Smart Transportation Alliance

OPTICITIES

Technical views on urban ITS mobility

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2017 STA Annual Conference & Innovation Awards
28 November 2017

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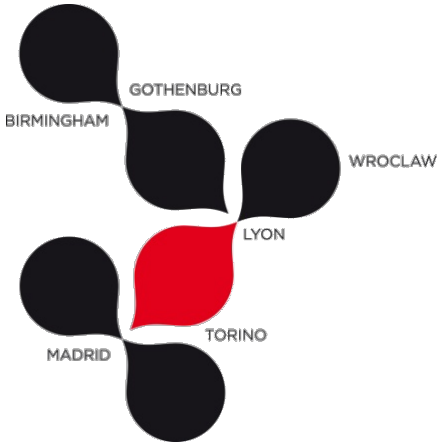
The **OPTICITIES** project was a 36 month FP7 European initiative, with a budget of 13M€ and a consortium of 25 members from 8 countries, running from 2013-2016

- Description of the project
  - Objectives
  - Major achievements
- Opportunities and challenges
- Follow-up – *HARMONY*

OPTICITIES
ENHANCING SMART MOBILITY



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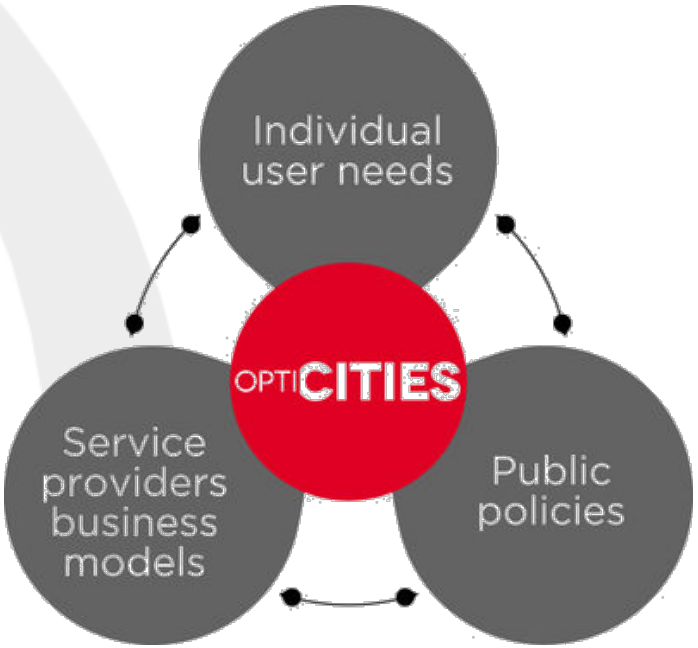
Objectives

- Set up **high level services for travellers and urban logistics**, addressing **user needs and urban mobility public policies**.
- Support mobility policies and an **open market for business development around urban ITS**.
- Define **standards and architectures to foster interoperability** among cities and travel modes.



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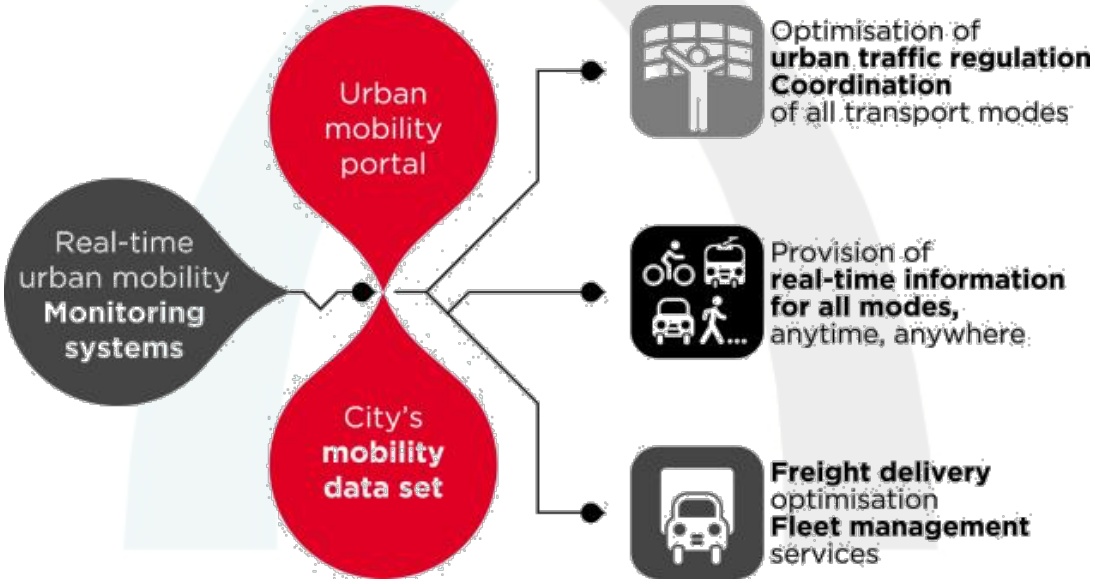
Objectives

- Set up a **comprehensive mobility data store in European cities** controlled by public stakeholders
- **Develop innovative services** managed by private sector or public stakeholders using the urban mobility data store, **supported by an adapted contractual framework**.



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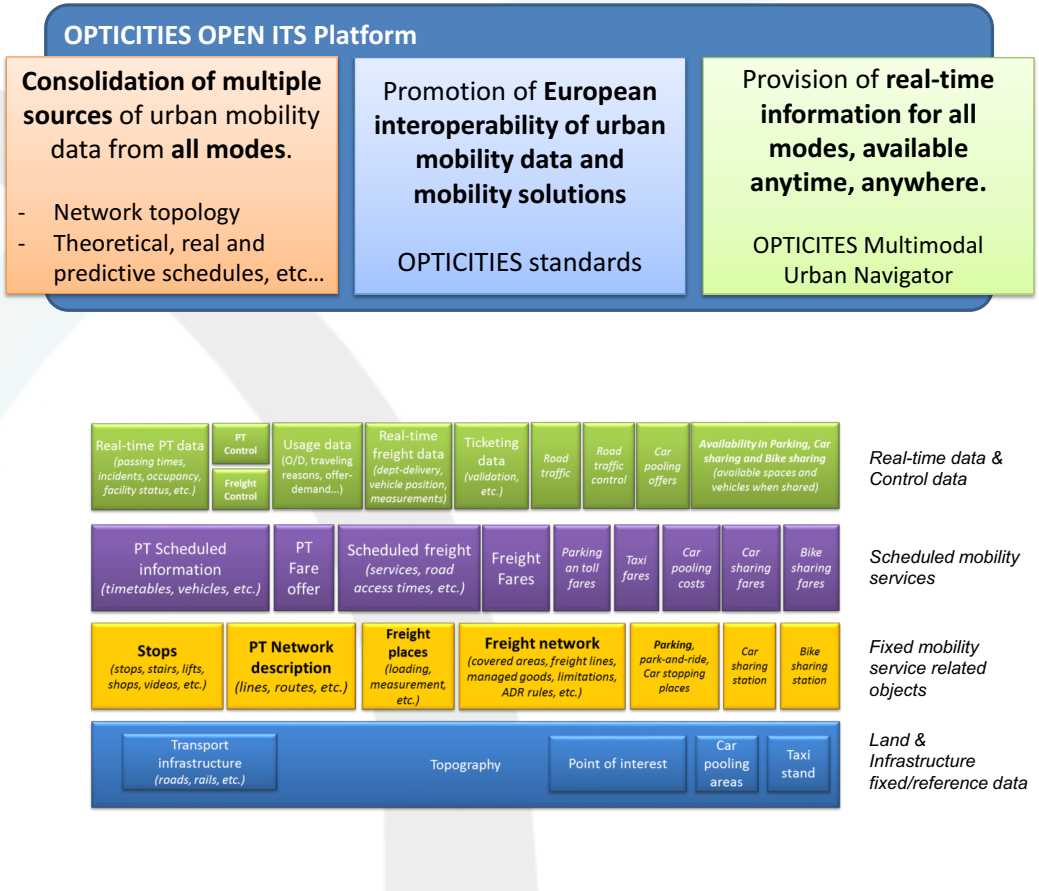
Major achievements

- A standard for an urban multimodal dataset taken on board by ISO and CEN.
- Mechanisms to integrate data on:
  - Public transport information, road traffic data, …
  - Road works management.
  - Freight access and tracking.
  - Collaborative user information.



