



**DEPARTMENT OF THE INTERIOR
1755-1850 MHZ
COMPARABLE BAND ANALYSIS
PHASE I SUMMARY REPORT**



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1. Introduction

NTIA ask all Federal agencies to internally study their radio systems utilizing frequencies in the 1755-1850 MHz band. The objective is to determine and report on the requirement(s) and all action(s) necessary to relocate all operations from the 1755-1850 MHz band to other comparable spectrum band(s) with the goal of completing relocation within 10 years.

NTIA Work Plan Information

Guidance/Overall Strategy from NTIA:

1. The band to be studied is the 1755-1850 MHz band and the objective is to relocate all operations within 10 years.
 - i. When considering comparable capabilities, the analysis of alternatives (AoA) will consider the NTIA 1755-1850 MHz Relocation Options Chart for possible comparable bands, commercial service solutions, and non-RF solutions. The AoA will reflect technical and operational assessments that include cost and time estimates.
 - ii. If any comparable bands require allocation changes, NTIA and FCC will provide assurance that appropriate actions will be pursued.
 - iii. Contingency of moving existing operations in comparable bands. NTIA and FCC will provide assurance that appropriate actions will be pursued.
 - iv. Output- Relocation Plan (entire 1755-1850 MHz band technical, operational, cost, and timelines within 10 years) including a transition plan that includes out of the 1755-1780 MHz band within 5 years.
 - v. Cost Guidelines and parameters. See CSEA "Relocation Costs" and Section 4 of the Ten-Year Plan. OMB will work closely and in collaboration with group(s) during entire process.
2. Schedule:
 - i. Phase I – Due by 1 April 2011. Provide summary report. Determine most likely comparable band(s) or possible alternative solutions. This will identify/Categorize each type of operation, gross assessment from AoA based on technical operational, assessment of potential comparable band(s) for each type of operation, gross costs and timelines to relocate estimates and identify prioritized comparable band(s) for further study.
 - ii. Phase II – Due by 1 June 2011. Provide interim report. Majority of agency effort needs to be completed by June 1, 2011 (draft studies, relocation plans, preliminary studies, considerations). This will reflect interim refinement of the original gross cost and timeline estimates provided in Phase I.
 - iii. Final Report into LRM – Completed by October 1, 2011
3. Work effort as a two-phase process:
 - i. Phase I: Cursory Evaluation of Bands for relocation



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- a.) Gross assessment from Analysis of alternatives based on Technical and Operations including costs and timeline to relocate
 - b.) Rank order band preferences and corresponding justification
- ii. Phase II: Detailed Analysis
- a.) Highest priority comparable band(s) only
 - b.) Technical, Operations and Cost Analyses
 - c.) Tradeoff (Technical vs Operations vs Cost)
 - d.) Describe relocation strategy (options, timing, phasing, etc.)
 - e.) Identify Costs associated with each including cost to totally vacate the band.
 - f.) Preliminary band(s) identified by June 1, 2011
 - g.) Identify Actions/Options

Analysis/Evaluation Methodology:

1. Identify/categorized each type of operation to be considered for the 1755-1850 MHz study (TRR, SGLS, UAVs/RPVs, ACTs, PGMs, EOD, Fixed Pt-to-Pt, video surveillance, others, etc).
 - a. Category/operations. Agency will provide specific details- description, characteristics, usage, time of operation, etc.
 - b. Consider operations in the various stages of the system review process
2. NTIA to assign NTIA lead person for each category/operation.
3. Consider commercial service operations and non-RF solutions.
4. Identify potential comparable spectrum bands to be considered for each type of category/operation.
 - a. Agency input on other possible comparable bands
 - b. Consider the NTIA 1755-1850 MHz Relocation Options Chart as the initial list for comparable band consideration.
 - i. Description of each of the comparable spectrum bands.
 - ii. Allocations, description, characteristics, usage, time of operation, etc.
 - iii. Identification of agencies using comparable spectrum.
 - iv. Consideration of on-going/upcoming proceedings.
 - v. Considerations of WRC items (past and current).
 - vi. Consideration of border agreements.
 - vii. International Considerations.
 - viii. Consider operations in the various stages of the system review process.
 - c. NTIA to identify NTIA person for each comparable spectrum band to provide assistance.
5. For each comparable band(s)
 - a. Technical Considerations-Preliminary
 - b. Operational Considerations-Preliminary
 - c. Gross cost estimate to relocate
 - d. Gross Timeline to relocate



