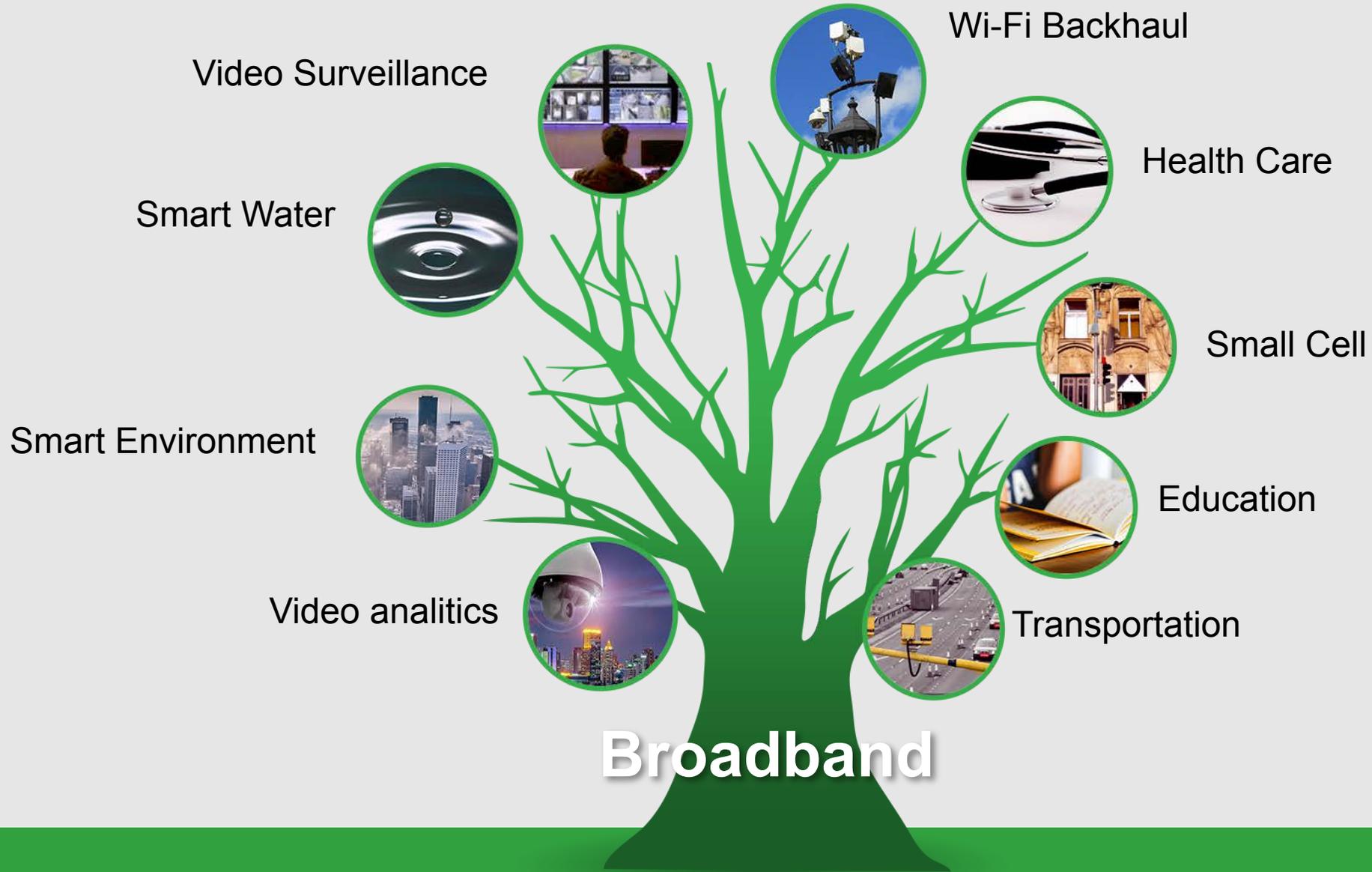


# SMART CITIES NEED RELIABLE NETWORK

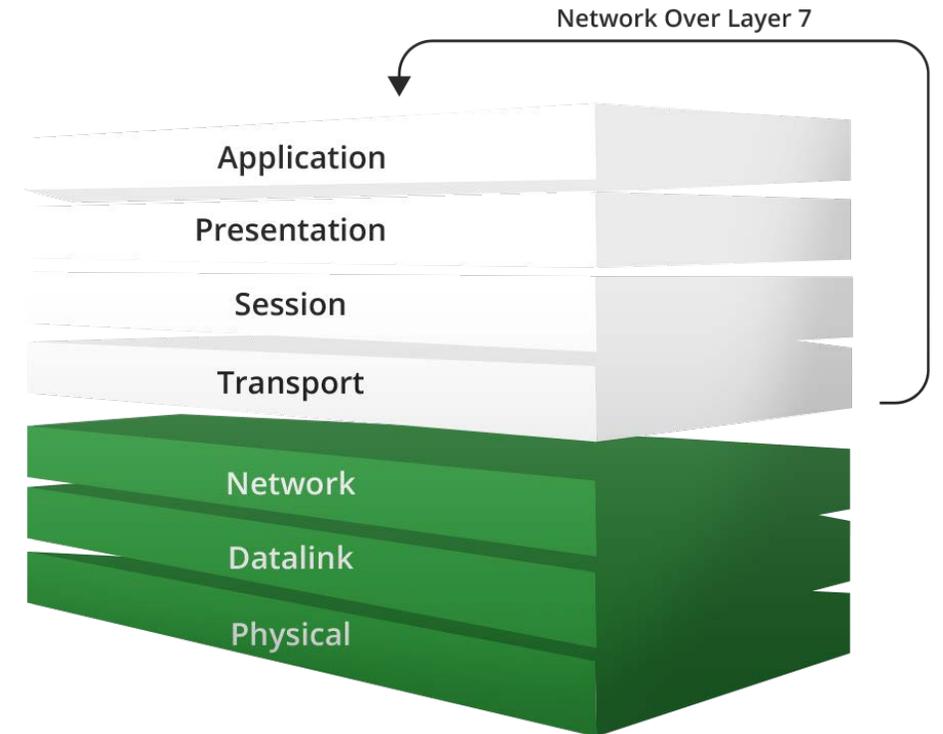
A night cityscape with a network overlay of white lines and nodes connecting various skyscrapers. The background is a dark blue night sky with a city skyline of illuminated buildings. Overlaid on the city is a network of white lines connecting several nodes, representing a reliable network. The nodes are placed at various points across the city, including on top of some buildings and in the open air. The lines are straight and connect the nodes in a way that suggests a complex, interconnected network. The overall image conveys the idea of smart cities and their reliance on a robust network infrastructure.