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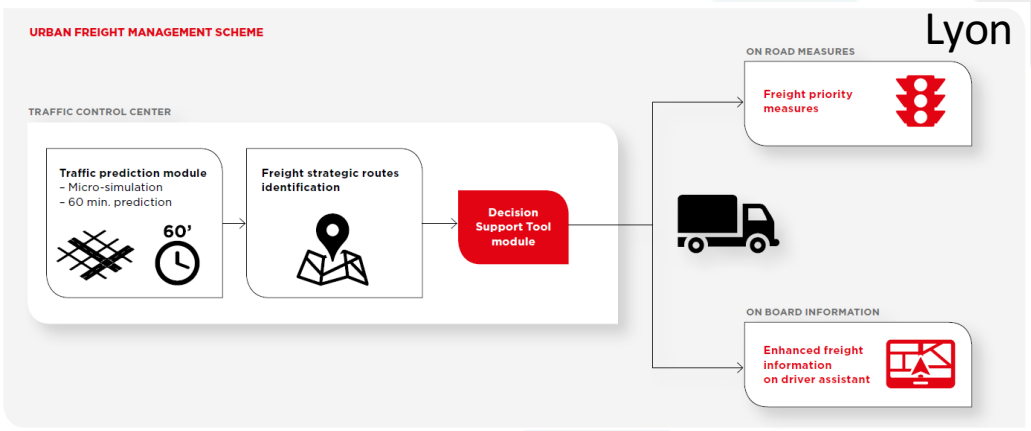
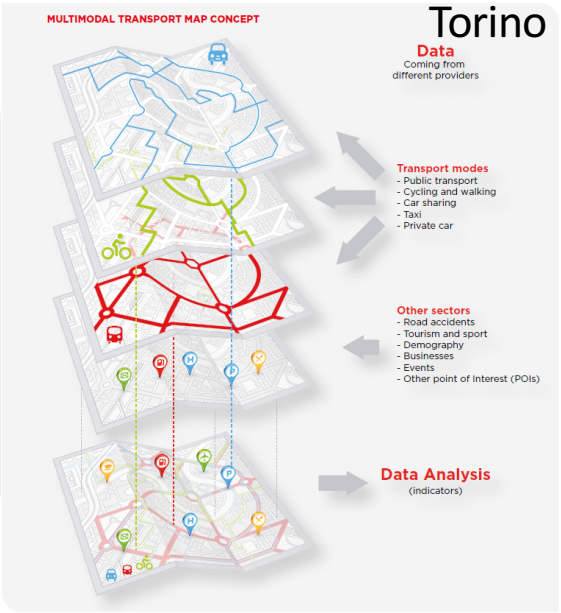
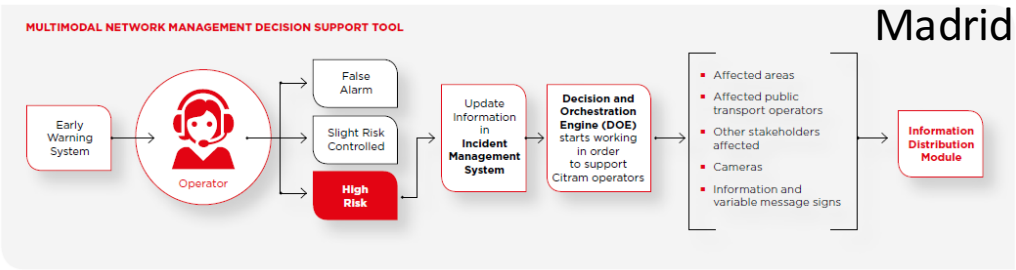
Major achievements

Reinforcement of the multimodal approach to implement holistic network management solutions.

- Multimodal network map for planning
- Multimodal network management
- Integrated soft priority tools for public transport
- Dangerous goods vehicles monitoring and management.
- Traffic prediction in traffic management centres







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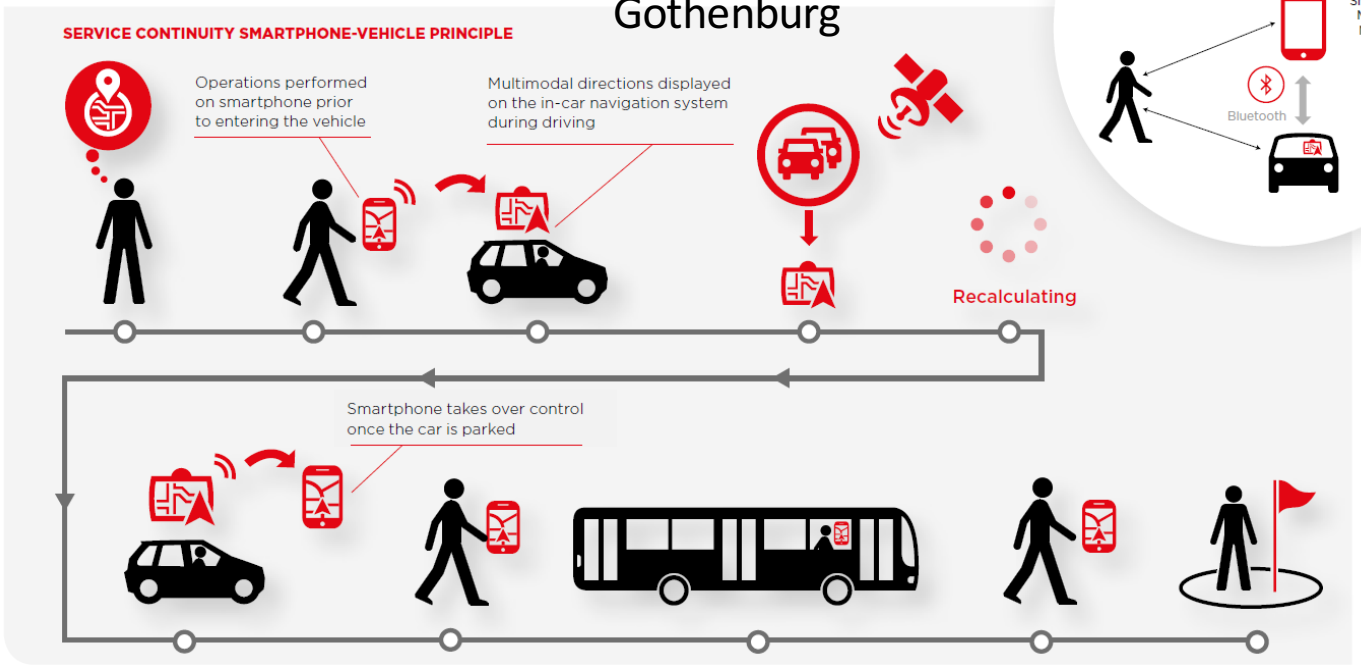
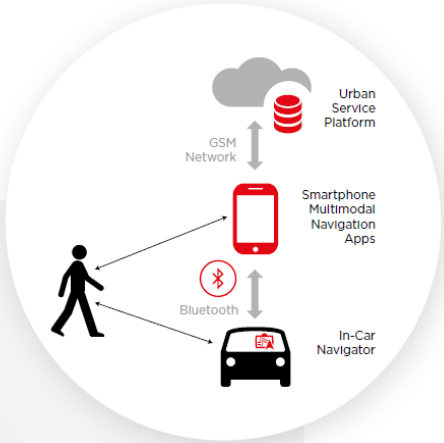
Major achievements

- Traveller information services are the key to a true seamless multimodal mobility for citizens.
- Complete trip information anytime, anywhere, updated in real-time.





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Opportunities & Challenges

- Pending consolidation of the concept of **the citizen as the central part of urban mobility environment**.
- Consideration and integration of small/dynamic ITS initiatives in the mobility policies.
- Complete integration of urban mobility data centres, traffic information services, data provision, ticketing information and payment mechanisms.
- Complete **integration of innovative data sources**:
  - Crowd-based and social-based information.
  - Mobile and Ad-Hoc networks data.
  - BigData and distributed processed information.

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Opportunities & Challenges

- First-mile and Last-mile passenger and freight or logistics issues are still pending issues.
- Prediction tools still do not consider all the information relevant for accurate decision-taking process.

- It is necessary to take a look at urban mobility in its wider environment and implications, with the citizens at its center.

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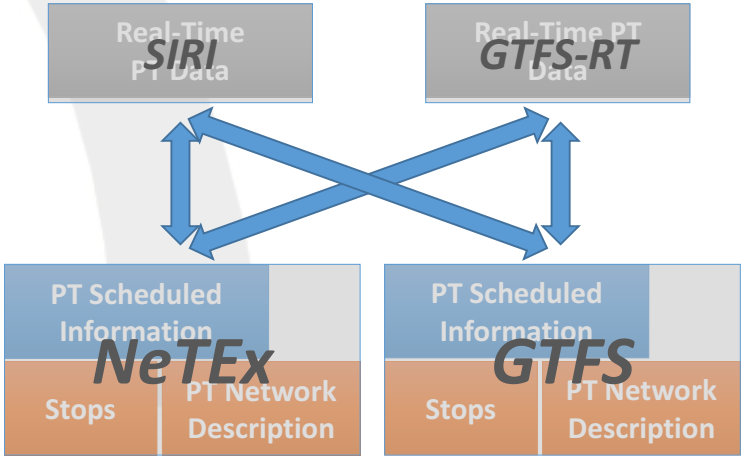
Follow-up: HARMONY

- 36 month project within the CEF-Transport EC programme, running from 2015-2018
- Aims at the integration of multimodal mobility mechanisms in public transport and traffic management entities in Madrid.
  - Static and Real-Time Multimodal data exchange mechanisms.
  - Contribution to the consolidation of multimodal datasets.



indra

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THANK YOU FOR YOUR ATTENTION

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Business models for Smart Cities