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- e. Provide Rationale for selection or non-selection and any required actions
 6. **Report – April 8, 2011- PPSG SWG meeting (Individual Agency Phase I Summary Report).**
 7. Study the feasibility of preferred spectrum band(s) for each category/operation.
 - a. Detailed Technical consideration
 - i. Non-EMC preliminary assessment (e.g., coordinate time solution)
 - ii. Technology requirements
 1. EMC study
 2. Assumptions, methodology, scenarios, etc
 - b. Detailed Operational consideration
 - c. Refined Time to Relocate
 - d. Refined Estimate of Costs
 - e. Detailed Relocation plan to relocate from the entire 1755-1850 MHz band within 10 years, including any transition plans (e.g., phasing) to relocate from the 1755-1780 MHz band within 5 years. In addition, for only SGLS determine sharing options (coordination distances, consolidating locations, relocating operations to rural areas, etc).
 - f. Identification of regulatory requirements
 - i. Regulatory proceedings
 - ii. Assignment availability
 - iii. WRC actions
 - iv. Border Agreements
 - g. Identification of contingency of moving exiting operations in comparable bands
 - h. NTIA to identify NTIA person for each study (See 1d and 2c above)
 8. **Interim Reporting. This will include initial draft of studies, relocation plans, preliminary results - June 1, 2011 – Provide status report, considerations, and future actions - 10 June 17, 2011- SWG Meeting**
 9. Evaluation of relocation plan/studies(s)
 - a. Actions to be Taken
 - b. Options to Consider
 - c. Next steps
 10. **Draft consolidated report completed on July 31, 2011. Includes summary of agencies' analysis, NTIA studies, relocation plan, gross cost estimates]**

Final Draft consolidated report due October 1, 2011. Announcement by NTIA on the Decision of the 1755-1850 MHz band - Report into the OMB interagency review process.



2. U.S. Geological Survey (USGS) - Comparable Band Analysis for the Proposed 1755-1850 MHz Relocation

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

Point to point microwave radios located on 15 sites 26 radios, throughout the Central California Coast ranges (18 radios) and in southern CA (8 radios).
 - 1.2. Identify the number of assignments by system type.

Twenty six (26) point-to-point assignments
 - 1.3. Identify the type of assignment by system (i.e., Local, regional, US/USA/US&P, etc)

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

Point to point radios carry continuous seismic data transmission from field equipment to data processing centers located in Menlo Park, CA ("NCSN" system) and Pasadena, CA ("SCSN" system). Near real-time seismic data are used for emergency response to significant earthquakes, tsunami warning, detection of volcanic unrest, and public information. Archived data are used for earthquake engineering and for seismological research. NCSN system carries data from 436 channels with data rate of 1.6Mbps from 52% of NCSN regional seismic stations. The SCSN system carries 389 channels, which comprises ~40% of its total channels.
 - 1.5. Describe why the operation cannot be accomplished by the use of commercial services or non-RF solutions

Data is compatible with commercial services, such as leased circuits, satellite, and/or 4G wireless. However, most microwave sites are in remote locations and do not have leased circuit availability or 4G service. It is essential to carry data over systems that will not fail or saturate during emergencies. In addition, research and analysis is ongoing and will be provided during Phase II however and until performing an engineering and cost-of-ownership analysis, it is not possible to evaluate the trade-offs of the various alternatives, such as successful land lease (access), lease line (if available), and cellular reliability during emergencies.
 - 1.6. Provide geographical area location of assignments, gross assessment of time of operation.

Operations are continuous for both systems (7X24X365). The nature of the information transferred and the emergency response component require continuous operations.

Operations are authorized for the NCSN from Geyser Peak north of Santa Rosa, CA south in the California Coast Ranges to Black Mountain east of San Luis Obispo, CA. The area encompasses major metropolitan areas including Santa Rosa, the Sonoma and Napa Valleys, Oakland, Berkeley, San Francisco, San Jose, Monterey, and Salinas Valley.



Operations are authorized for the SCSN from Edwards Air Force Base in the Mojave Desert south to Caltech campus in Pasadena, CA. The area encompasses the major metropolitan areas in the Los Angeles basin, including Anaheim, Pasadena, Glendora, Riverside, and San Bernardino.

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

Operations are continuous (7X24X365).

