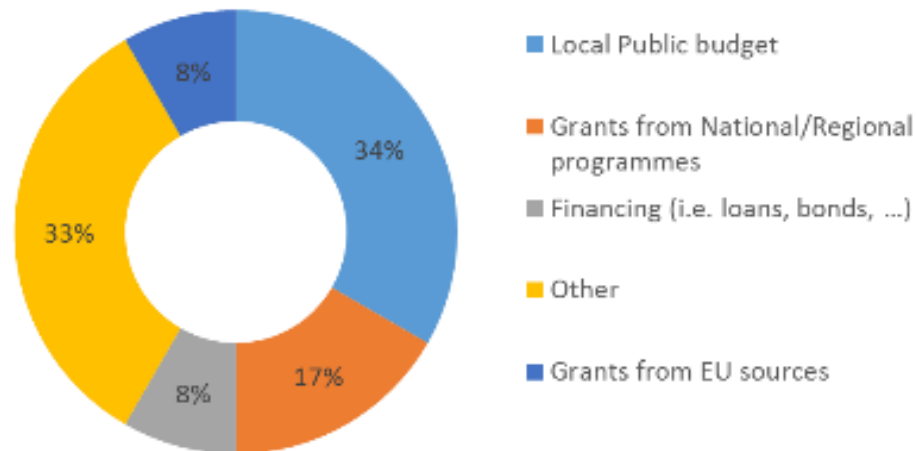
HL survey ...2

[Link to Survey](#)

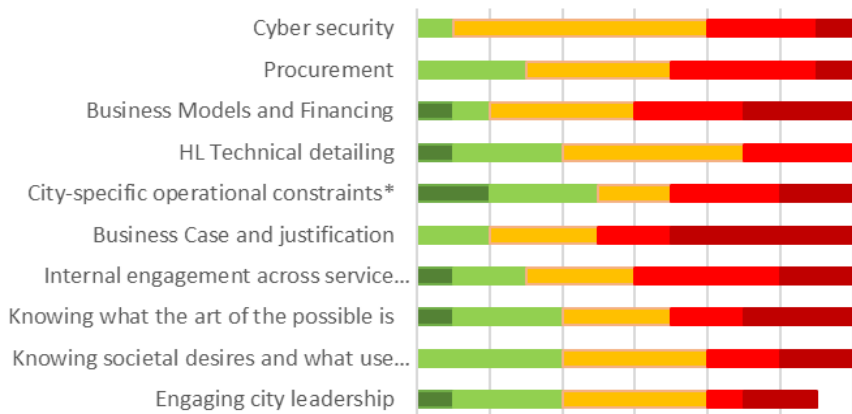
Business Models are mostly traditional



Finance Sources are predominantly public



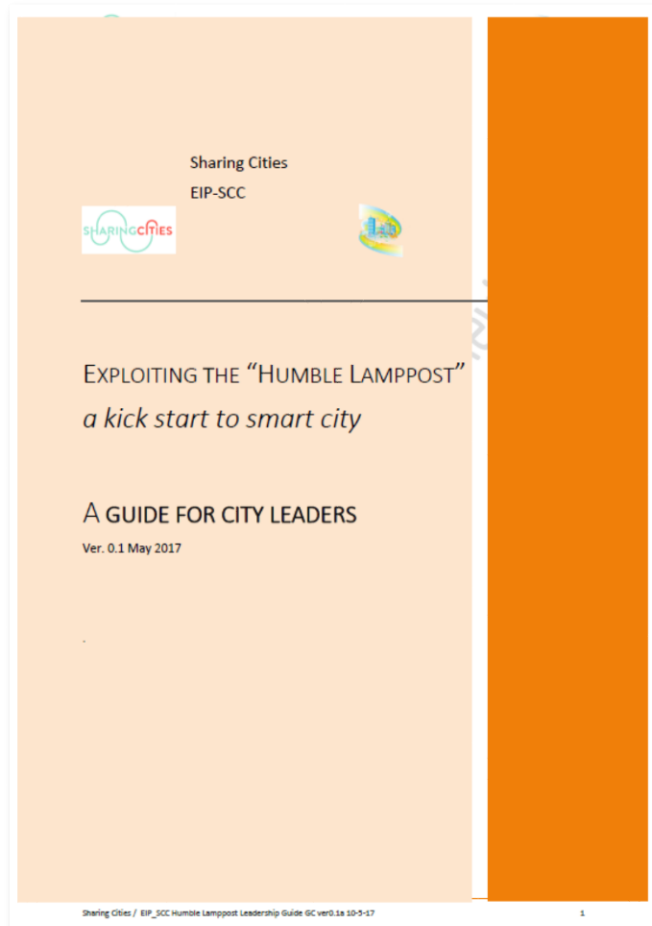
Challenges mostly financial and organisational



