



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Telecommunications and**  
**Information Administration**  
Washington, D.C. 20230

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To: Lawrence E. Strickling, Assistant Secretary for Communications and Information

From:  Karl B. Nebbia, Associate Administrator, Office of Spectrum Management

Re: FY08 Progress Report on the Spectrum Policy Initiative

Please find attached our report of activity under the Spectrum Policy Initiative for Fiscal Year 2008. I will be reviewing these activities in light of our work load, staffing and other activities that require our attention but were not included within the Initiative.

I will post to the Office of Spectrum Management website.

Attachment: FY08 Progress Report on the Spectrum Policy Initiative

# SPECTRUM POLICY INITIATIVE

PROGRESS REPORT FOR FISCAL YEAR 2008

## **National Telecommunications and Information Administration**

**LAWRENCE E. STRICKLING**  
**ASSISTANT SECRETARY**  
**FOR COMMUNICATIONS AND INFORMATION**

**OCTOBER 2009**



# TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	1
BACKGROUND.....	3
SPECTRUM POLICY INITIATIVE PROGRESS .....	4
<i>I. Capital Planning Processes and Integration of Spectrum Planning in Agency Strategic and Capital Planning Processes .....</i>	<i>4</i>
<i>II. Formal Assessment of Spectrum Needs: The Technical Planning Process.....</i>	<i>5</i>
<i>III. Strategic Spectrum Planning .....</i>	<i>5</i>
<i>IV. Commerce Spectrum Management Advisory Committee.....</i>	<i>6</i>
<i>V. Incentives for More Efficient Use of the Spectrum.....</i>	<i>7</i>
<i>VI. Public Safety .....</i>	<i>7</i>
<i>VII. Efficiency Initiatives .....</i>	<i>8</i>
<i>VIII. Advanced Information Technology .....</i>	<i>13</i>
<i>IX. Reducing International Barriers to United States Technology.....</i>	<i>14</i>
<i>X. Continuity of Government and Continuity of Operations Activities.....</i>	<i>15</i>
<i>XI. Unified Federal Response .....</i>	<i>15</i>
CONCLUSION .....	17
APPENDIX A .....	18
Status of Deliverables and Target Dates as of April 2009.....	18
APPENDIX B .....	28
Reports and Reference Documents .....	28

## EXECUTIVE SUMMARY

In Fiscal Year 2008 (FY08), executive branch agencies continued to improve spectrum management policies and practices in support of the goals of the National Telecommunications and Information Administration (NTIA) Spectrum Policy Initiative (“Spectrum Policy Initiative” or “Initiative”). NTIA provided leadership to the Federal agencies in fulfilling these goals, as well as in carrying out a number of the Initiative tasks. With respect to the progress of the Federal agencies in FY08, this report is based on the agency inputs made in November 2008. The agency reports are a part of this report but are separately located on NTIA’s website. This report also summarizes NTIA-led activities up through the end of September 2009.

The activities within the Spectrum Policy Initiative seek to ensure that the electro-magnetic spectrum is used efficiently in support of Federal missions and non-Federal systems, including those of state, local, and tribal governments as well as the private sector. The Initiative recognizes the critical role spectrum plays in U.S. economic growth and job creation, as well as in supporting national defense, homeland security, law enforcement, critical infrastructure, and transportation.

The Federal agencies in FY08 continued their participation in “Working Level Groups” chaired by NTIA and tasked to accomplish the goals of the NTIA Spectrum Policy Initiative. Agency spectrum managers provided leadership to improve internal agency processes for system planning, identification of spectrum requirements, and use of new technologies to increase spectrum efficiency. The agencies instituted processes to better identify and track spectrum-using assets and to link their missions to functional requirements and spectrum-dependent systems. The agencies also are working to better identify future spectrum requirements.

Several Federal agencies have taken steps to increase collaboration on spectrum matters among the Federal agencies; with state, local, and tribal entities; and with the private sector. Federal agencies increasingly are sharing spectrum through inter-organizational arrangements. They are also exploring technologies that utilize dynamic spectrum access sharing techniques and laying the groundwork for their use. The following examples reflect progress by the Federal agencies in improving spectrum management:

- Agencies increased integration of spectrum management into their overall information technology activities as well as agency strategic and capital planning processes;
- Agencies increased sharing of spectrum resources and infrastructure with each other and with state, local, and tribal entities; and
- The Department of Defense’s (DOD) DARPA XG program concluded its tests on the use of dynamic spectrum access sharing techniques.

In addition to individual agency progress, NTIA achieved several milestones with respect to the Spectrum Policy Initiative. These include:

- The Federal Strategic Spectrum Plan was published in March 2008;
- The Commerce Spectrum Management Advisory Committee (CSMAC) made recommendations to the Assistant Secretary on Federal spectrum management and on the spectrum sharing Test-Bed pilot program and submitted a Transition Report;<sup>1</sup>
- The major U.S. goals at the 2007 World Radiocommunication Conference (WRC-07) were achieved ; and
- The Spectrum Sharing Innovation Test-Bed pilot program to evaluate spectrum sharing between Federal and non-Federal spectrum users was initiated.

These actions by the Federal agencies and NTIA advanced the Initiative and accomplished a number of its goals.

In addition to the actions undertaken pursuant to the Spectrum Policy Initiative, NTIA took a lead role with respect to the relocation of several thousand Federal frequency assignments from the 1710-1755 MHz band to other spectrum. Pursuant to the Commercial Spectrum Enhancement Act (CSEA), the Federal Government reallocated 45 MHz of spectrum from Federal-only use to non-Federal use for advanced wireless services (AWS).<sup>2</sup> This spectrum, along with 45 MHz of non-Federal spectrum, was auctioned for \$13.7 billion and is facilitating the provision of innovative new wireless services in the commercial market. Pursuant to the CSEA, which provided for a spectrum relocation fund, approximately \$1 billion of the auction proceeds was transferred to 12 Federal agencies to fund relocation of wireless systems from the 1710-1755 MHz band. This reallocation of spectrum and relocation of Federal users also enabled the Federal agencies to implement new state-of-the-art communications systems. The reallocation of spectrum and orderly relocation of Federal systems under the CSEA demonstrate how public/private cooperation can benefit the U.S. economy while ensuring that Federal communications requirements can continue to be met.<sup>3</sup>

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<sup>1</sup> The CSMAC provided input to NTIA on a variety of subjects. These are outlined in Section IV of this report.

<sup>2</sup> See Commercial Spectrum Enhancement Act (CSEA), Pub.L. No. 108-494, 118 Stat. 3996-97 (2004).

<sup>3</sup> See *1710-1755 MHz Spectrum Band Relocation, First Annual Progress Report*, U.S. Department of Commerce, March, 2008, available at <http://www.ntia.doc.gov/reports/2008/SpectrumRelocation2008.pdf>.

## **BACKGROUND**

This Fiscal Year (FY08) Progress Report describes activities of the major spectrum-using Federal agencies, as well as those of the National Telecommunications and Information Administration (NTIA), undertaken to develop and implement a United States spectrum policy for the 21<sup>st</sup> century. The objective of the NTIA Spectrum Policy Initiative is to mobilize the radio frequency resource in support of Federal missions and national prosperity. The goals of the Initiative are to: foster economic growth; defend and secure our Nation; maintain U.S. global leadership in communications technology and services; and satisfy other vital U.S. needs in public safety, scientific research, Federal transportation infrastructure, and law enforcement.

At the request of the Assistant Secretary for Communications and Information, the major spectrum-using Federal agencies submitted progress reports in the fall of 2005, 2006, 2007 and 2008. The progress in meeting the goals of the Initiative made at the Federal agencies in FY08 is addressed in the November 2008 agency submissions.

