Smart Cities

Harnessing the Power of IoT, Big Data, Open Data, Open-Service Innovation Models

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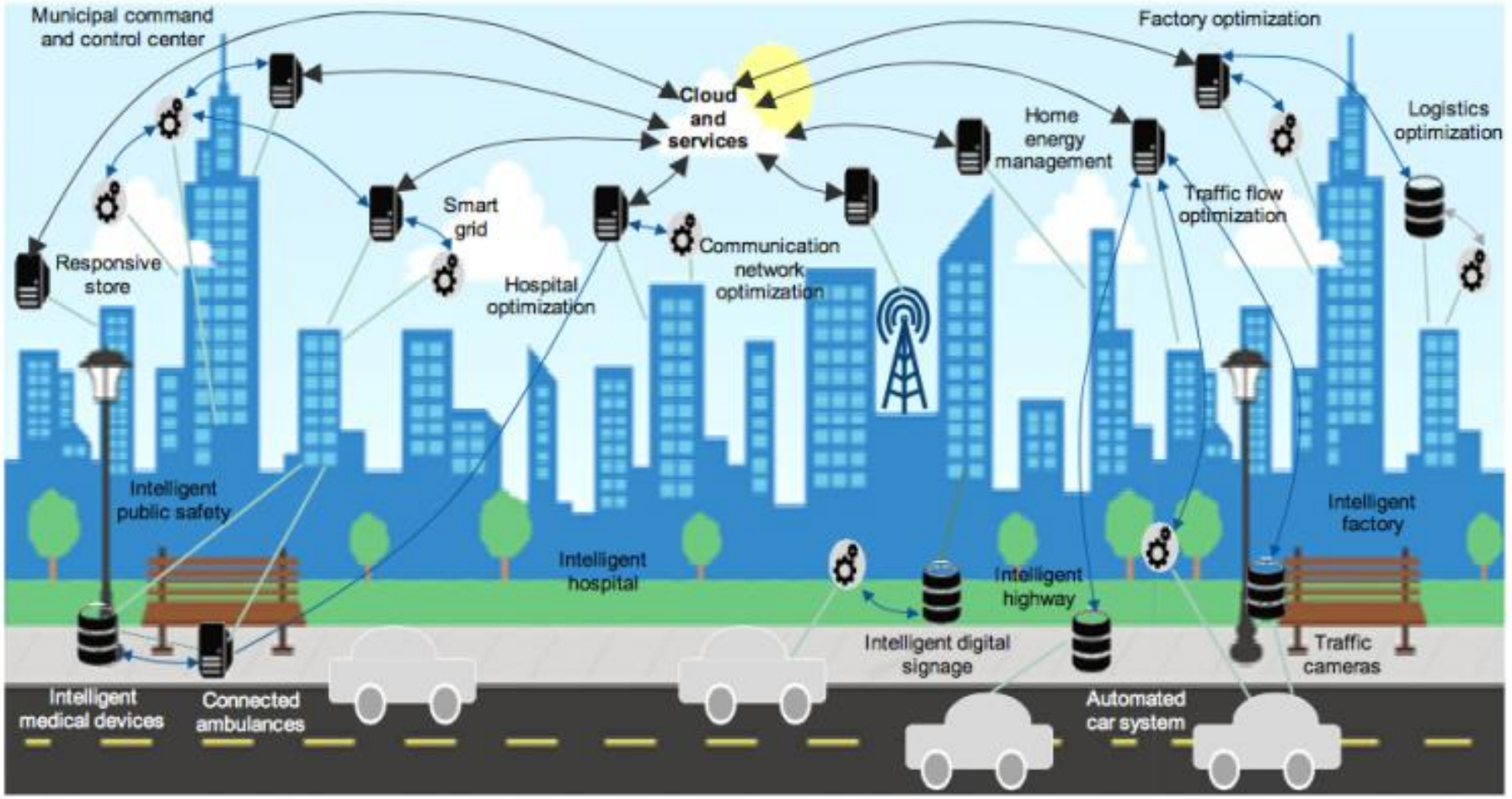
30 March 2017

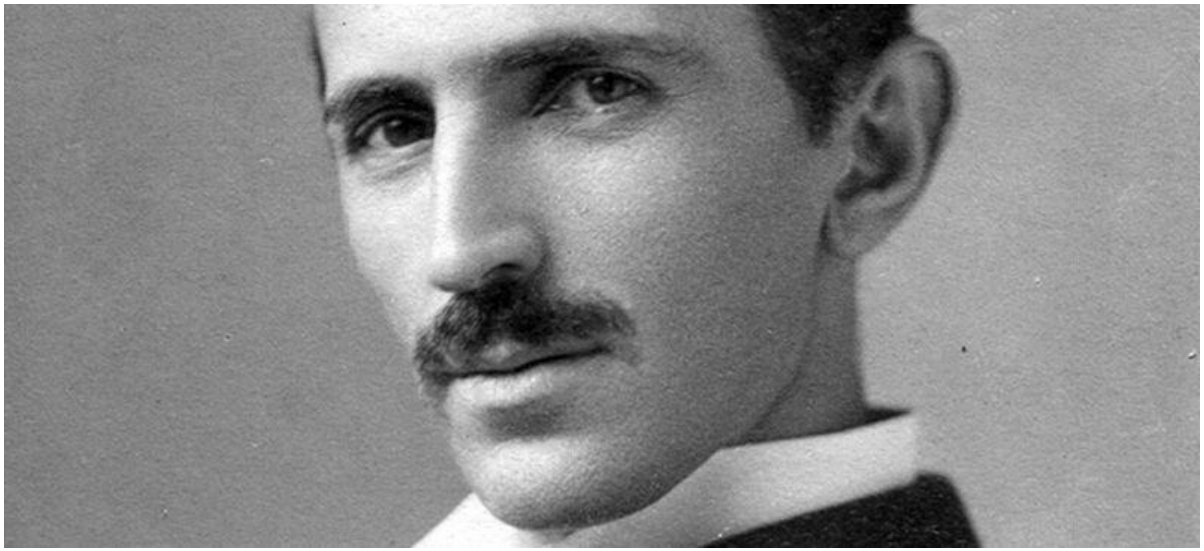
Optimal Solution



IDC Government Insights, 2013

IoT Predicted 90 Years Ago !

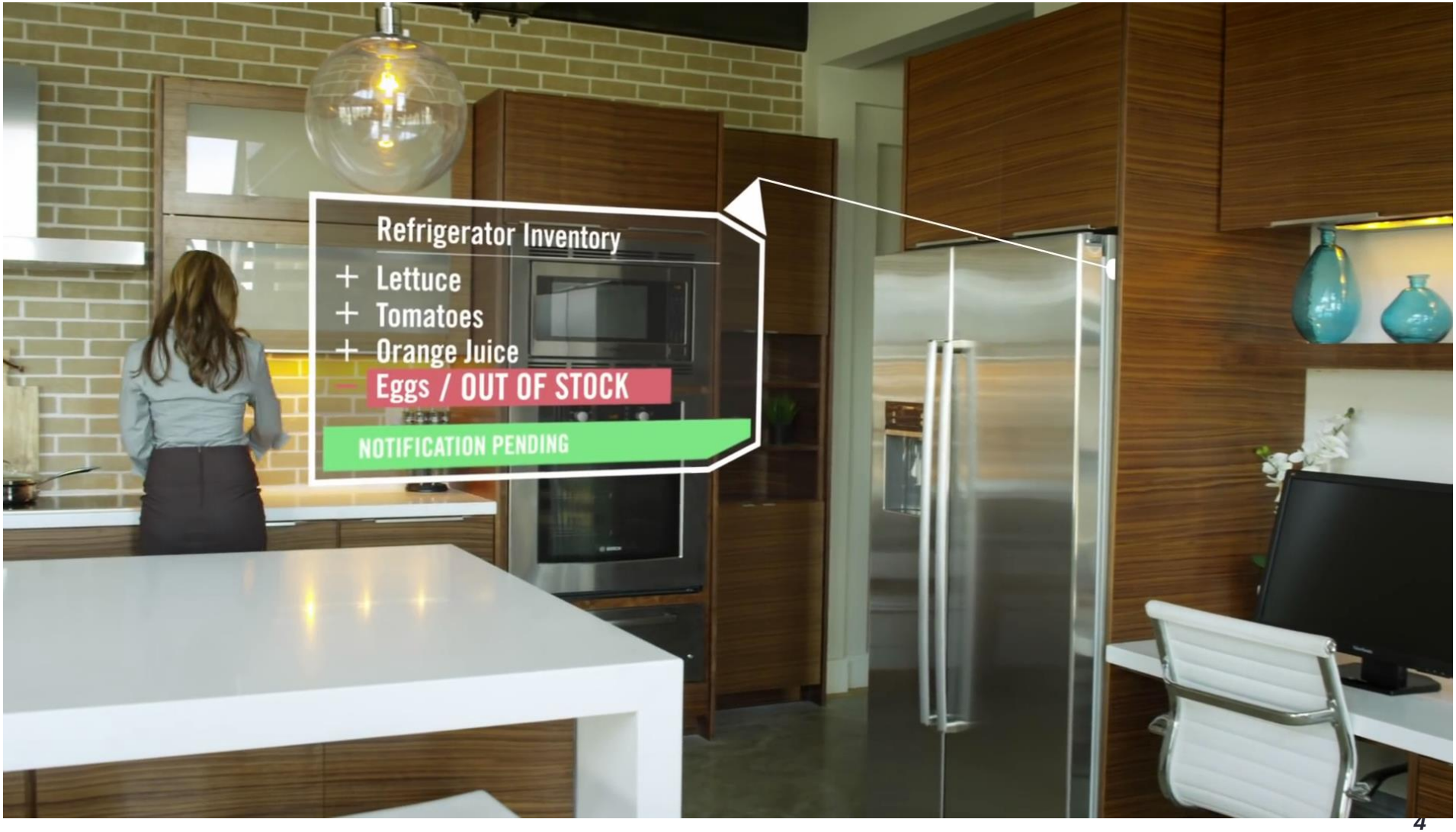
"When *wireless is perfectly applied the whole earth will be converted into a huge brain*, *which in fact it is, all things being particles of a real and rhythmic whole. We shall be able to communicate with one another instantly,* irrespective of distance…. *the instruments through which we shall be able to do this will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket.*" **Nikola Tesla, 1926**