Maxim Redin - Sales Director  
Siklu

# Connectivity is the Foundation of Smart City



# SMART CITY STARTS WITH RELIABLE NETWORK! Siklu



# FIBER is the Ultimate solution ?



Multi Gigabit capacity

Interference-free

Future-proof

## Fiber

Expensive

Slow time to market

Complex to deploy

Intrusive installations

Fiber Cut



# How about LEGACY WIRELESS?



Low cost

Fast implementation

Network Flexibility

## Legacy wireless



Interference

Easily hacked

On going support required

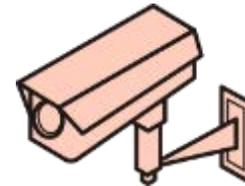
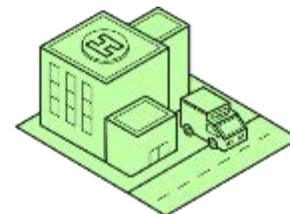
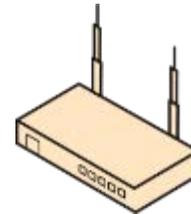
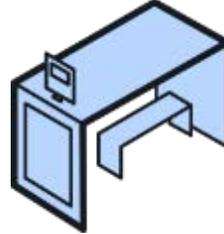
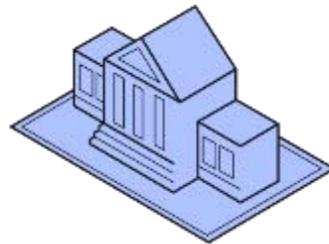
Limited capacity



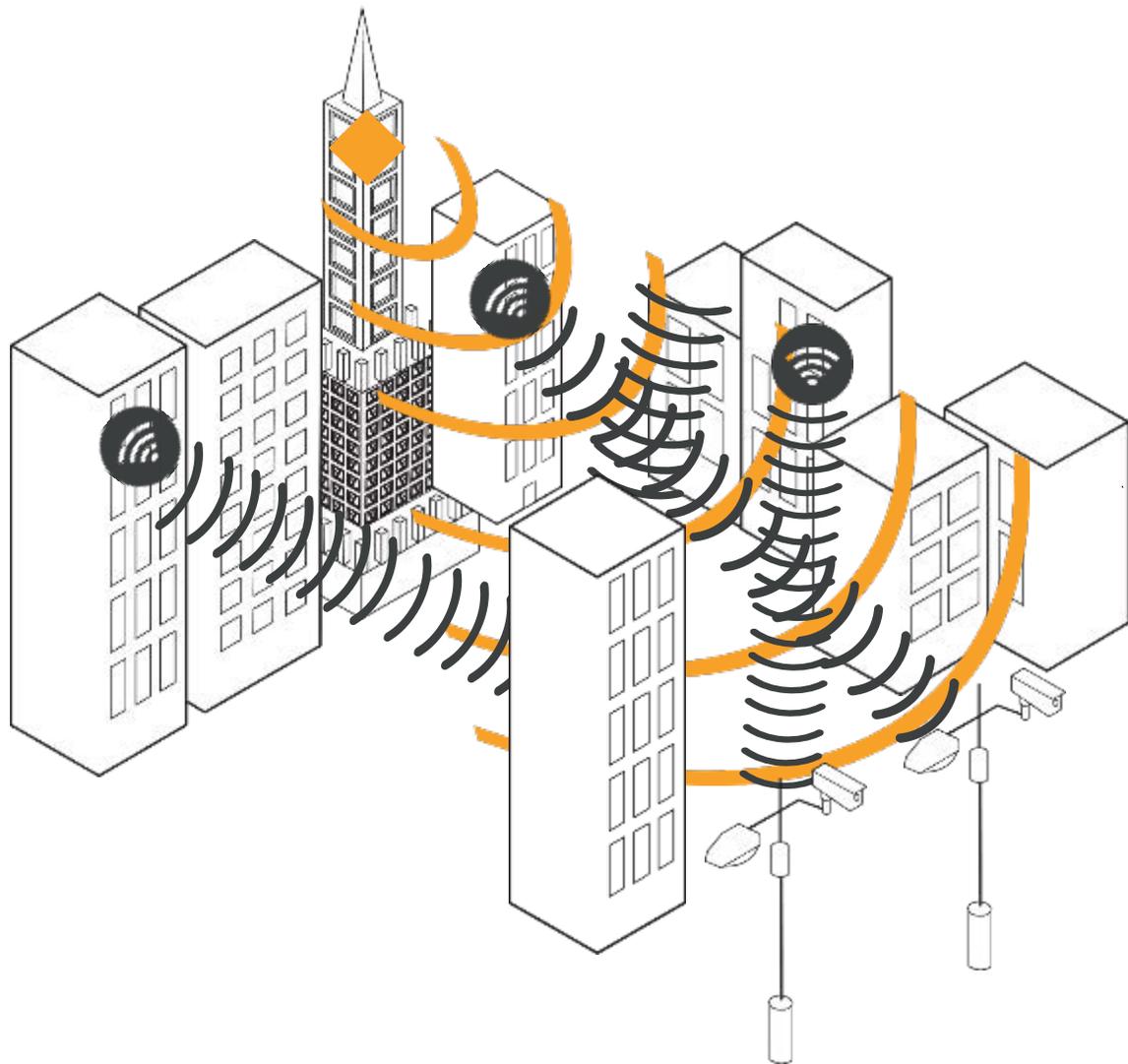
# SMART CITY WIRELESS APPLICATIONS

Standard	Bluetooth	ZigBee	Z-Wave	6LowPAN	Wi-Fi	NFC	SigFox	Neul	LoRaWAN
				<b>6LoWPAN</b>					
Frequency	2.4GHz	2.4GHz	900MHz	≤2.4GHz	2.4GHz, 5GHz	13.56MHz	900MHz	400÷900MHz	<1GHz
Capacity	<1Mbps	<250Kbs	<100Kbs	<250Kbs	<200Mbps	<420Kbps	<1Mbps	<100Kbps	<50Kbps

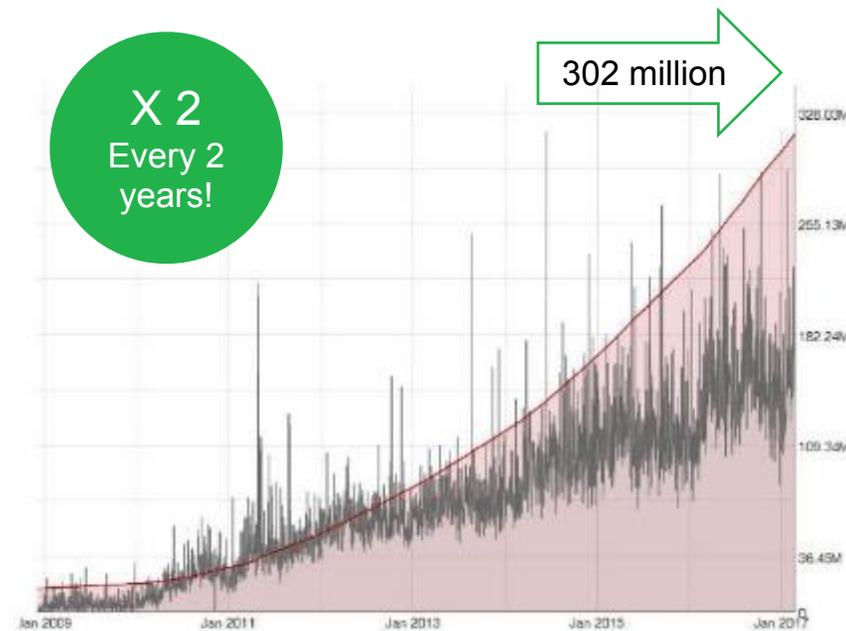
**Same Frequencies  
for multiple  
applications?**



