# Title: Rethinking Urban Infrastructures in the Digital Age

Subject: Data Drive Cities

* Data AndTech

Abstract:

The infrastructure that cities provide has evolved as needs changed and opportunities arose. Today, sensors check air quality, roadway cameras help with traffic flow and new energy systems have come to fruition. This evolution has the potential to have the greatest impact, as long as it involves citizens and leverages their creativity and innovation. How can local governments rethink urban infrastructures so that they better serve city dwellers?

Speakers:

#### Ellis Juan

#### Jonas Donizette Ferreira

#### Uwe Jasnoch

#### Burak Aydin

#### Ben Nduva

#### Oscar Pallarols

Conference:

[Music]

welcome to this very captivating themed

rethinking urban infrastructure in the

digital age we have a very diverse was

geographically and sector wise panel go

briefly introducing them jonathan Asante

is the mayor of Campinas one of the

highest growth cities in brazil very

close to Sao Paulo Vash not represent

sexagon is a company in the technology

field and consultant based in the United

States obviously he's from Germany Barak

Adan a Silver Springs Network a company

from Istanbul that is actually working

on network using radiofrequency very

very interesting been Duva is the head

of energy and infrastructure at the

Ordnance Survey this is a state-owned

company that specializes in actually

serving and getting data into n we have

a local Oscar pala rolls his director of

innovation a cell cell max is a telecom

company two very brief concepts that are

like to live with you before I give the

word to the mayor one is the concept of

smart cities as a European space that

uses ICT technology to deliver better

and more efficient public services who I

are the same time preserving physical

and environmental assets for future

generations

these are cities that put the citizen at

the center of its planning process the

second concept is the becoming in a

small city doesn't happen from Friday to

Monday over the weekend is a process you

need to have the adequate backbone

infrastructure of ICT connectivity I've

seen many cities spend 1 or 2 million

dollars in applications that they can

simply cannot run because they don't

have the the fiber optics and they don't

have the hardware to be able to run it

and it's a process where you should

start by the easier to implement

applications or easier to implement

solutions and the ones that can give you

benefits in the shorter time so don't

start doing the sophisticated solid

waste management system that tells you

exactly when the waste basket is half

full or is full completely start with

something more simple like changing your

public lighting emigrating from

traditional generally to LED technology

that will give you some savings that

will give you some extra money that you

can use for investments and with this

brief introduction I will now leave you

with the panel I will leave you first

with the mayor of convenience mayor he's

gonna speak in porto portuguese

portuguesa gonna start is senora's

señora zag reduce women cement a la

invitation para participar st grande en

quaint Roda cidades intelligence soy al

cardiology do de campinas a Presidente

de la francaise nacional del r car desde

brazil estoy aquí hoy como leader della

delegation de las mejores cidades del

brazil en este cilenti oportunidad para

compartir buenas iniciativa z levar

experiencias Ozzy tosses paraben or melo

haha' Northwest residents Rafa's era me

a presenter so in Portuguese esto nos

accreditor Mo's de Nova so a Nova so a

oportunidad de que nós temos de poder

fazil French yo pharisee resultados

melhores para no se Paparizou

yo quiero mostrar a key Adela Garcon

Brazil era que NOS acompaña son

professor grant C Dodds Jacob ties a

keifa's imparted our international spree

field ie akiha presenter French

nationals preface son cuatro Santos

Municipal Center presenter Papa song

set enticing percent do PB involve a

todos escape ties in principalmente

spring spicy dad's

temos as vice president systematic

assesses prefect some professors Lagado

Zara Genova so de tecnología que NOS

ayudan in famous hell achieves a estar

en un poco na na cidade in a cidade de

campinas amis Adagio million widows and

mutants tempie beii de catorce bastions

billions dollars

Tenga focus on para technology prey Nova

Samui Protestant ability' Giacomo's Mos

Espa de Vere

Vikram Ficano estado de Sao Paulo

Sudeste Brazil yo g lae inter most

populous cemetery Serie C Dodds do

estado sample I know jicama somos na

kilo kiyotsugu que otra P necesario para

que NOS pusimos tear anova so go Bermuda

spawn fazenda su apart Andhra poyo

incent Evo's Apache das universidades

tambien participant o e principalmente

initiative a bravado Eric reduce cement

a volver no Susie no eran on conseguí

a porous agua renew Brazil no estamos

trabajando muito compass areas public

Oprah Vedas prognosis pasamos cigar a

Bose resultados de algún resultados

Nessa are destined for Mossad agents a

seller adora semana de Sense technology

