Delivering 5G to Homes and Businesses, Profitably

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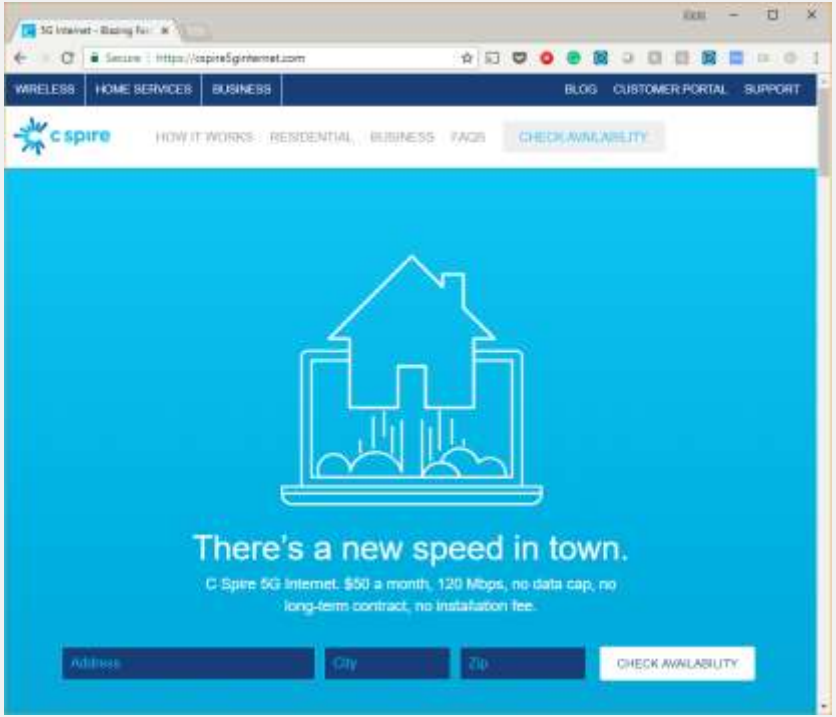
Siklu

I’m neither VZ nor AT&T
What is there for me in 5G?

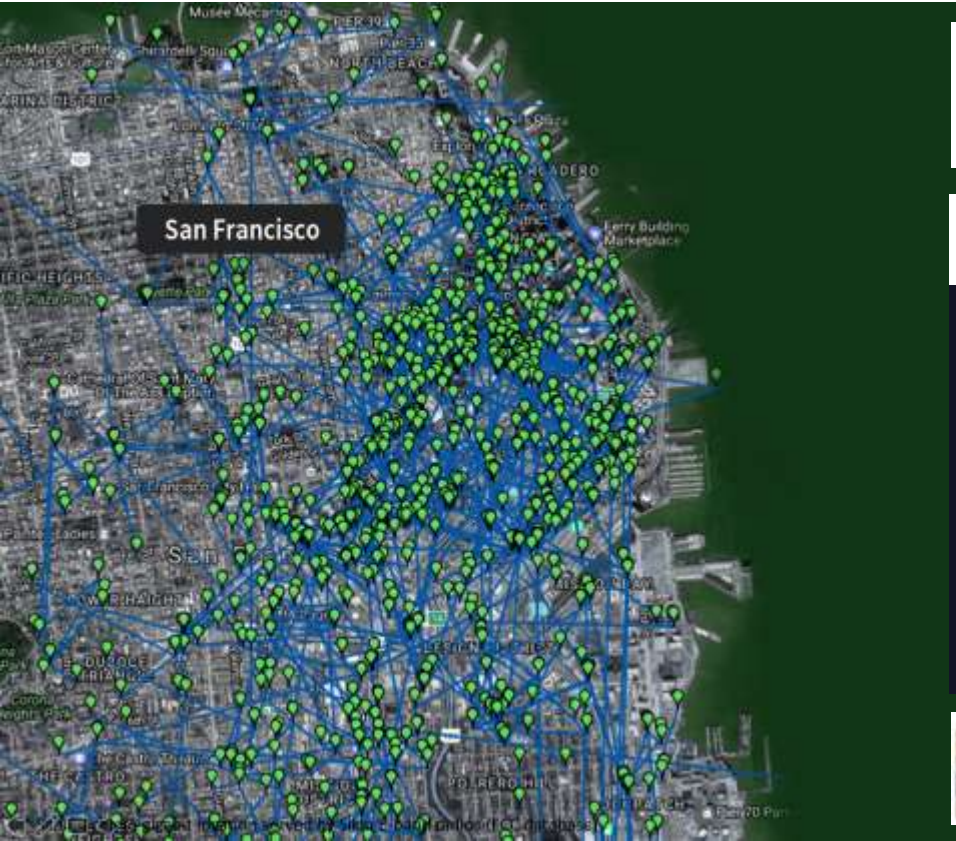
C Spire Delivers Affordable 5G Internet to Homes and Businesses



