

Symposium on Smart Cities NAS Arab American frontiers in Engineering

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WHILE CITIES ARE NOW HOME TO **HALF** OF THE WORLD'S 7 BILLION HUMANS (1.8B are in Facebook, 6.8B have a mobile phone and 3.17B have access to the internet)



On-Demand
Mobility
chariot



motivate
get going

Zagster

Bandwagon

Sensors



BreezoMeter
Because Breathing Matters

THE SMART MOBILITY ECOSYSTEM

Curated by:



Street Level Information/Ads



JCDecaux



Beacons/Proximity



Blue Bite



GIMBAL™

Self-driving Cars

TESLA



Faraday Future

Mapping



MAPZEN



MapBox

here



CARTO DB
Geospatial on the cloud

Traffic Flow



Mobile Ticketing



Mobility Apps



The Challenge

FACTS:

20+ M



5+ M



10+ M



1 month



From Data to Information

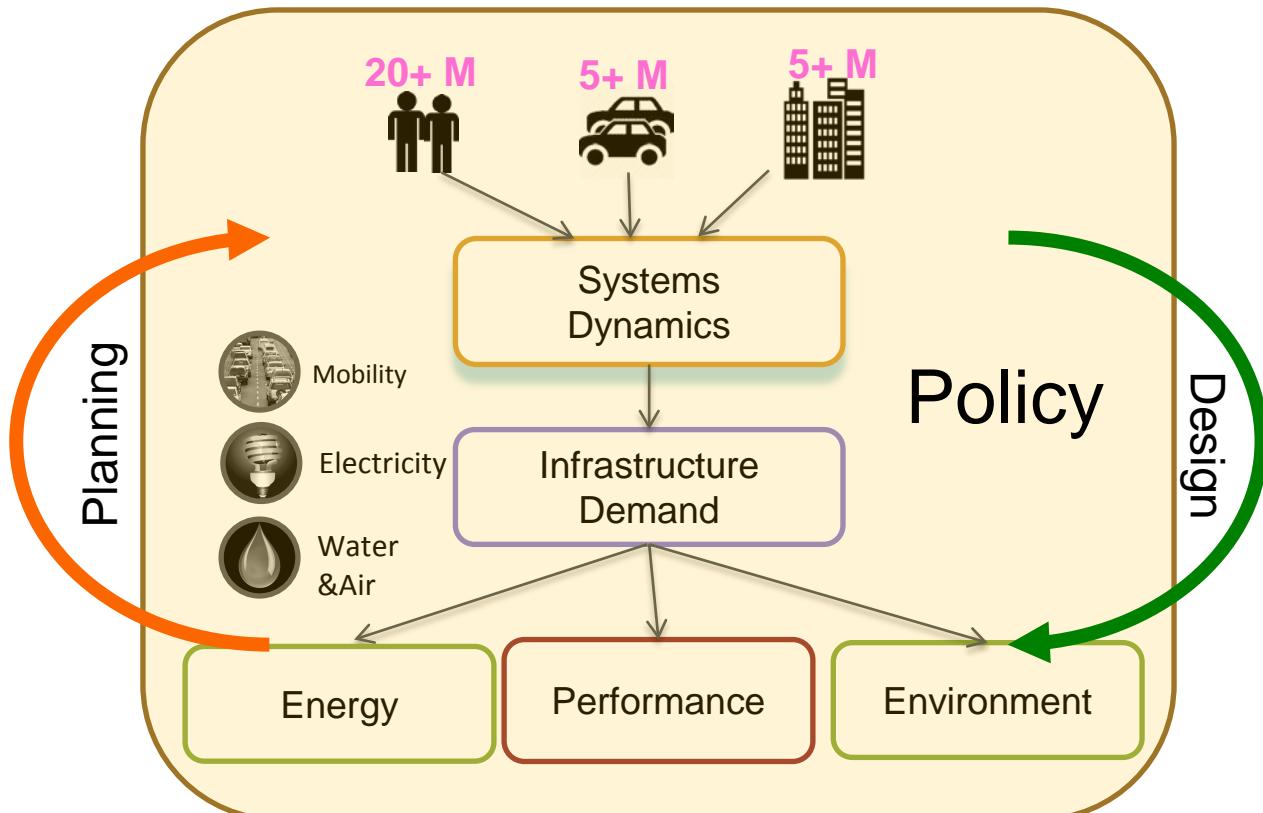
From Information to Action:

**Better informed policies for
the environment, public health
and inclusive well being**

Smart Infrastructure Planning of Urban Systems

Urban environments are changing:

- Rural-urban migration
- Quality of life
- Quality of service
- Sustainable Consumption



NAE's Engineering Grand Challenge: Restore and Improve Urban Infrastructure

Source: <http://www.engineeringchallenges.org/challenges/infrastructure.aspx>

The Opportunity

(ICT data or our digital bread crumbs)