Barriers predominantly financial & uncertainty

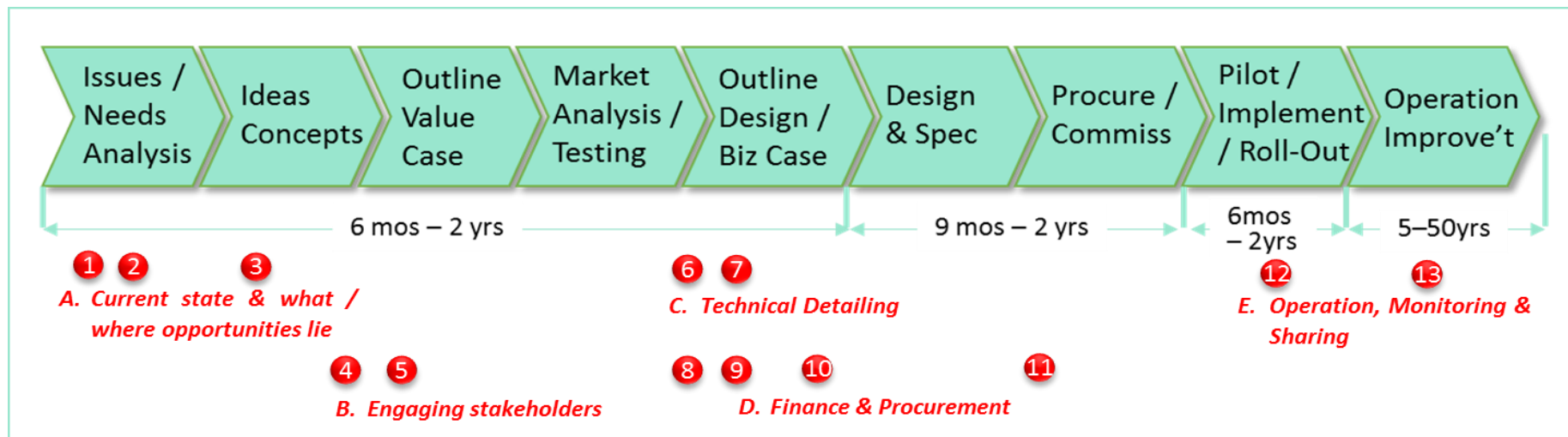
- Lack of proven RoI for smart services or clear case for added value services (in a time of public sector cuts)
- Relatively high price; lamps already equipped with LEDs
- Level of investment; Financing; Budget
- Uncertainty around what services to include to be future proof
- Pilot phase - testing concept
- Just starting; with successful replicable models, scale is foreseen
- Market maturity
- Public perception (big brother)
- Until now, no barriers

Leadership Guide



- A 6-page 'train read'
- Addressing the "Why"
- Introducing the Mgmt Framework (What)
- 7-steps for leaders
 1. Identify if this is THE quick win that can bring to life your smart city strategy
 2. If it is the quick win (or even if you'd like to just check first), give someone the mandate
 3. Actively support the use of the Management Framework
 4. Seek out scale and collaboration potential
 5. Set a rhythm of reviews to help coach the initiative through
 6. Check-out the business model and financing options
 7. Communicate about it!

