

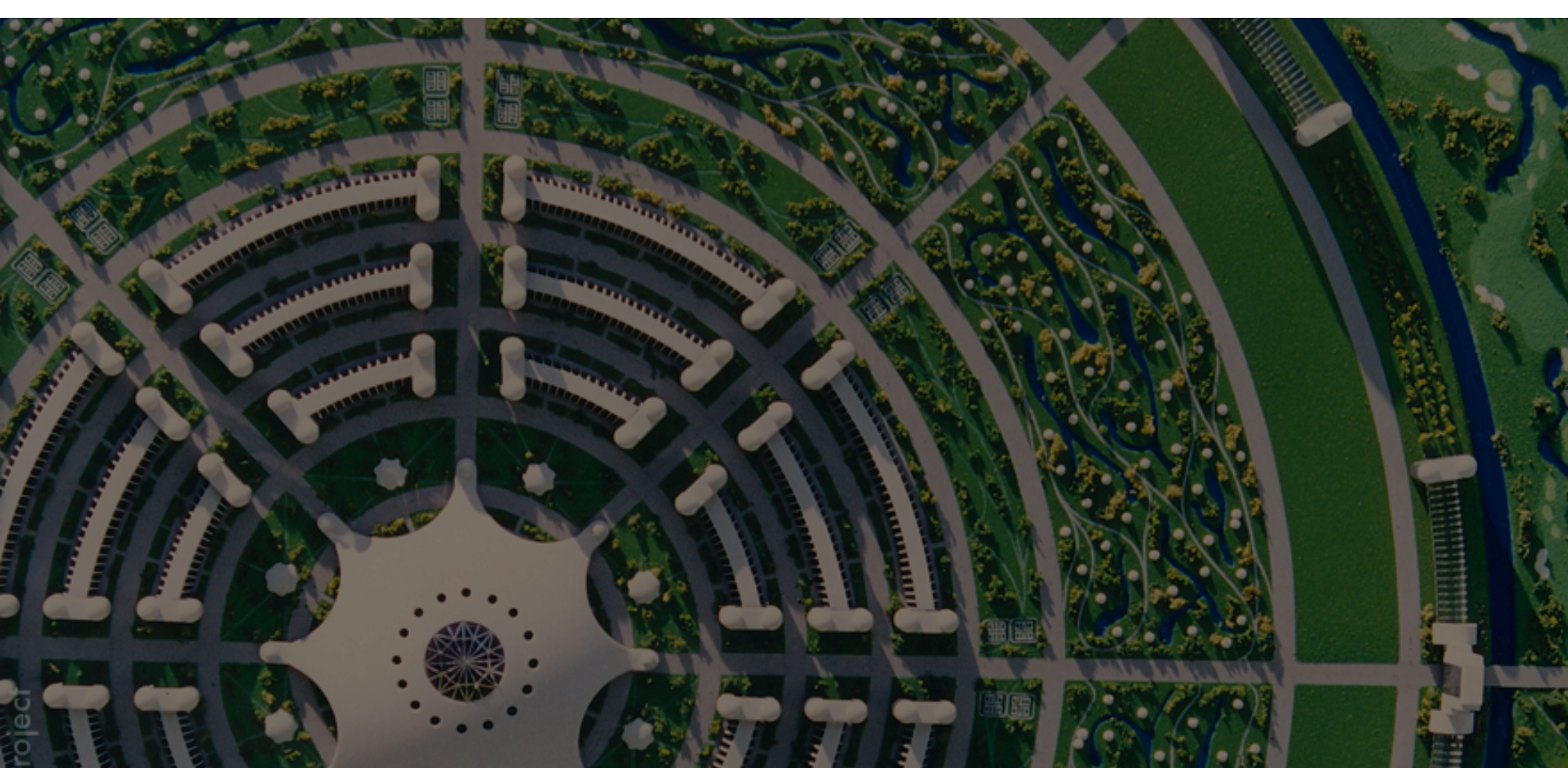
SMART CITIES: WHAT'S NEXT

ANTHONY TOWNSEND • DELFT VIA VIDEO LINK • 3 NOV 2016



STEPPING BACK, WE CAN SEE...

- Where smart cities come from
- What they have achieved
- The shift to long-term thinking
- Dilemmas where new technology enters old cities



WHERE SMART CITIES COME FROM

In 2008, for the first time...

More people lived in cities than the countryside.

We are now an urban species.

More mobile broadband subscribers than fixed.

