Machina Research

Smart Cities

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Machina Research: a specialist research/ consulting firm focused on M2M

Sector/Market/Demand side

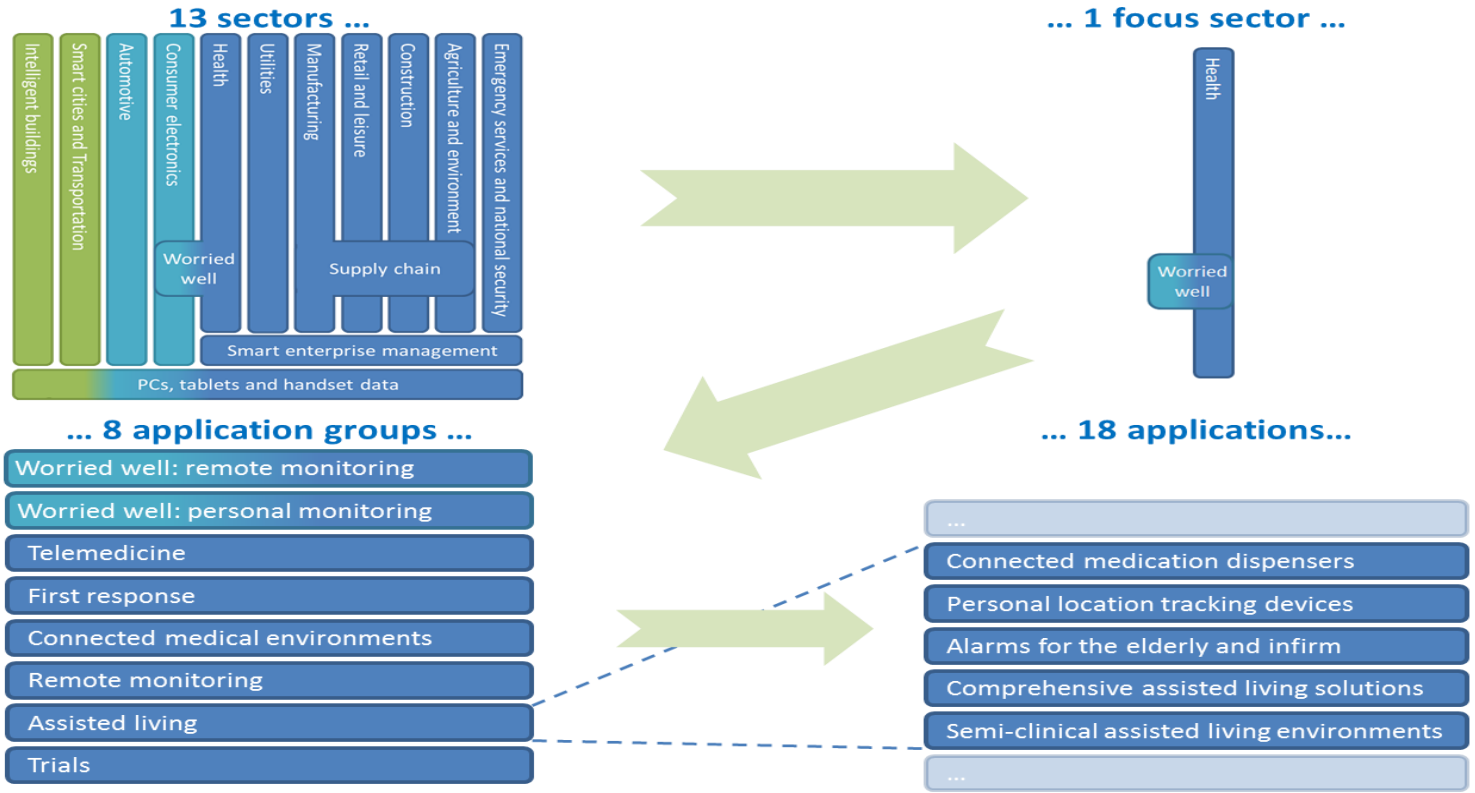
- **Quantifying the opportunity for M2M**
  - **Forecast Database** providing 10 year forecasts across 54 countries for 60 application groups
  - Detailed **Sector Reports** focusing on specific sectors (e.g. Automotive, Healthcare)