2. Comparable Band Evaluation - For each comparable spectrum band and for each type of operation, provide the following:

- 2.1. Technical Considerations: In considering any technology implications of relocating a "type of operation" or major system into a specific alternate spectrum band:

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)?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

However, preliminary analysis for moving to 8GHz requires occupation of additional microwave sites. Competition for mountain top space in the aforementioned geographical area of operations is intense and environmental requirements for permits are becoming more restrictive. Consequently, costs associated with maintenance and site leasing will increase significantly. Identification of available infrastructure to mount larger dishes to support 8GHz system is unknown at both existing and any proposed new sites. Without a "boots-on-the-ground" for site surveys, it will be impossible to know if a replacement microwave system is physically possible.

The existing microwave system has a back-haul leased circuit T1 loop for robust operation when a microwave link fails. Use of alternative technologies (satellite or 4G) may not provide the ability to have this robustness. Unlike a microwave system with a backhaul, leased circuit and 4G systems are likely to fail during an earthquake due to power outages and fiber cuts. In addition, dependant on availability of funds to perform a more thorough up-front engineering analysis, out-year costs for purchased services may prevent continued collection and transfer of information.

- 2.1.1. What are the available technical solutions that would enable the system to overcome such limitations (e.g., high gain antennas, higher power transmitter, etc.)

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

With preliminary analysis, it is known that at both existing and new sites, larger and heavier, high-performance dishes may be required for operating in the 8GHz band. However, all towers will have to be evaluated to determine if the added wind loading exceeds the safe design limit of the tower.



If USGS does not relocate to 8GHz and dependant on availability of funds to perform a more thorough up-front engineering analysis to examine and study how to use multiple technologies (satellite, 4G wireless, leased circuits) to achieve resiliency and robustness to determine the solutions that will best meet the needs and mission requirement of this critical seismic infrastructure.

2.1.2. What is the state of availability and maturity of the technology necessary to overcome the limitations?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Preliminary analysis shows 8GHz technology is adequate. So is 4G and satellite, but each technology has its own strengths and weakness. Moreover, dependant on availability of funds to perform a more thorough up-front engineering analysis is required to assess which technology is the best alternative to USGS existing 1755-1850 MHz microwave system.

2.1.3. For the system under consideration, what mitigation options would be available to minimize or eliminate the limitations due to this band?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Preliminary studies show - Few, if any. Limitations need to be determined in advance of any decision to move into any new system and comparable frequency band and or commercial or satellite service. It is imperative to conduct site surveys, through visits to all existing and proposed sites; to negotiate with landowners at each site to determine if permits to occupy will be issued; to evaluate structural integrity of all towers; and to assess whether the long-term operational costs are cost effective.

2.1.4. 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?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

No preferred technical solution has been identified because DOI and USGS have no funding to perform a thorough formal engineering analysis and evaluation of alternatives, limitations, and cost of operation to “put boots to ground” for site surveys etc... Without appropriate technical/engineering studies, any proposed move may compromise system integrity, exceed proposed costs, and extend transition times.



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?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Preliminary analysis on relocation to another band, and/or integration of commercial services is possible. However, each change in, and use of, any technology has its inherent limitations. For example, lease of commercial services (4G, satellite, etc.) will create unanticipated out-year costs that may limit system stability and development. A move to 4 or 8 GHz will require addition of new towers and known system expansions for additional links (hops). Additional systems will increase maintenance costs and lease costs into the future. Addition of high performance solid receiving dishes will increase lease costs at existing sites **if the dishes can be mounted at all**. Relocation to satellite would incur up/downlink delays that could affect the agency's mission to provide earthquake-early-warning.

The greatest limitation to moving forward at this time is a lack for up-front funding to conduct sufficient engineering studies. However, with appropriate funding for engineering analysis and studies, the best alternatives for the project can be determined for the costs, including future out-year costs, associated with those alternatives can be evaluated.

2.2.2. If there are limitations, to what extent will they impact mission effectiveness?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

If DOI USGS cannot fully replicate the functionality and capability of the existing 1755-1850 MHz microwave system, the seismic monitoring mission and public safety will be severely compromised in California. The existing system carries telecommunications of ~50% of all seismic stations with continuous telemetry in California operated by the USGS, and **almost all** of the seismic stations in the region served by the microwave system. Earthquake detection thresholds will increase from magnitude 1 to over 3 in these regions. ShakeMaps will not accurately depict shaking levels of significant events because there will be few, if any, observations from seismic stations. Consequently, rapid estimates of fatalities and economic loss will be unreliable and it will be impossible to operate an Earthquake Early Warning system. Essential seismological data will not be acquired, and thus compromise research by seismologists to understand how to forecast earthquakes, and hinder efforts of earthquake engineers how to understand the shaking levels necessary for structures to resist.