In addition to the progress made by the individual spectrum-using agencies, NTIA accomplished many of the goals of the Initiative. Accomplishments through the date of this report, along with tasks remaining and estimated completion dates, are summarized in Appendix A.

# SPECTRUM POLICY INITIATIVE PROGRESS

The following summarizes Federal agency activities in FY08, along with the NTIA's progress with respect to the Spectrum Policy Initiative. The agency FY08 Progress Reports are posted on NTIA's website.<sup>4</sup>

## ***I. Capital Planning Processes and Integration of Spectrum Planning in Agency Strategic and Capital Planning Processes***

This activity encompasses integration of planning for spectrum-dependent systems into agency strategic and capital planning processes, compliance with OMB guidelines, improved management approaches for spectrum-dependent systems, and ongoing collaboration between the Federal agencies and NTIA to address OMB guidelines.

DOD continues to develop its spectrum scorecard which will be used by program managers in the early stages of the equipment acquisition process to assess spectrum efficiency and mission effectiveness trade-offs. The DOD updated its acquisition forms and processes to consider spectrum requirements at the earliest possible point in the acquisition process. The DOD uses integrated architectures for capital planning and investment and its acquisition system and utilizes the Defense Spectrum Management Architecture (DSMA) for spectrum management.

The Department of Energy (DOE) is implementing an agency-wide Information Technology Management policy, DOE Order 200.1, which will formally delineate Departmental requirements and responsibilities for Federal spectrum management. In addition, DOE is finalizing a spectrum management guidance document which will include the requirements related to OMB Circular A-11 direction for NTIA certification of spectrum dependent systems.

The Department of Interior (DOI), as required by OMB Circular A-11, Section 33.4, plans to incorporate spectrum valuation to complement its business case analysis of major new radio-dependent system investments. DOI performs preliminary analysis of spectrum costs, both actual and intrinsic, and will incorporate both values to complement the overall business case. The Broadcasting Board of Governors (BBG) includes planning for spectrum-dependent systems within its agency capital and information technology process, which ensures compliance with OMB requirements. The United States Postal Service (USPS) has integrated spectrum management into strategic and capital planning processes.

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<sup>4</sup> The following Federal agencies submitted FY2008 Progress Reports: the U.S. Departments of Agriculture, Defense, Energy, Homeland Security, Interior, and Treasury; the National Aeronautics and Space Administration, Broadcasting Board of Governors, Federal Aviation Administration, and the U.S. Postal Service. The reports are available at [http://www.ntia.doc.gov/osmhome/spectrumreform/2007\\_Agency\\_Plans.html](http://www.ntia.doc.gov/osmhome/spectrumreform/2007_Agency_Plans.html).

## ***II. Formal Assessment of Spectrum Needs: The Technical Planning Process***

This activity includes agency implementation of a formal process to evaluate proposed needs for spectrum before seeking certification from NTIA for new or upgraded radio systems. NTIA's spectrum certification process can be used to ensure that agencies comply with OMB requirements concerning consideration of options and economic factors in decision-making on spectrum-dependent systems. NTIA is developing new rules applicable to the system certification process which would require submission of information on the actions by a Federal agency to comply with the requirements to consider the economic value of spectrum in making decisions concerning new major spectrum-dependent systems, as required by OMB Circular A-11, Section 33.4.<sup>5</sup>

DOD is developing a DOD-specific process to identify its current and future spectrum requirements.

## ***III. Strategic Spectrum Planning***

NTIA in FY08 released the Federal Strategic Spectrum Plan (FSSP), based on the 15 agency plans submitted in November 2005.<sup>6</sup> This plan contains a future vision of the need for regulatory structures which will support dynamic spectrum sharing techniques to ensure spectrum access. NTIA will work with the Federal Communication Commission (FCC) to create a National Strategic Spectrum Plan to provide a comprehensive picture of both Federal and non-Federal spectrum use and future requirements.<sup>7</sup>

The Federal agencies, in November 2007, submitted updated agency-specific strategic spectrum plans. The update to the FSSP will use these plans. The Federal agency November 2007 plans are posted on NTIA's website.<sup>8</sup>

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<sup>5</sup>The Office of Management and Budget (OMB), Circular A-11, § 33.4 (2006), *t* [http://www.whitehouse.gov/omb/circulars/a11/current\\_year/s33.pdf](http://www.whitehouse.gov/omb/circulars/a11/current_year/s33.pdf) (last visited, Feb. 7, 2008).

<sup>6</sup>In 2004, Federal agencies were directed to formulate agency-specific strategic spectrum plans providing (1) future spectrum requirements, (2) planned uses of new technologies, and (3) suggested spectrum efficient approaches to meeting identified requirements. The Federal Strategic Spectrum Plan was released by NTIA on March 20, 2008. *See*, National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President's Spectrum Policy Initiative: The Federal Strategic Spectrum Plan* (March 2008), <http://www.ntia.doc.gov/reports/2008/FederalStrategicSpectrumPlan2008.pdf>.

<sup>7</sup> *Id.* at 23.

<sup>8</sup> The individual agency plans can be found at [http://www.ntia.doc.gov/osmhome/spectrumreform/2007\\_Agency\\_Plans.html](http://www.ntia.doc.gov/osmhome/spectrumreform/2007_Agency_Plans.html).

#### ***IV. Commerce Spectrum Management Advisory Committee***

The Department of Commerce's CSMAC submitted reports in 2007 and 2008, making recommendations on spectrum management to the Assistant Secretary for Communications and Information.<sup>9</sup>

These reports are:

- (1) Transition of Federal Land Mobile Radio Systems to Increase Spectrum Efficiency;
- (2) Report on Operational Efficiency;
- (3) Definitions of Efficiency in Spectrum Use;
- (4) Streamlining Federal/non-Federal Spectrum Sharing;
- (5) Recommendations for Improving the Process for Identifying Spectrum for Future Reallocation or Sharing;
- (6) Opportunities for Government Adoption of Commercial Technologies; and
- (7) Opportunities Relating to the Spectrum Sharing Test Bed.<sup>10</sup>

In addition, at the end of 2008, the CSMAC prepared a Transition Report providing a summary of its activities and recommendations as well as background on activities at the NTIA and the FCC on improving spectrum management.<sup>11</sup>

The CSMAC is composed of experts from the telecommunications industry, the public safety community, and academia and provides advice to the Assistant Secretary for Communications and Information. The committee provides an opportunity for NTIA to benefit from the insights, experiences, and technical knowledge of the non-Federal sector. New members of the CSMAC were appointed in January 2009 for two-year terms and the Assistant Secretary of Commerce has the option of appointing additional members.<sup>12</sup> The CSMAC's charter was redrafted and renewed on April 6, 2009 extending CSMAC to 2011.<sup>13</sup> The charter also was amended to permit the committee to have up to 25 members. The charter is written broadly so that the CSMAC may consider: expanded availability of wireless broadband services, especially in rural areas; public safety spectrum issues; long-range spectrum planning; international opportunities to advance U.S. economic interests; technology and market trends; radio-frequency research and development efforts; and transparency and interoperability of Federal and non-Federal spectrum databases.

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<sup>9</sup> The CSMAC was established in November 2006 to provide advice on a broad range of issues regarding spectrum policy. A 2004 Executive Memorandum called for the creation of a Federal advisory committee on spectrum matters. 49 Weekly Comp. Pres. Doc. 2875, § 3(c).

<sup>10</sup> See Commerce Spectrum Management Advisory Committee Reports, available at [http://www.ntia.doc.gov/advisory/spectrum/csmac\\_reports.html](http://www.ntia.doc.gov/advisory/spectrum/csmac_reports.html).

