Continuous Mobile Delivery

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What Is Important To An Enterprise Grade Company?

Assumptions

1. Ability to record critical data to system of record while mobile.

1. Receiving bad data is not acceptable.

1. Cellular, WiFi, offline mobile capabilities are all critical to operations.

1. If system of record were down for days/weeks, it is important that all data can still be recorded digitally.

1. In a disaster recovery event, it is important to have all data available on a separate system to re-instantiate the system of record?

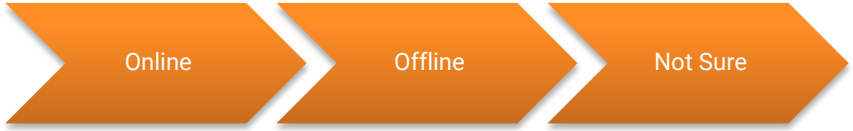
1. Technicians need to perform emergency work at times.

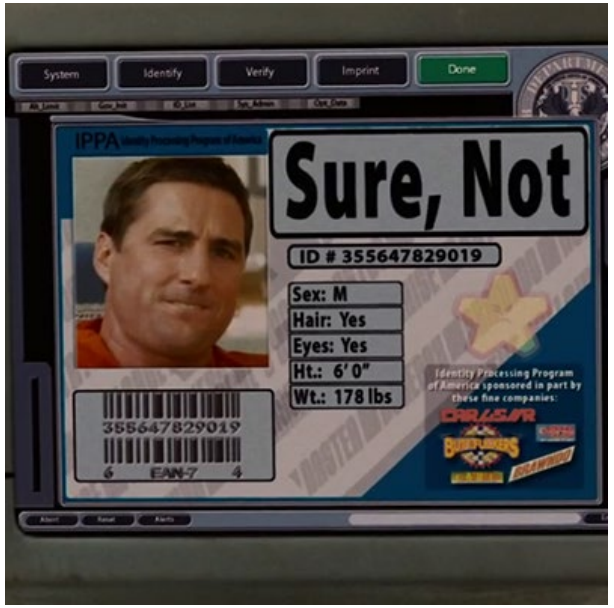
Risk & Exposure

- Unsure about proper mobile requirements.
- Selecting a mobile solution without proper requirements.
- Limited data and data recording capabilities.
- Errors in data entry/receiving bad data.
- Time consuming data entry processes.
- Loss of critical data.
- Inability to record critical data.
- Data sync times too long for technicians.
- Technicians using mobile device as a hammer.

Three Phases Of Mobility

Online **Offline** **Not Sure**





Online

- Users are connected from their mobile device to their system of record through a stable WiFi or cellular signal.
- All system of record data is accessible through the mobile device.
- The technician can access anything inside the system of record including PDF's and files that require more memory.

Offline

- Users are not connected from their mobile device to their system of record through a stable WiFi or cellular signal.
- Users can record data if the mobility tool is capable as a hybrid or fully offline solution.
- Data cannot be transferred back to the system of record until a WiFi or cellular connection returns.

Cellular/WiFi Battling Each Other

- Users do not have a steady connection from their mobile device to their system of record through a stable WiFi or cellular signal.
- This takes place when both the WiFi and cellular signals are minimal.
- The mobile device is now forced to continue switching in an effort to achieve a signal for the user.
- This drains battery life and kills active data temporarily stored to the device.

Online Only Mobile Solutions

Pros

1. Affordability - historically these online only solutions have been included with a purchase of a backend solution.

1. Work fine so long as there is always an active internet or cellular connection.

Cons

1. No functionality offline.

1. Loss of critical data when a connection is severed.

1. Technicians quickly stop using these types of mobile softwares and turn back to pen and paper.

Hybrid Mobile Solutions

Pros

1. Easily Accessible - typically deployed through public app stores.

1. Out of the box options typically match system back end.

1. Best deployed in settings where there are very limited or no gaps in WiFi coverage.

1. Very efficient for inventory counting.

1. Makes sense to deploy with a limited quantity of licenses.

Cons

1. Needs to be configured on three fronts:
    a. Saved queries need to be configured to achieve limited offline performance.
    b. Specific configurations to coincide with the backend/workflow.
    c. The mobility software will likely need to be configured to meet the organization's mobile goals.

1. Offline records are very limited.
    a. Roughly 20 records per query.
    b. A technician needs to preload a saved query to have that information available in an offline situation.
2. Closing out of the mobile app offline will likely delete temporarily stored data.

