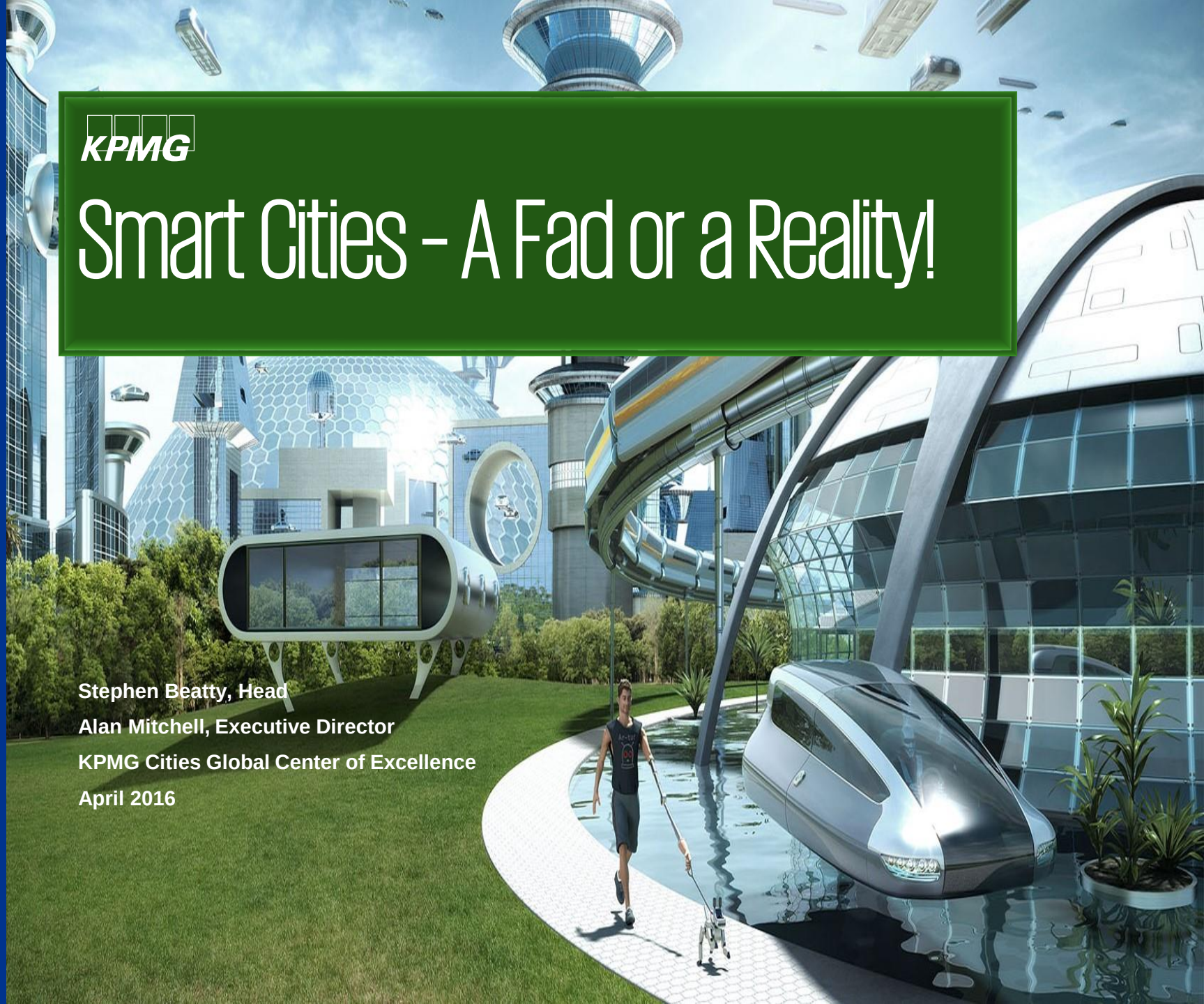

KPMG

Smart Cities – A Fad or a Reality!