caress Takara's a semana de CS

technology designed Akeno involve a most

odious cleanses da NOSSA hegemony

spouting sin tennis phase emos de

technologie de nova zone algo muy

presenting a vida de NOSSA cidade heat

ambience a Grey Goose apricot Eva Scavo

mention our pokémon stata lado

logo message na na estamos también con

programa de Tahiti or intelligence

primer oho a DES bureaucratization

fascist facility' do a video SUSE da de

un segundo a message energy immobile ax

Dodge

dando preference apprendi really a

facilitator tambay Campinas USA gia

assess debut IG my procession is a

fabric on music oscillator estas a jihad

in Campinas notice arrow issue de

seguros Chioma son - muy topo such a

villain subhana Allah Pro passenger

prácticamente todos profit Prince

promised as grancy dad Brazilians Akio

Kurdish are pricey no in contributions

imposed a cidade de campinas nos

conseguimos implementation

defibrillation todas las escuelas

monospace putin todavía lo la velocidad

a internet eat resent Oh a party digital

para dentro de las cuales

Oh apricot evoke an penis basic Oricon

cameras intelligence registrado Tambor

toda movement a song Viejo's la

necesidad de mazuma pre catchy vous

dirai-je transport mobile Adagio burn

axiom abou zona hora con la camisa

person todos NOS vamos

now in tempo hey ow especially Elia

orientation do or REO transportista

Segundo uma coisa KO result aqui es por

todo cidade own air NOS simple is meant

a human communication electronic lel

mihaela son conceded Oh Lucy da da

musica de Stratego local equation

Susie's asuntos interests nests Verdugo

voluminous Powell

yep Reef a Torah Torah Saban forum

Astros de Senado cuando voy a tomar

Madison tambay ella puede fazer makan

suit a a suspicious fertilized embassy a

pet spa so popular Ana's des rois in

questa cotton Bay nós temos no brasil

incumbent a municipal naritsugu's

towards evolve mo zoom aplicativo

prairie meadows

OS Porto's de salud phone SMS commence

como se como aplicativo espresso azusa

dad owns 10 su mo we stock is Becca

Mentos in call Post Odessa wood-mizer

Osmond s Wakasa a report in contra

you men comment a procuress falando

poktan been sobre o future odessa dad's

knowledge plan a cement

nós temos uma cidades sense grants

cuadrado moines polka character discos

municipal brazil ears diferentes da

cidade zero pay some grant money sips

potato nós temos ki faster news for

sauna parties urban is a so do against a

mental stats at a practice service

públicos ellis non-fee Quinta narrows

Campinas OS do so it sends Chrome's

cuadrado z-- quad sent some urban asado

Z Quattro sensing the potential intimacy

dodgy King Boris says room a cidade

grain Juma metropoli a he Co

metropolitan attend tres Malone smell

Jabba tarts

no santaguida Mo's character is Kazuo

qualidade Vida

implant a mo sumidero occupation plan a

John Doe roost amici uma cidades Favreau

Sarah

convivencia en tres pesos yo car - are a

key whomever gray de cemento as mad seat

fellow convict him a few Fed s zk knows

professor do brasil accommo Smoot

contains impart spa de Sevilla a no me

de frente nationals prefaced razandrich

IO desafío una todos nós physique on

key technology no say Japanese Alfred

stage más que la fossa conscious pesos

cinto no Jia Jia oak want we Super G

Miller are avoided Ella's yoga credo

quia grandest romantic knows pasamos

phasor is Eno Sonova geração kicker na

skier amazona reality uma fasoli dodge

my or Dada como si Jimenez digitized

Yvonne Chrissy in fluency and respect

sources who evolved with obrigada

towards pillow convince a to French

nationals preface the puesta de aqui I

suppose some despair water-ski knows for

intelligence meta great

multiplicative effect very disciplined

very disciplined in terms of time I

forgot to mention something in my

initial remarks and it's as in other

years to question there is an

application that you can download which

is called ask in vote and then later on

they will send me the questions that you

as a public are making and I will direct

them to each one of these speakers who

so ladies and gentlemen thanks a lot I

left for them to lecture and I'm going

to talk a bit about rethinking urban

infrastructure in the digital age I'm

from hexagon your technology provider

and I'm going to share some insights of

what we are doing what we are planning

what you can actually use and when

starting about singing about smart

cities I think it's a pretty nice start

to think about okay what is the

difference between a regular city and a

smart city so what does what are the

differentiators about that and it has a

couple of things it's of course it's a

public domain besides you can look at it

and there are a couple of highlights we

want to mention there the one is

engaging the citizens in the society if

you don't take the society with you

you're never getting smart of course

apply collaborative technologies for the

leadership's give them a chance to make

a good decision work across the

disciplines or break up these silos

where the people of thinking and working