2.2.3. What are the possible mitigation options available to minimize or eliminate the limitations?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Options are unknown until we have performed a thorough and formal engineering analysis and evaluation of alternatives and limitations.

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?

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

No preferred solution has been identified because we have no funding to perform a thorough formal evaluation of alternatives, limitations, and cost of operation.

2.3. The extent to which other constraints impede relocation (e.g., necessary allocation changes) to a comparable band and proposed remedies.

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- Lack of funding for planning and engineering studies.
- Potential unanticipated lease, operations, and maintenance costs.
- USGS, NCSN and SCSN do not have staff to relocate. Additional staff must be hired to relocate system and manage transition to full operational functionality.

2.4. A gross estimate of the time required to transition out of the 1755-1850 MHz band to a comparable band.

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.4.1. Less than 10 years?

Possibly, within 10 years if funding is provided to perform engineering study immediately and limitations described above and all other exogenous costs and considerations are addressable. If not, 10-15 years.

2.4.2. 10-15 years?

2.4.3. Greater than 15 years?

2.5. A gross estimate of the cost to transition out of the 1755-1850 MHz band to a comparable band.

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.5.1. Less than \$0.5B?

Without appropriate engineering studies of alternatives, it can only be a guess based on DOI USGS experience gained from the previous AWS relocation and recent ARRA project. If the NCSN and SCSN



relocate to 8GHz, the number of sites needs to double from 15 to 30, and we estimate the transition costs to be as high as \$45M. This number reflects costs for replacement radio equipment, new towers, new dishes, R56 compliance, labor, overhead, installation, and required permitting. In addition, operational costs due to leases and maintenance could increase by \$750K or more annually, assuming \$30K/site lease costs for 15 new sites, increased site lease costs for existing sites due to larger dishes, and added maintenance costs.

2.5.2. \$0.5B - \$1.5B?

2.5.3. \$1.5B - \$2.5B?

2.5.4. \$2.5B - \$5.0B?

2.5.5. Greater than \$5B?

- 2.6. A ranking of each comparable spectrum in priority order, from the highest to lowest, for each *type of operation and system type*

Research and analysis will be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Without appropriate engineering studies and understanding our options, a ranking would be of no value.

- 2.7. For each comparable band(s) for each type of operation discuss and provide the rationale for selection or non-selection.

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

3. 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.

Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

It is possible that we can relinquish the 1755-1780 MHz frequencies and consolidate our operations elsewhere in a comparable frequency band. Without appropriate engineering studies, there is no opportunity for early transition because we do not have sufficient information to make decisions. Because of the complexity of this system and its mission, DOI USGS estimates it would need approximately \$150K and 6 months to conduct appropriate engineering studies. The studies themselves should only take a few months. However, delays in issuing contracts for the studies will delay the information needed.



3. National Park Service - Comparable Band Analysis for the Proposed 1755-1850 MHz Relocation

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

Aeronautical Mobile video surveillance down link transmitters located on rotor blade aircraft.
Number of systems: Two (2). Both aeronautical platforms operate on the same frequency of 1764 MHz.

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

One (1) assignment - I065234

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

Local assignment for regional support

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

Real-time video surveillance downlink to Federal Agencies Command Post for video surveillance, mission management, Law Enforcement, Homeland Security, Search and Rescue and Medical Evacuation operations within the National Capitol Region. However, this aviation asset has been deployed to support National Emergency Response situations (e.g., U.S. Park Police deployed the asset to Louisiana to provide emergency response support during Hurricane Katrina relief operations).

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

Certain applications and information produced by the system are sensitive or classified. Therefore, command and control of the system must be inherently managed. Due to the nature of the aeronautical mobile operation, a non-RF solution will not meet the operational requirement.

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

Operations are authorized within the National Capitol Region (NCR), Washington D.C., Weekly (2-3 times within the week) and "On-Call" as requested by other Federal Agencies.

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

One to two hours duration when in operation however longer use has occurred depending upon the mission requirement.