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Agenda

1. **Images of Smart Cities – Is it all about Information Technology**
2. **Smart City Questions to Ponder**
3. **Smart City Definition – Improved Quality of Life?**
4. **City Programs to Consider**
5. **Matching Smart City Innovations to Services!**
6. **Where have investments gone right and wrong?**
7. **Developing a sound Business Case for Smart City Investments**
8. **What do Cities do about really disruptive Smart City solutions?**
9. **Lessons learned**

Images of Smart Cities

Sophisticated Information and Communication Technology Environments

Omnipresent Security Cameras

Singapore's Gardens by the Bay

Dedicated Bicycle Lanes

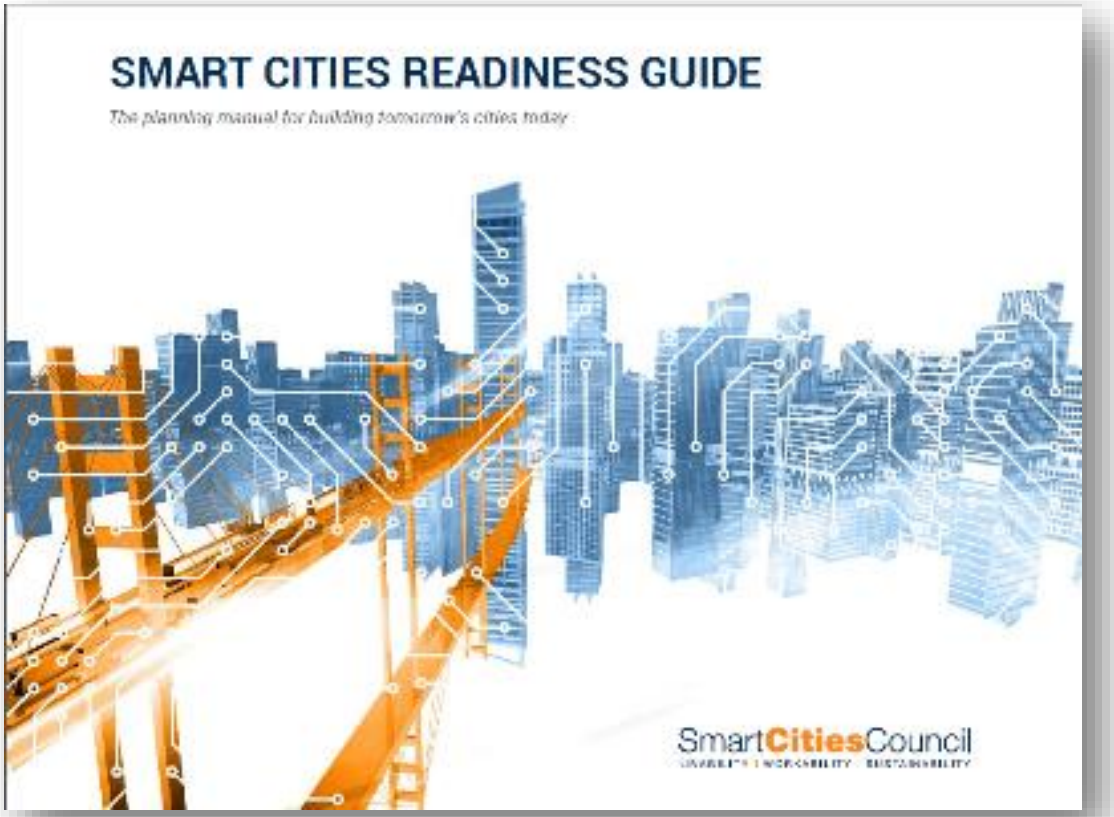
Smart City Questions to Ponder

- ✓ **A City is 'smart' in whose mind?** In the mind of city administrators? City residents, businesses and visitors?
- ✓ **Who determines 'smartness'?** Ourselves? Peers? Public?
- ✓ **Why is being 'smart' something to strive for?** Economic development? Customer satisfaction?
- ✓ **Does a 'smart' innovation have to involve information and communication technology?** Can it involve smart thinking? Can it involve streamlined service delivery?
- ✓ **When is a 'smart' innovation not 'smart'?** When it costs too much? When the objectives are not achieved? When it violates privacy / security regulations / controls?
- ✓ **Does a City have to implement all 'smart' innovations?** Can a 'smart' city innovation be provided by someone outside of the city administration?

Smart Cities Council's Definition of Smart City

A smart city uses information and communications technology (ICT) to enhance its livability, workability and sustainability. In simplest terms, there are three parts to that job: collecting, communicating and "crunching." First, a smart city *collects* information about itself through sensors, other devices and existing systems. Next, it *communicates* that data using wired or wireless networks. Third, it *"crunches"* (analyzes) that data to understand what's happening now and what's likely to happen next.

