

# CBRS Proves Its Value for Diverse Airport Applications

Minneapolis-Saint Paul International Airport

The Minneapolis-Saint Paul (MSP) International Airport is one of the busiest airports in the United States, serving both civilian and military air traffic and seeing over 31 million passengers in 2022. It has recently been recognized as one of the best airports in the world and the best in North America for the sixth time in the last seven years. The MSP airport covers over 3,400 acres and is centrally located within ten miles of downtown Minneapolis and downtown Saint Paul.

## Challenge

Effective communication is critical between airport personnel, airlines, ground handlers, and other entities operating at an airport to ensure efficient airport operations. Supporting sufficient coverage and capacity for the uneven volume of passengers present throughout the day is an equally high priority.

The Metropolitan Airports Commission (MAC) decided to investigate using a private cellular network at the MSP airport for various applications. Eduardo Valencia, the CIO of the Metropolitan Airports Commission, said, “At MAC, we are always looking for ways to leverage technology to provide innovative solutions and improve both operational efficiency and the customer experience.”

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Communication Technology Services (CTS), an OnGo Alliance member, used their Private Cellular LTE Network-as-a-Service on CBRS to address these challenges. The trial assessed the performance of CBRS in providing reliable, high-speed wireless connectivity to support airport operations and in the ability to extend existing airport operations platforms into a secure, private wireless domain. Six different applications were under review:



**Infrastructure monitoring** – The MSP airport uses an Intelligent Monitoring and Control System (IMACS) to connect all energy-related systems, including heating, air conditioning, escalators, baggage carousels, and airfield sensors. To function correctly, a high-throughput and low-latency network is required. Currently, most sensors and controllers are networked via Ethernet or fiber.



**Digital signage** is used in airports for flight information, safety notices, and advertising. Wired connections are used today to show text, images, and video.



**Airside maintenance tracking** – The MSP airport employs a widely used application called Cityworks, which uses HD video, schedules maintenance and safety inspections, handles work orders, and more. It currently operates on the Verizon public network.



**Common Use System Equipment (CUSE) carts** – are used within an airport, enabling multiple airlines to use the same airport infrastructure for passenger processing. The carts can be moved around and currently use either Wi-Fi or a wired Ethernet connection.



**Video surveillance** – The MSP airport uses a large network of video cameras, both indoors and outdoors. Currently, they are connected via fiber or Ethernet cables.



**Mobile application use** – All company-issued cell phones and laptops must be able to use the network. This currently includes Apple iPhones on a public wireless network and Wi-Fi.

## Solution

CTS designed, installed, integrated and operated the entire solution with support from MSP IT staff to demonstrate the value of a CBRS-based private cellular network. They provided an on-site edge compute node, CTS's proprietary Total Traffic Manager™ platform, and remote monitoring and maintenance. The solution consisted of:



Nokia Radio  
Access Network  
(RAN).



Druid  
Raemis  
mobile core.



Google's Spectrum Access  
System (SAS) was used for  
CBRS frequency licensing.



Cradlepoint  
LTE routers  
and modems.



BEC CBRS  
gateway.

Various use cases were monitored in an indoor lab and/or at outdoor locations around the airport and involved applications requiring low data rates (e.g., sensors) to high data rates (e.g., video).



Sensors are connected to the IMACS used for infrastructure monitoring, both directly and through controllers that aggregate performance for different platforms. With CBRS, performance was comparable to wired connections, even in areas that currently experienced poor coverage from the existing public network.



The MSP airport utilizes digital signs for wayfinding, information and advertising, which would be easier to place and move if wireless connectivity could be assured. The low-data use of digital signs made it easy under the high data rates provided by a CBRS network.



The Cityworks application is used primarily outdoors, where lack of coverage from the local ISP is widespread. With the CBRS network, drive testing showed that coverage was superior to the public wireless network, and throughput was far more consistent.



The CBRS-enabled CUSE workstation carts that were tested at the MSP airport showed “no noticeable difference in operations” compared to carts connected via wired ethernet while also benefitting from the flexibility of wireless operation.



Installing wired video cameras all over the airport would be prohibitively expensive, so wireless connectivity is much preferred if viable. Tests showed that CBRS-enabled wireless cameras provided high-level, top-quality video with sufficient latency, comparable to a wired network.



Mobile application testing performed well, with throughput comparable to a public network. With CBRS, outdoor coverage was easier to maintain than Wi-Fi, and reliability was better when the network was congested. The CBRS-based private network will have higher security than a public network or Wi-Fi, with security policies defined by the airport.

## Conclusion

The use of a CBRS-based network at the Minneapolis-Saint Paul International Airport was a success, with significant improvements in wireless coverage, capacity, and reliability. The CBRS network from CTS provided as good as or better coverage than the existing communications network. The success of CBRS at the MSP airport sets a precedent for other airports and industries to leverage CBRS technology to better serve a multitude of use cases.

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