SUSTAINABLE SYSTEMS

Designing a Smart City
Our Agenda

- The Media View
- Problems with sensors
- What are our operating goals?
- The US Conference of Mayors
The Media View

Press coverage from *Forbes*, *The Wall Street Journal*, *The Guardian* and dozens of other publications are gleefully optimistic about smart cities.
The Media View

The Media View

- No more traffic!
- Renewable energy for all!
- Fewer fires and disease outbreaks!
- Billions in savings!
- Automated vegetable gardens on roofs!
Designing a Smart City - 6
Sensory Overload

Smart cities are based on **data**. If you want data, you need **sensors**. It’s not like roads, buildings and street lights will wake up magically and start chatting about the weather. We need sensors to see, hear, smell, taste and feel on their behalf. A platform can then aggregate all their data and use it to make (or propose) decisions at speeds exceeding human capacity.
Sensory Overload

Sensors will measure temperature, traffic patterns, foot traffic, air quality and infrastructure integrity (e.g., is the bridge safe?), among many other things. Lux Research, an innovation research and advisory firm, has a report that suggests the world will deploy 1 trillion sensors by 2020.
Sensory Overload

1 trillion sensors by 2020!

Let's put that in perspective:

If you have 7.4 billion people deploying sensors, each person needs to deploy about 120 sensors within three years.
The U.S. alone buys over 3 billion batteries a year. We have not built 1 trillion batteries in the history of humankind, yet we’re supposed to make enough batteries to power 1 trillion sensors within three years? I doubt it. Even if we could manufacture batteries at that scale, the resulting pollution and energy consumption would offset many of the benefits. And tell me, who would monitor and replace the batteries in, say, 1 million public sensors scattered throughout New York City? Even the Energizer Bunny wouldn't get on board with that.
The Energizer Bunny Rules?

Challenges for Alkaline batteries (e.g., AA)

- Increasing Cost of Raw Materials: Disposable batteries witnessed a pressure on manufacturing cost owing to the increase in the price of raw materials, such as zinc and electrolytic manganese dioxide (EMD).

- Counterfeit batteries

- Competing battery technologies
Get wired!

Let’s say we ditch the batteries and connect sensors to wires instead.

Installing 1 trillion wires is prohibitively expensive.

Whether you power those sensors with solar, nuclear or fossil fuel energy, transmitting power from its source to a device is impractical.
Get unwired!

We want to install millions of sensors that can retrieve useful, potentially life-saving data. Yet with our current energy paradigms, we can’t power 1 trillion devices, let alone a million in a single city. Thus, the smart city is a sci-fi fantasy without **wireless power** (i.e., power at a distance).

Is our utopia dead in the water, then? No. There are companies (including ours) developing wireless power that resembles the functionality of Wi-Fi but for power. We can solve the problem as quickly as societies unwire power distribution.
We’re unwired – so what’s next?

We can ask some practical questions:
- How do we mitigate rush-hour traffic based on the data?
- How do we reduce particulate matter in our indoor and outdoor air?
- Where are pollutants coming from and how might we stop them?
- How do we prevent meat contamination at a nearby food processing plant from becoming a city-wide health crisis?
We assume that by tapping into the collective intelligence of both devices and people we can create better living environments. ... But data is not a magical cure to all our woes.

To quote author and entrepreneur Derek Sivers, “If [more] information was the answer, then we’d all be billionaires with perfect abs.”

* Culture slide
What are our goals for operating the smart city?

As we design smart cities around the data we want instead of the wiring we have, the dialogue gets more complex. ... that brings us to the toughest question of all:

What do we value in a human habitat?
Life from a Mayor’s Perspective

- The US Conference of Mayors
- Issues for Cities
- Criteria to be a “Good” City
The United States Conference of Mayors is the official non-partisan organization of cities with a population of 30,000 or larger. Each city is represented by its chief elected official, the mayor.

Mitch Landrieu, Mayor of New Orleans, President

www.usmayors.org

About 1409 members in 2017.
Some major issues

- Impact of Tax Reform on City Finances
- Impact of CDBG* Reductions
- #MayorsStand4All
- Mayors Agenda for the Future

* Community Block Development Grant
Impact of Tax Reform

Impacts of Tax Reform on Cities

State and Local Tax (SALT) deductibility and bonds are essential financing tools by cities when it comes to providing public safety, infrastructure, and good schools. Learn how tax reform proposals are impacting these tools.
Impact of Tax Reform

(1) Double taxation

SALT is a fundamental principle in the tax code since its inception in 1913. It is based on the principle that the federal government does not double tax local tax dollars paid by hard working Americans to support teachers, firefighters, police, local infrastructure and basic services. The Senate’s proposal would put the federal government in the decisions our residents make locally on local tax dollars.

(2) Tax-Exempt Municipal Bonds would be harder to sell and would raise less money for cities.
Impact of CBDG Reductions

The Community Development Block grant program in the U.S. Department of Housing and Urban Development is under attack. The proposed budget presented by OMB Director Mick Mulvaney is aiming to eliminate the entire program, over $3 billion dollars of funding that go directly to our cities.
Mayors are standing for everyone in their communities on various issues. Learn more about our efforts on immigration and affordable health care.
ON HEALTH CARE LEGISLATION

Reno Mayor Hillary Schieve

“The opioid epidemic is a growing problem in Reno and across the country and I’m proud to stand up with other mayors from both parties and all walks of life to take it head on while Congress stalls in partisan gridlock.”
In a memo released Monday, Sessions* established narrow criteria for defining sanctuary jurisdictions: those that “willfully refuse to comply” with a single federal immigration law, Section 1373. He also limited what types of funding the government can withhold from jurisdictions that don’t abide by it.

* Jeff Sessions, US Attorney General, 23May2017
Mayors Agenda 1

- Safety & Security of Neighborhoods
- Fixing Crumbling Infrastructure
Mayors Agenda 2

Modernizing & Expanding our Workforce

Creating Equitable Communities
Ensure the Safety and Security of Our Communities

• Invest in community policing and resources to build trust, reduce violent crime, prevent domestic terrorism, and make every neighborhood safe.

• Reform the criminal justice system.

• Pass comprehensive immigration reform.
Fix Crumbling Infrastructure to Build Resilience

• Pass a major infrastructure bill that invests in public infrastructure projects and prioritizes projects that make our communities more resilient.

• Support resilient and sustainable growth through investment and policies that recognize the impact our climate has on our collective health, safety, and economic future.

• Generate new jobs and career pathways while improving construction standards, worker training and safety, and efficiency.
Expand our Workforce to Drive Economic Growth

• Address the impact of technology disruptions in our communities.

• Invest in training and access to jobs that exist in today’s economy.

• Guarantee equal access to financing and capital.
Create Equitable Communities to Increase Opportunity for All

- Invest in inclusive neighborhoods, affordable housing, and community development.
- Improve our public education from pre-k through college.
- Provide affordable and quality health care in every community and promote an environment of health and well-being.
- Increase equity and ensure civil and human rights.
A final word

The rise of smart cities is an opportunity to ask, “What does it mean to be a human being in a modern city?” and then design an answer into our physical environment.

(The author says) ... I trust with powerful data, enabled by wireless power, we’ll come up with some great answers.
So which is it for your smart city?