

Q1 2021

Wireless Infrastructure Industry: Market Analysis Report

Wireless CapEx Report

Wireless Infrastructure Ecosystem

Industry Expert Perspectives

CONTENTS

3 Industry Outlook

4 Wireless CapEx Report: U.S. Mobile Network Operators

13 Wireless Infrastructure Ecosystem

17 Wireless Infrastructure Transactions

19 M&A Insight By Guest Contributor Clayton Funk, Houlihan Lokey

21 Investor Perspective By Guest Contributor Davis Hebert, CreditSights

24 D.C. Watch By Guest Contributor Leslie Stimson, Inside Towers

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In This Issue: The Outlook is Positive!

Capital expenditures are one of the most closely watched financial metrics in the wireless business. The reason is simple. Capex is the investment that the mobile network operators are making to build and maintain their network infrastructure.

More importantly, that's how equipment vendors and professional service providers get paid. Supplier organizations use capex guidance to plan and manage their own businesses, and to determine whether they can expect growth or a slowdown.

In this inaugural *Intelligence* issue, we present an in-depth analysis of the U.S. mobile network operator capital spending through Q1 2021. Our analysis is comprehensive even as we recognize that the top three MNOs are the most significant, accounting for roughly 95 percent of total U.S. wireless capex.

That said, they are not monolithic, nor do they march in lock step. On the contrary, each company has its nuances. To wit, T-Mobile is a pure play wireless company. Its reported capex is only for its wireless network.

By contrast, AT&T and Verizon operate wireless and wireline networks, and media businesses. Both companies stopped breaking out the capex allocated to their wireless networks, only reporting a corporate aggregate figure.

However, we do break out the wireless portion of that total capex for each company. Our methodology is based on a long tracking history of MNO capex and our work experience in the industry on both the service provider and supplier sides.

More than just summarizing annual and quarterly data, we analyze capex allocations by infrastructure product category and discuss the significance of capital intensity for each MNO's network infrastructure investments.

In the end, we offer our assessment of wireless capex trends over the next several years based on the MNO's current network status and investment guidance. Our takeaway at this juncture is that the wireless capex outlook is positive. Get the details from the article. You will not find such analyses from any other source.

Our novel Wireless Infrastructure Value Index tracks the stock performance of the top tower companies, fiber providers and data center operators as an indicator of the overall health of the wireless infrastructure business. Wireless Infrastructure Transactions highlights recent deals in the global wireless infrastructure market.

This issue includes an important Tower Transaction pointer from contributor Clayton Funk, Managing Director at Houlihan Lokey.

Davis Hebert, TMT Analyst-US Telecom at CreditSights contributes an interesting Investor Perspective.

Leslie Stimson, Inside Towers Washington Bureau Chief, updates us on the "Rip & Replace" program being developed at the FCC in an informative D.C. Watch article.

Enjoy the read. We welcome your feedback!

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Wireless CapEx Report: U.S. Mobile Network Operators

by John Celentano

Network Infrastructure Investment is on the Rise

Capital expenditure by the U.S. mobile network operators is one of the most closely watched financial metrics as an indicator of the health of the wireless infrastructure business.

Why? Capex is an indicator of the level of investment that MNOs are making in their networks. Capex drives network equipment procurement and use of all related capitalized services including site acquisition, licensing, permitting, engineering, installation, and maintenance activity. Ultimately, capex determines how the hundreds of companies and thousands of workers in the wireless infrastructure supply chain get paid.

Figure 1 presents the actual and projected aggregate capex for the U.S. MNOs, as of the end of 1Q 2021.

Figure 1: U.S. Wireless CapEx, 2016-2023e, 1Q 2021 View

Source: Company Reports, our estimates



Over the past five years, MNO capex has grown at a 2.5 percent CAGR. The 2016-2018 period reflects the wind down of 4G LTE deployments as aggregate capex leveled out in the \$27 billion range.

Beginning in 2019, however, the carriers commenced their 5G installations and steadily ramped through 2020. Capex grew to more than \$30 billion in 2020 even as the COVID-19 pandemic raged.

Over the next three years, the U.S. MNO capex is expected to grow at a 4.7 percent CAGR reaching \$35.36 billion by 2023.

Clarifying the Numbers

A couple of clarifying points on these numbers.

The data shown in Figure 1 represent only network infrastructure capex among the U.S. MNOs including AT&T, T-Mobile, Verizon, UScellular, and the other regional carriers. DISH Network capex is not included in the actual data through 2020 but it is factored into the projected data from 2021 and beyond as DISH's 5G network build progresses.

