

**INTERREG Alpine Space**

**“e-mobility SMART grid for passengers and last mile freight transports in the Alpine Space – e-SMART”**

## **Smart Territory Ecosystem Report**

**March 2020**

Document Details	
<b>Project acronym</b>	e-SMART
<b>Project title</b>	e-mobility SMART grid for passengers and last mile freight transports in the Alpine Space
<b>Project number</b>	753
<b>Action</b>	WPT3 SMART ENERGY INTEGRATION  Activity A.T3.1 Definition of Smart territories ecosystem in relation to energy and mobility integration
<b>Deliverable</b>	Deliverable D.T3.1.1 Smart territory ecosystem report
<b>Due date</b>	2020.03
<b>Delivery date</b>	2020.03
<b>Dissemination</b>	PPs
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Short Description
<p>This document provides a basic framework delivering on definitions, as well as the building blocks, of both a Smart Territory Strategy and Roadmap. The document aims to facilitate smart mobility and smart energy grids development, in turn facilitating a framework for the enablement of electronic vehicles, both freight and passengers, addressing last-mile issues, standards and interoperability and electronic vehicle charging networks for the Alpine region. The document provides a short description of a smart territory, considering the most important aspects of the same territory. Moreover, the document is open to possible amendments from the e-SMART Alpine Space Stakeholders. They can give their prospective and improve the definition of the smart territory as well as for the Strategic Roadmap.</p>

Dissemination level		
<b>PU</b>	Public	
<b>PP</b>	Restricted to other programme participants	
<b>RE</b>	Restricted to a group specified by the consortium	
<b>CO</b>	Confidential, only for members of the consortium	<b>X</b>

Revision history			
Version	Date	Author	Organization
V1.0	10.03.2020	Bas Boorsma - Cristina Cavicchioli	TSCAI - RSE

Final Document	16.10.2020	Bas Boorsma - Cristina Cavicchioli	TSCAI - RSE
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## 1. Introduction

This report has been produced under the Alpine e-SMART Programme, e-SMART project. Its purpose is to provide a basic framework delivering on definitions, as well as the building blocks of both a Smart Territory Strategy and Roadmap, ultimately facilitating smart mobility and smart energy grids, in turn facilitating a framework for the enablement of electronic vehicles, both freight and passengers, addressing last-mile issues, standards and interoperability and electronic vehicle charging networks for the Alpine region.

This report can be considered a “Living Document” consistently open to additions and amendments provided/to be provided by the cohort of the e-SMART project stakeholders.

## 2. “Smart Territory”

In defining the term “Smart Territory,” a vast body of experience in the smart city domain can be leveraged. Simultaneously, a definition of a smart territory must accommodate the fact that a given territory may comprise of multiple jurisdictions and possibly varying conditions and regulatory frameworks may apply. An expanded definition will be provided per below. This definition can then be broken down into ‘actionable’ components that get each addressed briefly. Last, the definition needs to be applied to the smart mobility and smart energy domains, covered per paragraph 2.3

### 2.1 Definition of a Smart Territory

A smart territory is a geographical region that may comprise of several communities and jurisdictions, in which these communities and their stakeholders leverage digital organizational principles, tools and (digital or analogue) innovations to help the community or communities evolve to become more sustainable, inclusive, successful and creative, and to ultimately benefit the individual citizen. The stakeholders of a smart territory leverage innovation to positively amplify and augment the existing social dynamism of the communities in question. A smart territory is able to positively address societal divides by digital means and is able to mitigate the divisive impact digital change may impose on a community. A smart territory concerns itself with innovations in which digitalization is not limited to facilitating a series of – often very impactful – efficiencies. Instead, a smart territory leverages digitalization to organize matters *differently*. A smart territory aims to leverage digitalization to propel individual growth and collective well-being across its geographical parameters and beyond, across its stakeholders, and upholds a high degree of inclusion as a central principle of design in policymaking, procurement, infrastructure roll-out, data management and solution deployment. Last, a smart territory endeavour upholds the highest standards possible with regard to ethical conduct, data privacy and cybersecurity.

As a smart territory may encompass multiple jurisdictions and communities with differing (possibly competing) care-about, a smart territory may need to avoid “one size fits all” approaches. Instead, a smart territory defines, sets forward and leverages a framework of principles, building blocks and reference architectures that facilitate differing choices from one jurisdiction to another, while ensuring:

- a. Interoperability (of solutions, access technologies, physical and digital infrastructure choices, as well as data sets, platforms, data lakes and utilities)
- b. 'Fairness' in the market
- c. Economies of scale (or the scalability & viability of a solution or architecture proposed)
- d. A territory-wide sharing of know-how
- e. A territory wide sharing of data (where desirable, legal and beneficial)
- f. A working synchronicity of regulatory environments: while differing local regulatory environments may apply within one territory, a smart territory ensures sufficient synchronicity between them to allow for effective territory-wide innovation and digitalization approaches

## **2.2 Smart Territory Defined within the scope of e-SMART**

Given e-SMART's focus on mobility, electric vehicles and smart energy grids, a derived, working definition can be produced for the sole purpose of e-SMART and the domains in focus:

A Smart Territory as relevant under the e-SMART program terms is a geographical region that encompasses several communities and jurisdictions. The territory's communities and their stakeholders leverage digital *and* analogue innovations, while standing in embrace of organizational, delivery and know-how sharing models that are aimed at setting the terms and conditions for the territory's mobility and energy futures. Ultimately, the smart territory's mission is to orchestrate (the conditions) for a *converged smart mobility and smart energy system* that ultimately allows for a sustainable, affordable, future proof smart energy grid, tied to mobility services designs that are sustainable, affordable, and accessible to all. The design fundamentals central to the territory's mobility and energy futures include:

- 1) Any of the smart territory's output is to ultimately serve the territory's citizens;
- 2) All of the smart territory's output is to contribute to a greener and more sustainable future for all;
- 3) Any of the smart territory's output is to contribute to higher levels of societal, inclusion;
- 4) The smart territory is to drive a convergence of smart mobility, smart energy and, ultimately, smart community solutions across the territory in order to be future-proof and avoid silos (of procurement, data, proprietary solutions or governance);
- 5) Smart territory's output must be focused on scalability and replicability of the policies, partner and procurement models leveraged, and the solutions & architectures implemented;
- 6) The smart territory may strive to aim for – the creation of - a 'permanent innovation' environment, inserting the tools, means and conditions that allow for continuous innovation in the mobility and energy space.

