

# CommScope Leadership in Digital RF Distribution Solutions

CommScope has been deploying Digital Distributed Antenna Systems (DAS) since 1993. DAS has been deployed to provide wireless access in the local loop and to extend the network where traditional solutions could not reach, even inside of buildings. Over the years, CommScope DAS has supported network migrations without changes to the hardware. Imagine the value of a network architecture that can support any protocol service and keep up with capacity changes for more than decade. For these reasons, operators either directly or through third party shared network solutions rely on CommScope DAS to deliver a high quality, reliable service.

CommScope's FlexWave™ Prism provides focused coverage and capacity with easily-deployable units that can support multiple frequencies and wireless services. FlexWave supports network sharing, reducing the total cost of ownership. The highly flexible system distributes RF capacity from centralized radio suites to strategically placed remote nodes close to the user, often times fifteen to twenty kilometers from the host location. These centralized radio suites, referred to as base station hotels, are beneficial to the operator because they minimize real estate and simplify management and maintenance of radio resources by housing assets in a single location, saving both CAPEX and OPEX. The solution offers unmatched scalability and compatibility for a growing number of protocols and frequencies.

CommScope's fiber and RF leadership, ongoing research and development, plus an ISO 9001 and TL9000 certified manufacturing system, combine to create industry-leading solutions supported by a world-class customer services organization. This combination offers a competitive advantage unmatched by any other company today.

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## Metro Coverage

CommScope DAS solutions are well suited to provide wireless access in dense metro environments where tall buildings create urban canyons and shadow effects that impede wireless service. Since traditional tower deployments around the urban core and roof-top base stations are unable to provide adequate street level coverage, CommScope's DAS systems offer an ideal solution. Prism distributes signals from centralized radio suites, minimizing real estate and easing management, to street-level Remote nodes that can be placed on or inside of utility poles, in vaults or other street-level fixtures. This network architecture focuses the RF precisely where the user needs it. Further, the digital simulcast feature allows the service provider to effectively direct capacity when and where it's needed.

## Metro Installation Sites Include:

- Los Angeles, CA
- New York City, NY
- Downtown Chicago, IL
- Navy Pier, Chicago, IL
- Barrington Hills, IL
- Downtown Detroit, MI
- Atlanta, GA
- New Orleans, LA
- Jakarta, Indonesia
- Baltimore, MD
- Washington, DC
- Ogden, UT
- Augora Hills, CA
- Malibu Oxnard, CA
- Mullholland Rattlesnake, CA
- Sleepy Valley, CA
- Charlotte, NC
- Hilton Head, SC
- Marthas Vineyard, MA
- Great Falls, VA
- Grosse Pointe, MI
- Back Bay, MA
- Dubai Studio City
- Indianapolis, IN



## Tunnels, Canyons, and Coastal Areas

Tunnels and canyons create shadow areas that traditional tower deployments are unable to penetrate. The very nature of a tunnel, canyon, or coast prohibits 360° overlapping cellular architecture. These areas are truly the network edge. As a result, mobile users entering these environments experience a high number of dropped calls. Prism is ideally suited for these harsh environments where electronics are subject to dirt, dust, and high temperatures, sea-salt and other contaminants. Prism is an environmentally sealed, high performance, hardened device that can be placed inside of utility rooms or utility poles. Prism's high-power Remotes can be cascaded via fiber, feed directional antennas, or leaky coax. Prism's digital simulcast improves quality of service and network efficiency by eliminating unnecessary hand-off.

## CommScope Tunnel ,Canyon, and Coastal Installation Sites Include:

- WMATA subway – Washington, D.C.
- Lincoln/Battery/Holland/Queens mid town tunnels – New York City, NY
- Topanga Canyon, CA
- Miami Beach, FL
- West Palm Beach, FL
- Ft. Pitt Tunnel – Pittsburgh, PA
- Squirrel Hill Tunnel – Pittsburgh, PA

## CommScope Leadership in Digital RF Distribution Solutions



- Downtown Tunnel – Norfolk, VA
- Midtown Tunnel – Norfolk, VA
- Pittsburgh International Airport – Pittsburgh, PA
- Ft. McHenry Tunnel – Baltimore, MD
- Harbor Tunnel – Baltimore, MD
- NY Grand Central – New York City, NY
- Penn Station – New York City, NY
- Allegheny Tunnels – Berlin PA
- Copenhagen Metro, Denmark
- Palm Tunnel Expansion – Dubai
- Melbourne Park – Australia
- Baltimore Tunnels – Baltimore, MD
- Ft McHenry Tunnel – Baltimore, MD
- Hampton Roads Tunnel – Hampton, VA
- Harbor Tunnel – Baltimore, MD
- Holland Tunnel – New York City, NY
- Lincoln Tunnel – New York City, NY
- Posey Tunnel – Alameda, CA
- Chaguanas Road, Trinidad and Tobago
- Corbon Canyon, CA
- White River Canyon, CA
- Estacion Parque Patricios, Buenos Aries



### Hard-To-Zone Areas: High-End Suburban, Nature Preserves and Historic Communities

A growing number of mobile users rely on mobile communication devices for all of their needs. These increasing demands for coverage in residential communities raise concerns about the visual and RF emission impact of large towers. CommScope's DAS solutions provide compact, stealth remote systems that blend with the environment, are quick and easy to deploy with fewer objections from municipalities and zoning boards.