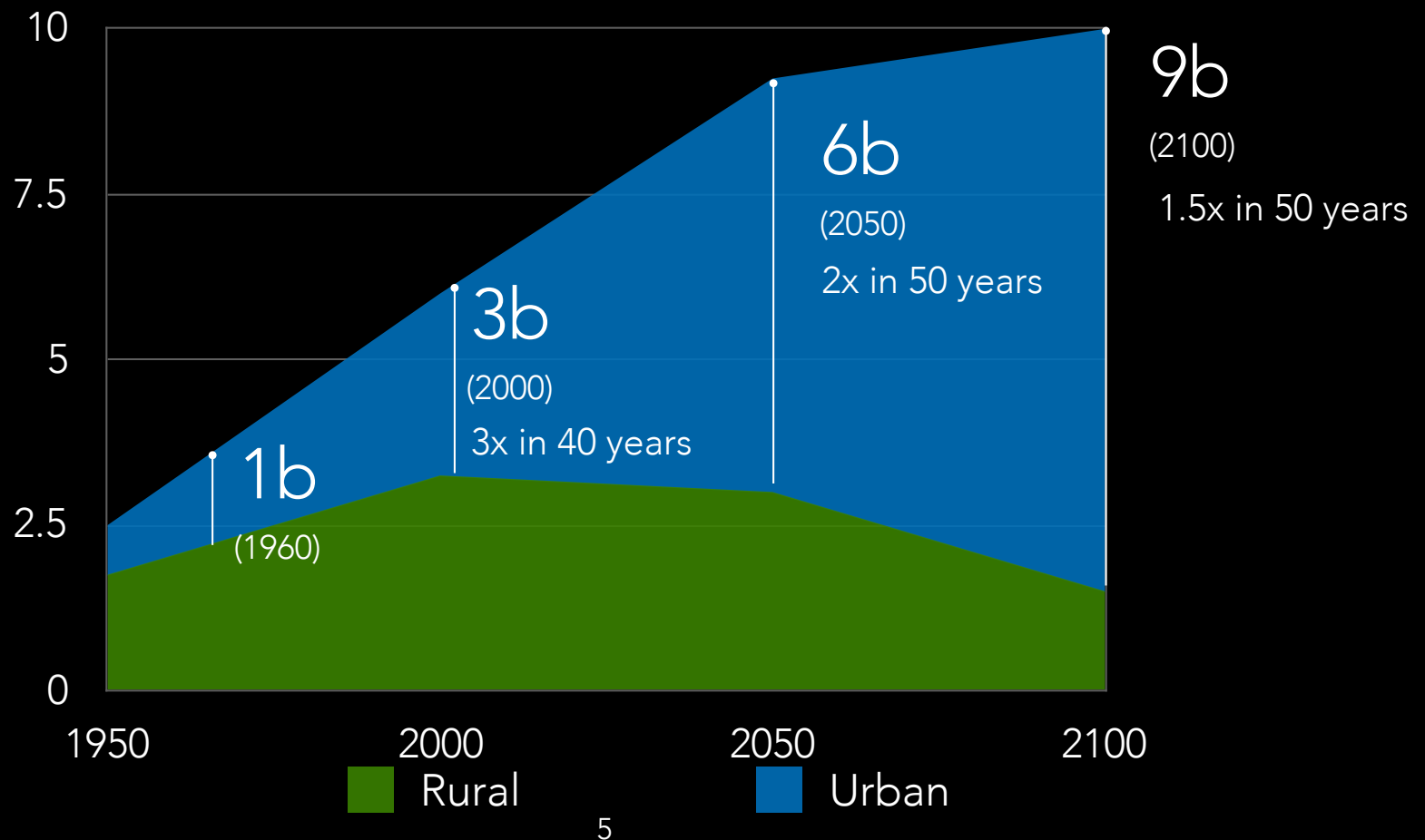
The Internet has been untethered.

More things are connected than people.

The Internet isn't about virtual spaces,
it's about physical places.

URBANIZATION

GLOBAL URBAN POPULATION

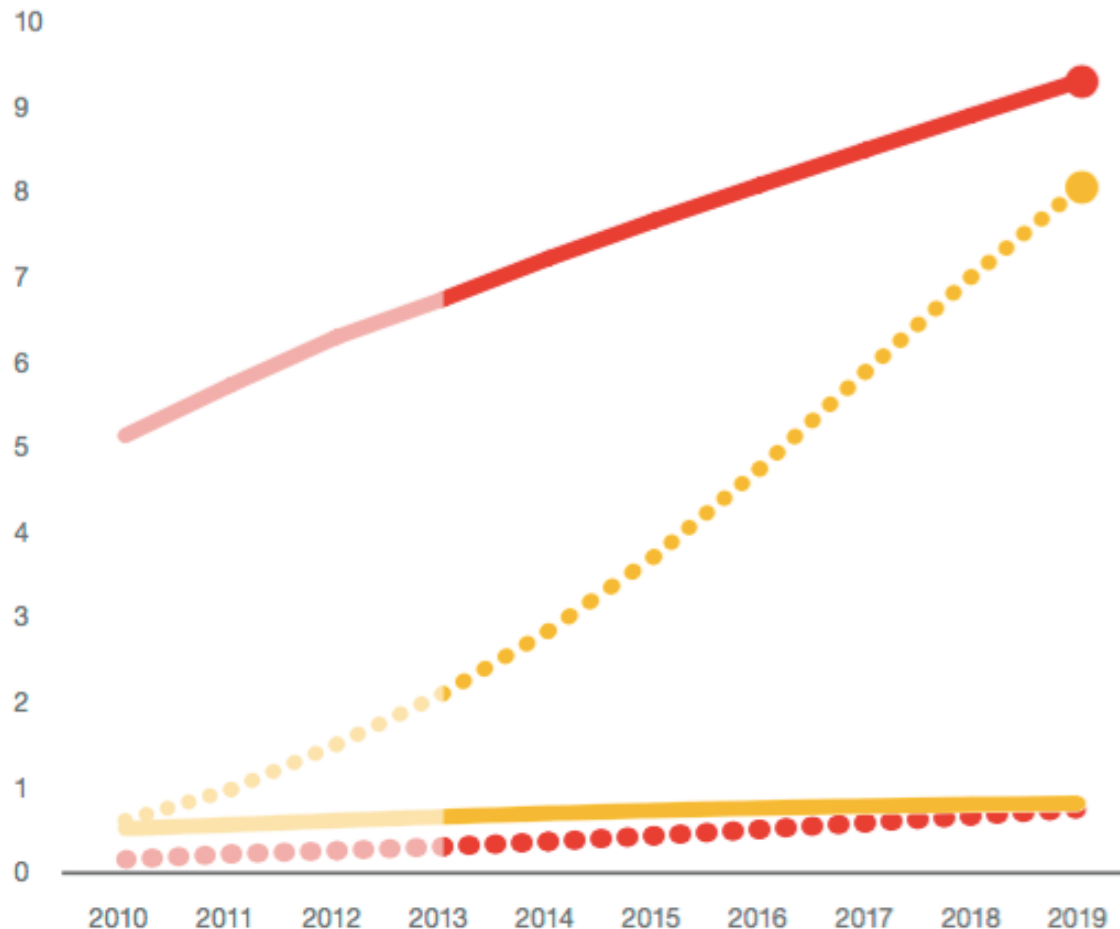


SOURCE: UNITED NATIONS POPULATION DIVISION

UBIQUITY, PART 1

MOBILE BROADBAND

Subscriptions/lines (billion)

