

CMU/ OEC and Crown Castle

April
2022

Crown Castle's involvement with CMU / OEC

One basic tenets of 5G is low latency compute which requires distributed facilities with high-speed connections

Crown's assets could be ideal locations for the compute facilities, but, to scale, the industry need developers, collaboration and testbeds

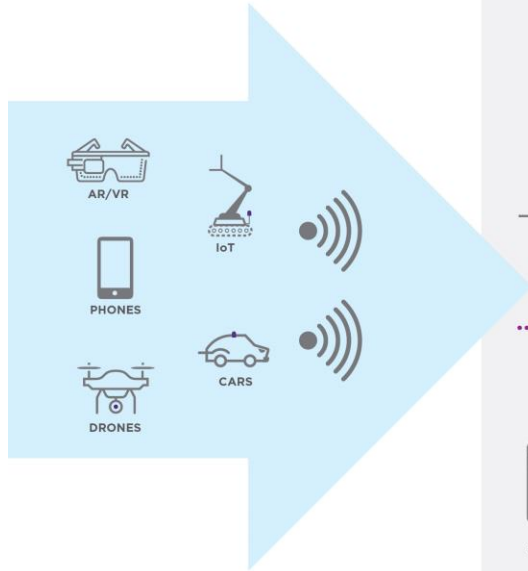
Crown developed a relationship with the CMU team to provide the underlying infrastructure for the testbed starting with an experimental license and moving to CBRS

Shared infrastructure can offset entry costs and enabling edge service providers to focus on providing high-margin software-based services to their end-users

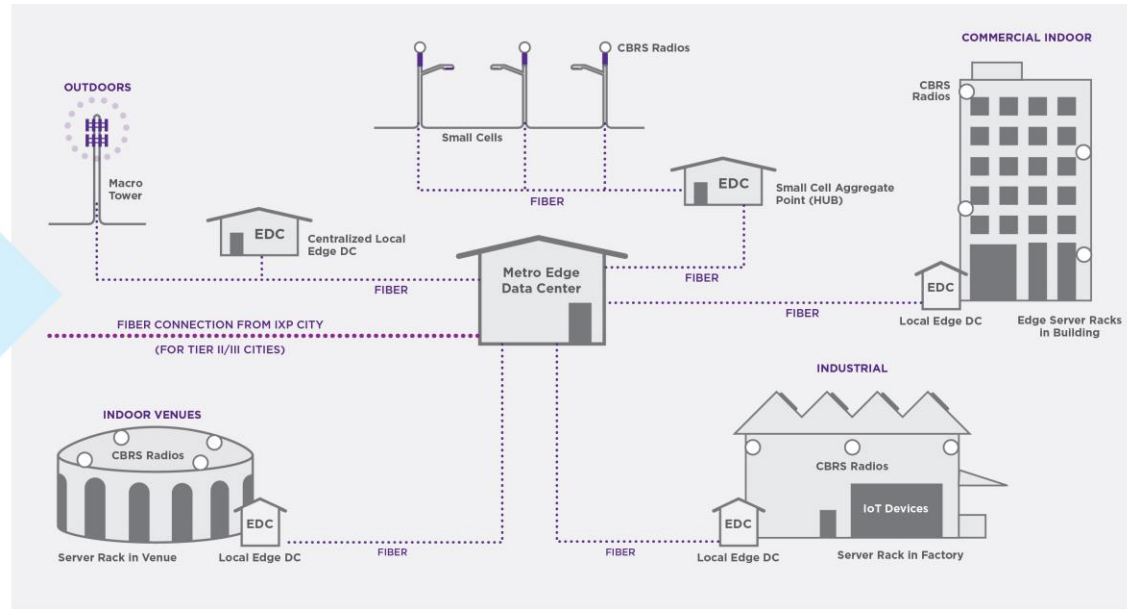
Evolution of Virtualized, Shared Infrastructure

Crown's local real estate and connectivity infrastructure will enable both virtualized 5G networks and a broad range of emerging enterprise Edge Compute scenarios