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4

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Wireless Infrastructure Ecosystem

Infrastructure Elements

The primary purpose of physical infrastructure is to support and enable wireless communications.

Wireless infrastructure comprises:

- tower sites and small cells for locating radios and antennas close to mobile devices and user equipment,
- distributed antenna systems (DAS) for distributing RF signals both inside buildings and around campus environments,
- fiber optic cables for connecting the RAN to the Core and for interconnecting data centers, data centers and edge computing that support the internet with cloud computing and data storage, and
- land that supports all types of physical structures.

Ancillary infrastructure elements include site DC power and batteries, backup power systems (diesel generators, solar, wind, uninterruptible power systems), equipment huts and shelters, and site security systems.

Valuing Infrastructure

The Wireless Infrastructure Value Index is composed of the stock prices of the top 13 North America-based companies and real estate investment trusts (REITs) in the wireless infrastructure business. Some of these companies own and operate wireless infrastructure outside of North America.

The table highlights the mix of infrastructure assets that these companies own and operate.

Wireless Infrastructure Ecosystem At-A-Glance

Company	Towers	Fiber	Small Cells	DAS	Data Centers	Land	Other
American Tower	x			x	x	x	
Brookfield Infrastructure Partners	x	x			x		
Colony Capital	x	x	x	x	x	x	x
CoreSite Realty					x		
Crown Castle	x	x	x	x	x	x	
Cyrus One					x		
Digital Realty Trust					x		
Equinix					x		
Iron Mountain					x		
QTS Realty Trust					x		
SBA Communications	x		x	x	x	x	
Switch Inc.					x		
Unit Group	x	x				x	

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13

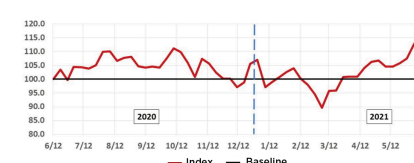
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Wireless Infrastructure Index

Intelligence created the Wireless Infrastructure Value Index as an indication of the relative value of these companies' stock prices as a whole over a moving 52-week interval.

Figure 7: Wireless Infrastructure Value Index: 52-Week Average

Source: Intelligence by Inside Towers



Intelligence records the stock price of each company at the end of each week. The sum of these stock prices is calculated to a reference benchmark level of 100. Then the sum of the stock prices for each successive week is normalized to that benchmark for the 52-week interval.

The chart shows that much of the index curve is above the benchmark level suggesting growth and positive stock performance.

The curve is not smooth, however. There are many highs and lows.

The index moves as the market values these stocks over time. Stock prices move based on each company's reporting of its progress and prospects among a wide range of tenants, and the investment actions that stock analysts recommend.

The challenge for the infrastructure companies is to sustain growth and profitability. Ideally, they want a high proportion of their available site capacity to be leased by multiple tenants with long commitments, say, 5-, 10-, or 15-year terms. In the U.S., these leases usually have built-in annual price escalators in the order of 3 percent along with lease renewal options.

Nonetheless, all leases are negotiable. In competitive markets where tenants have options, price can be a determining factor. The infrastructure companies often mitigate price competition by offering site value-added services to support the lease agreements.

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16

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Wireless Infrastructure Transactions

Wireless infrastructure deals and transactions are ongoing.

While it is difficult to track all of them, many of which are private, intelligence highlights notable transactions announced since the beginning of 1Q 2021-to-date. If you would like to contribute your transaction for this or future reports, please email John@insidetowers.com.

Notable Transactions 1Q 2021 to Date

DATE	BUYER	SELLER	INFRASTRUCTURE PLAY	DEAL VALUE	DEAL STRUCTURE
Jan 13	American Tower	Telefonica/ Telcel Towers	~31,000 towers in Europe & S. America	~\$9.4 B	Purchase
Jan 20	CTS	ClearSky Technologies	Carrier & Enterprise DAS	N/A	N/A
Feb 1	PepperTree Capital Mgmt.	Blue Sky Towers	1,000 U.S. & Caribbean	\$200 M	Equity Infusion
Mar 1	Digital Colony	Boingo	DAS, WiFi, CBRS	\$854 M	Share purchase, debt assumption
Mar 8	Phoenix Tower Int'l.	Monaco Telecom	885 towers in Malta & Cyprus	N/A	N/A
Mar 16	DartPoints	Immersion	8 data centers in 4 states	N/A	N/A
Mar 30	EdgePoint Indonesia (Digital Colony)	Indosat Ooredoo	4,200 towers	\$750 M	Sale & Leaseback
May 6	Diamond Communications/ Scout24 Capital	Melody Wireless Infrastructure	2,300 sites in 50 U.S. States	\$1625 B	Stock purchase agreement
May 17	Digital Colony	Landmark Dividend	Landmark Infrastructure assets	~\$372 M	Stock purchase
May 21	Liberty Global/ Digital Colony	AtlasEdge Data Centers JV	European edge data centers	N/A	N/A