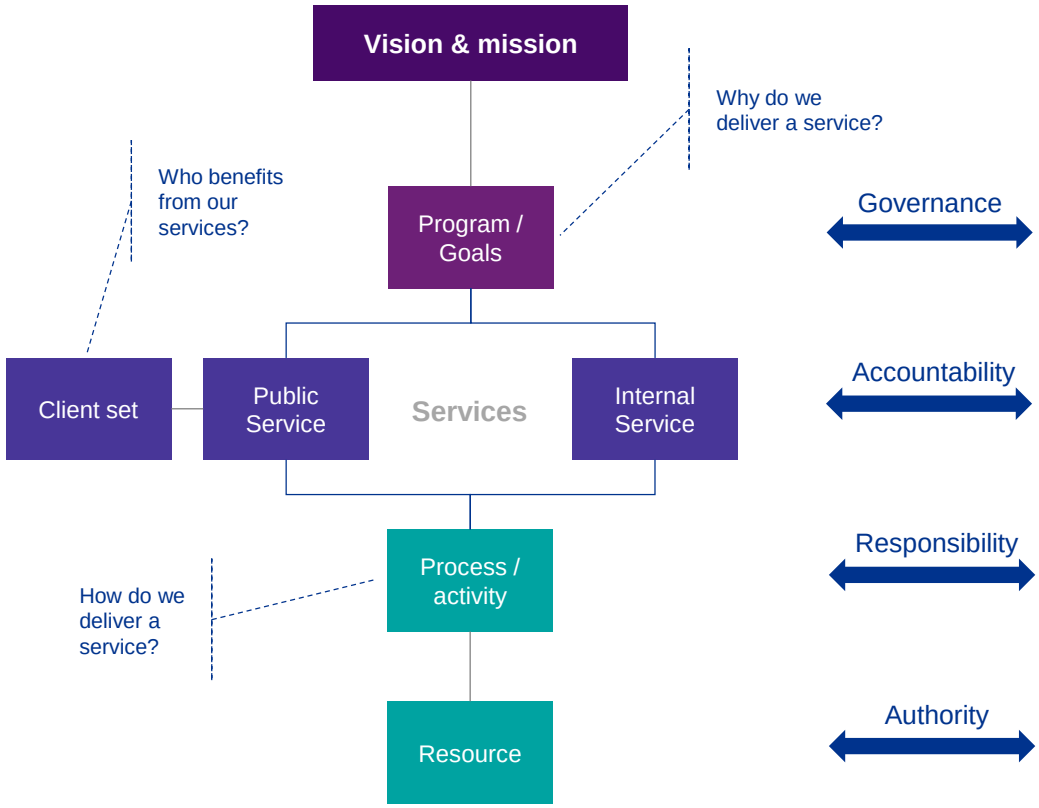
The strength in this definition is embodied in the phrase "**enhance its livability, workability and sustainability**".