2. Comparable Band Evaluation - For each comparable spectrum band and for each type of operation, provide the following:

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



2.1. Technical Considerations: In considering any technology implications of relocating a “type of operation” or major system into a specific alternate spectrum band;

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 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)?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 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.)

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.1.3.What is the state of availability and maturity of the technology necessary to overcome the limitations?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.1.4.For the system under consideration, what mitigation options would be available to minimize or eliminate the limitations due to this band?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 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?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

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?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.2.2.If there are limitations, to what extent will they impact mission effectiveness?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.2.3.What are the possible mitigation options available to minimize or eliminate the limitations?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



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- 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?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.3. The extent to which other constraints impede relocation (e.g., necessary allocation changes) to a comparable band and proposed remedies.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

- 2.4. A gross estimate of the time required to transition out of the 1755-1850 MHz band to a comparable band:

2.4.1. Less than 10 years?

Yes, within 1 year (12 months) transition can occur. However, research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.4.2. 10-15 years?

2.4.3. Greater than 15 years?

- 2.5. A gross estimate of the cost to transition out of the 1755-1850 MHz band to a comparable band:

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.5.1. Less than \$0.5B? Gross estimate under \$500K

2.5.2. \$0.5B - \$1.5B?

2.5.3. \$1.5B - \$2.5B?

2.5.4. \$2.5B - \$5.0B?

2.5.5. Greater than \$5B?

- 2.6. A ranking of each comparable spectrum in priority order, from the highest to lowest, for each *type of operation and system type*

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis

The 2200-2300 MHz frequency band is currently allocated for Aeronautical Mobile operations; and other Federal partners within the National Capitol Region have licensed operations providing acceptable results to customers.

- 2.7. For each comparable band(s) for each type of operation discuss and provide the rationale for selection or non-selection.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



The 2200-2300 MHz frequency range is currently allocated for Aeronautical Mobile operations; and other Federal partners within the National Capitol Region have licensed operations providing acceptable results to customers.

3. 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.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis. However, transition can occur in less than 5 years.



4. U.S. Fish & Wildlife Service - Comparable Band Analysis for the Proposed 1755-1850 MHz Relocation

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
Video Surveillance Body Wire – 5 sets.
 - 1.2. Identify the number of assignments by system type.
One (1) – I 024766
 - 1.3. Identify the type of assignment by system (i.e., Local, regional, US/USA/US&P, etc)
US&P
 - 1.4. Provide a brief description of the type of operation.
Real-time video surveillance used by U.S. Fish and Wildlife Service, Office of Law Enforcement, Special Agents for electronic surveillance operations.
 - 1.5. Describe why the operation cannot be accomplished by the use of commercial services or non-RF solutions.
The nature of the electronic surveillance operation is a body wire video surveillance system and as such, a non-RF solution or commercial services will not meet the operational requirement. In addition, information and data collected and recorded by the system are sensitive and classified. Therefore, command and control of the system must be inherently managed by DOI, U.S. FWS, Office of Law Enforcement for prosecution for violations of federal laws on federal lands. .
 - 1.6. Provide geographical area location of assignments, gross assessment of time of operation. .
Use is on an as needed basis for special operations on U.S. FWS Wildlife Refuges throughout US&P. In addition, use is as requested for other special operations by other DOI Law Enforcement offices to include other Federal agencies during Law Enforcement Joint Task Force operations. A typical operational duration may be on a weekly basis at any time of the day or night.
 - 1.7. Provide a gross characterization of the system’s frequency of use.
Two to five hours, when in operation however duration of use is dependent upon the mission requirement.
2. Comparable Band Evaluation - For each comparable spectrum band and for each type of operation, provide the following:
 - 2.1. Technical Considerations: In considering any technology implications of relocating a “type of operation” or major system into a specific alternate spectrum band;
Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



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)?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

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.)

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.1.3.What is the state of availability and maturity of the technology necessary to overcome the limitations?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.1.4.For the system under consideration, what mitigation options would be available to minimize or eliminate the limitations due to this band?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

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? .

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

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?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

However, this system operates in the 1700-1850 MHz and 2200-2300 MHz bands. In addition, as operations within the 1700-1850 MHz band will not be available for future use, during the initial analysis of the Government Master File (GMF) for the 2200-2300 MHz band shows 2662 RFA's registered for Federal and FCC operations and 414 RFAs registered with Canadian records. And until an in-depth radio frequency engineering analysis can be conducted, these preliminary findings from the number of RFA's registered in the 2200-2300 MHz band, it is expected the spectrum the EME is already congested due to the current incumbents operations at fixed locations. In addition, the potential move of other agencies into the 2200-2300 MHz band will further impede and diminish frequency-sharing opportunities.