Supply/Provider side

- **Best practice and key success factors**
  - Qualitative analysis in **Research Notes** of major issues such as security, platforms/software
  - Other Strategy Reports such as **CSP Benchmarking**
  - **Quarterly Module Shipment Tracker**

M2M Leaderboard

Machina Research approach

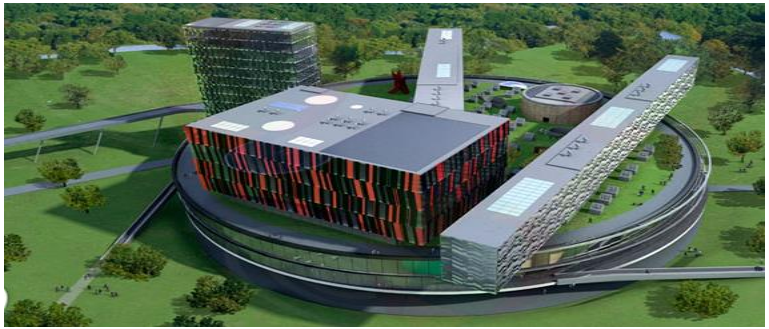


Drivers for the smart city

- Urbanisation: >50% of the world's population now lives in cities
- Relieving pressure on finite resources and capacity
- Reducing costs, particularly in a time of economic woe
- The green agenda – driving energy efficiency
- Pervasive mobile broadband networks
- Government push (including stimulus plans)

What is a smart city? A grand project?

Songdo, South Korea



Skolkovo, Russia

PlanIT Valley, Portugal

A smart city as a process

- **London Borough of Greenwich**
  - Emphasise the “human perspective”
  - First-follower strategy
  - Identify best practice and avoid reinventing the wheel
  - Focus on communicating benefits and building consensus
- **A*STAR in Singapore**
  - Historical focus on technology and investment to enable dense urban living
  - A platform for the city
  - Plans to export, at least regionally

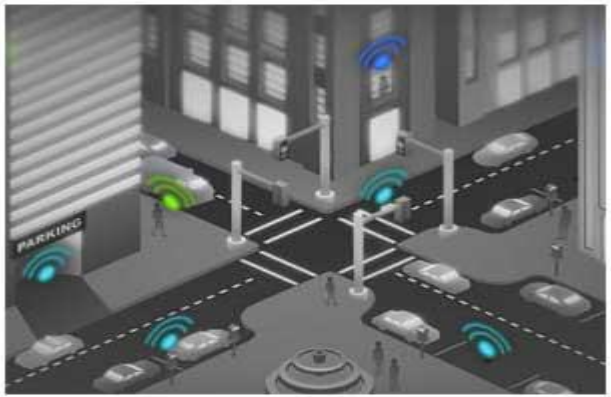
A smart city by accident: Lahore, Pakistan

- **Problems with dengue fever**
  - Foggers poison some areas too much, neglect some poor areas
  - Some foggers sell their insecticide, or demand bribes
- **1500 city workers equipped with smart phones**
  - Before and after photos, geo-tagged, uploaded, made public
  - Presence of larvae recorded
- **Improved targeting, improved monitoring of workers**
- **Solution now being applied to veterinarians, whose farmer clients may be phoned to check quality of service**
- **Plans to extend to make random calls to users of public services**

The reality is that short term volumes will be driven by point solutions

DSA,
D-Bahn

CCTV



Siemens
Streetline

Major Smart Cities applications

- **Digital signage**
  - High bandwidth
  - Little vertical-specific value add
  - High ARPU – can be USD100-150

- **CCTV**
  - Increasingly surveilled society – one public CCTV camera for every 300 population in UK
  - High bandwidth application
  - Potentially high ARPU

