

IEEE Guadalajara Pilot Program Experience

Dr. Victor M. Larios Rosillo
victor.m.lariosrosillo@ieee.org



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Económico Administrativas

Doctorado en Tecnologías de Información

IEEE Smart Cities Symposium Prague
Jun 2015

Agenda

- GDL Smart City Vision
- IEEE Smart Cities Initiative
- Smart Cities Context & importance of Metrics for GDL
- GDL Challenges
- Related Activities for GDL
IEEE Smart City Initiative



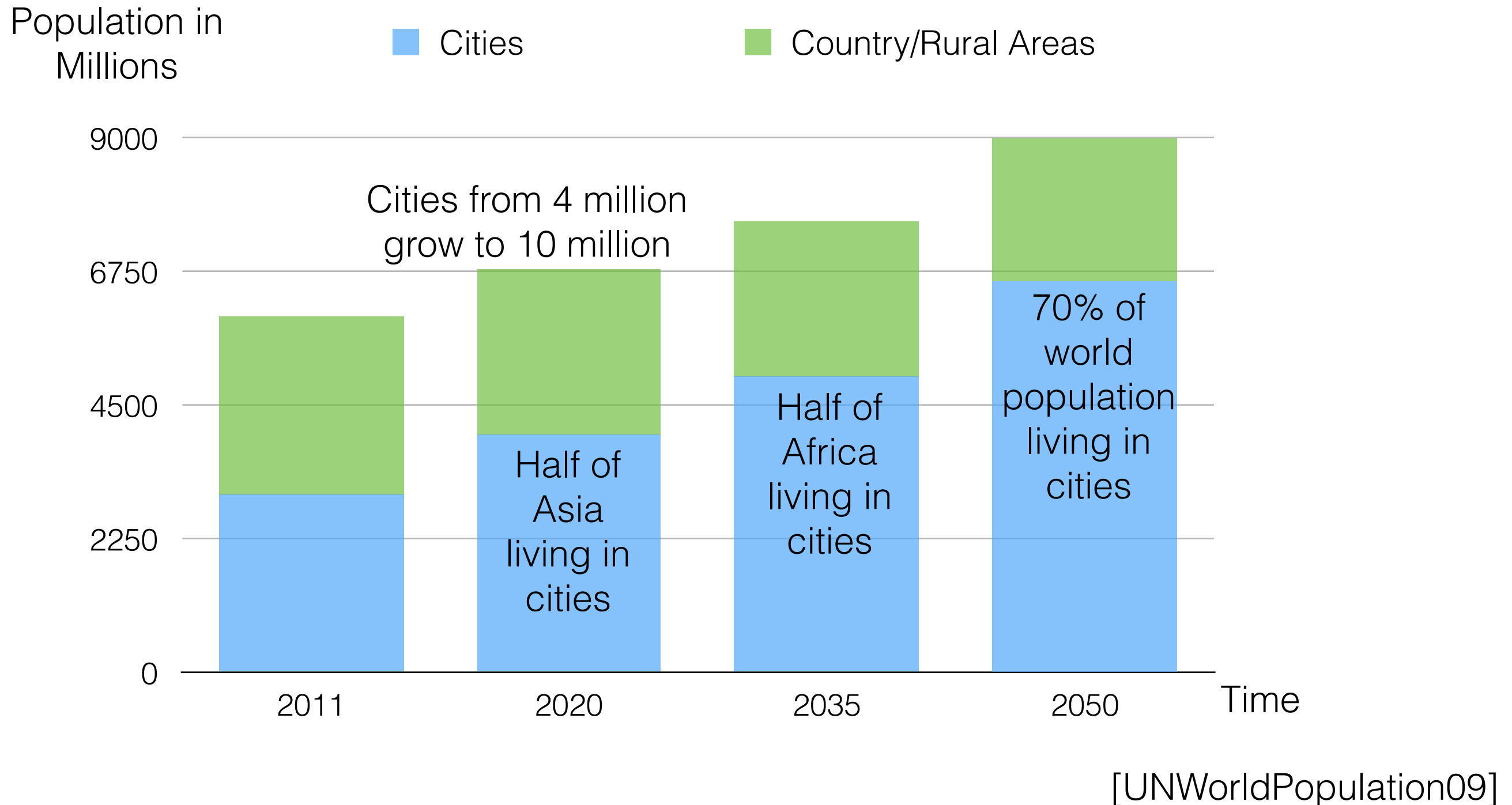
GDL Smart City Vision

Urbanisation Challenges

United Nations reports 50% of world population living cities since 2012...

Do we expect this vision for the future in cities ?