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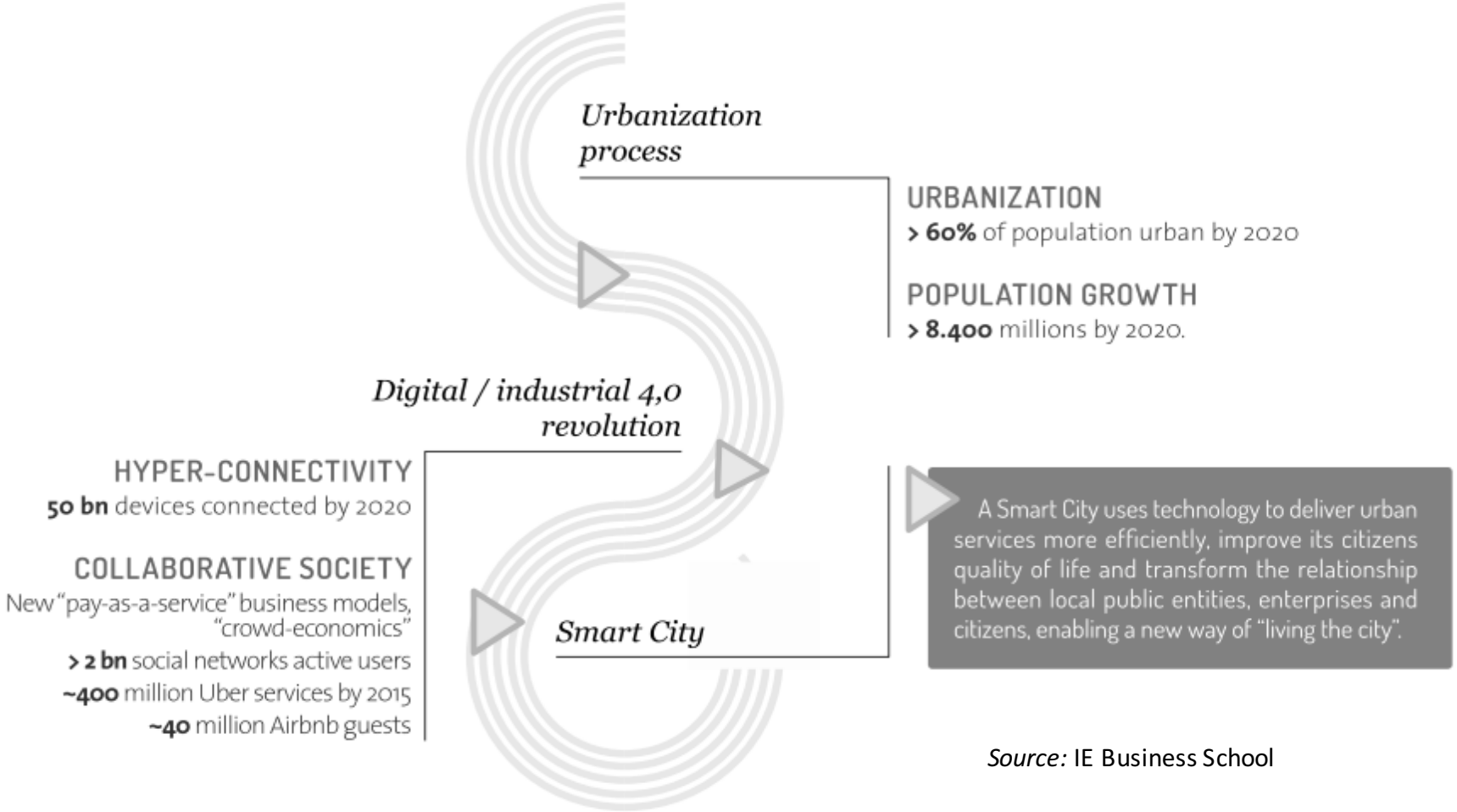
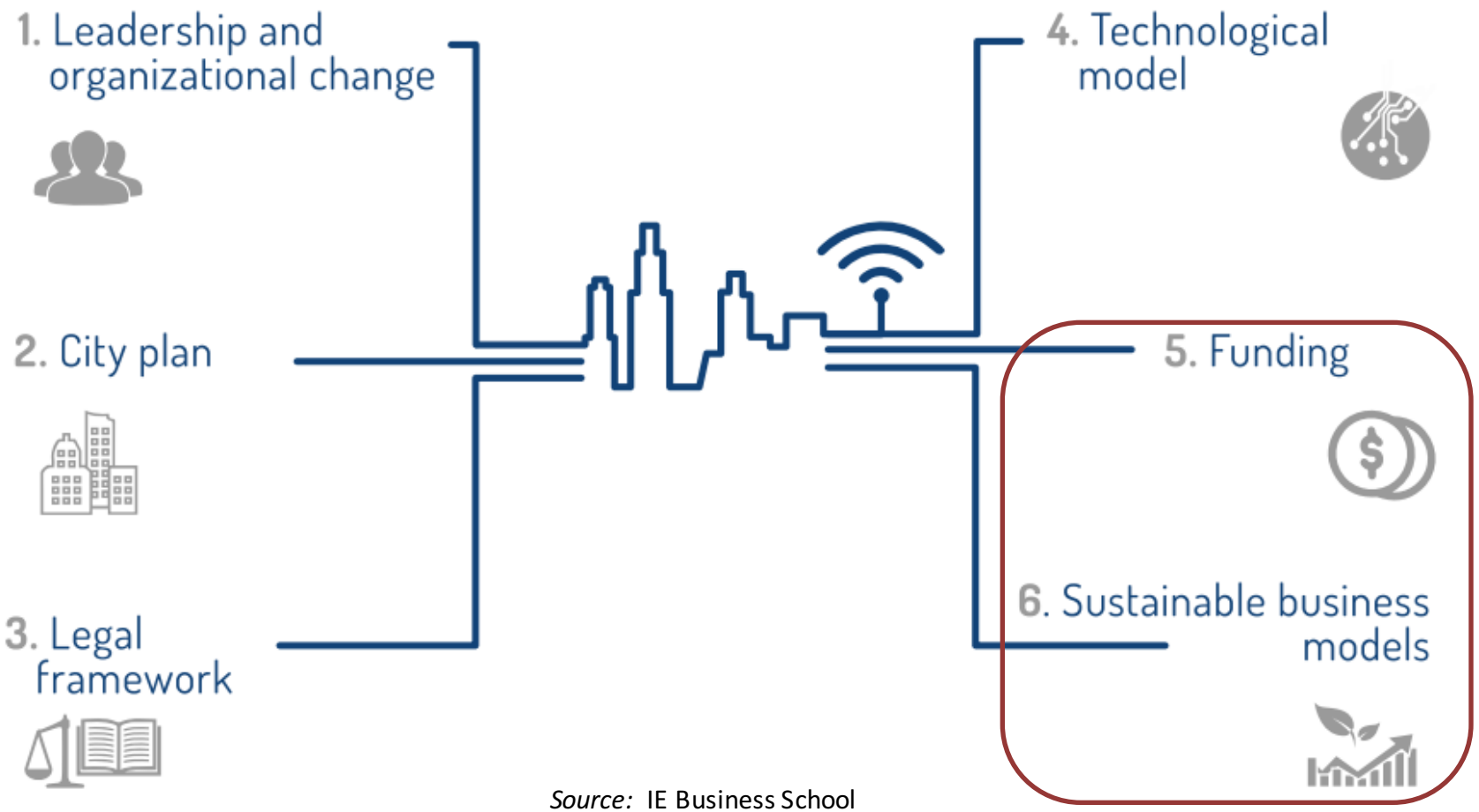
28 November 2017