HL “Mgmt F’work” Toolkit (ShC D3.9)

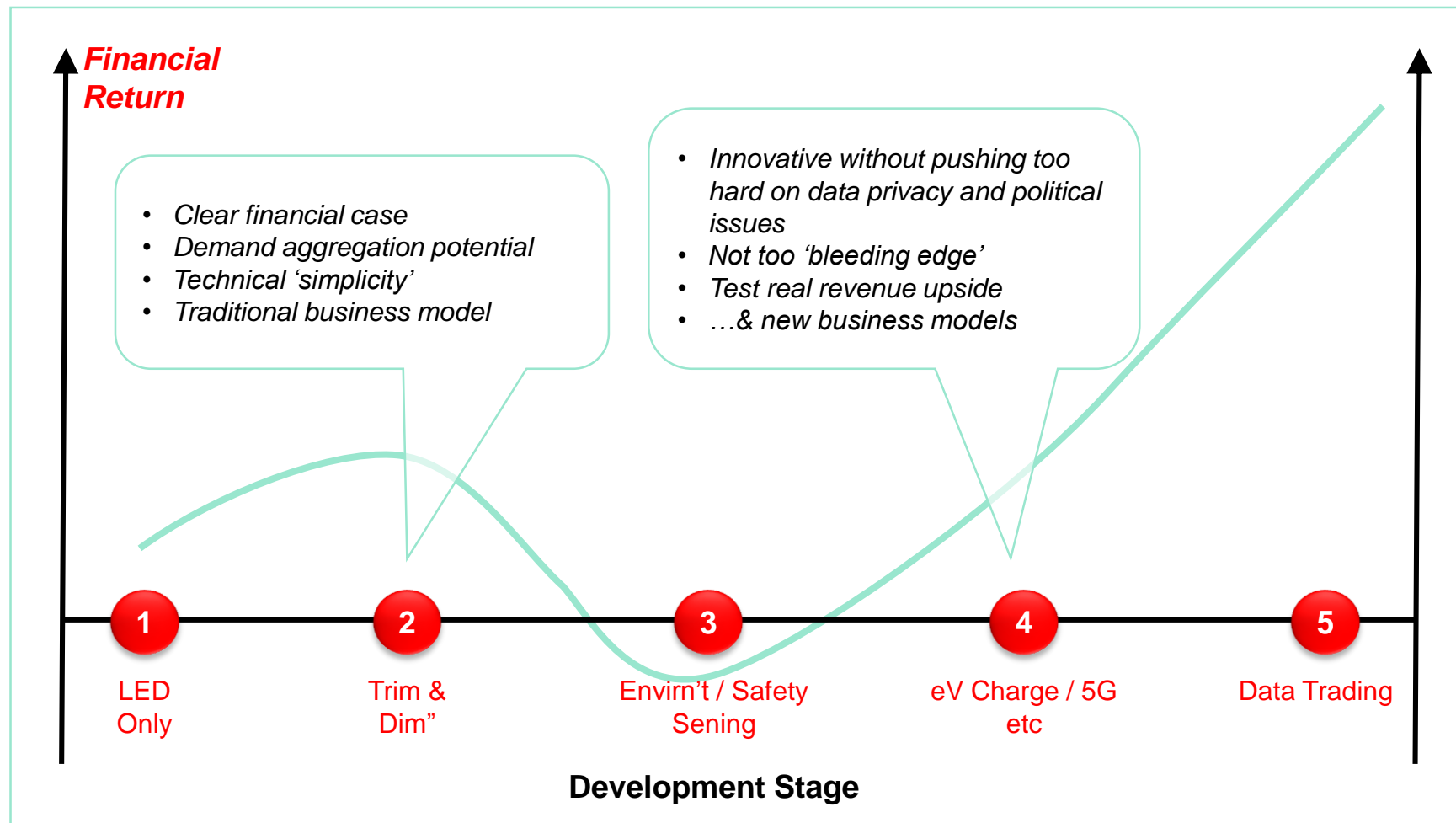


1. 5-stage Maturity / Devlpt Model (common frame of reference)
2. Use Case Templates (incl DIN Spec)
3. HL Asset Landscaping ('state' capture tools & mapping)
4. (BSI) Leadership Guide & Mgmt Framework
5. Business Case – 'outline' from SCC Decision Support Tool
6. Business Model Selection
7. Financing Sources
8. Detailed Specifications (DIN + many + any new?)
9. Procurement Templates
10. Operational savings metrics / KPIs
11. Benchmark / bench-learning activities