1 SENSORS & ACTUATORS

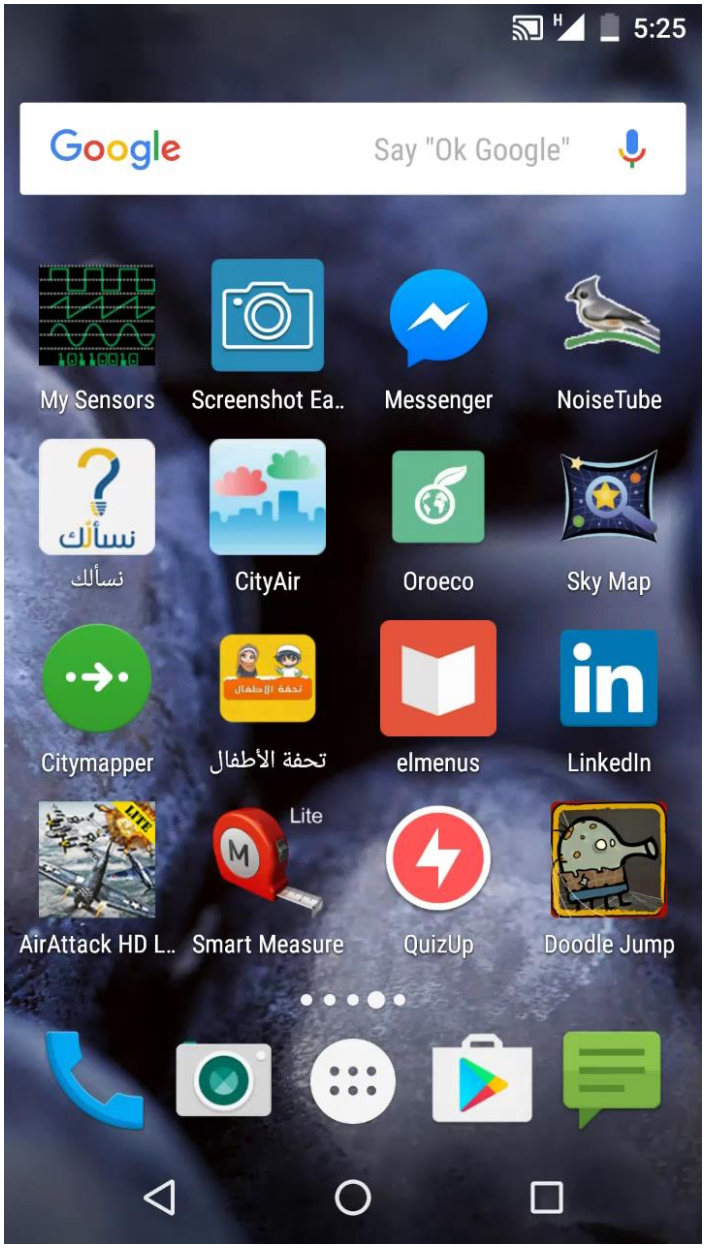
2 CONNECTIVITY

3 PEOPLE & PROCESSES



Your Smartphone!

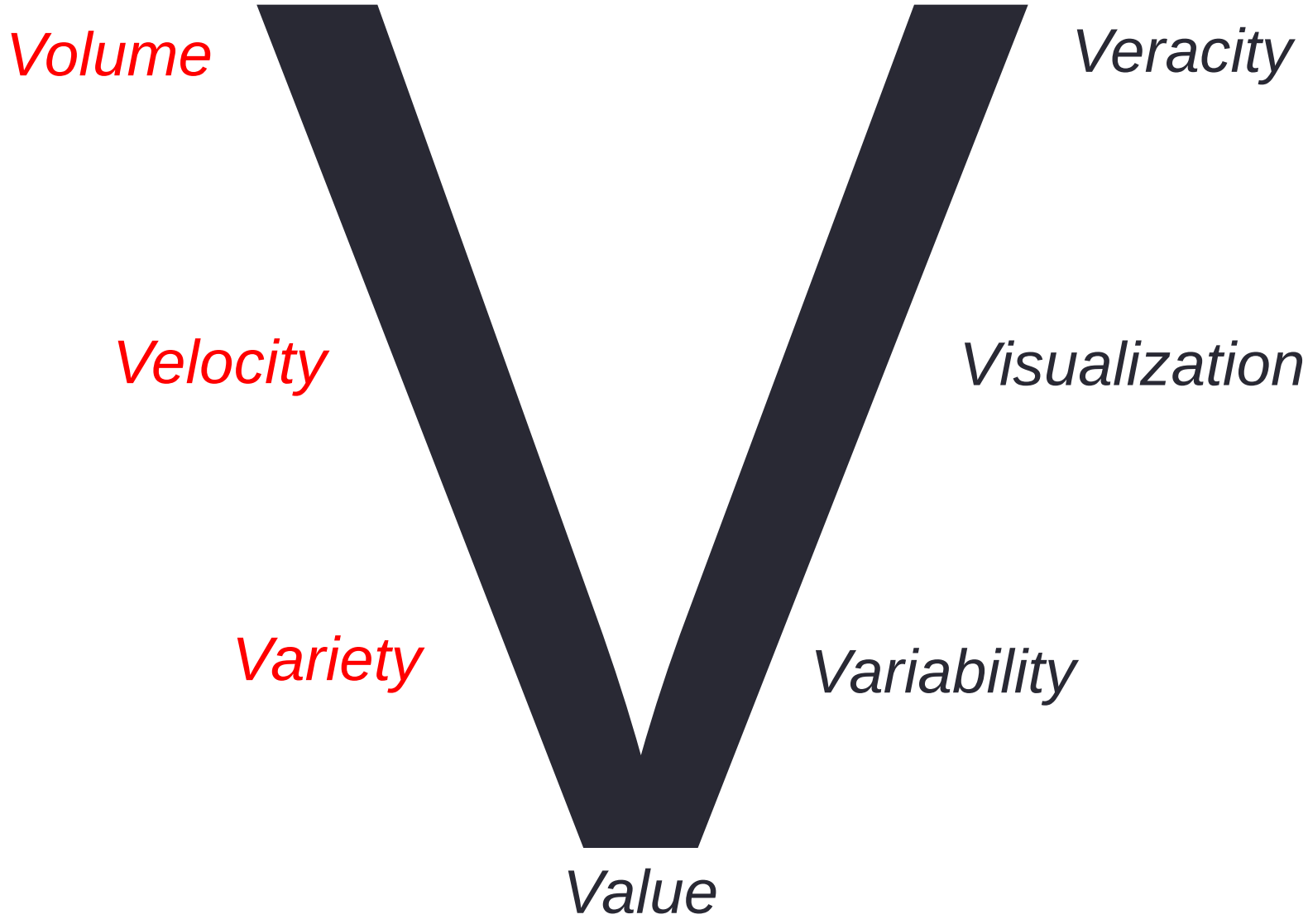
- Eyes → Camera
- Ears → Audio
- Speed → Accelerometer
- Location → GPS
- Movement → Gyroscope
- Direction → Compass
- Closeness → Proximity
- ……..



IoT Impact

- Connect with things
- Monitor things
- Manage things
- Control things
- Optimize things

Big Data & **Vs**


Volume
Veracity
Velocity
Visualization
Variety
Variability
Value

IoT Big Data Challenge

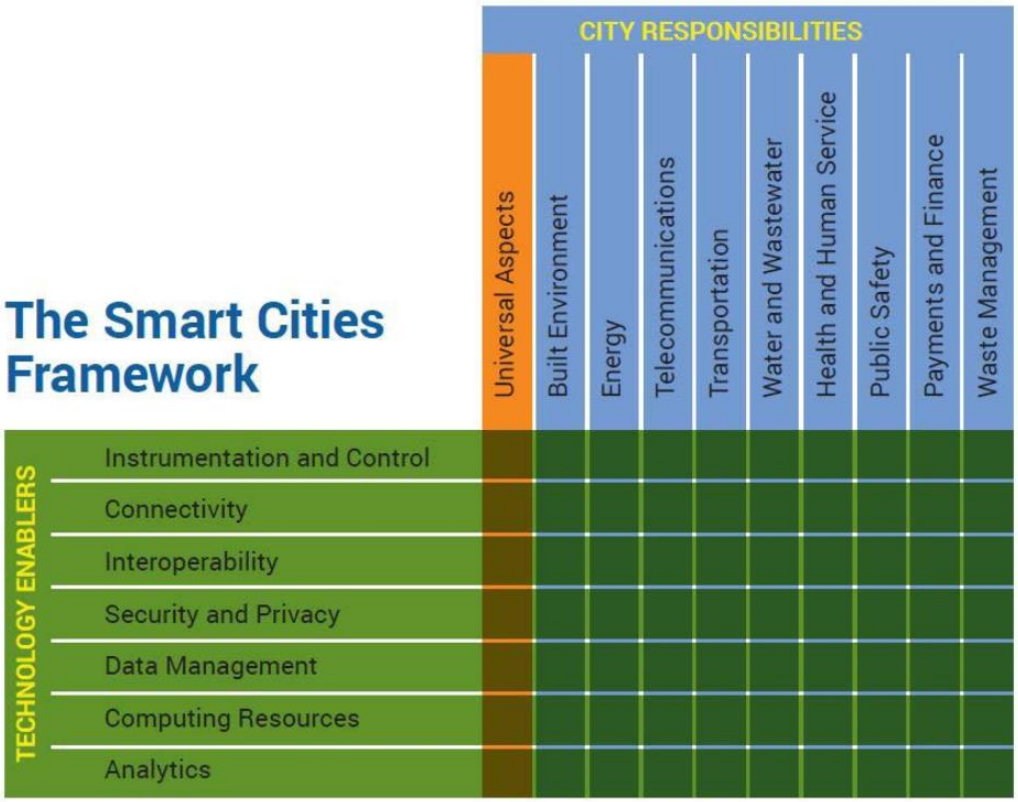
2011 to 2013

1.8 to 4 zettabytes

1 ZB = 1000^7bytes = 10^{21}bytes = 1000000000000000000000bytes = 1000exabytes = 1millionpetabytes = 1billionterabytes = 1trilliongigabytes