## 2.3 Smart Territory Definition Components Examined

Many terms and components used in the generic Smart Territory definition, as well as the applied definition within the e-SMART context may require a definition of elaboration. Appendix A is being referred to for such definitions and elaboration.

## 2.4 Smart Territory Roadmap & Monitoring Questions derived from the Smart Territory Definition

The following questions must be derived from the Smart Territory Definition that translate into Smart Territory Roadmap building blocks and a Smart Territory Monitoring Framework:

1. Has the territory applied a working definition of a Smart Territory on itself, its goals, its strategies and tools across the communities and jurisdictions it represents?
2. What Design Principles will the territory's stakeholders start out with?
3. What are the prime roles and responsibilities of local governments?
  - a. What can be left to market players?
  - b. What parts of the e-SMART vision cannot be accomplished without public sector intervention? (example: last mile transport solutions that are not 100% viable from a market perspective)
  - c. What actions and interventions will private sector players need most from local government entities in order to realize the e-SMART vision for the territory?

## 3 The 20 Building Blocks for Smart Community and Smart Territory Strategies

In order to effectively pave the way for a working smart territory digitalization and innovation strategy, in order to be able to monitor and understand progress in the implementation of the strategy it is imperative to articulate the critical ingredients to such a strategy, with each such ingredient representing one or more operational variables and questions. For the purpose of this report, the *Framework of 20 Building Blocks for Community Digitalization and Innovation* is being leveraged (Boorsma, "A New Digital Deal" – Revised 2020 Edition). All building blocks have natural repercussions for the smart territory domains in focus within the e-SMART program: smart mobility, smart energy grids, their convergence and their convergence within larger smart territory designs.

The Twenty Building Blocks Framework serves as a roadmap of design principles. Originally forged for the purpose of digitalization strategies for communities ("Smart City"), the framework is equally relevant to the e-SMART program:

- While some components within the e-SMART program will concern non-digital, analogue innovations, the same fundamentals and design principles still apply;
- Policies, procurement models, governance approaches on mobility or energy should not be seen in isolation from other components of a

smart territory definition. Further, in e-SMART, too, data is likely to be king. The call to action must therefore be clear: any action, policy or investment focused on mobility or energy must be embedded in the larger smart territory framework.



In some cases, the order and functions of the building blocks have been amended to best serve the domain of smart mobility and its varying stakeholders. Some of the building blocks can be considered more relevant than others within the context of E-SMART. Those building blocks considered most relevant will receive more in-depth attention and will translate into an expanded set of strategic questions and monitoring variables. The local government perspective is a dominant angle to the below.

### 1. Leadership

Various considerations must be taken into consideration when deciding on effective leadership for Smart Territories:

- a. Leadership must be “innovation-ready”. Innovation can easily fail. Failure of innovation is not necessarily a negative for innovation leadership. The unpredictable nature of innovation outcomes must be matched and integrated into leadership, leadership KPIs and leadership styles.
- b. Executive sponsorship: large-scale community innovation strategies require visible executive sponsorship. E-SMART requires no less such executive sponsorship. It’s important to define & confirm such sponsorship early in the program.

- c. Leadership across jurisdictions: as a smart territory typically covers multiple jurisdictions and multiple political colors, it's imperative leadership is identified across political colors with an explicit mandate across jurisdictions. While this may prove easier to execute on a non-political administrative layer, it is advisable to include political / executive leadership early on in the program also.
- d. Public-private ready: given the need for strong and stable public-private partnerships in the smart territory / regional smart mobility space, effective leadership constitutes leadership that defines operations and governance across public and private stakeholders by default and operates with experience and within comfort zones in doing so.

## 2. Vision + Roles

Any smart territory strategy must start-out with an overarching vision. Such a vision must encompass:

- a. A Future State
- b. Aspirations and long-term goals of all jurisdictions involved
- c. Exchange with territory citizens and relevant stakeholders
- d. Core components of what constitutes 'value' in terms of strategy outcomes for the public. For example, any smart territory smart mobility vision needs to consider last mile access, ease of access, affordability, and sustainability
- e. Role of Public Sector entities in ensuring the vision translates into reality (i.e last mile coverage when commercial viability of last mile coverage can be considered low)

## 3. Smart Territory Governance

The term governance is open to a broader array of definitions. For the purpose of this report and the e-SMART program, the following definition is proposed: *Governance encompasses all of the processes and instruments of governing – whether undertaken by a government, by a market or by a network – over a community, a territory or organization. The instruments of governance can include laws, norms, power or language, institutional collaboration and organizational structures within an organized society. It relates to "the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions.*

Key considerations for effective smart territory governance:

Most community digitalization and innovation strategies require the involvement, stewardship and ownership across multiple domains, departments and stakeholders. A digitalization strategy can therefore not be an effort single-handedly owned by the IT leader of a given organization. Effective innovation governance must be owned "horizontally" across departments within a local government entity and relate to (or involve) stakeholders of relevance across public and private domains. In a smart territory, such governance ideally gets defined across jurisdictions also. Smart Mobility as a Smart Territory domain

cannot be excluded from such 'horizontal' inclusion: The requirements for an effective smart mobility strategy for any given community include, among others:

- institutional involvement of mobility providers across public and private domains
- next generation spatial planning
- determined and yet undetermined sets of data
- open data approaches
- new types of public private partnerships
- machine deep learning investments
- cyber security strategies,
- smart energy grid stakeholder involvement
- next generation payment systems.

Effective governance systematically reflects this diversity of needs and stakeholders.