U.N. Urbanisation Trends



Urbanisation Trends & Technology Solutions

- Exposure to natural disasters
- Population explosion
- High cost of living
- Rising levels of pollution
- Increase of crime rates
- Infrastructure investment
- Exponential growth of data
- Potencial cultural clashes





GDL Facts

- Funded in 1539
- 4.4 Millions People in Metropolitan Area
- x4 growth in past 30 years
- 6 interconnected municipalities
- 17Km from north to south
- 1/5 of Mexico City Size



GDL Metropole compared with other Cities

#	City	Population (millions)
1	Tokyo JP	37.8
2	Mexico City MX	20.6
3	London UK	10.2
4	Wuxi CH	6.6
5	Madrid ES	6.1
6	San Fco-San Jose USA	5.9
7	Guadalajara MX	4.6
8	Prague CH	1.4
9	Trento IT	0.5

GDL historic center 1920



GDL historic center 2014



GDL historic center 2018



GDL High Tech Ecosystem

Ecosistema de Alta Tecnología de Occidente

ORGANIZACIONES DE APOYO



INSTITUCIONES EDUCATIVAS



Manufactura
Software
Servicios

Multimedia
Diseño

+600 COMPAÑÍAS DE
ALTA TECNOLOGÍA

+150 EMPRESAS DE
SOFTWARE Y SERVICIO

8 INCUBADORAS -
PARQUES TECNOLÓGICOS

Tecnologías Verdes
Aeroespacial
Automotriz
Biotecnología
Medios Creativos

GDL CCD Project

- 40 Hectares @ Digital Hub + 380 Hectares of sustainable impact

- Capacity for talent production & attraction

- IEEE volunteers with compromise

- High tech ecosystem supporting

Government

Academy

Society Volunteers

Industry

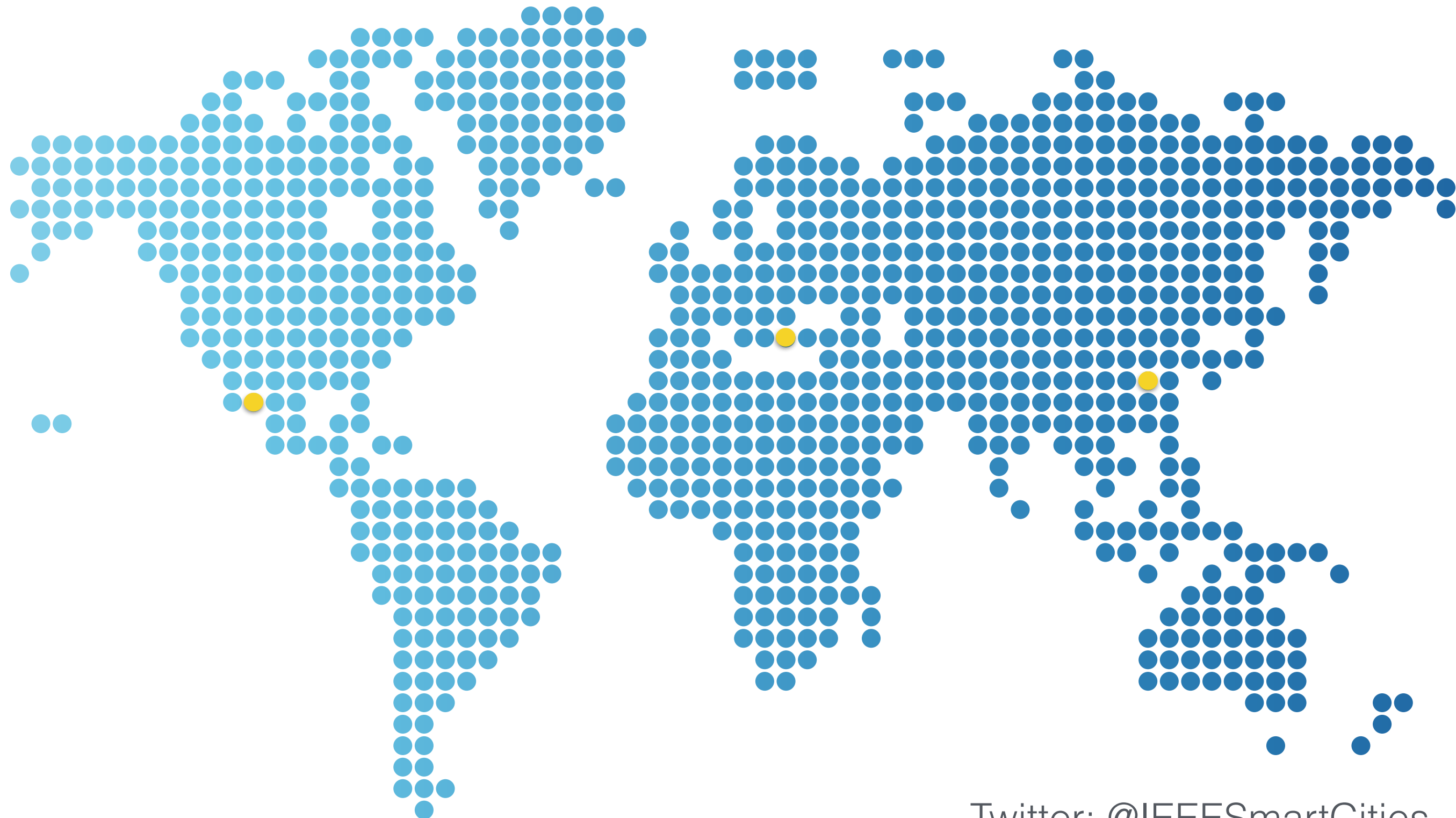


<http://ccdguadalajara.com/en/>

The background of the slide features a stylized illustration. At the top, there are green, leafy branches hanging down. Below them, a city skyline with several tall buildings is situated on a green hill. A river flows through the foreground, with a small bridge crossing it. The sky is a light blue gradient. The text 'IEEE Smart Cities Initiative' is centered in the middle of the slide in a large, orange, sans-serif font.