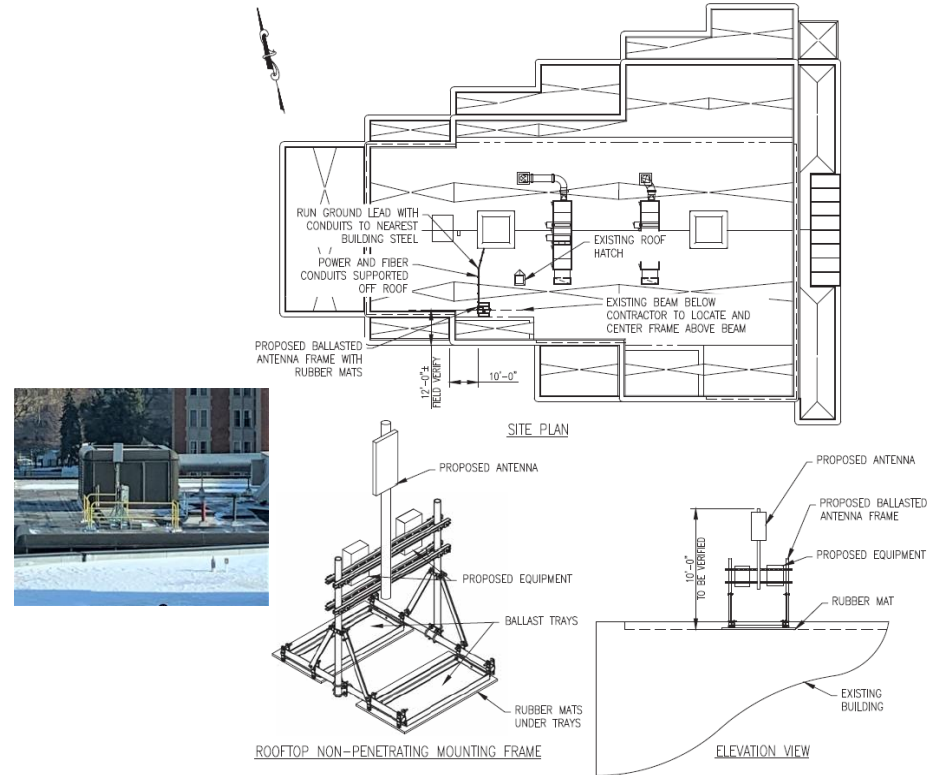
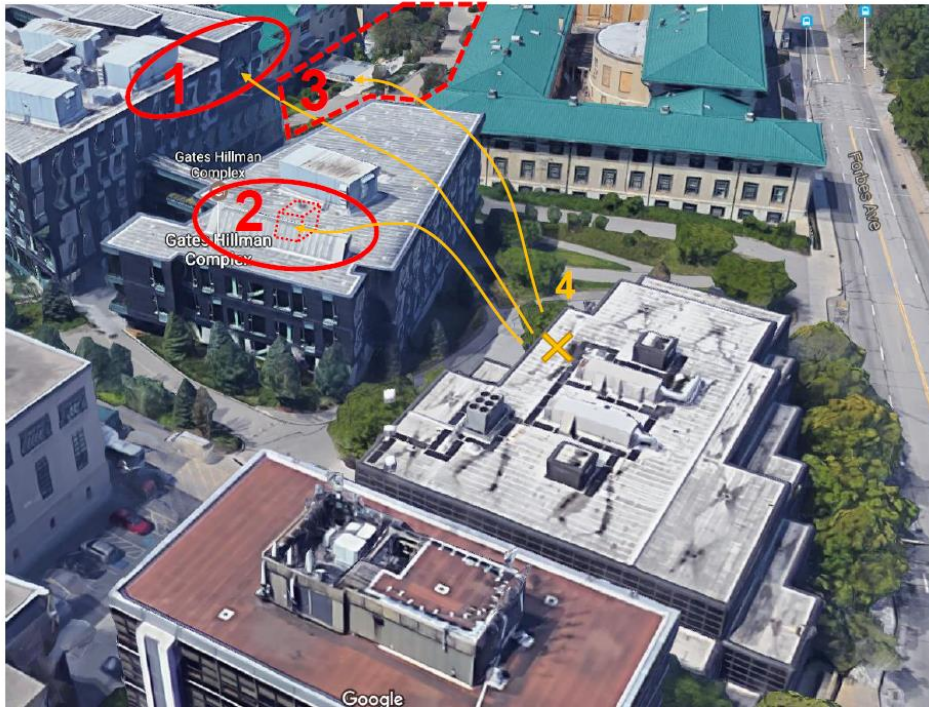
Edge Devices