# WiFi INTERFERENCES ARE GROWING FAST



WiFi interferences  
are growing fast



\* [www.wigle.net/stats](http://www.wigle.net/stats)

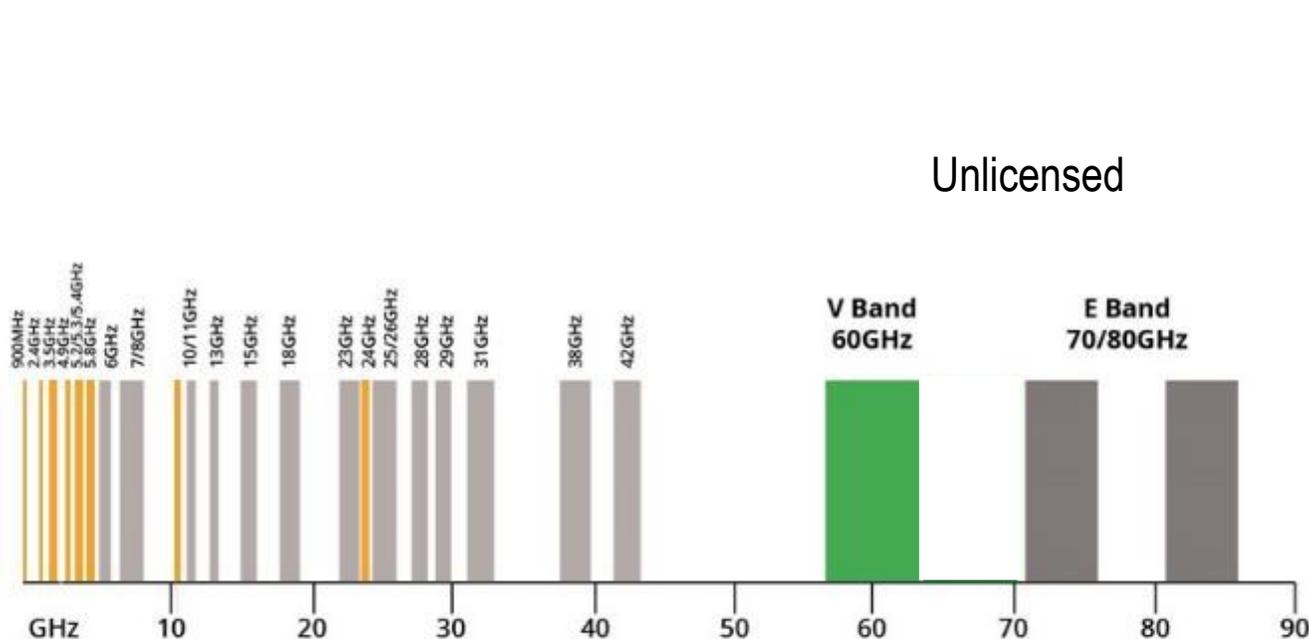
# Meet mmWave wireless (E-Band)

V-Band (60 GHz)

E-Band (70/80 GHz)



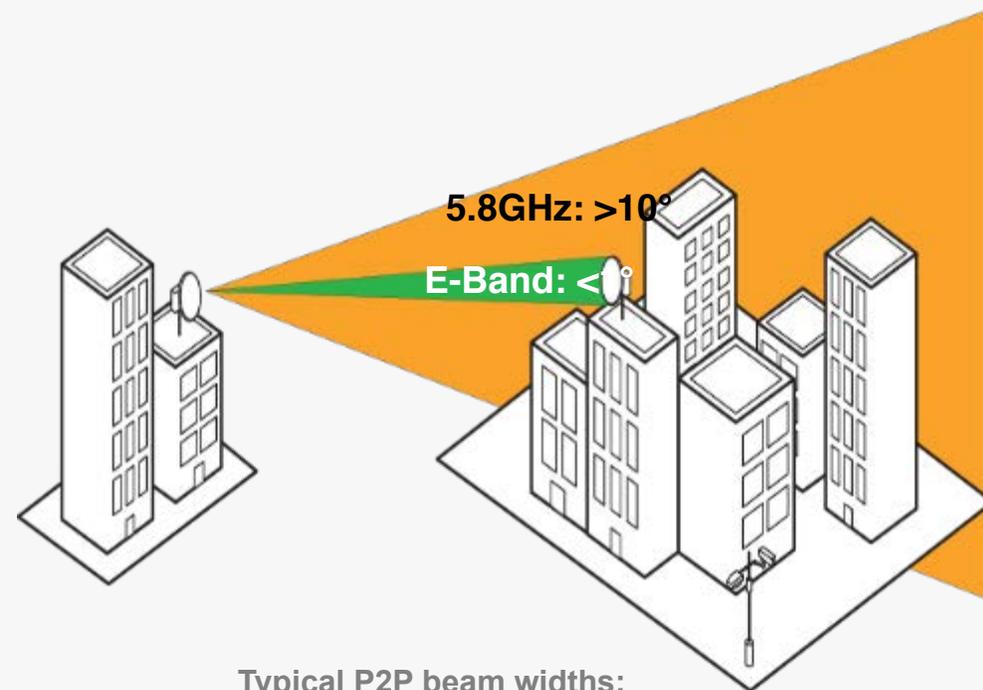
## Widest spectrum - High capacity!



