LuxTurrim5G, or 5G Edge Cloud on a Lightpole September 2018 Open Networking Summit Tapio Tallgren

Public

Definition of "LuxTurrim5G"

Light in a Tower

LuxTurrim5G







LuxTurrim2G



https://en.wikipedia.org/wiki/Oil_lamp#/ media/File:Korea-Horongbul-01.jpg





Eons pass, and technology evolves. with exponential speed



v = 1.5

LuxTurrim5G – Building key enablers for a Digital Smart City

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Bell Labs driven Business Finland Consortium Project

"Smart 5G small cell street pole infrastructure for digital service ecosystem in future urban city environments"



Smart cities require fast communication networks

NEED

Our society and cities face great challenges, e.g. to improve safety, energy efficiency, air quality, effectivity of transportation and quality of living

Smart cities need a new service infrastructure and a digital ecosystem enabling:

- Development of relevant smart city services
- High data capacity for citizens
- New service and **business opportunities** for companies
- One common flexible total cost optimized high capacity 5G network
- Opportunities for new **micro-operators** in the systems



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PROBLEM: Capacity of mobile networks

SOLUTION:

LuxTurrim5G

- Capacity of mobile networks is far too insufficient ٠ due to the increased number of users and new digital services built and planned
- The problem can only be solved by using small cell 5G • radio frequency technology & higher frequencies
- This requires **dense networks of antennas** setting new ٠ requirements for the network infrastructure

Highw avs with 5G lamp post chain Rural roads Smart city Highw avs with 5G lamp post chain LuxTurrim5G project develops & pilots smart light pole based 5G network infra

for smart cities

- Smart light poles with integrated 5G technology, ٠ different sensors, active screens, cameras etc.
- From proof of concepts towards business
- Ecosystem for piloting new technical solutions, digital services & business models



ΝΟΚΙΔ

How to get the 5G network? I.e., how to get fiber to New Radios?









Image credits: Finnish Traffic Agency/Laura Sumuvirta

Digital Smart City: LuxTurrim5G

5G mmW access points in every light pole

Mathematical Content of Content





Software view - Containers as runtime

Ultra Far Edge



Centralized Cloud Infrastructure





ANXXLuxTurrim 5G

LuxTurrim5G - Solution

We develop and pilot concrete technology enablers and service concepts for open Smart City Digital Ecosystem



Data processing path





What will the city do with data?





Source: Tanja Lahti/City of Helsinki



WeChat MyHelsinki miniprogram

Discover the best sights, restaurants and activities in Helsinki

Find information about the most important things

Get around Helsinki by walking or with city bikes, public transportation and taxis powered by Whim

Pay as you go for activities, sights, restaurants and transportation with WeChat Pay







Should the city build the 5G network?



Future Digital Smart City Platform



Data owned and shared locally to enable city wide digital ecosystem





From concept to reality



WaluxTurrim 5G

From 5G test network to a modern smart city

Possible extension: Autonomous self-driving bus network to Kera Railway Station City of Espoo: Kera area Modern city infrastructure with integrated 5G ecosystem

New residential area for 20.000 people



Plan for LuxTurrim5G Phase 2 test network, extract taken from LuxTurrim5G Light Pole Ecosystem Virtual 3D Planning Tool





LuxTurrim5G

Joint Research Project combining business and technology



Recent International Recognitions

LuxTurrim5G - Building key enablers for a Digital Smart City



City of Espoo awarded as Intelligent Community of the Year 2018, 6.6.2018 London



Exel Composites & LuxTurrim5G Innovation Competition Finalist at JEC World 2018, 8.3.2018 Paris





UN has selected city of Espoo as one of the five University citiesto be an example to meet the UN sustainability goals already at 2025 (global target 2030)One key enabling technology realized to be fast 5G light pole network as a platform of digital ecosystem



LuxTurrim5G

Building key enablers for a Digital Smart City



Nokia Bell Labs Disclaimer: This is a research project, possible products are not yet in the Nokia product roadmaps <u>www.luxturrim5q.com</u>