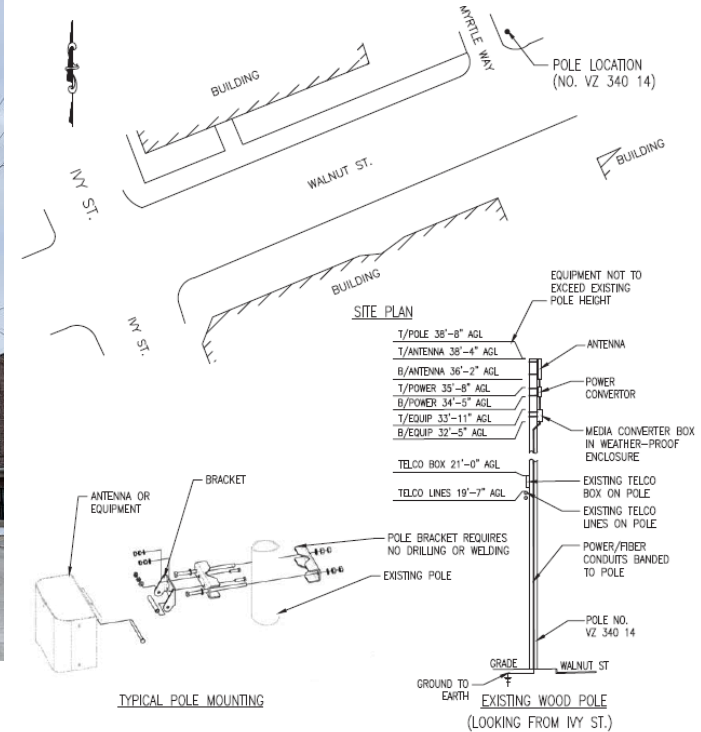
Virtualized Wireless Networks & Edge Computing



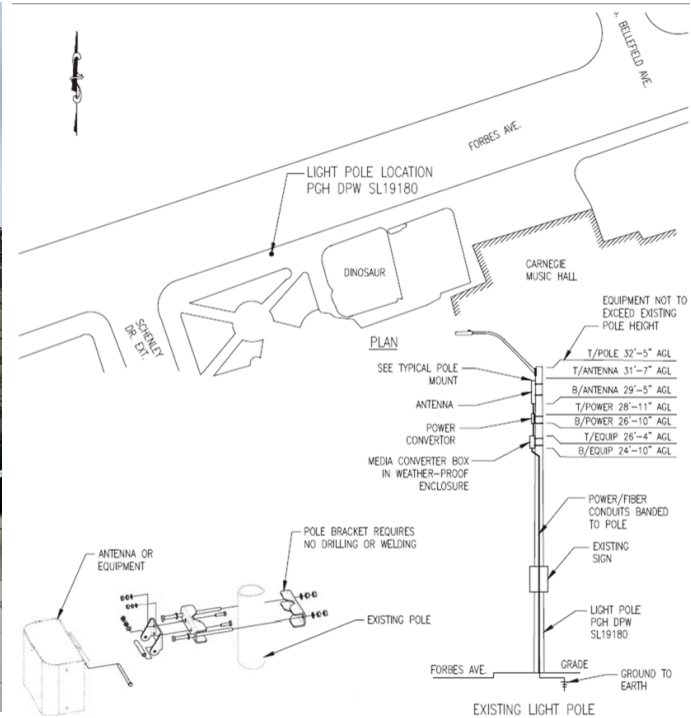
CMU Campus – Outdoor Small Cell



Walnut Street – Outdoor Small Cell



Forbes Ave– Outdoor Small Cell



Edge Evolution

5+ years ago, there was a single edge conference with 25-30 attendees, now there are multiple edge events worldwide and it is a topic of all wireless conferences

2019 ConnectX edge demonstration

OEC highlighted the importance of an open ecosystem and brought industry players from operators, vendors and hyperscalers together to pursue this vision

Real word deployments in industrial setting and partnerships announced between wireless carriers and hyperscale cloud providers for edge processing

Expanding use cases across many verticals

ConnectX 2019 – Crown Castle Edge Demo

The Open Edge Computing Initiative was present at this year's ConnectX Expo in Orlando, FL. Initiative members [Carnegie Mellon University](#) and [Crown Castle](#) partnered with [MobileEdgeX](#) to form part of the 5G Connected Community space.

The video below highlights the space sponsored by Crown Castle. To the left was the booth presented by CMU featuring OpenRTIST running at the edge; to the right, MobileEdgeX with their face detection comparison between edge and cloud. A representative from Crown Castle engages with show floor participants while OpenRTiST stylizes their conversation.

