5G is now a reality

HERE technologies helps accelerate 5G time to service and return on investment with innovative datasets to simplify network planning.
5G technology will be transformative and will provide an environment for innovation that will expand mobile networks to support a wide range of devices and services, connecting new industries with improved performance, efficiency, and cost. Based on a recent study by Qualcomm, the full economic benefits of 5G are projected to reach $13.2 trillion worth of goods and services, potentially supporting up to 22 million jobs globally by 2035.

These new 5G wireless networks will be built using multiple Radio Frequency (RF) spectrum bands. One particular RF spectrum band, known as mmWave (frequencies of 30 GHz and higher), has unique characteristics based on the physics of the RF signal in this frequency range.

5G mmWave signals can support very high connection speeds, however, they can only propagate for ~200-250 meters before signal regeneration is required. In addition, these signals are not able to penetrate solid objects such as walls, buildings, billboards and even tree foliage. This contrasts sharply with 4G/LTE RF signals in the mid-band frequency range which have multi-kilometer reach, and typically penetrate solid objects.

**Deploying 5G Networks**

MNOs (mobile network operators) deploying 5G networks in the mmWave spectrum band will need to account for key factors like significant cell site densification and line of sight planning. 5G networks require a substantial number of cell sites, 4-10 times the number of sites typically deployed per km2 in 4G/LTE networks.

Line of sight — to determine minimally obstructed paths for the RF signal to travel and avoid solid objects — needs to be addressed during the network planning and network design phases.

Identifying the optimal location of thousands of small cell sites and modeling their line of sight effectively will require rigorous planning and numerous site surveys. Time to service is critical as the first companies to market often achieve lasting leadership.

This type of aggressive infrastructure deployment might result in a spike in operational costs and greatly impact balance sheets. To achieve successful returns on their investments, MNOs need to gain efficiencies in their planning and deployment models.

There are other factors MNOs building 5G mmWave networks need to consider. First, the 5G network planning ecosystem is currently trying to design and plan 5G networks using legacy tools and algorithms designed for 4G/LTE network planning.

Second, since the physics of a 5G mmWave signal are completely different from 4G/LTE, legacy geodata is insufficient. 5G mmWave network planning, whether for Fixed Wireless Access or Mobile Broadband networks, requires a geodata set with sub-meter geometric and spatial precision to optimize placement of small and macro cell antennas, and to effectively map the mmWave RF signal lines of sight. More precise data inputs result in more accurate propagation models.
Innovative datasets brought to market by HERE Technologies to simplify network deployment.

HERE Technologies has performed groundbreaking work in 3D mapping and developed sophisticated algorithms to extract 3D object geometry, features, and attributes from base elemental content (e.g., terrestrial LiDAR, terrestrial 360°, satellite and aerial imagery) to provide highly precise, scalable and richly attributed datasets in a new product: HERE Geodata Models.

HERE Technologies has applied its geospatial data expertise to develop precise 3D map objects with associated geometry (e.g., Digital Terrain Models and buildings), and 3D vector objects (e.g., utility poles, vertical sections of streetlights, tree trunks and canopies), lending a new level of precision to RF planning for 5G mmWave networks.

HERE Geodata Models is a timely solution for MNOs and tower companies building 5G networks in mmWave spectrum bands to significantly simplify network planning and maintenance. It is the only solution on the market today supporting the sub-meter geometric and spatial precision requirements.

HERE Geodata Models aggregates various datasets:
- High precision 3D building objects
- 3D utility pole objects
- 3D streetlight objects
- 3D tree trunk objects
- 3D tree canopy objects
- High-resolution Digital Terrain Models (DTMs)

When used in concert with 5G network planning and network design application software tools, HERE Geodata Models makes it possible for MNOs to cost effectively identify, assess, and measure the optimal x, y, z real estate locations for placement of small cell antennas.

In addition to greater precision, HERE Geodata Models provide the scalability and global consistency required for mobile operators to maximize 5G mmWave RF signal propagation and optimize line of sight modeling and simulations. This can result in first mover advantages, accelerating time to service.
Accelerating 5G time to service and return on investment with HERE Geodata Models

MNOs have already made significant investments in 5G spectrum, now they need to quickly monetize new services and generate profits; HERE Geodata Models helps make that possible.

With HERE Geodata Models, network deployment can be easier, more precise, and much more cost effective. Our product leverages the largest, freshest combination of terrestrial LiDAR, terrestrial 360°, aerial and satellite imagery library on the market and has the capability to scale, rapidly building out this dataset anywhere in the world.

Performing 5G network planning with HERE Geodata Models can lower OpEx by up to 40% due to a reduction in the number of physical site surveys required, accelerating revenue by tens of millions per km² and creating a significant competitive advantage in a new market roll out.

The highly precise datasets in HERE Geodata Models enable getting to market faster and more cost effectively while reducing planning time and effort, increasing network efficiency, and achieving improved returns on investments.
Maximize your return on infrastructure investments. Digitize your 5G network planning, design and deployment with 3D geolocation data from HERE.

Want to talk? We do, too.

About HERE Technologies
HERE, a location data and technology platform, moves people, businesses and cities forward by harnessing the power of location. By leveraging our open platform, we empower our customers to achieve better outcomes – from helping a city manage its infrastructure or a business optimize its assets to guiding drivers to their destination safely. To learn more about HERE, including our new generation of cloud-based location platform services, visit http://360.here.com and https://www.here.com/solutions/infrastructure-planning/5g-network

© 2021 HERE - 360.here.com