and isolated fields not talking to each

other and that's but not least and

that's what we love to do because we are

technology company rather user data work

with infrastructures and work with

modern technology so what does it mean

in reality

well we truly believe that a smart city

a safe city is a kind of universe at the

University of different disciplines like

transportation like Public Safety like

health care like governmental services

and of course it's something which

belongs to sensors and data now the

yield point behind sense on data is you

need to provide the context and that's

what we call the digital city so we need

to really digitize our city to provide

the right context to put in the sensors

to put in the data and to draw the like

the right conclusion out of the things

you're going to see so digital first

that simply is exact because otherwise

they have no chance to do Smee nning

phul technology around it projects we

are working on

it's like smart security this is the

robot which is which is an outbound of

sensor technology you can put him

everywhere you don't like to go there

and mine my favorite samples always if I

have a refrigerator house with cool

stuff we are like minus 18 degrees I'm

not willing to make a petrol inside so

I'm putting him and have a look at if

everything is ok but same is the smart

energy we have smarting smart metering

so we know we do predictions about the

energy consumption we'd started planning

to make it optimal that we going to

reduce the large power plants energy

supply we do need the connected citizens

we do have intelligent transportation

everybody is talking about

autonomous driving but what does

autonomous driving and reality means we

have hundreds of sensors working

together and you need to connect this

different cars because otherwise we do

not gain benefit out of autonomous

driving as long as we cannot connect

them the benefit is not really worth to

mention and of course Martel's care

where all the sensors takes place now

talking about sensors it's you know

everybody has a smartphone you have to

do they have to state your question but

what is the smartphone in reality it's a

unit of Zen dolls with a display and a

computing power and some people still

using it to talk to others what that's

not designed for that anymore

it's more like it's it's an information

display it's in sensor and people are

trying to catch the data your location

your elevation whatever you part of them

is doing and then try to bring it

together the real part and that's that's

really a crucial part in that story we

cannot simply pipe the Zen for

information in the network and expect

that we can do something meaningful out

of it because piping each you know my

smartphone has something like 10 sensors

if every sensors piping is information

in the network the cellar network is

gone so we need to do some

pre-processing

that's what we call conversion C

platform we need to do some

pre-processing on sensor side to

minimize traffic and to maximize content

of what we're going to deliver to them

to the end unit otherwise we are stuck

with latency us bandwidth or whatever so

a lot of technical obstacles but with a

smart way you can really overcome these

things

and as I said we need to apply IT trends

now everybody knows about big data and

big data you cannot go to a conference

like this talking about technology

without mentioning big data I mean

that's a commodity technology but what

we are also think about and me to think

about is data fusion combining data to

generate sense and a meaning out of it

what we called deriving actionable

intelligence on it we must get the

insights and last but not least and for

my personal point of view the most

important technology IT technology for a

smart city its IOT Internet of Things

because there everything makes sense and

the most important element with IOT is

it's not the solution I'm sorry to say

that but IOT is a platform it gives you

a platform to generate a solution but it

is not such a solution and as already

said you need to foresee the change you

need to foursie's in upcoming new

technologies you do plan in really in

constant improvements and if you don't

do these things by reshaping how we are

thinking about that solution they never

be able to accomplish that and we never

be able to make it smart smart smart and

short look behind the theme basically

and that's what we're currently doing we

take all different kind of sensor from

from static sends off to real-time sends

us we need to fuse them we need to

process them in a cloud base to renew

the rule-based environment we need to

put the classical context an operational

data on side how to operate an

electrical network and then we need to

present the result of this computation

in a way a mayor can act on it that he

knows what he wants to decide here he

has a vision for a city and we should

give him the tools that he understands

what to do for the future and that's

what this stuff is all about and some

tools short ideas about that

this insight on on incident management