1. Out of the box functionality is often limited.

Offline First Mobile Solutions

Pros

1. Retains all EAM data when mobile application goes offline.

1. OCR capture becomes possible.

1. Offline enterprise mobility solutions can re-instantiate back end in a disaster recovery scenario.

1. If system of record is down, technicians can work for days, weeks, or months without a backend connection.

1. Likely to improve system of record performance.

Cons

- Requires server integration.

- IT will need to be involved in set up process.

Important Considerations

Software Care & Roadmap

- Pairing your software purchasing decision with a company that is heading in the same direction.
    - Future performance
    - Future tools
    - Seeking a software company that is focused on your LOB
- Is the software company growing and servicing or are they sunsetting the product?
    - Service strength
- Are you able to service your own software through an SDK or App Builder?
    - Will you be solely reliant on a software company to handle your updates, patches, fixes, service at large?

Cartography

- Define your logic and workflows
    - Note the reasons for each if you can
        - Most people accept change far easier with a concise explanation
- Allow your crew leaders to have input on how their team does their job best
- Confirm what is being asked and record change requests
- Check usage of application
    - To determine how you can help your org accept the mobility solution

What Is Shannon's Law?

Background

Claude Shannon is the father of modern cryptography.

Developed his noisy channel coding theorem during WWII at Bell Labs.

Shannon's theorem sets an upper limit on the rate at which data can be transmitted over any communications channel, whether wired or wireless.

Theoretical Limits

We are rapidly approaching the theoretical limits for wireless data transmission set by Shannon's Law.

Every successive cellular generation has brought dramatic increases in data rates.

2G networks offered a maximum theoretical data rate of 40 kbps–but today's 4G LTE-Advanced networks have peak theoretical data rates of 1 Gbps.

5G networks have peak theoretical data rates of 20 Gbps for downlink and 10 Gbps for uplink.

5G

5G sets a new standard for data transfer.

Instead of 20 or even 100 MHz, the 5G NR specification allows devices and towers to use up to 800 MHz of spectrum at any one time.

Demodulating 800 MHz of Radio Frequency into bits and bytes is very complex.

And doesn't always work as planned...

Frequency Challenges

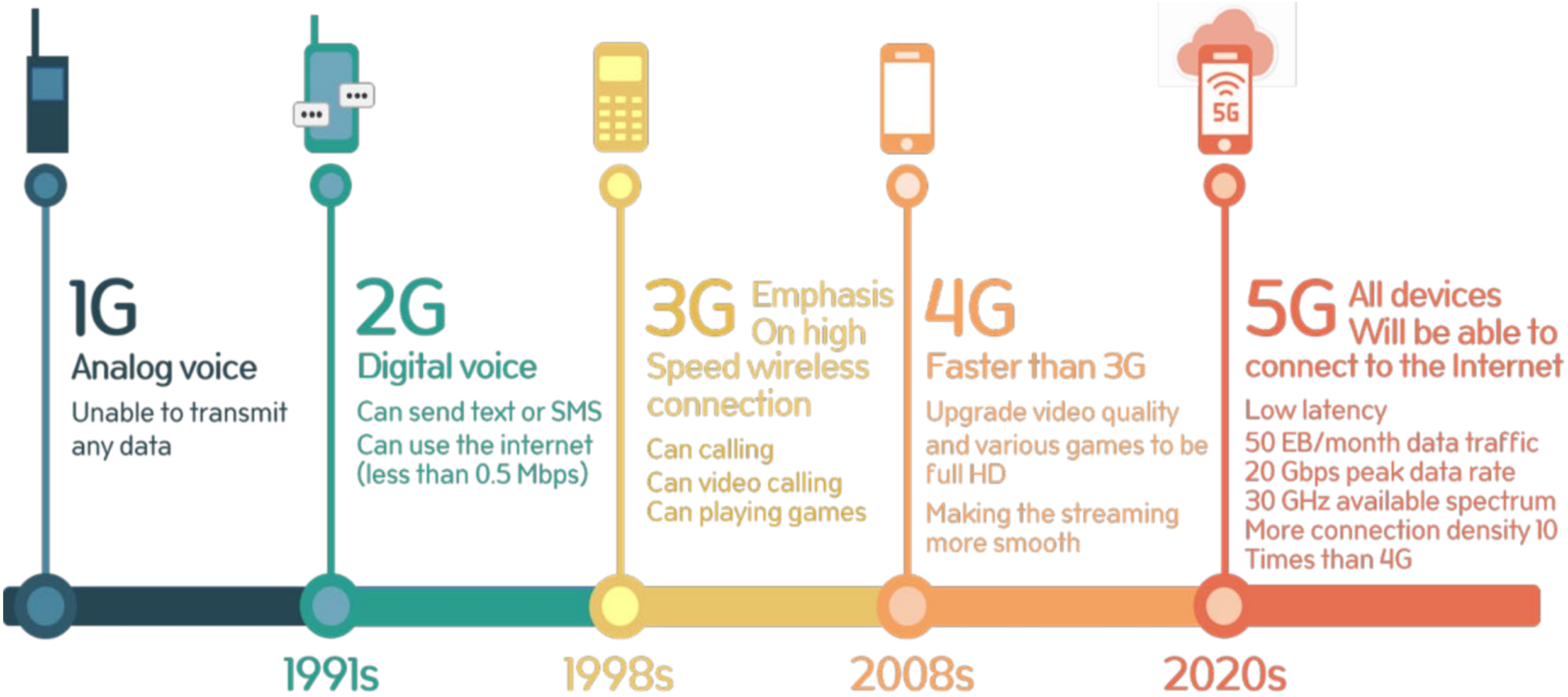
2G, 3G and 4G LTE networks started with low and mid-band spectrum because low and mid-bands travel far.