Open Data vs Closed Data

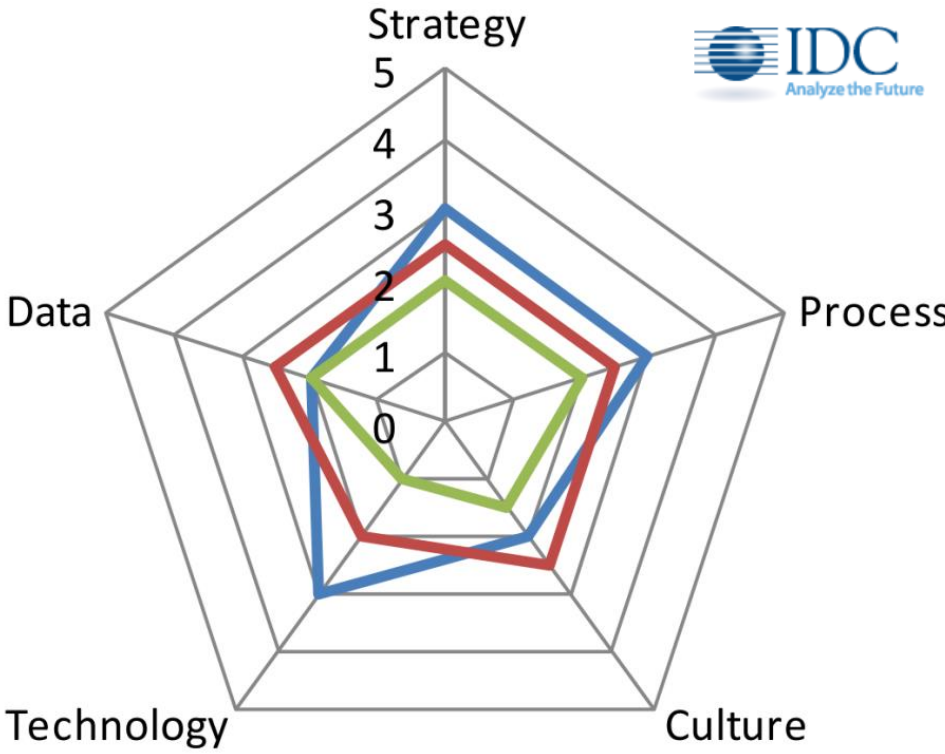
Data & Smart Cities



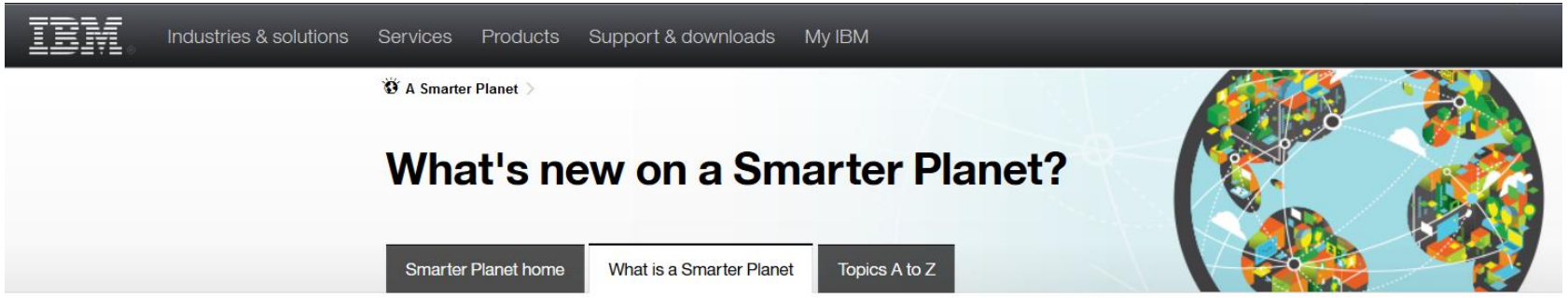
SmartCitiesCouncil
LIVABILITY | WORKABILITY | SUSTAINABILITY

Deloitte.

Data & Smart Cities



Who Cares ?



SmartThings Acquired By Samsung For Around $200 Million

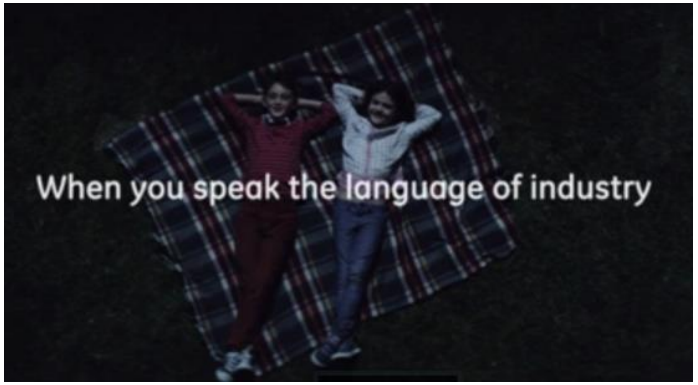
Posted Aug 14, 2014 by Greg Kumparak (@grg)

0 SHARES

Who Cares ?

Google closes $3.2 billion purchase of Nest

The acquisition brings with it the Learning Thermostat and the Protect smoke and CO detector as Google looks to make its mark in the smart home.



Businesses & Services

New Business Models

Businesses & Services

New Business Models

Uber's Otto self-driving truck delivers its first payload: 50K beers

Posted Oct 25, 2016 by Darrell Etherington (@etherington)

MAKERS
NOW IN THE UK
AdChoices

Crunchbase

Uber

FOUNDED
2009

OVERVIEW
Uber, a [San Francisco](/location/san-francisco

Uber and Real Estate

MAY 18, 2016 @ 03:05 AM 15,236 VIEWS

Uber Teams Up With Real Estate Developer To Replace Car Ownership

Brian Solomon, FORBES STAFF
Covering technology and the on-demand economy. FULL BIO

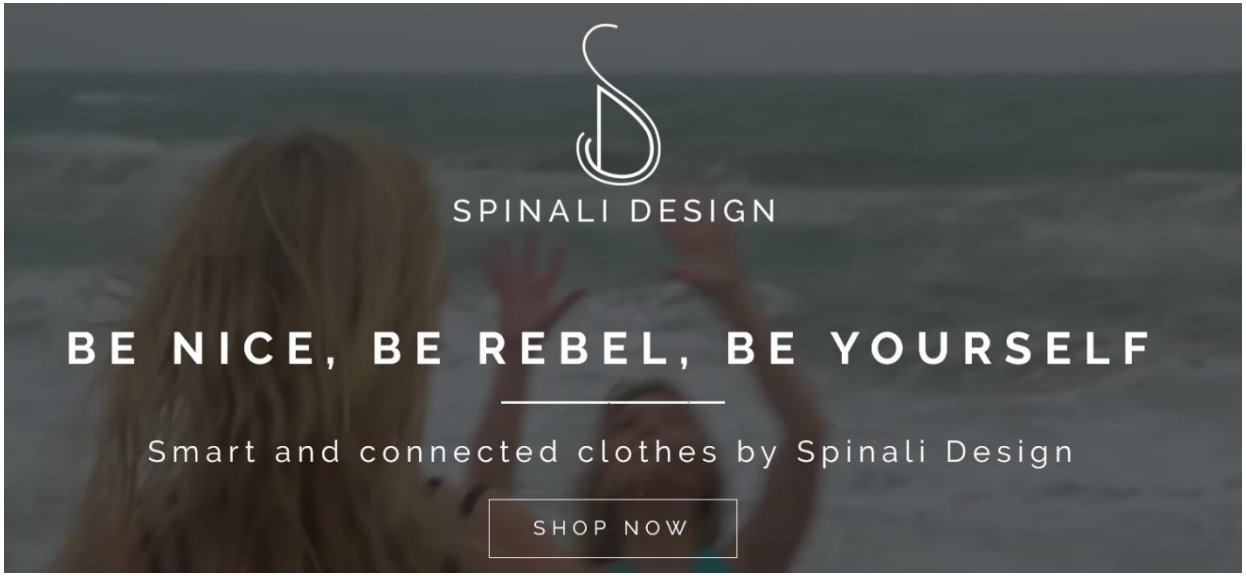
Photo by Martin Ollman/Getty Images

About 90% of U.S. households own a car–but Uber wants to change that.