The potential of smart cities



Source: IE Business School

Six key areas to build a smart city



Source: IE Business School

Business Opportunities

Smart Environment

Smart Mobility

Smart Economy

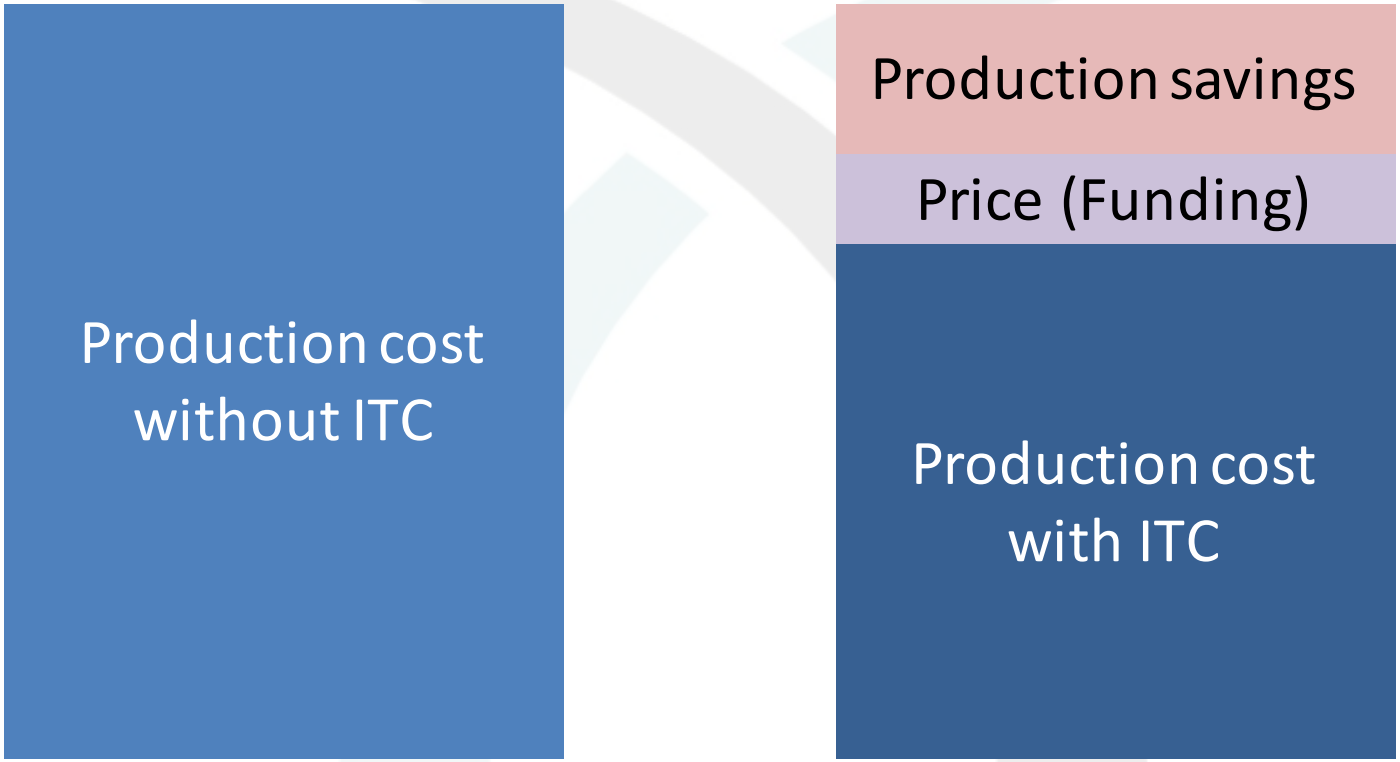
Smart Living

Smart Governance

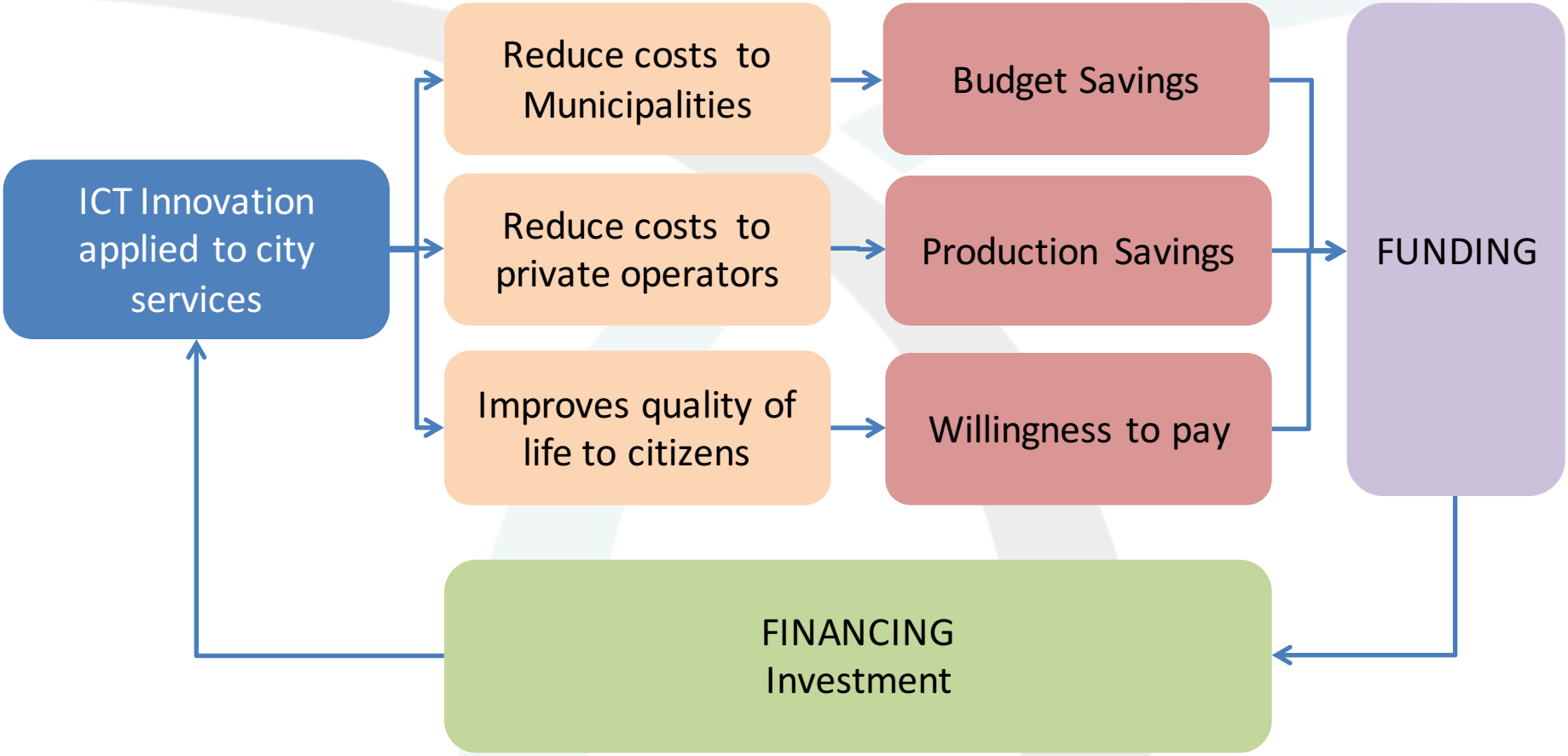
Keys for the success of business models

Create Value (OPPORTUNITY)	Capture Value (FUNDING sources)	Draw Resources (FINANCING sources)
• For the municipality • For companies • For the users • For others	• Budget savings • Cost savings • Willingness to pay • Value capture	• Government (EU, municipality) • Operators • Investors • Financial markets

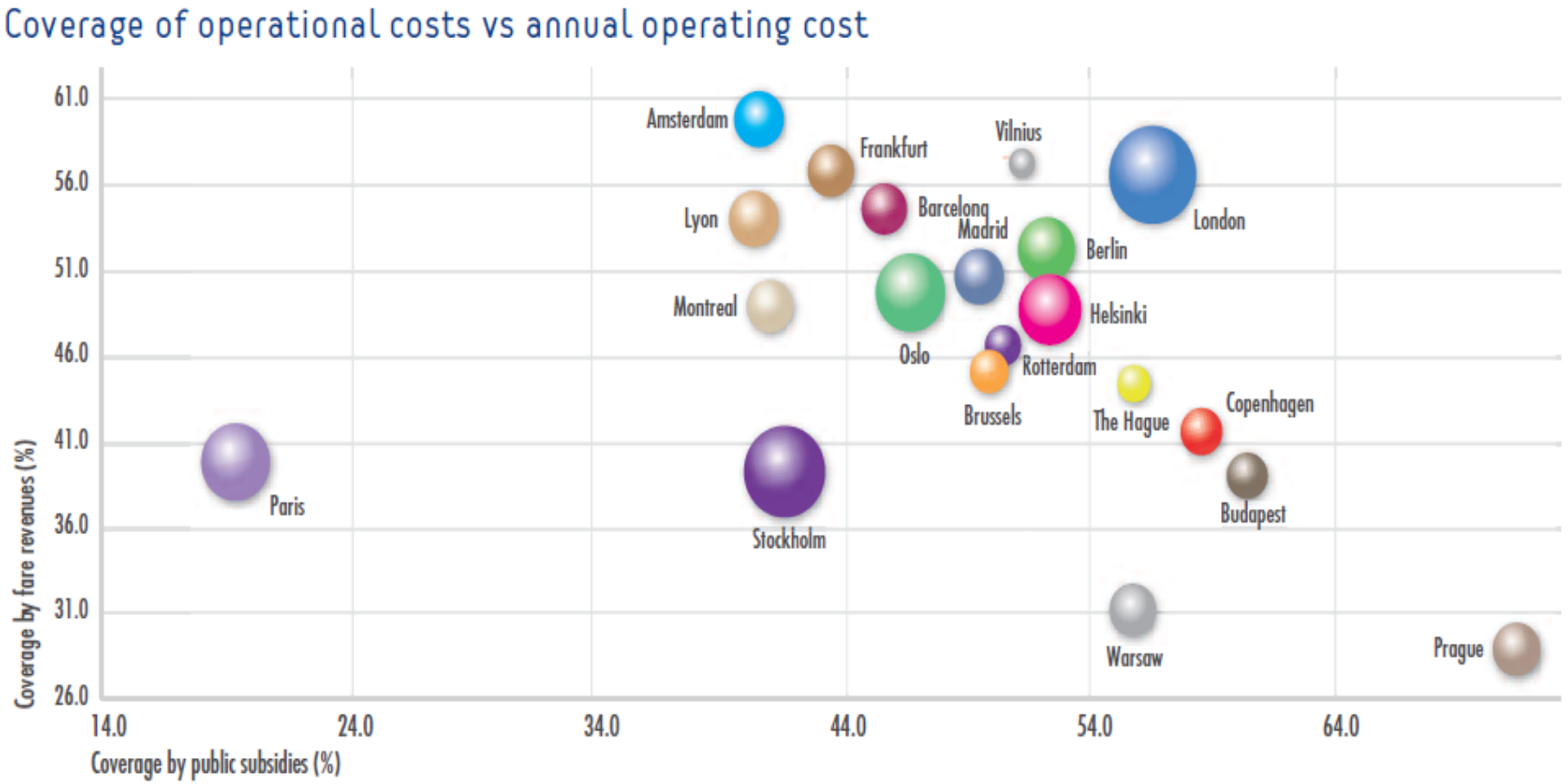
How can value be captured?