HL “Use Cases” considered

Humble Lamppost Use Cases		DIN	ShC
LIGHTING Related			
L1	Basic LED Energy, GHG, and Maintenance Improvement		Y
L2	Additional Energy Savings / Optimisation (CMS “Trim & Dim”)		Y
L3	Safety, Attractiveness & Façade / Mood Lighting (incl Improve the Quality of service and people safety – fault reporting)		Y
L4	Alternative Clean Energy – PV cells to power some lights		Y
NON-LIGHT Related			
NL1	Event-controlled adaptive street lighting system	Y	
NL2	Traffic monitoring (Driver Information; Traffic Monitoring; Parking)	Y	Y
NL3	Intelligent communication between vehicles and the imHLA	Y	
NL4	Public Wi-Fi	Y	Y
NL5	Wireless network support with a picocell or microcell	Y	
NL6	Environmental data acquisition (air quality, noise, water levels, etc)	Y	Y
NL7	Charging station for electric vehicles (vans, cars, bikes)	Y	Y
NL8	Drone charging infrastructure	Y	
NL9	Energy storage	Y	
NL10	Remote maintenance	Y	
NL11	Public security	Y	Y
NL12	Private security and surveillance / geofencing – pedestrian monitoring	Y	Y
NL13	Signage and advertising	Y	
	Public Engagement (safety of place, information speakers, information signage, tourist information)		Y

Differing value for different Use Cases



Tool: Development Assessment

Humble Lamppost: 5-Step City Needs Assessment		Maturity Assessment Rating				
Element	Goal (what is a notional ideal leading practice future state?)	On-Ramp 1: "Traditional"	On-Ramp 2: "Basic LED Upgrade"	On-Ramp 3: Basic Smart w/ New BizM	On-Ramp 4: Adv'd Smart/New BizM	On-Ramp 5: Leading Practice
Lamppost / Luminaire Asset	Common logical architecture design at EU (EIP) level, supported by EU / International Standards Orgtns. Flexible 'component-based' solution that cities can select as appropriate (inter-operability). 'Future proof' design that industry apply innovation to. Affordable, and template based / easy-to-procure packaged proposition.	Aging physical pole. no / limited ability to take additional attachments. High consumption luminaires. High down-time; hi maintenance.	Current State		Ambition	Component based smart lamppost, future-proof design for smart upgrades. Dynamic interoperability with city systems.
Societal view	Attractive lamppost design with pleasantly lit communities, with flexibility in operation (e.g. dimming, artistic lighting etc). Safe place (e.g. 'push to talk'; brighten when danger). Optional Smart Services enabled (e.g. eV charge; WiFi; Air..). Respect of personal data privacy (e.g. geofencing for retail offers).	Ugly old poles. Poor quality lighting. Sense of danger in some areas. Multiple customer complaints				Community (residents AND businesses) budgeting and lighting / smart services. SLA reporting
Built Env't interface	Integrated bldng/place based lighting, with movement controls, safety and light level sensitivity. Auto-fault reporting. Smart services commissioned by local community groups. Façade and artistic / mood lighting where appropriate. Auto integration between 'place' and lampposts (eg power storage).	Badly placed street lights irritating residents (hi / low intensity areas). No integrtn between place & l'posts. Poles detract.				Integrated building-place / lamppost lighting in design and operation. Mood / safety lighting.
Energy Mgmt System Interface	"Energy Efficiency": PV to power L/post. RE-FIT model to fund L/post. Monitoring. "Store & Control": Monitoring power consumption (accurate). CO2 emmission monitoring. Tarrif incentive. Storage (battery). Demand response asset. eV power; & eV to light. Licence life business model, revenue stream. Mobile phone charge. Store/Supply/Generate/DSR. Off-grid l'post. Micro-grid.	Street level energy measurement (often less).	No CMS. Measurement of energy consumption at area based level.	CMS (central mgmt system) for lighting level controls. Set / area level.		Auto integration and light / energy optimisation. PV/Alt energy systems.
Mobility interface	Mobility services; on/off & dimming as function of traffic flow. eSignage option. eV charge; eBike interface. WiFi mesh to better access eV charge network. Link with connected/assisted driving (infra-car etc).	Lampposts and lighting levels poorly integrated with transport system, with resulting risks.				eBike/Vehicle charge points with locatn-driver apps. Lamp to ITS interface.
Data Platform	Defined sensor interfaces (gateways). Clearly selected (open) protocols. Defined interoperability layer (sharing). Identifies lamppost and lighting status. Identified use cases for data.	No systems support. Lamps set on mechanical timers, no automation.		CMS integration with city platform.	Lighting / Lamppost-enabled smart data strategy (in-fencing) to respect privacy & enable services.	Due proection of personal and asset data, yet innovative data services with city / personal choice
Business Models Financing & Funding	Demand aggregation locally; networked internationally to enable best price / innovation mix; and support local SMEs. Business Models that incentivise aggregation; support x-silo delivery and liberate value. Multiple proof points for financial social ecological value.	Silo annual budgets that inhibit investment / long-term decisions. Constricting procurement practices.	Price-based LED upgrade (little demand aggregation)			Concession models. City-region commissioning. City-data monetisation for city/community.
Evaluation	KPIs: e-Charge (# charges per day; KW/day) Nos of useful 'push-to-talk' uses. KWhpv/KWh used. Nos Failures. Nos queries to answer	Outage complaints inefficiently handled. No/bad energy KPIs. No effective targets. Silo'd Ops costs.	Financial measures to demonstrate energy cost savings.	Public light levels set on top of background light levels to reduce public energy consumption.		Triple bottom line metrics, linked to commercial-retail monetisation / residential bonds
OTHER	Public Regulatory & Policy conditions that support swift commissioning / procurement; local business enablement and innovation.	Regulatory barriers. Constraining local policies. 'Silo' thinking and behaviours (almost encouraged).				Liberal regulatory environment that supports innovation. Open policies