IEEE Smart Cities Initiative

IEEE Smart Cities is looking to create a network of cities to share knowledge and experiences

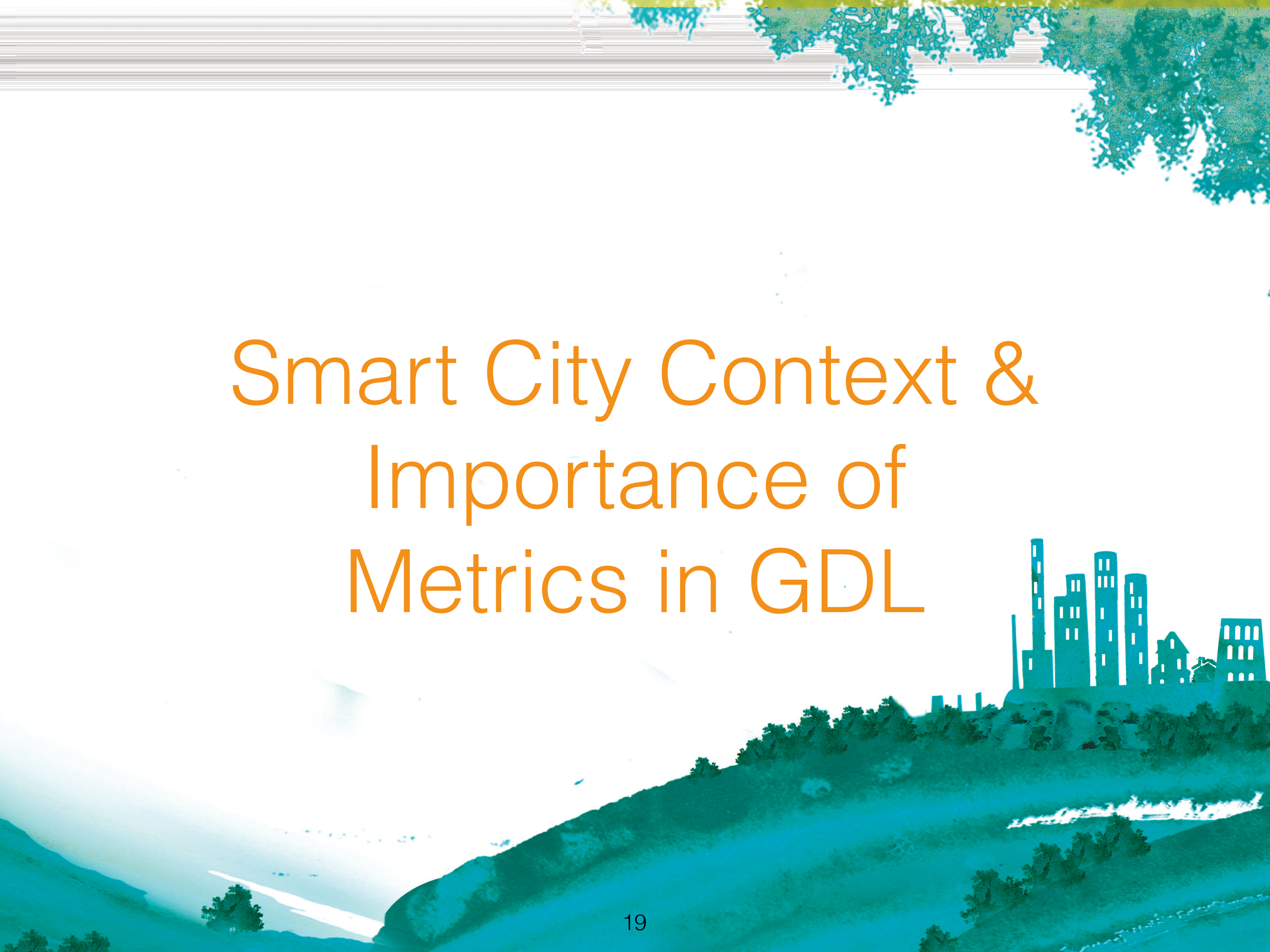


Gudalajara City is the first IEEE world pilot

Twitter: @IEEESmartCities
<http://smartcities.ieee.org>

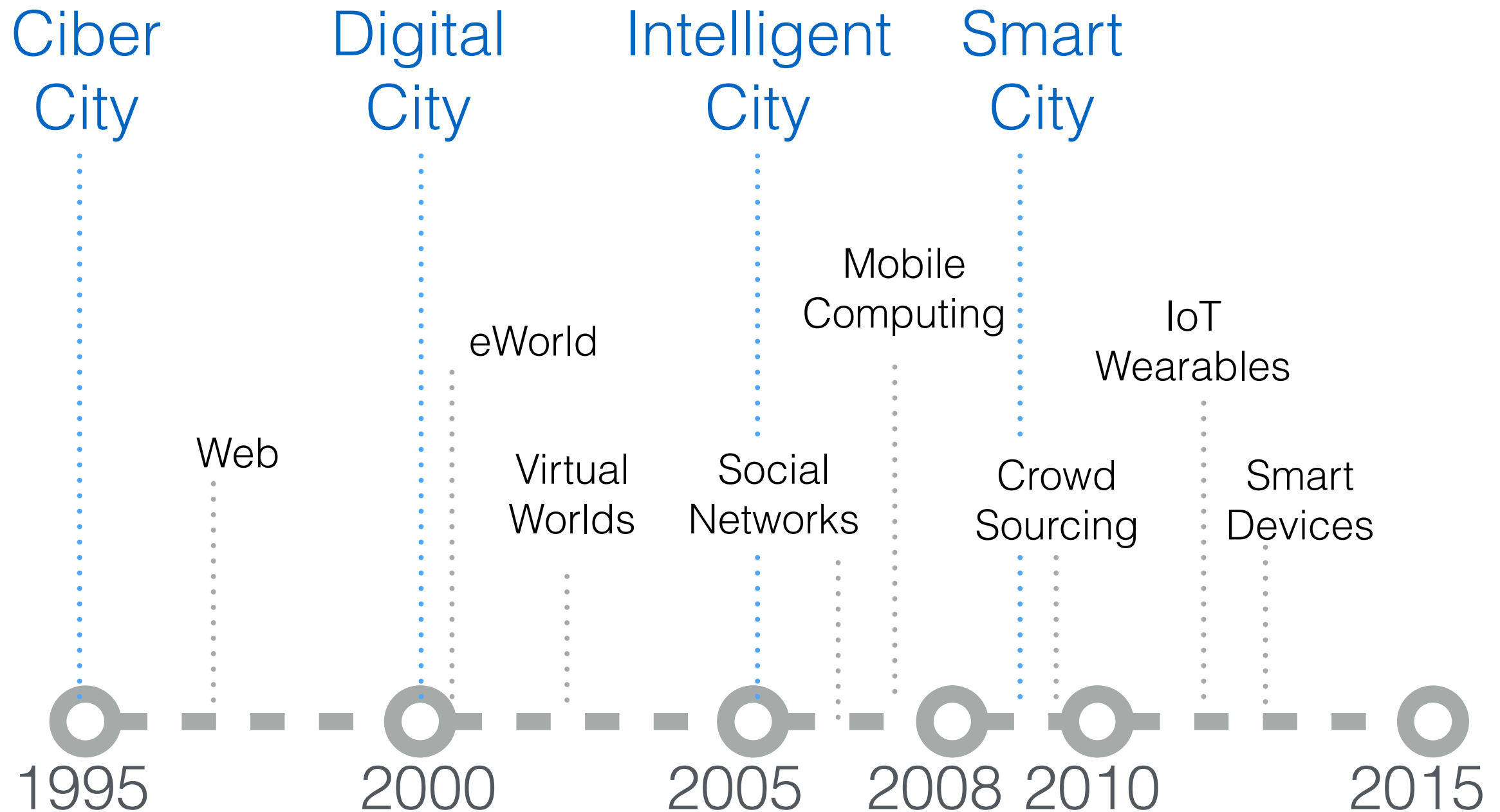
IEEE Kickoff event in Smart Cities of the Future Guadalajara City October 1-2, 2013





Smart City Context & Importance of Metrics in GDL

Evolution Timeline



Cities Evolution

Ciber Cities	cyberspace, cybernetics, governance and control based on information space	1995-2000
Digital Cities	digital representation of cities for simulation	2000-2005
Intelligent Cities	collective intelligence emerging from social networks, people driven innovation	2005-2010
Smart Cities	smartphones, sensor networks, IoT smart meters sustaining intelligence of cities - holistic view	2008- Until Today

[Schaffers:2011kt]