The added value of a smart city project

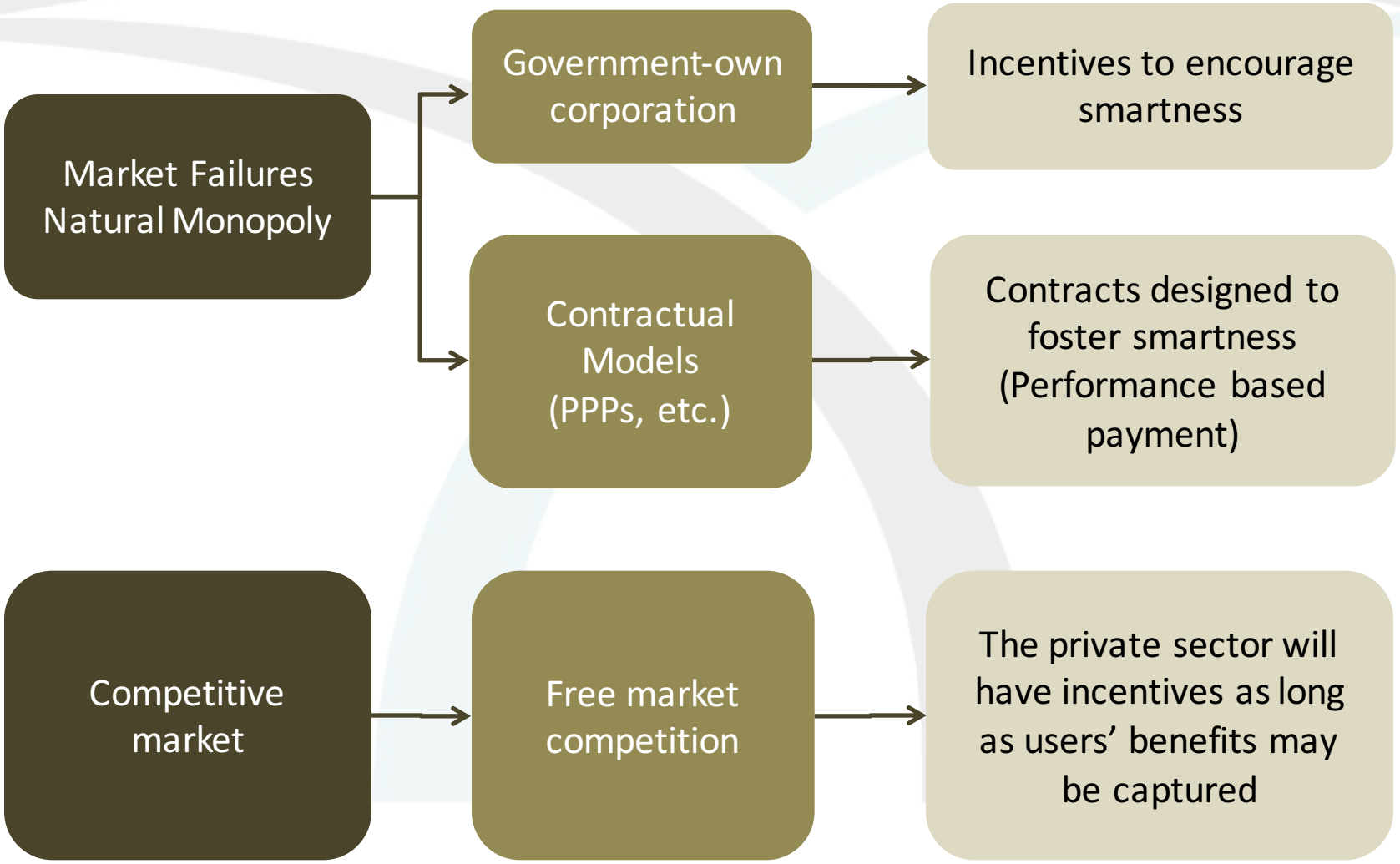


The potential of budget savings



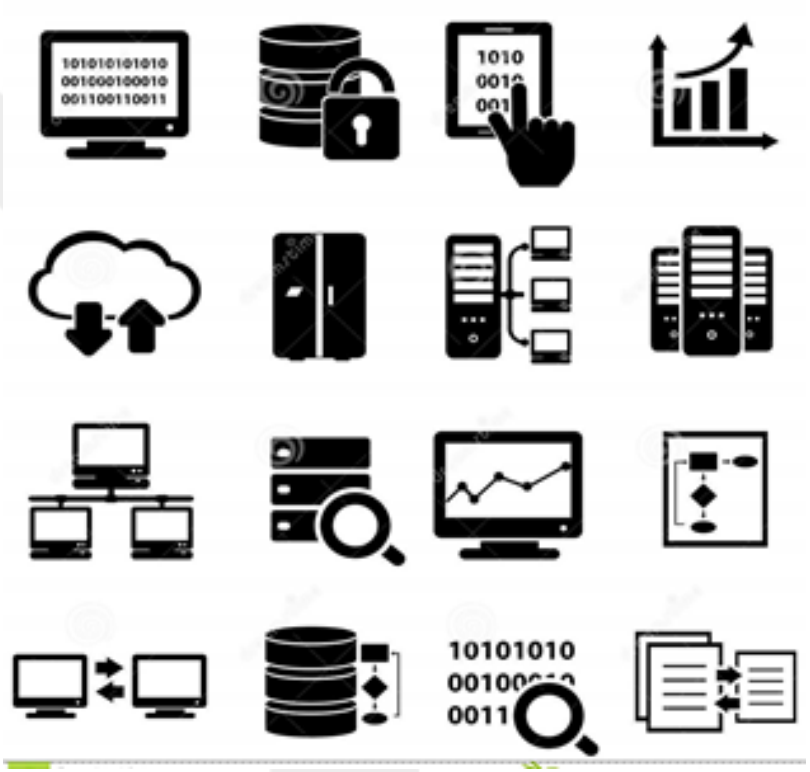
Source: EMTA Barometer

Different means of providing services within a city



Emerging business models

- Economy of data
- Crowd economy
- Internet of things

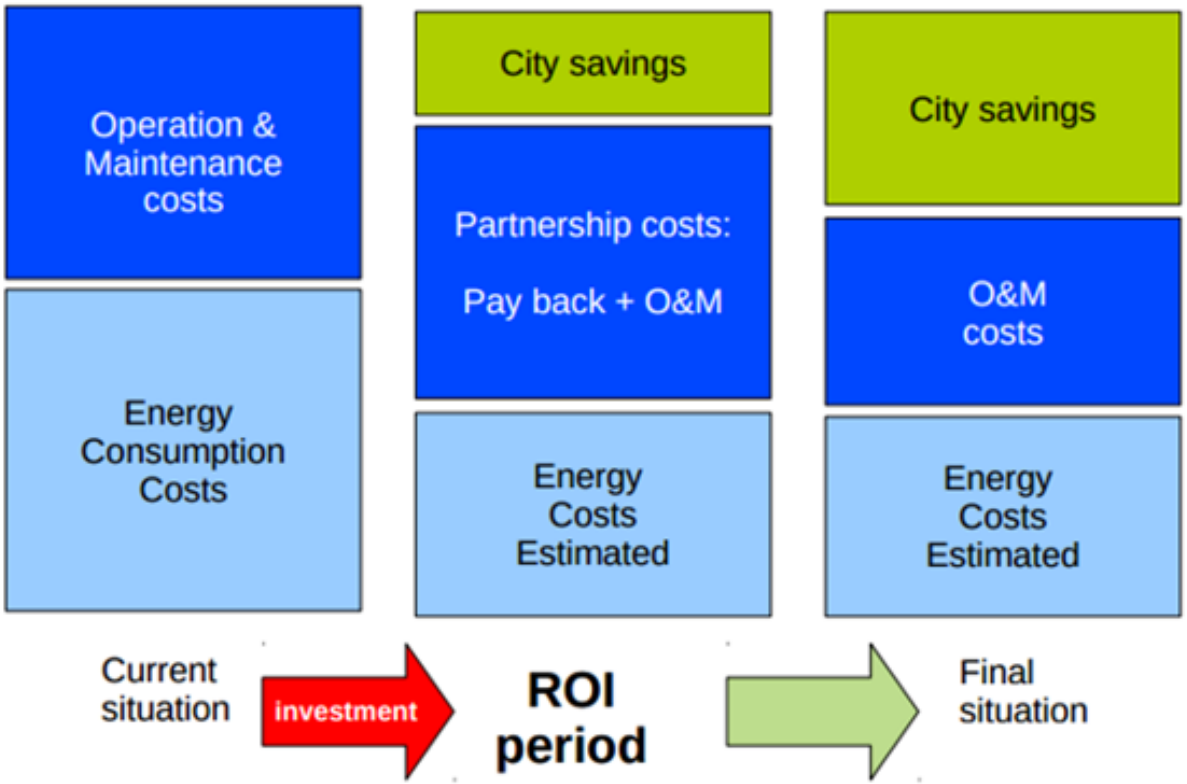


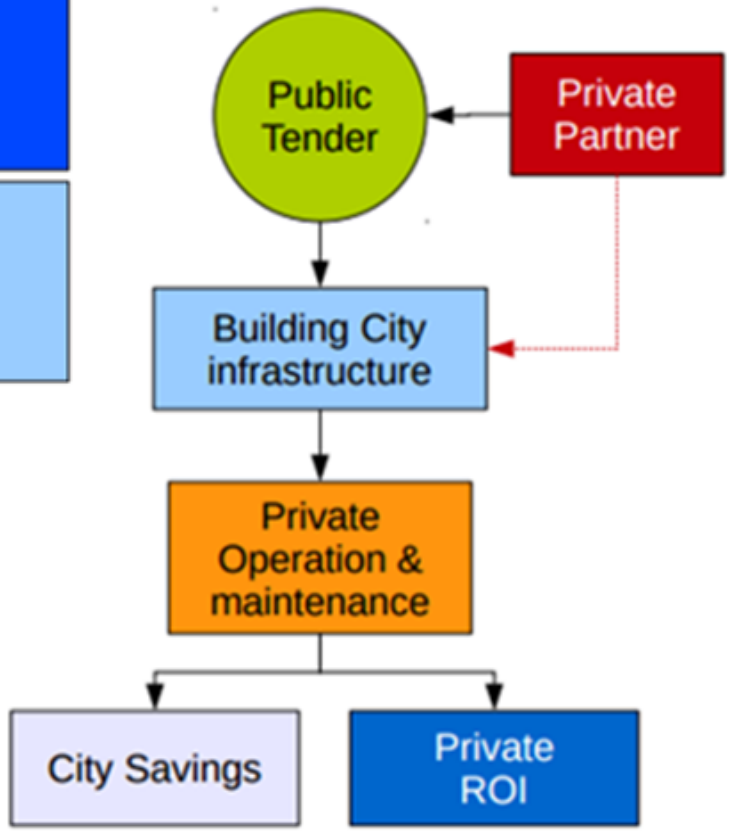
Challenges

- The **ideas** come **from the private sector** but most of the infrastructure belongs to the government
- There are both public and private **interests that need to converge**
- There are **many agents** with different characteristics and objectives
- Data sources are neither integrated nor available to everyone → **PLATFORMS**

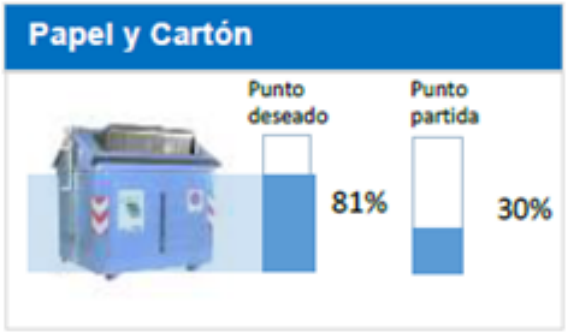
Vendors	CISCO	Secondary "interface" Can help to enrich vision Keep IT-staff relationship "in shape" Small Projects
IT integrators	indra, IBM, Telefónica, oesia grupo	Primary "interface" (losing ground) Can help to enrich vision Small-medium sized projects
Utility companies	ferrovial, endesa, fcc, acciona	The new (BIG) players BIG BIG projects Speak policymakers languaje They have €€€€€€€
Consultors	Deloitte., oesia grupo	Already in the game Very well "connected" Influencing on organization/business plans
Telecom operators	Telefónica, vodafone, Deutsche Telekom	Traditional partners User oriented services City systems integration "Comoditization"