<sup>11</sup> See Commerce Spectrum Management Advisory Committee Transition Report, (Dec. 13, 2008), available at [http://www.ntia.doc.gov/advisory/spectrum/meeting\\_files/CSMAC\\_Transition\\_Report\\_\(121208b\\_-\\_CLEAN\).pdf](http://www.ntia.doc.gov/advisory/spectrum/meeting_files/CSMAC_Transition_Report_(121208b_-_CLEAN).pdf).

<sup>12</sup> See [http://www.ntia.doc.gov/press/2009/CSMAC\\_090116.html](http://www.ntia.doc.gov/press/2009/CSMAC_090116.html).

<sup>13</sup> *Id.*

## ***V. Incentives for More Efficient Use of the Spectrum***

OMB instructed the Federal agencies to consider the economic value of radio spectrum when developing justifications for new systems.<sup>14</sup> NTIA is working with the Federal agencies to develop guidance on valuing Federal spectrum as well as identifying incentives for more efficient spectrum use within the Federal Government.

NTIA developed a plan to identify and implement possible incentives for both the Federal and non-Federal sectors to use spectrum more efficiently and effectively.<sup>15</sup> NTIA continues to examine spectrum valuation, user rights for Federal agencies, possible levying of user fees for Federal spectrum use, increased sharing, and other market and non-market-based approaches to stimulate the most efficient use of this important natural resource.

NTIA also is reviewing its current administrative cost-recovery fees applied to Federal spectrum assignments to assess whether various factors related to spectrum use, such as frequency range and geographical coverage of the system, can be taken into account in calculating those fees. NTIA's review has considered these factors as they impact the work load of spectrum management staff and not specifically as an incentive regarding the use of spectrum.

## ***VI. Public Safety***

A goal of the Spectrum Policy Initiative is to improve interoperability between Federal, state, local, and tribal public safety communication systems.

To improve public safety interoperability as well as make more efficient use of spectrum resources and wireless infrastructure, in FY08, some Federal agencies entered into additional frequency and infrastructure partnerships with state, local, tribal, and other entities. NTIA, in coordination with the Federal agencies and the FCC, within the Interdepartment Radio Advisory Committee (IRAC), is revising the Manual of Regulations and Procedures for Federal Radio Management ("NTIA Manual" or "Redbook") to clarify the requirements for Federal/non-Federal radio system sharing in the land mobile bands for these partnerships.

The FCC continues to consider how best to promote the implementation of a nationwide, interoperable, broadband public safety communications system using a portion of the 700 MHz analog television spectrum.<sup>16</sup> To ensure that Federal agency concerns are fully considered in the FCC's proceeding on using a public/private partnership to create a nationwide interoperable public safety broadband network, the NTIA-led Policy and Plans Steering Group (PPSG) developed a consensus position recommending to the FCC that Federal agencies have access to such a network in furtherance of their missions during emergencies.<sup>17</sup>

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<sup>14</sup> The Office of Management and Budget Circular A-11, § 33.4 (2006), *available at* [http://www.whitehouse.gov/omb/circulars/a11/current\\_year/s33.pdf](http://www.whitehouse.gov/omb/circulars/a11/current_year/s33.pdf).

<sup>15</sup> *See* Plan to Identify and Implement Incentives that Promote More Efficient and Effective Use of Spectrum, *available at* [http://www.ntia.doc.gov/osmhome/reports/Incentives\\_Plan.pdf](http://www.ntia.doc.gov/osmhome/reports/Incentives_Plan.pdf).

<sup>16</sup> *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, WT Docket No. 06-150, PS Docket No. 06-22, Third Further Notice of Proposed Rulemaking, 23 FCC Rcd 14301 (2008).

<sup>17</sup> *See* Section XI of this Report.

## ***VII. Efficiency Initiatives***

### **A. Sharing**

Agency initiatives to enable sharing of radio frequency spectrum and/or infrastructure among Federal agencies or between Federal agencies and state, local, and other entities accelerated during FY08 and are discussed below.

The United States Department of Agriculture (USDA) shares spectrum and infrastructure with many state, local, and tribal entities as well as other Federal agencies. USDA firefighting is a Federal “first responder” operation requiring multiple-organization and cross-jurisdictional communications. Sharing spectrum and radios with Federal, state, local, and industry partners is the single best short-term approach for USDA to achieve spectrum efficiency today. In many remote parts of the country, USDA’s spectrum dependent radio infrastructure is the only telecommunications technology available when fighting wild land fires. USDA also works closely with DOI to improve radio support services in remote areas.

Numerous DOE sites and facilities have mutual aid agreements with surrounding city, county, or state governments for support of law enforcement, fire and rescue, weather, and emergency medical services functions. Several National Nuclear Security Administration (NNSA) field sites are exploring the use of the 4.9 GHz band for fixed and mobile wireless service. The Idaho National Laboratory (INL) is installing a state-of-the-art, trunked Land Mobile Radio (LMR) System which is Project 25 compliant and which will support operations in the 700 MHz band made available as a result of the digital television (DTV) transition.<sup>18</sup> The INL is working with the State of Idaho on an infrastructure and spectrum sharing Memorandum of Understanding (MOU) that will allow integration and sharing of the State of Idaho’s 700 MHz system as well as interoperability with the INL’s current 406.1 – 420 MHz band operations. The Oak Ridge operations office is working with local law enforcement, emergency responders, and other agencies to improve mutual aid communications, possibly in the 4.9 GHz band.

The Treasury Department is utilizing shared statewide wireless networks in Alaska, Wyoming and other states. Treasury also continues to collaborate with the Departments of Justice and Homeland Security on the Integrated Wireless Network (IWN). IWN is a trunked radio system designed to meet the law enforcement and protective personnel tactical communications requirements of these three agencies which represent the majority of law enforcement personnel within the Federal Government.<sup>19</sup>

DOI entered into an MOU with Nebraska concerning sharing of spectrum and infrastructure and is increasing DOI sharing of Federal and non-Federal spectrum and infrastructure with non-Federal entities in Arizona, Wisconsin, Minnesota, Oregon, South Dakota, Washington, and Idaho. DOE also is exploring additional sharing opportunities with USDA’s Forest Service and DHS. DOE, in partnership

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<sup>18</sup> Project 25 (P25) is an interoperability suite of standards for digital two-way wireless communications products and systems. Radio equipment that demonstrates compliance with P25 is able to meet a set of minimum requirements to fit the needs of public safety. These include the ability to interoperate with other P25 equipment, so that users on different systems can talk via direct radio contact. The P25 standards are issued by the Telecommunications Industry Association (TIA), a committee of manufacturers, public safety agencies and state and federal communications professionals. The standards provide detailed information on the design of communications systems so that all purchasers of P25-compatible equipment can communicate with each other. See, <http://www.tiaonline.org/standards/catalog/search.cfm> which provides all the P25 standards adopted to date.

<sup>19</sup> More information on IWN can be found at <http://www.usdoj.gov/jmd/iwn/overview.html>.

with DHS, submitted a request to NTIA for certification for Federal agency use of the Wyoming Statewide Public Safety Land Mobile Radio Network “WyoLink”. Building on the initial spectrum certification for DOI use of the Montana “Interoperability Montana” Statewide Public Safety LMR system in 2007, this certification, when approved, will authorize access to Federal spectrum resources for augmentation of the WyoLink radio system to support Federal users.

The USPS shares spectrum through partnerships with other Federal agencies where practical and shares spectrum with certain state and local agencies for joint tactical operations.

## **B. Use of New Technologies**

DOD continues to lead the Federal agencies in exploring and developing new technologies, including systems that employ dynamic spectrum access (DSA) techniques, to facilitate spectrum sharing and access.

