

## U.S. Department of Housing and Urban Development

### Office of Inspector General, Office of Investigation

#### Comparable Band Analysis

##### Overview

The U.S. Department of Housing and Urban Development (HUD), Office of Inspector General (OIG), Office of Investigation (OI), at the request of the National Telecommunications and Information Administration (NTIA) is providing information on its current inventory of systems operating in the 1755-1780 MHz band. HUD-OIG-OI, will also attempt to provide gross usage data for current systems, and gross costs estimates for relocation to other bands or services. The timing and costs are based on current operations and may not include future technological advances.

1. 1755-1850 MHz Bands Characteristics --For each type of 1755-1850 MHz operation as provided in the NTIA chart, each affected agency, will provide the following:

- 1.1. Identify, by type, the systems they have in this band and the numbers of each system.

There are four regions within HUD-OIG-OI (Region 4 – Atlanta, GA, Region 6 – Fort Worth, TX, Region 7 – Kansas City, KS, Region 15 – Detroit, MI) that utilize this band for covert/body-worn audio and video surveillance for evidence collection during administrative and/or criminal investigations. HUD-OIG-OI has approximately 15 transmitters in the 1755-1850 MHz band in its technical equipment inventory.

- 1.2. Identify the number of assignments by system type.

HUD-OIG-OI currently has six frequency assignments in the 1755-1850 MHz band:

1. HUD 010004 M1775.000000 - Video Surveillance
2. HUD 970009 M1800.000000 - Video Surveillance
3. HUD 980005 M1800.000000 - Video Surveillance
4. HUD 980007 M1800.000000 - Video Surveillance
5. HUD 010005 M1800.000000 - Video Surveillance
6. HUD 980006 M1800.000000 - Video Surveillance

- 1.3. Identify the type of assignment by system (i.e., Local, regional, US/USA/US&P, etc).

The HUD-OIG-OI frequency assignments are authorized by NTIA as follows:

HUD 010004 - United States and Possessions (US&P)

HUD 970009 - United States of America (USA)

HUD 980005 - USA

HUD 980007 - USA

HUD 010005 - US&P

HUD 980006 - US&P

U.S. Department of Housing and Urban Development  
Office of Inspector General, Office of Investigation  
Comparable Band Analysis

1.4. Provide a brief description of the type of operation.

HUD-OIG-OI uses this band to conduct video surveillance during administrative and criminal investigations. These systems are primarily mounted on outdoor light posts and electrical poles; or worn by undercover agents and/or cooperating witnesses. Some of the “pole cams” are converting to IP-based systems which are accessible through the internet, but covert and body-worn video surveillance system manufacturers are still in the process of converting from analog to digital. Consequently, procurements for the foreseeable future will be a mix of analog and digital systems.

Note: HUD-OIG-OI does not operate or maintain any fixed microwave links or utilize airborne video surveillance systems in this band, or any other band.

1.5. Describe why the operation cannot be accomplished by the use of commercial services or non-RF solutions

Commercial services may be able to provide the required solutions to support the mission requirements in the future, however; cannot currently provide the high-quality video and audio required for evidence during trial. Criminal activity is not a 9-5 business and, consequently, HUD-OIG-OI special agents must be able to utilize these systems 24 hours per day, 7 days a week. Additionally, in order to protect the “chain of evidence” individuals with access to the evidence must be restricted. Future services provided by commercial carriers of 4G technology may be able to provide high quality video, but they currently do not provide the quality video and audio recordings required by US Attorneys to prosecute cases.

1.6. Provide geographical area location of assignments, gross assessment of time of operation.

These systems may be employed at anytime, any location, and are used for collecting potential evidence during criminal and administrative investigations. Systems may be operational for a meeting (typically a few hours), or may be employed to surveil and record activity at a business or residence over several days, weeks, etc.

1.7. Provide a gross characterization of the system’s frequency of use.

These systems are normally maintained by HUD-OIG-OI special agents/technical agents at regional offices around the country and may be used at any time. Some HUD-OIG-OI regions use the systems more frequently than others.