On Wednesday, Uber announced what it hopes will be the start of many local real estate partnerships designed to encourage residents to ditch their cars for ride-sharing and public transportation. This first partnership brings Parkmerced, a real estate development in San Francisco with over 3,000 rental apartments, into the fold.

Businesses & Services

New Business Models



Forbes / Tech

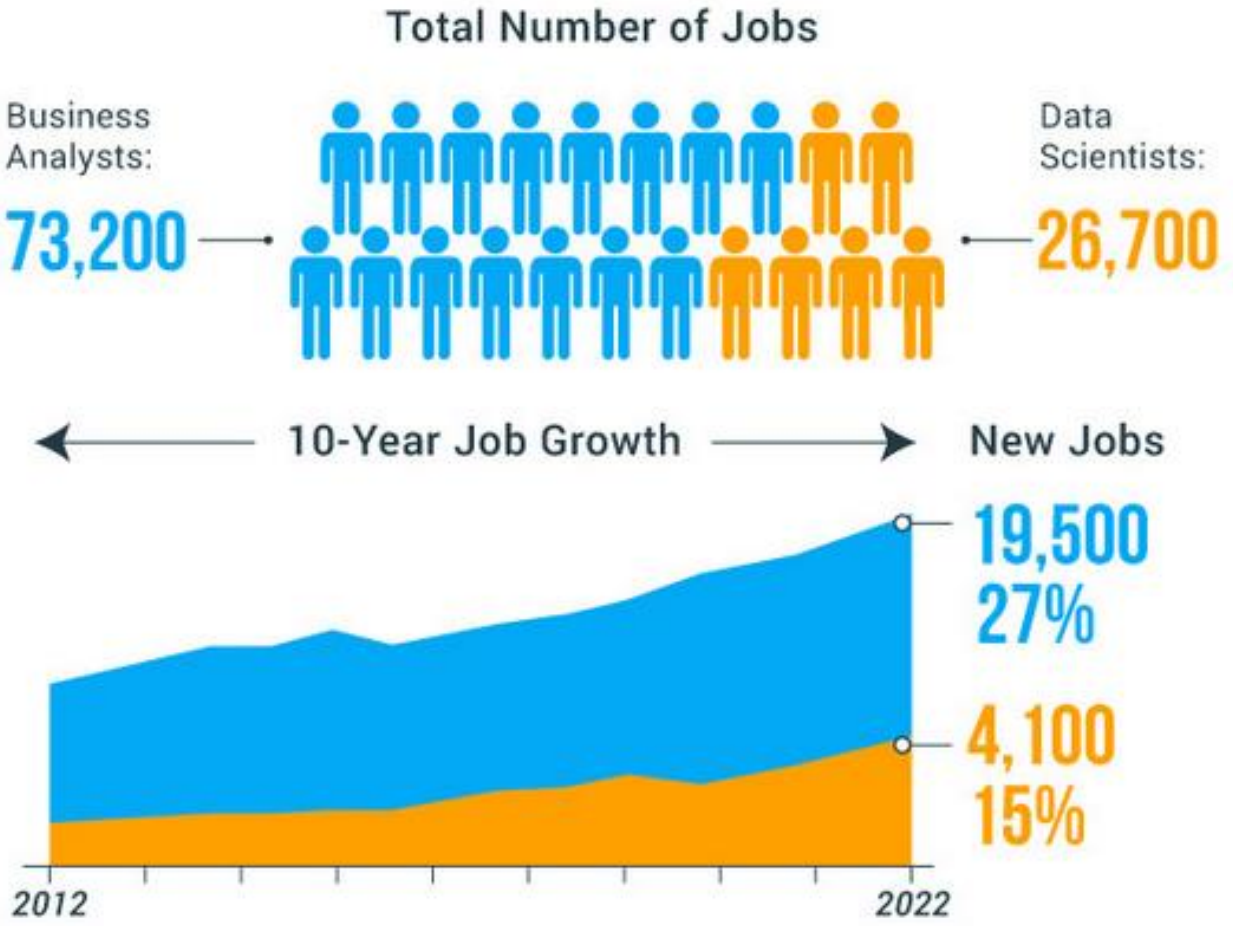
The Little Black Book of Billionaire Secrets

APR 21, 2016 @ 04:40 PM 281,885 VIEWS

10 Billion Items Of Connected Clothing: The Internet Of Things Just Became A Lot More Fashionable

New Jobs

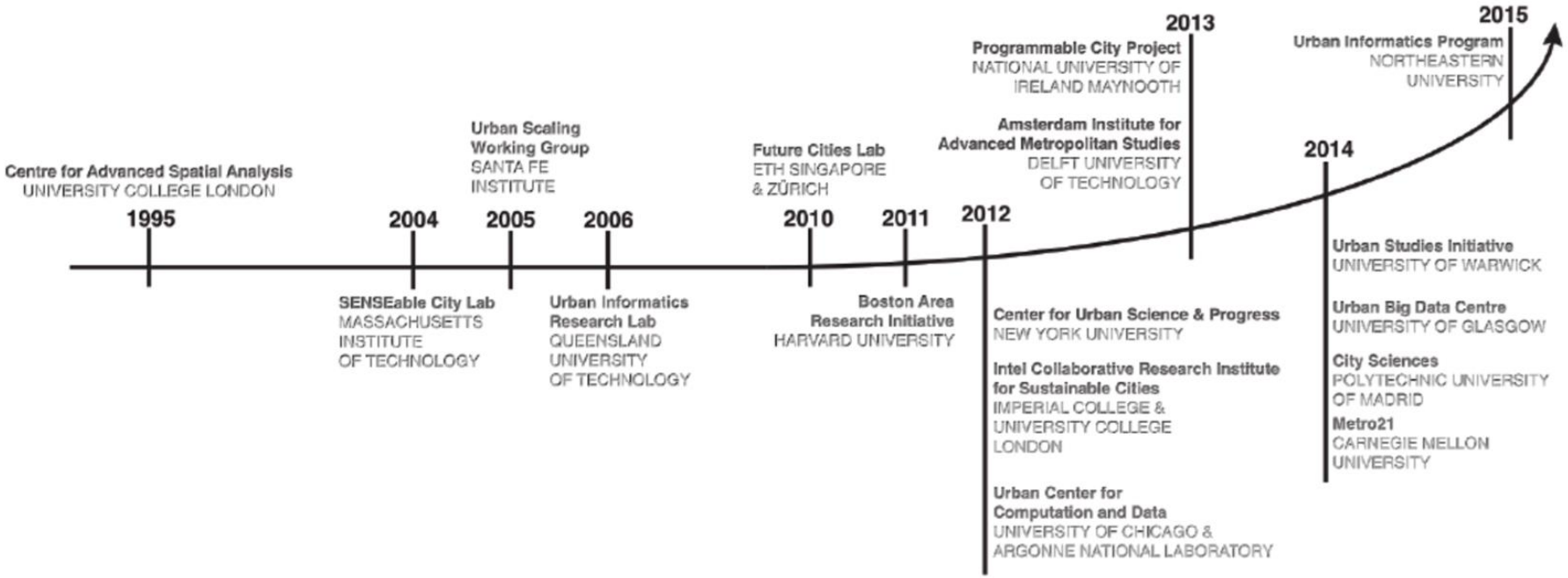
BUSINESS ANALYSTS



DATA SCIENTISTS

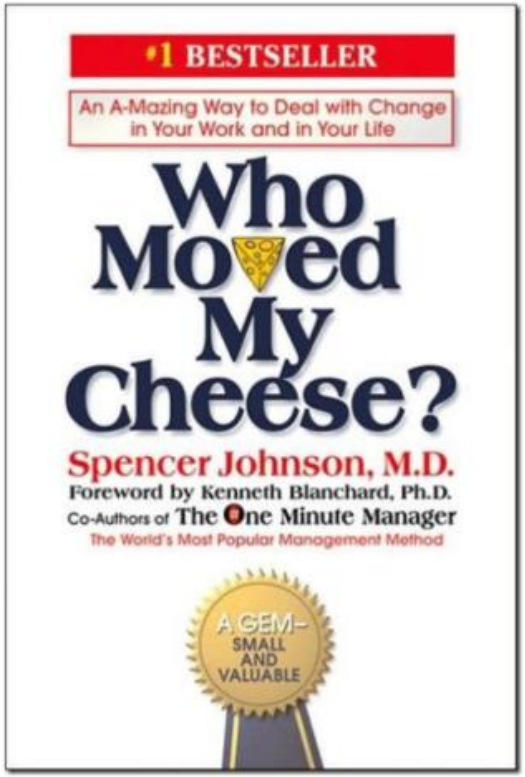
New Education / Programs

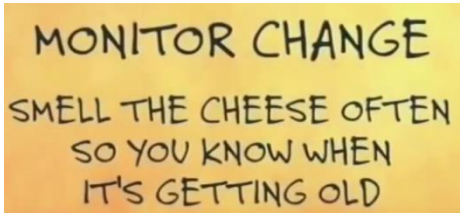
- **City Informatics / Urban Informatics**

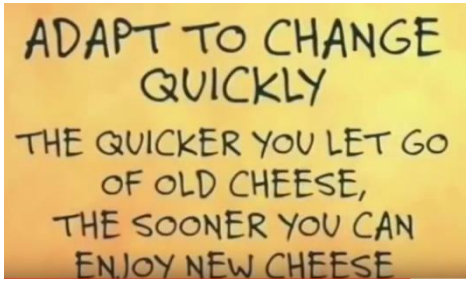


Why this trend is Dangerous ?