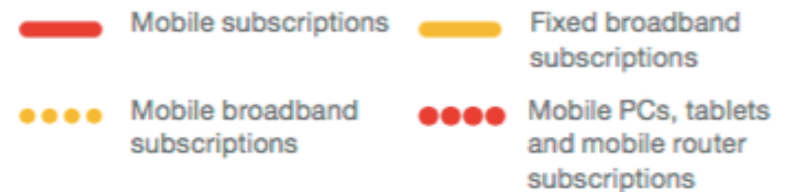


9.3 BILLION

**mobile subscriptions by
the end of 2019**

4X

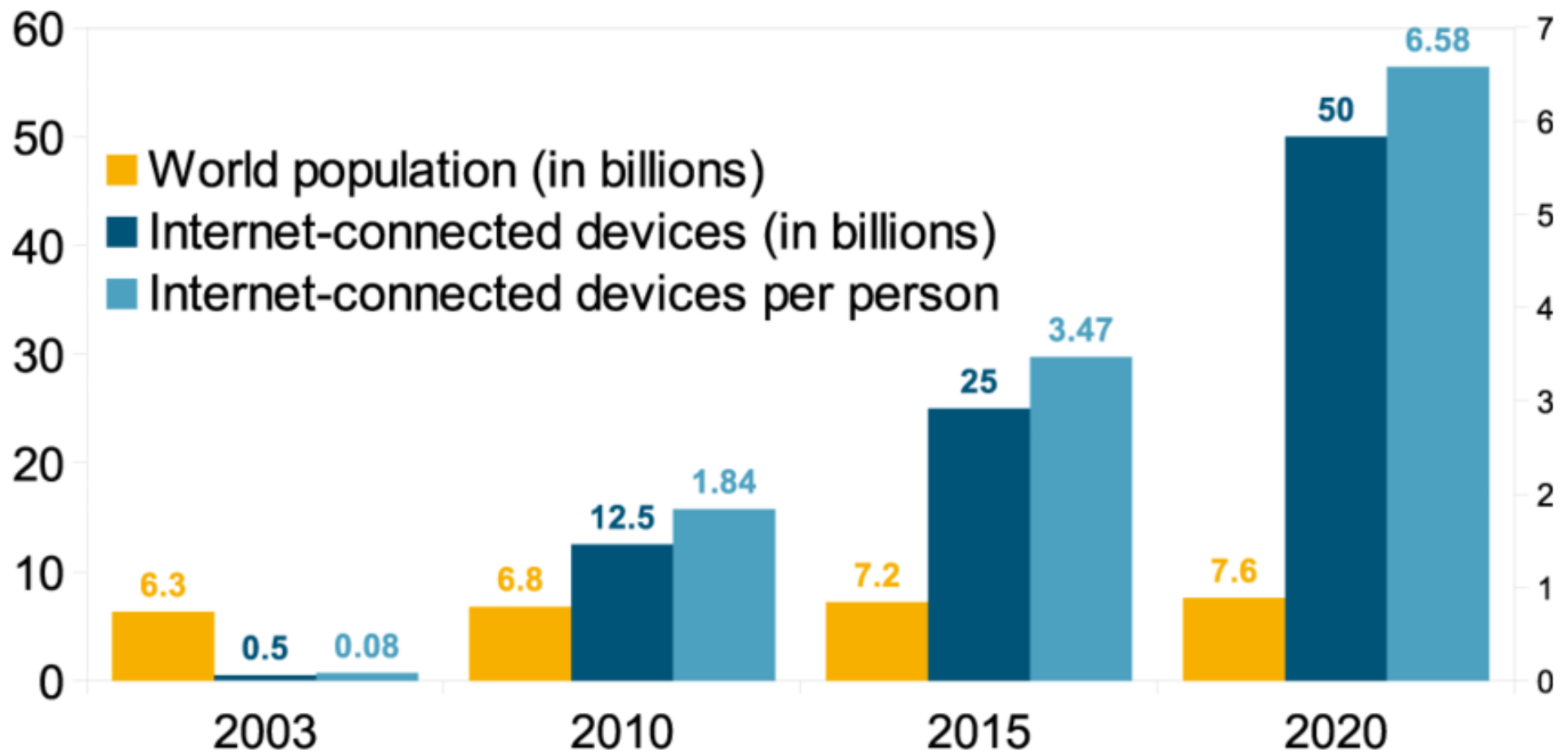
**growth in mobile
broadband subscriptions
between 2013 and 2019**



SOURCE: ERICSSON, 2013

UBIQUITY, PART 2

THE INTERNET OF MACHINES



SOURCE: CISCO SYSTEMS

A NEW GLOBAL INDUSTRY



2011 \$100 billion (Pike Research)

2013 \$408 billion (Arup)

2014 \$1.56 trillion (Frost & Sullivan)

~2-3% of global infrastructure spending

8

~2-3% of a district infrastructure cost

~2-3% of building construction cost



WHAT SMART CITIES HAVE ACHIEVED

NUMBER OF PLACES **119** NUMBER OF DATASETS **269** NUMBER OF OPEN DATASETS **149** PERCENTAGE OPEN **55%**

Key: ■ Yes ■ No ■ Unsure ■ No data

Data by Year: [2013](#) | [2014](#) | [2015](#) | [2016](#)

Sort ☐ alphabetically ☒ by score

[Add new location](#)

		Crime	Parcels	Construction Permits	Budget	Zoning (GIS)	Business Listings	Service Requests (311)	Transit	Restaurant Inspections	Web Analytics	Spending	Public Buildings	Procurement Contracts	Code Enforcement Violations	Lobbyist Activity	Campaign Finance Contributions	Property Assessment	Property Deeds	Asset Disclosure	Total Score
1	Las Vegas, NV	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1790
2	Austin, TX	1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1	■	■	1700
3	Los Angeles, CA	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1650
3	New York City, NY	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1	1650
5	Anchorage, AK	■	■	■	■	1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1400
6	Baton Rouge, LA	■	■	■	■	■	■	+ Add	1	■	■	+ Add	■	■	+ Add	■	■	■	■	■	1325
7	San Francisco, CA	■	■	■	■	■	■	■	■	■	1	■	1	+ Add	+ Add	■	+ Add	+ Add	+ Add	+ Add	1285
8	Chicago, IL	■	■	■	■	■	■	■	■	■	■	1	+ Add	+ Add	+ Add	■	■	+ Add	+ Add	1	1260
9	Louisville, KY	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1125
10	Washington, DC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1020

