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Sustainable Transformation Network

1

Client Logo/Name - hidden

Smart Infrastructure and Smart Cities
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2

Content



- What is a Smart City ?
 - Background – why Smart Cities?
 - Smart City Principles
 - Smart City Concepts
 - Basic Smart City development process
- Smart Infrastructure
 - Principles
 - Smart Technologies - IoT
 - Smart City Infrastructure Di
 - Urban planning
 - IT related Smart
 - Sensors
 - Smart
 - S
 - Sn
- Conclusion
- Q & A

Example – Example – Example

Smart City Principles



A Smart City...
is a concept for innovative urban development, enabling sustainable transfr

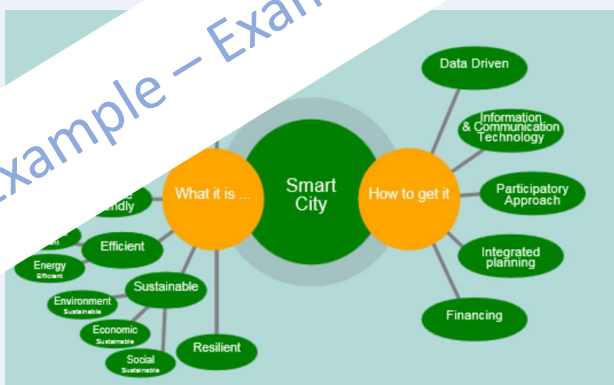
A Smart City...
is liveable, climate friendly and inclusive.

... it fosters innovation & quality of life.
... it is environmentally and economical
... it takes care for social equity and

... it makes extended use
gathering, infrastru
human wellbe

... it is energy-
increasingly pu
able energy.

Example – Example – Example



Smart City Concepts (2)



- Today, IT-centered Smart City Concepts are evolving, which frequently focus on digital content and services, ranging from
 - from simple e-service delivery,
 - to autonomous infrastructure monitoring and control,
 - to data collection for information integration and exchange,
 - sometimes enabling participatory decision making.
- Advanced IT-centered Smart City Concepts are also referred to as “information cities”, applying information and communication technologies (ICT) to urban planning and management.
- To do so, ICT provides large amounts of data, which are processed on data platforms, from where information is derived, analyzed, and causal relationships are identified. This information is then used to finally develop solutions for urban planning and management.
- The domains of Smart City Concepts include energy, transportation, mobility management, waste management, water management, and energy efficiency, to (e-)governance.



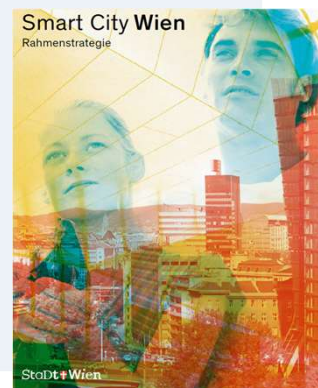
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Generic Smart City development process



- The process follows the “policy cycle” – a standard concept of policy making:
- Agenda setting - problem identification
 - Elaboration of a Smart City Strategy with a vision and objectives (usually set up as a participatory process through involvement of citizens)
 - Assessment of the current situation
 - Gap analysis between current state and desired state
 - Elaboration of possible future development scenarios
 - Policy Definition / Commitment
 - Urban Infrastructure renewal
 - Infrastructure concept development
 - Concept development
 - Cost benefit analysis
 - Extension
 - Infrastructure implementation
 - Impact monitoring

Example – Example – Example



Smart Infrastructure



- Principles
- Smart Technologies - IoT
- Smart City Infrastructure Dimensions
 - Urban planning
 - IT related Smart City technologies
 - Sensors and information networks
 - Monitoring of natural environments
 - Infrastructure maintenance monitoring
 - Crime and disaster prevention
 - e-governance
 - Smart Mobility
 - transportation
 - traffic control
 - Smart Grids
 - Smart Buildings
 - Smart Factories
- Summary
- Q & A