2. Comparable Band Evaluation – HUD-OIG-OI has frequency authorization for video surveillance in one frequency band: 1755-1850 MHz. The band with the most similar propagation characteristics to the 1.7 GHz band is the 2200- 2290 MHz band. The signal loss experienced in the higher bands make them much less favorable than the 2.2 GHz band. Systems operating in higher bands decrease operating distances and increase the need for repeaters and directional antennas. The reduced distances and the need for additional repeaters and directional antennas make the higher bands poor replacements for the 1.7 GHz band. Manufacturers are currently developing “next generation” surveillance systems using IP, Wi-Fi and as well as Radio Frequencies in higher bands.

U.S. Department of Housing and Urban Development  
Office of Inspector General, Office of Investigation  
Comparable Band Analysis

**2200-2300 MHz band**

- 2.1. Technical Considerations: In considering any technology implications of relocating a “type of operation” or major system into a specific alternate spectrum band:
- 2.1.1. If any, what are the limitations on system performance anticipated in this band that would be attributable to technical or technology shortcomings (e.g., propagation loss, signal fading, path reliability, etc)? **This band has similar propagation characteristics to the 1755-1850 MHz band, though increased signal loss is to be expected.**
  - 2.1.2. What are the available technical solutions that would enable the system to overcome such limitations (e.g., high gain antennas, higher power transmitter, etc.). **The transmitter power is typically increased by up to 3 dB to compensate for the increased signal loss.**
  - 2.1.3. What is the state of availability and maturity of the technology necessary to overcome the limitations? **Systems are currently available in this band to support Federal Law Enforcement agencies.**
  - 2.1.4. For the system under consideration, what mitigation options would be available to minimize or eliminate the limitations due to this band? **Unknown**
  - 2.1.5. Which preferred technical solution has been identified to overcome any performance limitations related to technology and what are the reasons why this solution is preferred? **Unknown**
- 2.2. Operational Considerations
- 2.2.1. What are the alternate bands’ EME (i.e., presence of incumbents, systems employed in band, # of assignments, location, time of operation, gross characterization of the system’s frequency of use, etc.) that limit the ability of the system under consideration to fulfill its mission? **This band is 90 MHz wide and is currently allocated to Earth Exploration-Satellite, Fixed, Mobile, Space Operation and Research services. Currently, HUD-OIG-OI has no assignments in the band. The relocation of all Federal law enforcement surveillance operations would only exacerbate the congestion currently experienced in this band.**
  - 2.2.2. If there are limitations, to what extent will they impact mission effectiveness? **There would probably be an increase in harmful interference from and to the Federal law enforcement operations.**
  - 2.2.3. What are the possible mitigation options available to minimize or eliminate the limitations? **Increase transmitter power and receiver sensitivity**
  - 2.2.4. What is the identified preferred solution for overcoming the limitations on performance brought on by the operational environment and what are the reasons this solution is preferred? **Unknown**

U.S. Department of Housing and Urban Development  
Office of Inspector General, Office of Investigation  
Comparable Band Analysis

- 2.3. The extent to which other constraints impede relocation (e.g., necessary allocation changes) to a comparable band and proposed remedies. **None**
- 2.4. A gross estimate of the time required to transition out of the 1755-1850 MHz band to a comparable band...**Less than 10 years.**
- 2.5. A gross estimate of the cost to transition out of the 1755-1850 MHz band to a comparable band...**Less than \$100K**
- 2.6. A ranking of each comparable spectrum in priority order, from the highest to lowest, for each type of operation and system type. **This band would be preferable to the other listed bands.**
- 2.7. For each comparable band(s) for each type of operation discuss and provide the rationale for selection or non-selection. **The other Federal Law Enforcement agencies have reviewed the other comparable bands and provided appropriate pros and cons for each band.**
- 2.8. Early Transition - Identify any operations that could transition from the 1755-1780 MHz portion of the 1755-1850 MHz band in less than 5 years? If yes, please answer question 2.5. **Yes, dependent on the timeliness and availability of funding for replacement of current systems.**