#### 4. Needs, Challenges, Comparative Advantages

For a smart territory strategy to be effective, it needs to focus more broadly than 'solutions': *solutionism* has often proved to be a negative in the smart city domain. A smart territory builds on a clear analysis of the actual needs and challenges of a given community or a group of communities, but also its comparative advantages that can be amplified further by means of the territory's innovation strategy.

#### 5. Assets

As a foundational step towards implementation of any smart territory strategy, the strategy owners must consider the assets required and the helpful assets already owned or in place. While this appears a 'no-brainer', surprisingly often municipalities and regional governments are surprisingly incomplete in their assessment of the assets required and assets already in place of relevance to the strategy execution. This equally applies to a smart territory smart mobility strategy. Assets to consider include:

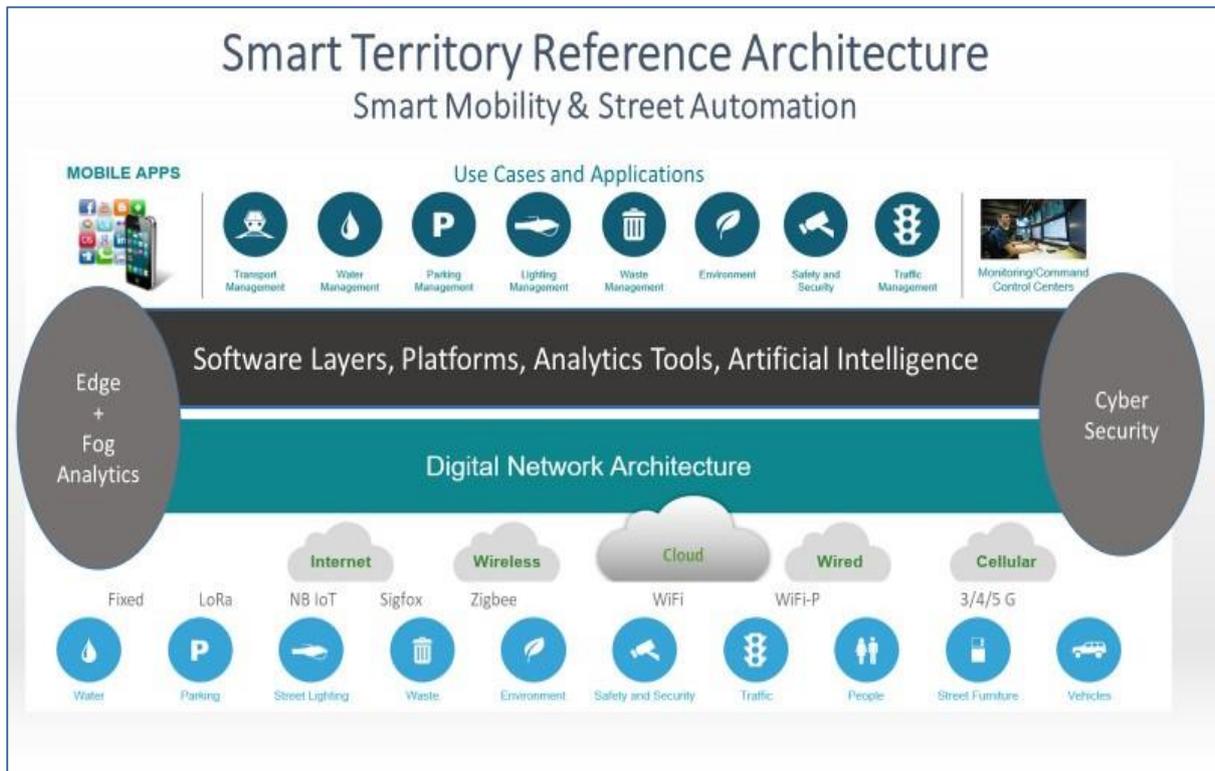
- Existing Mobility & Energy Infrastructure Assets
- Empty ducts
- Right of way over existing infrastructure (i.e sewage, ducts etc)
- Outdoor light and light poles
- Street furniture
- Street cameras and sensors
- Traffic lights
- Street cabinets
- Digital infrastructure (ie fiber, copper lines)
- Existing service agreements
- Parking facilities
- Existing physical road infrastructure
- Data
- Data analytics tools and platforms

- Data capturing Tools (i.e satellites, video cameras)
- Police force and its assets
- Public Transport companies and its assets
- Emergency services, their tools and assets

#### 6. *Art of Connecting Everything*

Next generation seamless and secure connectivity is imperative for any smart territory strategy. Several fundamental insights apply:

- a. A robust, sufficiently future proof base access infrastructure is a must-have. While infrastructure service providers such as telcos and cable companies may typically cater for much of the *current* needs, they may not (yet) deliver on (near) future infra requirements (think digital connectivity requirements of future automated vehicles for instance), nor may they cater for higher bandwidth requirements everywhere - *throughout the territory*.
- b. There will never be a one size fits all technology providing access to all use cases. 5G currently receives its unbalanced share of attention and expectations: although automated vehicles will push demand for 5G, only some use cases truly require 5G in the expanded set of smart territory use cases. Many use cases require low bandwidth, cost effective, low energy wireless technologies, such as LoRa or Narrowband IoT. A sensor in a sewage conduit, measuring the integrity of the sewage infrastructure, for example, cannot be helped by 5G, but instead gets powered by long range, low power access technologies (battery life counts for that sensor!). A smart territory reference architecture therefore converges a rich array of access technologies to power a wider variety of use cases. Or, even better to put that statement in reverse: for all possible desired smart territory use cases to function in the best, most seamless, interoperable and future-proof ways possible, all use cases must be matched by the most workable access technology for the optimal functioning of that particular use case. This means the territory must prepare for a hybrid future of a converged access technologies.



- c. Intelligence in the network is increasingly required on “the edge” of the networks, hyper-local. This is particularly relevant for smart mobility and smart energy grid use cases of tomorrow, where low latency, fast & hyper local data analytics, as well as first line of defense cyber security measures are mission critical. Edge and fog computing capabilities are an essential requirement as a result.