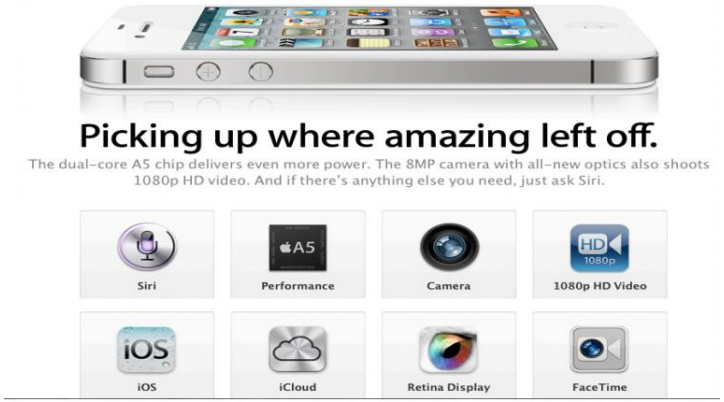
Who Moved My Cheese ? Syndrome







Motorola Razr vs iPhone



What Kodak Can Teach Us About Avoiding Failure

In its hey-day Eastman Kodak was huge: it employed 140,000 workers at its height, and in 1996 it was ranked the fourth most valuable brand in the United States, behind Disney, Coca-Cola and McDonald's.

When you bought film for your camera (or a disposable camera), Kodak film was virtually your only option. You could buy the cheaper Fujifilm, but Kodak was winning the marketing game, capturing 90% of the film market.

What about ……. ?

Technology	• is moving like a fast freight train
IoT	• is happening and more things will be connected
Big Data	• is around you and it will get bigger
Open Data	• is free and it will be more liquid
Business Models	• are changing and cheese is moving

What about Citizens?

Technology	• is moving like a fast freight train
IoT	• is happening and more things will be connected
Big Data	• is around you and it will get bigger
Open Data	• is free and it will be more liquid
Business Models	• are changing and cheese is moving

Citizens

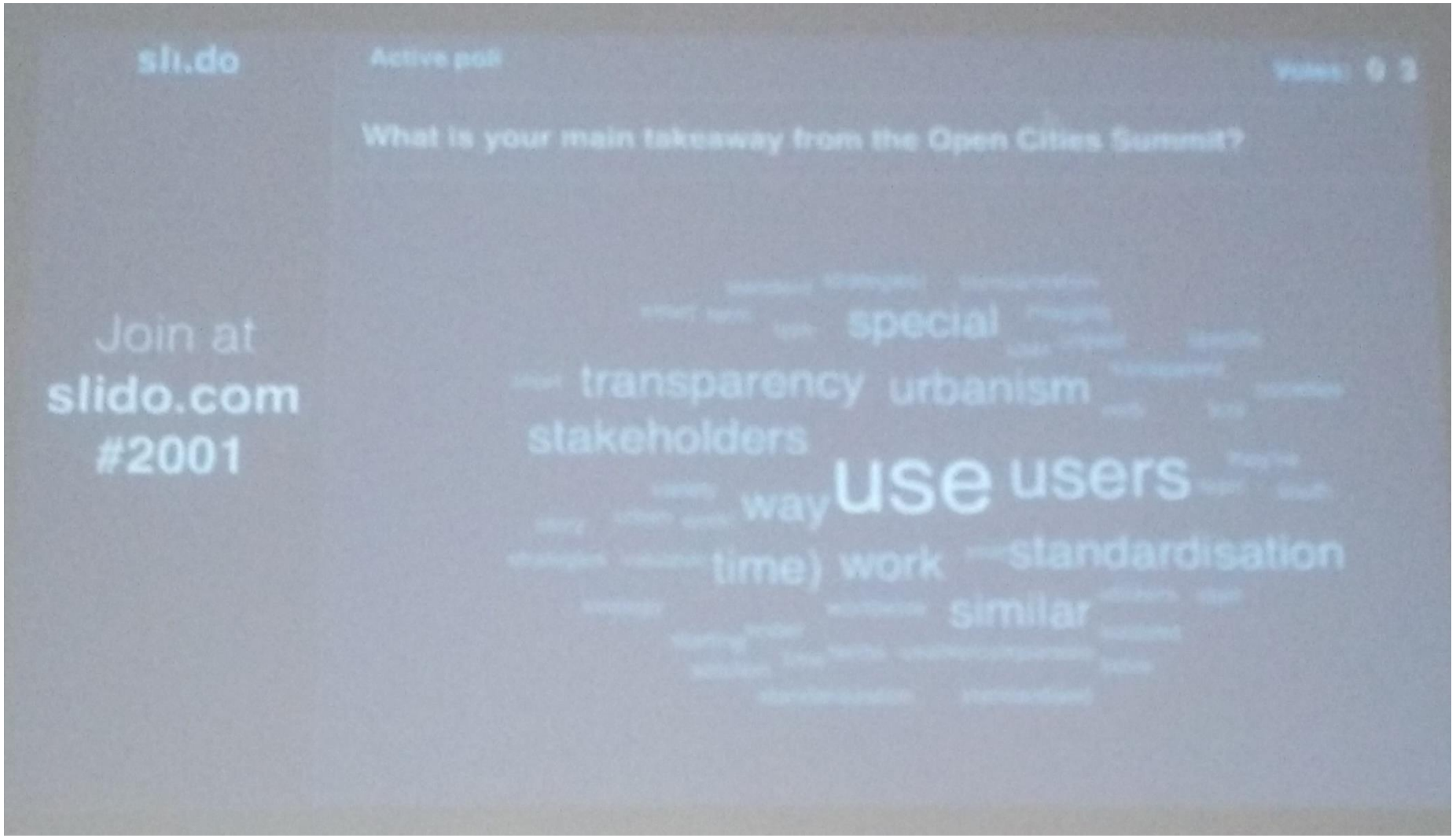
Social Experiment in London

US Defense- 10 Red Balloons Challenge

- December 2009
- 10 Red weather balloons were launched from different locations across the US
- Investigate power of social media
- Define the GPS coordinates
- Prize: $40,000
- Participant: 4,000 Teams

The key to mobilizing large numbers of people is *incentives*

Open Cities Summit - Tweets / Feedback



Case 1: Eco Mileage System

Country: Korea
City: Seoul
Launched : 2009

- An online program aims at reducing energy consumption.
- Citizen participation program gives incentives to households and organizations who voluntarily cut back on electricity/water/gas

Eco-Mileage Check (Debit) Card

(1 mileage point = 1 Korean Won)

Energy conservation	■ 100,000 points for saving of over 10%
Public transportation	■ 10% of public transportation cost saved as points
Green product purchase	■ 1~5% of green product purchases saved as points
How to use points	■ Convert into cash. ■ Use as cash at partner shops. ■ Pay your mobile communication bill. ■ Pay your apartment maintenance fee.

Source: Metropolis
http://policytransfer.metropolis.org/case-studies/eco-mileage-system

Case 1: Eco Mileage System

Country: *Korea*
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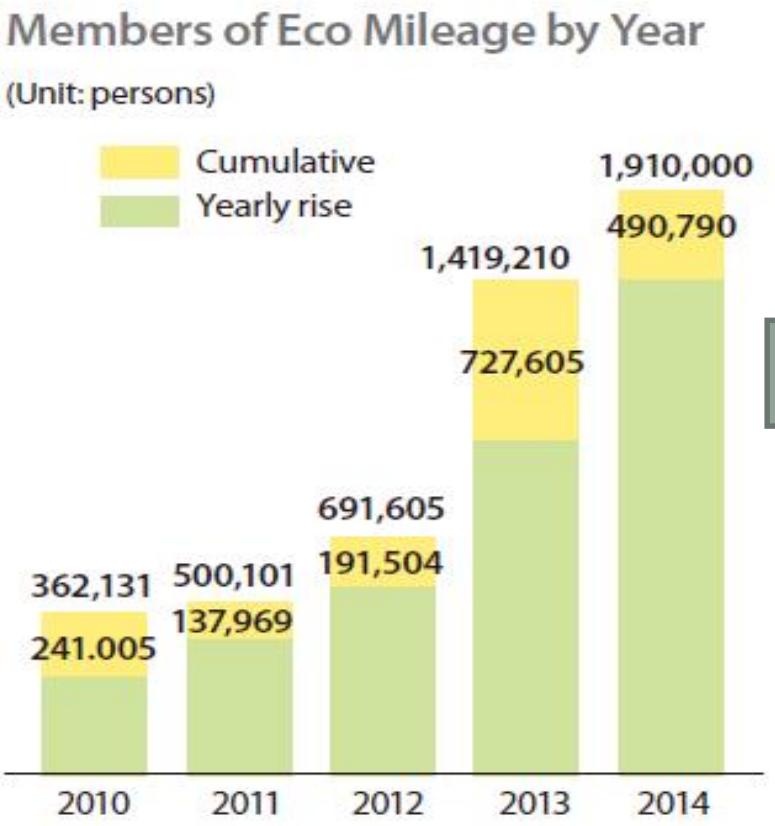