$50/month, State-wide

- Business and residential
- No contracts
- No caps
- No credit check
- 120Mbps service
- Initial plan is to cover almost all Mississippi

WEBPASS a Google Fiber Company
SIMPLE URBAN INTERNET USING SIKLU SOLUTIONS



Webpass from Google fiber

SPEEDTEST™

	↓	↑	
1. Webpass	369.94	380.91	Mbps
2. XFINITY	115.50	12.27	Mbps
3. AT&T U-verse	22.97	4.74	Mbps
4. Sonic	21.40	5.31	Mbps

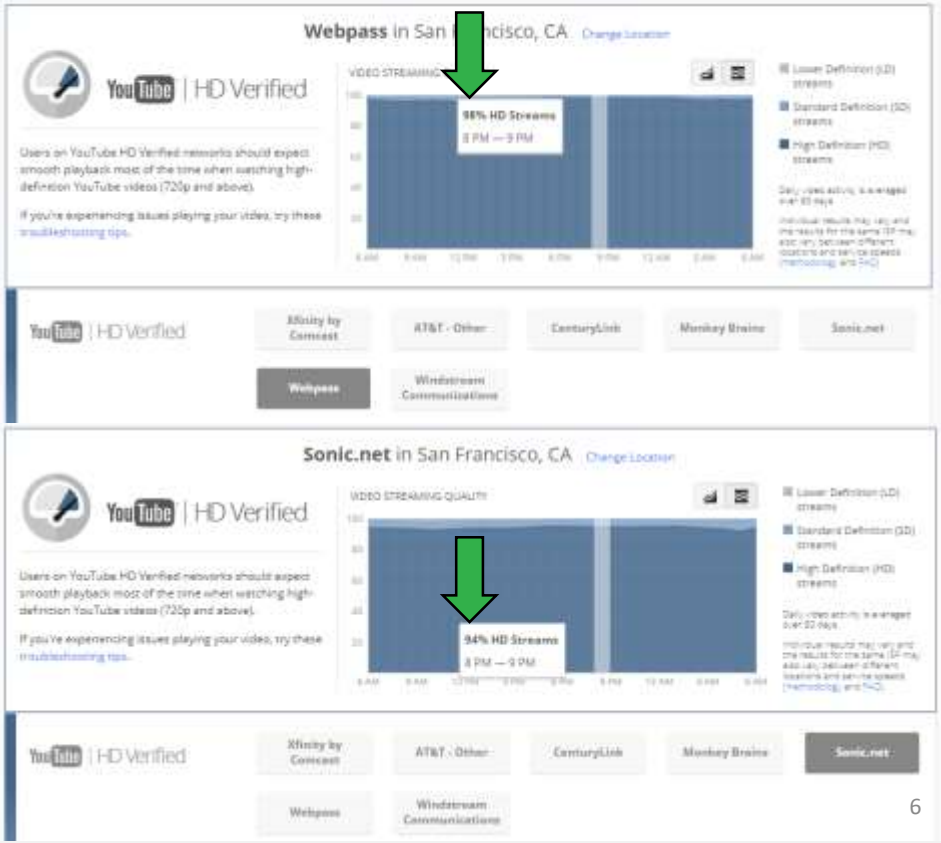
2. Webpass
756 reviews
Internet Service Providers

Serving San Francisco and the Surrounding Area
(415) 233-4100

Webpass in San Francisco, CA, Siklu mmWave

Webpass, using primarily 70/80Ghz, delivers **98% HD** video quality in peak hours

Outperforming all other service providers, even fiber only like Sonic.net



https://www.google.com/get/videoqualityreport/

FWA Market Opportunity in the US*

60M SFUs

4.5M MDUs

2M commercial buildings

* The numbers refer to structures in sub-urban and metro areas, not connected to fiber but within fiber reach

What is There for Me?

- Others are successfully doing it
- No compromise on the performance – not low performance CAF sh**
- The market is underserved
- The opportunity is huge
- It is scalable nationwide

Now let’s talk business!