so basically what we see here isn't bi

dashboards where they have collected all

the different incidents reaction times

so we make predictions about how we

believes that the crime is evolving what

we can do in terms of conductivity so

these are these kind of management tools

people need to have in order to get the

insights another one which is together

with a governmental agency and non

profit agency here in Barcelona is the

question of how lovely and livability is

in a certain quarter and that means what

are the key components is they have a

framework was 41 components for

measuring about the livability of a city

so of the the equality is a noise and so

the mayor and the city managers can can

select something and understand why a

certain part is a liveable one and why

it's not really likely to live there

because of certain conditions like too

much noise to sum up the connectivity

part and that's really the key for us we

need to bring these things together we

need to relate these things together

that means we need to create that what

we call situational imbalance we me to

understand me to understand how our city

is operating in order to make it good

and this is how hackathon is seeing this

world we do have the different domains

public safety we have transportation we

have the digital city we have a safe

city because we truly believe you never

ever feel a smart city if it's not safe

for you and then we have seas in tech

collecting things which brings the city

to the final smart part end of the story

and look at this eight seconds never

believe it

thank you very discipline as well and

now we're going to hear from Barak

so I don't want to make the same

presentation the exact on presentation

let me still running okay perfect

hello everybody my name is Brock hiding

I'm the EMEA GM general manager for

Silver Spring technologies and I need to

make a small correction the Silver

Spring technologies is a silicon

valley-based

technology company called the New York

Stock Exchange not Istanbul originated

this company

I'm from stumbles orders just a small

correction as I start let me talk about

the Silver Spring technologies we are a

company of internet of important things

or internet of critical things what we

do is we connect the critical things to

the Internet and help you manage these

critical things and the reliability and

securities is the most important thing

for us in that world to to give you some

understanding which continents we are

which countries we are operating and

what kind of a business that we are

doing in different parts of the world

we are managing 27 point three million

devices connecting to IOT active devices

and we are just processing the 5.6

billion bytes of data per day and the

uptime of these services that we are

providing is 99.999 so it's extremely

reliable and it's extreme name trusted

IOT platform when we take a look at the

what kind of services that we are

providing under the big umbrella of IOT

we are providing 21 different vertical

solutions under the smart city ranging

from smart electric meters to waste

management smart parking solutions or or

security cameras surveillance cameras

and so on so we are a smart city company

providing solutions for utilities

companies teas and enterprises and when

you take a look at the clients that we

have from all around the world you can

see different utility companies cities

that we are working and also we are

working with an extensive partner

network but let me roll back and focus

on the digital era why we are talking

about the smart cities today and what's

expected from us when you take a look at

the technology waves you can see the

first wave started with 1990s but we

only changed the internet page and come

up using with the enterprise software

softwares but by the year 2000 and 2010

the things started to change and

technology starts to touch to our life

that's why the time cover magazine is

place the cover page we are entering the

the you era which means the person the

you is very very important and it's a

you centric word this is the rise of the

the end-user this is the rise of the

season this is the rise of a consumer

era and another time cover explains the

the the the online world is becoming

more popular and popular this is

becoming real popular by 2010 and 2010

the mobile applications came into our

life and we are using extensively and

right now new wave of transformation is

beginning this is the beginning of a I

would say robotic world or artificial

intelligence world so the expectations

are shifting but one thing is not

shifting that the end users the

consumers right now we are serving to

the to the end users or consumers that

are extensively using the mobile

applications they are waking up with

checking the emails or

checking the Twitter's or or the

Facebook's and they are using around 30

applications per user and they are we

are installing more than hundred

applications in our smart phones and our

attention span is shrinking from 12

minutes to 8 minutes and when we take a