HL Suggested Forward Actions

1. Survey implementation / analysis
2. OJEU contract and tender analysis
3. Technical blockers resolutions
4. Develop Standards listing & Detailed Spec
5. Develop Value Cases for non-light use cases
6. Aggregate Demand across SCC01s & beyond
7. Map/Engage Industry ecosystem
8. Engagement of financial community
9. Set-up / Follow-up Pavilion event (Sept/Oct?)
10. Develop templates (eg proc't) to speed action
11. Webinars / Workshops on LG/Mgmt F'work
12. Move materials to Standards Orgtns
13. Upgrade of Decision Support Tool
14. Ongoing comms activities to engage market
15. InnoSupp SME Action

Breakout 1

Citizen-Focus

Business Models & Financing

Integrated Policy Planning & Regulation

What are the ‘Horizontal AC’-specific challenges in relations to (i) Urban Platforms & (ii) Humble Lamppost (or indeed II&P in general)?

What will our initiatives need on these topics in order to succeed at scale and pace, and in a common manner?

What could the horizontal ACs build back into their deliverables that would help matters?

CF

- SET (Societal insight, Engagement & participation Toolkit)
- Data Privacy
- Manifesto

BM

- Financing (sources) Guide
- Business Models Library (& Toolkit)
- Case Study capture

IPPR

- From planning & Implmntn to Scale-Up
- Tools for Decision Making (KPI focus)
- 6-Nations Smart City Forum
- Smart Cities Guidance Package

Breakout 2

Urban Platform

Humble Lamppost

Small Giants

1. Review the messages in and content of the presentation slides
2. Review and discuss deliverables produced to date
3. Share pertinent experience in the field
4. Review “Suggested Actions”
5. Outline the roadmap

UP

- Critical Success Factors (CSFs) to get market adoption
- Importance of guides and standards?
- How to address 3 key blockers?

HL

- Is the approach taken (demand side readiness) the right one? What’s better?
- How to access resource to cause action?
- How to scale, fast?