Following completion of the tests of dynamic spectrum access through its Defense Advanced Research Projects Agency NeXt Generation communication program (DARPA XG), DOD is further assessing such technologies in its Wireless Network after Next (WNaN) program. WNaN will go beyond the DARPA XG dynamic spectrum and policy-based control technologies to evaluate adaptive techniques. As part of the DARPA XG program, prototype radios are being built for further validation and use by the U.S. Army. The Joint Tactical Radio System (JTRS) program office awarded a contract to Shared Spectrum, Inc. to conduct tests of DARPA XG with Wideband Network Waveform (WNW). Following these tests (expected to be completed in calendar year 2009), the JTRS program office will decide whether or not to fund development and production of the radios.

DOD has a draft DSA Roadmap for the implementation of DSA processes and technology into DOD systems. In addition, the DOD is monitoring global standardization efforts related to DSA to identify the potential impact of these efforts, identify areas which are not currently being addressed by national and international standards bodies, and ensure that the interests of the DOD are appropriately taken into account in developing U.S. positions within the standards bodies.<sup>20</sup>

As part of a technology demonstration, the DOE Oak Ridge National Laboratory (ORNL) is developing a wideband hybrid spread spectrum waveform. The goal of the demonstration is to confirm that wideband communication can operate below the noise floor, thus enabling secure communication. ORNL also is actively investigating cognitive radio technologies including differential evolution (population based search algorithms); inferential sensing; mapping parameters to population vectors or “chromosomes;” and bio-inspired secure computing, communications, and control.

DOI is implementing modern open radio technology standards. It has developed a land mobile radio architecture to converge various technologies including land mobile equipment based on the P25 standards, satellite, and radio over internet protocol (ROIP). The USPS also is migrating towards more spectrum-efficient technology which will eliminate its need for additional pairs of land mobile channel assignments.

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<sup>20</sup> These standards-setting organizations include the Institute of Electrical and Electronic Engineers (IEEE) and the International Telecommunication Union (ITU).

BBG promotes the International Telecommunication Union (ITU) standard for digital shortwave broadcasting, digital radio mondiale (DRM), which will enable improved performance and more spectrum-efficient systems, once radio receiver prices are sufficiently low for broader deployment by BBG. The international broadcasting community promotes this common standard which is a necessary pre-requisite for large-scale production of the digital shortwave radios.<sup>21</sup>

NASA has a technology development initiative in the area of optical communications to alleviate spectrum congestion and enable it to meet the high data rate requirements envisioned for future exploration of the moon and Mars.

NTIA chairs an informal DSA Coordination Group (DSA CG) which provides a venue to ensure that Federal spectrum managers have access to information on technology developments, including private sector efforts.<sup>22</sup> The DSA CG also provides an opportunity for updates on Federal use of systems employing DSA technology, as well as standards activities relating to DSA.

An important part of NTIA's Spectrum Policy Initiative is the Spectrum Sharing Innovation Test-Bed pilot program (Test-Bed).<sup>23</sup> This pilot program will enable Federal and non-Federal users of spectrum to explore new technologies and methods to share the finite radio spectrum. The Test-Bed pilot program will evaluate the ability of DSA devices employing spectrum sensing and/or geo-location techniques to share spectrum with LMR systems operating in the 410-420 MHz Federal band and in the 470-512 MHz non-Federal band.<sup>24</sup> To address potential interference to incumbent spectrum users, the Test-Bed pilot program will include both laboratory and field measurements performed in three phases: Phase I - measurement of equipment characteristics; Phase II- evaluation of equipment capabilities; and Phase III- field operation evaluation.

NTIA worked with the Federal agencies and the FCC to develop a test plan for Phase I and coordinated the plan with the IRAC, the Test-Bed participants, and the public. DOD and DOE assisted NTIA in assessing the industry applications for participation in the Test-Bed.

Testing of the first DSA device began in March 2009. NTIA estimates it will take three to four months to complete the testing for each DSA device. After coordinating the test results with the Test-Bed participants, NTIA will issue a report documenting the results and publish it in the Federal Register for public review and comment.

Testing will assess how systems employing DSA sharing techniques can be implemented in conjunction with existing legacy radio systems. This will provide information as to regulatory changes needed to accommodate new Federal systems using DSA capabilities and to encourage the incorporation of such capabilities in future Federal spectrum-dependent systems. The Test-Bed was established as a means for the Federal agencies to work cooperatively with industry, researchers, and academia to

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<sup>21</sup> See website of the Digital Radio Mondiale Consortium for up-to-date information on the DRM standard-setting process, <http://www.drm.org>.

<sup>22</sup> Dynamic Spectrum Access technology allows a radio device to (i) evaluate its radio frequency environment using spectrum sensing, geo-location, or a combination of spectrum sensing and geo-location techniques, (ii) determine which frequencies are available for use on a non-interference basis, and (iii) reconfigure itself to operate on the identified frequencies.

<sup>23</sup> See generally, <http://www.ntia.doc.gov/ntiahome/frnotices/2006/spectrumshare/comments.htm>.

<sup>24</sup> See National Telecommunications and Information Administration, Docket No. 080129095-8096-01, 73 FR 6710 (Feb. 5, 2008) and *Federal Communications Commission Designates Spectrum and Provides Guidance For Participation In a Spectrum Sharing Innovation Test-Bed*, ET Docket No. 06-89, *Public Notice*, FCC 08-295 (rel. Feb. 5, 2008).

examine new technologies that can increase efficiency in spectrum use and improve spectrum management. The Test-Bed will continue through Fiscal Year 2010. Depending upon the success of the pilot program, NTIA will examine various options to establish an on-going Test-Bed program. Such an on-going program would enable NTIA, the Federal agencies, and non-Federal entities to continue to evaluate DSA and other emerging spectrum sharing technologies. NTIA expects that this pilot program will drive future innovation and increased sharing to benefit Federal and non-Federal users. It should serve as a proving ground and catalyst for advancing technologies important to the successful implementation of emerging spectrum sharing techniques such as DSA.

### **C. Commercial Services and Unlicensed Devices**

Use of commercial services by Federal users can reduce the need for spectrum allocated for Federal use and dedicated Federal systems, and often improve mission support. The agencies' annual reports indicate that they rely on and are expanding their use of commercial wireless services and devices. DOD continually evaluates commercial solutions and uses many of them, particularly commercial wireless communication systems. DOD also is one of the largest users of commercial satellite systems, leasing commercial mobile and fixed satellite services and capacity around the world.

The growing consumer demand for unlicensed devices has led to an explosion in technologies and an increasing demand for spectrum access. Some of these devices operate in frequency bands allocated for the radiolocation service, which are used primarily for DOD radar systems. Licensed systems also may operate or seek to operate in frequency bands used by DOD radar systems. For example, the DOD is evaluating the possible impact on its radar systems in the 3.5 GHz frequency range from commercial Worldwide Interoperability for Microwave Access (WiMax) systems. WiMax systems in this band are being licensed for use outside the United States. In the United States, this band is not available for such systems. Because DOD operates some of its systems outside the United States, it must consider the impact of such operations. The DOD is also analyzing other radar bands that may be at risk from emerging wireless technologies. The studies being performed by DOD will consider interference mitigation technologies and approaches for facilitating co-existence of radar and other communication systems.<sup>25</sup>

Some agencies are phasing out portions of their dedicated infrastructure and systems as they migrate to commercial services. For example, USDA has replaced many links between dispatcher systems and remote radio system controller sites with commercial landlines, resulting in a lower total cost of ownership. USDA plans to continue this conversion to commercial services as infrastructure supporting similar links reaches the end of its lifecycle. Some Treasury bureaus have migrated from agency-operated LMR systems and now exclusively use commercial services to satisfy their wireless voice and data requirements. The USPS utilizes commercial wireless services, particularly push-to-talk mobile radio. The USPS also leases service from commercial satellite systems and is increasing its use of unlicensed devices.

BBG is experiencing a decline in the use of High Frequency (HF) spectrum as other media such as TV, the internet and mobile digital media devices are more widely used throughout the world.