UNLEASHED TRANSPARENCY

THE SMART MOBILITY ECOSYSTEM

On-Demand
Mobility
chariot



motivate
get going

Zagster



Sensors



SIGFOX
One network A billion dreams



Curated by:

TRANSIT SCREEN

Traffic Flow



Mobile Ticketing

SIEMENS



xerox



masabi

Autonomous Vehicle Tech



QUANERGY

drive.ai

Mobility Apps



Citymapper



moovit

Street Level Information/Ads



Clear Channel Outdoor

LinkNYC

JCDecaux



Intersection

Beacons/Proximity



Blue Bite

GIMBAL

Self-driving Cars

TESLA



lyft



Faraday Future

Mapping



MAPZEN

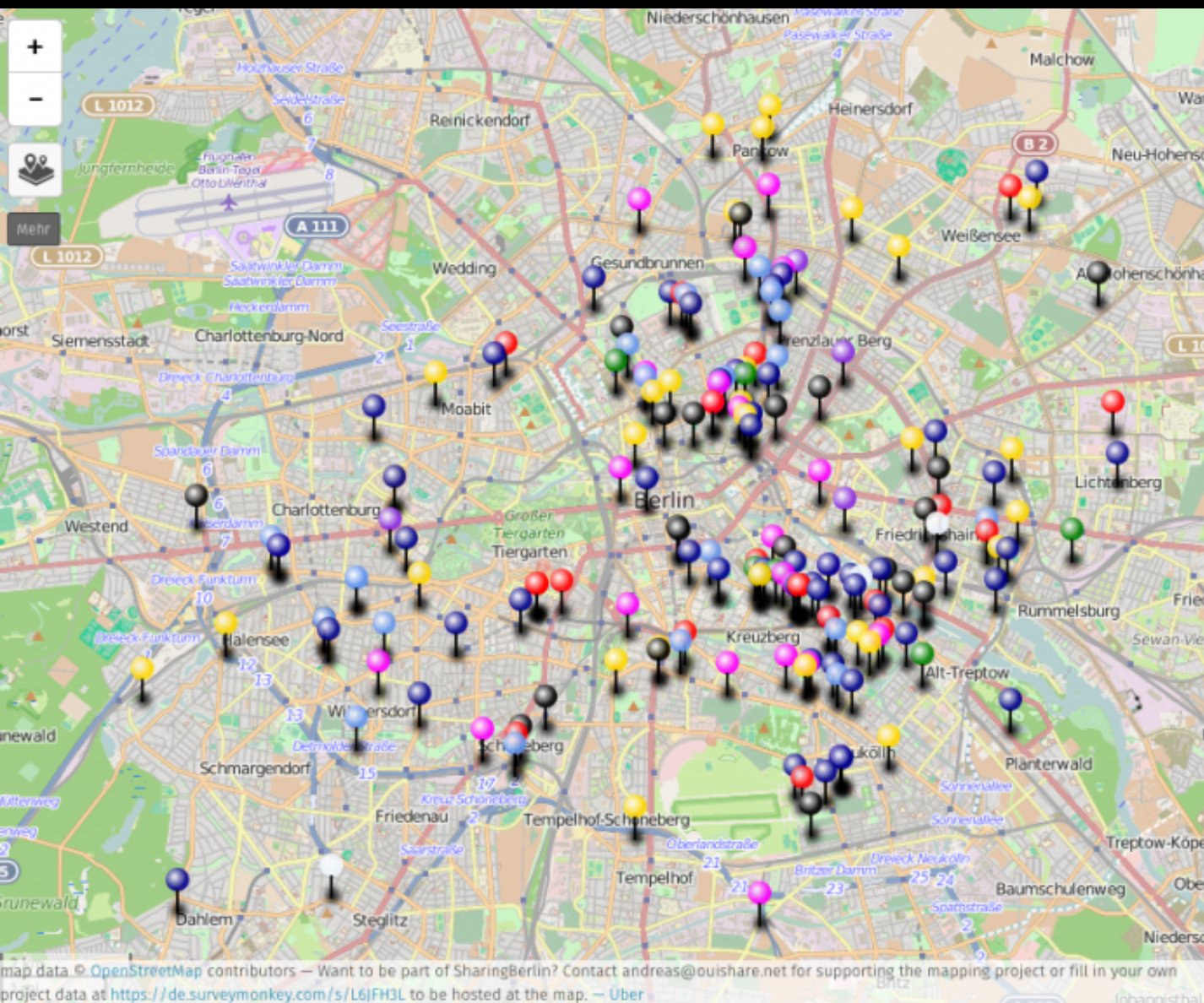


MapBox



CARTO
Geospatial on the cloud

RE-PROGRAMMED MOBILITY



Sharing Berlin

von sharingberlin

Mapping the Berlin Sharing Economy Startups and Companies

- **Arbeit & Tätigkeiten**
- **Energie**
- **Gegenstände**
- **Geld & andere Transaktionssysteme**
- **Gemeinschaftsbildung & Selbstorg.**
- **Mobilität**
- **Nahrung**
- **Räume**
- **Wissen**

▼ Credits

Credits der Benutzerinhalte

Want to be part of SharingBerlin? Contact andreas@ouishare.net for supporting the mapping project or fill in your own project data at <https://de.surveymonkey.com/s/L6JFH3L> to be hosted at the map.

