Agenda

1. Smart City Programs
2. Intelligent Infrastructure
3. Success factors for Smart City Programs
At Siemens we lead the way towards more intelligent and efficient infrastructures

We are the **powerhouse for infrastructure automation** and lead you to more intelligent and efficient infrastructures

**The 4 stages of Infrastructure development**

1.0  
Brick and steel infrastructure

2.0  
Semi automated infrastructures

3.0  
Intelligent Infrastructures

4.0  
Fully integrated and intelligent Infrastructures
Smart City programs need a clear target, performance indicators and cross-domain integration

<table>
<thead>
<tr>
<th>Phase</th>
<th>Awareness &amp; Visioning</th>
<th>Individual Projects</th>
<th>Holistic Smart City Programs</th>
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</table>
| Description | • Rising awareness about the topic  
• First ideas about potential outlook for own city  
• Information gathering and learning from others | • Start of first isolated projects in different areas  
• Projects not connected to overarching strategy  
• No cross-domain integration | • Comprehensive strategy across different domains  
• Target setting, benchmarking and performance controlling  
• Implementation of measures according to strategy |

Integration of vision and projects into strategy key success factor
A city can be defined as ‘smart’ when social capital, traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life

(Adapted from Caragliu et al. 2009)

- **Smart Living**: e.g. e-Health, public safety, intermodal transport
- **Smart Environment**: e.g. Sustainable buildings, water management
- **Smart Government**: e.g. e-government services, open data, transparency, resilience
- **Smart Economy**: e.g. High-tech industry, ease of doing business, innovation culture
- **Smart Mobility**: e.g. Emission free transport, advanced parking, accessibility
- **Smart Society**: e.g. agile civil society, social inclusion, e-learning
Singapore developed a cross-domain sustainability strategy, covering major infrastructure areas

**Singapore Resource Profiling Study**

- Identification of energy efficiency potentials in Transport, Information Technology and Buildings
- Impact analyses of new technologies which drive the agenda of City Authorities and roadmap for implementation
- Evaluation of e.g. 36 transport levers to identify CO₂ reduction potential
- Test-bed concepts for pilot projects
Smart Cities aim to increase efficiency via cross-domain collaboration and new partnerships

Many cities started Smart City Programs...

**Santander**
More than 12,000 sensors to help the government operate as efficiently as possible

**Barcelona**
Working to merge urban planning, ecology, and information technology to improve the lives of citizens

**Amsterdam**
Aims to become one of the most sustainable cities by 2040 with help of a unique partnership called Amsterdam Smart City (ASC).

...from which others can learn

- Focus on comprehensive strategy across infrastructure areas and domains
- Implementation of IT and smart technologies as enablers for new services
- Stakeholder involvement and strong partnerships beyond “traditional” networks
- End-user orientation of measures and services
- Positive impact on sustainability, quality of life and competitiveness of cities
Siemens is supporting the development of the Smart City project Aspern in Vienna (Austria)

**Facts and figures**
- Target: Multifunctional urban space for 20,000 inhabitants and 20,000 jobs
- Development period: 20 years
- Planning area: 240 ha
- Net construction area: 100 ha

**Challenges**
- Build a Smart City quarter as a worldwide flagship project for energy efficiency and quality of life and to showcase Vienna as one of the smartest and greenest cities in the world

**Smart solutions**
- Active smart grid management
- Electro mobility in the Smart City
- Building energy management systems including decentralized generation and storage
- Self-sufficient energy supply
- Smart public street lighting
- Infrastructure monitoring

**Customer benefits**
- Platform to extend the tested smart quarter technology city (Vienna) and Europe wide
- Sustainable economic growth initiated by smart solutions and high quality of life
Siemens is also supporting the Smart Dubai program of H.H. Sheikh Mohammed

Smart City Vision for Dubai

"Smart City's main aim is to provide better connections and increase cooperation between the emirate and its residents. It promotes the use of government facilities using the largest possible number of smart applications."

H.H. Sheikh Mohammed Bin Rashid Al Maktoum

Strategic direction

- **Transforming Dubai into the smartest city in the world** in the upcoming three years
- **Change peoples' live for the better** through high quality services delivered via ICT, smart applications and underlying intelligent infrastructures
- **More than 1,000 high quality services within strategic pillars**
  - 1. Smart Living
  - 2. Smart Mobility
  - 3. Smart Society/People
  - 4. Smart Economy
  - 5. Smart Governance
  - 6. Smart Environment
- **Implementation via Smart Dubai Program Management Office**, governmental agencies, pilot districts and collaboration with private sector
Our understanding of the Smart City challenge – Smart Services based on Intelligent Infrastructures

Strategy

Efficiency

Competitiveness

Quality of life

Ease of doing business

Opex/Capex reduction

Benefits and cost of service

Smart Applications

Smart Living

Smart Society

Smart Governance

Smart Mobility

Smart Economy

Smart Environment

Physical systems and processes

Data/information

Delivery and Operations Models

Intelligent Infrastructures

Buildings

Transp.

Utilities

Security

ICT

Automation & Control

Connectivity

Connectivity

Buildings

Transp.

Utilities

Security

ICT

Automation & Control

Physical systems and processes

Data/information

Delivery and Operations Models
Intelligent Buildings are able to operate efficiently and adjust automatically to changing conditions.
Integrated Mobility Platform supports seamless travel across different transport modes

Integrated mobility platform

- Concept for integration of passenger transport services (Intercity and Urban Rail, Bus, Taxi, Car Sharing etc.) incl. target groups, travel behavior/buying patterns
- Design of IT solution architecture incl. core functions, client and partner interfaces, and (IT) service descriptions
- Business Case and impact evaluation incl. user and revenue potentials, deployment costs, business and financing models
- Implementation roadmap incl. recommendations for IT systems integration
Example of "Smart Parking and Smart Lighting" for evaluation of cross-domain OT & IT interdependencies

1. Individual infrastructure for Lighting & Parking
   - Separate infrastructures for Lighting and Parking
   - Individual communication network, power supply, etc. and operation and maintenance models

2. Integrated Lighting & Parking solution
   - Integration of sensors for advanced parking solutions in street lighting infrastructure
   - Use of complementary infrastructure

3. Sensor network for Smart City apps
   - Lighting pole as multi-purpose sensor network for multiple Apps: Lighting, Parking, Traffic, Security, WIFI, ...

TODAY

TOMORROW

NEAR FUTURE
Our lessons learned for successful Smart City Programs

- Commitment from the top and clearly defined target
- Integrated program management across organizational boundaries
- Stakeholder integration and focus on citizens
- Technological concepts combining IT and OT
- Clear cost-benefit-analysis including non-monetized aspects
- New collaboration models and partnerships