Keynote Speech

IEEE Smart Cities

Helping to Make Smarter Cities a Reality

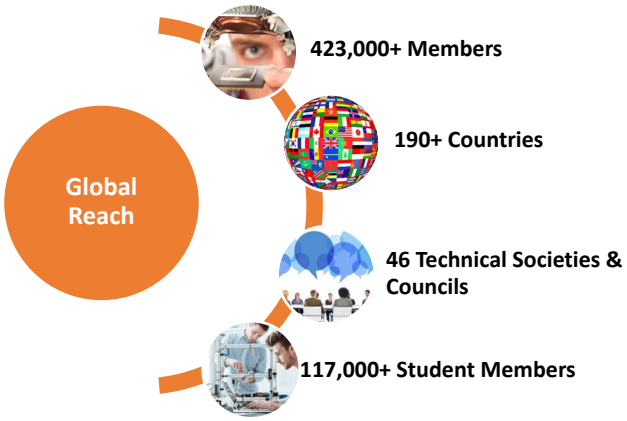
Saifur Rahman
IEEE PES President
International Smart Cities Conference (ISC2)
Kansas City, MO
17 September 2018

IEEE

Virginia Tech Research Center
Arlington, Virginia, USA

2 2

IEEE at a Glance

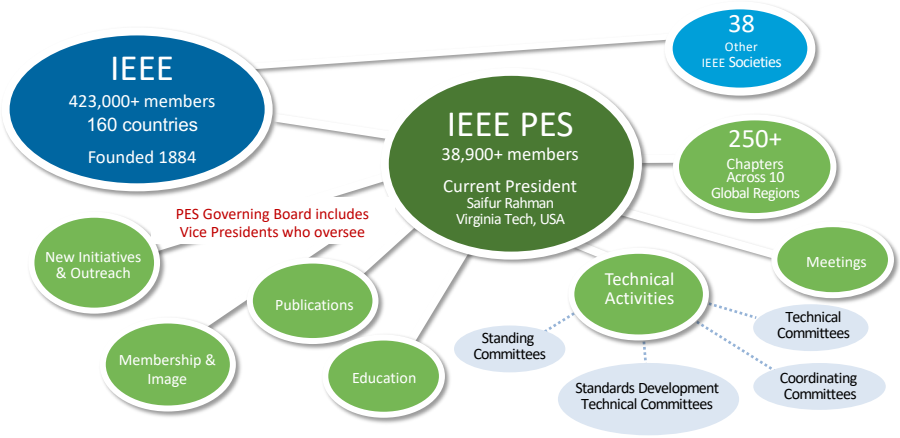


3

IEEE at a Glance

4

PES is the Second Largest Society in the IEEE



5

IEEE Smart Cities

Brings together various IEEE's technical societies and organizations to advance the state of the art for smart city technologies for the benefit of society

Serves as neutral broker of information amongst industry, academic, and government stakeholders.

- Smart Buildings
- Smart Living
- Smart Transportation
- Smart Energy
- Smart Communications
- Smart Networks
- Self-Aware Digital Hub
- Environmental Awareness

Get involved. Visit: smartcities.ieee.org

6

IEEE Smart Cities

IEEE Smart Cities provides unbiased smart cities expertise for the benefit of humanity

IEEE PES Power & Energy Society™

IEEE ComSoc™ IEEE Communications Society

IAS IEEE INDUSTRY APPLICATIONS SOCIETY Linking Research to Practice

CSS

CEDA IEEE Council on Electronic Design Automation

IEEE SMC Systems, Man, and Cybernetics Society

www.smartcities.ieee.org

IEEE PES Power & Energy Society®

7

IEEE

What are Smart Cities

- There is no single consensus definition of a smart city, but there is some agreement that a smart city is one in which information and communication technology (ICT) facilitates improved insight into and control over the various systems that affect the lives of residents.

Picture from: http://politic365.com/2017/09/01/smart-cities-require-smart-planning-policy-to-benefit-communities/

Smart City Connected Community

Building Blocks of a Smart City

The Connected City

A connected city is one where all relevant city systems—transportation, utilities, employment, health care, public safety, education, and others—are capable of communicating with each other to allow coordination and reduce waste.

Smart City

A **smart city** is an urban development vision to integrate information and communication technology (ICT) and Internet of things (IoT) technology in a secure fashion to manage a city's assets.

To be fully "smart," a city must be "connected."

Optical based traffic signal preemption system for emergency and transit vehicles

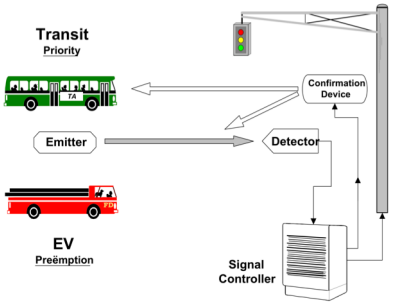
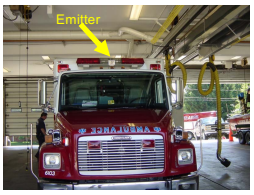
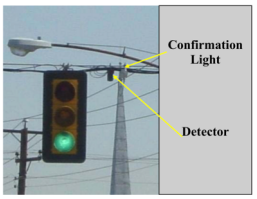


Figure 12 : System Architecture for 3M Opticom Emitter Detection System





https://vtechworks.lib.vt.edu/bitstream/handle/10919/31319/ThesisFinalVersion.pdf?sequence=1