“Edge Computing”- Intelligence on the Edge of the Network (and why it matters)

Imagine a fully automated EV Truck entering an intersection. The truck needs to ‘talk’ directly to the traffic lights and it will need other information without any delay. Any automated analysis must happen hyper-locally. It cannot happen in some remote datacenter, intelligence at street cabinet level will be needed.



*Smart Territory Strategy of Interoperability*

The highest degree of interoperability between platforms, access technologies, solutions, end devices, software must be attained for a smart territory strategy to succeed long term. The rationale for striving to such comprehensive interoperability lies in the following points:

- Avoiding proprietary pitfalls which can result in vendor-lock-ins
- Avoiding proprietary lock-ins that hinder future innovation
- Creating a level playing field in which different technologies, varying data sets, competing innovations and overlapping software choices converge – seamlessly
- Strengthening the future-proofness of a smart territory strategy
- Creating a shared territory environment, market and architectures within which different jurisdictions and private sector players can make different choices and procurements without such differing choices resulting in fragmentation on the smart territory strategy
- Building on the previous point: without a clearly upfront shared understanding as to how to achieve interoperability, any smart territory strategy is likely to attain limited degrees of success.

In order to achieve interoperability for a smart territory, the following instruments are relevant:

- Forge and publish reference architectures
- Forge and publish requirements for openness and interoperability, to apply to all public sector procurements. This includes open APIs, data sets, software languages, platform interoperability, vertical point solutions, physical sockets & connections
- Forge and publish a smart territory ‘catalogue’ of solution providers / vendors that adhere to all conditions set.
- Consider forging ‘market-neutral havens’ for digital / infra assets of relevance to all smart territory stakeholders such as open access digital infrastructure, unbundled energy infrastructure with a shared base infrastructure and a data utility.
- Detailed defining of ‘openness’ and ‘interoperability’ in any public sector procurement and any SLA with a provider relevant to the smart territory, with such definitions becoming top-line in any RFI & RFP.

### 7. *Cyber Risk Management*

Key considerations concerning Cyber Risk Management:

- Although many of the smart territory’s energy and mobility solutions may end up analogue, most of the organizational fundamentals and innovations will be digital. Cyber risk management therefore is a strategic care-about;
- Cyber Security does not exist. Cyber Risk Management does;
- The territory stakeholders must prepare with the assumption that a cyber breach will happen at one point. Key question the smart territory stakeholders must address in that light are the following:

- Once a breach happens, what default scenario will the energy & mobility systems fall back on?
- How can components of all grids and systems be designed to continue operations in isolation (for example: micro-grids that continue to work if the larger energy grid fails)
- Most breaches happen and/or begin on ‘the edge’ of networks, in end devices (i.e credit card reader, a camera on a light pole, a sensor). A key design consideration must therefore be: how can cyber defenses best be built on the ‘frontline’ of networks, on the edge of networks. Taking e-SMART energy grid and smart mobility objectives as the starting point, the ‘edge’ security question is relevant to, for example, street cabinets, smart light poles, smart mobility and EV charging payment systems.
- Make Cyber Risk considerations part of the earliest designs, pilots, Proof of Concepts.

#### 8. *Data Strategies*

One of the many pitfalls of smart community/city/territory data strategies is to commence with a generic open data initiative, without a clear purpose in mind. A design lesson learned over the past few years in multiple smart community initiatives around the world, is to be clear on purpose only to then define what data is required to achieve what must be achieved. One of the most successful organizations in charge of smart mobility has been the London Transport Authority, because of the reasons mentioned. For e-SMART to succeed and, ultimately, for the smart territory to succeed across jurisdictions, the fundamental questions that must be addressed are as follow:

- What do we want to achieve and what data is needed for that?
- What data do we already have to achieve the purpose in mind, and what data needs to come from elsewhere?
- Once it is clear what data is needed (and therefore carries value), how can it be collected, managed, analyzed and exploited in a way that it is accessible, open for use to all relevant stakeholders in the smart territory, while creating an equal access level playing field for all private sector players involved?
- Various instruments exist to achieve the former point:
  - Standard Level Agreements with private sector partners that set the conditions in such a way that all relevant data is accessible to all while maintaining the highest level of security;
  - Data Commons, Data Utilities: entities, architectures and legal constructs that operate as a neutral ‘haven’ for data, regulated by the territory public sector stakeholders;
  - Open Data initiatives with purpose clearly defined.
- What data can best be stored and what data can best be destroyed once it has served its prime purpose?

- If no data utility is created, who will regulate data as well as algorithms relevant to the e-SMART territory work?

Work on data (strategies) is often complex, may evolve quickly and requires differing in-depth expertise. An explicit point of advice per this report is to create an e-SMART working group specifically on this topic in order to avoid the many trapping along the route.