Smart Cities Emerging Models

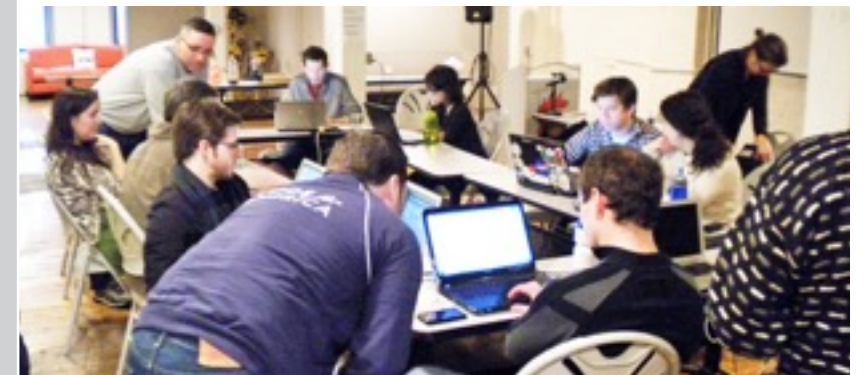
Panopticon

City control based in a central operation center
Ex. Rio De Janeiro



Civic Hackers

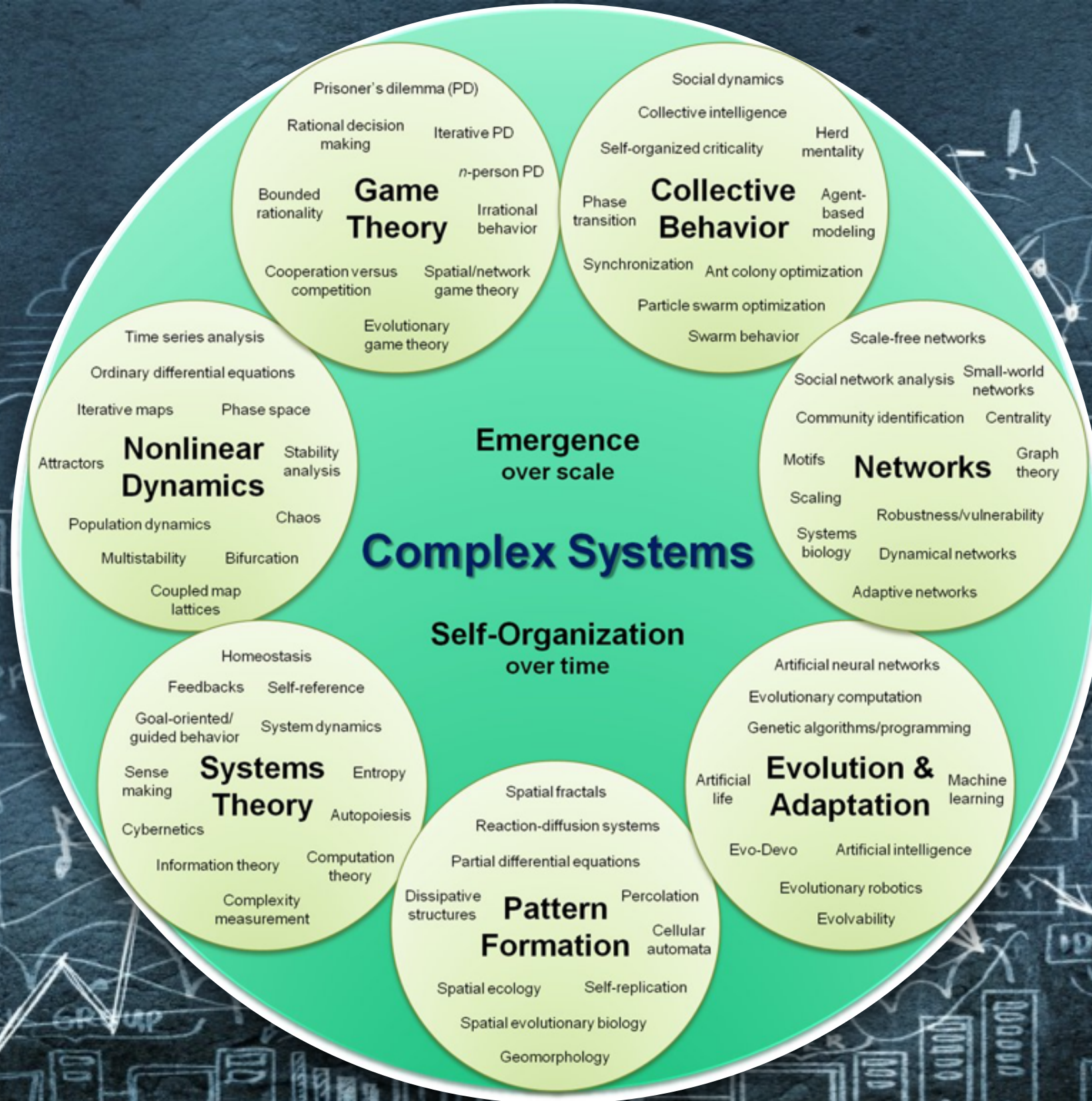
Citizens participate in solutions for the city
hacking systems & data
Ex. Madrid