## Narrow beams - No Interference!

V-Band (60 GHz)  
Unlicensed, 9GHz

E-Band (70/8 GHz)  
Unlicensed, 10GHz



Typical P2P beam widths:

- 5GHz
- 70GHz

## mmWave Wireless

Multi Gigabit Capacity

Immune to interference

Secure

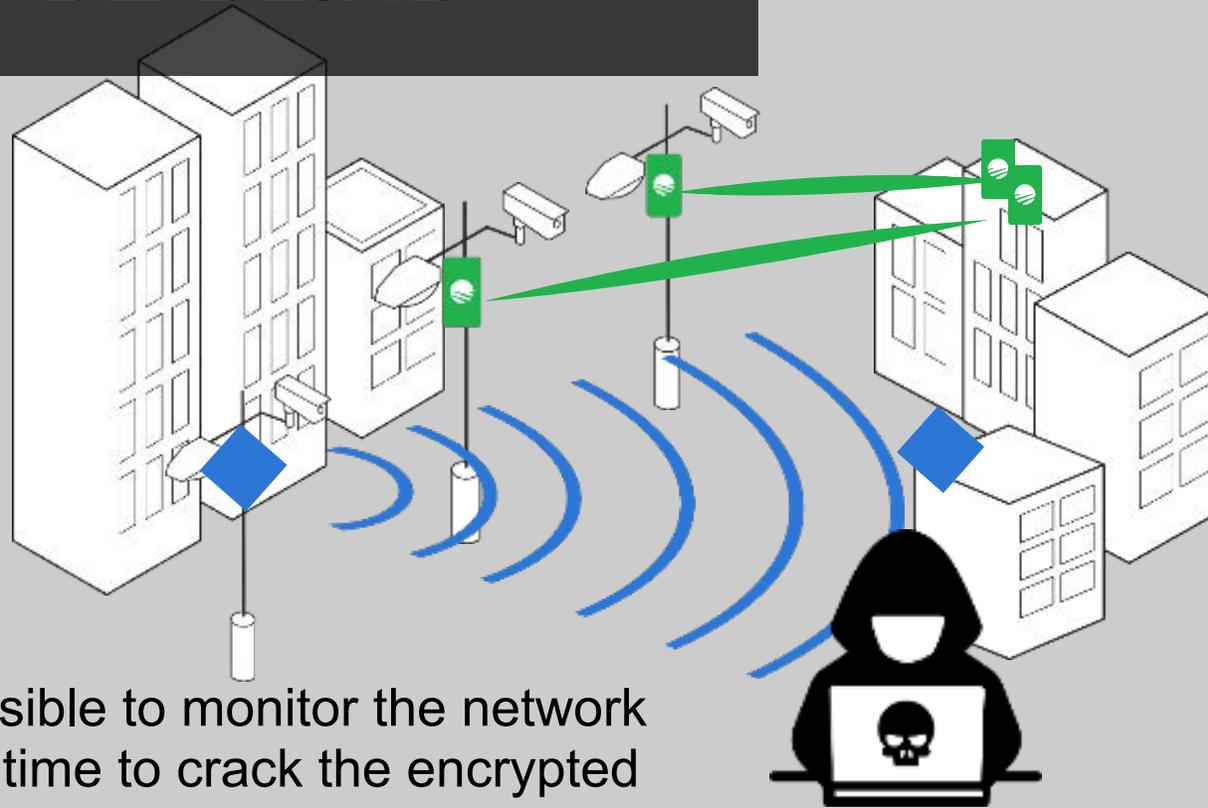
Affordable

Very low latency

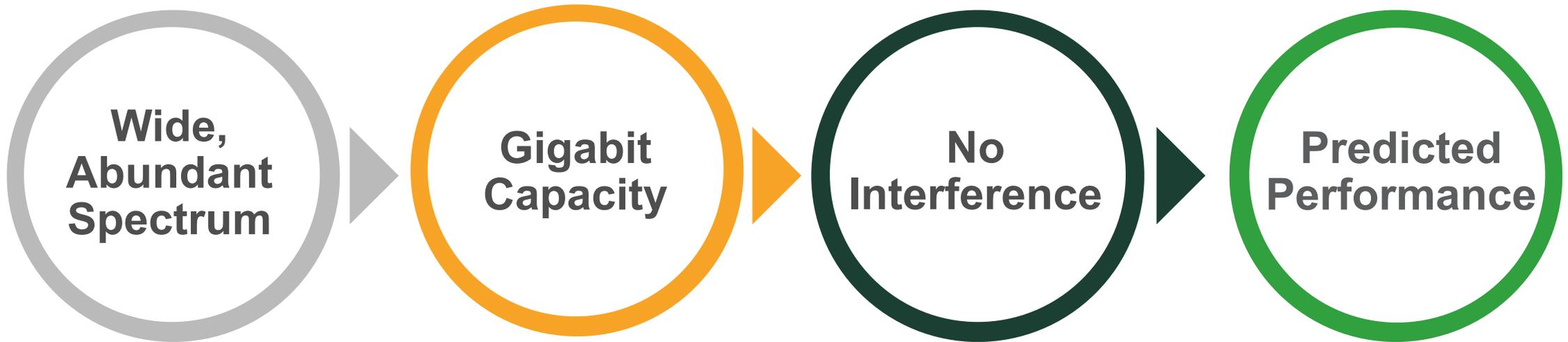
Quick time to market

# YOU CAN'T AFFORD TO BE BLIND

as secure as fiber



- Virtually impossible to monitor the network
- Do not get the time to crack the encrypted network
- mmWave is as secure as fiber