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<sup>25</sup> As an example, Dynamic Frequency Selection is being used by Unlicensed National Information Infrastructure (U-NII) devices to share with radar systems in the 5 GHz frequency range.

## D. Spectrum Engineering and Analytical Tools

NTIA's staff, in cooperation with the Federal agencies, continues to focus on developing models and tools to improve Federal spectrum management. NTIA completed a report on how spectrum efficiency in the LMR service can be improved.<sup>26</sup> Other studies will address spectrum efficiency for fixed service and radiolocation services.

NTIA is developing a Best Practices Handbook with the support of the Federal agencies, particularly DOD. The topics addressed in the Handbook include: antenna modeling, building attenuation modeling, propagation modeling, interference protection criteria, measurement techniques, encounter scenarios, receiver performance, bandwidth correction factors for various types of interfering signals, and aggregate interference analysis techniques. NTIA has drafted numerous technical documents which will form the basis for the Best Practices Handbook. The DOD has been actively engaged in supporting the development of these documents. For example, the DOD is updating the Communications Receiver Performance Degradation Handbook to include additional modulation, coding and interferer types, and to allow for analysis of the impact of a wide range of technologies and their associated signal structures.

DOD is continuing its development of the Spectrum Management Transition Initiative (SMTI). This was initiated to support relocation of Federal systems required by the CSEA.<sup>27</sup> SMTI improves automated spectrum management assessment and analysis by: (1) enhancing the current frequency assignment algorithms to increase spectral efficiency; (2) migrating to a web-based system with a simplified user interface; (3) developing a real-time frequency scheduling capability to enable more efficient assignment of frequencies at test and training facilities; and (4) developing an automated capability to support acquisition of replacement systems. The system also provides a simulation-based capability which can evaluate operational implications of relocation of systems from 1710-1755 MHz to other bands.

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<sup>26</sup> The first study created a database of frequency assignments from the Government Master File in the 162-174 MHz band, in the Washington, D.C., area. National Telecommunications and Information Administration, U.S. Department of Commerce, *Federal Land Mobile Operations in the 162-174 MHz Band in the Washington, D.C., Area, Phase 1: Study of Agency Operations*, NTIA Report 06-440 (August 2006) available at <http://www.ntia.doc.gov/osmhome/reports.html>. The second study used field measurements to characterize the federal LMR channel usage in the 162-174 MHz band (July 2007) available at <http://www.its.bldrdoc.gov/pub/pubs.php>. The third study used the results of the first two studies to derive the geographical coverage and traffic level specifications needed to design more spectrally efficient LMR systems that would provide the same level of performance and coverage as the current conventional LMR systems (December 2007) available at <http://www.ntia.doc.gov/osmhome/reports.html>.

<sup>27</sup> Supra Note 2. .

## ***VIII. Advanced Information Technology***

Information technology (IT) plays a key role in improving spectrum management as well as providing access to information on Federal spectrum use to Federal spectrum managers and, to the extent consistent with national security, the public. To automate and improve the existing system certification and frequency assignment processes, NTIA is developing the Federal Spectrum Management System (FSMS). This new system will provide a web-based interface which integrates current software and paper-based approaches used by Federal agencies to prepare their system certification and frequency assignment requests, identify frequency availability, and perform interference analyses. The FSMS will capture additional data on proposed frequency assignments, including geographic location and time factors of use. These additional data elements will assist the agencies in identifying where sharing spectrum and/or infrastructure with other Federal agencies might be feasible, and will provide more visibility for the Federal agencies into the spectrum use of their own and other agencies. It will also provide for easier identification of spectrum users and the parameters of such use for resolving possible interference situations.

DOD is working closely with NTIA in planning and developing the FSMS. DOE also has contributed to developing the FSMS Transition Plan. The Bonneville Power Administration (BPA) has volunteered to test the beta version of the FSMS. To enhance its spectrum related IT capabilities, DOE and other agencies utilize commercially available radio frequency interference analysis software. Use of such software has enabled DOE to analyze technical studies from Advanced Wireless Service (AWS) licensees to support implementation of the their systems in advance of the date required for relocation of DOE's operations in the 1710 – 1755 MHz band. Treasury is utilizing advanced radio propagation and engineering software based on the Telecommunications Industry Association Telecommunication Systems Bulletin (TSB)-88 commercial standard to perform interference analyses, frequency selection, and propagation studies.<sup>28</sup>

NTIA performed a technical study comparing the existing analysis methodology used by the Federal agencies and the methodology employed in TSB-88.<sup>29</sup> The technical analysis showed that greater frequency re-use among Federal LMR systems could be achieved by transitioning from the use of the current methodology towards the methodology recommended in TSB-88-B. Increasing frequency re-use by identifying more interference-free frequencies that can be assigned enables a more efficient use of the LMR frequency bands. In light of the increasing demands for LMR assignments, and to improve spectrum efficiency, Federal spectrum managers should use frequency assignment methods that accurately represent interference to and from systems in the environment. Consequently, NTIA recommended that Federal agencies use software based on the methodology described in TSB-88-B for assigning frequencies in the land mobile frequency bands. Use of the TSB-88-B methodology can help avert imminent LMR spectrum shortages faced by federal agencies, particularly in spectrally congested environments. The interference analysis methodology described in TSB-88B will be implemented within the FSMS for the Federal LMR bands.

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<sup>28</sup> Telecommunications Industry Association, Wireless Communications System Performance in Noise Limited Situations Recommended Methods for Technology Independent Modeling, TSB.88-1-C (May 2008) (TSB.88-1-C) (Copy on file with NTIA).

<sup>29</sup> National Telecommunications and Information Administration, U.S. Department of Commerce, Assessment of Federal and Non-Federal Land Mobile Radio Frequency Assignment Methodologies NTIA Report 07-447 (May 2007) available at <http://www.ntia.doc.gov/osmhome/reports.html>.

In the near to mid-term, IT improvements will support Federal spectrum management evolution and reduce paperwork, duplication of effort, and the time needed for application processing. The FSMS also will evolve over time to support assured and dynamic spectrum access as the technologies supporting such access mature.

DOD in FY08 established a Global Electromagnetic Spectrum Information System (GEMSIS) Program Office. GEMSIS initially will provide a coalition joint spectrum management planning tool and an online host nation spectrum worldwide database. Ultimately, the goal of GEMSIS is to provide a secure, globally-connected suite of spectrum management services, integrating spectrum management operations into net-centric operations.<sup>30</sup>

## ***IX. Reducing International Barriers to United States Technology***

### **A. World Radiocommunication Conferences**

NTIA served on the U.S. delegation to the 2007 World Radiocommunication Conference (WRC-07) held October 22 to November 16, 2007. NTIA worked with the FCC, the Department of State, and U.S. private sector interests to develop U.S. proposals and positions for WRC-07 and to pursue U.S. objectives at the conference.<sup>31</sup> The U.S. achieved its objectives at WRC-07 in part because of early cooperation within the U.S. preparatory process as well as early and on-going coordination with other western hemisphere nations.<sup>32</sup>

As described in the official delegation report on WRC-07, the United States substantially met its major objectives for the Conference, which included the following:

- **Identification of Spectrum for Wireless Broadband.** Identify spectrum and obtain favorable regulatory treatment for international deployment of international mobile telecommunications (IMT), to be used for advanced terrestrial wireless services (e.g., wireless broadband), while protecting the satellite and radar systems that rely on the C-band (3400-4200 MHz) from IMT identification to the maximum extent possible;
- **Protecting Wireless Broadband Rollout in the United States.** Secure stringent limits to protect emerging terrestrial systems from interference from satellite systems in the 2500-2690 MHz band and impose such limits as soon as possible;
- **Preserving Access to HF.** Prevent allocation of new frequencies for broadcasting in the 4-10 MHz HF band, which is already fully utilized;

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<sup>30</sup> "Net-centric", or "network-centric", refers to participating as a part of a continuously evolving, complex community of people, devices, information, and services interconnected by a communications network to optimize resource management and provide superior information on events and conditions needed to empower decision makers. The terms "information-centric" or "knowledge-centric" might better describe such eco-systems because the objective is to find and exploit information and the network itself is only one of several enabling factors along with sensors, data processing and storage, systems, and information distribution.