look at a webpage if I doesn't catch

something in 3 seconds we skip it so

this is the digital era this is our

customers and we are all serving to them

so we need to shift our mindset and with

the new wave of digital era new

technologies are coming to the picture

like the vertical farming like variable

technologies or the sensors that are

implanted everywhere in the in the

cities according to Cisco there are

going to be 50 billion smart devices by

2020 and 200 billion sensors in our life

by 2020 and the cities will be hosting

this the majority of the sensors by

providing the every information that's

required to make the decisions happen in

the in the city and one thing is also

coming autonomous cars are coming to the

picture Electrical will vehicles will be

the majority on the vehicles on the on

the streets starting from 2020s so our

life is changing but this is becoming a

digital disruption in every manner and

this digital disruption is changing how

we are thinking and how we are behaving

and this the cities are not immune to

this digital disruption and we are

seeing how the cities are changing and

how cities are becoming more colorful

more technology oriented and there is a

big race to serve for those seasons with

the more technology and it's quite

understandable because the seasons

living in the city is asking for

technology so we need to provide the

maximum technology to make

our seasons life much better according

to the survey 54% of the world's

population is living in urban areas

right now and the number is increased or

almost doubled from 1960 and by 2013

it's expected to be going over 60% of

the world's population is living in the

urban cities and the energy consumption

is 62 per 60 to 80 percent in urban

areas and the traffic congestion is

everywhere a problem so when we take a

look at these problems we can find the

sophisticated problems of today's cities

with the sophisticated technologies and

it's important to use the technology to

have the seasons better living in the

cities one thing is in important that

there are four thing is important that I

would like to make you think about it

first the agility of the solutions and

and considering that the end users

expectation is pretty high

all the companies the municipalities

distribution companies are there to come

up with agile solutions no one has a has

a mercy to wait for a couple of hours to

get a service from the municipality and

the reliability should should be very

high 99.9 reliability is required by our

customers that's why we are providing to

them and the flexibility of the

solutions is critical because we need to

come up with the solutions as as fast as

we can and as flexible as we can and the

ownership of the solutions is critical

we need to find a reliable and trusted

partners all of the time thanks for

listening to me

Thank You Vera very discipline as well

and now we have been a excuse me on the

time setting I think somebody has

changed the time setting and is reduced

in twos better put it in one I think

it's better for the speaker please Thank

You Liz okay good afternoon ladies and

gentlemen

my name is Ben and uver I'm head of

energy and infrastructure ordnance

survey I'd like to thank the committee

for inviting us to tell you a little bit

about a project that we delivered this

year and the project was based in a

small South Coast town called

Bournemouth and a study was into what

data what content and software do you

need to roll out a 5g network so first

of all I'm just going to tell you a

little bit about the organization that I

work for to give you some context and

then on to the projects itself and then

finally what I want to finish on is a

bit about what is a 5g Network mean for

residents and businesses of the small

town on the south coast called

Bournemouth so audun survey are a

government company around a thousand

people 300 surveyors fleet of aircraft

and our role is to create the geographic

mapping database of Great Britain we've

been innovating for quite some time now

we were established in 1791 I perceived

threats of invasion from from the

continent so we decided to map the south

coast of England using long chains of a

known length which were surprisingly

accurate by the way in 1971 we were the

first national mapping agency to fully

digitized all of our map holding in 2007

we created and deployed continue to

manage our own geospatial network to

enable to correct correct the GPS

position of our surveyors features that

they're capturing so within only a

couple of centimetres and in 2015 we

also launched our Eurasian hub which

like our incubator

for SMEs looking to deliver new

solutions into the marketplace but what

does that what does that that data

actually look like so here's an example

and in simple terms a map is a way of

showing what can be found at a location

and then these different layers of

mapping are then combined with other

types of data that are spatially enabled

in order to get a better understanding

of what's happening at that location for