5G's mm Wave bands are high frequency and lower the distance they can travel in free space compared with low and mid-band spectrum.

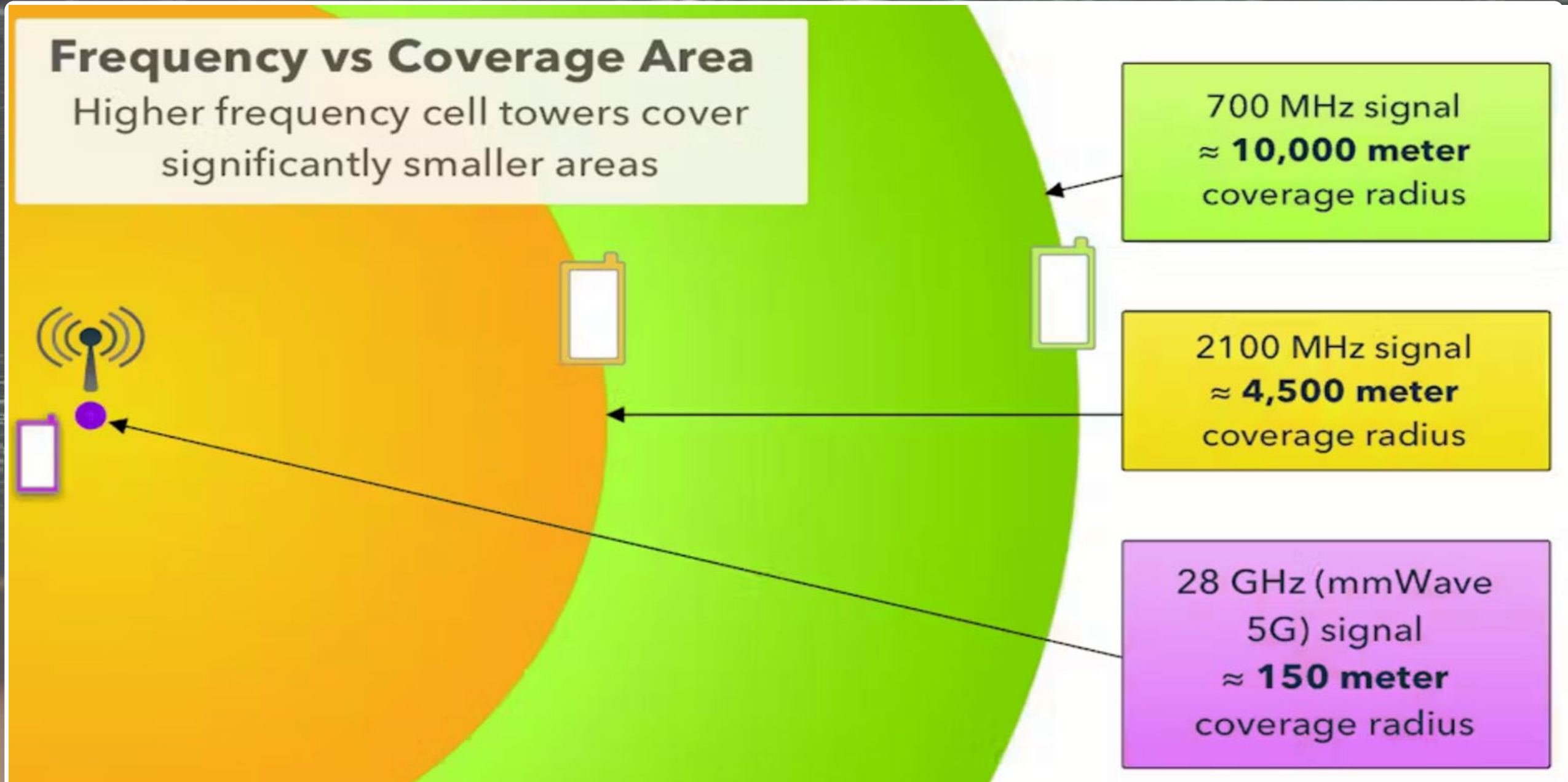
Additionally, the 5G's mmWave bands are more easily absorbed by obstacles.