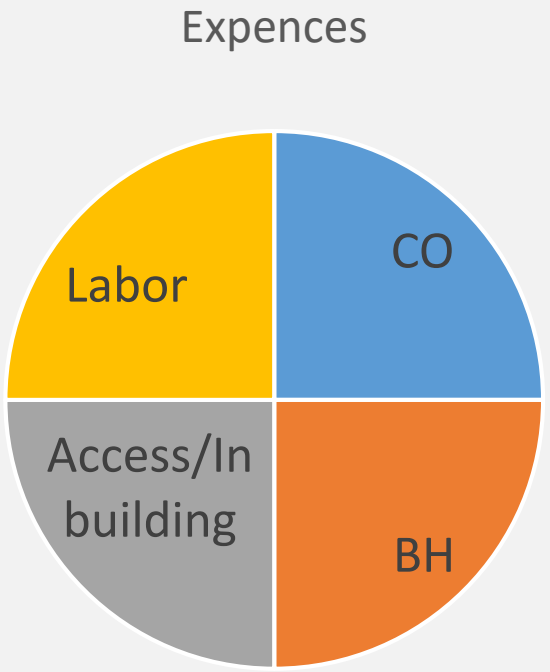
Agenda

- Understanding the business case
- Choosing the right technology
- You need a solution!
- Reducing labor cost and truck rolls
- Taking advantage of modern wireless design: advanced planning and design tools

How Much Money Do I Have?

- ROI: 2yr
- ARPU: $55/month
- GM: 80%

- Total net revenue from a customer: ~$1K/customer



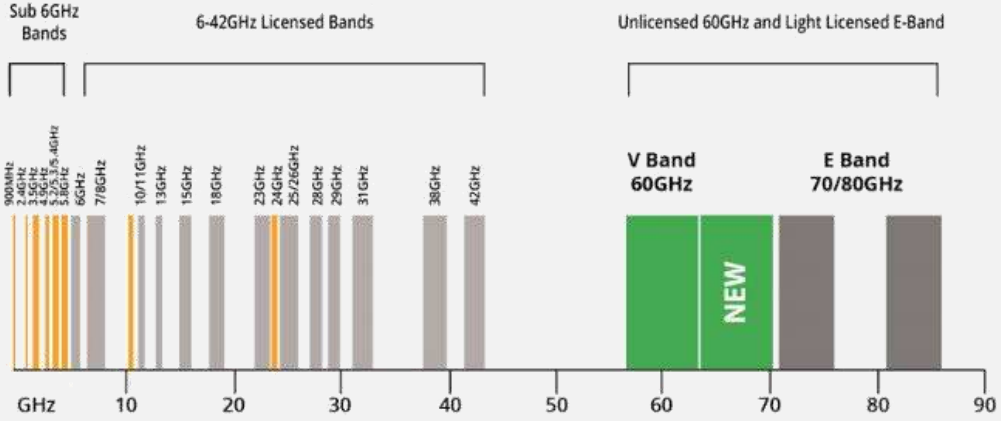
What Technology Should I Use to Deliver 5G Internet?

KPIs:

- Performance – what technology will provide me a competitive advantage over incumbents (DOCSIS)?
- Business case – what technology will enable me to make the business case (from a previous slide)?
- Access to spectrum – what spectrum do I have access to and will not cost me and arm and a leg?