example flood zones or population data

or network assets for example so this

data stack that we create takes anything

up to 200,000 changes every day and that

data that's published then turns into

quite a powerful tool so there are lots

of different types of use cases so more

or less most human activity is based

upon knowing where things are and then

how do they relate to two other things

so geospatial data supports businesses

government and community activity in the

right wide range of of ways from

designing and maintaining and repairing

utility assets through to emergency

response being able to direct people to

the right place in response but also

identifying where to invest in the

building of schools and hospitals and of

course the optimization of online

deliveries is important to all of us as

well as been connections and even

facilitating the purchase of our new

house

so as I said Maps a collection of data

have it allow us to describe a location

but not all maps are created equally but

there is a difference so the OS data

that we create is published in such a

way so as to allow machines to be able

to interpret that information so onto

the project itself what we did is we

coordinated UK government and we

undertook a study to understand the data

that's required for a 5g rollout three

objectives reduce cost

maximize coverage and maximize capacity

we didn't do it on our own

so we worked with the 5g Innovation

Center at University of Surrey the

metrological Office of Great Britain and

also Bournemouth Borough Council so the

first place we went to was data lots of

data I'm not going to start from the top

that's that's a mission we had done have

enough time so a more helpful slight

perhaps what we did is we did we

deployed the range of vehicle aerial and

ground survey in order to create a point

cloud we then meshed all of those points

together in order to be able to describe

features such as buildings lampposts and

trees the 5g Innovation Centre undertook

a range of different studies to

understand how certain frequencies were

impacted by features then they created a

propagation model but then we found out

that actually some of the tools are on

the market to be able to manipulate and

manage that data didn't quite work so we

built our own tool in order to allow

network planners to be able to create

coverage predictions on the fly one of

the major issues we found was around

data quality lampposts in the wrong

place which when you're supplying a bulb

or replacing a bulb it's not a problem

at all when you're planning for a 5g

network just a few meters of inaccuracy

creates a significant impacts your

network planning

and this is the result so the white

posts you can see there there are a

lampposts lampposts have become the new

park lane on the Monopoly board by the

way and through a combination of the

features and the attribution and the

propagation model this area which is

about a hundred meters 100 meters

squared that gives you an understanding

of the kind of coverage you can you can

achieve when you roll out network onto

onto three small lampposts just there

this is another view which really just

gives you an understanding of how a

network planner can move and manipulate

antenna in order to get better coverage

some key findings so vegetation and

street furniture create significant

losses and noise and if you're running

our network we need to start to find

solutions to some of these problems

building facades their type and their

roughness they have an impact on signal

propagation so how do you collect that

data because it's pretty difficult to do

so we know we're surveying company or

how do you plan around those kinds of

issues and then for transportation

bridges and gantry's are going to be

required in order to provide the

coverage that network that network

planners need and last but not least

speaking internally just being able to

maintain a 3d neutrally held geospatial

model is non-trivial

next month month December month of

Christmas Christmas tree lights all over

the place havoc for Network propagation

so the case of Boris and I've got a

minute left so Boston Consulting Group

save it after property providing good

solid connectivity is one of the is the

second most second biggest economic

driver for a town tourism is massive for

a South Coast town like Bournemouth so

into interactive infrastructure and

augmented reality are being investigated

right now giving over road space to

improve the public realm that's being

investigated better information for the

emergency services IOT smart lighting

those are all being looked at as ways in

which to leverage this new network and

then joining up services for all lastly

I'll just finish to say that Bournemouth

are actually due to roll out a live

network by March next year they're in

the process of engaging globally to try

and find ways in which to leverage that

network and use it as a testbed 5g is

going to be a worldwide phenomenon so

the council whilst thinking globally are

actually acting very locally thank you

[Applause]