Source: Company and Industry Reports

Transaction Details

BOSTON, MA, Jan 13, 2021-American Tower Corporation (NYSE: AMT) entered into definitive agreements with Telefonica S.A. (Telefonica), under which it will acquire Telcel Towers, comprising approximately 31,000 existing communications sites in Germany, Spain, Brazil, Chile, Peru, and Argentina. The total consideration for the transaction is approximately US\$ 9.4 billion. In addition, AMT expects to spend approximately \$500 million to construct a committed pipeline of approximately 3,300 new sites in Germany and Brazil through 2025.

MARLBOROUGH, MA, Jan 20, 2021-Communication Technology Services (CTS), a U.S. provider of over 9,000 in-building DAS and campus wireless solutions, has acquired ClearSky Technologies, based in Orlando, FL. ClearSky offers an array of innovative managed services that enable the planning, deploying, and managing of wireless communications and was an early entrant into the private wireless network space in industries such as warehousing and hospitality. The acquisition provides CTS network solutions and expertise that is critical to the successful deployment of private LTE and 5G networks. ClearSky's Forte helps to accelerate the integration of DAS deployments into carrier networks.

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17

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D.C. Watch

"Rip & Replace" Is Easier Said Than Done

By Leslie Stimson, Inside Towers Washington Bureau Chief

Telecom equipment manufacturers and wireless service providers (WSPs) want the FCC's "Rip & Replace" program to begin. At the same time, they are requesting that the reimbursement process be settled as soon as possible. The program is meant to compensate smaller carriers for removing so-called "untrusted gear" from their networks.

Public comments were due in late April on the initial "Supply Chain Reimbursement Program Report," a catalog of eligible expenses and estimated costs with a list of categories of suggested replacement equipment and services. The report was produced for the FCC by Widely, the same company that developed a replacement cost catalog for the television repack expense reimbursement program.

The nearly \$2 billion Rip & Replace program is intended for WSPs with 10 million or fewer subscribers. Widely focused on the removal, replacement, and disposal of communications equipment and services produced or provided by Chinese manufacturers, Huawei and ZTE.

More time, flexibility in both timing and reimbursement, and finding workers with the right skills when needed are top of mind for the industry. Nokia summed it up this way: "The deployments to replace covered equipment will involve an unprecedented number of carriers attempting to replace equipment during the same period of time, and concurrently with a parallel nationwide effort to deploy 5G."

Nokia suggests manufacturers and RF consulting, structural and field engineers may not be able to handle the "potential onslaught" of requests that will roll in once the program begins. "There may be thousands of towers requiring structural analysis, as well as wireless broadband networks that will need network engineering design and review."

Ericsson pressed the Commission to go beyond finalizing the reimbursement catalog, including quickly selecting a program administrator and approving reimbursement application forms. "Operators need this certainty before they can begin their work," stressed the manufacturer.

The FCC recently sought public input on the application forms. Comments are due by June 23.



"While we are hopeful that the process will proceed apace, there could be individual requests for waivers to extend deployment deadlines," said Ericsson. "We ask the Commission to move quickly to address these items and get to a place where funding decisions and reimbursements can begin to flow smoothly."

The Competitive Carriers Association indicated the greatest challenge for affected WSPs will be transitioning out equipment without disrupting service to customers. As the report notes, these providers will likely have to create a parallel network of replacement equipment in all or some portion of their network. Only after the second network is built and tested will the provider be able to transition its existing customers to the new network," said CCA.

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24

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UP NEXT from intelligence

by Inside Towers

Intelligence Briefing - early August

- A subscriber-exclusive, 1-hour interactive briefing call by John Celentano, highlighting new developments and updating key market metrics since the 1Q 2021 issue release.
- An opportunity for direct dialog and to ask your most pressing questions.
- Check your email for the scheduled briefing date announcement.

2Q21 Issue - early September

- New, in-depth analysis of another wireless infrastructure segment, not available from any other source.
- Insights from contributing Industry Experts.
- Updated wireless infrastructure Index data and recent transactions.
- Subscribers will receive email announcements for the 2Q 2021 report release date.

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