SG

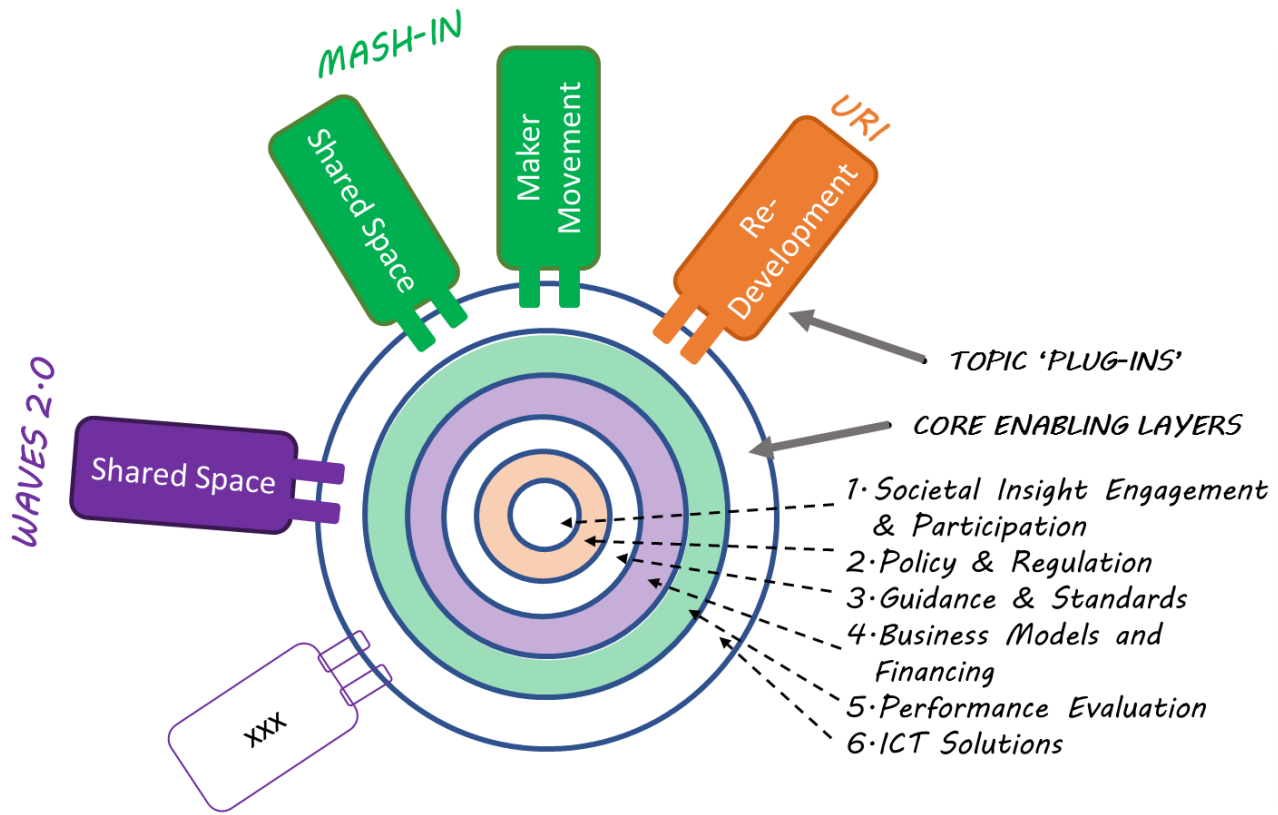
- Short term steps to address Circ-01
- How to integrate tighter in EIP
- What else is pertinent to Small Giants?



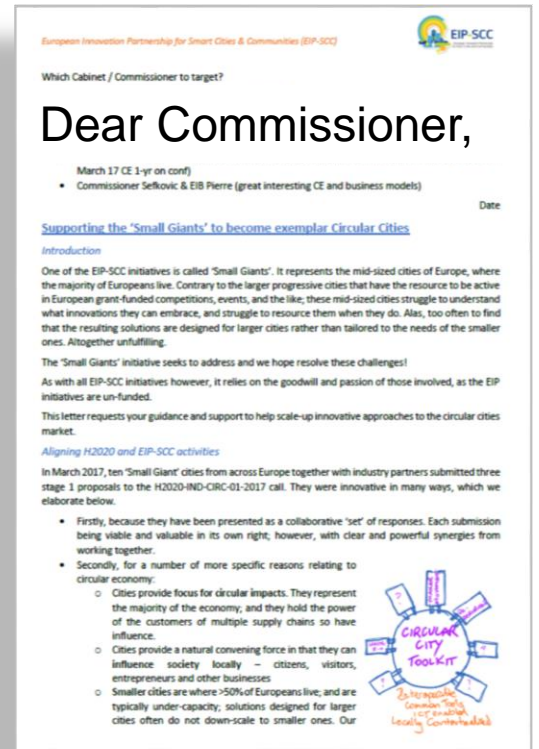
Small Giants

Small Giants

Ten Cities engaged in Circ-01 initiative



A 'Toolkit' for Smart Circular Cities
 Focus on replicable 'plug-in' solutions, common cross-cutting topics with scale-up in big cities



Soliciting strategic EC support & funding