thank you bang good luck with the 5g

luncheon and now to close this very very

disciplined panel we have from cell next

telecom which is a technology company

based in our beautiful whole city

Barcelona what Scotty thank you thank

you so much a pleasure to share with

this so qualified audience about our

bill for the next generation

infrastructure is related to the digital

era so let me let me just pay some

attention about what's happening in the

city is very much related to the

infrastructures cities nowadays are very

intensive in the circulation of six

items which are intensive in terms of

using infrastructure we are talking

about energy water goods people

information and trash and these are the

three the six things that mainly use

more than the first infrastructures in

the city

if we don't think about what the digital

transformation means that means that on

top of this which is analogical physical

based we are introducing a digital layer

and this digital allows getting some

information that provokes cities moving

from a mechanical physiology so

different layers pipelines

transportation grids public transport to

natural cities where real-time

information allows us real-time

decision-making

so we'll still have all the physical

elements as infrastructures because

things moving our physical ones but we

get something new which is data related

to that things that can allow the city

to act as a control tower as a neural

system for the real-time decision and

this is the crucial point from 7ex point

of view to understand what we can do on

these infrastructures one important

thing already repeated message but I

think it's relevant too and I want to go

to the foundation of that element which

is the IOT the Internet of Things we

cannot really be successful in the IOT

wall if we do not have clear idea

understanding of the different steps in

the value chain

let me explain for a while six five

sorry main steps first the sensors we

need to capture sub data sometimes

citizen is the sensor itself all the

time these are physical sensors but we

are in the very early stage of sensing

we just take temperature move on

counting people cars pressure this is

the easy D is the power of all this

stuff let's think about disruptive

sensors already working on think about

microbial life sensor imagine before

coming into this room this sensor tells

you oh do not come into that room

there's a flu bidders on flying

somewhere

if you get in you will be bet in three

days please reschedule your agenda

that's gonna be really disruptive when

new generation of sensors now we are in

a very very early stage and this

information capture from a sensor needs

to be sent to a kind of data collection

hub through some connectivity solutions

and I'll go I'll go through later

so sensor capturing data connectivity to

transport that data somewhere to collect

that data which is just rate data data

information knowledge to do something

and that knowledge to do something which

is the brain step it is about the

business logics what the hell I'm gonna

do with that data

23 what is 23 degrees DB's noise people

walking around my home thefts in my home

coming in what exactly's IOT means at

the end a call to action whatever I get

I need to apply some business logics on

top of and it's a call to action to the

last phase in this case a kind of

process map city action and doing

something because all this is value

oriented in the fourth step as you can

see there are two levels the brain one

which is the logics and a second one if

I get critical mass enough ego if I have

information enough maybe I can predict

something if I can predict something

probably value increase but this is the

concept and most of the deployments when

thinking about infrastructure should be

considering that value chain what extra

information can I get from

infrastructure which is relevant

real-time informing something I can

interact because this is a call to

action to the end user and user mean

citizen or not maybe other city

employees companies providing specific

public services whatever

as I mentioned connectivity it's

relevant and 5g will transform the way

connectivity happens we can see on the

picture there are some on the left side

there's a multi technologies

connectivity just port for mobile

coverage we have the macros are the big

towers we have the small small cells as

already seen bye-bye been and and its

presentation we have the Wi-Fi we need

to take all this data and all this data

it's removed on the 5g to somewhere

nearby the consumption point because

data processing will happen near by the

consumption point that means that we

will start installing in the

infrastructure in the city cabinets to

process data so probably when I get

login in ways traffic information it's

not necessary to send that data

somewhere at Google or at any data

processing center worldwide but nearby

the Avenue I'm in a congestion and this

is what really impacts on the way how to

deploy this infrastructure these are

real cases from cell necks three cases

three pictures the first tool on the

left

starting on the Left these are the fibre

network in Barcelona which is own

deployed by the city hall to provide

services and the rest of capacity on the

wholesale market managed by sonics small

cells in Barcelona already integrated in

the urban street furniture and the last

one also from cell NEX but this is

Milano Piazza Duomo this is a lamppost

and this is the future site this is the

future cell telecom site you can see in

that picture just a pure lighting

structure we have a camera we have IOT

sensing and we have a small black box

the last one is just an antenna

providing the coverage to all aminos