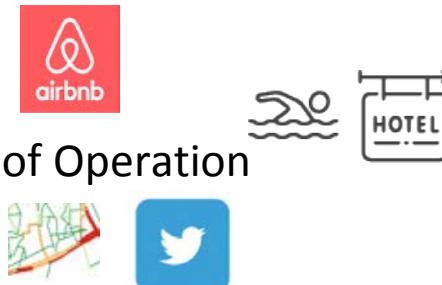
Data from Companies

- Mobile Phone Data
- Waze
- Credit Card Transactions



On-line

- Airbnb Supply
- POIs and hours of Operation
- Online Maps
- Social Media



Other sources

- Camera and GPS Data
- Transit feeds



2017 *This Is What Happens In An Internet Minute*

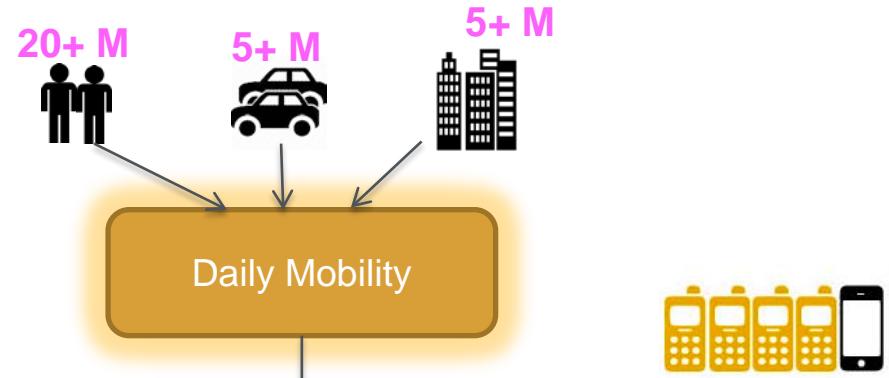


The Scale

5 billion mobile phone users
10,000 credit card transactions every second
16 million text messages and 452k Tweets



Big data Platforms for Traffic Management



Existing approaches

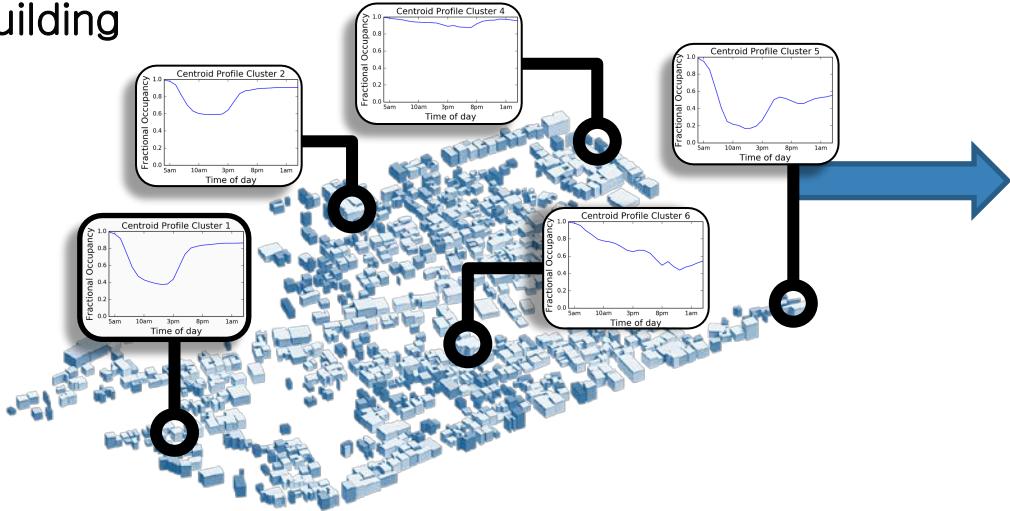
- Activity models based on travel diaries

New approach

- Passively Extracted Data expedite the Generation of Information

Big data Platforms for Energy Management

Building Occupancy, Weather and Physics of Building



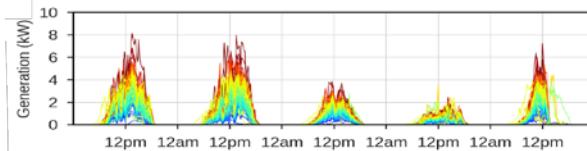
Existing approaches

Energy Models based on Building Technologies and occupant behavior

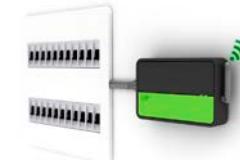
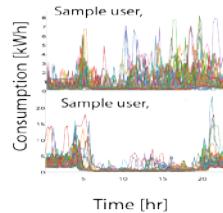
New approach

Real times sensing of consumption allows to prioritize savings intervention and the adoption of new technologies

Photovoltaic Production



Electric Daily Consumption





Jane Jacobs

“Cities are understood as ‘problems of organized complexity’, dealing simultaneously with a sizeable number of factors which are interrelated into an organic whole” (1961)

working from particulars to the general in a “web way of thinking”

In a data rich reality we have the unprecedented opportunity to seek for see similarities, patterns and universals, to then see differences, variation and specifics.



*Methods
for Data
Management
and Visualization*

*Platform for
Data
Technology and
Policy*

*Methods for
Sensing and
managing Urban
Energy
Network*