Collaborative

Government and Society
participate investing in
projects
Ex. Amsterdam



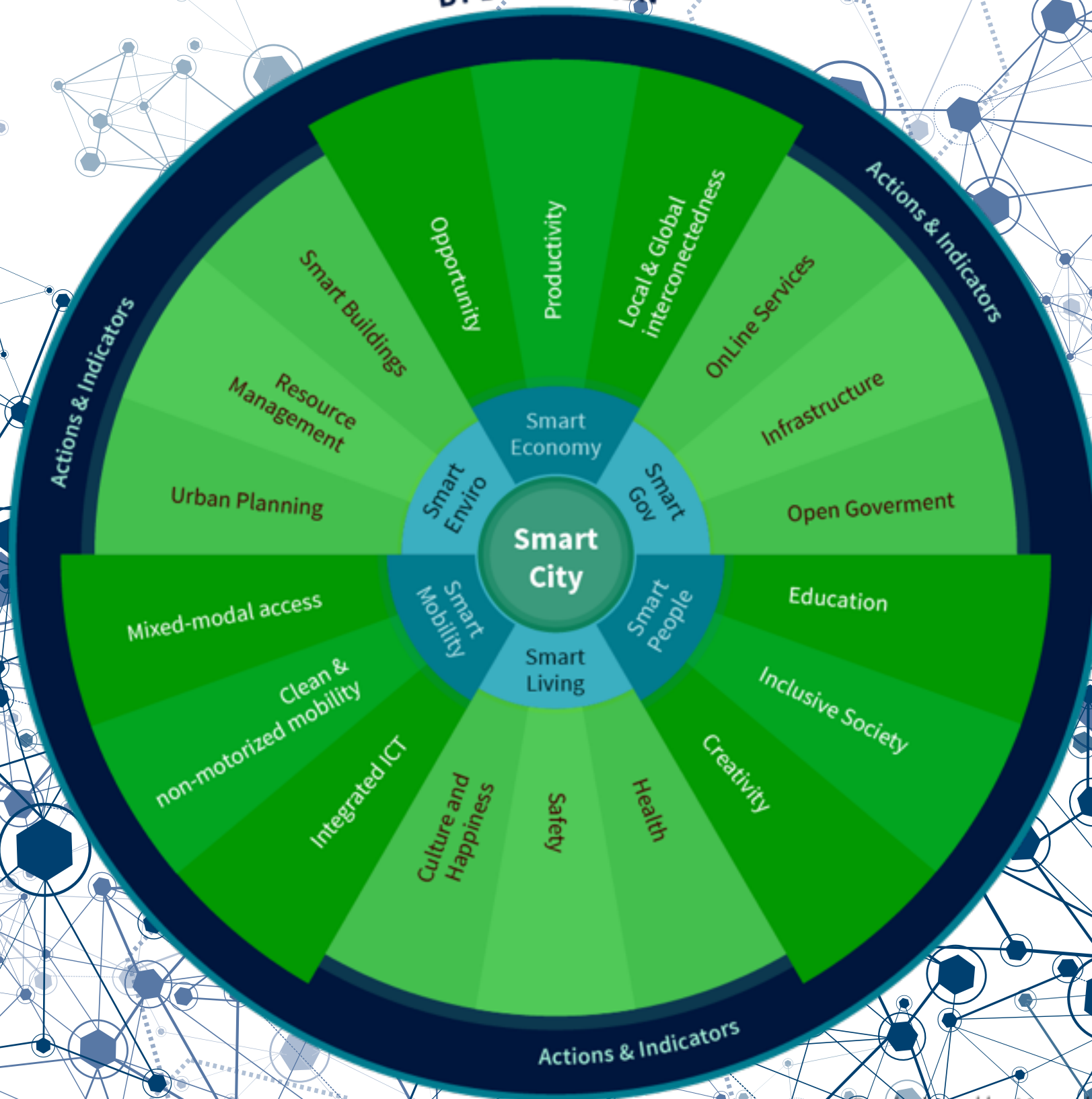


A Smart City is a **Complex System** and need an holistic view

[Harrison:2011uu]

Smart City Metrics

BY BOYD COHEN



Smart Cities Cycles



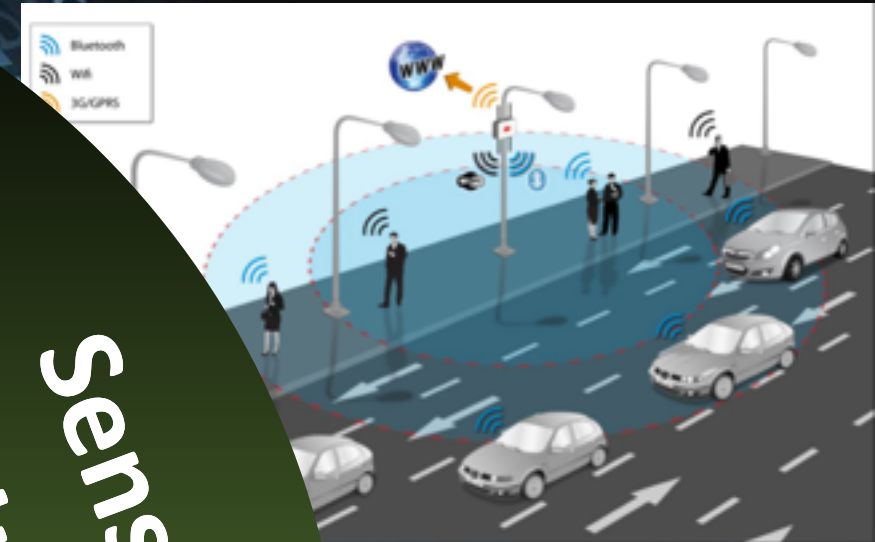
**Analytics &
Visualization**

Smart Cities

Cycles

**Open
Data**

**Sensor
Network**





GDL Challenges in Smart Cities

GDL Smart City Challenges

- Massive availability of sensors
- Communication resilience (using power line communication)
- Empower innovation with local talent (Living Labs)
- Support environmental & social sustainability
- Innovate in green devices, recycle as possible