### 9. *Smart Territory Regulatory Approaches*

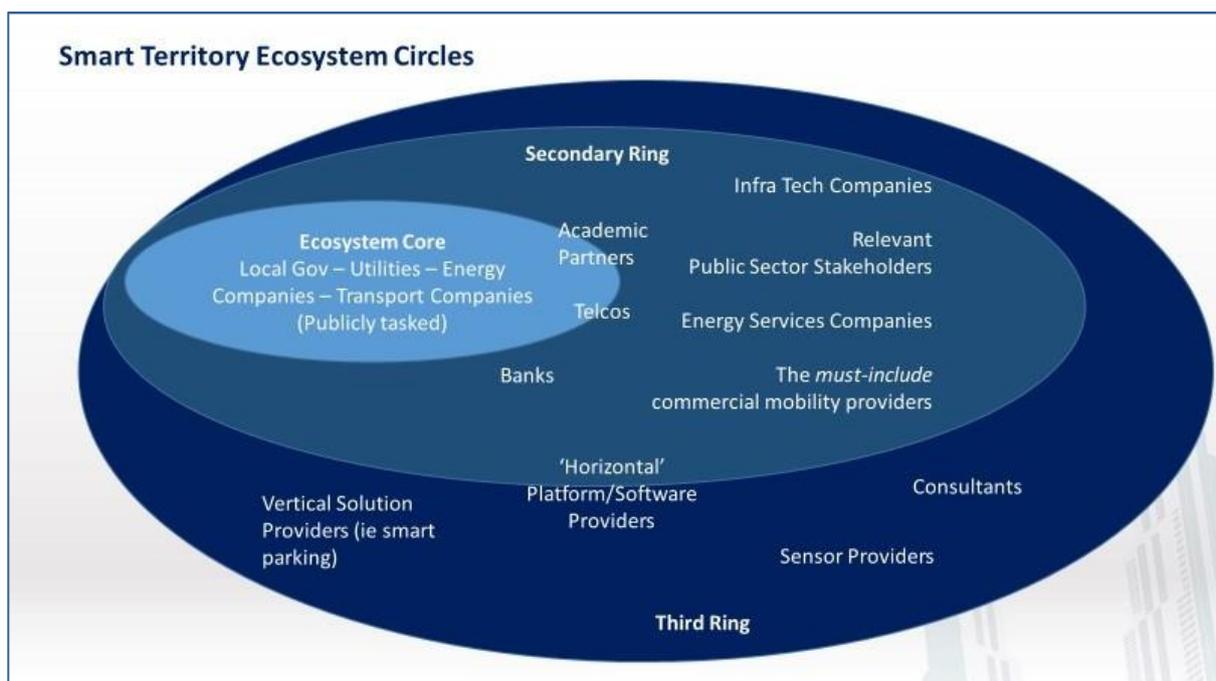
Regulatory environments are by their very nature slow to adapt to the innovations and changes produced by smart territory work. Old regulations may even prove to be total showstoppers. Given the many jurisdictions within the e-SMART ecosystem, unity in regulation may not always exist. Key considerations for the smart territory stakeholders must therefore include:

- What objectives, solutions, and innovations the territory wishes to produce can be expected to be challenged by any of the territory regulations?
- A lesson learned in smart city endeavors is that it helps to make regulators part of the conversation early when it comes to designs, architectures and solutions that are likely to challenge the existing regulatory framework. What topics/projects/work streams within the smart territory may prove most challenging, and what regulators need to be invited into the exchange as a consequence?
- Another lesson learned in smart city endeavors is that some innovations require amendments to an existing set of regulations only, while in others it needs to a total reframing of regulations (1.1 versus 2.0 essentially). When regulatory challenges emerge, the territory's stakeholders must decide what type of regulatory intervention is needed: an amendment or new regulations altogether? For example, regulating Uber as if it is a regular taxi company may not be effective. Any jurisdiction may opt for new regulatory interventions applying to uber type of mobility services in order to keep the market 'fair'. On the other hand, digital innovation applied to regular public transport may have limited, incremental consequences for existing regulations only. In such a scenario, the old regulatory framework still works but may need specific amendments.

10. *Ecosystems & Public Private Partnerships*

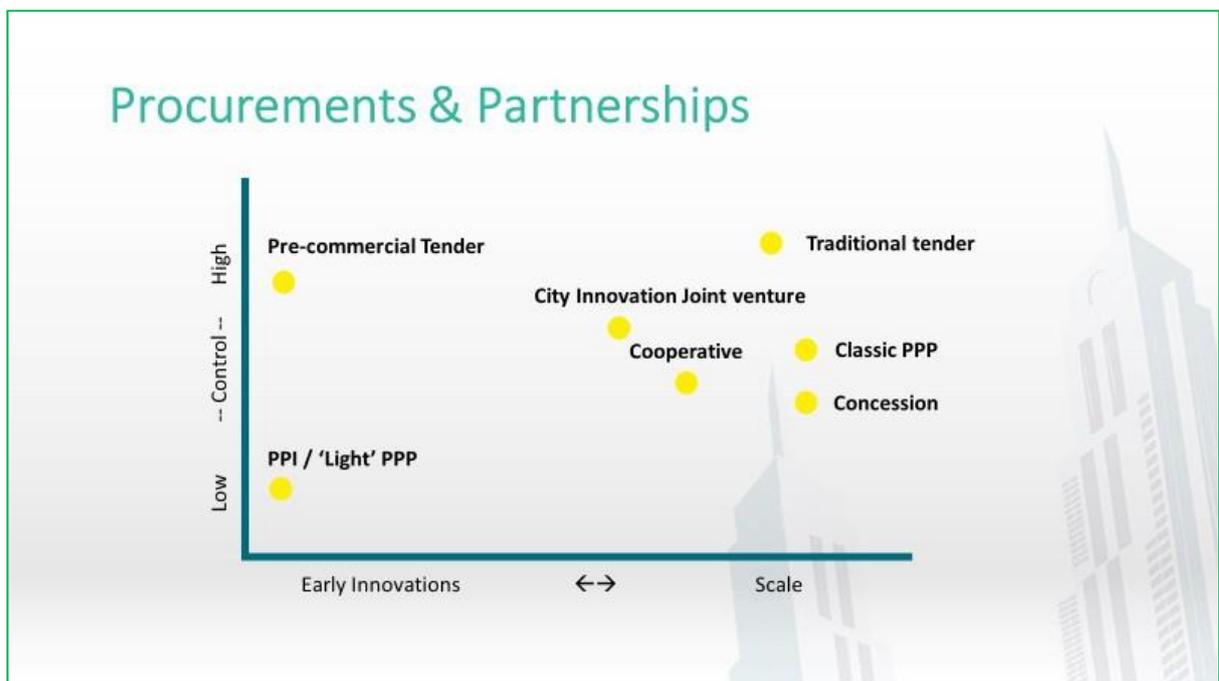
Key smart territory considerations on ecosystem:

- For Ecosystems to be effective, they first of all must be established that they are in fact an ecosystem. In short, an open, unmanaged forest is a biological equivalent of an ecosystem, a managed monoculture agricultural design provided by a seed monopolist is not. An ecosystem celebrates and leverages diversity to achieve the aims of the smart territory. It is a foundational insight.
- Ecosystems can be rendered ineffective if too many ecosystem partners are in the ‘control room’ of smart territory decision-making. Typically, to drive an effective convergence of solutions, architectures, policies and provisioning across energy and mobility domains, territory stakeholders are best advised to not start out with a vertical end-solution provider (a particular EV charging solution system for example) to then reverse-engineer that solution into a larger, to be created ecosystem. The best flow is vice versa: commence with the ‘horizontal’ players and partners of relevance across domains and solutions (for example, local governments, energy utilities, transport companies, street and energy services management companies) to then later extend into a secondary circle of ecosystem partners. The smart territory partners need to work on such selection early (at least by forging the proper ‘place-holders’) following from the smart territory vision, asset assessment and objectives.



