

SMALL CELLS: US POLICY EVOLUTION

May 24, 2022

Mark Reudink

Board of Governors Representative, 5G Americas

Head of Technology Strategy, Crown Castle

(Presenting on behalf of Chris Pearson of 5G Americas)

AGENDA

- **Who We Are – 5G Americas**
- **Challenge: Delivering on the Promise of 5G**
- **Importance of spectrum**
- **Small cells and network densification**
- **US Regulatory Policy: Small Cells**

5G AMERICAS FACILITATES AND ADVOCATES FOR THE ADVANCEMENT AND TRANSFORMATION OF LTE, 5G AND BEYOND THROUGHOUT THE AMERICAS.

Airspan

antel

AT&T

ciena

CISCO

CROWN
CASTLE

ERICSSON

intel

LIBERTY
LATIN AMERICA

MAVENIR

NOKIA

Qualcomm

SAMSUNG

Shaw)

Telefonica

T-Mobile

vmware

WOM



**Technical Facilitation
& Coordination**

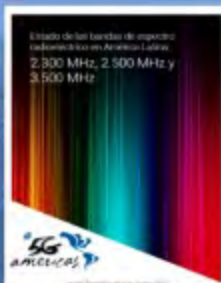


Regulatory Policy



Educational Outreach

Technical Work Groups / White Paper Publications



June 1, 2021
State of the Radio Spectrum Bands in Latin America: 2,300 MHz, 2,500 MHz & 3,500 MHz



July 14, 2021
Mid Band Spectrum & Coexistence with Radio Altimeters



Aug 12, 2021
Analysis of ITU Spectrum Recommendations in Latin America



Aug 19, 2021
Private and Enterprise Networks



Sep 15, 2021
Vehicular Connectivity: C-V2X & 5G



Oct 6, 2021
5G Vertical Use Cases



Nov 2, 2021
5G Edge Automation and Intelligence



Nov 10, 2021
Fixed Wireless Access with 5G Networks



Nov 19, 2021
Mobile Communications Towards 2030



Dec 3, 2021
Security for 5G

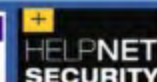


Jan 14, 2022
Cellular Communications in a 5G Era



Jan 26, 2022
5G and Non-Terrestrial Networks

Our white papers can also be found here:



Oct. 2019

PRECISION PLANNING FOR 5G ERA NETWORKS WITH ***SMALLCELLS***



5G AMERICAS IS **PROUD** TO CONTINUE OUR
PARTNERSHIP WITH SMALL CELLS FORUM

MORE HERE:

<https://www.5gamericas.org/precision-planning-for-5g-era-networks-with-small-cells/>



GLOBAL MOBILE NETWORK DATA TRAFFIC
GROWTH REMAINS **STRIKINGLY HIGH**.