# Hybrid Fiber Wireless – High performance practical solution

FIBER

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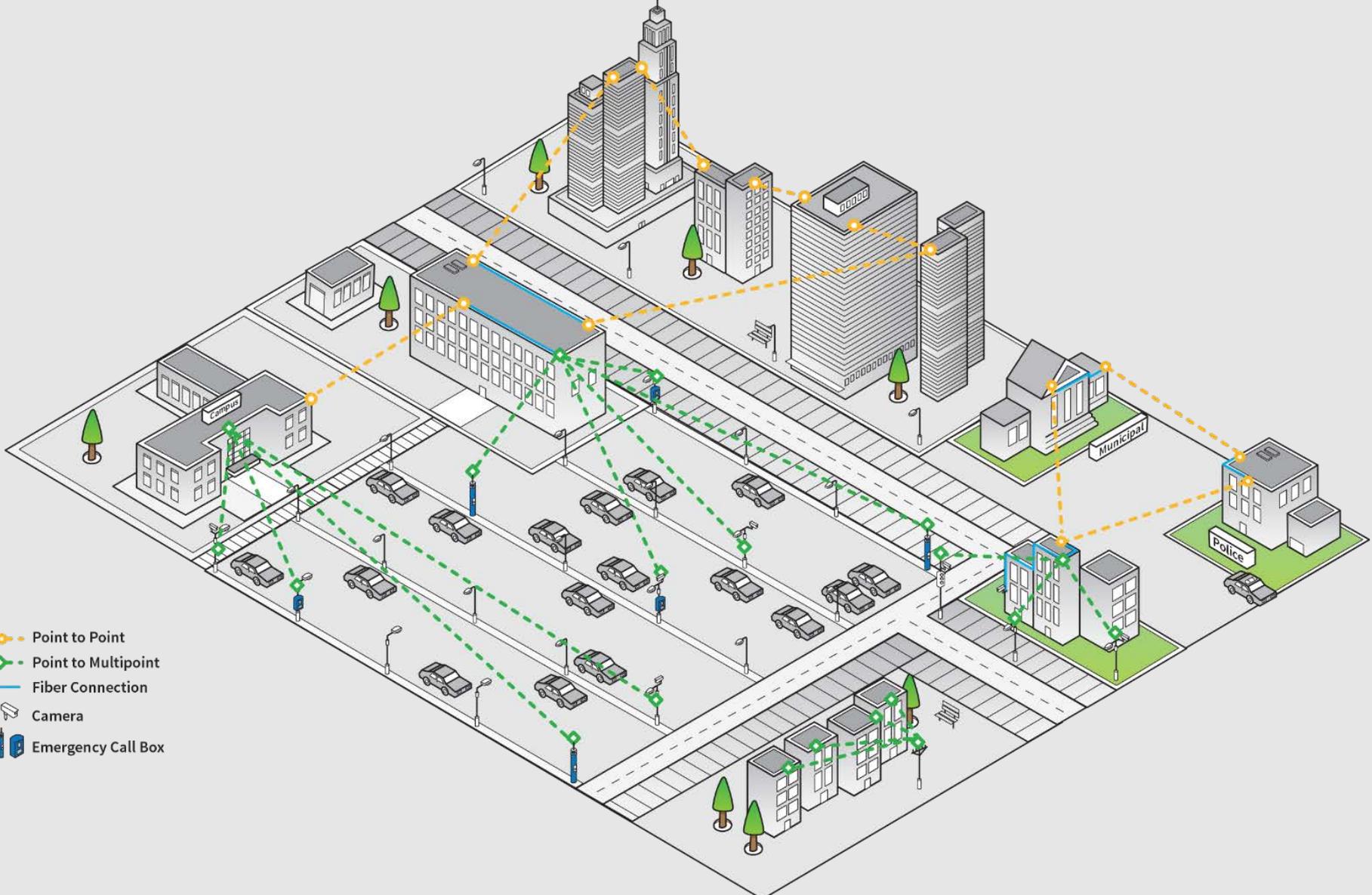
+

mmWave WIRELESS

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# SMART CITIES WITH HYBRID FIBER WIRELESS



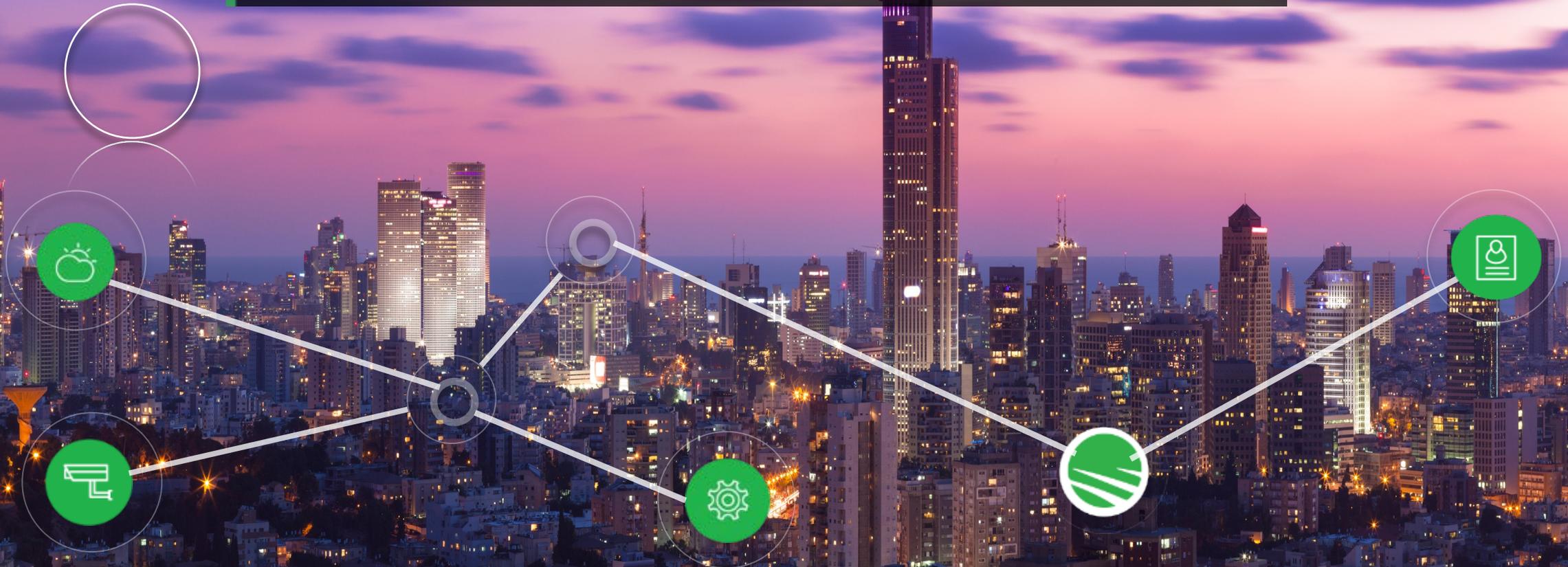
The background of the slide is a blurred city street scene. In the foreground, a utility pole is visible with several pieces of equipment. At the top of the pole is a white, square-shaped Siklu mmW camera. Below it are some electrical components and cables. Further down the pole is a white, rectangular box with a circular opening, and at the bottom is a white, dome-shaped camera lens. A green circular graphic is in the top left corner.

# Примеры проектов видеонаблюдения с технологией mmW



- Line of site,
- location of fiber,
- local power, is the power continuous or only at night (when the lights are on),
- who owns the utility poles (sometimes not owned by the city but by utility companies such as electricity company),
- funding availability (budget)