- Procurement & Partnering

Differing project objectives are tied to differing procurement and partnering models. Standard public sector procurements is, of course, mainly conducted by means of tenders. Tenders are the best tool for procurement if the product or service is fully mature, understood and is expected to deliver exactly what is was set to deliver per terms set in a RFI/P. However, whenever innovation becomes one of the objectives, standard tenders are rarely effective. Various procurement instruments exist that cater differently for innovation goals. This includes ‘light public private partnerships’, pre-commercial tenders, but also joint ventures (a much heavier instrument) can address innovation goals adequately. For each e-SMART / smart region project, procurement and living lab it is imperative to qualify clearly what procurement (and partner) model best applies.



Smart Territory Collaboration in Procurement is an obvious care-about: regional procurement (involving multiple jurisdictions) help create economies scale, cost efficiencies, interoperability, security and it affords a better negotiation position in the marketplace. However, it does come with complexities: not every jurisdiction may want to procure the same set of solutions and services at the same time. A great example is the smart community procurements in Brescia, where a smart region procurement strategy has allowed for a smart light and smart infrastructure (smart parking, public WiFi, and LoRa/ Narrow Band IoT deployments with optional opt-ins for each community - see illustration below). The procurement was initiated and overseen by Raffaele Gare-

ri, current chief digital transformation officer of the City of Rome, and co-founder of e-SMART partner TSCAI.

## Brescia Smart Region

1. ALFIANELLO	15. PADENGHE SUL GARDA
2. BORGO SAN GIACOMO	16. PADERNO FRANCIACORTA
3. CAPERGNANICA	17. PASSIRANO
4. CHIARI	18. PEZZAZE
5. COCCAGLIO	19. PISOGLNE
6. CONCESIO	20. POMPIANO
7. GAMBARA	21. PONCARALE
8. GARDONE RIVIERA	22. PUEGNAGO SUL GARDA
9. LODRINO	23. RUDIANO
10. MANERBA DEL GARDA	24. SENIGA
11. MARMIROLO	25. SULZANO
12. NAVE	26. TAVERNOLE SUL MELLA
13. OME	27. TREMOSINE SUL GARDA
14. OSPITALETTO	28. VEROLAVECCHIA

Smart Lighting+ Smart City

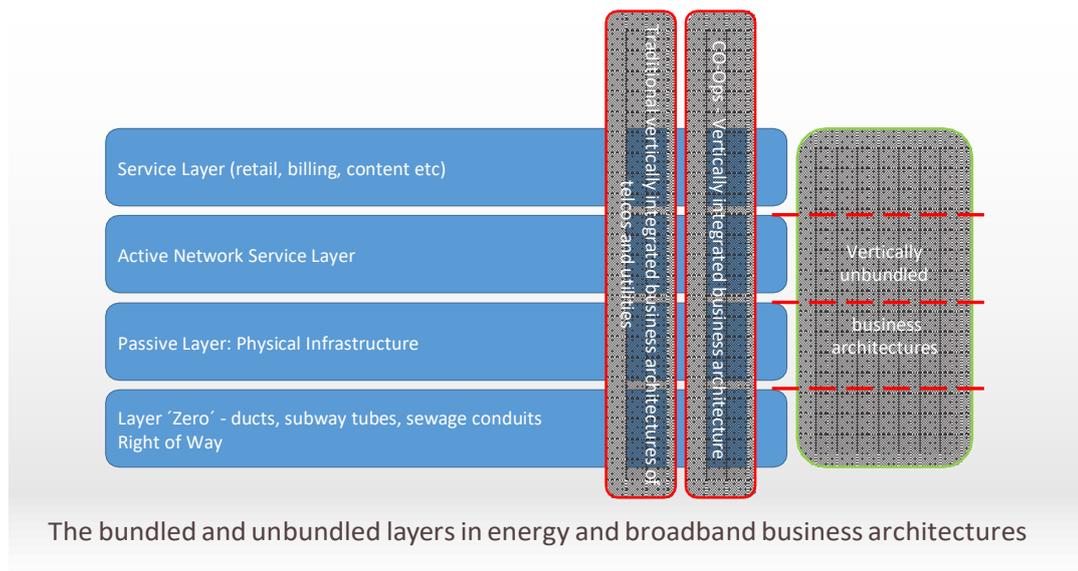
Smart City

- ▶ Other municipalities can enter the group
- ▶ Eventual new entries can join at the same conditions

### *Business Architectures*

As relevant as ecosystem, partner and procurement models is a number of strategic business architecture considerations. For all mobility, smart grid and overarching smart community related deployments, different levels of ‘vertical integration’ and ownership models exist. Two basic options exist that provide the two ends of a wider spectrum of choice. On the one hand one has the vertically integrated model, where a telco, a railway company or energy company owns and manages the entire value chain: railways, trains and services. Or fixed broadband networks, wireless networks and telco operations. On the other end of the spectrum is the unbundled model where different layers are ‘split up’ and regulated as such. For example, the rail infrastructure is owned by a different entity than the one running the actual train services. Or a fiber infrastructure is being owned by a utility or a public interest organization (a municipality for instance), providing a neutral playfield and a fair market for competing players using that same infrastructure. Traditionally, ports and airports are good examples: one airport is used by many competing airlines. One airline does not own the airport (which is essentially what telcos do: they vertically integrate & own platform infrastructure). As EV charging networks, next generation public transport and new layers of smart energy grids or the data that governs it all are serving a public interest, a strategic smart territory consideration is the degree to which private sector vertical integration is desirable or serves the purpose best. The future of data governance – a topic of debate

where it concerns mobility and energy – appears on the radar under this header: should a smart territory pursue a market neutral data utility to govern and manage all of the mobility and smart community related data?