Example – Example – Example

Smart City Infrastructure Dimensions



Sustainable Urban planning: Allocating built environment

ICT

Smart Grids, renewable energy generation

Optimised industrial processes

Smart Buildings

Smart Security and safety /

Example – Example – Example

IT-Related Smart City technologies



- Public information networks
 - Environmental monitoring and control networks,
 - Safety and security networks
 - e-governance
- Smart infrastructure - monitoring and management
 - Smart grid systems, supporting demand side management and demand
 - Further resource management networks for energy, water, resources and adapt to infrastructure states
- Smart mobility
 - Smart transportation
 - Traffic control
 - Transportation information
- Smart energy supply
 - Smart Grid
 - Renewable energy
- Smart building
 - Monitoring and control of internal processes increasing human comfort and safety
 - Energy efficiency, control & improvement, demand side management

Example – Example – Example

Smart Mobility and transportation infrastructure (1)



- Smart Mobility – spatial organization and interrelation of transport modes (often in combination with urban planning concepts promoting reduced car use, Superblocks)
 - to reduce travel time
 - to foster reduction of motorized individual travelling,
 - to provide convenient trip organization with appropriate infrastructure (see next page)
- Smart traffic management and transportation
 - Traffic management and control
 - carried out through sensor networks, data processing, and control systems, to better distribute traffic increasing travel speed and reducing traffic load
 - Smart transportation
 - establishing a multi-modal transport network and provide all modes of transport
 - ensuring efficient use of bus-, tram and metro lines load
 - adapting infrastructure depending on passenger load along the transportation lines.
 - providing real-time information, trip planning and ticketing for easy change between traffic modes

Example – Example – Example

Smart Mobility and transportation infrastructure(2)



- Smart transportation technologies combines internet, wireless technologies and other smart technologies to improve urban travel efficiency and travel comfort
- There exist numerous applications of technologies related to smart transportation, applied in various smart transportation systems
- Exemplary technologies for smart transportation, applied in various smart transportation systems
 - Mobility-as-a-Service (MaaS) solutions, is a new approach to urban mobility, combining all transportation modes (featuring timetables, booking, ride-sharing, instant payment, etc.) into a single platform, suggesting different route options).
 - Connected Cars technologies apply vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, sharing location and speed data for congestion monitoring and traffic control.
 - Autonomous Vehicles operation requires advanced sensors and AI, its application is in an initial phase.
 - Car Navigation require location services and real-time traffic data, enabling to monitor car movement.
 - General traffic load monitoring uses sensors and data analysis to monitor car location detection or V2I communication.
 - Traffic signal control uses sensors and data analysis to optimize traffic flow.
 - Speed limit enforcement uses sensors, cameras etc.
 - Electronic toll collection systems make use of automatic number plate recognition.

Example – Example – Example

Summary: Smart Cities and Smart Infrastructure



- Smart Cities and Smart Infrastructure technologies deal all with improving urban infrastructure and services
- It is important to set up an integrated strategy to implement a set of smart technologies to establish a Smart City.
 - Smart urban planning is essential as initial step to establish appropriate distribution of land uses, functions and transportation networks. This serves as physical infrastructure where smart technologies are embedded.
- Relevant topics referring to Smart Infrastructure are:
 - Provision of transparent information on the state of infrastructure for monitoring, control and adapt where it is necessary.
 - Sufficient information provision of the city's infrastructure status and performance allows for citizen participation in decision making and resource allocation.
 - Convenient mobility services: smart traffic management, intelligent road traffic, traffic jams, reduce travel time
 - Energy efficiency: smart energy management, smart grids, smart buildings, together with Smart Grids, trigger GHG reduction.
 - Smart Buildings: smart building management, smart energy management, smart buildings, together with Smart Grids, trigger GHG reduction.
 - Smart Buildings: smart building management, smart energy management, smart buildings, together with Smart Grids, trigger GHG reduction.
 - Measure evaluation: smart infrastructure management, smart infrastructure management, smart infrastructure management, together with Smart Grids, trigger GHG reduction.

Example – Example – Example