City Programs address Livability, Workability and Sustainability

City innovation practices are service-based, rather than organization-based

1 Service model



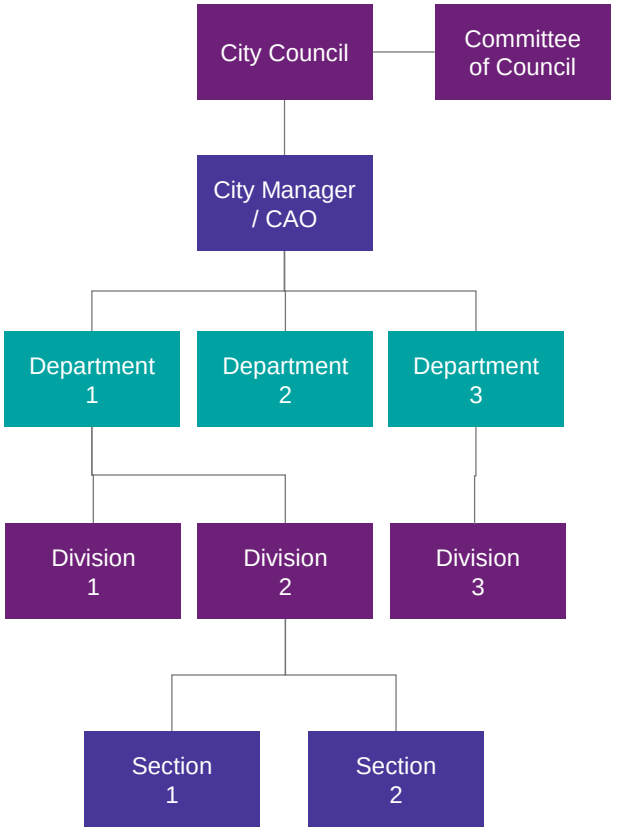
Governance

Accountability

Responsibility

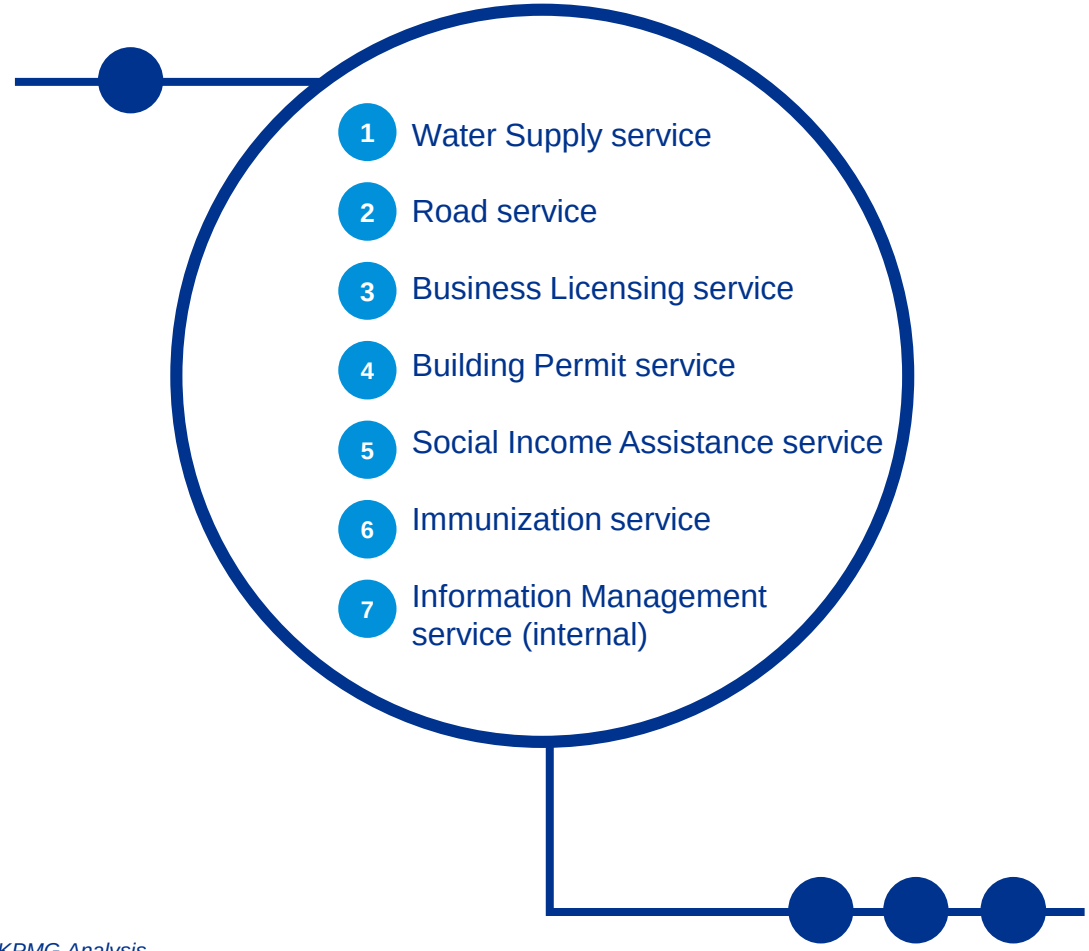
Authority

1 Organizational model



Source: open data, KPMG Analysis

Common services we expect to be provided



Comments

- The service based approach seems to be the only practical approach to determining what smart city innovations should be pursued
- Linking smart city innovations to services can transition a city's understanding of what a smart city might look like!
- What then are the smart city innovations?

Source: KPMG Analysis

Smart City Innovations - Taking the Mystery out of the Concept

Smart City Innovation
Intelligent Transportation System
Automated Traffic Signalization System
Bike Share
Parking Space Finder (ParkMe)
Pay-by-Phone Parking
Parking Guidance System (Available Parking Space Counter)
Smart Guide, Smart Eye, …
Real Time Tracking of Transit Vehicles
GPS Fleet Tracking Software
Automated Meter Reading
Proactive Maintenance Management
Smart Sensor (Instrumentation) plus Smart Valves (Control) for Sewer Backup and Overflows
Proactive Maintenance Management
Mobile Graffiti Complaint System
Mobile Inspector
Smart Lighting
Proactive Policing
Mobile Crime Reporting
Online Crime Reporting
Crime Reporting Mobile Apps
Automated Vacuum Collection
Waste Bin Tracking System
Wireless fill-level sensors at recycling drop off locations
Event Permitting Solution
Living Lab
Remote Controlled Irrigation
Remote Controlled Ornamental Fountains

Cross-reference of smart practices to city services

Service	Current ICT Investment	Best Practice Opportunity
Water Supply	Smart Meter Reading Water Maintenance Management System	Water Billing with Consumption Profile
Road	Road Maintenance Management System	Intelligent Transportation System
Business Licensing	Business Licensing System with Electronic Application Capability	End-to-end electronic service delivery (starting with renewal)
Building Permit	Building Permit System with Electronic Application Submission and Status Monitoring	End-to-end electronic service delivery with electronic inspection request and mobile inspection reports (on site)
Social Income Assistance	Social Assistance Application System	Electronic Payment Card
Immunization	Electronic notification of school aged children	Electronic Health Record
Information Management Service	Open Data Portal	Master Data Management (Clients, Properties, Accounts, etc.)