### 11. Delivery Models

As an extension to the previous point: how will services get delivered? Should smart territory local governments own the assets that lead up to the service needed, or should it procure and/or regulate a service? Should a smart territory own an EV charging grid and contract providers on top of that, or should a smart territory procure a service with the winning company providing all of the assets?

### 12. Geography of Innovation

The concept of the Geography of Innovation was first coined by an American think-tank as it tried to analyze and understand where innovations happen best geographically, why and how that geography is shifting. The traditional Geography of Innovation may typically be a campus area or an industry district. Most effective smart community innovation hotspots have migrated to community centers, however: places where innovations, companies, local government and citizens connect. Whether that is wholly desirable depends on the question whether a particular innovation focused initiative has a so-called 'license to fail'. For example, if one is to conduct experiments with a new type of driverless bus with yet to be fully validated technology onboard, the experiment is best advised to avoid crowded community centers. If, however, social innovation, citizen engagement is the aim with a technology that has been proved, a community center may be the best location indeed. Such considerations ought to be central to the smart territory planning when it comes to its living labs, its pilots and demonstrators.

### *13. Culture of Innovation*

While this is a building block of deeper relevance when steering a larger smart community initiative, it is not unimportant when initiating and governing smart mobility and smart grid related innovations. How much does your organization stand in embrace of a culture of innovation? Does your organization accept failure as a viable outcome in the work at hand? Are resources being made available in the understanding the return of investment may not be achieved or very different outcomes than expected may end up being produced? How are our teams and leadership organized to sustain innovation goals?

### *14. Community Communications*

A smart territory community communications strategy is one of the prime instruments for ensuring that a community innovation exercise is an inclusive one. For everyone to be informed, participating, contributing, where and when relevant. What is striking, however, is how often communications fail at multiple levels. All too often inhabitants remain unaware of some 'smart community' program being under way in their community; some may only find out by traveling abroad, discovering that his or her city is considered "smart", a perception that simply may not exist all that much back home. Many citizens may continue living in their supposedly smart community in perfect oblivion of their community's 'smart' efforts for a long time to come. All too many projects occur in isolation and do not comprehensively include all stakeholders of relevance. And matters often turn to worse as passive uniformness edges into loudly communicated distrust among citizens and community push-back. A good communications strategy defined as part of a community digitization endeavour is more than a PR campaign. It is likely to involve multiple goals and stakeholders. For e-SMART to result in long-term sustainable achievements, awareness and citizen engagement are key. Among the instruments to be considered are:

- Public Town Hall Meetings
- Joint Iteration Meetings & Workshops
- Demonstrator programs (where citizens and other stakeholders get invited to experience the innovation in question)
- Hackathons
- Active smart territory social media use
- Living Labs that are open to the public
- Citizen Engagement: involving citizens in early monitoring of designs, PoCs and scaled deployments
- Citizen-as-a-sensor: solutions where citizens are an integral part of the chain (for example: a reporting app for public transport malfunctions/damage)

### *15. Good Design*

Good Design is a critical ingredient that should be part of the earliest consideration. The notion of good design applies to multiple layers: of course, user interfaces come to mind, or easy to use EV payment systems, for instance. But the principle of good design also applies to most other building blocks –

from vision to governance, to network architectures or delivery models. Bad design result in digital divides as well as the not so digital kind. The practical advice to smart territory stakeholders should be: apply design think methodologies to much of the smart territory work that is or will be undertaken – from early solution designs to PoCs and beyond. This typically means stakeholders commence with a desired social, economic, environmental or mobility related outcome and to reverse-engineer from that desired outcome what it will take from a technology, regulatory, governance, ecosystem and procurement point of view what it takes to get there.

### *16. Skills*

Here is a practical yet elementary question for all smart territory stakeholders: do you have the expertise within your team and/or organization to deliver on the smart territory tasks at hand? Have you allowed a scan to be conducted as to what gaps currently exist or are likely to emerge? How will you address those gaps? How much will you outsource and how critical do you consider some of those skills to be to not rely on outsourcing? For example, a mobility department in a given jurisdiction will get ever more work and responsibility that will involve advanced data analytics. Are you ready?

### *17. Proof of Value*

In many smart community projects, efforts focus on pilots and proof of concepts. E-SMART living labs, too, will do too. However, often pilots lack the DNA for scaling and replicability. Often PoCs get exercised successfully, proving out a design or technology, or merely building a demonstrator. Yet often we forget to obtain the most important lesson we hope to gain from such pilots: can we actually expect to derive the value from the solution or service we hope it will produce? Will it deliver on better mobility, a smart bus design that integrates easily into an existing bus fleet for instance? Often it is not a Proof of Concept we need, but a Proof of Value. For a Proof of Value to be successful, size often matters. To stick to the bus example: one smart bus will not teach you a lot how it will assimilate within an existing fleet of busses, but 20 may. The practical advice for smart territory stakeholders must be to define very clearly what learning goals are to be attained from a particular experiment, what value must be proven and, next, how to best ascertain that lesson can in fact be learned within the set-up of the living lab or pilot.