GDL Smart City Design Strategy

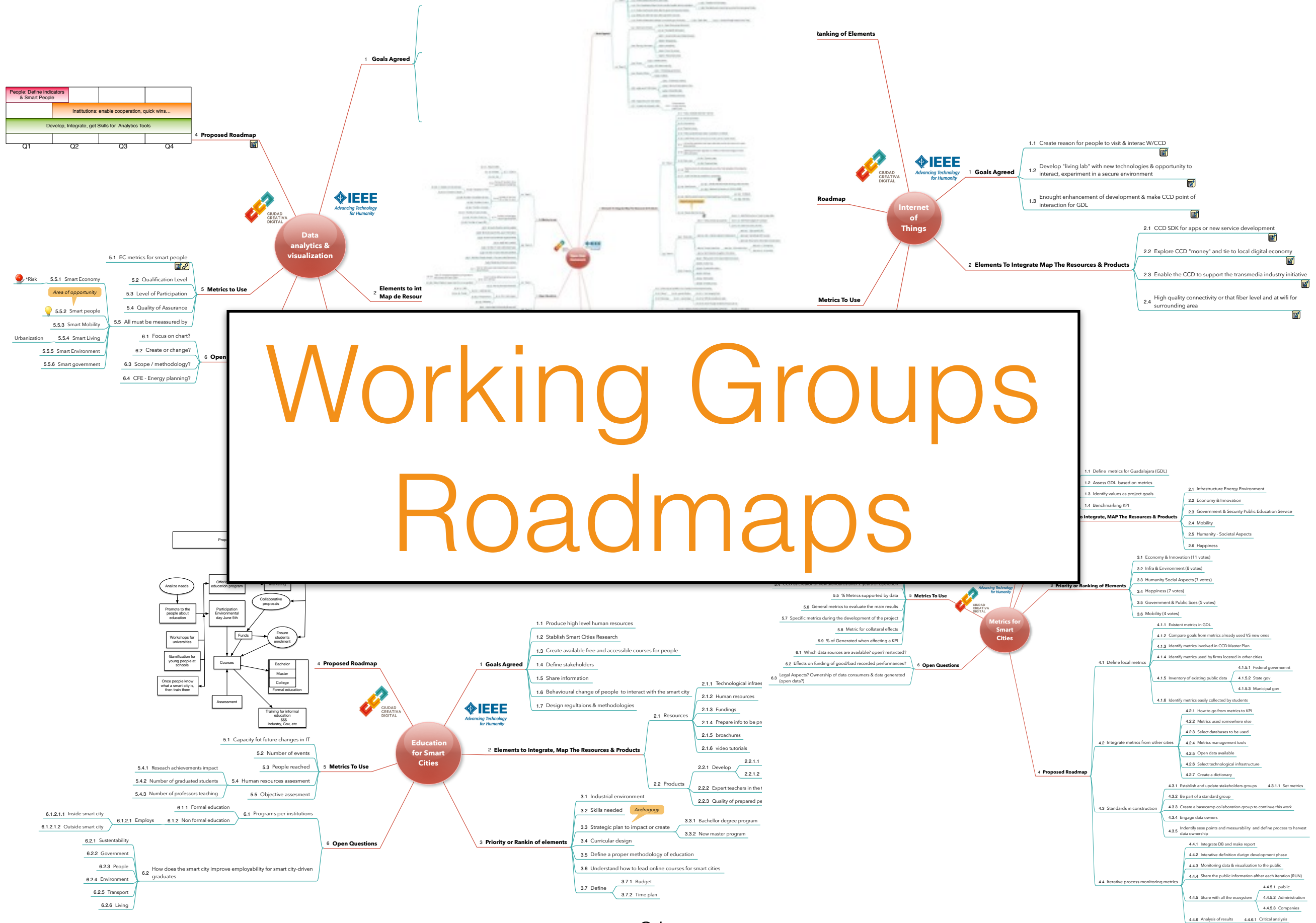
- Interoperability
- Modularity
- Scalability
- Support Open Architectures as possible
- Resiliency & Security

Current Activities

Creating communities embracing the initiative



Working Groups Roadmaps



IEEE White Papers

Allows to:

- Communicate experience in process
- Share best practices
- Enable worldwide collaboration

Is a process of working groups

<http://smartcities.ieee.org>



IEEE Smart Cities Grants for Postgraduate Students

Goal

The plan is to engage both professors and students to create a strong human knowledge base in the area of Smart Cities. This is a two pronged endeavour - involvement of students through PhD and Master theses and the contribution to the development of Massive Open Online Courses.

Allocation Grant

1. Two PhD Students for two years each at US\$60,000 per PhD Student (US\$15,000 per PhD Student per year); and
2. Ten Student theses - five in the first year and five in the second year at four hundred United States dollars (US\$400) per month for ten (10) months per year per Student thesis.

Important dates

Deadline: 15th August.

Decision: 22 August.

Submission

<http://smartcities.ieee.org>

ieeesmartcity.gdl@ieee.org

vmlr/15072014



Call for Participation

IEEE Smart Cities initiative in order to increase human capital in Guadalajara Section as first pilot program, opens their call to postgraduate students to apply for the selection process to receive a grant. The duties for the selected students, will be to support full time, the activities of the working groups developing the Smart City initiative locally in the IEEE Guadalajara Section. As a result, an outstanding thesis work in Smart Cities should be accomplished.