Urban lighting case





Waste management case



- Sensors to know how full are the waste containers
- Optimization of routes to pick up the containers:
  - Frequency
  - Route design
- Estimated savings of between 20 and 25%

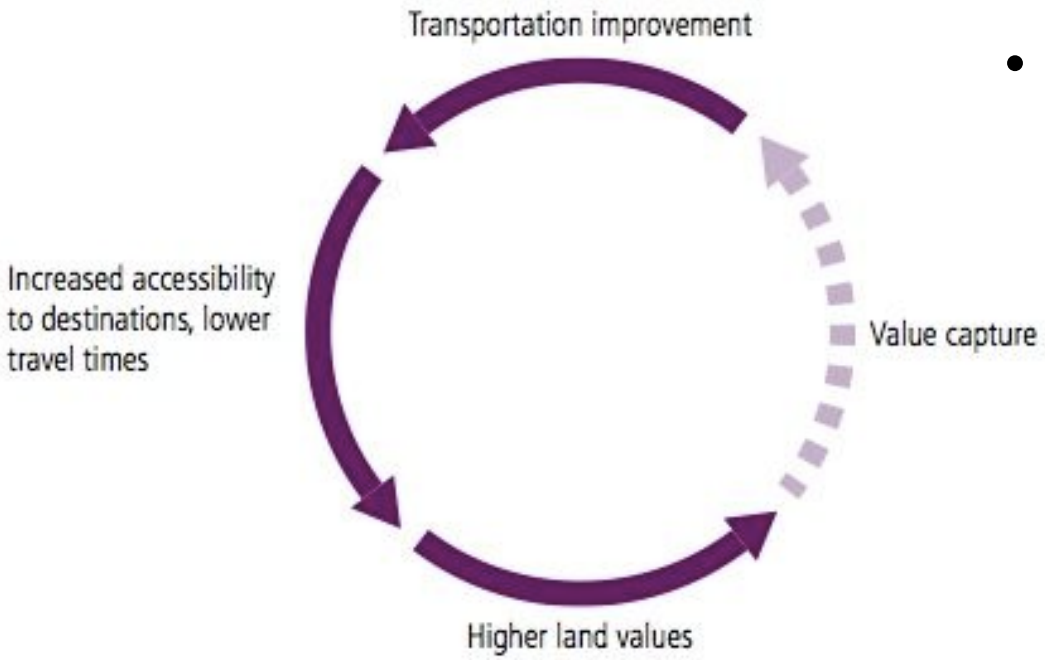
Public park management

- Contracting approach based on performance-based payments:
  - Results on the basis of quality indicators
- Incentives to the contractor to use ICT to optimize
- Potential savings:
  - 30-35% water consumption
  - 15% maintenance
  - 5% energy consumption

On-street parking management

- Savings of time and costs for the users
- Sensors to know the occupation
- Pricing approaches to guarantee a reasonable occupation rate
- Information to users through
  - Apps
  - The internet
- Revenue source for the city

Capturing the value of other beneficiaries



- Indirect beneficiaries should also contribute to fund smart city projects through
  - Taxes to greater values of real estate prices
  - Charges to shops and commercial areas

Private business models: mobility sharing

Key ideas

- Business models for smart cities are still at an early stage
  - There is a lot of work ahead
  - Some regulatory aspects have to be defined
- The key of success is to create value and being able to capture it
- The definition of the right incentives by the City is crucial for success

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THANK YOU FOR YOUR ATTENTION

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Rating the Success of Transport Infrastructure Delivery

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Thierry Vanelslander, University of Antwerp

2017 STA Annual Conference & Innovation Awards
28 November 2017

Business models for ENhancing funding and Enabling Financing of Infrastructure in Transport

European Commission

This BENEFIT project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635973

BENEFIT

Business Models for Enhancing Funding & Enabling Financing for Infrastructure in Transport

Cerema

Road and Bridge Research Institute

UNIVERSITY of OULU

OULUN YLIOPISTO

TÉCNICO LISBOA

University of the Aegean

uclan

TIS

TRANSPORTES, INOVAÇÃO E SISTEMAS

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University of Antwerp

PA&M

Public Administration & Management

University of Antwerp

KIT

Karlsruhe Institute of Technology

TRT

The Bartlett School of Construction & Project Management

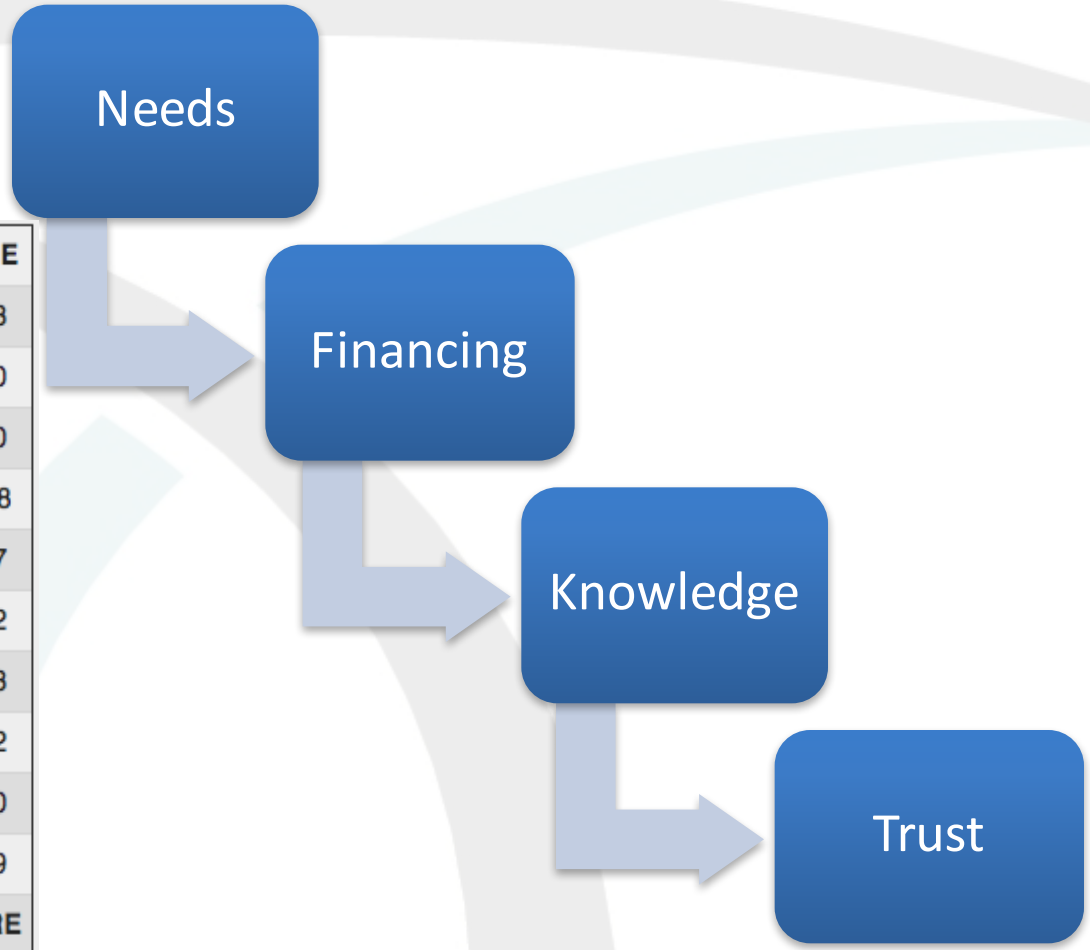
UCL

Contents

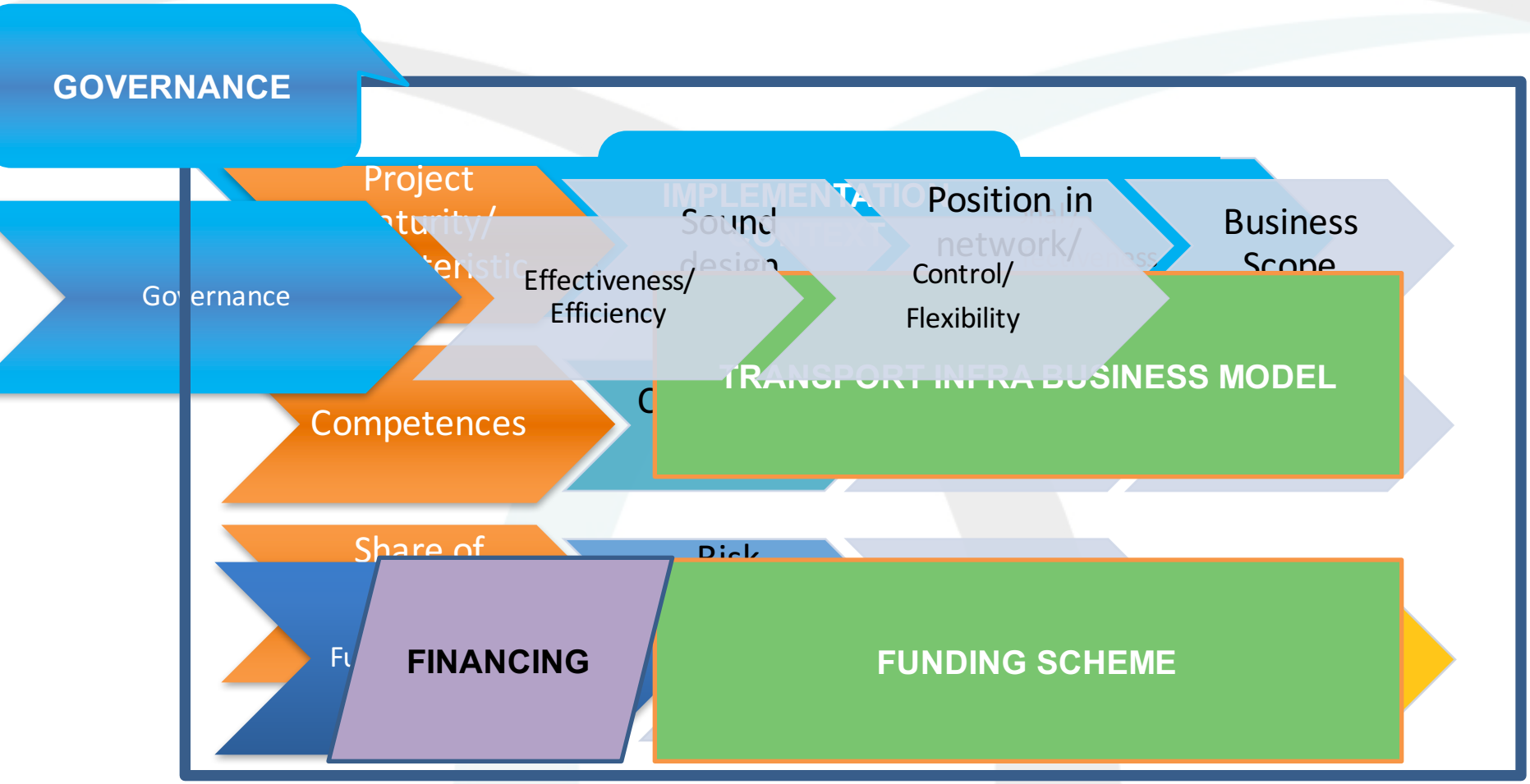
- Needs
- Lessons Known, Confirmed & Learnt
- Response & Concept
- Approach
- Transport Infrastructure Delivery Performance Rating
- Post BENEFIT Web Application - Examples
- Way Forward