### *18. Smart Territory Ethics*

Consider the following questions in all smart territory project questions:

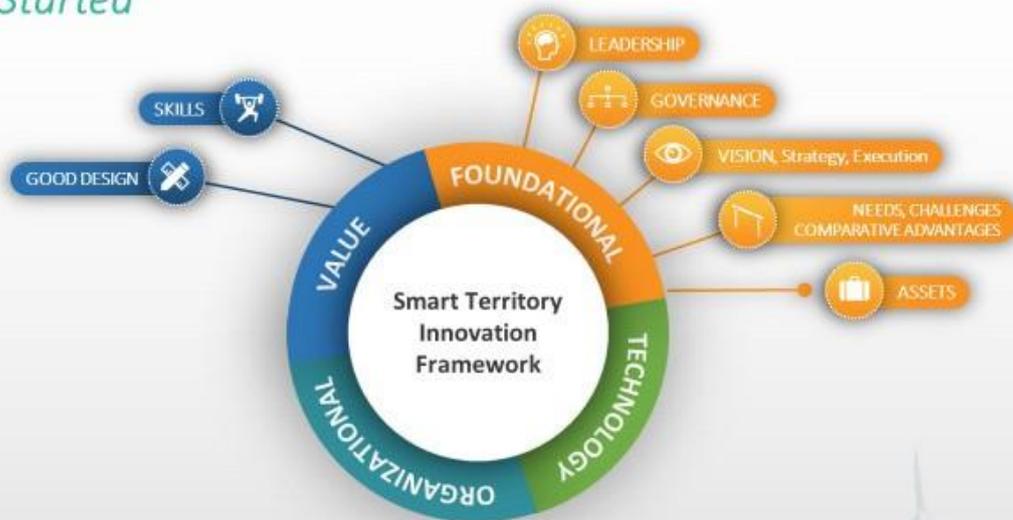
- Am I building the right solution or service for the right reason?
- Can it be abused now or in the future?
- Have I taken ethical considerations into my earliest solution designs?
- Is the solution or service I'm building an inclusive one?
- Do I or my peers/team understand the technologies involved?
- If data takes centerstage in my solution design, what will happen to that data beyond its prime use?

- Would I use or subject myself to the service or solution in question myself?
- Do I have a professional in my team that has been formally tasked with assessing ethical considerations on each part of the smart territory work?

**Where to commence?**

It is advised to commence smart territory engagements by addressing the foundational building blocks, as well as the components of ‘skills’ and ‘Proof of Value’. The Toolbox tied to this report (PowerPoint format) is being referred to: it includes the core questions tied to these building blocks to be addressed at a smart territory program leadership level.

**Smart Territory Phase One**  
*Getting Started*



**Appendix A: Definitions and clarification on terms and components of the Smart Territory Definition**

*Digitalization*

Digitalization should not be confused with digitization, although the terms often get applied interchangeably. *Digitization* concerns itself with the act of translating something from an analogue format into a digital one (i.e a library registry). *Digitalization*, on the other hand: addresses the core processes of our organizations and social and economic life by means of network design, digital technologies, and the organizational structures, values, rules and expectations they embody. Generally, the latter gets referred to throughout this report

### *Inclusion*

Inclusion has increasingly become a central premise of successful community digitalization and innovation approaches. Bad design results in the amplification of old divides and the creation of new ones. A central design question must therefore be: who or what is being left out within my current solution/architecture/policy framework design? Especially for public sector entities such questions are crucial. In the case of next generation mobility, this central premise of the definition results in questions like: is ‘everybody’ covered in our ‘last mile’ approaches? Is EV charging provisioning being planned in ways that can be considered fair, inclusive and affordable to ‘all’? Will our next generation freight transport approaches in our territory provide the same levels of access and ‘ease of transit’ in our territory as in other territories?

### *Mitigate the divisive impact digital change*

Community Innovation and Digitalization strategies may have negative (‘undesired’) impact. This can include the disappearance of old jobs, public distrust of new technologies proposed within public domains, new societal groups that can be considered disenfranchised. A smart territory strategy cannot be considered if:

- a. The strategy architects & policy makers have insufficiently researched the potential negative impact
- b. Measures have insufficiently been articulated to mitigate such negatives (i.e. on the job training, citizen counselling, providing social, economic and or fiscal support for those that are at risk of being excluded on economic grounds)

### *Beyond Efficiencies*

Territory Innovation and Digitalization Strategies can produce great efficiencies yet should not produce efficiencies alone. As territory policy maker must contemplate ‘system-wide’ challenges to include sustainable smart energy provisioning, air quality, societal aging, urbanization, as well as the plight to provide the foundation for an environment in which *sustainable sustainability* is achieved and continuous innovation is a must-have, efficiencies (‘doing things slightly better or slightly less bad’) will not suffice alone. It must consider doing things better *and differently*.

### *Digital and Non-Digital Innovations*

Not all innovations aimed at within a smart territory approach are necessarily digital. As the mayor of Florence stated in a 2018 conversation: “If the innovation I seek is analogue and gets the job done, then analogue it is.” Most innovations are likely to be digital, but digital is not necessarily the cornerstone of every solution we seek.

### *Interoperability*

Any sustainable, long term, vendor agnostic smart territory must forge an environment that is interoperable at any level of a technology, service and business architecture. This then includes:

- a. Network Architectures to include access technologies, data transmission, activation services of network infrastructures;
- b. Data, Data Platforms, APIs, Analytics tools, algorithms
- c. Vertical Point Solutions (ie Smart Parking, adaptive outdoor light etc)
- d. Non-digital infrastructure, energy infrastructure and street furniture
- e. Tools, Businesses, Services that run on the aforementioned infrastructures (i.e. EV taxi service, an EV charging provider, Mobility Data Analytics company).

Interoperability is the goal in domains that are subject to consistent innovation where technology standards may remain lacking. Interoperability can and must serve as a prerequisite within smart territory specific RFI, RFPs and PPPs. Interoperability must mean a longer term contractual understanding of the levels of openness and interoperability that is to be provided by a private sector infrastructure or service provider, and/or must mean a definition how a solution or service constitutes an 'plus & play' offering that can be replaced by a comparable, competing offering without putting the architecture at large at risk.

### *Ethics and Security*

Every Smart Territory strategy can only be considered smart, sustainable and effective if it comprises of a cyber security approach that is end to end, from Proof of Concept to mature, scaled deployments, and can be considered ethically sound within the boundaries of the implications of the strategy proposed in the here and now as well as in the foreseeable future.