<sup>31</sup> The requirements the Federal agencies identified in their agency-specific strategic spectrum plans submitted in November 2005 were fully considered in developing the U.S. proposals to the conference.

<sup>32</sup> In 2005, NTIA issued a report recommending improvement to the United States preparatory process for World Radiocommunication Conferences. See National Telecommunications and Information Administration, U.S. Department of Commerce, *World Radiocommunication Conferences, Recommendations for Improvement in the U.S. Preparatory Process*, NTIA Report No. 05-427, May 2005, available at [http://www.ntia.doc.gov/reports/wrc/wrc\\_05232005.htm](http://www.ntia.doc.gov/reports/wrc/wrc_05232005.htm).

- **Resolving Conflicts between Scientific and Commercial Systems.** Balance the competing demands of protecting valuable scientific research conducted by passive sensing satellites without unnecessarily hampering deployment and operation of commercial and government services today and in the future;
- **Increasing Spectrum for Aeronautical Telemetry.** Obtain international recognition of bands in the 4-6 GHz frequency ranges as harmonized spectrum for aeronautical telemetry to be used for air-to-ground flight tests in designated test areas;
- **Providing Spectrum for Aviation.** Allocate new spectrum in the 112-117.975, 960-1164, and 5091-5150 MHz bands for aeronautical mobile satellite services to support modernization of civil aviation communication systems; and
- **Defining the Agenda for WRC-11.** Adopt an agenda for the next World Radiocommunication Conference that contains a manageable number of timely and significant agenda items.<sup>33</sup>

#### **B. Ensuring Access for U.S. Companies to International Markets**

NTIA, in FY08, released a report which addresses international barriers to implementation of United States telecommunications technologies and services and the impact of global and regional spectrum harmonization and standardization.<sup>34</sup>

#### ***X. Continuity of Government and Continuity of Operations Activities***

The Federal agencies refined their Continuity of Government (COG) and Continuity of Operations (COOP) plans and stepped up these activities in FY08, including greater organizational and testing efforts with respect to wireless systems in support of COG and COOP. Agriculture identified a secure mobile satellite solution compliant with National Communications System Security Directives (NCSD).<sup>35</sup> The agency also upgraded the secure cellular phones used by continuity of operations senior leadership. BBG upgraded its COOP Plan and physical facilities in support of COOP and COG. Its COOP site was relocated to provide for more efficient transfer of operations if and when the need arises. BBG has an on-going program to test its COOP plan. Treasury created an HF network to provide emergency communications between its bureaus' emergency operating centers (EOCs) and Treasury's EOC and headquarters. Treasury continues to install HF radios at each site. Treasury also is evaluating various commercial satellite systems to comply with NCSD requirements for secure backup communications.

#### ***XI. Unified Federal Response***

<sup>33</sup> *United States Delegation Report: World Radiocommunication Conference 2007*, U.S. Department of State, April 24, 2008 at 1-3.

<sup>34</sup> *Improving International Spectrum Management Policies and Framework*, U.S. Department of Commerce, National Telecommunications and Information Administration, March, 2008, available at

[http://www.ntia.doc.gov/osmhome/spectrumreform/International\\_Spectrum\\_Policy\\_Improvements\\_Report3-13-08\\_Final.pdf](http://www.ntia.doc.gov/osmhome/spectrumreform/International_Spectrum_Policy_Improvements_Report3-13-08_Final.pdf)

<sup>35</sup> See, National Communications System Library of Directives, available at <http://www.ncs.gov/library.html>.

NTIA and the Federal agencies are working together through the NTIA-led working level groups to complete the actions identified in the NTIA Spectrum Policy Initiative Implementation Plan published in 2006 and updated in 2008.<sup>36</sup> The actions in fulfillment of the Spectrum Policy Initiative, including the recommendations in the Task Force Reports<sup>37</sup> completed thus far, as well as projected dates for remaining actions, are contained in Appendix A of this FY08 report.

NTIA and the Federal agencies, in FY08, also worked together to develop executive branch policy recommendations to the FCC. Based on advice from the Policy and Plans Steering Group (PPSG) and the recommendations of the Task Force Reports, NTIA submitted to the FCC proposed amendments to two MOUs between the two agencies. These proposed changes would: (1) expand the role of the FCC Defense Commissioner to encompass critical national security, homeland security, public safety, law enforcement, and critical Federal transportation infrastructure interests; and (2) allow additional time for Executive Branch consultation with respect to proposed FCC actions which could significantly affect Federal missions.<sup>38</sup> NTIA continues to coordinate with the FCC to finalize the proposed language of these MOUs.

Also, during FY08, the PPSG arrived at a consensus Administration position with respect to the FCC's proceeding on a public safety broadband network in the 700 MHz band.<sup>39</sup> As a result, NTIA filed comments on behalf of the Executive Branch stressing the critical need for Federal emergency access to a public safety broadband network.<sup>40</sup>

The PPSG will continue to function in a high-level advisory capacity to NTIA's Assistant Secretary as complex policy matters arise.

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<sup>36</sup> National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President's Spectrum Policy Initiative – Implementation Plan*, March, 2006, available at <http://www.ntia.doc.gov/osmhome/reports/ImplementationPlan2006.htm>; and *2008 Update to the Implementation Plan* (Nov. 2008), available at [http://www.ntia.doc.gov/osmhome/spectrumreform/2008\\_Update%20to%20ImplementationPlan\\_Final\\_24Nov08\\_rev\\_1Dec08.pdf](http://www.ntia.doc.gov/osmhome/spectrumreform/2008_Update%20to%20ImplementationPlan_Final_24Nov08_rev_1Dec08.pdf).

<sup>37</sup> National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President's Spectrum Policy Initiative: Report 1* (2004) (Recommendations of the Federal Government Spectrum Task Force), available at [http://www.ntia.doc.gov/reports/specpolini/pressspecpolini\\_report1\\_06242004.htm](http://www.ntia.doc.gov/reports/specpolini/pressspecpolini_report1_06242004.htm) and *Report 2* (2004) (Recommendations from State and Local Governments and Private Sector Responders), available at [http://www.ntia.doc.gov/reports/specpolini/pressspecpolini\\_report2\\_06242004.htm](http://www.ntia.doc.gov/reports/specpolini/pressspecpolini_report2_06242004.htm).

<sup>38</sup> Letter from Meredith Attwell Baker, Acting Assistant Secretary for Communications and Information, NTIA, to the Honorable Kevin J. Martin, Chairman, FCC (dated May 23, 2008).

<sup>39</sup> *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, WT Docket No. 06-150, PS Docket No. 06-22, Third Further Notice of Proposed Rulemaking, 23 FCC Rcd 14301 (2008).

<sup>40</sup> "Public Comments: FCC Proceeding on Nationwide, Interoperable Public Safety Broadband Network," available at [http://www.ntia.doc.gov/filings/2008/FCC\\_700MHzDBlock\\_081125.pdf](http://www.ntia.doc.gov/filings/2008/FCC_700MHzDBlock_081125.pdf).