RE-INVENTED AND REVIVED SHARING



STOCKHOLM ROYAL SEAPORT

Daily electricity use

Daily hot water use

Timing of electricity use

Daily CO₂ emission

Waste generation

Biogas production

Leave the latest in

8 HOURS AND 26 MIN

to arrive before 08:15 at Skanstull-
Internationella Engelska Gymnasiet

- 07:17: at fiskartorpsgatan 111, walk for 1865m to Universitetet T-bana
- 07:46: at Universitetet T-bana, take metro 13 to Axelsberg T-bana (Stockholm kn) till stop Slussen T-bana
- 08:06: at Slussen T-bana, take metro 19 to Hagsätra T-bana (Stockholm kn) till stop Skanstull T-bana
- 08:08: at Skanstull T-bana, walk for 345m to Skanstull-Internationella Engelska Gymnasiet

Buses from: Kista

514 to Spånga station
179 to Vällingby

Metros from: Kista

Nu	11 to Akalla	12 min
7 min	11 to Akalla	26 min
	11 to Akalla	23:31

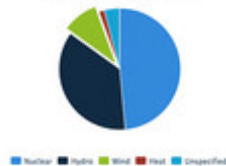
SIGN IN

NOTIFICATIONS WEATHER ENERGY TRAFFIC WATER SOCIAL ENGAGE FEEDBACK

b)

ENERGY

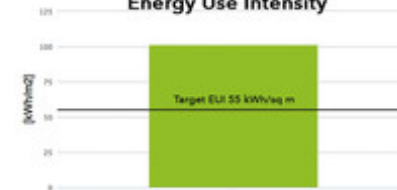
Realtime Nordic
Power Grid Mix



Realtime District
Heating Grid Mix



Your Current
Energy Use Intensity



Your Comparative
Domestic Electricity Use



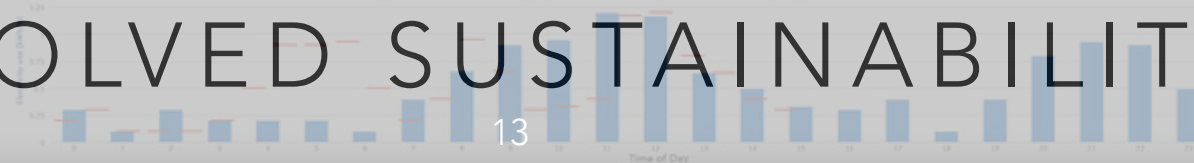
Your Comparative
Domestic Hot Water Use



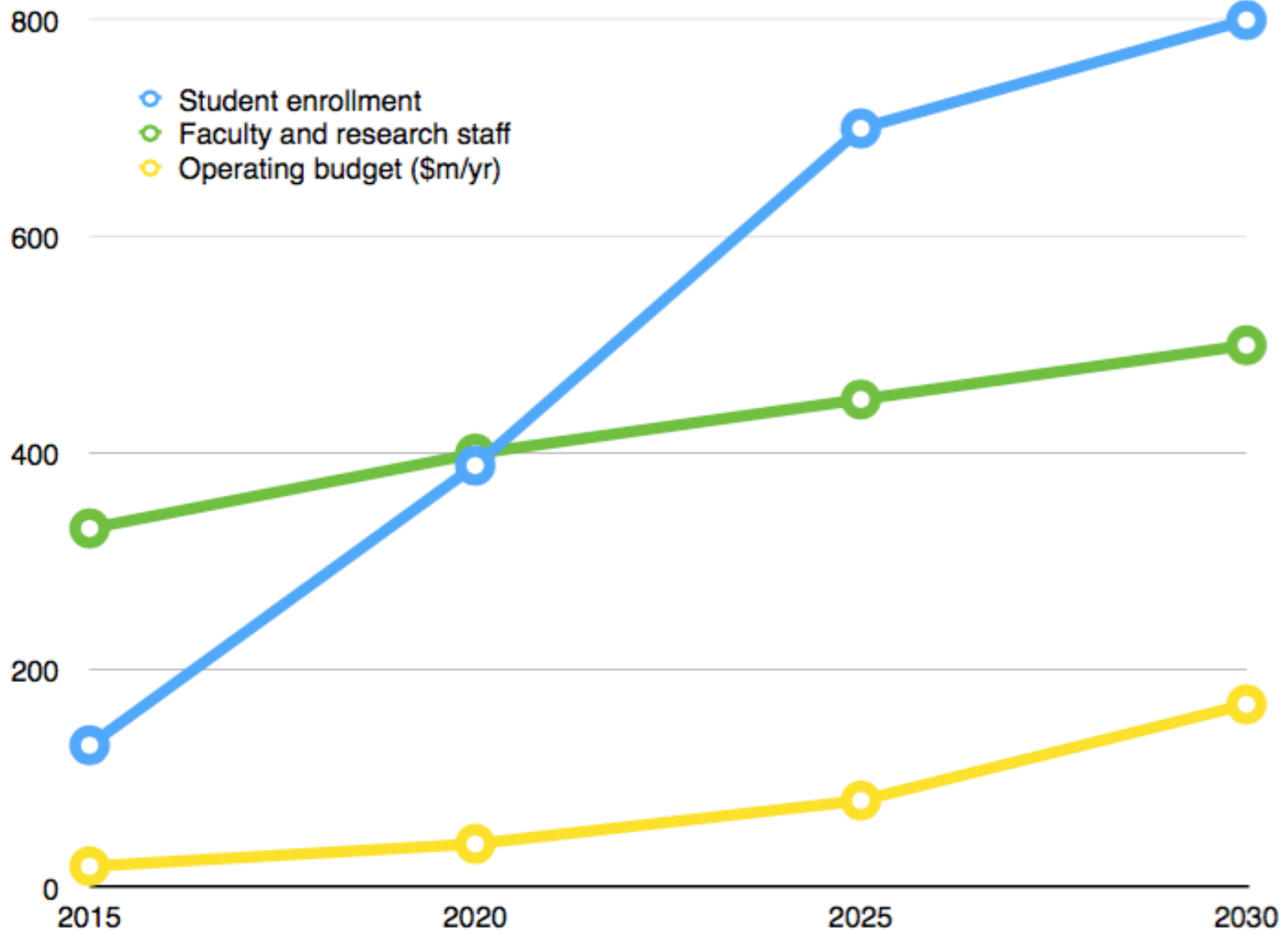
Your Comparative
GHG Emissions per Capita