44%

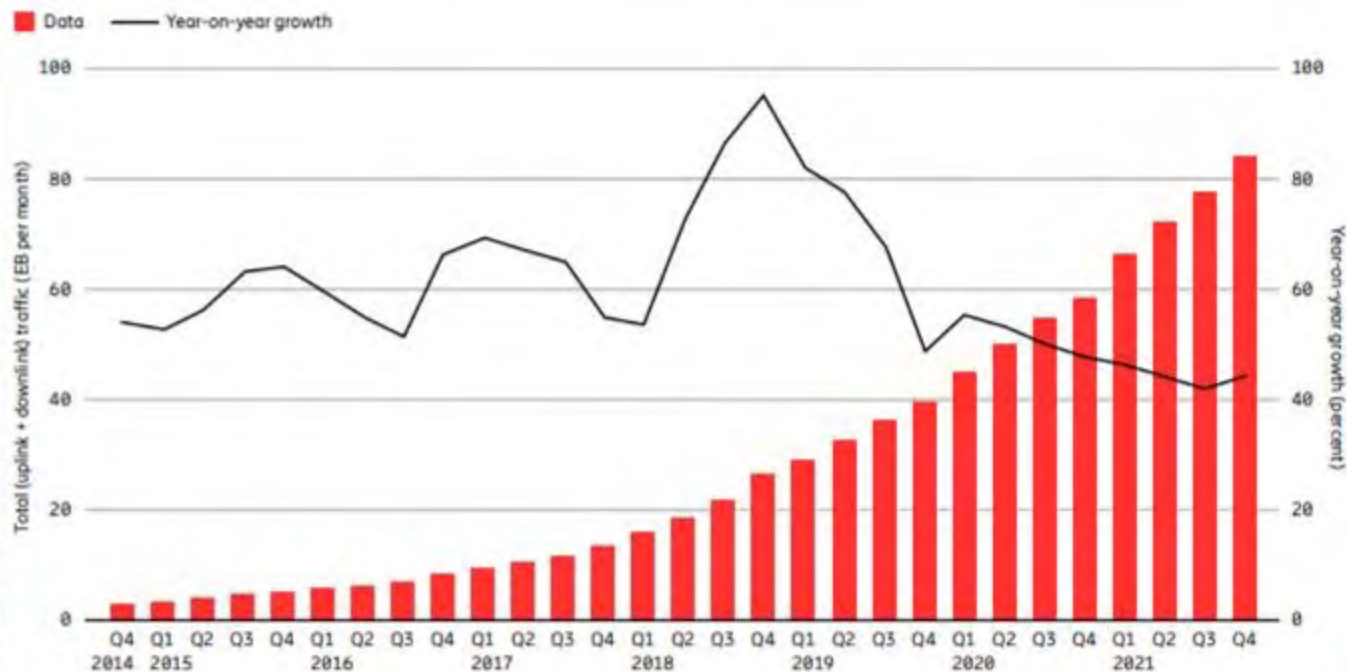
Annual data
growth

=

Doubling
size or
capacity of
the network

every
20
Months

Global mobile network data traffic and year-on-year growth (EB per month)



Source: Ericsson traffic measurements (Q4 2021).

Note: Mobile network data traffic also includes traffic generated by fixed wireless access (FWA) services.

* Traffic does not include DVB-H, Wi-Fi or Mobile WiMAX. VoIP is included.

Source: [Ericsson Mobility Report Q4 2021 Update](#) (Feb. 2022)

ECONOMIC IMPACT OF 5G IN THE US



In the next decade



1.4–1.7

Trillion dollars



3.8–4.6

Million jobs created

Boston Consulting Group Study, behalf of CTIA – Feb 3, 2021

Between 2021 - 2025



Up to \$2.7

Trillion dollars in sales
(Indirect effects)



16

Million jobs transformed

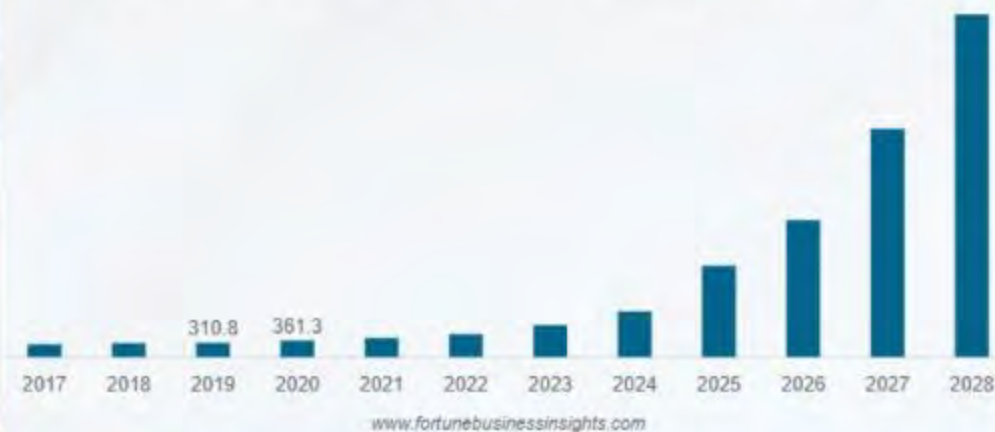
Accenture, behalf of Qualcomm – Feb 2021