2.2.2.If there are limitations, to what extent will they impact mission effectiveness? Will have less options (choices) of channels to use on shared basis - Research and analysis to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



2.2.3. What are the possible mitigation options available to minimize or eliminate the limitations?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

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?

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Preliminary studies suggest that new equipment will have to be purchased that operates within one of the comparable relocation frequency bands identified for relocation options.

2.3. The extent to which other constraints impede relocation (e.g., necessary allocation changes) to a comparable band and proposed remedies.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

Preliminary studies shows it is that one of the comparable relocation frequency band options may be able to be utilized.

2.4. A gross estimate of the time required to transition out of the 1755-1850 MHz band to a comparable band.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.4.1. Less than 10 years? Yes

2.4.2. 10-15 years?

2.4.3. Greater than 15 years?

2.5. A gross estimate of the cost to transition out of the 1755-1850 MHz band to a comparable band.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

2.5.1. Less than \$0.5B? Gross estimate under \$500K

2.5.2. \$0.5B - \$1.5B?

2.5.3. \$1.5B - \$2.5B?

2.5.4. \$2.5B - \$5.0B?

2.5.5. Greater than \$5B?

2.6. A ranking of each comparable spectrum in priority order, from the highest to lowest, for each *type of operation and system type*

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.



2.7. For each comparable band(s) for each type of operation discuss and provide the rationale for selection or non-selection.

Research and analysis is to be provided during Phase II dependant on availability of funds to perform a more thorough up-front engineering analysis.

3. 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.

Depending on availability of funds through the CESA, transition may occur in less than 5 years.



5. Conclusion

The 1755-1850 MHz frequency band is to be determined whether the spectrum can be made available for wireless broadband services within 10 years on an exclusive basis. This candidate band requires an electromagnetic interference analysis and detailed engineering studies on a system-by-system and site-by-site basis to meet the Commerce Secretary's recommendation due by October 1, 2010.

Based upon the work plan methodology prescribed, further detailed research and analysis is to be provided during Phase II. However, the going forward work is dependent on availability of funds to perform a more thorough up-front engineering analysis. This means that the timing and progress of the 1755-1850 comparable analysis effort by DOI, USGS, U.S. FWS and NPS will be importantly impacted by the availability of federal authority and funds to do the planning, evaluation, and sharing or relocation work

The NTIA 10-Year Plan (The Plan) and Timeline assumes "supporting legislative actions" by OMB during a broad range of going-forward time periods. However, there are no up-front achievement of obligation authority and cash funding for federal agencies to do required up-front cost studies and evaluations in the 1755-1850 MHz if the future federal spectrum relocations or sharing efforts are to be successful.

Specifically, the schedule in the Plan assumes a tremendous amount of DOI agency work during FY 2011 and beyond for "technical analysis", "operational analysis" and "cost analysis" but does not show a planning date when funding is assumed to be available for the work. In effect, there is an implicit assumption in the Plan that federal agencies can fund all of the evaluation work during FY 2011. In addition, as discussed at the PPSG on August 6, 2010, and at present, the U.S. Congress is likely to enact one or more continuing funding resolutions for FY 2011 that will likely not include FY 2011 funding for such incremental agency work.

Moreover, DOI believes that OMB should put forth language to amend the current Commercial Spectrum Enhancement Act (CESA) to the U.S. Congress to allow federal agencies to request funds in the FY 2012 Presidents Budget. Or, alternatively allow federal agencies to show in their budgets or in OMB's portion of the budget the use of federal funds to fund agencies for FY 2011 activities and for FY 2012 and beyond in accordance with the Plan schedule.

DOI will attempt to provide further resources as it can for continued research and analysis moving forward towards Phase II. However, our resources and staffing are limited and reporting for Phase II is dependent on availability of funds to perform a more thorough up-front engineering analysis.

DOI request that NTIA aggressively request OMB to be more specific on the assumed date that the White House and OMB will propose an amendment of the current Commercial Spectrum Enhancement Act (CESA) to the U.S. Congress. To include, the amendment should specifically address when federal agencies could expect to apply for receipt of funding (i.e., first Quarter of FY 2012 or first half of FY 2012).