Major Smart Cities applications

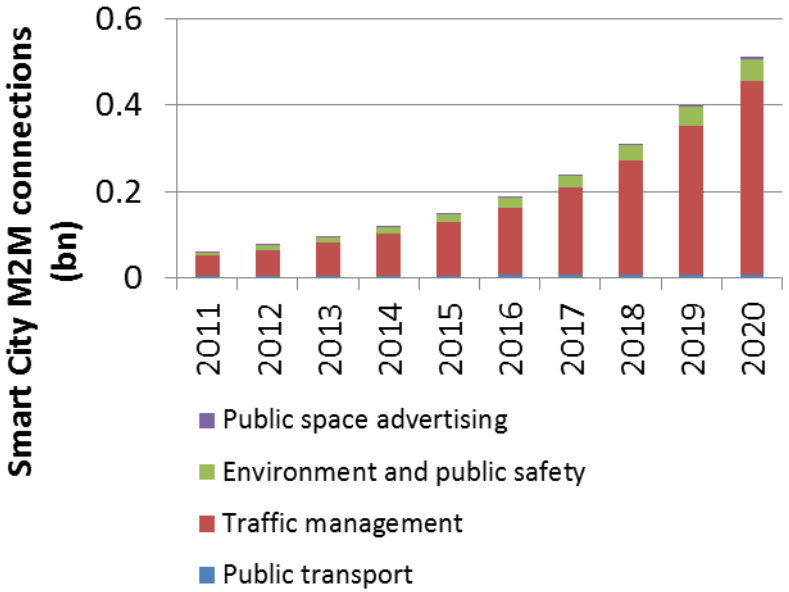
- **Traffic management**
  - Will make frequent use of non-cellular technologies
  - Requires heavy systems integration
  - Less appealing for MNOs

- **Public transport**
  - Highly mobile
  - Typically deep systems integration
  - Low ARPU
  - Significant end user benefits