## CONCLUSION

NTIA's work on its *Spectrum Policy Initiative* accelerated in FY08 and additional action items identified in the Implementation Plan were completed. The Federal agencies improved internal processes, made more efficient use of spectrum, and considered alternatives for meeting future spectrum requirements. Accomplishments include: implementation of the Spectrum Sharing Innovation Test-Bed Pilot Program; publication of the Federal Strategic Spectrum Plan; issuance of a report on international barriers to introduction of U.S. technologies and services; publication of a plan for studying incentives for more efficient spectrum use; completion of several technical studies on means for increasing efficiency in the use of spectrum; use of the PPSG to develop consensus executive branch positions on telecommunications policy issues; and issuance by the CSMAC of recommendations for spectrum management improvements. In FY08, the Federal agencies prepared updated agency-specific strategic spectrum plans which are being used to prepare the update to the Federal Strategic Spectrum Plan.

## APPENDIX A

### SPECTRUM POLICY FOR THE 21<sup>ST</sup> CENTURY: Status of Deliverables and Target Dates as of April 2009

Project A: Improve Stakeholder Participation and Maintain High Qualifications of Spectrum Managers		
<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>A.1.</b> Establish a Commerce Spectrum Management Advisory Committee (CSMAC)	The NTIA established the Department's CSMAC to provide advice and recommendations to the Assistant Secretary for Communications and Information on a broad range of issues regarding spectrum policy, including the implementation of innovative technologies and services.	
	Advisory Committee Charter	May 2005
	Advisory Committee Re-Chartered	Mar.2007; Mar.2009
	Establishment of CSMAC	Jan. 2006
	Public Meetings	Dec. 2006; May 2007; Dec. 2007; Feb. 2008; Apr. 2008; Jul. 2008; Sept. 2008; Dec. 2008
	Advice to NTIA on Spectrum Sharing Test-Bed	Advice provided in Nov. 2007
	Committee Reports	Completed Sept.-Dec. 2008
	Transition Report to NTIA	Submitted in Dec. 2008

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>A.2.</b> Establish a High Level Interagency Advisory Group -- Policy and Plans Steering Group (PPSG)	The role of the PPSG, comprised of Assistant Secretaries or their equivalents in major spectrum-using Federal agencies is to advise the Assistant Secretary on complex and pressing spectrum issues that affect Federal agencies.	Meetings – Jan. 2005; Mar. 2005; Oct. 2007; Mar. 2008; Jul. 2008
<b>A.3.</b> Resolve Inter-governmental Spectrum Disputes Through the Existing White House Policy Coordinating Committee (PCC) Process and Revise the NTIA/FCC MOU to Provide an Additional Minimum 15 Business Days to Accommodate the PCC Process	MOU between NTIA and the FCC to provide additional minimum 15 business days to accommodate PCC process of resolving coordination issues between FCC and executive branch agencies.	PCC is on-going.  NTIA submitted revised proposed MOU language to the FCC in May 2008.  Coordination with the FCC is on-going.
<b>A.4.</b> Expand the Role of the FCC Defense Commissioner	MOU between NTIA and the FCC to expand the role of the FCC Defense Commissioner.	NTIA submitted revised proposed language to the FCC in May 2008.  Coordination with the FCC is on-going.
<b>A.5.</b> Promote a Career Development Program and Spectrum Management Training		Program reactivated in Jan. 2008; Master plan expected to be completed in Dec. 2009

**Project B: Reduce International Barriers to U.S. Innovations in Technologies and Services**

<i>Tasks</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>B.1.</b> Improve U.S. Preparations for World Radiocommunication Conferences (WRCs)	Study and recommendations on improvements to U.S. preparations.	Report issued in May 2005.
<b>B.2.</b> Improve International Spectrum Management Policies and Regulatory Environment	Study and recommendations on Impact of International Spectrum Management Policies and Regulatory Environment on U.S. Competitiveness.	Report issued in 2008.

**Project C: Modernize Federal Spectrum Management Processes with Advanced Information Technology**

<i>Tasks</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>C.1.</b> Implement Advanced Information Management Systems	The Federal Spectrum Management System will utilize advanced information technology to develop a web-based process for preparing and processing applications for system certification and frequency assignments. It will consolidate existing paper-based and multiple software systems, including Spectrum XXI and El-Cid.	On-going project; system will be developed by a contract system integrator in conjunction with NTIA staff and with input from the Federal agency user community.
Project 1 - FSMS Core Enterprise Services	Setup hardware and network infrastructure, SOA, Oracle middleware, Documentum base product, requirements development, New FreqNet Portal, baseline C&A.	To be completed by Sept. 2009.
Project 2 - Cross Domain Security Solution	Establish and accredit CDSS IOC.	Deferred to a later date due to high cost. Continuing to research alternate solutions.
Project 3 - Spectrum Policy and Planning Authorization	Implement portal services & Spectrum Policy and Planning workflows.	To be completed by Mar. 2013.
Project 4 - NARA Records Exchange	Establish electronic document exchange between NARA and OSM.	To be completed by Mar. 2011.
Project 5 - Spectrum Regulation	Implement Frequency Assignment & System Certification workflows.	To be completed by Apr. 2014.
Project 6 - Spectrum Analysis	Implement Analysis of Spectrum Use Services & Assignment Review workflows.	To be completed by Aug. 2012.
Project 7 - Industry Portal	Implement equipment manufacturer self-certification	To be completed by Mar. 2012.

**Project D: Satisfy Public Safety Communication Needs and Ensure Interoperability**

<i>Tasks</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>D.1.</b> Spectrum Sharing between Federal and Non-Federal Public Safety Agencies	Assessment of feasibility of spectrum sharing between Federal and non-Federal Public Safety Entities.	Completed. Report on Federal/non-Federal spectrum and infrastructure sharing published Jun.2007.

<b>Project E: Enhance Spectrum Engineering and Analytical Tools</b>		
<i>Tasks</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>E.1.</b> Develop Analytic Approaches, Software Tools, and Engineering Techniques for Evaluating and Improving the Efficiency and Effectiveness of Federal Spectrum Use	<p>The deliverables will be a series of reports that make recommendations for improving spectrum efficiency for the following radio services: land mobile radio, fixed, radiolocation, and satellite.</p> <p>These reports will be used to develop a spectrum efficiency recommendations report that includes an approach and timeframe for implementing the recommendations. The goal of these activities is to identify and utilize the recommended techniques to improve efficiency in Federal use of spectrum.</p>	<p>Report on Spectrum Efficiency Recommendations</p> <p>To be submitted for NTIA clearance in Sept. 2010</p>
	NTIA Report TR-08-455, Measurements of Land Mobile Channel Occupancy for Federal bands 162-174 MHz and 406-420 MHz in the Denver CO area.	Published in 2008
	Recommendations to Improve Spectrum Efficiency in the Federal Land Mobile Radio Frequency Bands.	Sent to Federal agencies for review in 3 <sup>rd</sup> Quarter 2009
	Assessment of Federal and Non-Federal Fixed Point-to-Point Microwave Radio Frequency Assignment Methodologies.	Under review by the Federal agencies; expected in 4 <sup>th</sup> Quarter 2009
	Channel plans for the 7/8 GHz fixed service bands.	Completed in 2 <sup>nd</sup> Quarter 2009
	Implement channel plans for the 4 GHz fixed service bands.	Expected completion in 4 <sup>th</sup> Quarter 2009.
	Implement channel plan for the 7/8 GHz fixed service bands.	Expected completion in 4 <sup>th</sup> Quarter 2009.