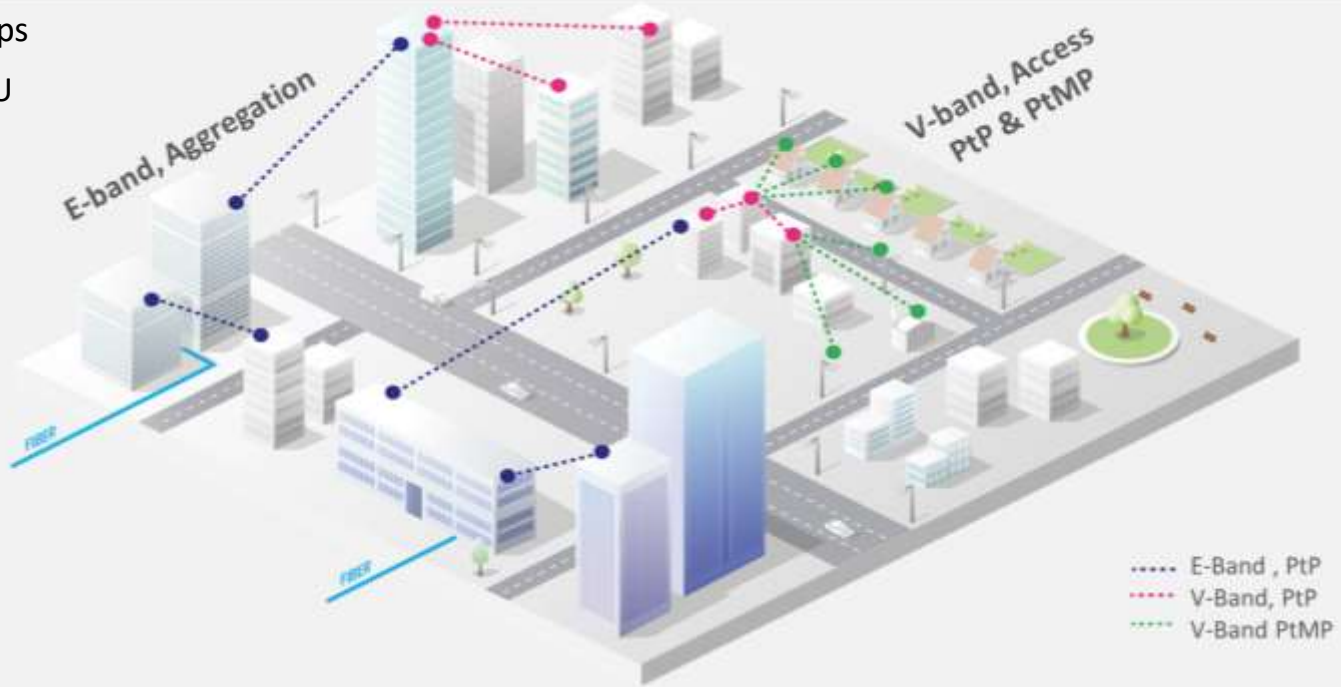
Comparing KPIs for Different FWA Technologies

	Sub 6GHz Bands	6-42GHz Licensed Bands	Unlicensed 60GHz and Light Licensed E-Band
Performance	✗	✓	✓
Business case	✓	✗	✓
Spectrum	✓	✗	✓



What is the Right Solution for Me?

- Capacity: 100Mbps – 10 Gbps
- Installation: Tower/Pole/SFU roof top/MDU rooftop
- Distance: 100ft – 3mi
- Interfaces: fiber, copper
- PtP, PtMP
- Networking: aggregation, access



No one size fits it all!

The Most Comprehensive mmWave Offering

Roof Top High-Capacity Point-to-Point

- >90 years MTBF
- 1 - 10Gbps full duplex
- Up to 2.5mi. range

Street-level Point-to-Point

- Dual PoE out
- Up to 1Gbps aggregated
- Up to 0.4mi. range

Street-level Point-to-Multi-Point

- Auto-alignment with 90° Scanning Antenna
- Up to 1.8Gbps aggregated
- Up to 1,000ft range

Product Matrix

Product	Band	Configuration	Installation	Max rate w/upgrade	Ethernet ports
MH-B100 (BU)	60GHz License exempt	PtMP	Street level	1.8Gbps TDD	2x 1G base T + 1xSFP
MH-T200 (TU)	60GHz License exempt	PtMP	Street level	1Gbps TDD	1 or 3x 1G base T
EH-600TX	60GHz License exempt	PtP	Street level	1Gbps TDD	3x 1G base T
EH-1200TX	70GHz Lightly licensed	PtP	Rooftops	1Gbps TDD	2x 1G base T + 2x 1G SFP
EH-1200FX	70/80GHz Lightly licensed	PtP	Rooftops	1Gbps FDD	2x 1G base T
EH-2500FX	70/80GHz Lightly licensed	PtP	Rooftops	2Gbps FDD	2x 1G base T + 2x 1G SFP
EH-5500FD	70/80GHz Lightly licensed	PtP	Rooftops	5Gbps FDD	1x 10G SFP+
EH-8010FX	70/80GHz Lightly licensed	PtP	Rooftops	10Gbps FDD	1x combo 10G SFP/ base T + 1x 1G base T

How to Drive the Labor Cost Down?