The Smart City M2M opportunity

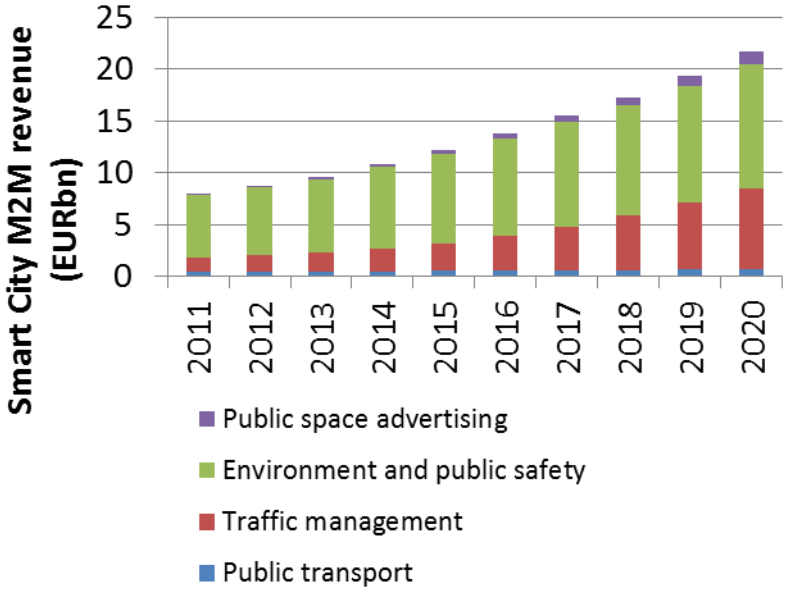
Smart City M2M Connections 2011-20

Source: Machina Research Forecast Database, 2012



Smart City M2M Revenues 2011-20

Source: Machina Research Forecast Database, 2012



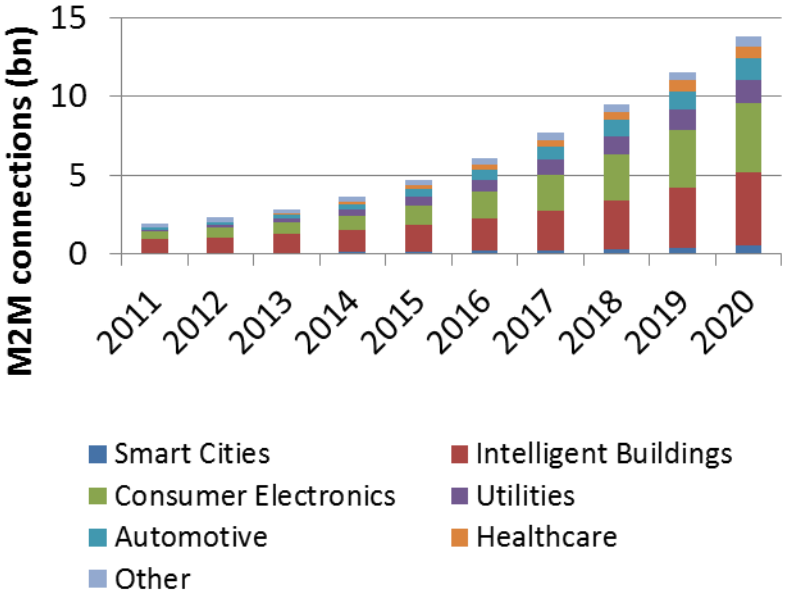
However, virtually all aspects of M2M are about providing the ‘smart city’

- **Urban environment:**
  - Public transport
  - Traffic management
  - Environment & public safety
  - Digital signage
- **The wider smart city**
  - Utilities: smart meters, smart grid, electric vehicle charging
  - Connected cars – interaction between vehicle and environment
  - Healthcare: connected living solutions
  - Intelligent buildings: building automation etc.
  - Supply chain
  - Retail

The wider M2M opportunity related to urban living

M2M Connections 2011-20

Source: Machina Research Forecast Database, 2012



M2M Revenues 2011-20

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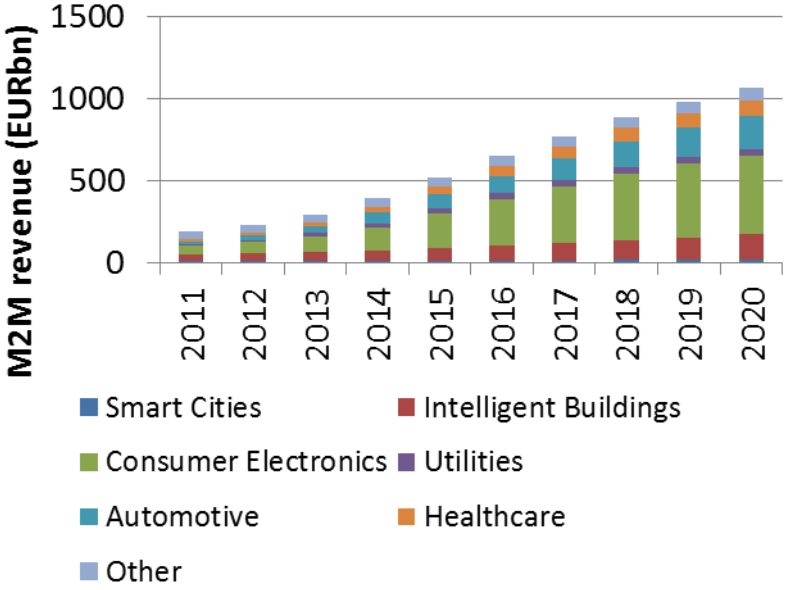

Conclusions

- M2M connectivity will drive efficiencies and improve urban living in many ways
- The top-down ‘Smart City’ is a rare occurrence
- Retrospectively stitching applications together in a meaningful way is challenging – lots of fragmentation
- Network effects abound – the value of connecting devices increases with the number and range of devices that are connected
- Truly smart cities may be a consequence of the IoT

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