SMALL CELL 5G NETWORK MARKET

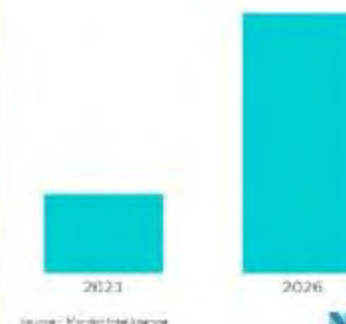
“The small cell 5G network market is expected to witness market growth at rate of 54.3% in the forecast period of 2021 to 2028”

(Source: Data Bridge Market Research, April 2022)

North America Small Cell 5G Network Market Size, 2017-2028 (USD Million)



Market Summary
CAGR: 25.82%



Study Period: 2018- 2026

Base Year: 2021

Fastest Growing Market: Asia Pacific

Largest Market: North America

CAGR: 26.82 %

NOKIA

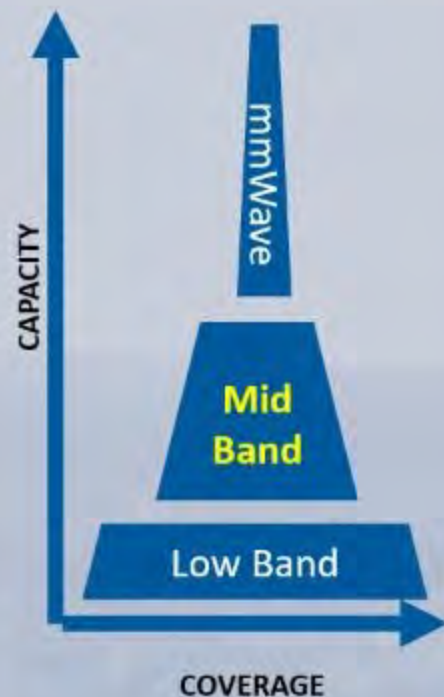
Qualcomm

verizon

HUAWEI

ZTE

DIFFERENT SPECTRUM UNLEASHES DIFFERENT USE CASES



- As spectrum frequency goes up, capacity increases and coverage decreases
- **mmWave** is suitable for high-bandwidth, short-distance applications.
- **Mid-band** works well for applications that need both capacity and coverage
- **Low-band** works well with applications that need broad coverage and constant connectivity.

mmWave



- First Responders
- Automated Factories
- Robotics
- AI/ML requiring large data sets
- Science/research with large data sets and video
- Large events