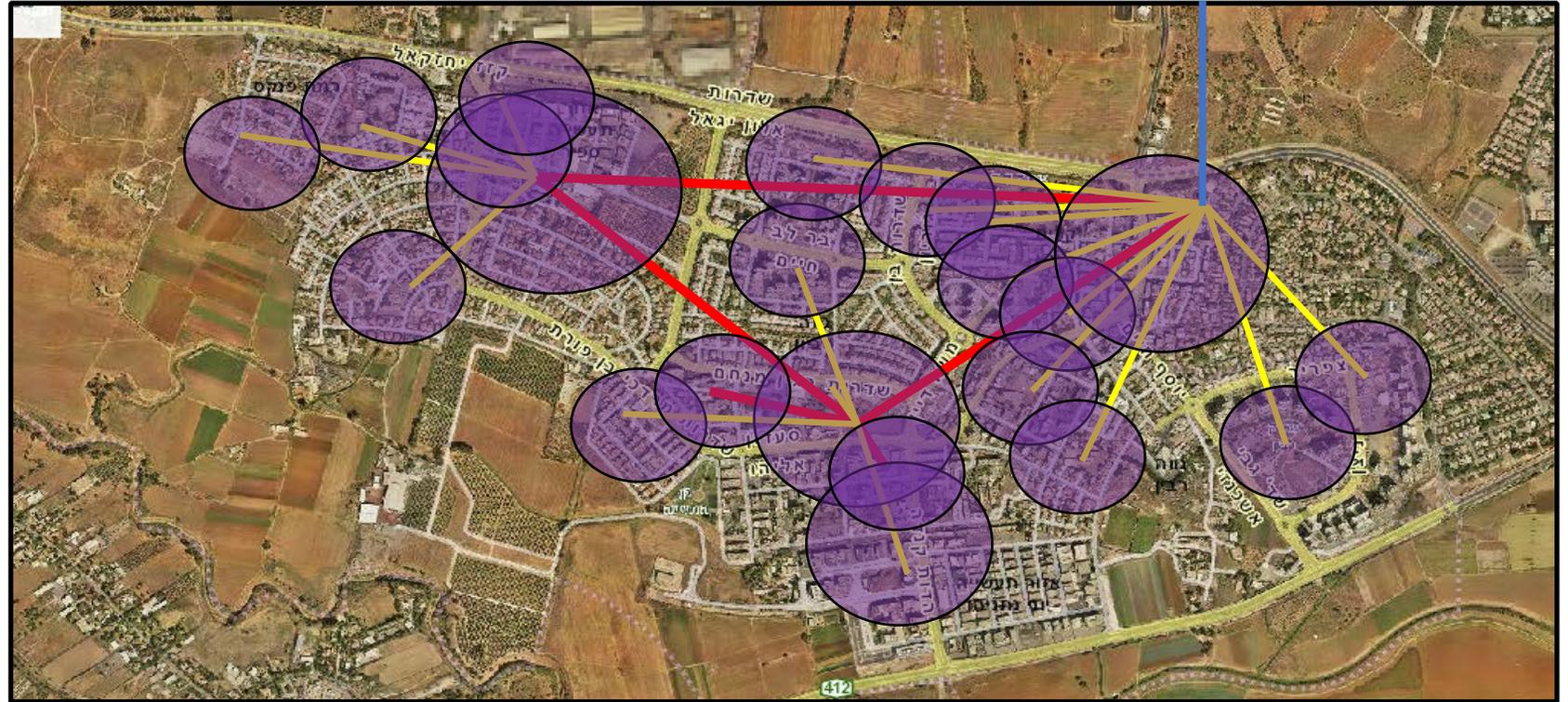
# Tel Aviv Case Study





# THE HFW OPTION

- Wireless + Networking  
Equipment – Rub 30.6M
- Installation cost – Rub 13.6M
- Total – Rub 44.2M

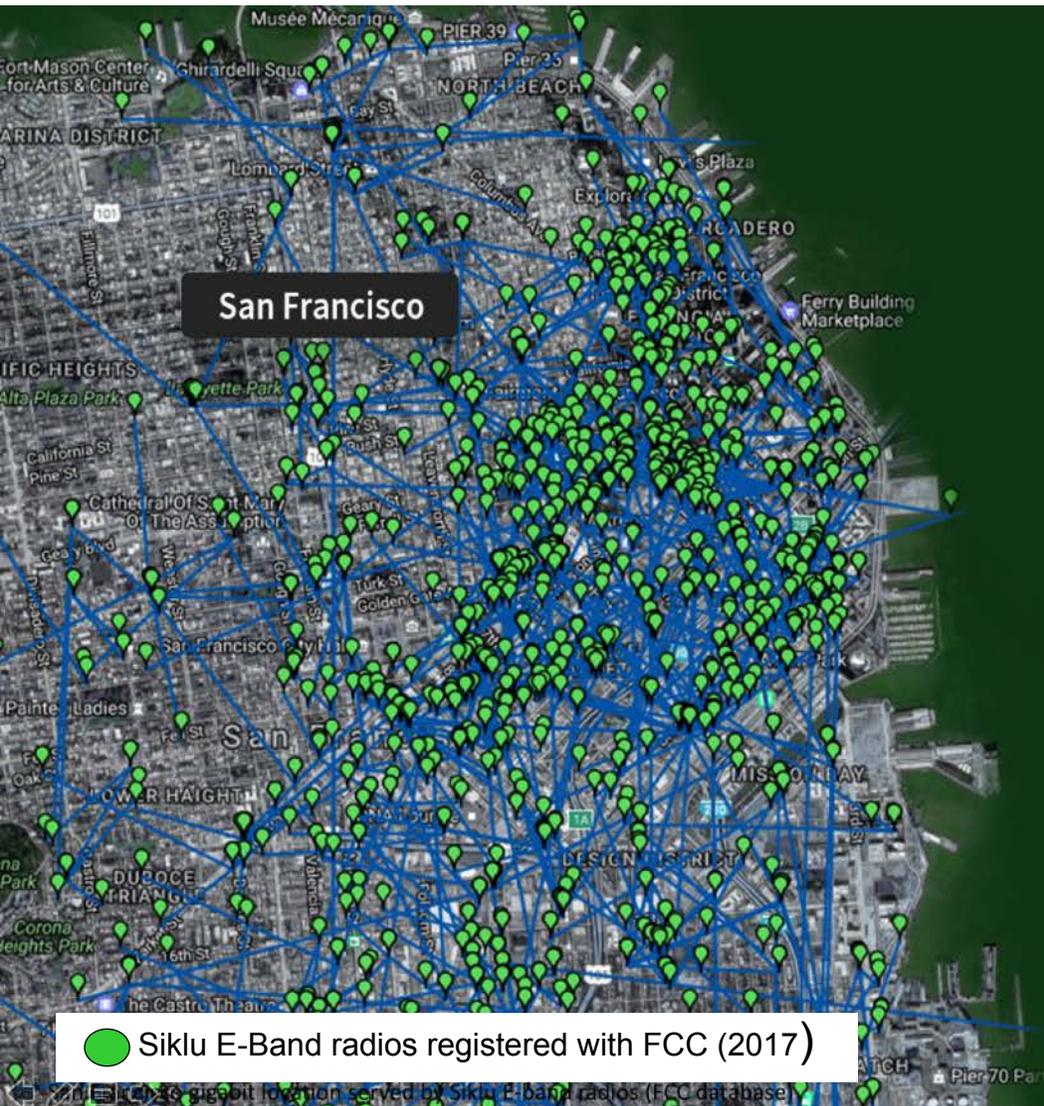


- One network serves 254 cameras:
  - City center
  - Car parks
  - Housing projects
  - City's anchors
  - Temporarily installs for special events
- **Street level:** radios eliminated camera latency issues resulted from previous 5.8GHz systems
- **Backhaul:** migrate from leased fibre lines, delivering significant operating expense reductions