Source: open data, KPMG Analysis

Each Smart City Innovation can be evaluated as to their Potential Value / Savings

Practice	Description	City's budget for service	Savings potential	Savings potential, USD
Automated Meter Reading for Water Supply Service	The technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (gas, electric) and transferring that data to a central database for billing, troubleshooting, and analyzing	USD 40m*	3-5%*	~ 1.6m
Smart Sensors and Valves for Sewer Backup and Overflows for Wastewater Collection & Treatment Service	The technology relies on wireless sensors installed under manhole covers to monitor water levels in sewer pipes. The system consists of 115 sensors that communicate live updates every five minutes wirelessly to a central control center. «Smart» valves can be opened or closed to redirect flow into pipes where capacity is available	USD 60m*	2-3%*	~ 1.5m
Remote Controlled Irrigation for Park Service	An irrigation controller can use local weather stations and forecasts to automatically adjust the watering times of your irrigation zones based on your local weather conditions.	USD 5m*	1%*	~ 50k

Note: cost / savings are provided for illustrative purposes only

Source: KPMG Analysis

Where have investments gone right and wrong?

Consider for a moment the following Smart City innovations!

- In one City they can now monitor the location of every garbage truck … in real time!

  Why? Was it for monitoring the location of the truck or the driver? What do they do with this app tomorrow?

- In another City they have a very sophisticated weather monitoring and prediction modelling tool that can forecast storm surges to warn residents about pending floods!

  So let me get this right … you monitor the weather and predict storms … then presumably you notify folks when the storm is going to hit … to avoid them being swept away by the flooding … right? With the money to make this smart innovation work, why not address the flooding by building better storm water drainage?

- Consider the goal of reducing water consumption by introducing automated meter reading so that residents can change their behavior!

  Knowing how much water I consume and when will not change my behavior! Knowing what I use the water for within my household may change my behavior.

- Faced with the question of whether to charge for “On-Street Parking”, one City canvassed the public using social media. To their surprise the resounding response was “yes”! They then implemented a smart mobile app that allows drivers to record their location on the street with the GPS device and then to record when they began and ended their parking stay!

  Roadway congestion has reduced considerably and the public are happy that they are not boxed in by other cars that are double / triple parked!

So far Smart City Innovations seem manageable … but …

Beware of Smart City Innovations that are truly disruptive, such as:

- ✓ **Autonomous Vehicles –** at first this seems to be nothing more than another vehicle choice but consider for a moment if a City had Autonomous Vehicles available on demand, then:
  - ❖ Why would you need parking?
  - ❖ Why would you need to own a car?
  - ❖ What would happen to the taxi industry?
  - ❖ What spin off employment impacts will this have?

- ✓ **Internet of Things (IoT) –** linking everything to everything seems weird but now I can control my home thermostat, my refrigerator, my home security system from my mobile phone, so what is next?

- ✓ **Drone Technology** – a colleague in Germany asked me what I thought about Amazon's idea to deliver packages in Germany using drones – at first I waved it off, then I stopped and started to realize a whole new set of City services:
  - ❖ Regulations governing what can be shipped by drones and with what weight restrictions?
  - ❖ Three-dimensional drone routes designed and controlled by the Transport Department?
  - ❖ Building design guidelines to deal with drone shipments …

Smart City Lessons Learned

- ✓ **A Smart City is for you to define!** Many cities are using the phrase “smarter city” where smarter can be translated into more efficient, more effective and/or better quality service!

- ✓ **Your Customers are a Target Audience!** Don’t forget to engage your customers in the dialogue … perhaps through town halls, stakeholder engagement forums, etc.

- ✓ **Other Stakeholders include Universities / Colleges** – Some great thought leadership is coming out of educational institutions … best to engage them as soon as possible! Include them as partners

- ✓ **Don’t discount the Smart City Innovations as a fad!** A new era of transformation is upon us and may have a more profound impact than the introduction of the telephone, the car and computers combined.

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