Mid-Band



- VR/AR
- High-resolution video
- Autonomous cars
- Drones

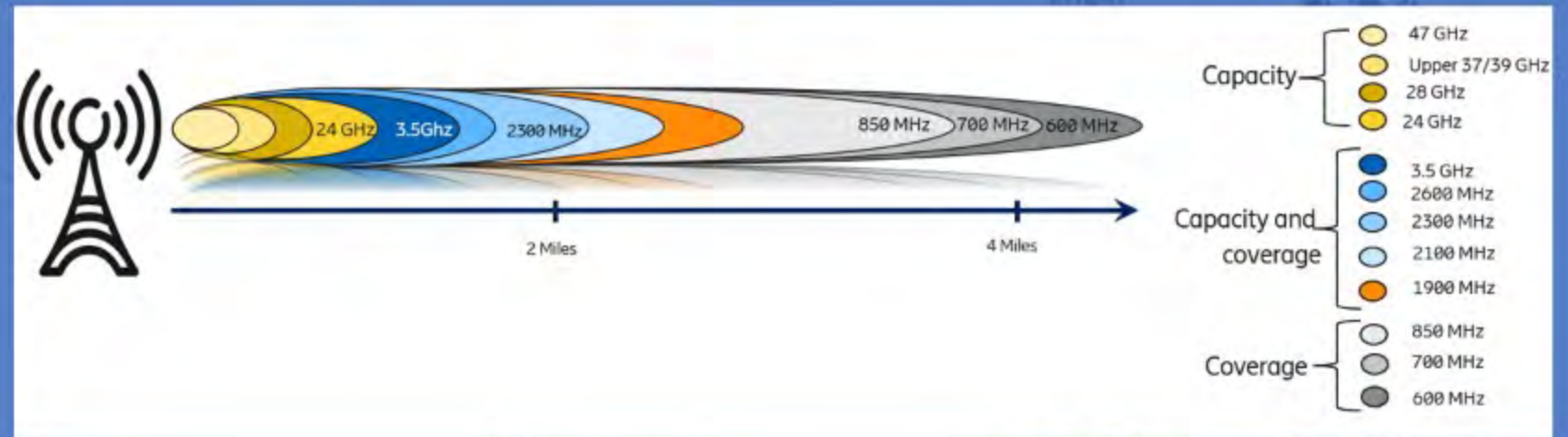
Low-Band



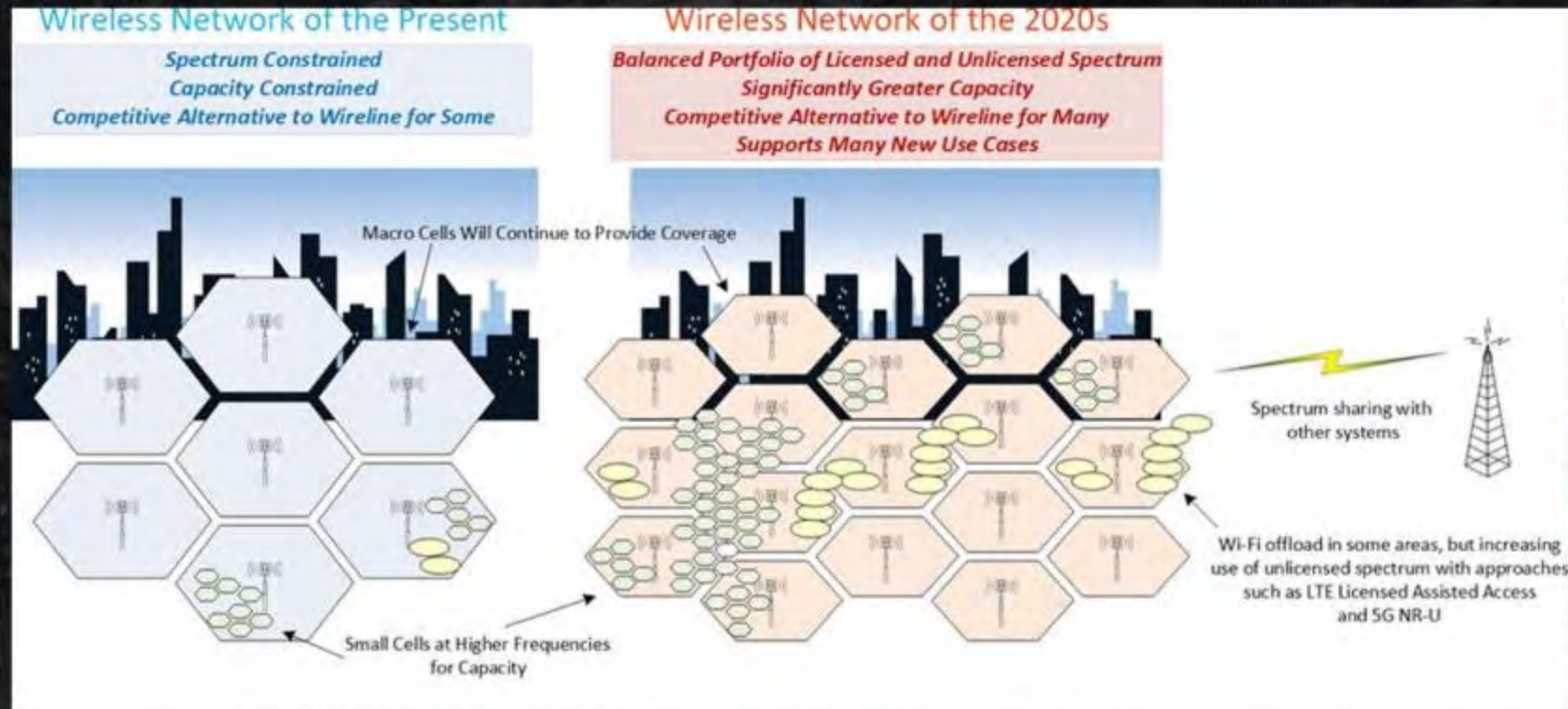
- Smart city sensors
- Smart home sensors
- Urban-rural digital divide
- Healthcare sensors
- Wearables

FUTURE NETWORKS NEED ADDITIONAL LICENSED SPECTRUM

- Lower frequencies = Less capacity. Longer range. Fewer sites needed. Faster deployments.
- Millimeter wave and frequencies above 6 GHz provide very high capacity, but deployment will need many more cell sites.
- # of cell sites needed directly translates into **speed & cost of deployment** and service availability.