# City of San Francisco

## Fastest ISP & Smarting Up



Webpass

from Google fiber

Video Surveillance



Public Safety



WiFi Backhaul



Education



Transportation



Health Care



Fixed Wireless Broadband

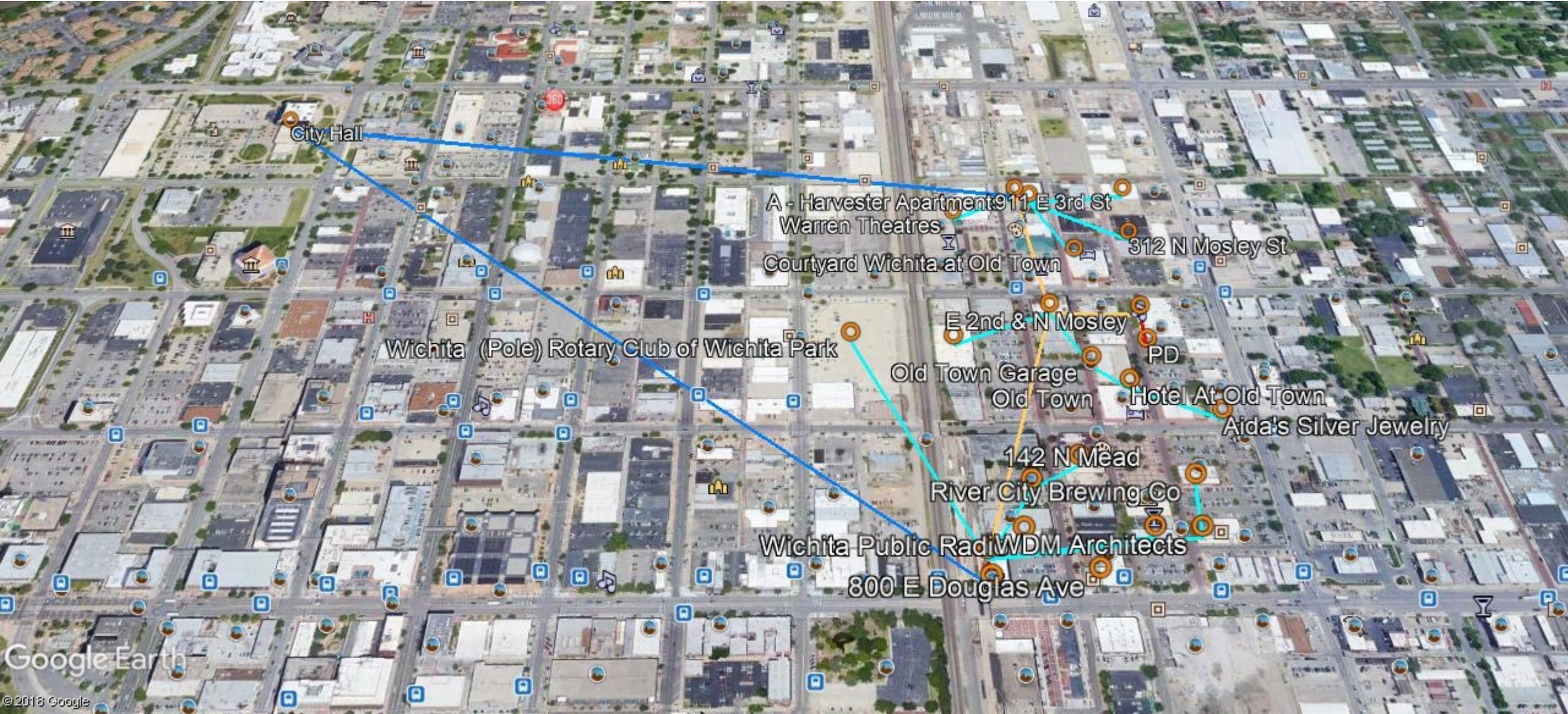


# City of Wichita, KS - Smart City

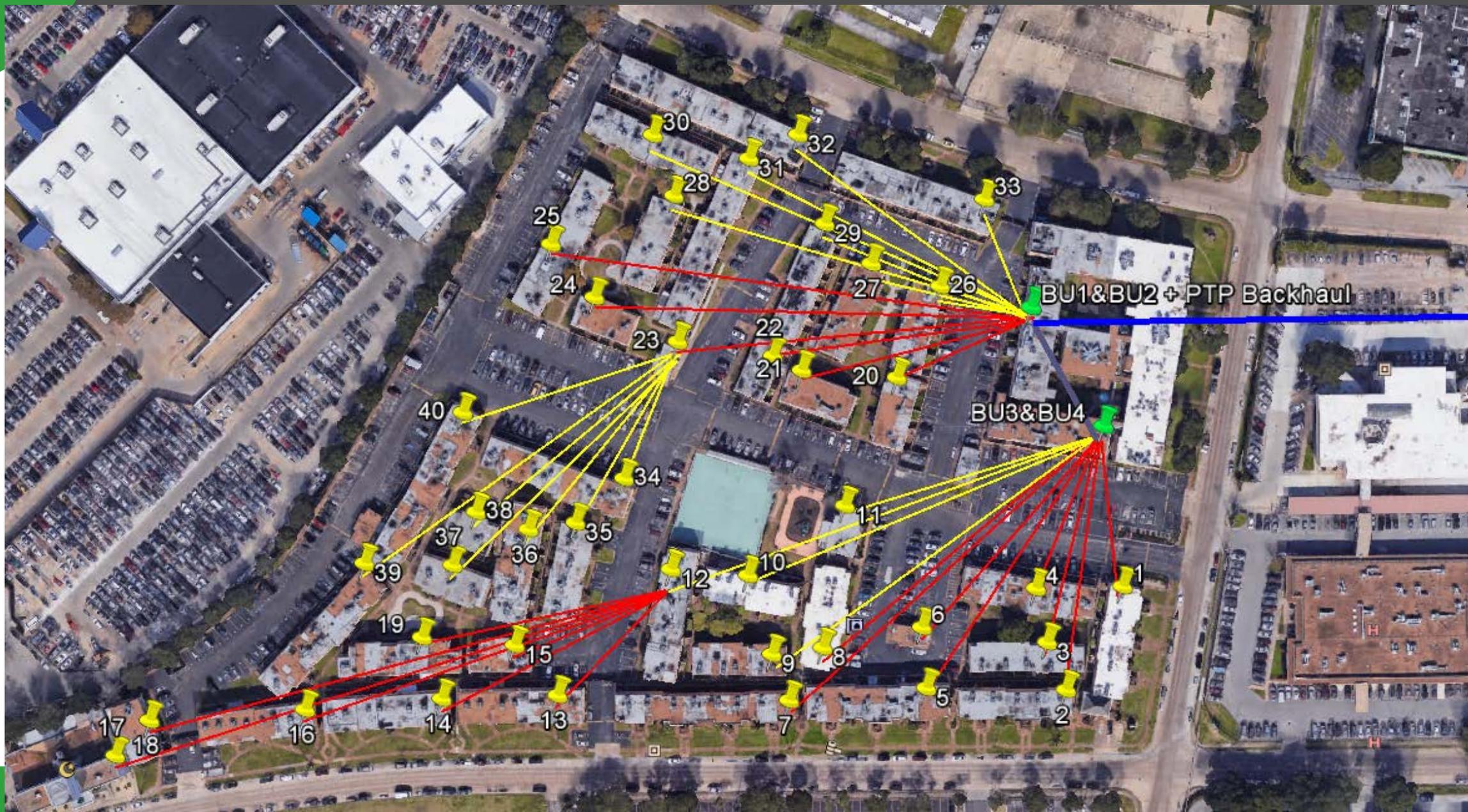
- Safe & Smart City project
- Транспорт трафика от камер видеонаблюдение & сеть между зданиями
- Замена аренды ВОЛС (cost saving)
- Все решения Siklu mmWave EtherHaul™ and MultiHaul™ radios
- **Axis** video surveillance cameras and **Genetec** video surveillance cameras