Your Actual Electricity Use Compared to Optimal Use



DEVOLVED SUSTAINABILITY



LAUNCHED A NEW URBAN SCIENCE



THE SHIFT TO LONG-TERM THINKING



WORKING PAPER #25 / JUNE 2015

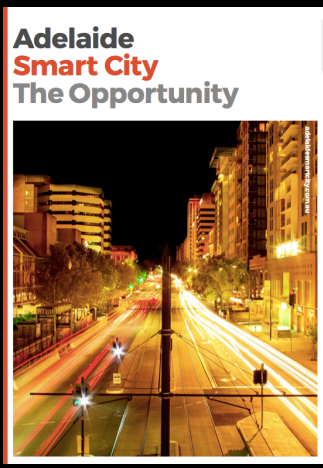
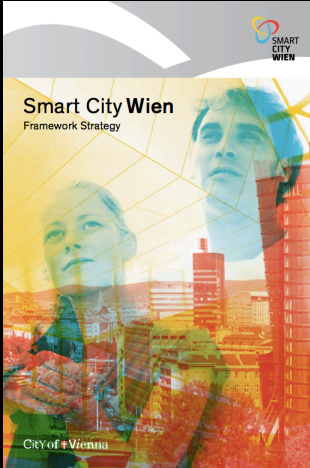
DIGITAL MASTER PLANNING:
An Emerging Strategic Practice in Global Cities

+ DR. ANTHONY TOWNSEND AND DR. STEPHEN LORIMER



NYU

Marron Institute
of Urban Management



[HTTPS://PERMA.CC/HX3F-AVEJ](https://perma.cc/HX3F-AVEJ)

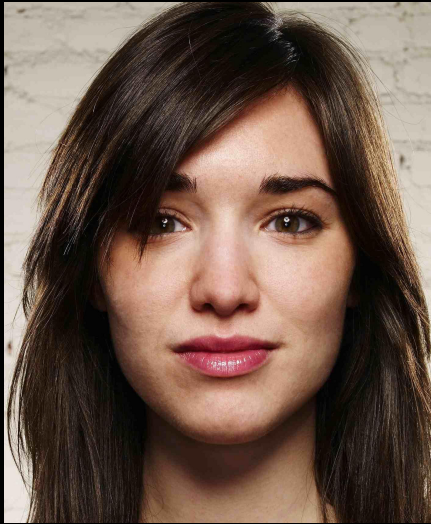
DIGITAL MASTER PLANS

	NYC	Dub.	Chi.	Lon.	S.F.	H.K.	Sing.	Barc •
Internet access	4	0	3	0	4	0	0	0
IT skills	7	6	6	2	9	3	2	0
Open data	6	4	3	4	8	1	0	2
Citizen engagement	7	2	1	4	15	1	1	1
E-government	3	9	4	11	13	4	0	3
IT infrastructure	1	7	1	1	89	4	5	5
IT industry promotion	2	16	8	7	5	0	0	0
Urban infrastructure	0	1	2	0	10	0	2	15

WHAT THE PLANS SAY

- Education / Research
- Empowerment
- Environment
- Funding / Support
- Government
- Incubators / Accelerators
- Infrastructure
- Open Data
- Prototypes / Demonstration
- Startups





New York

Single agency



Chicago

Devolved to an NGO

SMART
LONDON
INNOVATION
NETWORKS

London

Delegated to stakeholders

WHO IMPLEMENTS THE PLAN

THE EVOLVING MOVEMENT

MODI'S 'SMART' VISION TAKES SHAPE

SMART CITIES WHAT THEY ARE AND HOW THEY WILL HELP

- Smart cities, in the most basic terms, are urban settlements that exploit technology to offer more structured and hospitable living conditions for residents.
- Information and Communication Technology (ICT) forms the backbone of smart cities and is the main tool to address common problems like congestion and waste of energy.
- Such cities have a centralised control system which provides real-time inputs on availability of water, electricity, public transport, healthcare and education.
- Intelligent communication tools enable administrators to manage and respond to emergencies faster.
- Consumption of scarce resources like water and energy is streamlined through the use of technology.
- Better energy management systems help people automate energy-consuming systems in buildings.
- There is emphasis on the use of renewable sources of energy.

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The urban development ministry has identified almost all the places where the NDA's 100 smart cities will come up

INTELLIGENT TRANSPORT

- Smart cities have an integrated transit corridor, where Bus Rapid Transit corridors as well as suburban train networks are linked with pedestrian and cycle lanes. Furthermore, there are pods to carry people directly from point to point, with no stop at intervening stations.

- Smart cards facilitate travel in multiple modes of public transport.
- Real-time transport displays can provide visibility and information on availability of public transport as well as the condition of traffic on routes.
- Digital parking meters send information to mobile phones when a space opens up.

Seven smart cities each will be built in Rajasthan, Gujarat, Karnataka and Kerala