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>E.2.</b> Develop and Promote Recognition in the Spectrum Management Community for Best Practices in Spectrum Engineering	Best Practices Handbook	Expected completion in Dec. 2010
	DOD Joint Spectrum Center Report prepared for NTIA, Communications Receiver Performance Degradation Handbook Phase 2	Expected completion in 4 <sup>th</sup> Quarter 2009
	Technical Memorandum on Radiowave Propagation Modeling	Expected completion in 4 <sup>th</sup> Quarter 2009
	Technical Memorandum on Antenna Modeling	Expected completion in 4 <sup>th</sup> Quarter 2009
	Technical Memorandum - Description of a Model to Compute the Aggregate Interference from Radio Local Area Networks Employing Dynamic Frequency Selection to Radars Operating in the 5 GHz Frequency Range	Expected completion in 4 <sup>th</sup> Quarter 2009
	Initial Short Range Mobile-to-Mobile Propagation Model	Expected completion in 4 <sup>th</sup> Quarter 2009
<b>E.3.</b> Conduct a Pilot Program to Evaluate Approaches and Techniques to Increase Spectrum Sharing Between Federal and Non-federal Spectrum Users	Establish, conduct and evaluate results of use of devices and technologies to facilitate sharing through Spectrum Sharing Innovation Test-Bed	
	Notice of Solicitation for Participation in the Test-Bed, 73 Fed. Reg. 6710 (Feb. 5, 2008)	FR Notice in 2 <sup>nd</sup> Quarter 2008
	Submission of Test-Bed Applications	Submitted in 2 <sup>nd</sup> Quarter 2008
	Selection of Test-Bed Participants	Completed in 3 <sup>rd</sup> Quarter 2008
	Phase I Test Plans	Completed in 1 <sup>st</sup> Quarter 2009
	Phase I Testing	Started in 2 <sup>nd</sup> Quarter 2009
	FY2009 Test-Bed Progress Report	Expected completion in 4 <sup>th</sup> Quarter 2009

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>E.4.</b> Develop and Promote the Use of Modern Analytic Tools	Catalog with spectrum management analytical tools.	
	Prepare initial spectrum management models and tools catalog for use by Federal spectrum users,	Expected completion in 4 <sup>th</sup> Quarter 2009
	Initial catalog of spectrum management analytical tools provided to Enterprise Architecture Council Working Party 4.	Expected completion in 4 <sup>th</sup> Quarter 2009
	Official catalog is an on-going effort requiring constant updates when new spectrum management analytical tools are developed.	On-going

**Project F: Promote Efficient and Effective Use of Spectrum**

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>F.1.</b> Improve the Technical Planning Process	Recommendations for changes to the NTIA Manual with respect to the Spectrum Certification process.	Expected completion in 4 <sup>th</sup> Quarter 2009

**Project G: Improve Long-Range Planning and Promote Use of Market-Based Economic Mechanisms in Spectrum**

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>G.1. Improve the Processes for Federal Agencies' Spectrum Planning and Produce a National Spectrum Plan</b>	Federal Strategic Spectrum Plan published biannually; Annual Reports on Progress with respect to the President's Initiative; National Strategic Spectrum Plan; guidance to the Federal agencies concerning agency strategic spectrum planning	
	Federal Strategic Spectrum Plan	Published in Mar. 2008
	Activities within WLG-G with respect to Federal agency strategic spectrum planning	On-going
	Update to FSSP	Draft completed Mar. 2009
	FY2007 Progress Report on the President's Initiative	Published in Nov. 2008
	FY2008 Progress Report on the President's Initiative	Draft completed Apr. 2009
	Develop a National Strategic Spectrum Plan (NSSP)	Letter to FCC seeking participation in Jun. 2008; expected completion TBD
	Draft options for obtaining data relating to non-Federal spectrum use and future requirements such as NOI	Expected completion TBD
	Draft outline of NSSP (note: requires coordination with and participation of FCC)	Expected completion TBD
	Gather Data	Expected completion TBD
	Draft NSSP	Expected completion TBD
	Publish NSSP	Expected completion TBD

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>G.2. Improve Federal Agencies' Processes and Procedures to Better Consider the Economic Value of Spectrum When Investing in Spectrum-Dependent Systems</b>	Guidance to the Federal agencies on compliance with Section 33.4 of OMB Circular A-11 on considering spectrum value when seeking funding for major spectrum-dependent systems; guidance to the Federal agencies concerning integration of spectrum planning with capital and strategic planning	
	OMB guidance - OMB added Section 33.4 to Circular A-11 to require Federal agencies to consider the value of spectrum for major spectrum-dependent systems	Nov. 2004
	Guidance to Federal agencies on compliance with Section 33.4 of Circular A-11 - Draft guidance paper within WLG-G (WLG-G-07/ 39 rev.2) (Note: awaiting input on method for calculating the economic value of spectrum)	TBD based on input on method for calculating economic value
	Integration of Spectrum Management Decision-making into Agency Capital Planning and Strategic Planning Activities	On-going
	In conjunction with WLG-F consideration of whether revisions to NTIA Manual may be required	On-going

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>G.3.</b> Develop a Plan to Identify and Implement Incentives for Improving Efficiency in Federal Agencies' Spectrum Use (in conjunction with the Office of Policy Analysis and Development)	Incentives Implementation Plan; workshop on economic and other incentives for efficient use of spectrum; study on international practices with respect to incorporation of market mechanisms into spectrum management	
	Prepare Incentives Implementation Plan	Forwarded to the White House in Mar. 2006; published Nov.2008
	Conduct workshop on the use of economic or other incentives in order to increase the efficiency of Federal and non-Federal spectrum use	Feb. 2006
	Examine international practices that incorporate market mechanisms into more efficient spectrum use	Study (unpublished) completed in 2006

<i>Task</i>	<i>Deliverables</i>	<i>Status/Target Deliverable Dates</i>
<b>G.4</b> Promote the Implementation of a Wide Range of Incentives to Improve the Efficiencies of Both Government and Private Sector Spectrum Use (in conjunction with the Office of Policy Analysis and Development)	Contractor-produced study providing unit of consumption for spectrum use; revised structure for current OSM cost-recovery fee for Federal agency spectrum use; study on Federal spectrum value and development of fees to promote efficient use of spectrum; draft legislation to implement spectrum use fees; study on sharing between Federal agencies and non-Federal unlicensed systems; study on Federal spectrum rights; proposals to provide Federal agency more flexible rights with respect to spectrum to enable sharing with other Federal agencies and non-Federal entities	
	Enter into contract or MOU with outside organization to develop a unit of consumption for and a methodology to estimate the value of spectrum used by the Federal government (OPAD lead with support from OSM)	TBD
	Consideration of revised structure for administrative cost-recovery fees (OSM lead)	TBD
	Evaluation of possible spectrum use fees applied to Federal agency spectrum use based on spectrum use/value (dependent on completion of contract study as referenced above)	Expected completion TBD
	Evaluation of possible draft legislation to implement a spectrum use fee (dependent on completion of contract studies referenced above)	Expected completion TBD
	Consideration of possible implementation of spectrum use fees for Federal agencies (dependent on completion of preceding tasks and Congressional action)	Expected completion TBD
	Case study on 5 GHz sharing and specific proposals to increase sharing through new technologies and techniques for dynamic spectrum sharing	Draft completed in Jan. 2009
	Study of the rights afforded to federal spectrum users and proposals to give Federal agencies broader authority to use radio spectrum	Expected completion TBD

## **APPENDIX B**

### **Spectrum Policy Initiative: Reports and Reference Documents**

#### **1. Federal Strategic Spectrum Plan**

National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President’s Spectrum Policy Initiative: The Federal Strategic Spectrum Plan* (March 2008), available at <http://www.ntia.doc.gov/reports/2008/FederalStrategicSpectrumPlan2008.pdf>.

#### **2. Annual Progress Reports**

National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President’s Spectrum Policy Initiative: First Annual Progress Report* (unpublished).

National Telecommunications and Information Administration, U.S. Department of Commerce, *Spectrum Policy for the 21<sup>st</sup> Century – The President’s Spectrum Policy Initiative: Second Annual Progress Report* (October 2007), available at <http://www.ntia.doc.gov/reports/2007/SpectrumPolicySecondReport2007.pdf>.

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05-432	 Interference Protection Criteria: Phase 1 - Compilation from Existing Sources -technical report
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