367,832 TOE yearly

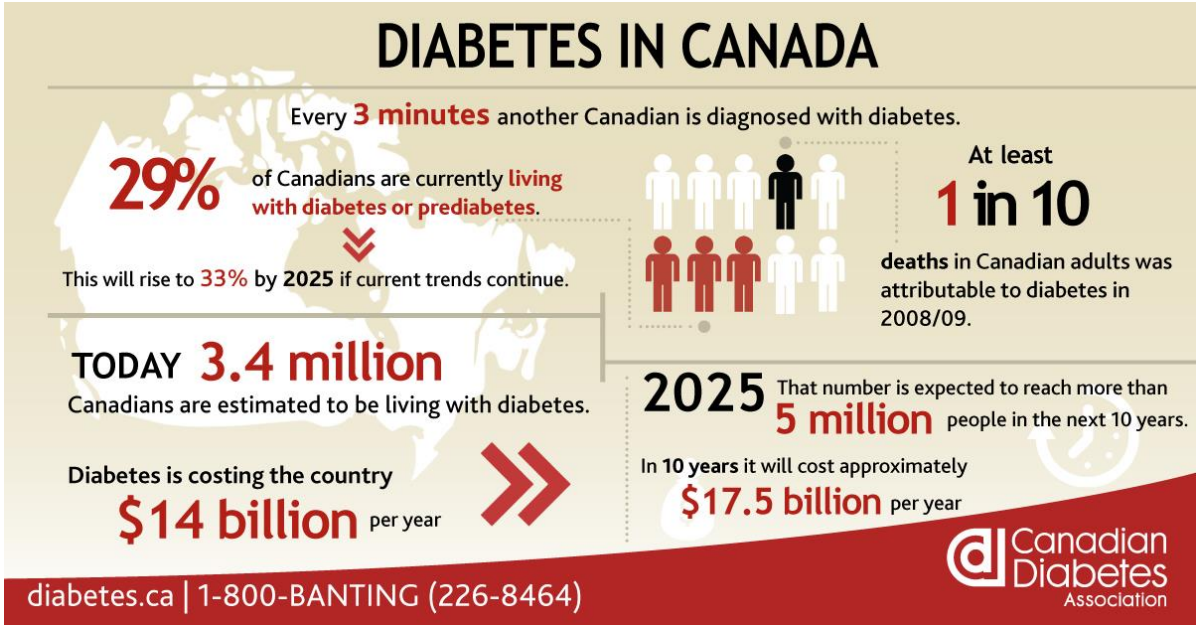
153,198 TREES yearly planted

Case 2: Carrot Rewards

Country: Canada
City: BC
Launched : 2016

- Combining the incredible power of smartphone technology and loyalty points
- A Mobile App announced by the federal government that will use incentives to reward Canadians for making healthy lifestyle decisions

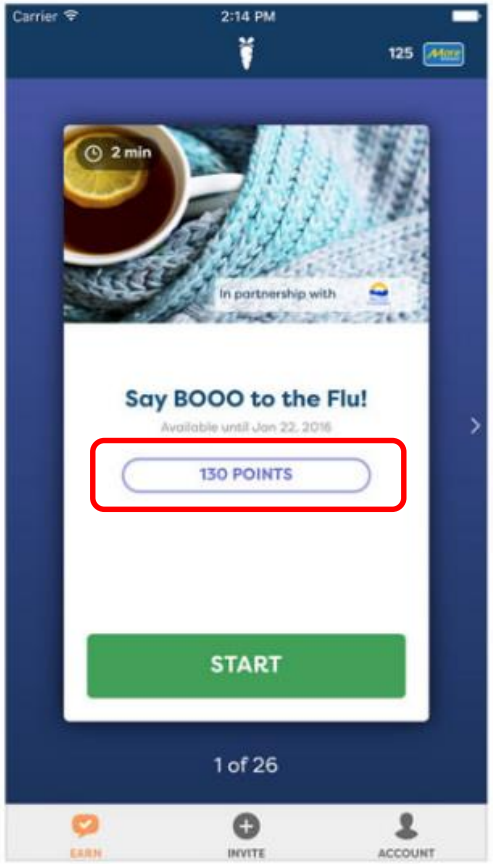
carrot rewards carotte points santé



Case 2: Carrot Rewards

Country: *Canada*
City: *BC*
Launched : *2016*

- The government encourage people to take steps toward a better health that can save money on disease treatment.



Cut Treatment Costs

Decrease in number of Canadians living with Diabetes

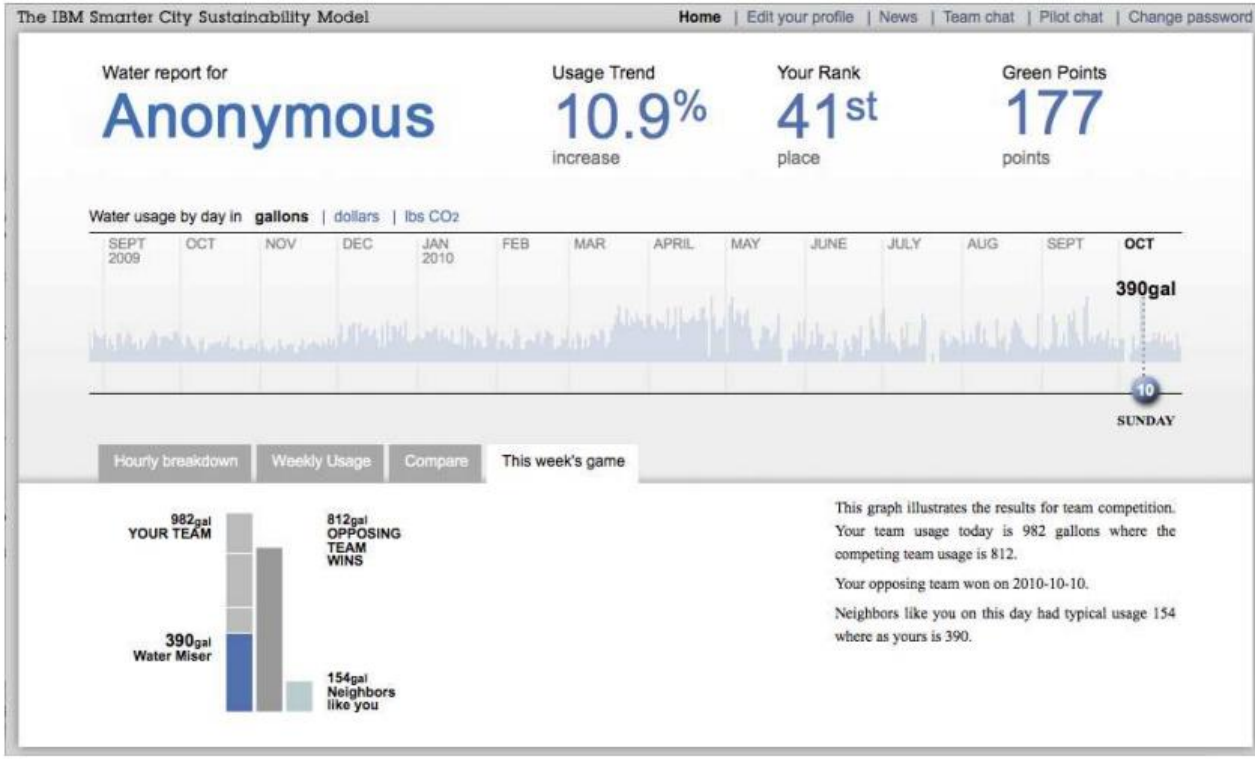
Raise Public Health Awareness

Public Health Agency of Canada | Agence de la santé publique du Canada | British Columbia | BC Healthy Living Alliance | Canadian Diabetes Association | YMCA | Heart & Stroke Foundation

Case 3: Smart Meter

Country: *USA*
City: *Dubuque*
Launched : *2010*

- Combining Analytics, Cloud Computing and Community Engagement to Conserve Water



Source: GCN
https://gcn.com/Articles/2013/08/05/big-data-cities-Dubuque.aspx?Page=2

Case 3: Smart Meter

Country: *USA*
City: *Dubuque*
Launched : *2010*

9 Weeks Pilot two set of 150 households

65 M Gallons

Annual Water Savings

EQUIVALENT TO

$200

Annual water bill saving

Case 4: Metropia

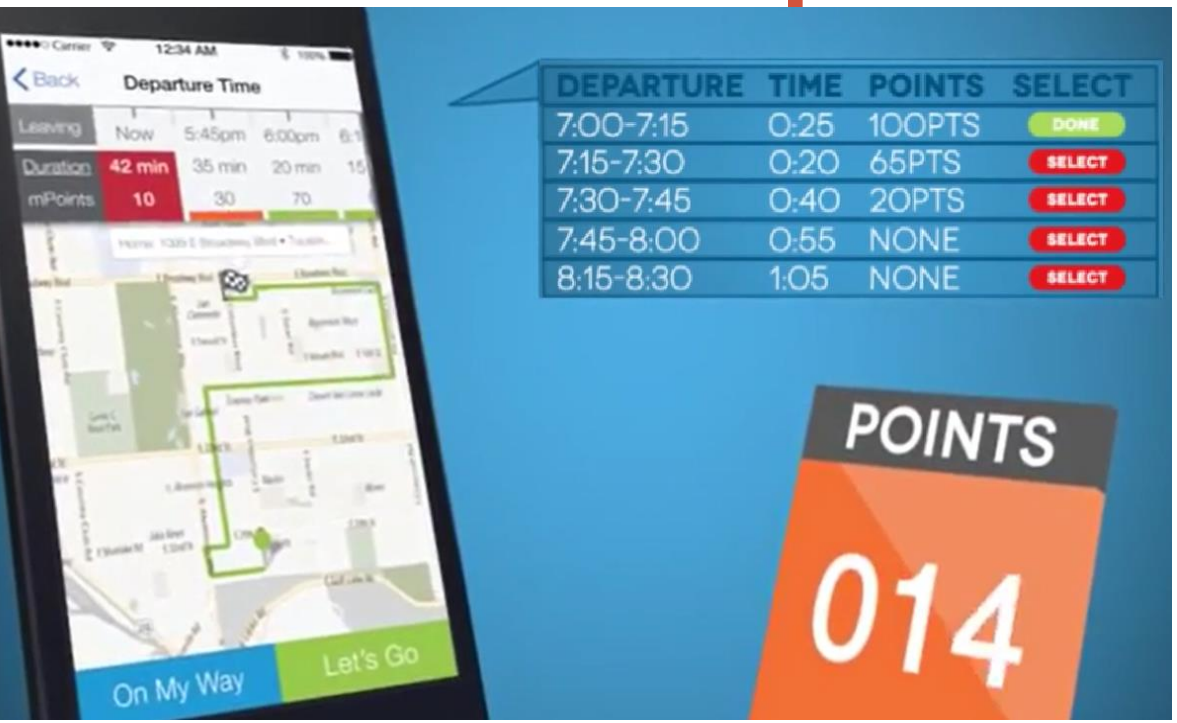
Country: *USA*
City: *Tucson*
Launched : *2015*