KARNATAKA

KERALA

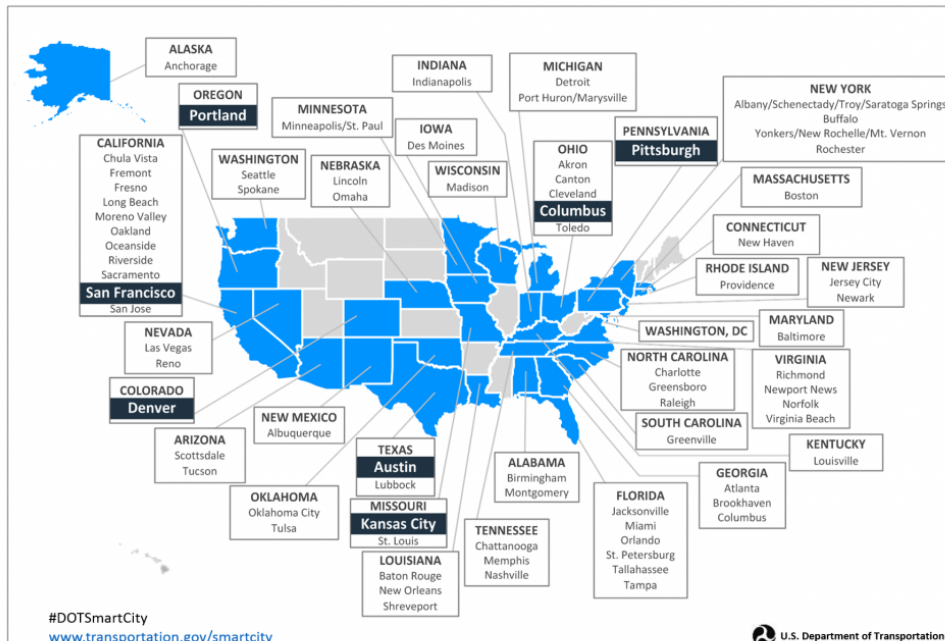
THE PRIME MINISTER'S DREAM PROJECT

- The Narendra Modi government plans to build 100 smart cities across India and made an allocation of ₹7,060 crore to this end in the Budget 2014-15.
- Cities such as Delhi, Hyderabad, Surat,

Colombatore, Bangalore, Mangalore, Jamshedpur, Mumbai and Chennai have launched initiatives for deployment of advanced communications systems, Metro networks, traffic management frameworks, smart meters, GPRS for solid waste management, online water quality monitoring, online building plan approval schemes, etc



DOT Smart City Challenge



#DOTSmartCity
www.transportation.gov/smartcity

U.S. Department of Transportation

Bloomberg
Philanthropies

MAYORS
CHALLENGE

ENGLISH

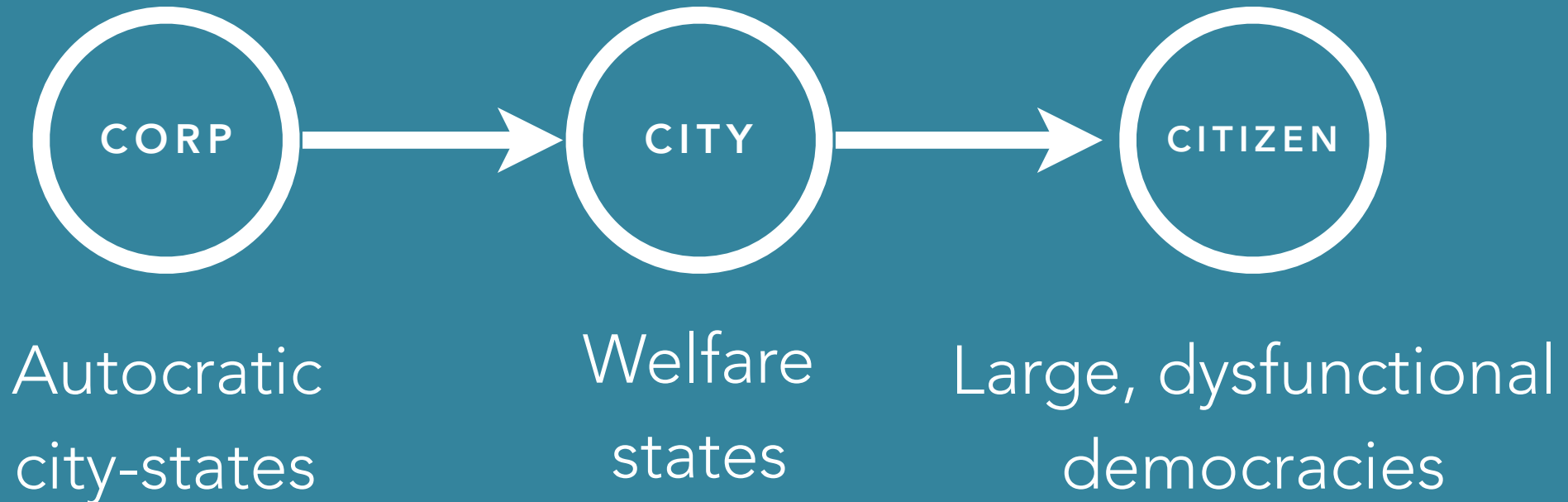
LOG IN

A COMPETITION CALLING ON CITY LEADERS FOR

BOLD IDEAS

2016 MAYORS CHALLENGE • LATIN AMERICA & THE CARIBBEAN

THIRD WAVE OF SMART CITIES



smart cities are...

“communities where
government, business,
and citizens are using
digital technology to
address **timeless** urban
problems.”