operating in Italy into that square one

single box one antenna for signals for

different aminos some ideas about where

this is happening to

this is happening to also in some

stadiums as a been use that somehow our

smart our crowded places this is a

cygnus installation the brand new in

Spain this is one de metropolitana from

the Latika Madrid Stadium new one this

season this is an infrastructure

providing service to 70,000 people with

the same infrastructure connectivity

that you can get 60 megabytes megabits

download speed by user only one network

this is the real impact on these city

infrastructures not anymore

different 4G networks overlap and a lot

of inefficiency and a lot of cost and

what about public safety as you know in

Barcelona we had a tragedy this August

last August a terrorism attack and at

that situation which is really

mission-critical it's the time that you

really rely on something which is 100%

available for those emergency corpse and

how do you take that in a place that

this one which is line 9 in Barcelona

how do you get coverage in so deep

infrastructure you need leaky feeder you

need to integrate whatever solution to

make this work very very very few times

if if we are lucky but you need to

provide that solutions and we need to

think about that how do we get all this

connectivity in how to deploy this and

this is a responsibility on every one

decision public safety and coming to the

maritime communications from selnick we

provide all the maritime communications

in the America a variant Peninsula so

all the national wide territory in Spain

this is true maritime communications are

normally analog are not digital we are

becoming digital just to make 3d

recognitions of chips and SOS messages

and what about the network in terms of

energy distribution think about the top

one process nowadays we know and think

the impact of this kind of solutions

when going in a distributed way

and just to finish let me think about

something which is relevant and I'm not

sure you are aware of we talked about

autonomous car an autonomic are by

definition its autonomous so everything

would need to drive should be onboard

and not to depend from something because

otherwise this is not autonomous but we

need to have all roads and streets

digitalized otherwise how you will

interact with these situations are you

familiar with these situations plan

explain both and this is my last light

on the left side it's a brightening sign

that you cannot recognize the traffic

the traffic light which is green any car

with a video or cameras on board

recognizing signals by video processing

cannot recognize that so needs to have

digital ID information and provide

real-time information about that traffic

traffic light information but look at

the right side this is a truck crossing

in front of me if I don't have anything

digitalized the interpretation of the

car about this truck is the one that you

can see on the lower sides I can

identify a truck but because there's

some numbers there maybe I can get

confused that this is a traffic sign

they are on the door three poles maybe I

can understand that these are poles on

the street and on the left side this

could be a fence with someone maybe a

rider crossing the street so a huge

confusion for the autonomous car if I

cannot provide that information

real-time and telling the car hi some

other asset is crossing please stop we

will in we will not get success on that

on that path thank you so much

[Applause]

okay we managed to have two minutes 27

seconds for one question we have three

private companies from the

internet-of-things arena hexagon Silver

Springs Network and Celtics we have one

state on come on corporation on data

mapping in we have a major of a very

attractive city in Brazil convenience so

should I pick one question all right

okay I think the best one is easier and

destitute what will be the impact of 5g

infrastructure in cities anyone on the

panel can take it again what would be

the impact I mean already

Oscar is already using his hot city

status yeah okay sorry

5g will be mainly overlapping four

elements one it's going to be gray do

much more spectrum and which that that's

going to be higher frequencies so higher

frequencies lower range that means small

cells because the traditional tower

doesn't work on that frequency so first

thing much more small cells nearby the

the consumption point for seamless

experience indoor/outdoor first second

fiber if we get so much traffic with new

handsets new solutions and so on we need

to take that traffic to the end to the

core of the network and back to the app

or to the smartphone this will only

happens if we have fiber enough where

these small cells are connected so a lot

of capillarity in terms of fiber

arriving through street furniture third

visualization everywhere we have

nowadays one box from one amino another

box from an under the nominal and up to

40 minutes by country average we will

have only one box for the four aminos as

i explained on the stadium these will be

trol from a control tower with software

kind of virtualization very much like

cloud to IT and the last one h computing

at the time that we want very short

latencies lower than one millisecond

there's no time enough for a data to go

to the core of the network and be back

once processed imagine a virtual reality

application and so on so needs to be

nearby and that near my by means lower

than fifth ten to fifteen kilometers so

we will need to start providing cabinets

with IT servers processing that data

that we consume around that 10 15

kilometer circles Thank You Skaar please

join me in giving a round of applause to

our very almost discipline panel thank