What if?

INDICATOR	VALUE
Financial-Economic Indicator (FEI)	0.633
Institutional Indicator (InI)	0.730
Governance Indicator (GI)	0.750
Cost Saving Indicator (CSI)	-0.018
Revenue Support Indicator (RSI)	0.127
Level of Control (LOC)	0.412
Remuneration Attractiveness Indicator (RAI)	0.923
Revenue Robustness Indicator (RRI)	0.312
Reliability/Availability Indicator (IRA)	1.000
Financing Scheme Indicator (FSI)	0.869
TIRI RATING	**SCORE**
Cost to completion	C
Time to completion	C
Actual vs forecast traffic	C
Actual vs forecast revenue	BEN

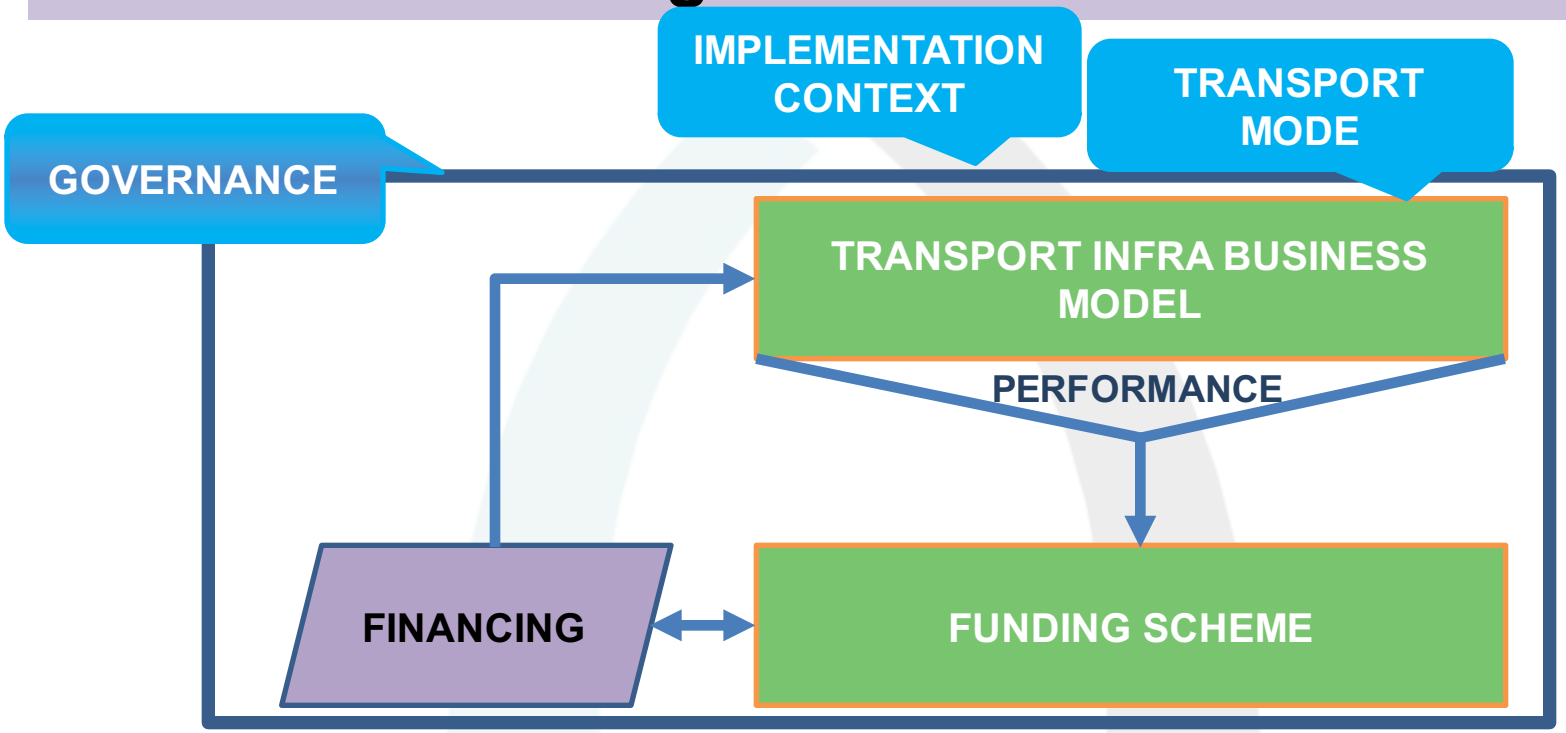


Lessons Known, Confirmed & Learnt



Lessons Known, Concept Confirmed & Learnt

Factors Influencing Success



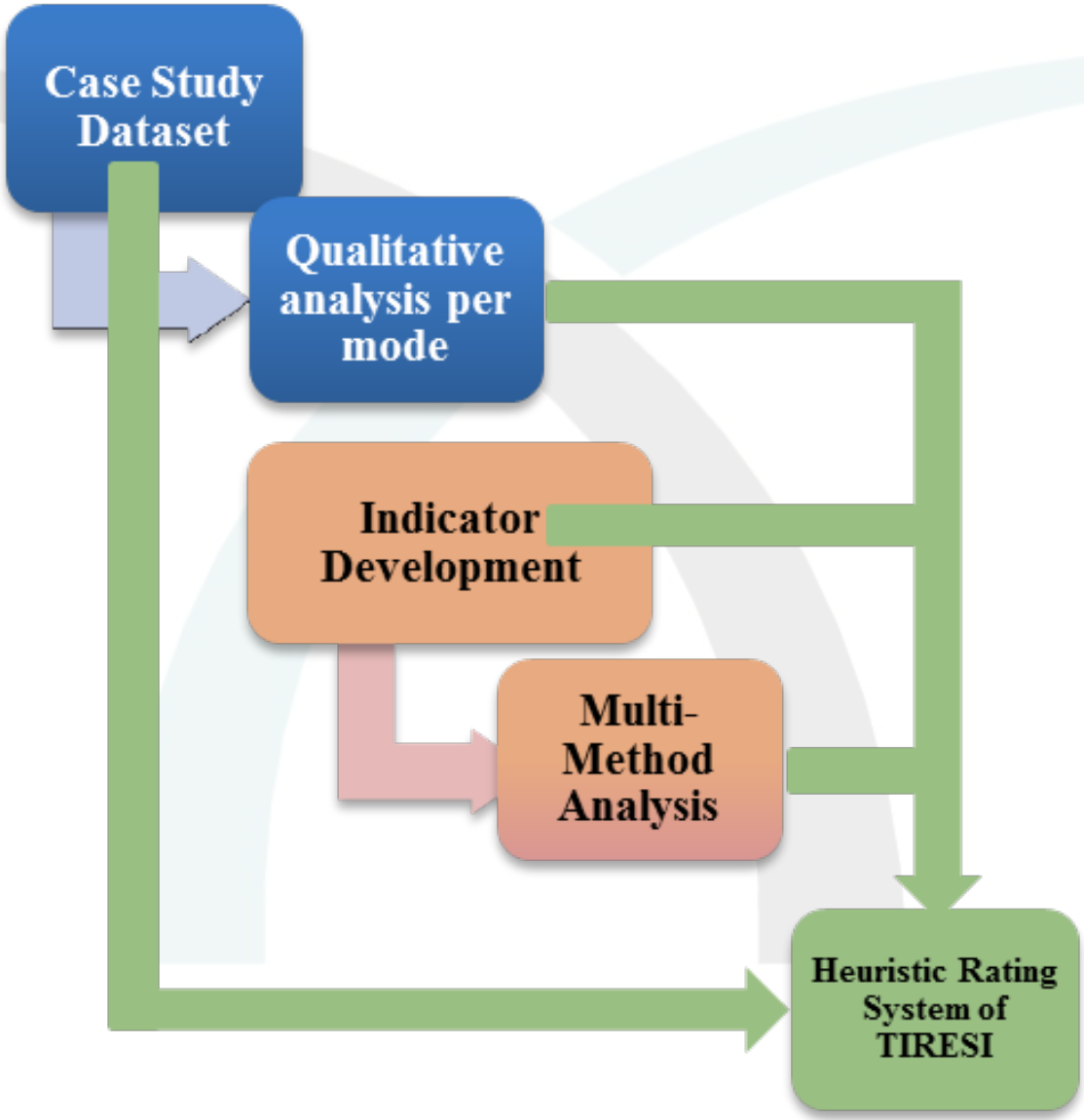
Response & Concept

- Identify Combinations of Factors that lead to "successful" projects
- Describe the project delivery space through **indicators** (combine factors) to simplify
  - These are **not** Key Performance Indicators!!!
  - BUT they may be used as **benchmarks**