- It is not a rocket science install, doesn't require licensed tower climbers etc.
- Satellite dish/Wifi like installation
- Decide what to do inhouse and what to outsource
- When outsourcing, do a project based approach
- Use local subcontractors
- Do a site survey by yourself

- Makes it a win-win!
  - For you – lower labor cost
  - For integrator – larger projects

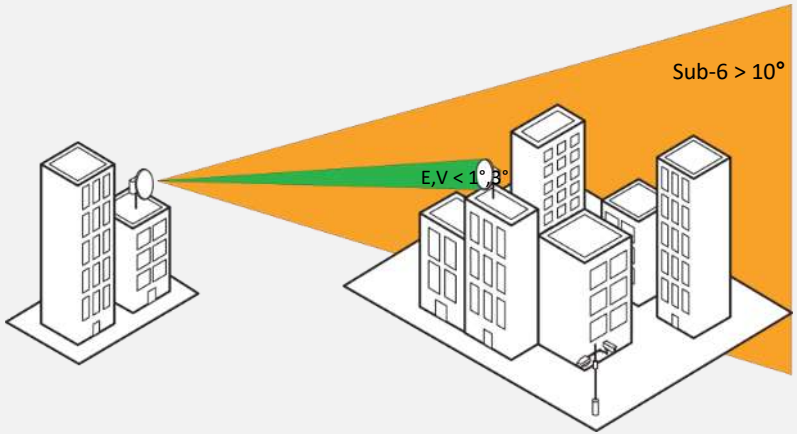
How to Minimize Truck Rolls?

Future proof technology:

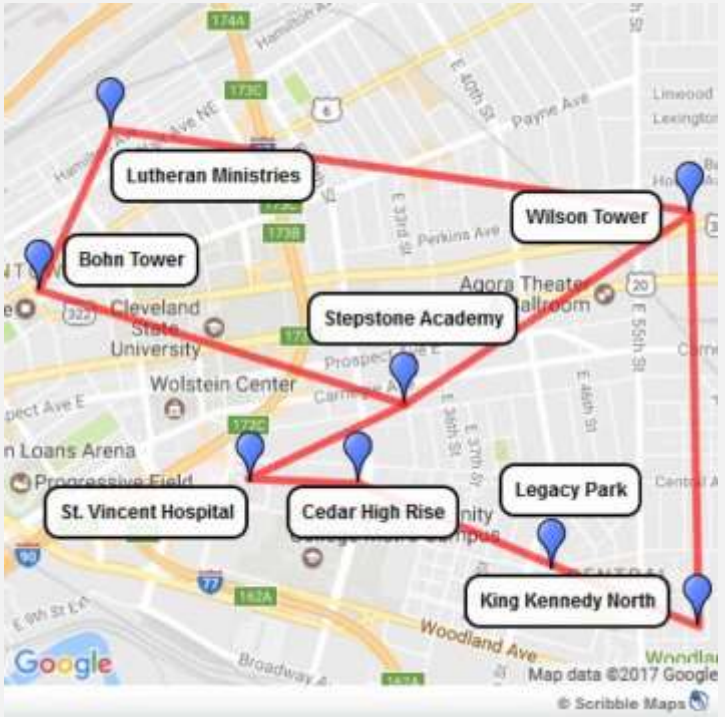
- mmWave provides you immunity to interference
- mmWave provides huge amount of spectrum – multi gigabit speeds
- Build a reliable network topology
- Don’t compromise on quality

E-Band (70/8 GHz)
Lightly licensed , 10GHz

V-Band (60 GHz)
Unlicensed, 14GHz

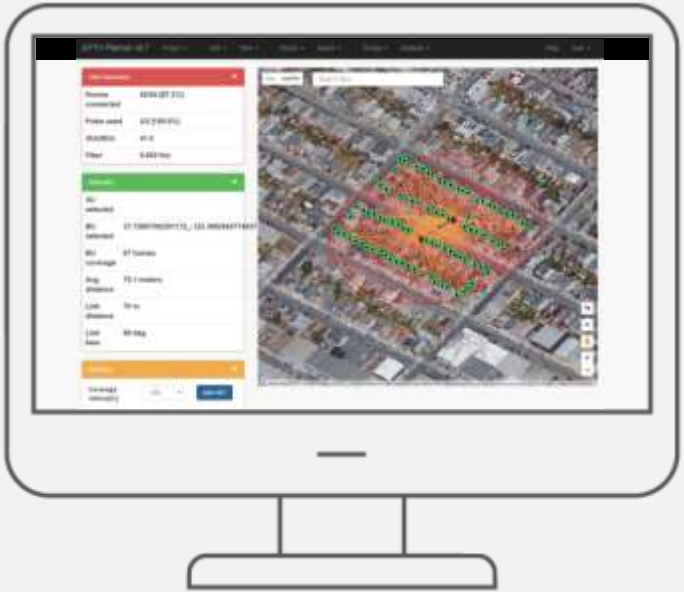


Use Advanced Networking – Rings (ERP)