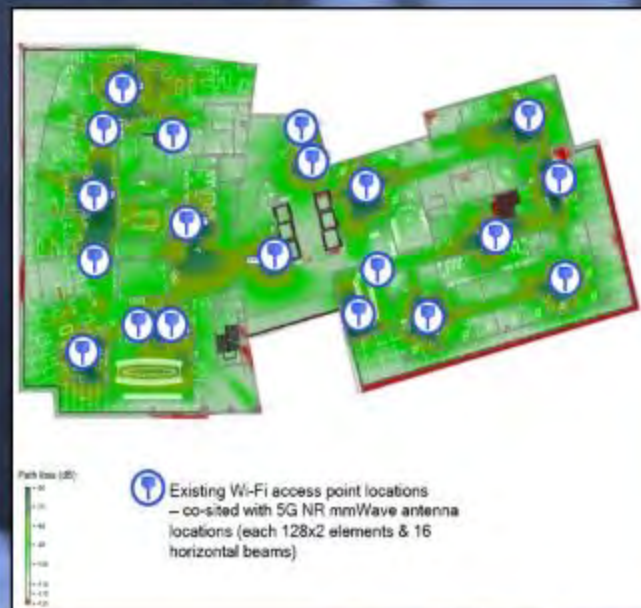
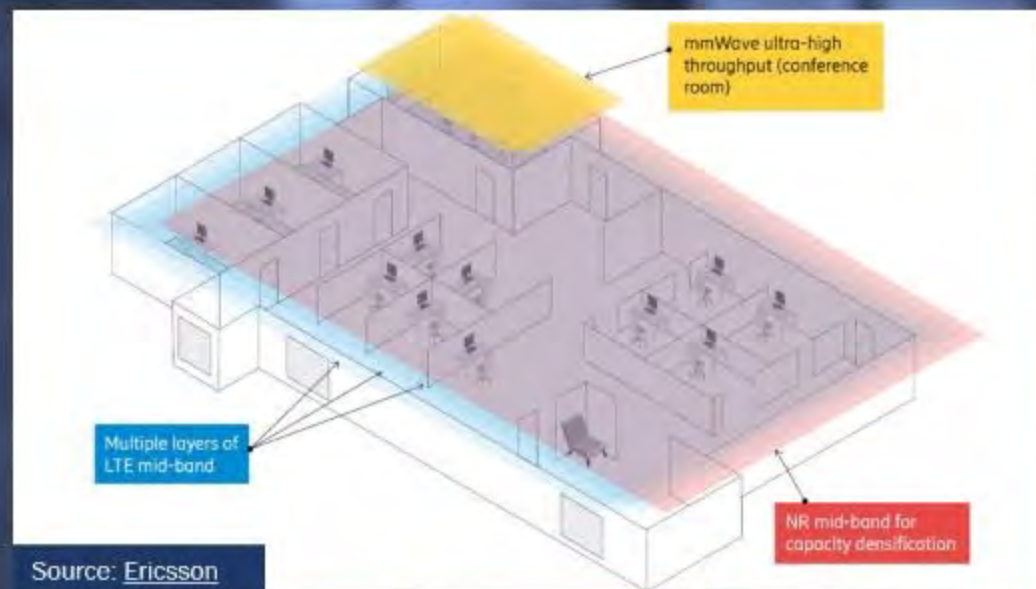


WHAT NETWORK DENSIFICATION COULD LOOK LIKE FOR 5G



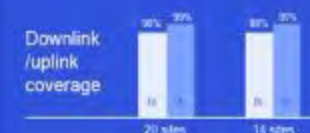
MANY OPTIONS TO INTEGRATE INDOOR 5G SMALL CELLS FOR MAXIMIZING PERFORMANCE AND COVERAGE