# City of Wichita – Wireless Design



# PtMP на 60 ГГц – новые перспективы



# City of Buena Park, CA Public Safety

## Emergency Call Boxes

- Backhaul for video surveillance and VOIP
- Public parking lot safety cameras plus Code Blue Emergency Call Boxes
- Lack of fiber led to decision to use wireless
- mmWave was selected to provide higher level of reliability of the network (avoid problems with interference) plus provide bandwidth required for video and VOIP
- MultiHaul 60GHz point to multipoint radios connecting cameras and ECB's together
- EtherHaul EH614TX point to point radios providing backhaul to Buena Park PD
- Around 15 Siklu radios installed and around 14x cameras



## Campus Security

- Replacing approx. 30 sub 6GHz Fire Tide radios throughout the campus
- Issues with interference in sub 6GHz frequencies and insufficient bandwidth for video
- Trialing SmartHaul™ EMS System
- MultiHaul and EtherHaul EH600TX radios for zero interference and gigabit capacity
- mmWave providing connectivity from the cameras all the way back to the Police Department



## Видеонаблюдение & WiFi

- Бесплатный Wi-Fi по той же сети с мультифокальными HD камерами наблюдения
- К Сети подключены сенсоры с парковок и др. датчики «умного города»





WIRELESS MESH DEPLOYMENT WITH REDUNDANCY

## Наблюдение за периметром

- Заказчик: самые крупные площадки по продажам автомобилей (США)
- 106 рабочих станций
- Avigilon камеры & VMS
- 60 ГГц радио для избежания помех от WiFi источников

**AVIGILON**  
THE BEST EVIDENCE™

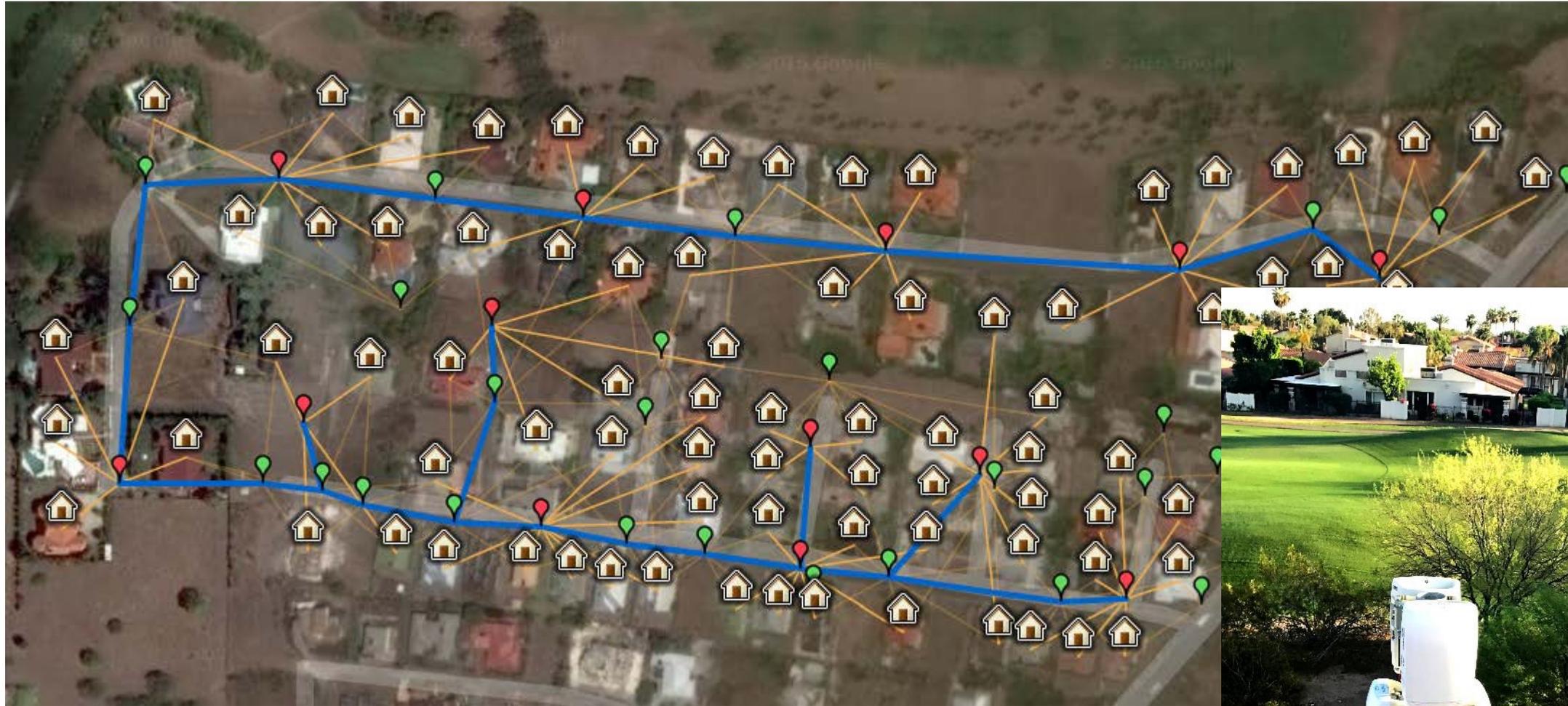


## Аппаратный узел CrimeEye®

- Замена 5.xGHz радио
  1. Увеличена пропускная способность
  2. Увеличена технологичность
- Компактность & простота



# Коттеджный посёлок



- видеонаблюдение
- ТатТелеком (Казань)
- Дождь на трассе не мешает работе радиолинка
- Приложено видео к слайду





*Thank You*  
maxim.r@siklu.com  
8916 7721334

**Siklu**  
*Magic in the air*

**Siklu**  
*Magic in the air*