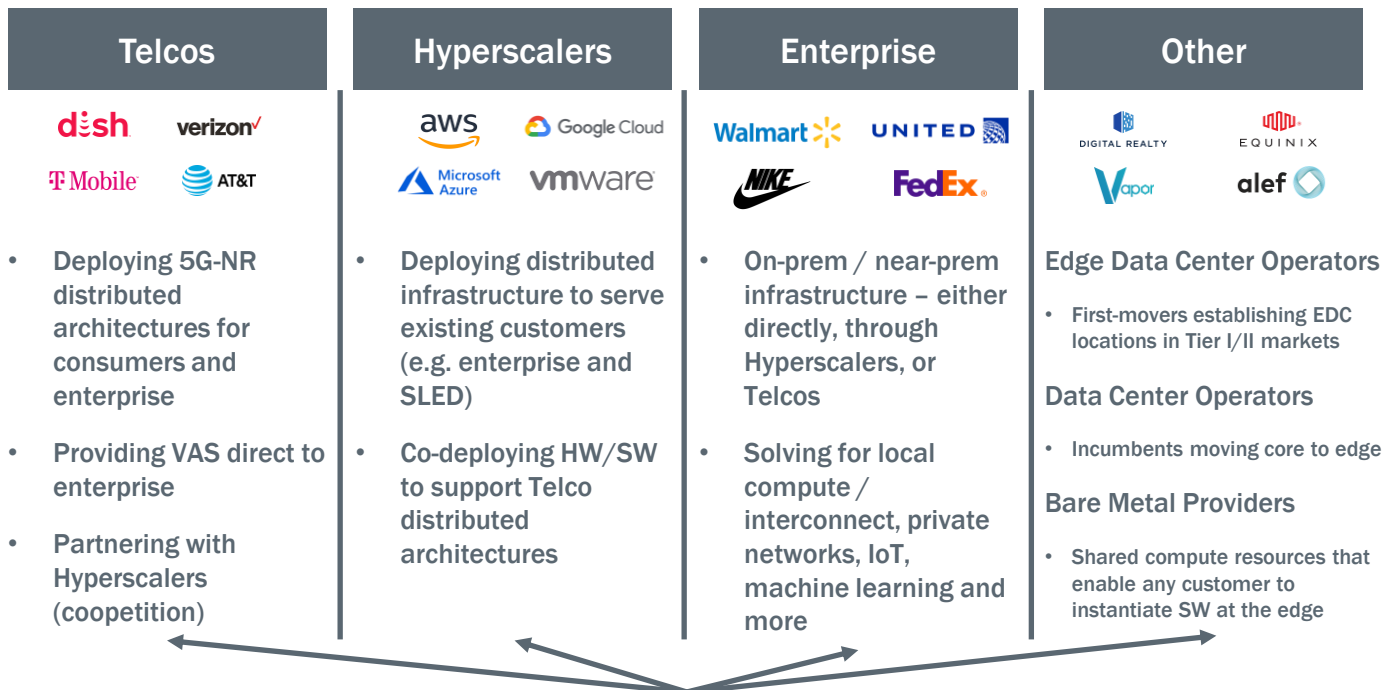


Use Cases

Vertical Markets Use Cases

Communications Network Operator	cloud-RAN NFV/SDN CORD MEC
Smart Cities	Smart Lighting Traffic Signals Smart Buildings Public Venues Public Safety Utilities
Consumer	Gaming Information Social Media and Entertainment Internet Health and Fitness Messaging and Communications
Residential	Security Infotainment Assisted Living Smart Appliances Energy Management
Manufacturing	Asset Tracking/Supply Chain Remote Operations Diagnostics and Maintenance Logistics and Warehousing Operational Automation Security Enforcement
Automotive	Autonomous Assisted Driving Operations and Maintenance Traffic Management Infotainment
Healthcare	Continuous Patient Monitoring and Intervention Remote Patient Monitoring and Intervention Cognitive Assistance Physical Therapy Patient Record Management
Energy and Utilities	Generation Distribution Transmission Renewables/Microgrids OA&M
Enterprise IT	Cloud Workloads
Commercial UAV	Mapping and Surveying Photogrammetry 3D Modeling and Digital Elevation

Edge Ecosystem



Ultimately problems are being solved for enterprise and consumers, but these are the players pursuing infrastructure at the edge, sometimes for each other

Future Opportunities

Carriers are transitioning from 4G to 5G cores which will enable low latency applications for consumers

An open ecosystem is required to drive scale – developers, compute platforms, etc.

Facilitation of compute resources for mobile applications across connectivity type and edge compute owners requires continued research

Real world test facilities, such as the activity at CMU, are critical for development and testing

Thank you

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