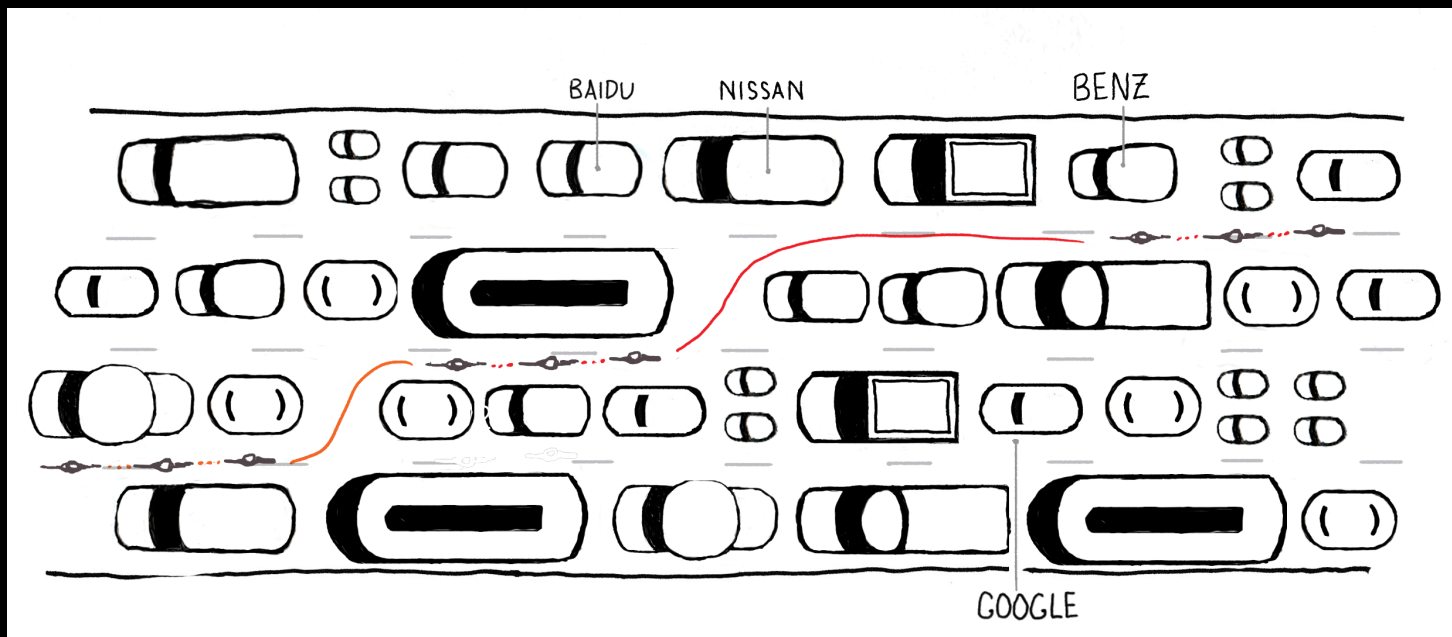
MORE PASSIVE PARTICIPATION OR UBIQUITOUS SURVEILLANCE?



AUTOMATION FOR EFFICIENCY **AND** EQUITY?



SEAMLESS SERVICES: ENHANCING OR UNDERMINING GOOD URBAN DESIGN?



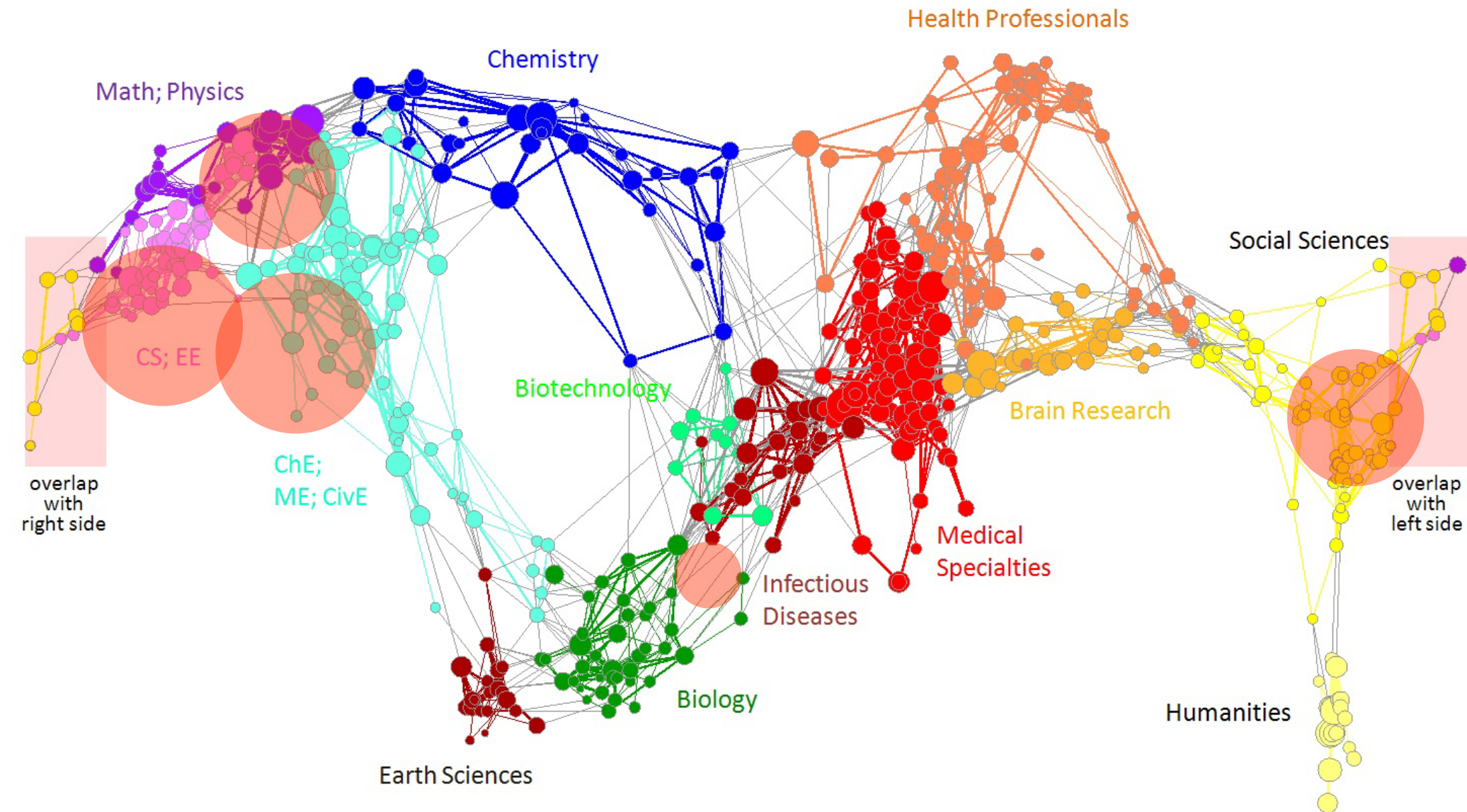
AUTONOMOUS OPERATIONS DRONES FOR GOOD, NOT EVIL



EVIDENCE-BASED GOVERNANCE: CATALYST FOR REFORM, OR BAND-AID FOR BUREAUCRACIES?



URBAN SCIENCE: NARROWING OR BROADENING OUR PERSPECTIVE ON URBAN COMPLEXITY?



END