A typical 4G LTE cell tower can serve a user 10 km away, but a 5G mmWave tower operating might cover just a 100-meter radius.

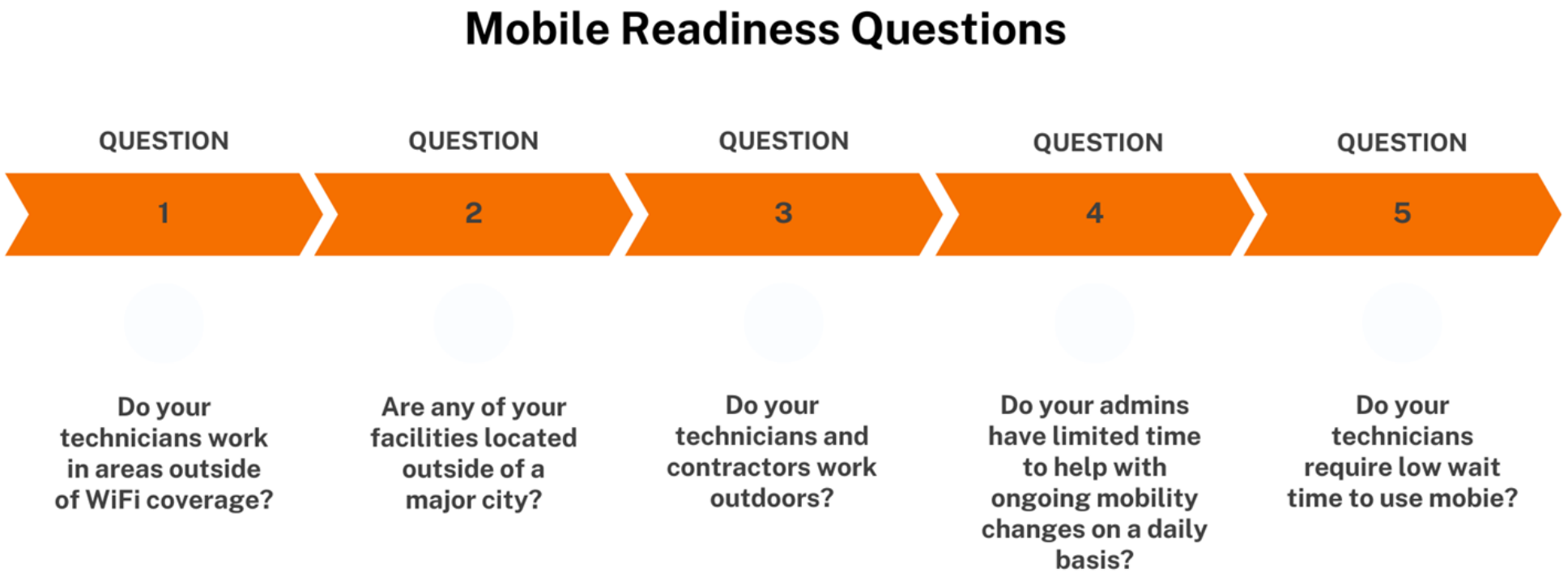
1G-5G Expectations



How does high frequency stack up?



Mobility Readiness Diagram



Questions?

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