Take Advantage of Software Tools

- WiNDE – automating planning and design of wireless network (https://www.siklu.com/plans/)
- Interactive MDU business case (https://go.siklu.com/financial-analysis-calculator-lp)
- Link budget calculator (http://lbc.siklu.com/)



Putting it all together

Summary

- ✓ Choose the right technology (KPIs): mmWave – 60/70/80 GHz
- ✓ Think solution: Siklu provides a complete mmWave product offering
- ✓ Labor cost can be a significant portion – know how to reduce it
- ✓ Build to last - choose Carrier grade, high MTBF, field proven gear
- ✓ Take advantage of planning and design tools to scale and overcome wireless challenges

Company Snapshot

Founded: 2008

Employees 85; Headquarter Israel; Presence in USA, CALA and EMEA

Most Deployed

mmWave solutions in the US

Most Comprehensive

mmWave offering

60 GHz V-Band PtP	60 GHz V-Band PtMP	70-80Ghz E-Band PtP	Network Planning Tool

Our Expertise: mmWaves

- Strongest mmWave Team Worldwide
- Network to Chip level expertise
- Ability to innovate and execute

> 60,000

Units installed in more than 25 countries

Strong Investors

ARGONAUT PRIVATE EQUITY

SERCOMM

TAMIR FISHMAN

QUALCOMM

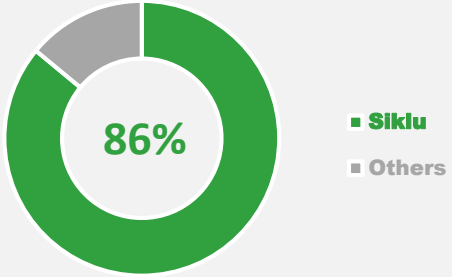
evergreen VENTURE PARTNERS

Siklu is Leading Gigabit Wireless Market

2017 mmW market share

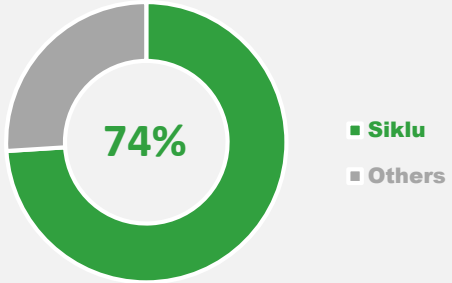
E-Band

2017 70/80GHz registered links in the USA (FCC DB)

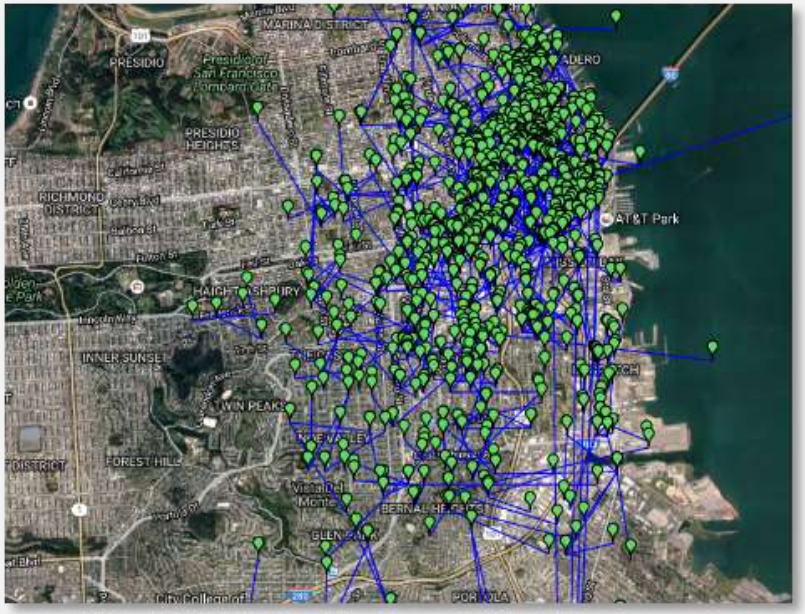


V-Band

2017 global 60GHz links shipments (SLR)



Most deployed mmWave systems in the world



** San Francisco gigabit location served by Siklu E-band radios (FCC database)*

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THANK YOU