- **5G indoor small cells can be integrated** with distributed radio or distributed antenna systems (DAS) deployments for improved indoor capabilities
- **Indoor 5G small cells can be co-sited** with 4G LTE, Wi-Fi or other wireless technologies to maximize performance and coverage



Achieving comparable performance with fewer APs

Deploying 5G NR mmWave at 14 out of 20 possible Wi-Fi locations



1. Coverage simulation based on 3GPP's maximum allowable path loss analysis with ray tracing propagation model and measured material and propagation loss. Maximum 0.4 Gbps for downlink speed and coverage. 2. Using 5G NR 28 bandwidth and 500 MHz uplink bandwidth with 7.1 GHz 5G NR.

Source: "Cellular Communications in a 5G Era" (5G Americas)

SPECTRUM, CELL SITES AND US FEDERAL REGULATION: FCC AND NTIA



**Federal
Communications
Commission**



Jessica Rosenworcel
(Chair)



Brendan Carr



Geoffrey Starks



Nathan Simington



TBC (By Senate)



**National
Telecommunications
and Information
Administration**



Alan Davidson
Assistant Secretary of Commerce for Communications and
Information and NTIA Administrator

**FCC oversees commercial spectrum, while
NTIA oversees spectrum for federal and
government use.**

WHAT IS THE US DOING TO IMPROVE SPECTRUM COORDINATION?



FCC & NTIA committed to spectrum coordination

The Federal Communications Commission (FCC) and National Telecommunications and Information Administration (NTIA) today announced a **new initiative** to improve U.S. government coordination on spectrum management. The Spectrum Coordination Initiative will involve actions by both agencies to strengthen the processes for decision making and information sharing and to work cooperatively to resolve spectrum policy issues.

(Source: FCC, NTIA Establish Spectrum Coordination Initiative, Feb. 15, 2022)

Five Key Areas to Address

5

Reinstate High Level Meetings

Reaffirm Roles and Responsibilities

Renew Efforts to Develop a National Spectrum Strategy

Recommit to Scientific Integrity and Evidence-Based Policymaking

Revamp Technical Collaboration

FEDERAL COMMUNICATIONS COMMISSION 5G FAST PLAN (2018)



Restoring Internet Freedom

National policy for Internet providers, also encourages wireless investment and innovation while at the same time protecting various Internet freedoms. (ie., repeal of 'net neutrality')



One-Touch Make-Ready

These rules govern the attachment of network equipment to utility poles (often an important aspect of 5G cell sites). This will help reduce costs and streamline 5G deployment.



IP Transitions

FCC rules will be revised to accommodate and promote company investments in next-gen networks and services.



Business Data Services

Updated rules for high-speed services by lifting rate regulation as needed, which will aid in incentivizing fiber network investment.



Supply Chain Integrity

Prevent taxpayer dollars from being used for purchases from companies posing national security threats to American networks.



Small cell regulations

New rules to speed up federal review of small cells by reducing regulatory impediments to 5G small-cell infrastructure deployment.

State and Local Review of Small Cells: Local municipal roadblocks that slow down 5G deployment removed. State and local deadlines for approving or disapproving small-cell site applications are also affected.



STATE AND LOCAL SMALL CELL REGULATIONS



US Supreme Court Decision

Cities may not prohibit access to utility poles for provisioning telecom services, extending to municipal fees.

On June 28, 2021, the U.S. Supreme Court denied the petition for certiorari filed by consortiums of various municipal governments and associations seeking to overturn the Ninth Circuit's decision in *City of Portland v. FCC*, which upheld the Federal Communications Commission's (FCC) extension of Section 253 protections to municipal property in the public right-of-way, including utility poles.



>30 States

Have enacted streamlined small cell regulations, including:

- Streamlined applications to access public rights of way.
- Caps on costs and fees.
- Streamlined timelines for the consideration and processing of cell siting applications.

Source: National Conference of State Legislatures, Aug 2021

5G AMERICAS LINKS



White Papers

Full white papers. 100% free. PDF.

www.5gamericas.org/white-papers



Regulatory

Filings. Comments. Issues. FCC and NTIA.

www.5gamericas.org/advocacy-and-regulatory/



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Thank you

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