- An incentive-based mobile platform that helps transportation agencies, businesses and commuters drive improvements to city mobility

metropia
Driving a better city

Case 4: Metropia

Country: *USA*
City: *Tucson*
Launched : *2015*



EARN REWARDS

Reduce your CO2 emissions

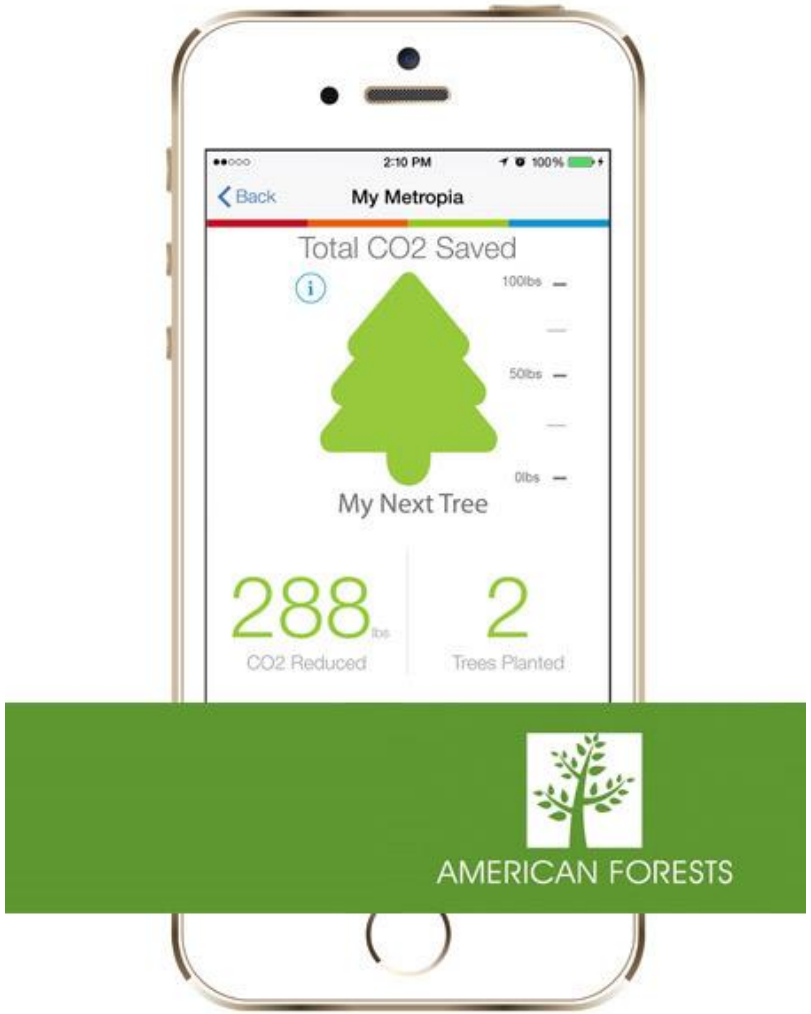
Avoid Traffic

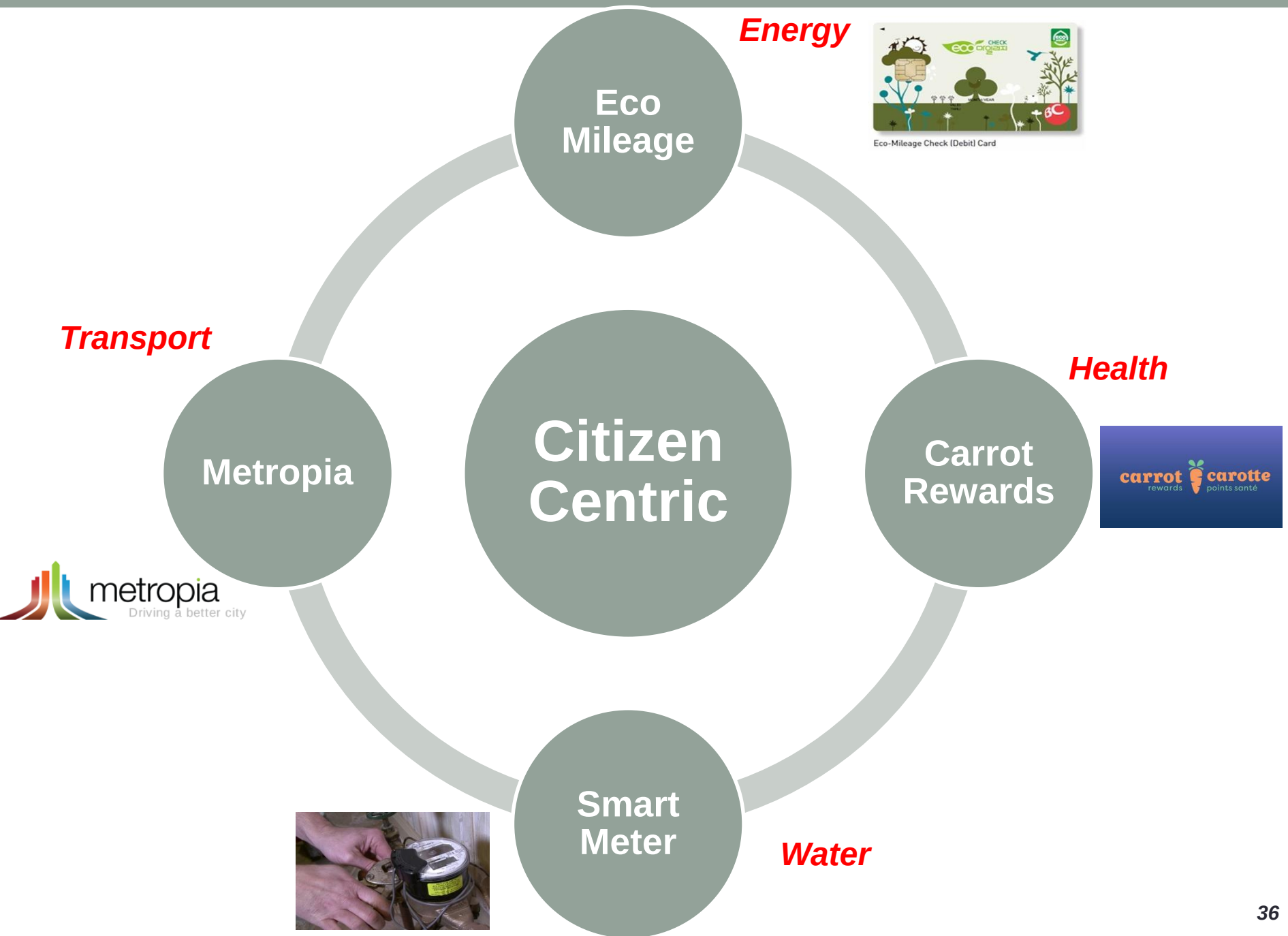
Spend less time on the road

Better Route at better times

Case 4: Metropia

Country: *USA*
City: *Tucson*
Launched : *2015*

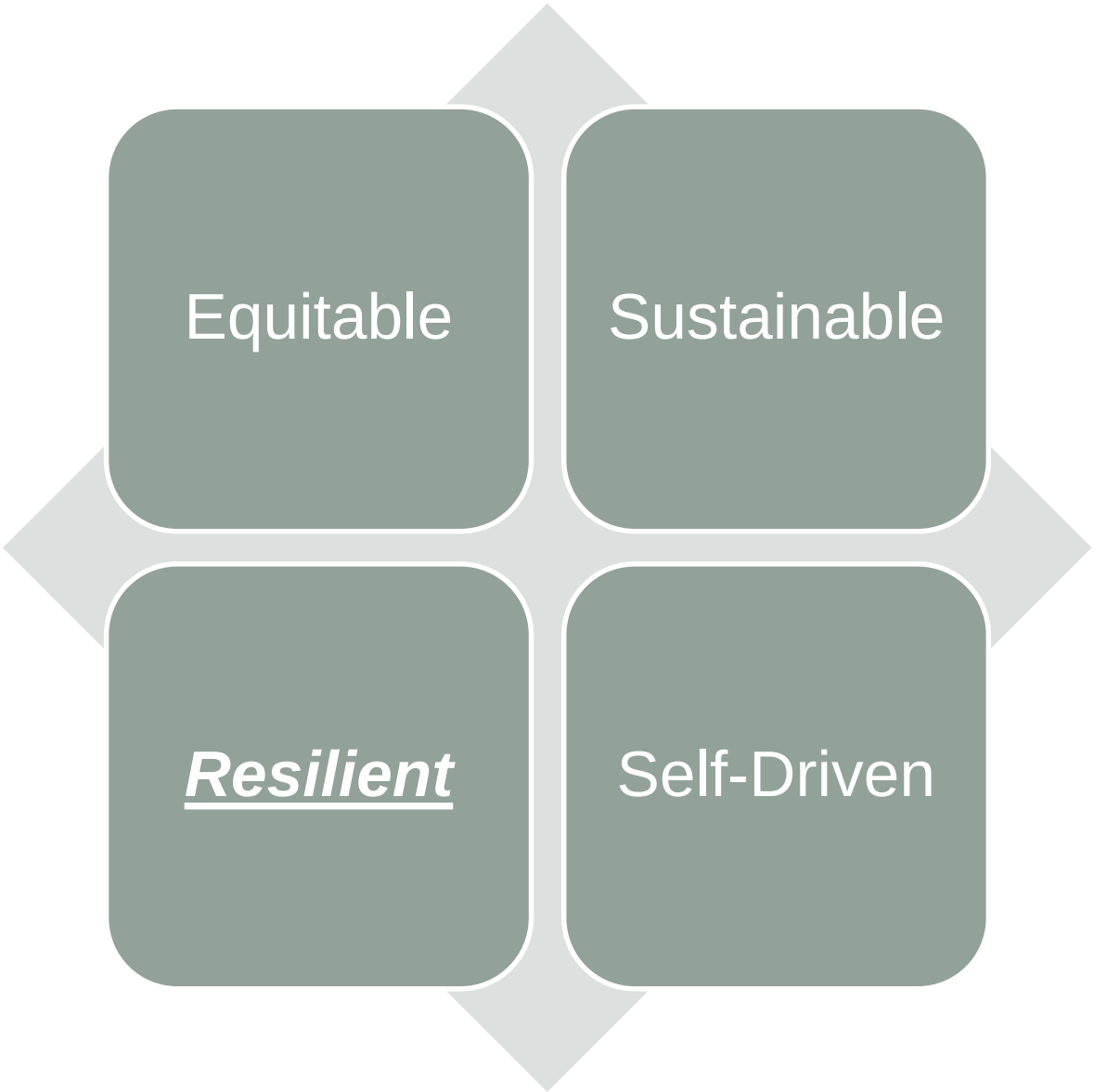



Energy
Eco Mileage
Eco-Mileage Check (Debit) Card
Transport
Metropia
Citizen Centric
Health
Carrot Rewards
carrot rewards
carotte points santé
metropia
Driving a better city
Smart Meter
Water

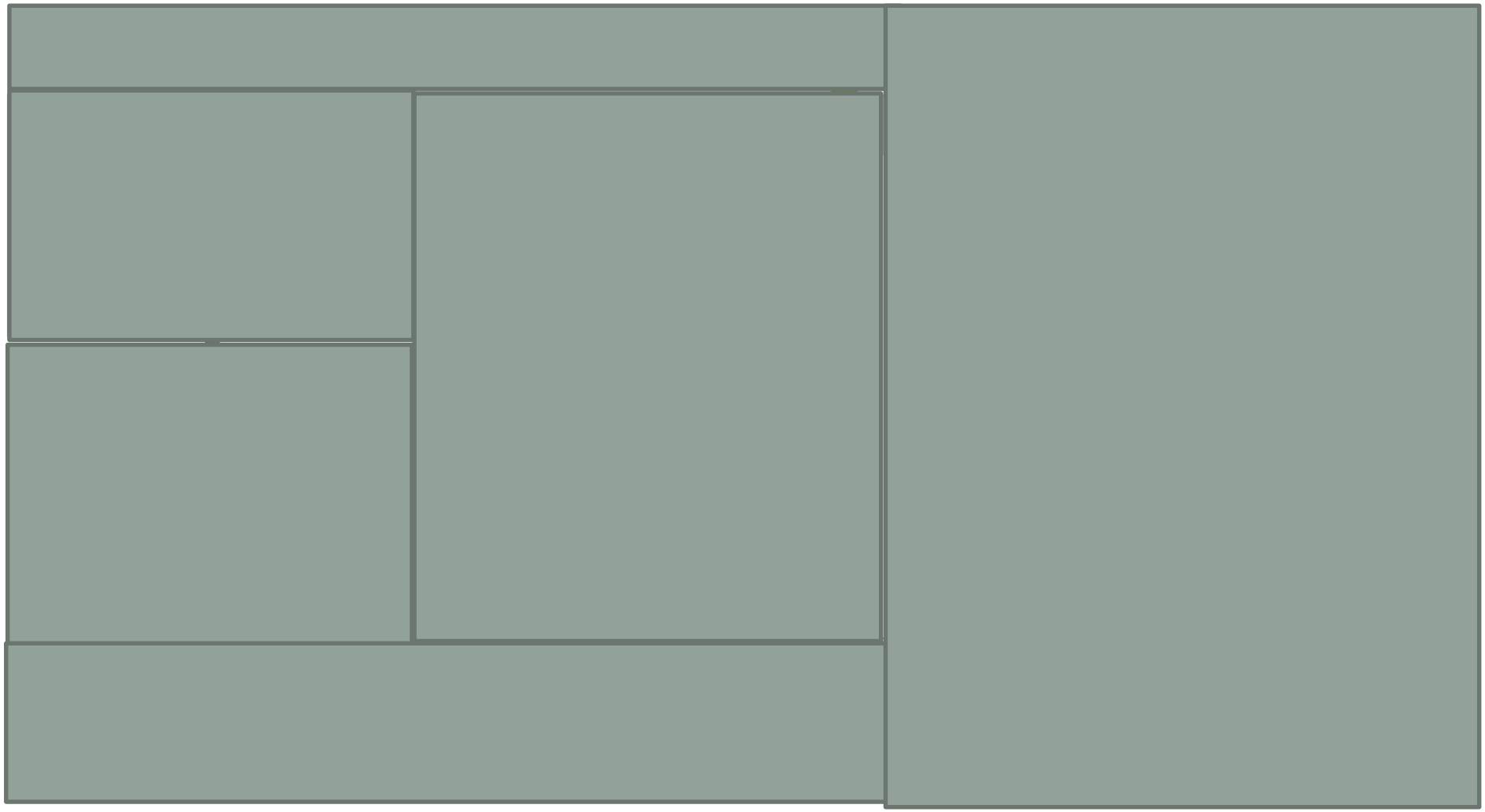
Wise Cities

Employ Data
Incorporate Knowledge
Collaborate with Citizens
Boost Entrepreneurship and Innovation

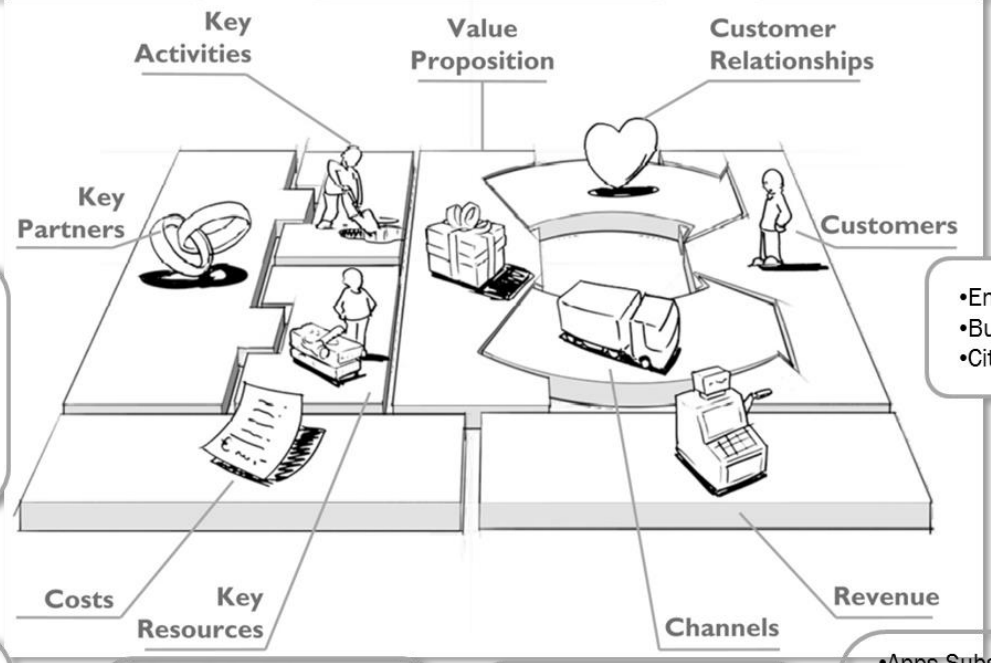
Wise Cities



Framework for Wise Cities



Business Model



- Data Science
- Business Analytics
- Engineering Services
- Capacity Building
- Public Outreach & Campaigns
- Mobile Loyalty Programs
- Marketing

- Public-Private Collaboration
- Boost City Image
- Regional Solution
- Flexibility to Future Demand
- Empowered Citizens
- State-of-the-Art DD Transport Services
- Efficient and Safe Operations
- Less Fuel Consumption and Pollution

- Pleasant and Safe Commute
- Increase Customer Value and Exposure
- Incentives / Discounts
- Travel Vouchers
- Integration of Services

- Citizens
- Authorities/ Municipalities
- Businesses / Loyalty Programs Companies
- Universities
- Public Transit Operators

- End-user Citizens
- Businesses
- City Managers / Officials

- System Development
- App Development
- Installation and Operations
- Operation & Maintenance
- Training and Coaching
- Loyalty Program Design

- Data Scientists
- Business Analysts
- Technical Transportation Expertise
- ICT Technology Experts
- Computing Power
- Telecommunication Channels

- Public Media Outreach
- Social and Educational Campaigns
- Social Media Platforms
- Local Champions
- Email Newsletters
- Notifications

- Apps Subscription and Advertisement
- Third Party Products for Targeted Advertising/Marketing
- Loyalty Programs Revenue
- Brokerage Fees
- Indirect Savings on Congestion, Safety, and Health

Smart Cities

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