### CommScope Suburban Installation Sites Include:

- Great Falls, VA
- Monte Sereno, CA
- Nantucket, MA
- Seven Hills, Las Vegas, NV
- Muddy Branch, MD
- Hilton Head, SC
- Flower Mound, TX

### Campus Solutions



Corporate and university campuses support hundreds, often thousands of mobile users. Providing consistent, reliable service in these environments is particularly challenging because you're bridging the outdoor network and the indoor network. Stakeholders want a solution that will satisfy the whole property, maintain its visual integrity, and be easy to install and manage. CommScope's solutions are ideal for this environment. Whether you are a healthcare organization rolling-out a new mobile patient information system, a university with a broad on-line learning course catalog or tasked with rolling-out a security system, or any other enterprise growing increasingly reliant on mobile technology and applications, the CommScope portfolio offers unmatched options. Designing an entire campus "outside in" by placing Prism nodes throughout the campus near buildings that need greater in-building wireless coverage saves more than 30% time and money compared to traditional cell sites or an all in-building "inside out" design.

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## CommScope Corporate and University Installation Sites Include:

- Duke University – Durham, NC
- Michigan State University – East Lansing, MI
- Mississippi State University – MS
- Notre Dame – South Bend, IN
- Stanford University – Palo Alto, CA
- University of Alabama – Birmingham, AL
- University of Pittsburgh – Bradford, PA
- University of Texas – Austin, TX
- University of Central Arkansas – Conway, AR
- MIT – Cambridge, MA
- Miami University – Miami, FL
- UC Berkeley – Berkeley, CA
- UCLA – Los Angeles, CA
- Vanderbilt – Nashville, TN
- Washington University – St Louis, MO
- Yale – New Haven, CT
- Stanford – Stanford, CA
- 30 Rock – New York City, NY
- AIG Harborside Financial – Jersey City, NJ
- Bellagio – Las Vegas, NV
- Disney Aulani – Kapolei, HI
- University of Michigan – Ann Arbor, MI
- Facebook Campus – Menlo Park, CA
- Ford Center, OK
- Home Depot Center – Carson, CA
- IKEA – Calgary, AB
- Walmart HQ – Bentonville, AR
- Yahoo Campus – Sunnyvale, CA
- GM – Bowling Green, OH
- Goldman Sachs – New York City, NY
- MGM Grand Casino – Las Vegas, NV
- Salesforce.Com, San Francisco, CA
- Sandisk Campus – Milpitas, CA
- Sony Pictures Thalberg Cohn – Culver City, CA
- Hard Rock Casino – Las Vegas, NV
- Trump Tower – Chicago, IL
- Sears Tower – Chicago, IL
- Abercrombie & Fitch – New Albany, OH
- Allina United Hospital – St. Paul, MN
- United Health Group – Minneapolis, MN
- Comer Hospital – Chicago, IL
- Flinders Hospital – Bedford Park SA, Australia

## Stadiums and Large Venues

Convention centers, sports stadiums, airports, and other large venues have a lot in common. They serve a large concentration of mobile users increasingly reliant upon mobile phone use. The users often tax the existing network, snapping photos and transmitting data to their friends and families during special events. In the case of the business user at an airport or convention hall, using the down-time to set-up their virtual office and expect the same level of network connectivity and service as they do in their office.

The common ground in these large venue and stadium applications is having a dense population taxing bandwidth from multiple service provider networks. It's not uncommon for these venues to generate as much as 10,000-15,000 simultaneous calls. Users experience inconsistent quality of service where they rely on it most. Macro cells fail to optimize these venues which have complex and dense infrastructure. A DAS solution improves both coverage and capacity as the antennas are placed closer to the user and allow the service provider to manage capacity throughout the system. From base station hotels, capacity spikes can be managed with digital simulcast.



## CommScope Stadium and Large Venue Installation Sites Include:



- Ford Field – Detroit, MI
- Michigan State University – East Lansing, MI
- Greektown Casino, Detroit, MI
- Fenway Park – Boston, MA
- Xcel Energy Center – St. Paul, MN
- McCormick Place – Chicago, IL
- Multiple NASCAR tracks
- FedEx Field – Washington, DC
- Raven's Stadium – Baltimore, MD
- Continental Arena – East Rutherford, NJ
- Pittsburgh International Airport – Pittsburgh, PA
- Conseco Fieldhouse - Indianapolis, IN
- Bank of America Stadium – Charlotte, NC
- St Pete Times Forum – Tampa, FL
- Staples Center – Los Angeles, CA
- Sun Life Stadium, Miami, FL
- Superspeedway – Talladega, AL
- Target Field – Minneapolis, MN
- Time Warner Cable Arena – Charlotte, NC
- Tropicana Field – St. Petersburg, FL
- UCLA Campus, Pauley Pavilion  
– Los Angeles, CA
- UNC Kenan Stadium – Chapel Hill, NC
- Melbourne Park – Melbourne, Australia
- Eden Park – Melbourne, Australia
- FedEx Field – Landover, MD
- Lambeau Field – Greenbay, WI
- Louisville Arena – Louisville, KY
- Oakland Coliseum – Oakland, CA
- Oracle Arena – Oakland, CA
- Ravens Stadium, Baltimore, MD
- Rogers Centre – Toronto, ON
- Rose Bowl Stadium – Pasadena, CA
- Turner Field – Atlanta, GA
- Soldier Field – Chicago, IL
- Yankee Stadium – Bronx, NY
- McCormick Center – Chicago, IL
- Palisades Center Mall – West Nyack, NY
- Indiana Convention Center – Indianapolis, IN
- Denver Convention Center, Denver, CO
- Disneyland – Anaheim, CA
- Hershey Park – Hershey, PA
- Madison Square Park – New York City, NY
- Pittsburgh Airport – Pittsburgh, PA
- Atlanta Airport – Atlanta, GA



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