Student eligibility criteria

The following requirements to be covered will be evaluated to apply for the grant:

- IEEE Student active member (mandatory)



Current Status:

- 4 Master Students (IOT, ODF, DAV)
- 1 PhD (MTX)
- New in 2015: 6 Master + 1 PhD

**Empowers Working Groups
+
Core activities**



Living Lab For Smart City Solutions



[Veeckman:2014ic]

Open Data
Framework

Metrics

IEEE Smart Cities
MOOCs EDx
Development
2014-2015

Data Analytics &
Visualization

IoT





7,552
Total Enrolment

149
Countries

Introduction to Metrics for Smart Cities

Develop a basic understanding of the elements of a Smart City and learn the impact of using metrics to measure its performance.

About this Course

The concept of a Smart City holds much promise for improving the quality of life for city dwellers, but what technologies to citizens' needs in order to... and engaging more directly with city... that covers different aspects related to big... between channels and entities for... pressing differences between various... lyzed as a complex system. Since a... e of its individual sectors to obtain t... of life, including: urbanization,... useful for estimating consumed reso...

Estimated effort: 5 - 7 hours per week

Prerequisites:

Recommended for students in their last year of urbanism, architecture, or information technologies, as well as professionals interested in Smart...

15% High School
38.1% College Degree
45.3% Advanced Degree

Age Distribution:
29% Under 25
46.6% 26 to 40
19.2% 41 and Over

WAYS TO TAKE THIS EDX COURSE:

Pursue a Verified Certificate

Plan to use your completed coursework for job applications, career advancement, or school applications? Then work toward a Verified Certificate of Achievement to document your accomplishment. A minimum fee applies.

Minimum fee required. [See details](#)

[Learn more about Verified Certificates](#)

MOOCs Structure

Deliverables:

- Videos
- Learning objects
- Document lectures
- Quizzes
- Handbook
- EDx Platform



Time Frame:

4 Weeks 5 lessons per Week = 10 per
week of student work = 40 hrs
(ADDIE Model)

[Shelton:2011ke]

First IEEE International Smart Cities Conference

Hilton Guadalajara - Guadalajara, Mexico
October 25-28, 2015

The First Annual IEEE International Smart Cities Conference (ISC2-2015) is the premier conference sponsored by the IEEE Smart Cities Initiative.

[Submit Your Manuscript](#)

Call for Papers

Original and innovative contributions in smart city research and advanced implementations and deployments are sought for technical sessions. Please submit articles conveying new developments in theory, analytics, numerical simulation and modeling, experimentation, advanced deployment and case studies, results of laboratory or field operational tests, and other related creative endeavors as well as special educational developments for smart city curricula.

The conference theme is *Smart City for Sustainability*.

Organizing Committee

General Co-Chairs:

Mr. Gilles Betis
EIT ICT Lab, France

Dianna Valadez
IEEE GDL Section Chair

Program Co-Chairs:

Prof. Yin Hai Wang
University of Washington, USA

Victor M. Larios,
University of Guadalajara, Mexico

The technical areas include, but are not limited to:

- Smart city theory, modeling, and simulation
- Intelligent infrastructure
- Sensors and actuators
- Smart economy development
- Open data and big data analytics
- Safety and security systems
- Smart healthcare & emergency management
- Smart environment and policy development
- Citizen engagement and smart governance
- Connected Vehicle (CV) technologies
- Smart mobility and transportation
- Internet of Things (IoT) and smart cities
- Intelligent vehicle-to-infrastructure integration
- Smart grid
- Environmental capital reduction
- Digital city and smart growth
- Smart traffic system operations
- Smart buildings
- Smart city implementation
- Pedestrian/bicyclist safety; mobility systems
- Smart city for special needs
- Smart manufacturing and logistics
- Environmental monitoring technologies

Important Dates

Special Session proposal submission deadline:	March 31, 2015
Full-paper submission deadline:	Extended Deadline 30th June
Workshop/Tutorial proposal submission deadline:	
Notification of acceptance:	
Final paper submission deadline:	July 1, 2015

Conference + Exhibition +
Workshops + Hackathon

Thank you !

victor.m.lariosrosillo@ieee.org



References

- [UNWorldPopulation09] *World Population Monitoring*. United Nations Publications, 2009.
- [Demographia15] W. Cox, *Demographia world urban areas: population & density*. Demographia <http://www.demographia.com/>. Cited, 2015.
- [Schaffers:2011kt] H. Schaffers, N. Komninos, M. Pallot, B. Trousse, M. Nilsson, and A. Oliveira, “Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation.,” *Future Internet Assembly*, vol. 6656, no. 31, pp. 431–446, 2011.
- [Harrison:2011uu] C. Harrison and I. A. Donnelly, “A Theory of Smart Cities,” *Proceedings of the 55th Annual Meeting of the ISSS - 2011*, Hull, UK, vol. 55, no. 1, Sep. 2011.
- [Veeckman:2014ic] C. Veeckman and S. van der Graaf, “The city as living laboratory: A playground for the innovative development of smart city applications,” presented at the Engineering, Technology and Innovation (ICE), 2014 International ICE Conference on, 2014, pp. 1–10.
- [Shelton:2011ke] K. Shelton and G. Saltsman, “Applying the ADDIE Model to Online Instruction,” in *Instructional Design*, no. 37, IGI Global, 2011, pp. 566–582.