Transport Infrastructure Delivery

Indicator	Measure
Financial Economic	National Productivity (GCI of the WEF)
Institutional	Government effectiveness/stability (WGI &OECD ETCR)
Governance	Contractual effectiveness/efficiency & flexibility/control
Cost Saving	Structural Efficiency
Revenue Support	Effective Project Integration
Transport Mode	Reliability & Availability of infrastructure & transport service
Remuneration Attractiveness	Project Income potential
Revenue Robustness	Project Revenue potential
Financing Scheme	1-WACC (adjusted)

Approach


Case Study Dataset
Qualitative analysis per mode
Indicator Development
Multi-Method Analysis
Heuristic Rating System of TIRESI

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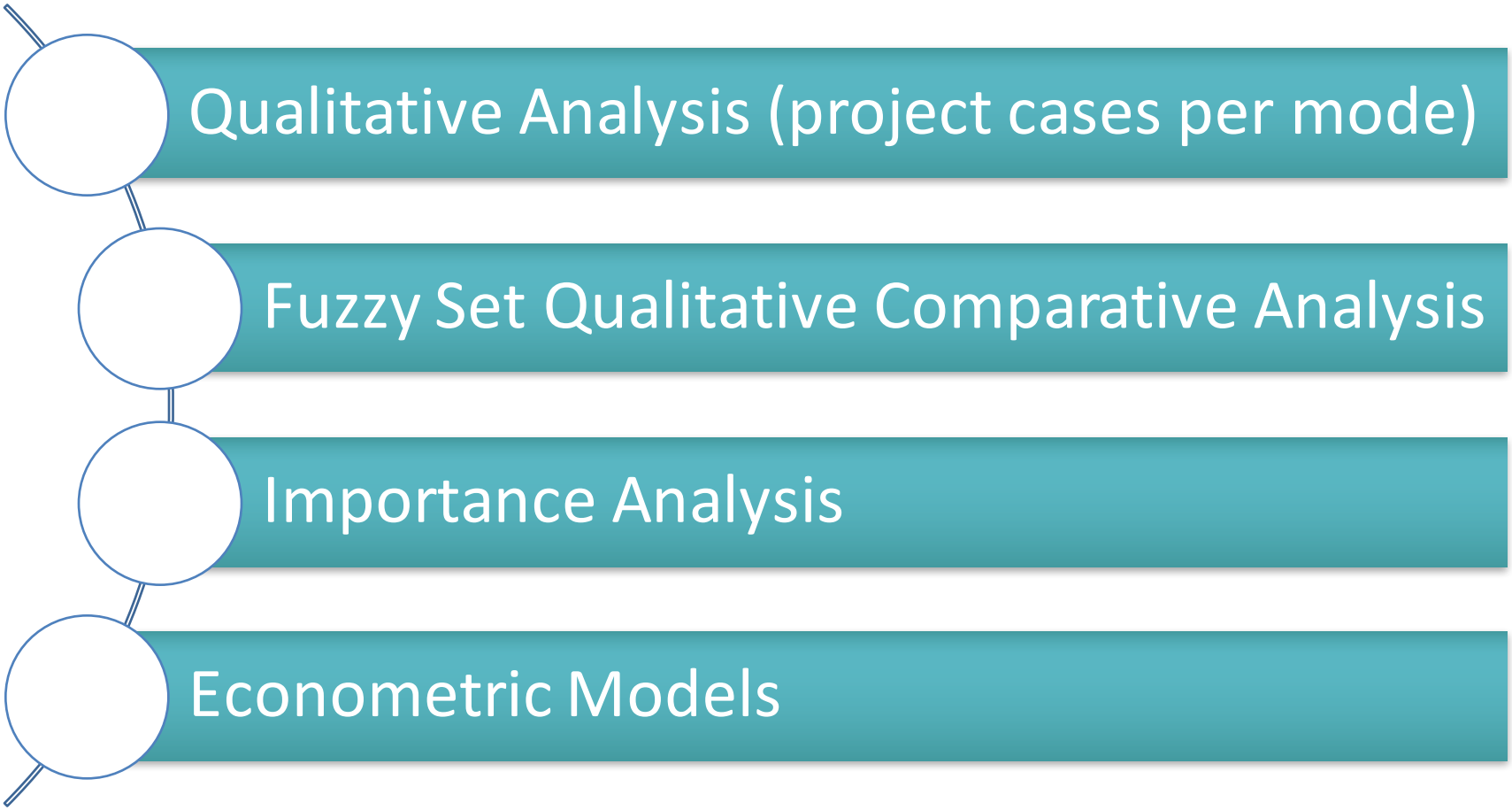
The BENEFIT H2020 Project

Multi-Analysis Approach



Lessons Known, Confirmed & Learnt

Factors Influencing Success

- **No single indicator (factor)** of the project system that can define the likelihood of achieving an outcome target but rather **combinations of them**;
- There is **no single combination of project indicator (factors)** that can secure the successful attainment of **all project outcomes** simultaneously;
- **Outcome targets are not achieved by the same combination of factors across all modes** of transport.

Transport Infrastructure Delivery
Defining Success

- Meet Cost to (construction) completion target
  - Retain the need for financing and CBA
- Meet Time to (construction) completion target
  - Timely start of operation/returns
- Meet Demand (traffic) target
  - Attain transport, environmental, social goals, CBA
- Meet Revenue target

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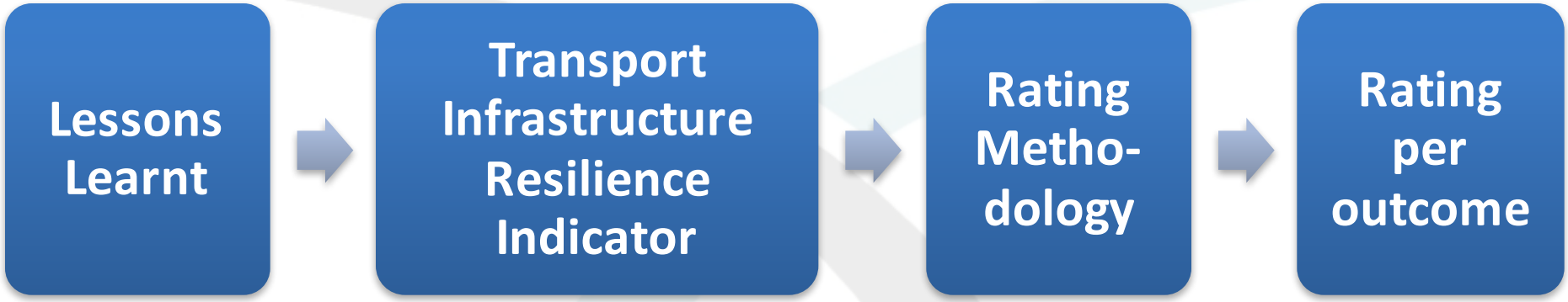
The BENEFIT H2020 Project



"the ability of a Transport Infrastructure project to withstand, adjust and recover from changes within its structural elements with respect to its ability to deliver specific outcomes (such as cost and time to completion, expected traffic and expected revenue targets)".

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The BENEFIT H2020 Project

Project Outcome Rating System

Rating	Description
A	Very high likelihood of achievement of outcome
B	Average likelihood of achievement of outcome
B_{EX}	A rating describing a fairly robust internal project structure but subject to exogenous vulnerability
B_{EN}	A rating describing a project implemented under largely positive exogenous conditions but with internal structure vulnerabilities.
C	Low likelihood of reaching of achievement of outcome

Post BENEFIT App

Metrolink @ Award

INDICATOR	VALUE
Financial-Economic Indicator (FEI)	0.635
Institutional Indicator (Inl)	0.820
Governance Indicator (GI)	0.688
Cost Saving Indicator (CSI)	1.000
Revenue Support Indicator (RSI)	0.270
Level of Control (LOC)	0.588
Remuneration Attractiveness Indicator (RAI)	0.333
Revenue Robustness Indicator (RRI)	0.667
Reliability/Availability Indicator (IRA)	1.000
Financing Scheme Indicator (FSI)	0.981
TIRI RATING	**SCORE**
Cost to completion	A-
Time to completion	A-
Actual vs forecast traffic	BEN+
Actual vs forecast revenue	BEN+

Metro do Porto @ Award

Metrolink @ Final Operation

INDICATOR	VALUE
Financial-Economic Indicator (FEI)	0.600
Institutional Indicator (Inl)	0.790
Governance Indicator (GI)	0.688
Cost Saving Indicator (CSI)	1.000
Revenue Support Indicator (RSI)	0.270
Level of Control (LOC)	0.588
Remuneration Attractiveness Indicator (RAI)	0.333
Revenue Robustness Indicator (RRI)	0.667
Reliability/Availability Indicator (IRA)	1.000
Financing Scheme Indicator (FSI)	0.995
TIRI RATING	**SCORE**
Cost to completion	N/A
Time to completion	N/A
Actual vs forecast traffic	BEN+
Actual vs forecast revenue	BEN+

Way Forward

Financing

- Expertise & Knowledge on Infra
- Assessment of project RESILIENCE
- Resilience Indicator Rating next to Creditworthiness Rating

- Regulation circle

Transport Infra Delivery

- Planning Scenarios
- Financing Scheme Scenario Testing
- “Project Health” Monitoring
- Effective Management
- Low risk Projects > Low cost financing
- Public & Private (co) financed

Way Forward

Continue Validation

Extend

- All transport mode infra outcomes (Rail, Ports & Airports)
- Other infra sectors

Way Forward

www.benefit4transport.eu

What does BENEFIT do?

http://www.tiresias-online.com/benefit/

Calculation of Indicators to be used for Transport Infrastructure Resilience Indicator Rating

Beta version

User name

Password

Login

If you don't have a password please Sign Up

If you wish to edit your previous inputs, please login through edit page.

This BENEFIT project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635973

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