13

14

Maricopa Assoc. of Governments, Arizona, USA

Final Report

14

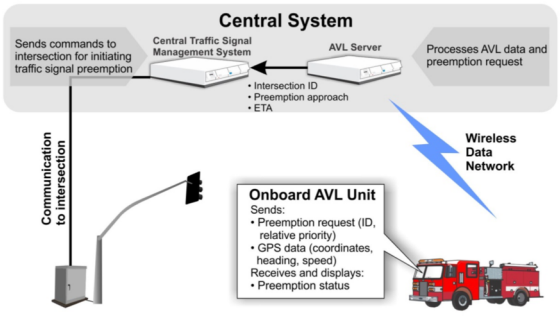
Optical based traffic signal preemption system for emergency vehicles Arlington, Virginia

Detector for Traffic Signal Pre-emption on intersection of 9th Street and Glebe Road, Ballston, Arlington.

Typical Signal Detector

Source: Maricopa Association of Governments (MAG) Emergency Vehicle Preemption
State of the Practice Study Final Report

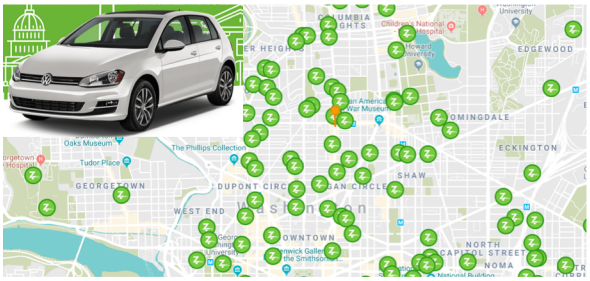
Central/Automatic Vehicle Location based traffic signal preemption for emergency and transit vehicles



Source: Maricopa Association of Governments (MAG) Emergency Vehicle Preemption
State of the Practice Study Final Report

Connected Transportation

- Connected vehicles and travelers will be able to share data with all sorts of equipment, and be able to procure mobility as a service, rather than purchase vehicles



Self-driven Vehicles

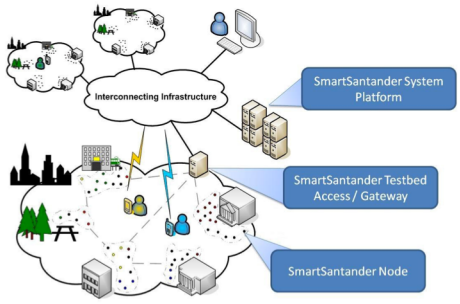
Source: Qualcomm

Smart City Examples

Santander, Spain

- Living experimental laboratory smart city
- 10,000 sensors located around downtown
  - Attached to street lamps, poles, building walls, beneath the asphalt of parking lots.
- Sensors data collection from:
  - Traffic, environment, weather, and people.
- Smart phone applications makes the data available to citizens
  - Real-time transit information, culture event schedules, tourist sightseeing information, and retail offers.

Santander, Spain



Pictures from:
http://www.smartsantander.eu/
https://www.bloomberg.com/news/articles/2013-05-16/spains-santander-the-city-that-runs-on-sensors

What is Normal

The New Normal

Smart Trash Cans in Baltimore, USA

How is IEEE helping ?

- Community building
- Conferences
- Content development
- Awareness building
- Outreach to policy makers

With all of the investment and attention being given to smart city development efforts around the world, how do we increase collaboration and coordination?

Resilient Infrastructures

Intelligence & Analytics

Sustainable Agriculture

Cleaner Mobility Technology

Distributed Renewable Energy

IoT Proliferation

Smart Water Management

E-Health

Smart City Pledge for Social Good

IEEE proposes to support participating cities in strategically leveraging technology to improve conditions in cities, strengthen local and regional economies, and support healthy populations in this new era of urbanization.

Proposed Actions

1. Develop a Smart City Program
2. Collaborate to develop and implement applications
3. Support policies and initiatives
4. Quantify, track, and publicly report progress

IEEE Smart Cities Support

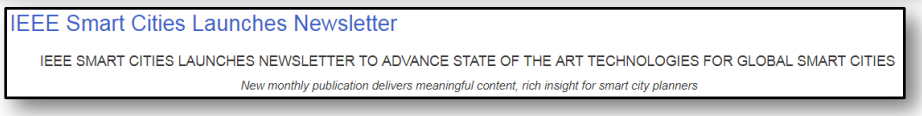
1. Convene representatives of leading smart cities
2. Direct IEEE's Technical Community
3. Provide education, research, and innovation

25

Credible Technical Information

smartcities.ieee.org

Conferences **Webinars** **Workshops**



@IEEESmartCities

26

27
SHARE YOUR EXPERTISE
Please join one of the following committees
• IEEE Smart Cities Education Committee
• IEEE Smart Cities Marketing Committee
• IEEE Smart Cities Publications Committee
• IEEE Smart Cities R&D Committee
• IEEE Smart Cities Technical Acitivities Committee
Become a member of IEEE's team of globally-recognized Smart Cities leaders
For more information, contact smartcities-info@ieee.org
Join the IEEE Smart Cities Technical Community Today!
Visit: smartcities.ieee.org
IEEE PES Power & Energy Society
27
IEEE

Thank you
Saifur Rahman
www.saifurrahman.org
President
IEEE Power & Energy Society