



## City of Houston CATP Coverage Testing



**Location:**  
Houston, Texas



**Business Needs:**  
To ensure the city's network of first responders, public works employees, and infrastructure are connected no matter where in the city they are located.

## Customer Profile

Located in the southeastern part of Texas, Houston is home to more than 2.2 million residents spread out over 669 square miles. Being the fourth-largest city in the United States and home to seven of the ten tallest buildings in the state presents potential signal coverage issues with the city's public safety wireless communications system. A system is only as good as its coverage and the City of Houston required the best.

## Customer Challenge

The City of Houston needed to ensure their vast Public Safety network was accessible to all members of its emergency and public works personnel, at all times and at all locations, throughout the city. Whether inside the 1,000+ foot JPMorgan Chase Tower or in the aptly named 48-foot house, the city's wireless communication system must operate at peak reliability, in-building and on the street, to help protect the citizens and public employees that call the City of Houston, home.

## CommDEX Solution

- CommDEX was tasked to upgrade and reprogram all of the existing radio subscriber equipment to ensure communication in all areas of Harris County, inside buildings and on the street.



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# Commdux Roles



## **System Testing**

Testing was conducted in accordance with approved test procedures previously agreed to between Motorola Solutions (Motorola) and the City. A reliability of 95% DAQ 3.4 was the pass criteria throughout the identified service area. For test purposes, with the exception of the downtown area, the City was divided into uniform square grids of approximately ½ mile by ½ mile in area. For better testing resolution downtown, the downtown area was divided into 1/10 mile by 1/10 mile grids.

Each successful test point that delivered an audio quality equivalent to speech classified as “understandable with repetition only rarely required with some noise/distortion,” both in sending and receiving, from radio to radio, and radio to dispatch console operation was counted. A failure in either the sending, or radio to radio direction constituted a failed test call. For testing purposes, accessible grids intersecting or contained within the defined coverage area were tested with a portable radio. Test teams would enter a grid and then search to identify an appropriate building to perform testing in. The test team would then perform an on-street audio test outside the vehicle prior to entering the structure. Once inside the structure, the team would perform a minimum of five test points as closely located to the four corners and center for the building as possible. More test points were included for larger structures according to guidance developed with Motorola and the city. For all testing the field team utilized a radio with the proposed flexible whip antenna, worn on the belt (3’ AGL), using the Motorola Swivel Belt Clip, and equipped with a speaker/microphone.

## **The Test Teams Consisted Of:**

### **Monitor Team**

Each Dispatcher team was equipped with a Motorola MCC7500 dispatch console, or a Motorola APX7000 portable radio (for portable-to-portable test calls), and three Plantronics headsets per dispatch operator position.

- Dispatcher or other person - Provided by City
- Test Monitor - Provided by the City
- Test Monitor - Provided by Motorola

### **Field Teams**

Each Field team was equipped with a Motorola APX7000 portable radio. Field teams were also equipped with Motorola’s Voyager computerized coverage testing configuration.

- Driver - Provided by City (typically a representative from the Police or Fire Department)
- Test Monitor - Provided by the City
- Record Keeper - Provided by Motorola

## The City of Houston's Test

The 20 dB service area of the City of Houston test consisted of 3,251 grids that were tested while the 10 dB service area consisted of 5,295 grids tested. Additionally, 217 grids in the downtown area were created and also tested for on-street and in-building performance. Finally, six grids for the Medical Center were tested for on-street and in-building. The downtown and Medical Center areas were tested for a 30 dB performance while the remaining grids were tested for 20 dB performance. Teams would attempt to identify a structure of the appropriate loss profile.

Whenever appropriate 20 dB buildings could not be found, teams would test 10 dB buildings, and if no building could be located, teams would perform the test inside the vehicle.

The overall area was divided into four quadrants (NE, SE, SW, and NW) each of which were tested by 30 test teams total divided among the four quadrants. The test of the Public Safety system paired thirty separate field teams with fifteen dispatch teams. Each dispatch team supported two field teams.



## Testing Results

Commdex completed the testing of over 17,000 grids and 4,100 random buildings. These results represented the 10 dB, 20 dB, Downtown, and Medical Center service areas with an overall pass-rate of 99.98%.

**99.98%**

*Overall Pass-rate*

### About Commdex:

Commdex provides network solutions to telecommunications service providers and manufacturers for the deployment of telecom networks, facilities and supporting systems. Commdex specializes in designing and implementing mission critical voice and data networks over Wi-Fi, microwave, land mobile radio and other technologies. Commdex offers a broad, rich portfolio of proven telecom solutions. Its solutions, services and methodologies have been tested and proven in hundreds of customer environments. Its customer base ranges from state, local and federal customers, to large enterprises and equipment manufacturers.

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